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simulation entwicklung consulting

Manual and configuration

Enertex®

Dual KNX PowerSupply 1280

Manual

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Note

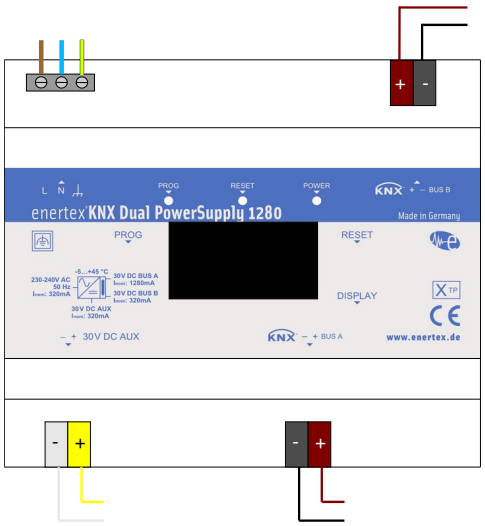
Inhalt

Safety Instructions

- Installation and assembly of electrical devices may only be carried out by qualified electricians.
- When connecting KNX / EIB devices, specialist knowledge through KNX™ training courses is required.
- If the instructions are not followed, damage to the device, fire, a dangerous electric shock or other hazards may occur.
- The manufacturer is not liable for any costs or damages incurred by the user or third parties as a result of the use of this equipment, misuse or malfunction of the connection, malfunction of the equipment or the subscriber equipment.
- Opening the housing, other unauthorized changes or modifications to the device will void the warranty!
- The manufacturer is not liable for improper use.

Commissioning

Assembly and connection



CAUTION!

Electric shock when touching live parts. Electric shock can lead to death.

Before working on the device, disconnect the connecting cables and insert live parts in of the surrounding area!

For safety reasons, the protective conductor must be connected!

The mains voltage is connected to the 3-pole screw terminal located at the top left.

The mains cable must be fused with 16 A or less.

The two EIB / KNX buses are connected to the two black / red terminals. Please pay attention to the polarity!

Peripheral devices (30 V DC) or a choke for another EIB / KNX line can be connected to the white / yellow terminal located at the bottom left. The auxiliary voltage input of KNX devices where the KNX ground is internally connected to the ground of their auxiliary voltage input (e.g. Gira S1/X1, various weather stations, ..) must not be supplied via the AUX output, as this has a negative effect on the signal quality of the KNX signals. In case of doubt, the connection of the two grounds within a device can be checked with a multimeter while the device is disconnected. Please pay attention to the polarity!

Connection with Enertex® KNX TP Secure coupler

When using two KNX lines in a project, an additional coupler is usually used to enable communication between the two lines. The Enertex® KNX TP Secure coupler is suitable for this purpose. Its "MAIN LINE" connection can either be connected to the output Bus A of the Enertex® KNX Dual PowerSupply or to the connection Bus B. This selection of the connection has no effect on the functionality of the overall system. The "SUB LINE" connection of the coupler is then finally connected to the remaining bus output of the KNX power supply.

Commissioning functions

After correct installation and connection of the device, the mains supply voltage can be switched on. The integrated bus coupler is ready for operation as soon as the POWER LED flashes briefly every second. Then the voltages and currents at all three outputs are shown on the display.

The unit can then be programmed using ETS 5 or higher. The programming can be either secure (entry of the Secure key required) or unsecure. In secure mode, the device communicates encrypted on the bus using the KNX™ Data Secure protocol.

Functional description

Brief description

The Enertex® KNX DUAL PowerSupply 1280 provides with a single device two separately operating KNX power supplies with 1280 mA and 320 mA and a third 30V auxiliary power supply with 320 mA (100% overload capable). The device enables a compact realisation of a powerful inner line in combination with another physically and topologically separated second outer line.

The additional unchoked 30 V auxiliary voltage output provides a DC supply for further devices or, by means of a further external KNX choke, a third KNX line (320 mA). Each of the three outputs has its own current limiter, which protects against short circuit and overload. The limitation is selective so that if one output or KNX line is short circuited, the other two outputs or lines can continue to operate normally.

The device has additional measuring and diagnostic functions. Measured values and device parameters are shown on the OLED display of the device, e.g. current, voltage, peak current with time stamp for both KNX lines and the auxiliary voltage output. This simplifies commissioning, maintenance and analysis of the KNX installation.

Further measurement and diagnostic data are sent to the main line via group objects, including device temperature, telegram rate, energy meter, the last bus voltage failure, the last bus voltage recovery and the last bus reset, each with a time stamp.

Communication via group addresses is carried out with standard KNX protocol unencrypted or encrypted with KNX Data Secure. A bus reset is carried out for output Bus A and Bus B using KNX group addresses.

The KNX DUAL PowerSupply 1280 also has an integrated real-time clock with a power reserve of approx. 36 hours and can be parameterised as a timer. An extensive switch clock application with 64 switching times for max. 64 group addresses, including extensive logic functions, holiday calendar and astro function is integrated. The time switches can directly address KNX group addresses switching, dimming, blinds, scene, colour RGB, colour HSV and operating mode heating controller.

Display and operating elements

Button PROG

Switch programming mode on/off:
Press the button. The unit is set to programming mode and can be programmed by means of ETS 5 or higher.

Trigger factory reset:
Press for at least 10 seconds until PROG LED flashes

Button RESET

Show info about reset triggering:
Press briefly < 1 s

Switch off KNX line Bus A for 20 seconds:
Press between 3 ... 6 seconds

Switch off KNX line Bus B for 20 seconds:
Press between 7 ... 10 seconds

Button DISPLAY

Activate display / scroll through pages:
Press the button.

LED PROG

On: Device in programming mode

LED RESET

On: During a bus reset on Bus A or Bus B for 20 s

LED POWER

Flashes briefly every second: Device in normal operating mode

DISPLAY

After one minute the display switches off automatically. To switch it on again, press the DISPLAY button briefly.
When the display is switched on, pressing the DISPLAY button causes the display to scroll

through various information pages.
The following information is shown on the display:

Menu structure on the display

#	Page name	Designation	Description
1	Actual Values	Bus A	Current / voltage or "OVERCURRENT", if current over 2700 mA
		Bus B	Current / voltage or "OVERCURRENT", if current over 800 mA
		AUX	Current / voltage or "OVERCURRENT", if current over 800 mA
		TEMP	Device temperature
		TIME	Current time of the device (corresponding to communication object 34)
		DATE	Current date of the device (corresponding communication object 35)
2	Max. Currents	Bus A	Max. current with time of maximum (time, date)
		Bus B	Max. current with time of maximum (time, date)
		AUX	Max. current with time of maximum (time, date)
3	Telegrams Bus A	Act. Telegrams	Current telegram rate in telegrams / second from Bus A
		Av. telegrams	Average telegram rate in telegrams / second from Bus A. Average value since restart of the device
		Max. Telegram	Maximum telegram rate in telegrams / second from Bus A with time of maximum (time, date)
4	Device Info	Software	Version of the firmware. For firmware updates, refer to section Firmware Update. →Firmware update
		PHY	Physical address on the bus. Factory setting: 15.15.255
		SNR	Serial number of the device
5	Secure- Key		QR code for scanning the Secure Key (FDSK) with the ETS or with the Smartphone App "JUNG KNX Secure Scanner”
			Secure key (FDSK) as text

Table 1: Menu structure on the OLED display

Instructions for use

This chapter provides background information on the various application scenarios and parameterisation options of the Enertex® Dual KNX PowerSupply 1280. A detailed description of the ETS application follows in the further course in the chapter ETS application. Within the individual chapters there are often cross-references to the corresponding parameter descriptions. The parameter descriptions contain cross-references to the explanations.

Factory reset

If you want to reset the unit to the factory settings, press the PROG button on the front panel for 10 seconds. After this time the red LED starts flashing - then the PROG button can be released and the unit will reset to factory settings. On delivery the phy. address of the unit is 15.15.255 and the ETS application is unloaded.

Bus Reset

A bus reset can be triggered on Bus A or Bus B by pressing the reset button for a longer period of time. To reset Bus A, the push-button must be pressed for 3 - 6 s, for Bus B 7 - 10 s. Alternatively, the two resets can also be performed remotely via object „Remote Bus Reset - Bus A“ (ID17) and „Remote Bus Reset - Bus B“ (ID18). → Communication objects

A bus reset disconnects the respective bus line from the power supply and short-circuits the line for 20 s, so that all devices in the line are reset and restarted. Since the internal bus coupler, which provides diagnostics and timer functions, is connected to Bus A, it is also reset and restarted as soon as a reset is triggered on Bus A.

Firmware update

The firmware of this device can be updated. This is done, as with all other Enertex® devices, very easily via the KNX bus using the software Enertex® Updatetool. At

http://www.enertex.de/d-downloads.html

you can download the Enertex Updatetool including detailed instructions. On this download page, the latest firmware versions for all Enertex devices can also be downloaded.

Failure on an output

If there is a failure on one of the three outputs, this has no effect on the other two outputs. The following table shows the scenarios for the specific case of a short circuit or excessive overcurrent at an output:

Bus A	Bus B	Aux	Impact
Short-circuit / Current over 2700 mA	Normal operation	Normal operation	- Failure of Bus A - Normal operation of Bus B (voltage > 28V) - Normal operation of Aux (voltage > 28V) - Display is off, because integrated bus coupler is connected to Bus A
Normal operation	Short-circuit / Current over 800 mA	Normal operation	- Failure of Bus B - Normal operation of Bus A (voltage > 28V) - Normal operation of Aux (voltage > 28V) - Display shows "OVERCURRENT" for Bus B
Normal operation	Normal operation	Short-circuit / Current over 800 mA	- Failure of Aux - Normal operation of Bus A (voltage > 28V) - Normal operation of Bus B (voltage > 28V) - Display shows "OVERCURRENT" for Aux

Table 2: Failure conditions

Separation between Bus A and Bus B

The device provides a power supply for two bus lines. These are connected to the output Bus A and Bus B. Each of the two lines is equipped with its own KNX choke, its own reset circuit and its own overcurrent limiter. This means that they operate like two separate lines with regard to bus communication and fail-safe operation. This means that an overcurrent or short circuit in one line does not affect the other line. As well, communication between the two lines is only possible when using a KNX TP coupler. Since the bus coupler integrated in the device, which provides diagnosis and timer functions, is connected to Bus A, the device can only

communicate on Bus A, if not using a KNX TP coupler.

Measurements

The device measures current and voltage on all three outputs every second and also the device temperature and the telegram rate on Bus A. These measured values are shown in real time on the display.

According to the parameterisation, the measured values are sent to the KNX bus cyclically and / or on change or on explicit request using the objects "Request measured values" (ID48) or "Request extreme values" (ID49). → Communication objects

Different KNX data types are also available for the output of current, voltage and temperature values. These types can be parameterised. → Parameters

Extreme values

The minimum and maximum measured value of a measured variable is stored in one extreme value communication object each. This allows the area, in which a measured variable is located, to be displayed or to detect a critical situations.

All extreme values are resetted each time the device is restarted. They are also resetted by the analysis reset.

Energy meter

The energy meters are used to monitor energy consumption.

On the one hand, the energy consumed from the mains and on the other hand the sum of the energy over the three outputs is measured. For both measurements, three counter readings are provided in each case, which display the energy consumed in relation to different starting times (lifetime, since restart, since analysis reset).

Send cyclically

Measured values, extreme values and energy meters can be sent cyclically on the bus. This function is used, for example, for the equidistant indication of a measured value on the bus or in a diagram, respectively.

When activated, the corresponding values are transmitted on the bus with a cycle time which can also be parameterised with the ETS. The first transmission is carried out shortly after a restart of the application. From this point on, the value is then transmitted cyclically. The transmission processes are not synchronised with the time of day.

If the cycle time 0 is parametised in the ETS, the value is never transmitted cyclically.

Send on change

Measured values and extreme values can be sent on the bus when changes occur. This function is used for the complete representation of a measured value on the bus or in a diagram, respectively. As the measured values are only sent after a change, this can be done with minimum bus load. At most one change of a measured value per second can be sent on the bus.

In the ETS it can be parameterized, after which change the value on the bus is sent again. This

value is always specified as a percentage. The first transmission is always performed shortly after a restart of the application. From this point on, a new value is transmitted if the measured value has changed by more than the percentage value set with respect to the value last transmitted on the bus. It does not matter whether the last value sent was sent on the bus due to the function "cyclical transmission", "transmission on change" or "request measured values" (ID48). → Communication objects

With the setting "Send on change" it must be noted, that the last transmitted measured value can differ from the actual current measured value by up to the percentage value that was parameterised in the ETS. With the help of the adjustable percentage value, however, a suitable compromise between the deviation of the indication from the actual measured value and the bus load can be selected.

If the percentage value 0% is specified in the ETS, the value is never sent when it changes.

Limit values

In the application, limit values can be defined for all measured currents, voltages, temperatures and telegram rates. Exceeding or falling below these limit values triggers corresponding telegrams on the bus. In this way, for example, overloads, overvoltages, undervoltages, voltage dips or critical telegram rate overruns can be signalled on the bus. These telegrams can be used, for example, for alarm messages or directly to initiate (i.e. switch) appropriate countermeasures.

If a limit value is exceeded, then value 1 is sent to the corresponding communication object "Limit value exceeded/undercut - Status". If the value falls below the limit value, value 0 is sent to the same communication object. The limit values must be specified as absolute values.

A hysteresis can also be defined for the limit values. This prevents a flood of telegrams in case of a fluctuation of a measured value around the limit value (In extreme cases, at most of one telegram per second can be sent to the bus for limit values without hysteresis). The setting of a hysteresis has the consequence that value 1 is only sent to the limit value status object, when the measured value exceeds the value "parameterised limit value + 1/2 x parameterised hysteresis range value". Similarly, the value 0 is only sent to the limit value status object, when the measured value falls below the value "parameterised limit value - 1/2 x parameterised hysteresis range value".

Function of the time switch

Description

Up to 16 time switches can be configured, each with an identical structure. For each of the 16 time switches a maximum of 4 so-called switching times can be parameterised. The parameterisation is carried out in the sub-menu called switching time 1 .. 4. There you can set a time and a telegram (or several) to be sent.

As the following figure shows, a telegram is sent on the bus when the switching time has occurred and the parameterised conditions for date or objects are fulfilled:

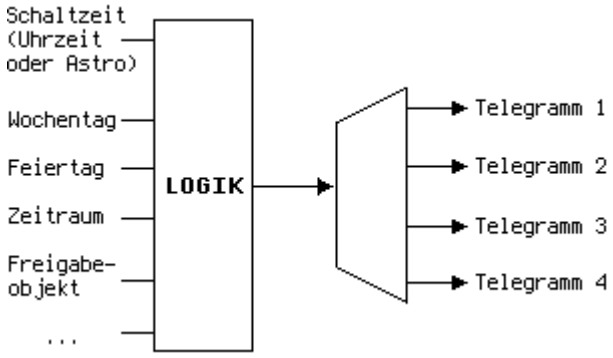


Figure 1: Diagram of the time switch

When a time switch is activated a telegram with the corresponding communication object is sent to the bus, e.g. "CO-178: Telegram 1". For the communication object, the type and the value to be sent must be pre-parameterised in the ETS. This is done under "Time switch - Configuration". The logic block shown in the figure is valid for the complete time switch, i.e. it is always the same for all 4 switching times of the time switch. It is configured under "Time-switch - Config". As inputs for the logic, special weekdays, public holidays, certain time periods or one of 3 global release objects (ID164 - 166) from the bus can be used.

To use public holidays and periods, these must be defined before under "Define public holidays" or "Define periods".

Lock objects

Each time switch also has its own lock object (ID173 for time switch 1, ID182 for time switch 2, ..), with which the switching times of the time switch can be set to inactive. All switching times of the time switch are inactive as long as the lock object has the value ON. If the lock object is OFF or the lock object is not linked, the time switch is active.

Example - Shutter control

The following example describes the often required application of a timer for a shutter control. Two shutter in the bedroom and in the kitchen, should be raised in the morning and lowered in the evening. Since the shutting down of the blinds in the evening should take place depending on the sunset, the astro function is used there. In addition, the blinds will be raised later in the morning on non-working days than on working days.

Two time switches are required for this functionality, as a distinction is made between working days and non-working days. For this reason, the number of time switches is set to 2 in the tab "Set time switches".

To drive the shutter, depending on the sunset, the astro function must be configured in the "Astro function" tab. There the location and the time zone must be defined.

As each time switch must trigger an action in the morning and in the evening, two switching times are required per time switch. The number of switching times is set in the tab "Time switch 1 - Config" and in the tab "Time switch 2 - Config".

A clearer structure of the parameterisation can be obtained by renaming the tabs appropriately. For this purpose the time switch 1 is renamed to "TimeSwWorkingDay" and time switch 2 to "TimeSwFreeDay". This is done via the input fields "Timer designation". Likewise, switching time 1 and switching time 2 are renamed to "Morning" and "Evening". This results in a very clear structure:

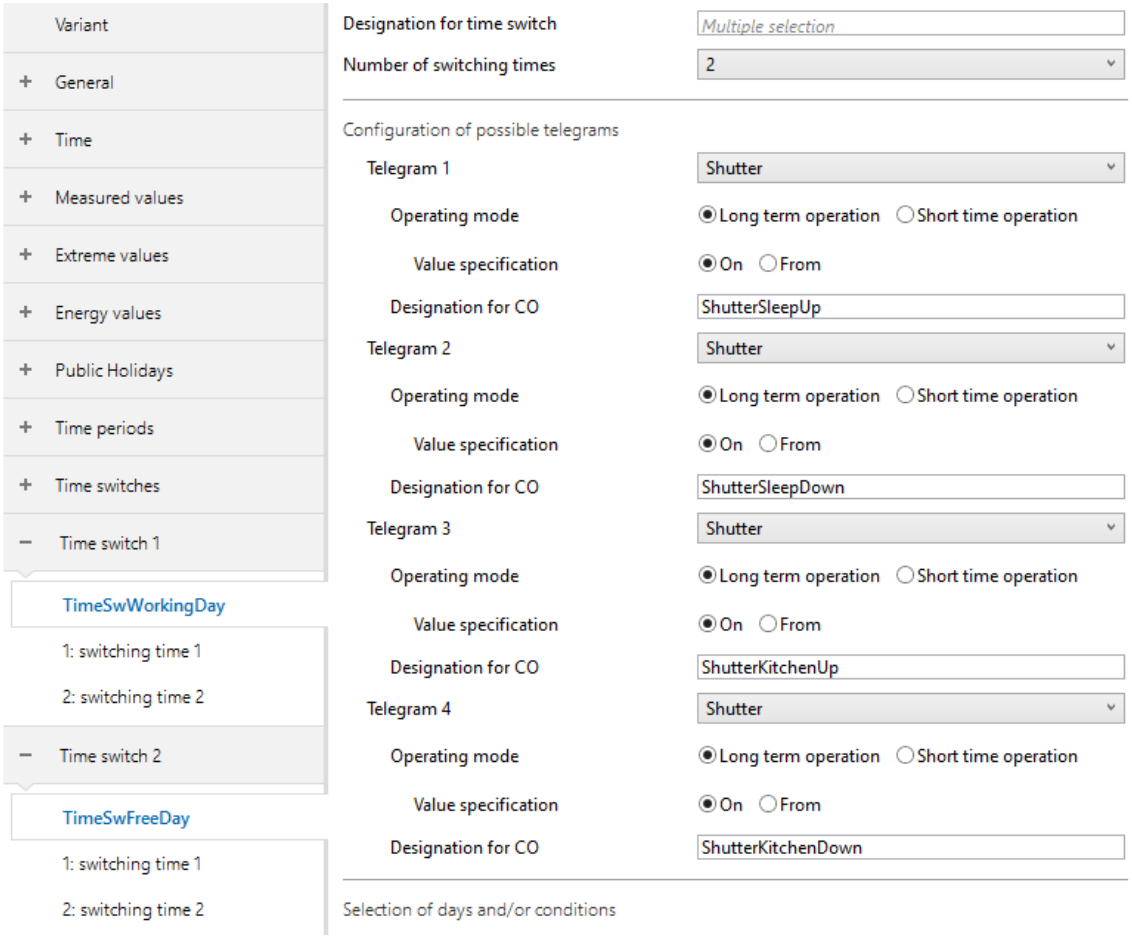


Figure 2: Predefined telegrams for the time switches

The next step is to configure the telegrams that should be sent at the switching times. Four different telegrams are required for the described application:

- Telegram 1 with value "Up" for the roller blind in the bedroom
- Telegram 2 with value "Down" for the roller blind in the bedroom
- Telegram 3 with value "Open" for the roller blind in the kitchen
- Telegram 4 with value "Down" for the roller blind in the kitchen

These four telegrams are configured in the "Time switch - Config" tab under "Configuration of possible telegrams". A data type and a value must be entered for each of the four telegrams. As can be seen in Fig. 2, the type long term blind operation is selected for all four telegrams. Telegrams 1 and 2 should be linked to the shutter in the bedroom, telegrams 3 and 4 to the shutter in the kitchen. Telegrams 1 and 3 are assigned the value "Up". This means that these communication objects are intended for raising the shutter. Telegrams 2 and 4 are used with the value "Down" to lower the shutter. The four communication objects can be named accordingly using the text fields "Designation for KO", which is used here for clarity. The communication object for telegram 1 is sensibly renamed "ShutterSleepUp". From this name, the function, location and value for the communication object can be seen immediately. Since the same telegrams are also required for time switch 2, these can be parameterised together by using the multiple selection with the control key in the ETS.

In the tab "1:Morning" the switching time in the morning can now be defined. In the example, a fixed time for working days is selected here, whereby the shutter can also take over an wake up

function:

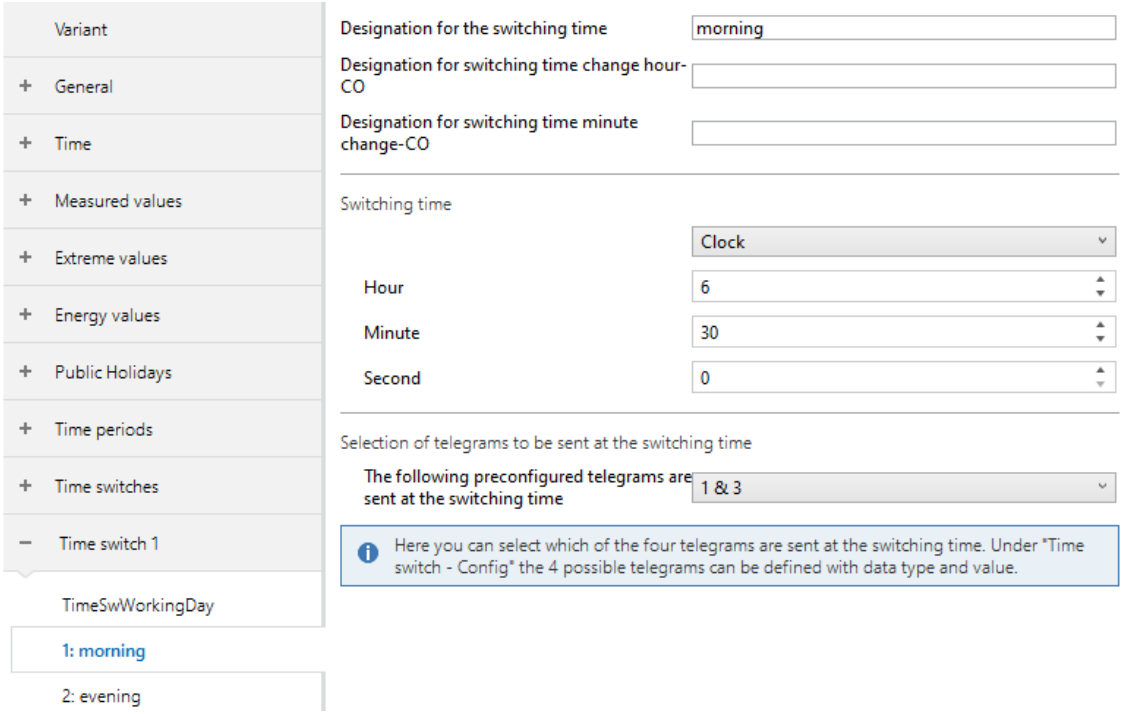


Figure 3: Morning switching time

In addition, the telegrams to be sent at this switching time must be selected here in the lower area. These would be telegrams 1 and 3, whose communication objects have previously been renamed "ShutterSleepUp" and "ShutterKitchenUp".

The second switching time called "2:evening" is parameterised depending on the sunset:

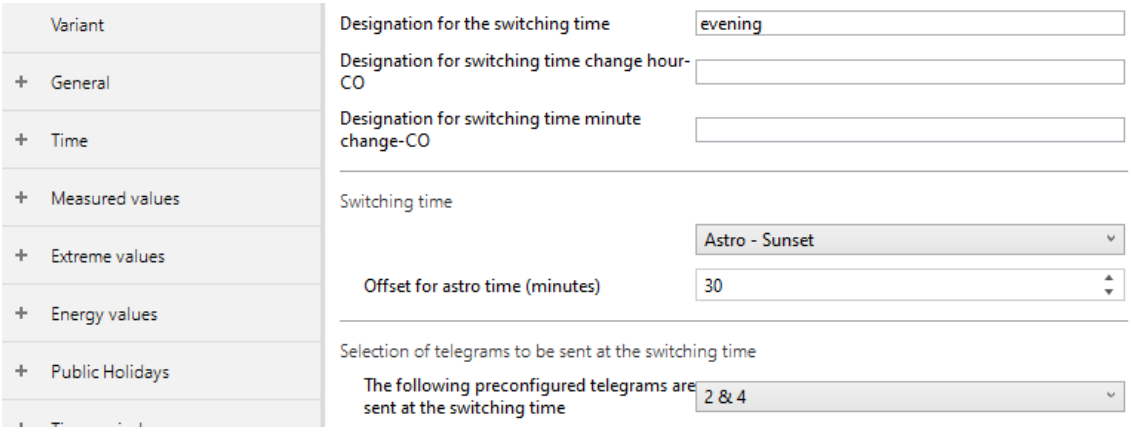


Figure 4: Evening switching time

Due to the offset selected here, the two shutters are lowered 30 minutes after sunset. Here, too, the assignment to the pre-configured telegrams must be made. These would be telegrams 2 and 4 here, whose communication objects were previously renamed "ShutterSleepDown" and "ShutterKitchenDown".

The two switching times for time switch 2 are configured almost identically in the example. Thus, the multiple selection of the ETS could again be used for common parameterisation. In the example, however, the switching time "1:morning" for time switch 2, which is only to be active on non-working days, is subsequently changed to 9:30 a.m., so that the "Wake up function" on non-

working days takes place later.

In addition, the days on which the respective time switch is active must also be specified. This is again done in the tab "TimeSwWorkingDay". The following figure shows these conditions:

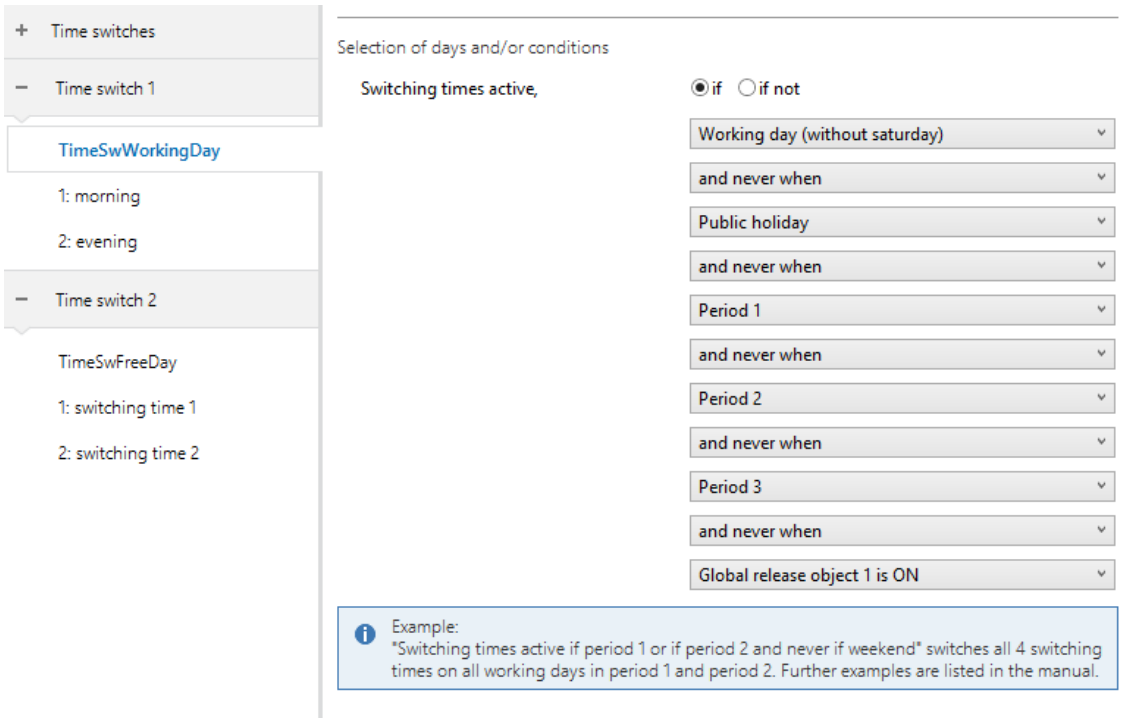


Figure 5: Conditions for time switch 1: TimeSwWorkingDay

According to the selected conditions, the two switching times of time switch 1 are active if a working day (Mo-Fr) but no public holiday (public holidays are defined later), no period 1 (is defined later as Easter holidays) is active, no period 2 (is defined later as Whitsun holidays), no period 3 (is defined later as Christmas holidays) and the "Global release object 1 ON" is not. The "Global Release Object 1" is a 1-bit object provided by the bus. The object could be used for example as a "holiday object" and set by a push button (possibly also by a button on the web server) at the beginning of a holiday and cleared at the end of a holiday. With this parameterisation the time switch is active on all days on which you go to work.

The time switch 2 is now parameterised to the contrary, so that it is only active on days when you have time off. This is done with this parameterisation:

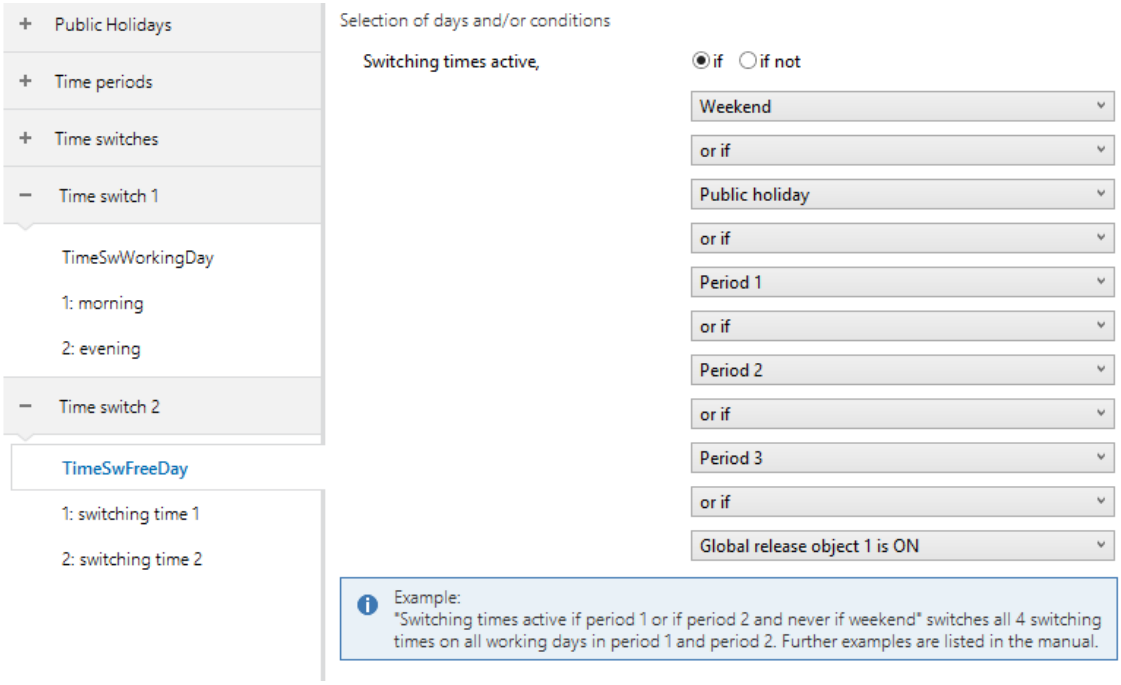


Figure 6: Conditions for time switch 2: TimeSwFreeDay

Finally, the used holidays and time periods still need to be defined. This is done in the tab "Define public holidays". In the example 5 holidays are defined, which are renamed again for clarity:

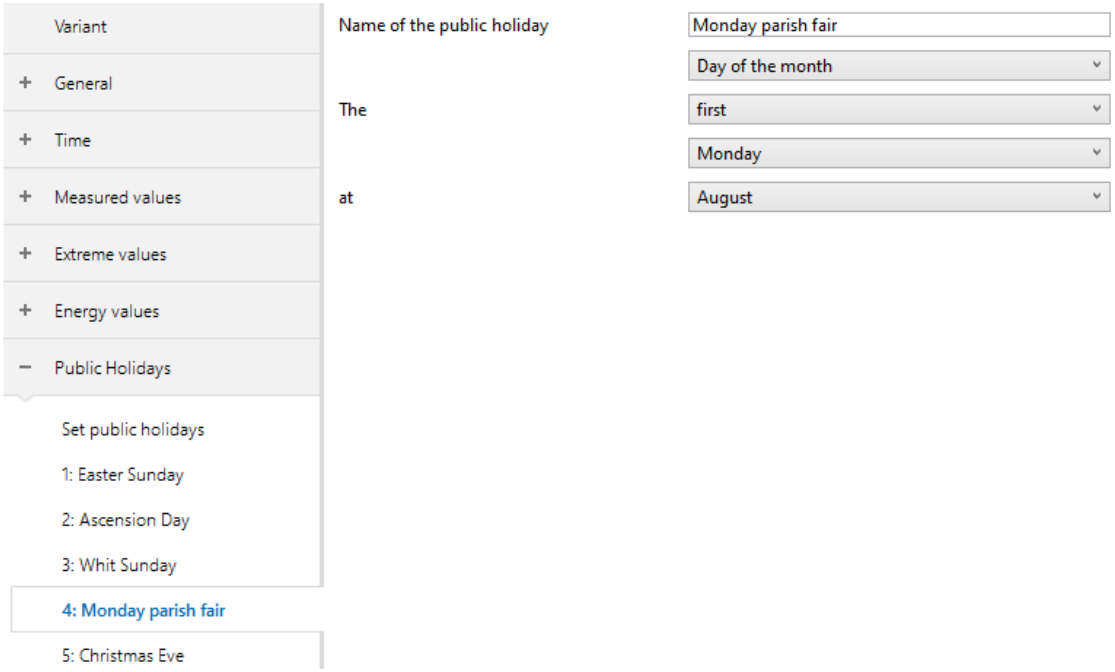


Figure 78: Definition of public holidays

The public holidays Easter Sunday, Ascension Day and Whit Sunday can be defined with the input option "Easter holiday". The exact date of the Easter holidays is calculated automatically by the unit for the respective year. As can be seen in fig. 7, the parish fair Monday is defined with the input option "day in month". Christmas Eve, on the other hand, is defined with the input option "Simple date". All these holidays can now be used as input for the conditions of the two time switches. This is also used in this example. Furthermore, the public holidays can also be used to define periods of time, such as holidays. This is shown in the next section.

In the tab "Define time periods", time periods can be defined which can be used for the conditions of the time switches. In the example 3 periods are defined: Easter holidays, Whitsun holidays, Christmas holidays:

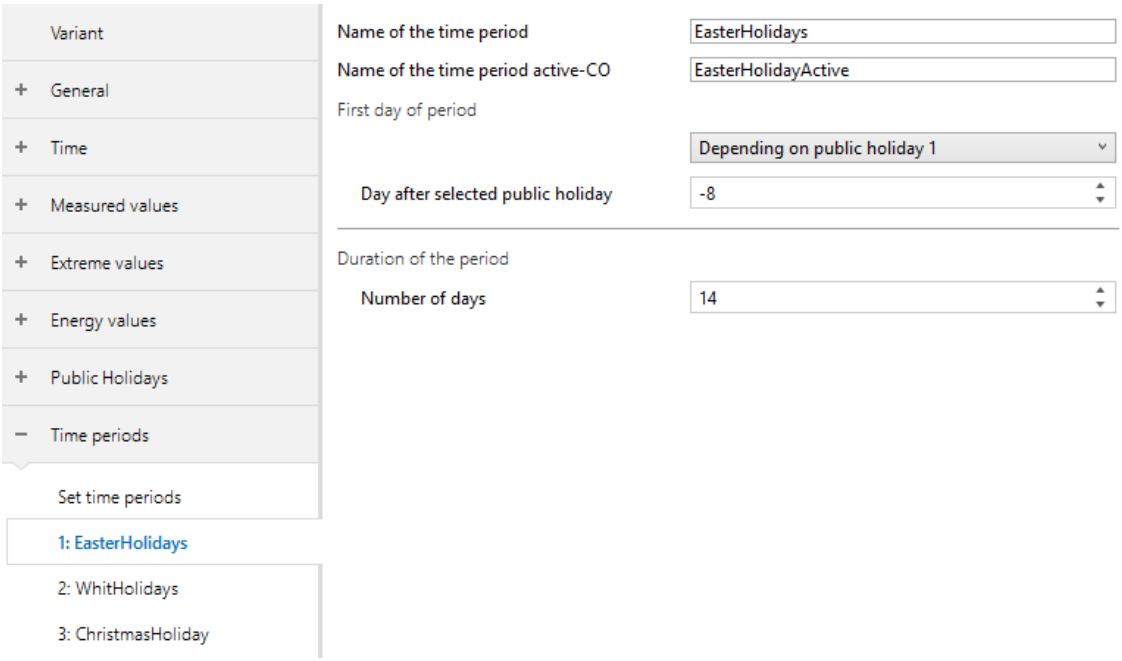


Figure 910: Definition of periods

As shown in Fig. 9, the Easter holidays are given in relation to Easter Sunday (= public holiday 1). According to the parameterisation the period starts 8 days before Easter Sunday, i.e. the Saturday one week before Easter at 00:00:00. With the duration of 14 days the period ends on the Friday after Easter at 23:59:59 hrs. Pentecost holidays are indicated in the same way. For the Christmas holidays you can also use a concrete date to enter the first day. For example, you can set the start day to 23.12. and define the duration of 15 days. This defines the Christmas holidays from 23.12. to 6.1.

The parameterisation of the example is now complete. Finally, in order to be able to send the telegrams of the two time switches on the bus, the eight predefined communication objects must be linked with the corresponding group addresses on the bus:

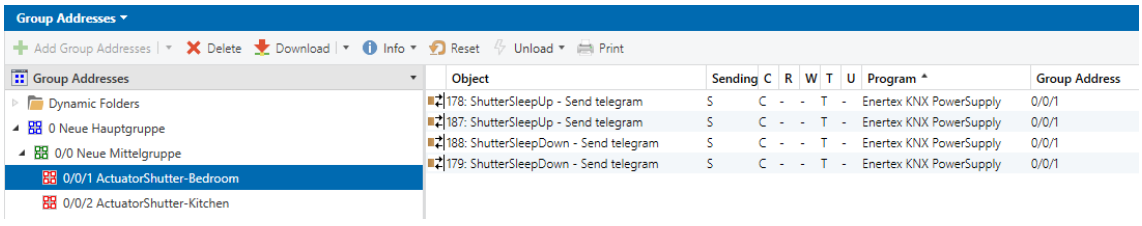


Figure 11: Link to GA ActuatorShutter-Bedroom

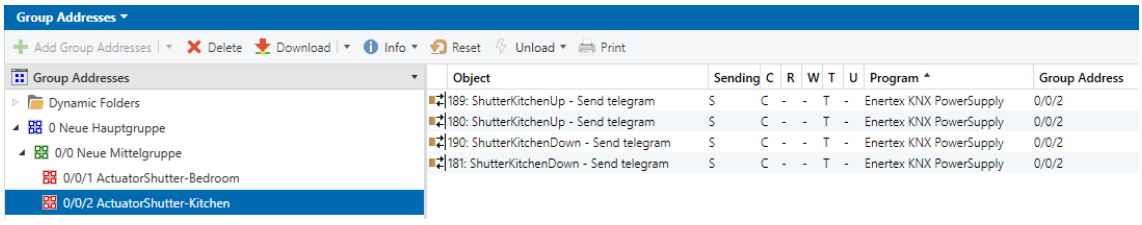


Figure 12: Link to the GA ActuatorShutter-Kitchen

ETS application

Specification

ETS: from version 5.0

Database file

At http://www.enertex.de/d-downloads01.html you will find the current ETS database file, as well as the current product description.

Parameters

Note: Depending on the parameterisation, some setting options may not be available. In these cases they are not displayed in the ETS.

Variant

The following settings can be made under the "Variant" tab:

Figure 13: Variant

Name	Options	Description
Variant	**Enertex KNX DUAL PowerSupply** / Enertex KNX 1280PowerSupply 960³	Selection of the variant of the used Enertex KNX power supply unit. This application can be used for all Enertex KNX power supplies.

General

Settings

In the "General Settings" tab, the following settings can be made:

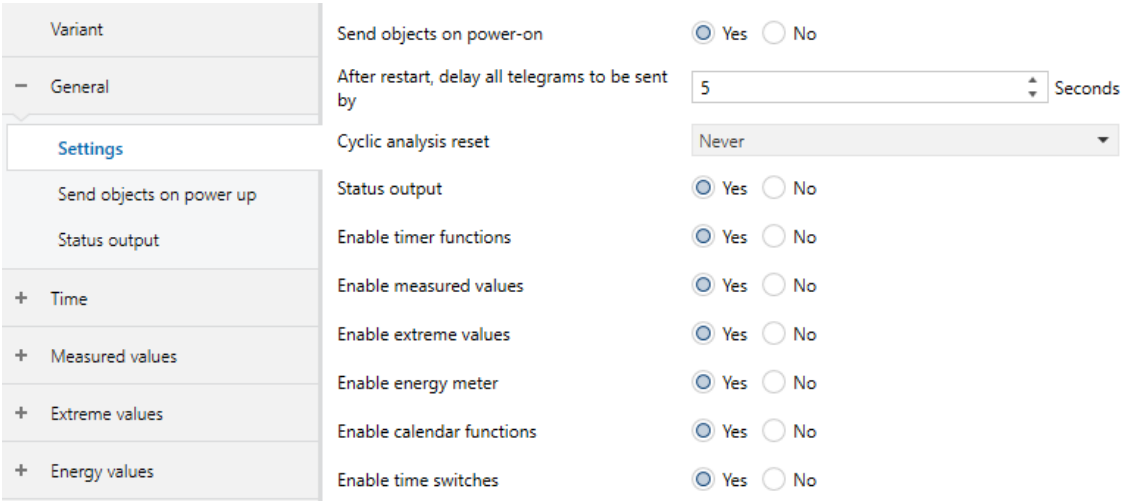


Figure 14: General settings

Name	Options	Description
Sending objects on power-on	Yes / **No**	If active, the tab "Send objects on power-on" is enabled. TThere you can parameterise the transmission of communications objects ID1 - ID12. → Communication objects
After restart, delay all telegrams to be sent by	0 .. **5** .. 255	All telegrams sent from this device after the device is restarted are delayed by this time in seconds. By a suitably selected delay the bus is relieved after a bus reset.
Cyclic analysis reset	Daily / Weekly / Monthly / Annually / **Never**	Cycle in which stored extreme values and energy counters are reset. The following reset times apply: - Daily: daily at 00:00:00 - Weekly: Monday at 00:00:00 - Monthly: On 1. at 00:00:00 - Annually: On 1.1. at 00:00:00
Status output	Yes / **No**	If active, the tab "Status output" is enabled. There you can parameterise the transmission of the communication object "Output status information". Via the communication object "Output status information" (ID14), status information can be sent cyclically to the bus in text form (e.g. "I_BUS: 453 mA"). If several of the following status values are activated, they are written to the bus one after the other via the same communication object (ID14). This allows the status values to be shown one after the other on a display. The text messages are written to the communication object at the interval of the "Status outputs to the bus" parameter.
Enable timer functions	Yes / **No**	If active, the "Time" tab is enabled. There the device can be parameterised as a KNX clock or time receiver.
Enable measured values	Yes / **No**	If active, the communication objects for the measured values (ID50 - ID63) and the "Measured values" tab are enabled. The transmission of measured values can be parameterised there. → Communication objects
Enable extreme values	Yes / **No**	If active, the communication objects for the extreme values (ID98 - ID122) and the "Extreme values" tab are enabled. Here, the transmission of extreme values can be parameterised. → Communication objects
Enable energy meter	Yes / **No**	If active, the communication objects for the energy meters (ID139 - ID144) and the "Energy values" tab are enabled. The transmission of energy meter values can be parameterised there. → Communication objects

Name	Options	Description
Enable calendar functions	Yes / **No**	If active, the tabs "Public Holidays" and "Time periods" are enabled. There, public holidays and time periods (e.g. for holidays) can be parameterised.
Enable time switched	Yes / **No**	If active, the "Time switches" tab is enabled. Time switches can be parameterised there.

Send objects on power up

The following settings can be made under the tab "Send objects on power on":

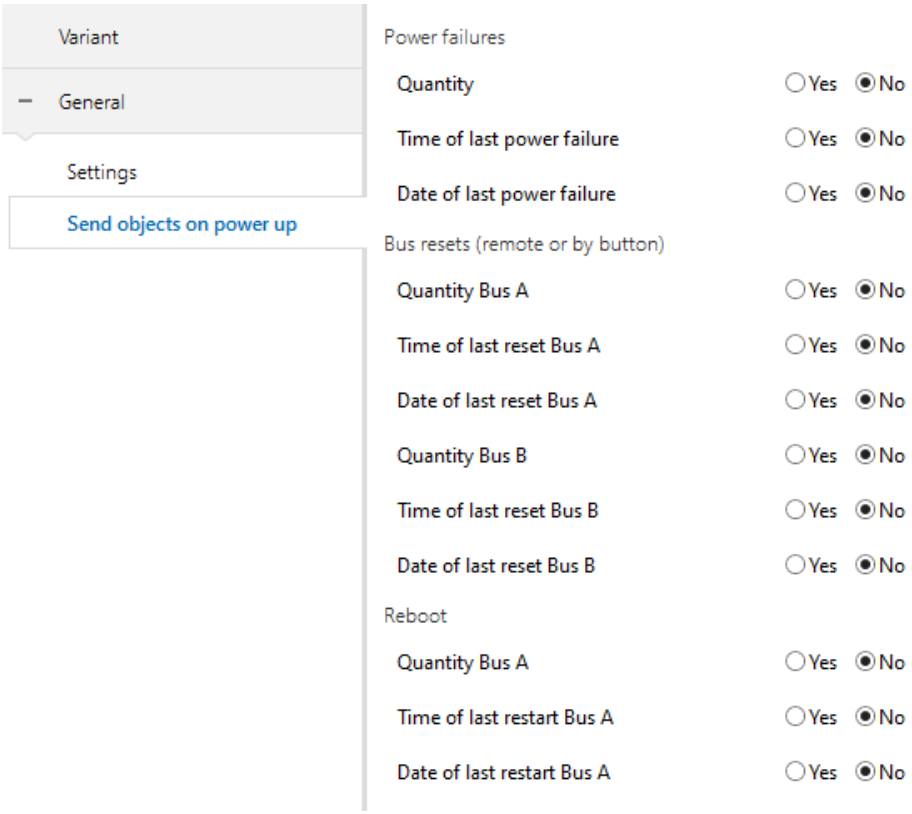


Figure 15: Send general objects on power up

Name	Options	Description
Quantity	Yes / **No**	If active, the communication object "Number of power failures"(ID1) is sent to the bus each time the device is restarted. → Communication objects
Time of last power failure	Yes / **No**	If active, the communication object "Last power failure - clock"(ID2) is sent to the bus each time the bus is restarted.
Date of last power failure	Yes / **No**	If active, the communication object "Last power failure - date"(ID3) is sent to the bus each time the bus is restarted.
Quantity Bus A	Yes / **No**	If active, the communication object "Number of bus resets - Bus A"(ID4) is sent to the bus each time the device is restarted. → Communication objects
Time of last reset Bus A	Yes / **No**	If active, the communication object "Last bus reset - Bus A - clock"(ID5) is sent to the bus each time the device is restarted.
Date of last reset Bus A	Yes / **No**	If active, the communication object "Last Bus Reset - Bus

		A - date"(ID6) is sent to the bus each time the device is restarted.
Quantity Bus B	Yes / **No**	If active, the communication object "Number of bus resets - Bus B"(ID7) is sent to the bus each time the device is restarted. → Communication objects
Time of last reset Bus B	Yes / **No**	If active, the communication object "Last bus reset - Bus B - clock"(ID8) is sent to the bus each time the device is restarted.
Date of last reset Bus B	Yes / **No**	If active, the communication object "Last Bus Reset - Bus B - date"(ID9) is sent to the bus each time the device is restarted.
Quantity Bus A	Yes / **No**	If active, the communication object "Number of bus restarts - Bus A"(ID10) is sent to the bus each time the device is restarted. → Communication objects
Time of last restart Bus A	Yes / **No**	If active, the communication object "Last bus restart - Bus A - clock"(ID11) is sent to the bus each time the device is restarted. Time difference between "Last bus restart - Bus A - clock"(ID11) and "Last power failure - clock"(ID2) could be used to determine how long the bus was without power.
Date of last restart Bus A	Yes / **No**	If active, the communication object "Last bus restart - Bus A - date"(ID12) is sent to the bus each time the device is restarted.

Status output

The following settings can be made in the "General Status output" tab:

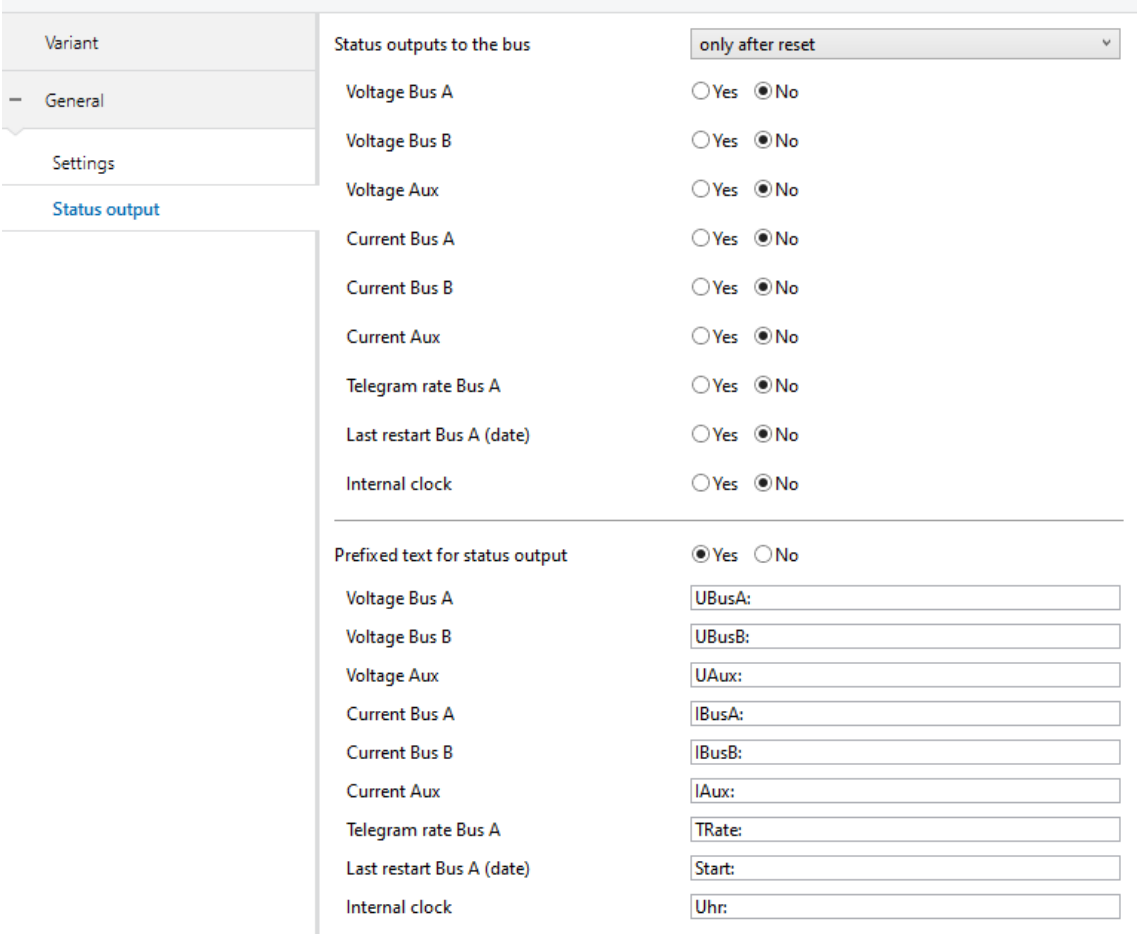


Figure 16: General status output

Name	Options	Description
Status outputs to the bus	**only after reset** / 10s / 30s / 1min / 5min / 30min / 1h	After this time has elapsed, a new telegram is sent to the bus via the communication object "Output status information" (ID14). After each transmission, the content of the telegram changes, starting with voltage Bus A. This is followed by voltage Bus B, voltage aux, current Bus A, current Bus B, current Aux, telegram rate and last restart Bus A und internal clock. Finally, this cycle starts all over again. If the output of a value is not activated, then this value is skipped. If the value "only after reset" is selected, then each activated value is only transmitted after the reset. In this case the time interval between the telegrams is fixed at 6s. → Communication objects
Voltage Bus A	Yes / **No**	The current voltage of communication object "Voltage - Bus A" (ID50) is output in the status output via communication object "Output status information"(ID14). Output takes place e.g. with "29.89 V".
Voltage Bus B	Yes / **No**	The current voltage of communication object "Voltage - Bus B" (ID51) is output in the status output via communication object "Output status information"(ID14). Output takes place e.g. with "29.89 V".
Voltage Aux	Yes / **No**	The current voltage of the "Voltage - Aux" communication object (ID52) is output in the status output via the "Output status information" communication object (ID14). Output takes place e.g. with "29.89 V".
Current Bus A	Yes / **No**	Current current of communication object "Current - Bus A"(ID53) is output in the status output via communication object "Output status information"(ID14). Output is made, for example, with "347 mA".
Current Bus B	Yes / **No**	Current current of communication object "Current - Bus B"(ID54) is output in the status output via communication object "Output status information"(ID14). Output is made, for example, with "347 mA".
Current Aux	Yes / **No**	Current current of communication object "Current - Aux"(ID55) is output in the status output via communication object "Output status information"(ID14). Output is made, for example, with "347 mA".
Telegram rate Bus A	Yes / **No**	Current value of communication object "Current telegram rate (per second) - Bus A"(ID62) is output in the status output via communication object "Output status information"(ID14).
Last restart Bus A (date)	Yes / **No**	Value of communication object "Last bus restart - Bus A - date"(ID12) is output in the status output via communication object "Output status information"(ID14). Output takes place, for example, with "15.06.".
Internal clock	Yes / **No**	The value of the communication object "Clock"(ID34) is output in the status output via the communication object "Output status information"(ID14). Output takes place, for example, with "12:34". If the internal clock is invalid, then "--:--" is sent.
Prefixed text for status output	Yes / **No**	If active, an additional character string is placed in front of the corresponding status value. E.G. "U_BUS: 30 V". If "No" is selected, then the output would only be "30 V". The string can be parameterised separately for each status value.
Voltage Bus A	(max. 6 characters)**UBusA**:	String which is displayed before the value of the voltage Bus A in the communication object "Output status information" (ID14).
Voltage Bus B	(max. 6 characters)**UBusB**:	String which is displayed before the value of the voltage Bus B in the communication object "Output status information" (ID14).

Name	Options	Description
Voltage Aux	(max. 6 characters)**UAux**:	String which is displayed before the value of the voltage Aux in the communication object "Output status information" (ID14).
Current Bus A	(max. 6 characters)**IBusA**:	String which is displayed before the value of the current Bus A in the communication object "Output status information" (ID14).
Current Bus B	(max. 6 characters)**IBusB**:	String which is displayed before the value of the current Bus B in the "Output status information" communication object (ID14).
Current Aux	(max. 6 characters)**IAux**:	String that is displayed before the value of the current aux in the communication object "Output status information" (ID14).
Telegram rate Bus A	(max. 6 characters)**TRate:**	String which is displayed before the value of the telegram rate in the communication object "Output status information" (ID14).
Last restart Bus A (date)	(max. 6 characters)**Start:**	String which is displayed before the date of the last restart on Bus A in the communication object "Output status information" (ID14).
Internal clock	(max. 6 characters)**Uhr:**	String which is displayed before the clock in the communication object "Output status information" (ID14).

Time

Settings

The following settings can be made in the "Time settings" tab:

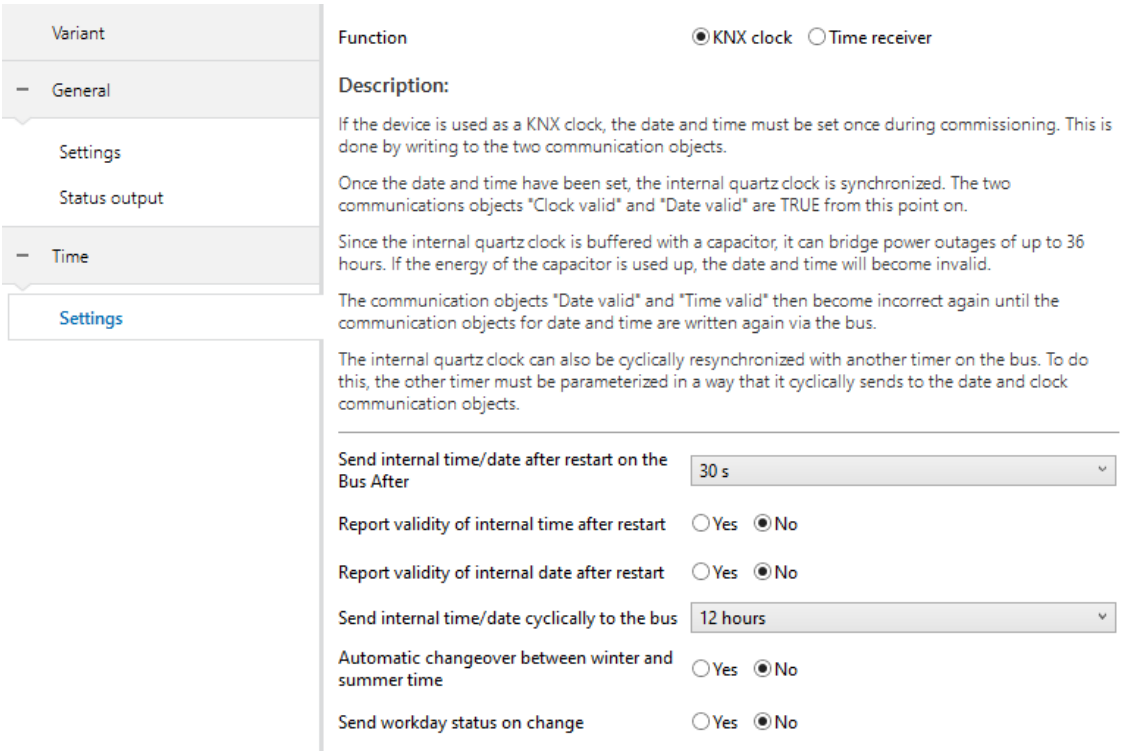


Figure 1718: Time - selection as KNX clock

Name	Options	Description
Function	**KNX clock** / Time receiver	Here you can select whether the device should set the time for the bus or whether the time should only be received from the bus. For further information on the timer function, please refer to the application or the description in Figure 17 above.
Send internal time/date after restart on the Bus After	immediately / 10 s / **30 s** / 60 s / 2min / 5 min / never	The time of the internal clock is sent to the communication object "Clock"(ID34) and "Date"(ID35) after the device is restarted. → Communication objects
Report validity of internal time after restart	Yes / **No**	The communication object "Clock valid"(ID38) is sent after restarting the machine.
Report validity of internal date after restart	Yes / **No**	The communication object "Date valid"(ID39) is sent after restarting the machine.
Send internal time/date cyclically to the bus	15 min / 30 min / 1 hour / 3 hours / **12 hours** / 24 hours / never	The time of the internal clock is sent in this cycle to the communication object "Clock"(ID34) and "Date"(ID35).
Automatic changeover between winter and summer time	Yes / **No**	If active, the internal clock automatically changes over between winter time and summer time. The time changeover is carried out according to the European regulations, i.e. in the time zone UTC+0 at 01:00, in the time zone UTC+1 at 02:00, in the time zone UTC+2 at 03:00 ...
Working day Send status on change	Yes / **No**	If active, the communication object "Working day (Mon - Fri)"(ID41) is sent to the bus whenever it changes. The object is also sent when the device is restarted.

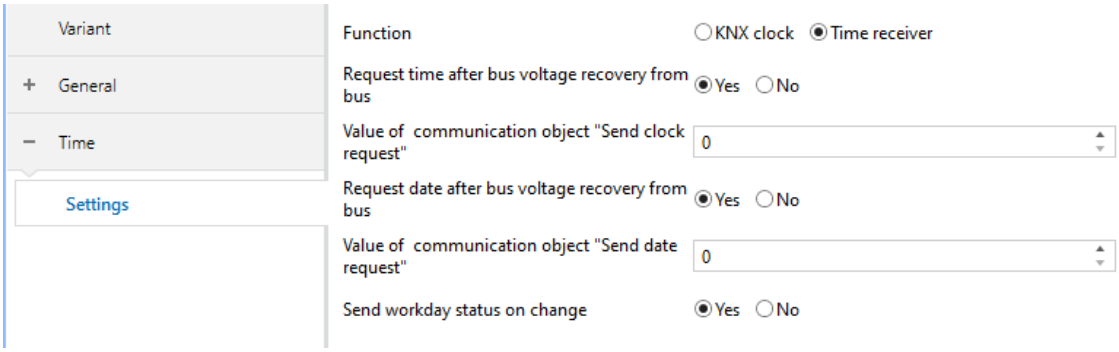


Figure 19: Time - Selection as Time receiver

Name	Options	Description
Request time after bus voltage recovery from bus	Yes / **No**	If active, the communication object "Send time request"(ID36) is enabled and is sent to the Bus After the device is started. This object can be used to trigger another bus device, which serves as a KNX clock for the bus, to send its time.
Value of communication object "Send clock request"	**0** .. 1	Setting the value for the communication object "Send time request" (ID36). → Communication objects
Request date after bus voltage recovery from bus	Yes / **No**	If active, the communication object "Send date request"(ID37) is enabled and is sent to the Bus After the device is started. This object can be used to trigger another bus station, which serves as a KNX clock for the bus, to send its date.
Value of communication object "Send date request"	**0** .. 1	Setting the value for the communication object "Send date request" (ID37).
Send workday status on change	Yes / **No**	If active, the communication object "Working day (Mon - Fri)"(ID41) is sent to the bus whenever is is changed. The object is also sent when the device is restarted.

Measured values

Settings

The following settings can be made under the "Measured values" tab:

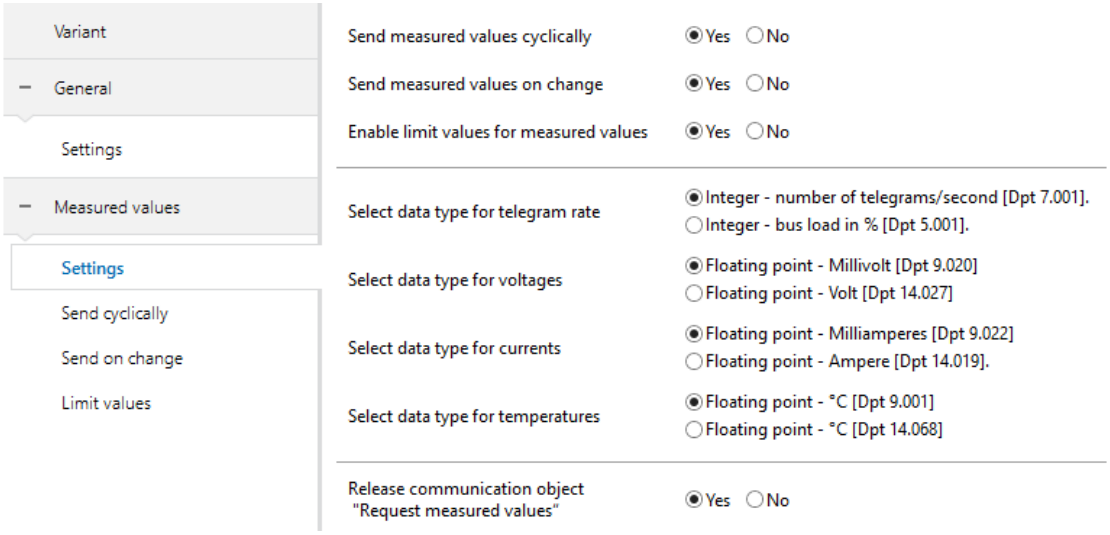


Figure 20: Measured values - Settings

Name	Options	Description
Send measured values cyclically	Yes / **No**	If active, the measured values can be sent cyclically. Activates the "Send cyclically" tab.
Send measured values on change	Yes / **No**	If active, the measured values can be sent when changes occur. Activates the tab "Send on change".
Enable limit values for measured values	Yes / **No**	If active, the communication objects for the limit values (ID74 - ID91) and the "Limit values" tab are enabled. There the transmission of limit values can be parameterised. → Communication objects
Select data type for telegram rate	Integer - number of telegrams/second [Dpt 7.001]. / Integer - bus load in % [Dpt 5.001].	Here you can select the data type for the telegram rate. The selected data type affects the measured values, extreme values and the limit values of the telegram rate. The unit of the telegram rate is either telegrams per second or bus load in percent, whereby a bus load of 100% corresponds to a telegram rate of 50 telegrams per second.
Select data type for voltages	Floating point - Millivolt [Dpt 9,020]. / Floating point - Volt [Dpt 14.027].	Here the data type for the voltage can be selected. The selected data type affects measured values, extreme values and limit values of the voltage. The unit of voltage is either millivolts or volts. The data type Dpt_14.027 corresponds to the single-precision format according to IEEE- 754 standard.
Select data type for currents	Floating point - Milliampere Dpt 9,022]. / Floating point - Ampere [Dpt 14,019].	The data type for the currents can be selected here. The selected data type affects all measured values, extreme values and limit values of the currents. The unit of current is either milliamps or amperes. The data type Dpt_14.019 corresponds to the single-precision format according to IEEE- 754 standard.
Select data type for temperatures	Floating point - °C [Dpt 9.001]. / Floating point - °C [Dpt 14,068].	The data type for the temperatures can be selected here. The selected data type affects all measured values, extreme values and limit values of the temperatures. The unit of temperature is always °C. The data type

Name	Options	Description
		Dpt_14.068 corresponds to the single-precision format according to IEEE- 754 standard.
Enable communication object "Request measured values"	Yes / **No**	If active, the communication object "Request measured values"(ID48) is enabled.

Send cyclically

The following settings can be made under the tab "Send cyclically":

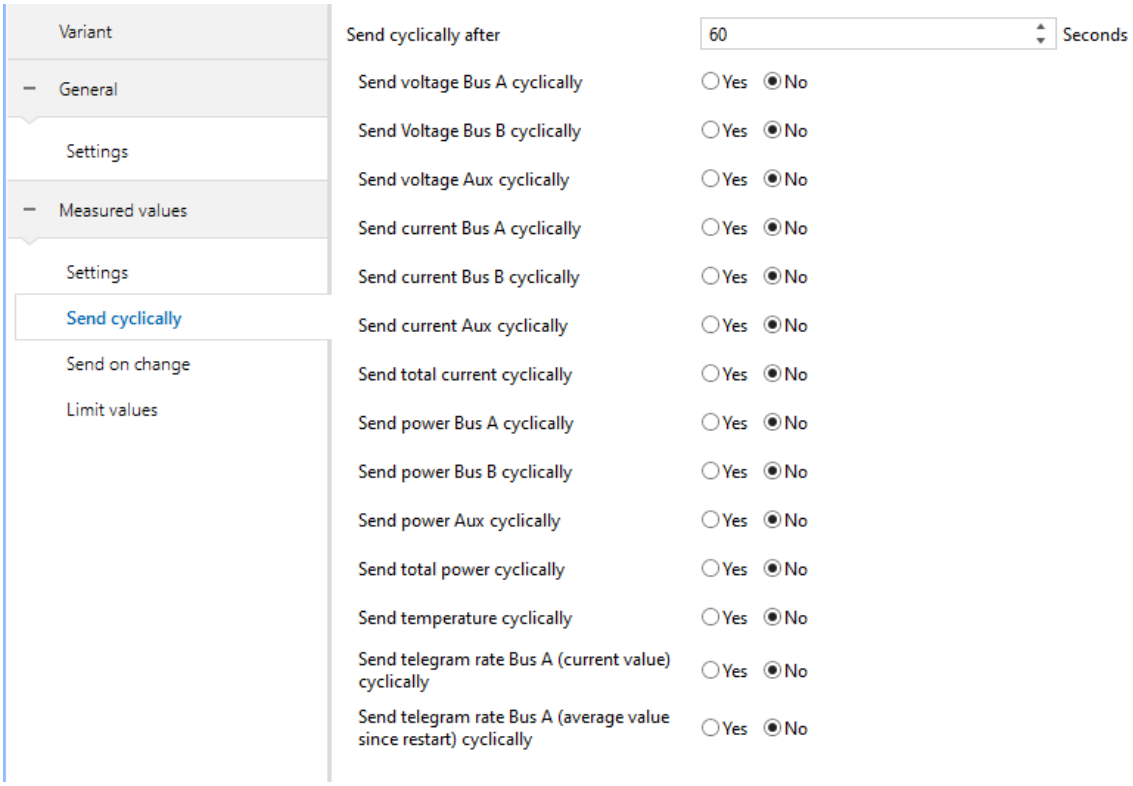


Figure 21: Measured values - send cyclically

Name	Options	Description
Send cyclically after	0 .. **60** .. 172800	Cycle time in seconds in which the measurement values activated below are sent to the bus. If a time greater than 0 is set, the measured values are sent for the first time when the device is restarted. If the value is 0, transmission is not cyclical. → Send cyclically
Send voltage Bus A cyclically	Yes / **No**	If active, the communication object "Voltage - Bus A"(ID50) is sent cyclically
Send voltage Bus B cyclically	Yes / **No**	If active, the communication object "Voltage - Bus B"(ID51) is sent cyclically
Send voltage Aux cyclically	Yes / **No**	If active, the communication object "Voltage - Aux"(ID52) is sent cyclically
Send current Bus A cyclically	Yes / **No**	If active, the communication object "Current - Bus A"(ID53) is sent cyclically
Send current Bus B cyclically	Yes / **No**	If active, the communication object "Current - Bus B"(ID54) is sent cyclically
Send current Aux cyclically	Yes / **No**	If active, the communication object "Current - Aux"(ID55) is sent cyclically
Send total current cyclically	Yes / **No**	If active, the communication object "Current - Total"(ID56) is sent cyclically

Name	Options	Description
Send power Bus A cyclically	Yes / **No**	If active, the communication object "Power - Bus A"(ID57) is sent cyclically
Send power Bus B cyclically	Yes / **No**	If active, the communication object "Power - Bus B"(ID58) is sent cyclically
Send power Aux cyclically	Yes / **No**	If active, the communication object "Power - Aux"(ID59) is sent cyclically
Send total power cyclically	Yes / **No**	If active, the communication object "Power - Total"(ID60) is sent cyclically
Send temperature cyclically	Yes / **No**	If active, the communication object "Temperature"(ID61) is sent cyclically
Send telegram rate Bus A (current value) cyclically	Yes / **No**	If active, the communication object "Current telegram rate - Bus A"(ID62) is sent cyclically
Telegram rate Bus A (average value since restart) send cyclically	Yes / **No**	If active, the communication object "Average telegram rate - Bus A"(ID63) is sent cyclically

Send on change

The following settings can be made under the "Send on change" tab:

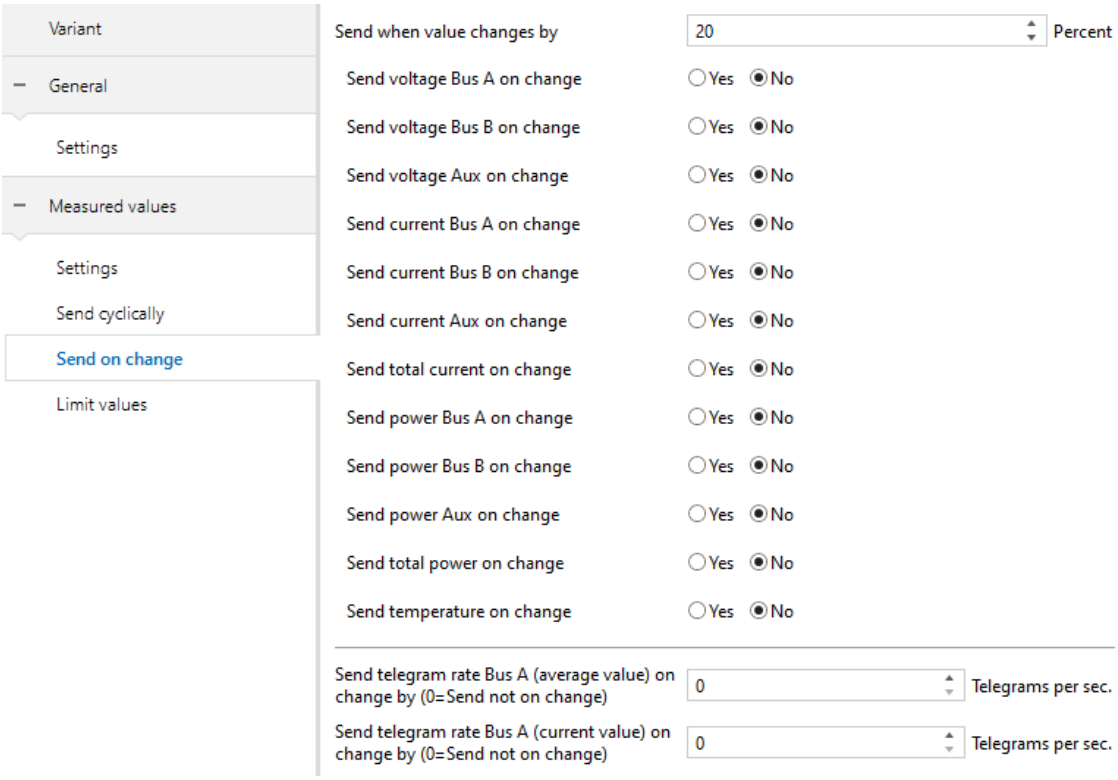


Figure 22: Measured values - Send on change

Name	Options	Description
Send when value changes by	0 .. **20** .. 100	Setting of the percentage value, upon its change the below activated measuring values are sent to the bus. If a value greater than 0 is set, the measured values are sent for the first time when the device is restarted. The reference value for the change in percent is the last value sent on the bus. If the value is 0, the message is never sent sent on change. → Send cyclically
Send voltage Bus A on change	Yes / **No**	If active, the communication object "Voltage - Bus A"(ID50) is sent when it is changed

Name	Options	Description
Send voltage Bus B on change	Yes / **No**	If active, the communication object "Voltage - Bus B"(ID51) is sent when it is changed
Send voltage Aux on change	Yes / **No**	If active, the communication object "Voltage - Aux"(ID52) is sent when it is changed
Send current Bus A on change	Yes / **No**	If active, the communication object "Current - Bus A"(ID53) is sent when it is changed
Send current Bus B on change	Yes / **No**	If active, the communication object "Current - Bus B"(ID54) is sent when it is changed
Send current Aux on change	Yes / **No**	If active, the communication object "Current - Aux"(ID55) is sent when it is changed
Send total current on change	Yes / **No**	If active, the communication object "Current - Total"(ID56) is sent when it is changed
Send power Bus A on change	Yes / **No**	If active, the communication object "Power - Bus A"(ID57) is sent when it is changed
Send power Bus B on change	Yes / **No**	If active, the communication object "Power - Bus B"(ID58) is sent when it is changed
Send power Aux on change	Yes / **No**	If active, the communication object "Power - Aux"(ID59) is sent when it is changed
Send total power on change	Yes / **No**	If active, the communication object "Power - Total"(ID60) is sent when it is changed
Send temperature on change	Yes / **No**	If active, the communication object "Temperature"(ID61) is sent when it is changed
Send the telegram rate Bus A (average value) on change by (0=Do not send on change)	Yes / **No**	Setting of the value, which, if changed, causes the telegram rate "Average telegram rate - Bus A"(ID63) to be sent to the bus. If a value greater than 0 is set, the telegram rate is sent for the first time when the device is restarted. If the value is 0, the telegram rate is never sent on change.
Transmission of the telegram rate Bus A (current value) on change by (0=Do not send on change)	Yes / **No**	Setting of the value which, if changed, causes the telegram rate "Current telegram rate - Bus A"(ID62) to be sent to the bus. If a value greater than 0 is set, the telegram rate is sent for the first time when the device is restarted. If the value is 0, the telegram rate is never sent on change.

Limit values

The following settings can be made under the "Limits" tab (Part 1):

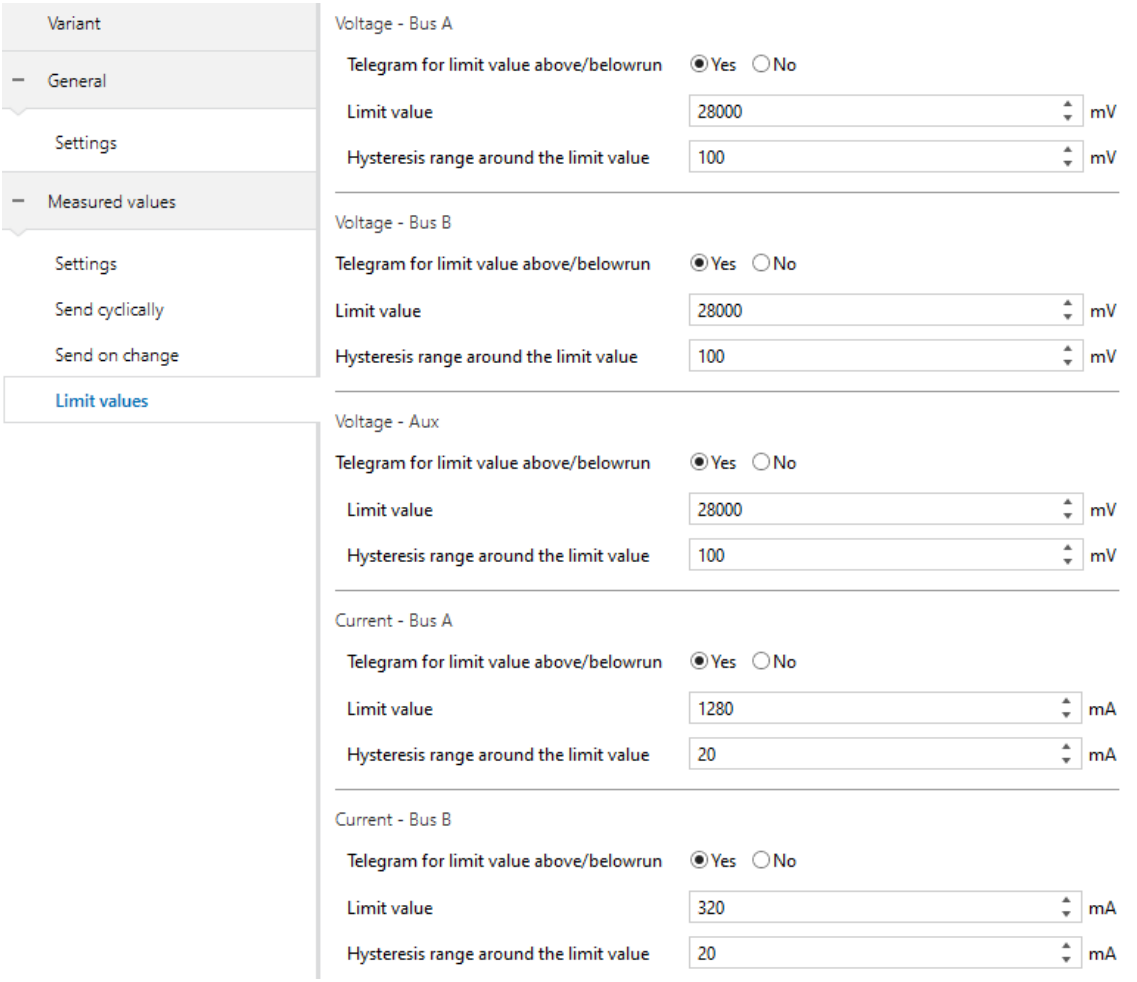


Figure 23: Measured values - limit values (Part 1)

Continuation of the settings under the "Limits" tab (part 2):

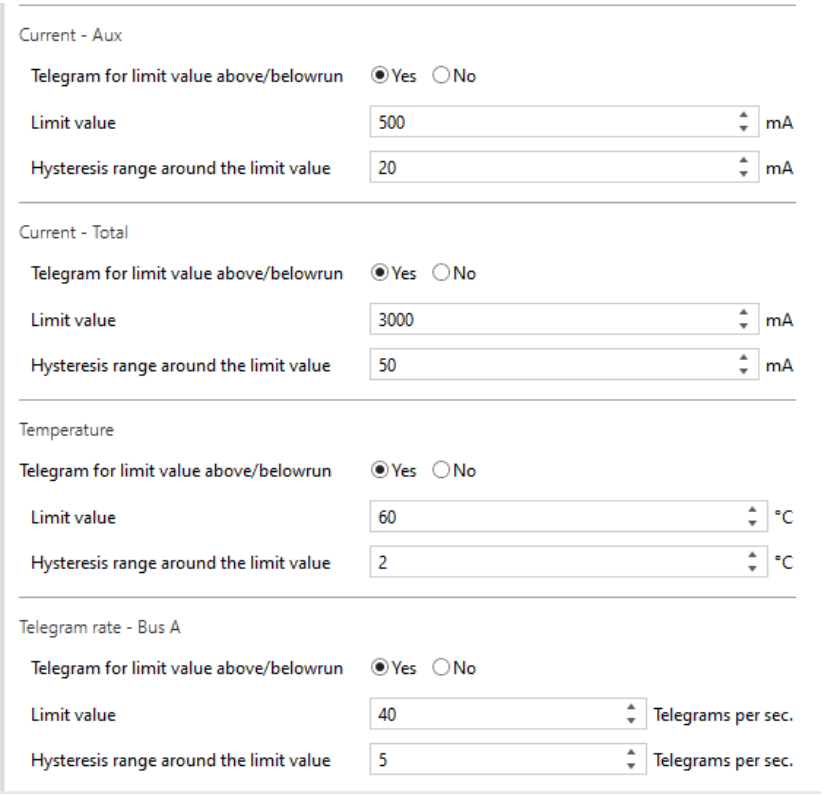


Figure 24: Parameter limit values (Part 2)

Name	Options	Description
(Voltage - Bus A) Telegram for limit value over/underrun	Yes / **No**	If active, the following communication objects are enabled: - " Voltage - Bus A - limit value "(ID74) - "Voltage - Bus A - limit value above/below"(ID75) If the set limit value is exceeded/fallen below, the communication object "Voltage - Bus A - limit value above/below"(ID75) is sent. → Communication objects
(Voltage - Bus A) Limit value	0 .. **28000** .. 35000	Limit value in millivolts for the bus voltage above/below which the corresponding communication object should be transmitted. → Limit values
(Voltage - Bus A) Hysteresis range around the limit value	0 .. **100** .. 2000	Total hysteresis range in millivolts, i.e. range between lower and upper hysteresis threshold. If the bus voltage changes only in the hysteresis range around the limit value , no new telegram is output. → Limit values
(Voltage - Bus B) Telegram for limit value over/underrun	Yes / **No**	If active, the following communication objects are enabled: - " Voltage - Bus B - limit value "(ID74) - "Voltage - Bus B - limit value above/below"(ID75) If the set limit value is exceeded/fallen below, the communication object "Voltage - Bus B - limit value above/below"(ID75) is sent.
(Voltage - Bus B) Limit value	0 .. **28000** .. 35000	Limit value in millivolts for the bus voltage above/below which the corresponding communication object should be transmitted.
(Voltage - Bus B) Hysteresis range around the limit value	0 .. **100** .. 2000	Total hysteresis range in millivolts, i.e. range between lower and upper hysteresis threshold. If the bus voltage changes only in the hysteresis range around the limit value , no new telegram is output.

Name	Options	Description
(Voltage - Aux) Telegram for limit value over/underrun	Yes / **No**	If active, the following communication objects are enabled: - " Voltage - Aux - Limit "(ID74) - "Voltage - Aux - limit value above/below"(ID75) If the set limit value is exceeded/fallen below, the communication object "Voltage - Aux - limit value above/below"(ID75) is sent.
(Voltage - Aux) Limit value	0 .. **28000** .. 35000	Limit value in millivolts for the bus voltage above/below which the corresponding communication object should be transmitted.
(Voltage - Aux) Hysteresis range around the limit value	0 .. **100** .. 2000	Total hysteresis range in millivolts, i.e. range between lower and upper hysteresis threshold. If the bus voltage changes only in the hysteresis range around the limit value , no new telegram is output.
(Current - Bus A) Telegram for limit value over/underrun	Yes / **No**	If active, the following communication objects are enabled: - " Current - Bus A - limit value "(ID80) - " Current - Bus A -(ID81 Grenzwert über-/unterschr.") If the set limit value is exceeded/fallen below, the communication object "Current - Bus A - limit value above/below"(ID81) is sent. → Communication objects
(Current - Bus A) Limit value	0 .. **1280** .. 4000	Limit value in milliamperes for the current above/below which the corresponding communication object is to be transmitted. → Limit values
(Current - Bus A) Hysteresis range around the limit value	0 .. **20** .. 255	Total hysteresis range in milliamps, i.e. range between lower and upper hysteresis threshold. If the bus current changes only in the hysteresis range around the limit value, no new telegram is output. → Limit values
(Current - Bus B) Telegram for limit value over/underrun	Yes / **No**	If active, the following communication objects are enabled: - " Current - Bus B - limit value "(ID82) - " Current - Bus B -(ID83 Grenzwert über-/unterschr.") If the set limit value is exceeded/fallen below, the communication object "Current - Bus B - limit value above/below"(ID83) is sent.
(Current - Bus B) Limit value	0 .. **320** .. 4000	Limit value in milliamperes for the current above/below which the corresponding communication object is to be transmitted.
(Current - Bus B) Hysteresis range around the limit value	0 .. **20** .. 255	Total hysteresis range in milliamps, i.e. range between lower and upper hysteresis threshold. If the bus current changes only in the hysteresis range around the limit value, no new telegram is output.
(Current - Aux) Telegram for limit value over/underrun	Yes / **No**	If active, the following communication objects are enabled: - " Current - Aux - Limit "(ID84) - "Current - Aux -(ID85 Grenzwert über-/unterschr.") If the set limit value is exceeded or undercut, the communication object "Current - Aux - limit value above/below"(ID85) is sent.
(Current - Aux) Limit value	0 .. **500** .. 4000	Limit value in milliamperes for the current above/below which the corresponding communication object is to be transmitted.

Name	Options	Description
(Current - Aux) Hysteresis range around the limit value	0 .. **20** .. 255	Total hysteresis range in milliamps, i.e. range between lower and upper hysteresis threshold. If the bus current changes only in the hysteresis range around the limit value, no new telegram is output.
(Current - Total) Telegram for limit value over/underrun	Yes / **No**	If active, the following communication objects are enabled: - " Current - Total - Limit "(ID86) - " Electricity - Total -(ID87 Grenzwert über-/unterschr.") If the set limit value is exceeded or not reached, the communication object "Current - Total - limit value above/below"(ID87) is sent.
(Current - Total) Limit value	0 .. **2000** .. 4000	Limit value in milliamperes for the current above/below which the corresponding communication object is to be transmitted.
(Current - Total) Hysteresis range around the limit value	0 .. **20** .. 255	Total hysteresis range in milliamps, i.e. range between lower and upper hysteresis threshold. If the bus current cchanges only in the hysteresis range around the limit value, no new telegram is output.
(Temperature) Telegram for limit value over/underrun	Yes / **No**	If active, the following communication objects are enabled: - " Temperature - limit value "(ID88) - "Temperature limit value over/under"(ID89) If the set limit value is exceeded or not reached, the communication object "Temperature limit value over/under"(ID89) is sent. → Communication objects
(Temperature) Limit value	0 .. **60** .. 100	Limit value in °C for the temperature above/below which the corresponding communication object should be sent. → Limit values
(Temperature) Hysteresis range around the limit value	0 .. **2** .. 20	Total hysteresis range in in °C, i.e. range between lower and upper hysteresis threshold. If the temperature changes only in the hysteresis range around the limit value, no new telegram is output. → Limit values
(Telegram rate - Bus A) Telegram for limit value over/underrun	Yes / **No**	If active, the following communication objects are enabled: - " Telegram rate - Bus A - limit value "(ID90) - "Telegram rate - Bus A - limit value above/below"(ID91) If the value of the communication object "Current telegram rate - Bus A"(ID62) exceeds or falls below the value of the set limit value, a telegram is sent to the communication object "Telegram rate - Bus A - limit value above/below"(ID91).
(Telegram rate - Bus A) Limit value	0 .. **40** .. 255	Limit value of the telegram rate in the unit of telegrams per second, above or below which a telegram is to be output
(Telegram rate - Bus A) Hysteresis range around the limit value	0 .. **5** .. 255	Total hysteresis range in telegrams per second,, i.e. range between lower and upper hysteresis threshold. If the telegram rate changes only in the hysteresis range around the limit value, no new telegram is output.

Extreme values

Settings

The following settings can be made in the "Extreme Value Settings" tab:

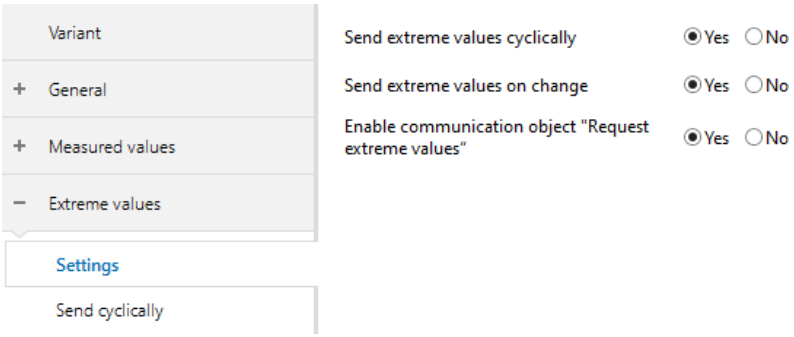


Figure 25: Parameter extreme value settings

Name	Options	Description
Send extreme values cyclically	Yes / **No**	If active, the extreme values can be sent cyclically. Activates the "Send cyclically" tab. → Extreme values
Send extreme values on change	Yes / **No**	If active, extreme values are sent automatically as soon as they change. Only the extreme value that changes is sent. → Extreme values
Enable communication object "Request extreme values"	Yes / **No**	Enables the communication object "Request extreme values". When sending to the object, the power supply unit sends all extreme values (ID98-122). → Communication objects

Send cyclically

The following settings can be made under the tab "Send extreme values cyclically":

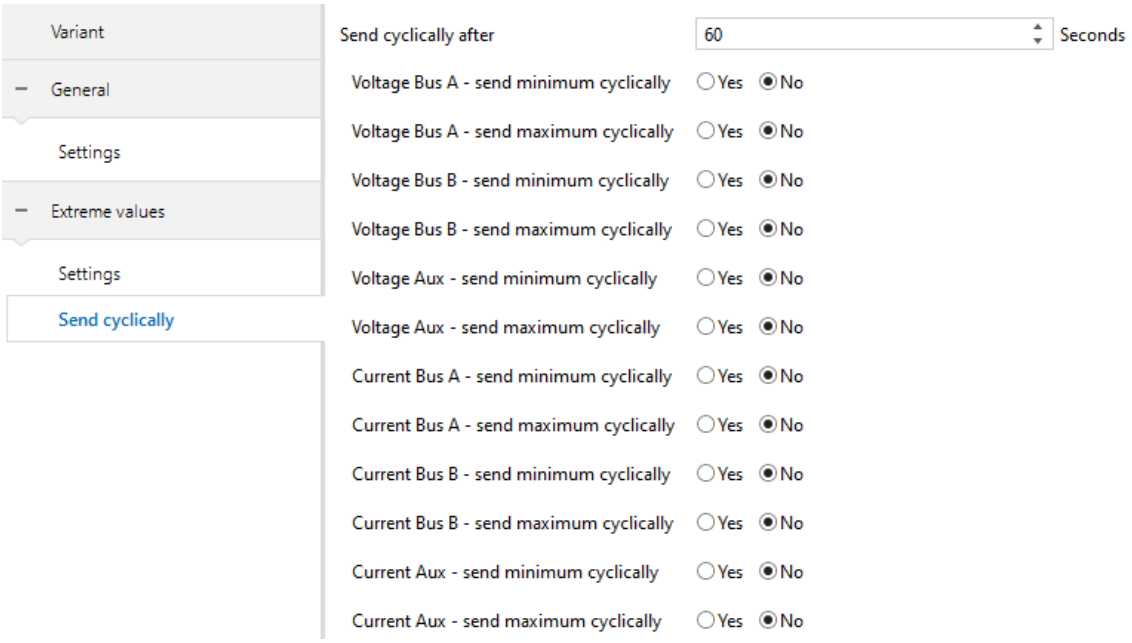


Figure 26: Parameter Extreme values- Cyclical transmission - Part 1

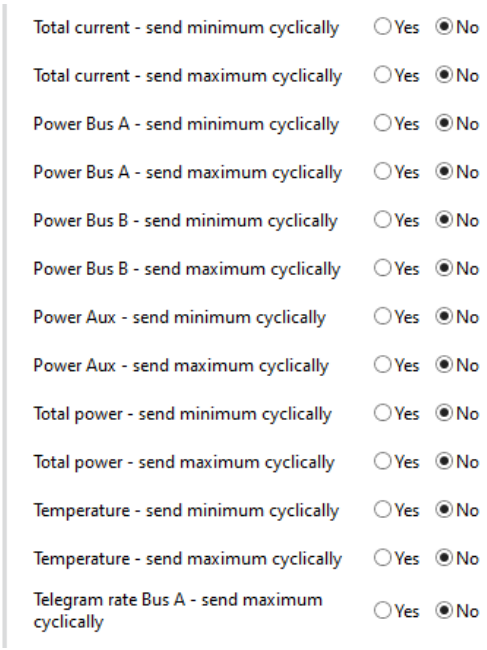


Figure 27: Parameter Extreme values- Cyclical transmission - Part 1

Name	Options	Description
Send cyclically after	0 .. **60** .. 172800	Cycle time in seconds in which the extreme values activated below are sent to the bus. If a time greater than 0 is set, the measured values are sent for the first time when the device is restarted. If the value is 0, transmission is not cyclical. → Communication objects
Voltage Bus A - send minimum cyclically	Yes / **No**	If active, the communication object "Voltage - Bus A - min"(ID98) is sent cyclically
Voltage Bus A - send maximum cyclically	Yes / **No**	If active, the communication object "Voltage - Bus A - max"(ID99) is sent cyclically
Voltage Bus B - send minimum cyclically	Yes / **No**	If active, the communication object "Voltage - Bus B - min"(ID100) is sent cyclically
Voltage Bus B - send maximum cyclically	Yes / **No**	If active, the communication object "Voltage - Bus B - max"(ID101) is sent cyclically
Voltage Aux - send minimum cyclically	Yes / **No**	If active, the communication object "Voltage - Aux - min"(ID102) is sent cyclically
Voltage Aux - send maximum cyclically	Yes / **No**	If active, the communication object "Voltage - Aux - max"(ID103) is sent cyclically
Current Bus A - send minimum cyclically	Yes / **No**	If active, the communication object "Current - Bus A - min"(ID104) is sent cyclically
Current Bus A - send maximum cyclically	Yes / **No**	If active, the communication object "Current - Bus A - max"(ID105) is sent cyclically
Current Bus B - send minimum cyclically	Yes / **No**	If active, the communication object "Current - Bus B - min"(ID106) is sent cyclically
Current Bus B - send maximum cyclically	Yes / **No**	If active, the communication object "Current - Bus B - max"(ID107) is sent cyclically
Current Aux - send minimum cyclically	Yes / **No**	If active, the communication object "Current - Aux - min"(ID108) is sent cyclically
Current Aux - send maximum cyclically	Yes / **No**	If active, the communication object "Current - Aux - max"(ID109) is sent cyclically
Total current - send minimum cyclically	Yes / **No**	If active, the communication object "Current - Total - min"(ID110) is sent cyclically
Total current -	Yes / **No**	If active, the communication object "Current - Total -

Name	Options	Description
send maximum cyclically		max"(ID111) is sent cyclically
Power Bus A - send minimum cyclically	Yes / **No**	If active, the communication object "Power - Bus A - min"(ID112) is sent cyclically
Power Bus A - send maximum cyclically	Yes / **No**	If active, the communication object "Power - Bus A - max"(ID113) is sent cyclically
Power Bus B - send minimum cyclically	Yes / **No**	If active, the communication object "Power - Bus B - min"(ID114) is sent cyclically
Power Bus B - send maximum cyclically	Yes / **No**	If active, the communication object "Power - Bus B - max"(ID115) is sent cyclically
Power Aux - send minimum cyclically	Yes / **No**	If active, the communication object "Power - Aux - min"(ID116) is sent cyclically
Power Aux - send maximum cyclically	Yes / **No**	If active, the communication object "Power - Aux - max"(ID117) is sent cyclically
Total Power - send minimum cyclically	Yes / **No**	If active, the communication object "Power - Total - min"(ID118) is sent cyclically
Total Power - send maximum cyclically	Yes / **No**	If active, the communication object "Power - Total - max"(ID119) is sent cyclically
Temperature - send minimum cyclically	Yes / **No**	If active, the communication object "Temperature - min"(ID120) is sent cyclically
Temperature - send maximum cyclically	Yes / **No**	If active, the communication object "Temperature - max"(ID121) is sent cyclically
Telegram rate Bus A - send maximum cyclically	Yes / **No**	If active, the communication object "Telegram rate (per second) - Bus A - max"(ID122) is sent cyclically. This maximum represents the maximum of the measured value "Current telegram rate (per second) - Bus A"(ID62). → Communication objects

Energy values

Settings

The following settings can be made in the "Energy value settings" tab:

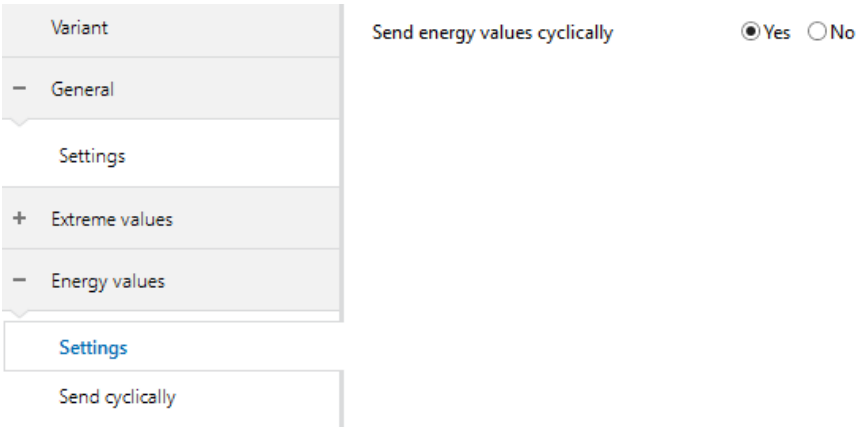


Figure 28: Energy value parameter settings

Name	Options	Description
Send energy values cyclically	Yes / **No**	If active, the energy values can be sent cyclically. Activates the "Send cyclically" tab. → Energy meter

Send cyclically

The following settings can be made under the tab "Energy values Send cyclically":

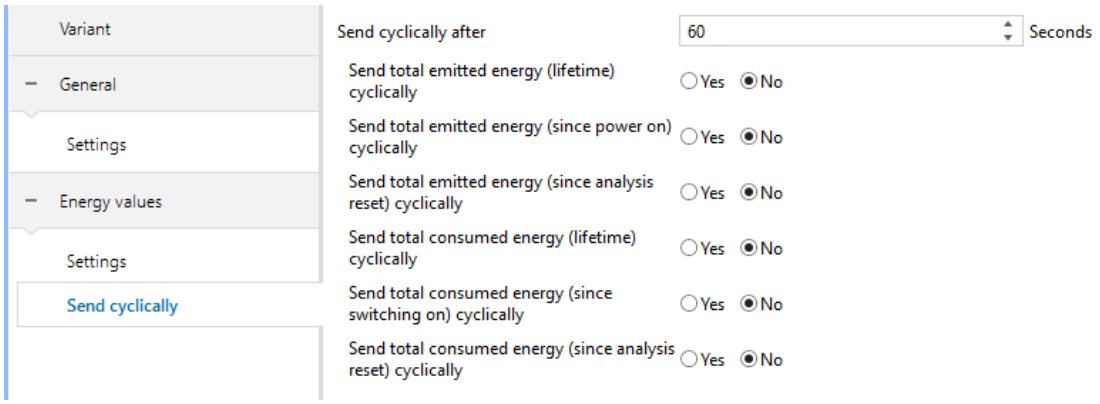


Figure 29: Energy values parameter - send cyclically

Name	Options	Description
Send cyclically after	0 .. **60** .. 172800	Cycle time in seconds in which the energy values activated below are sent to the bus. If a time greater than 0 is set, the measured values are sent for the first time when the device is restarted. If the value is 0, transmission is not cyclical. → Communication objects
Send total emitted energy (lifetime) cyclically	Yes / **No**	If active, the communication object "Total emitted energy lifetime" (ID139) is sent cyclically
Send total emitted energy (since power-on) cyclically	Yes / **No**	If active, the communication object " Total emitted energy since power-on"(ID141) is sent cyclically
Send total emitted energy (since analysis reset)	Yes / **No**	If active, the communication object "Total emitted energy since last analysis reset"(ID142) is sent cyclically
Send total consumed energy (lifetime) cyclically	Yes / **No**	If active, then the communication object " Total consumed energy lifetime"(ID143) is sent cyclically
Send total consumed energy (since power-on)	Yes / **No**	If active, the communication object " Total consumed energy since power-on"(ID144) is sent cyclically
Send total consumed energy (since analysis reset) cyclically	Yes / **No**	If active, the communication object "Total consumed energy since last analysis reset"(ID145) is sent cyclically

Holidays

Set public holidays

The following settings can be made in the "Set Holiday" tab:

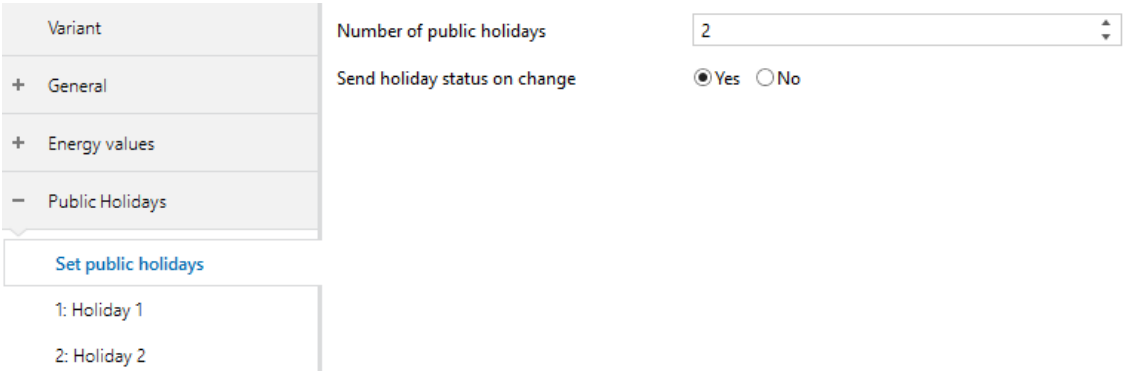


Figure 30: Parameter Holidays - set public holidays

Name	Options	Description
Number of public holidays	**0** .. 18	Number of public holidays. A new tab is activated for each defined public holiday.
Send holiday status on change	Yes / **No**	If active, then the communication object "Holiday"(ID153) is sent on the bus whenever it changes. The object is also sent when the device is restarted. → Communication objects

Holiday 1 ... 18

The parameters for the tabs Holiday 1..18 are explained using Holiday 1 as an example.

Under the "Holiday 1" tab, the following settings can be made:

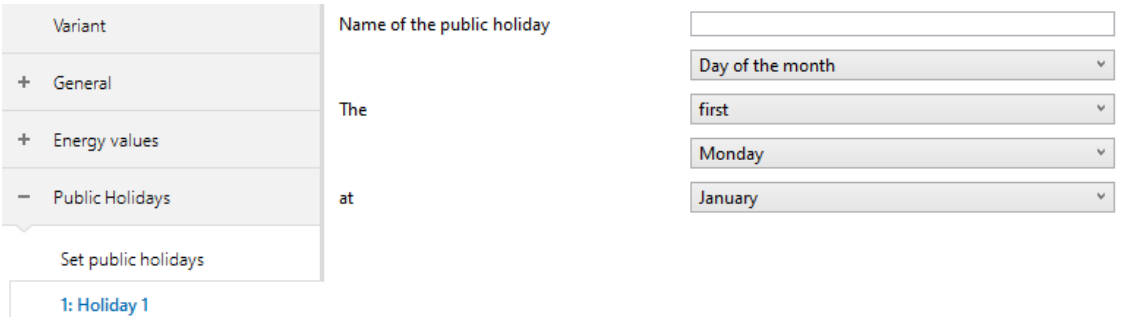


Figure 31: Parameter Holiday 1 - If the input option "Day of the month" is selected

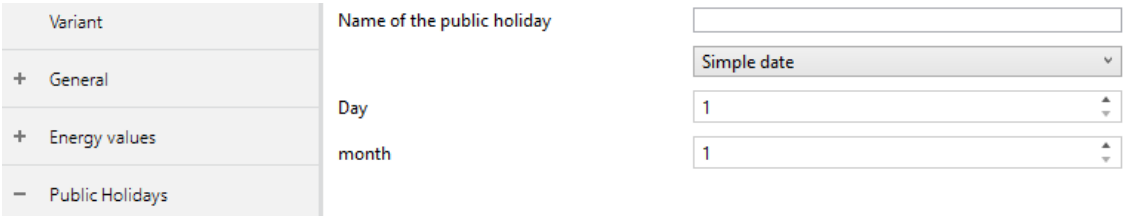


Figure 32: Parameter Holiday 1 - If the input option "Simple date

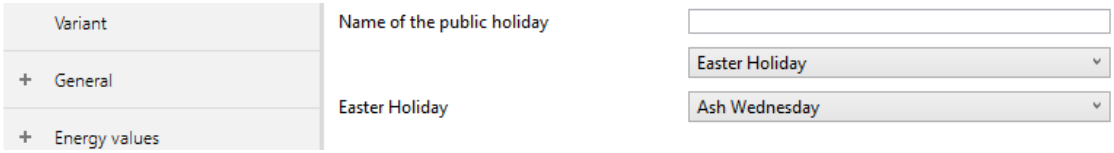


Figure 33: Parameter Holiday 1 - If the input option "Easter holiday" is selected

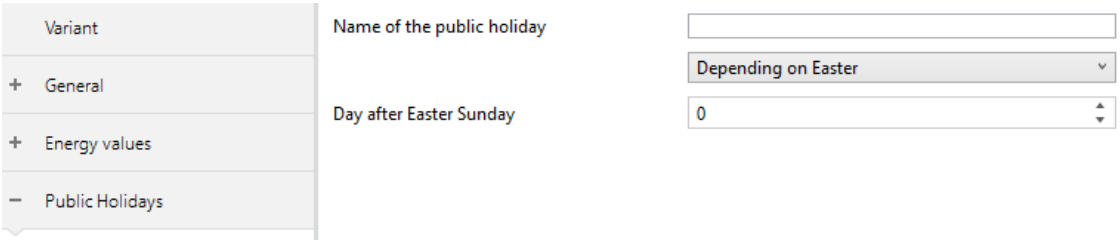


Figure 34: Parameter Holiday 1 - If the input option "Depending on Easter

Name	Options	Description
Name of the public holiday	String with max. 20 characters	Name displayed in the tab for holiday 1. This designation is only used for clarity within the ETS application.
	Day of the month / Simple date / Easter Holiday / Easter	Select the input option for the holiday. The selection determines the activation of the next input fields.
The	**first** / second / third / fourth / fifth	Only enabled if the input option "Day of the month" is selected.
	Monday / Tuesday / Wednesday / Thursday / Friday / Saturday / Sunday	Only enabled if the input option "Day of the month" is selected.
at	**January** / February / March / April / May / June / July / August / September / October / November / December / every month	Only enabled if the input option "Day of the month" is selected.
Day	**1** .. 31	Only enable if the input option "Simple date" is selected.
month	**1** .. 12	Only enable if the input option "Simple date" is selected.
Easter holiday	**Ash Wednesday** Good Friday / Holy Saturday / Easter Sunday / Easter Monday / Ascension Day / Corpus Christi / Whit Sunday / Whit Monday	Only enable if the input option "Easter holiday" is selected.
Day on Easter Sunday	-365 .. **0** .. + 365	Only enable if the input option "Depending on Easter" is selected.

Periods

Set time periods

The following settings can be made under the "Set time periods" tab:

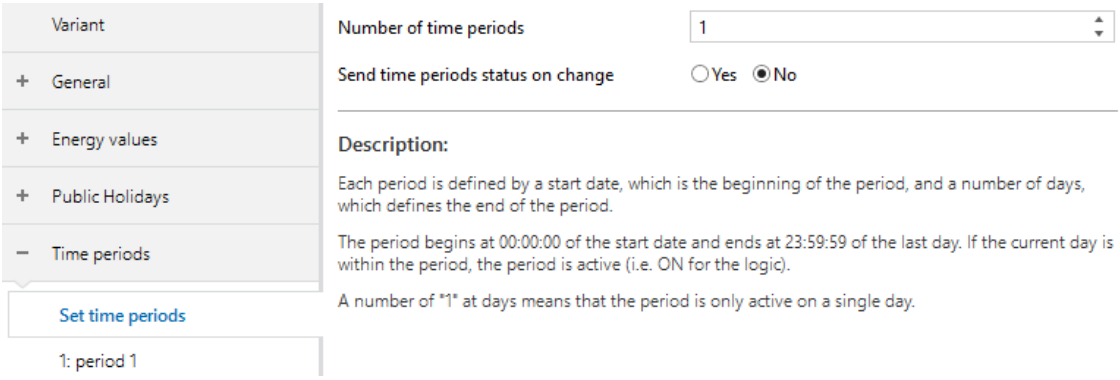


Figure 35: Parameters Periods - define

Name	Options	Description
Number of time periods	**0** .. 10	Number of time periods. One new tab is activated per defined time period.
Send time periods status on change	Yes / **No**	If active, then a communication object for the time period (ID154 - ID163) is sent on the bus whenever it changes. Only the changed object is sent. In addition all status objects are sent for the time periods when the device is restarted. → Communication objects

Period 1 ... 10

The parameters for the tabs Period 1 ... 10 are explained using period 1 as an example.

The following settings can be made under the "period 1" tab:

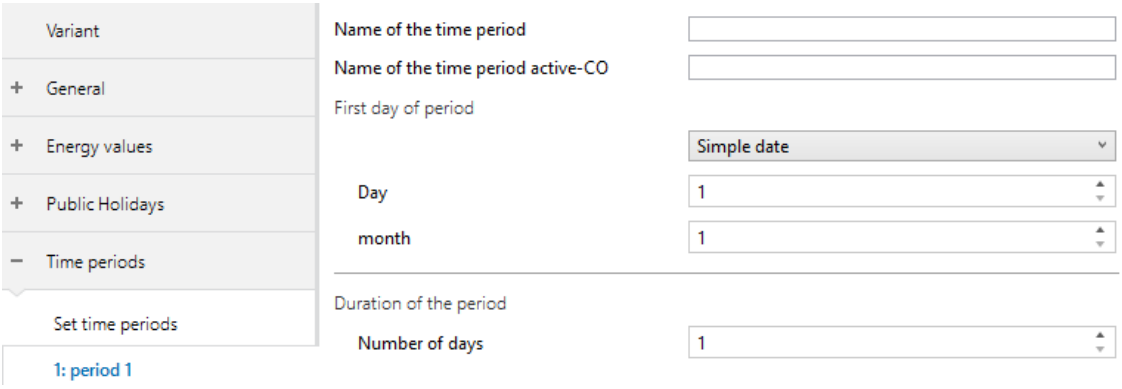


Figure 36: Parameter Period 1 - If the input option "Simple date" is selected

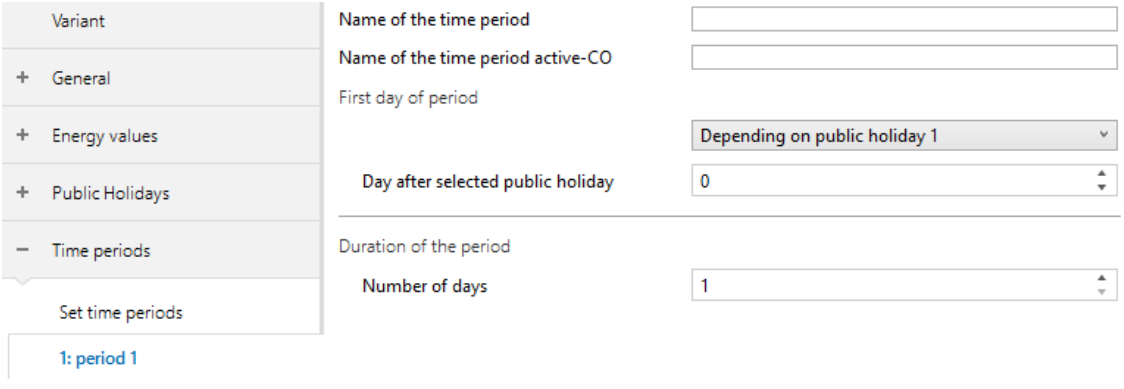


Figure 37: Parameter Period 1 - If the input option "Depends on ..." is selected

Name	Options	Description
Name of the period	String with max. 20 characters	Name displayed in the tab for period 1. This designation is only used for clarity within the ETS application.
Name of the time period active-KO	String with max. 20 characters	Designation for the communication object "Period 1-Active"(ID154). This designation is only used for the clarity of the communication objects within the ETS application.
	Simple date / Dependent on Ash Wednesday / ... / Depending on public holiday 1 ... 18	Select the input option for the period. The selection determines the activation of the next input fields.
Day	**1** .. 31	Only enabled if input option "Simple date" is selected. Enter the day on which the period begins.
Month	**1** .. 12	Only enabled if input option "Simple date" is selected. Enter the month in which the period begins.
Day after selected public holiday	-365 .. **0** .. +365	Only enabled if input option "Dependant on .." is selected. Offset in days to the start day of the period. If you enter -2, the start day of the period would be the day that is two days before the selected holiday.
Number of days	**1** .. 65535	Duration of the period in days. If you enter 1, the time period would only cover the start day

Time switches

Set time switches

The following settings can be made under the tab "Set time switches - time switches":

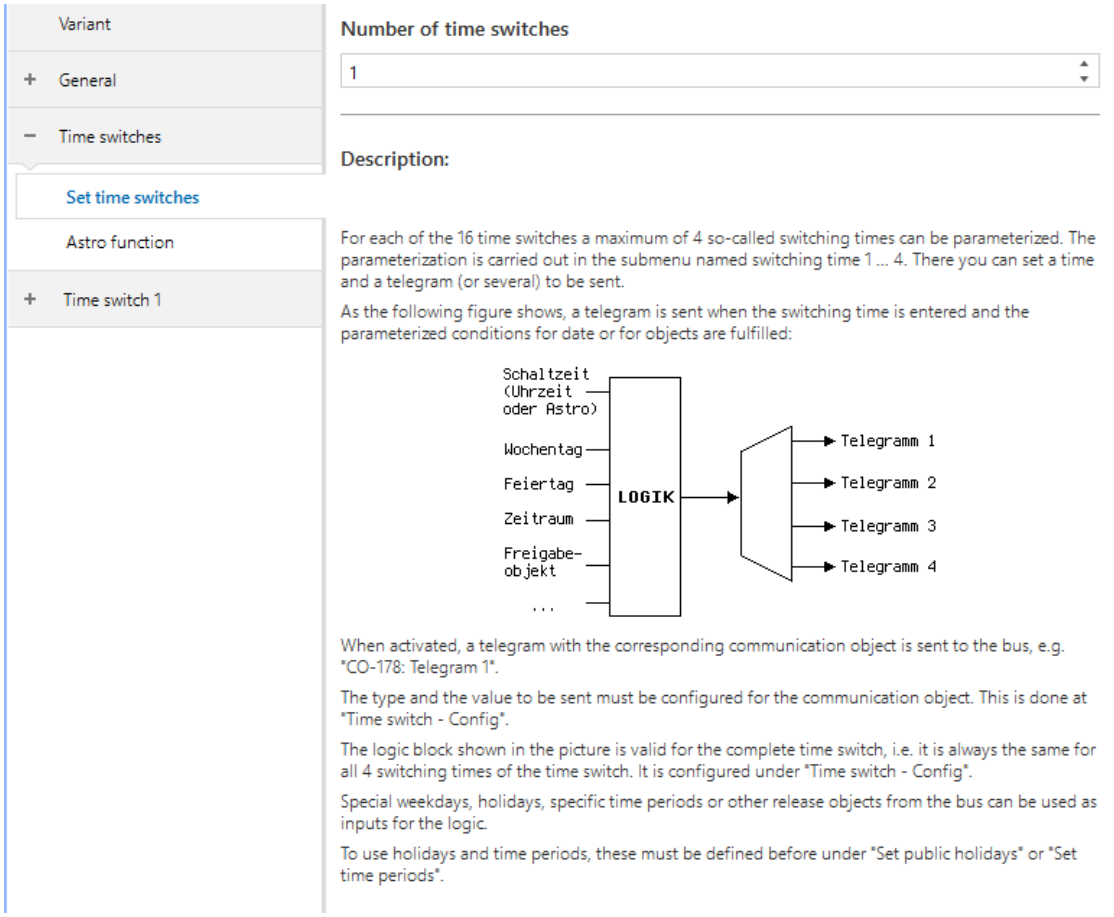


Figure 38: Set timer switch parameters

Name	Options	Description
Number of time switches	**0** to 16	Number of time switches. One new tab is activated per defined time switch.

Astro function

The following settings can be made under the tab "Astro function":

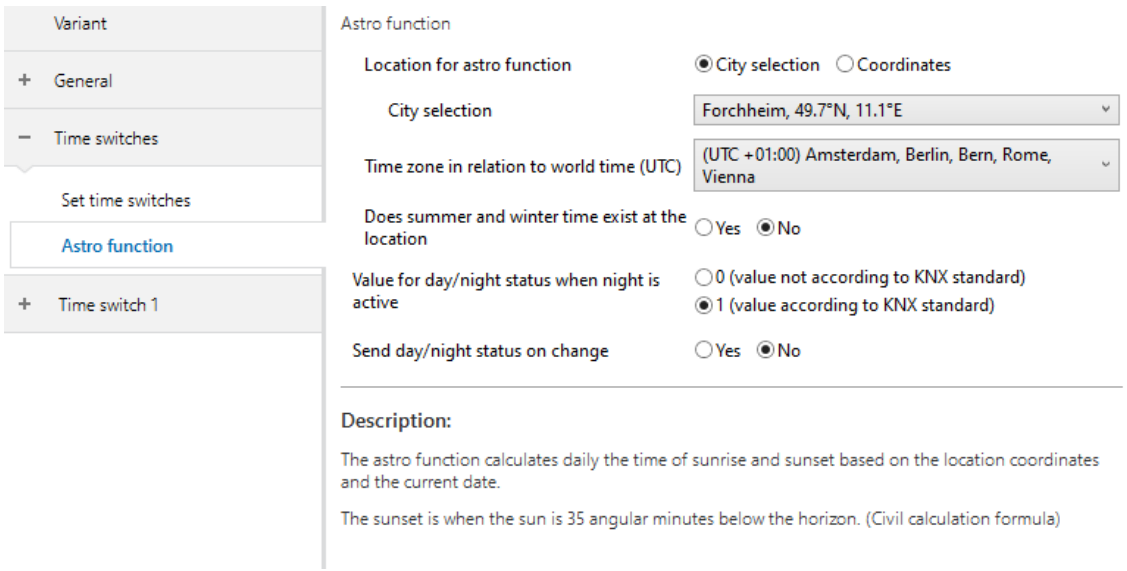


Figure 39: Timer astro function parameters - city selection

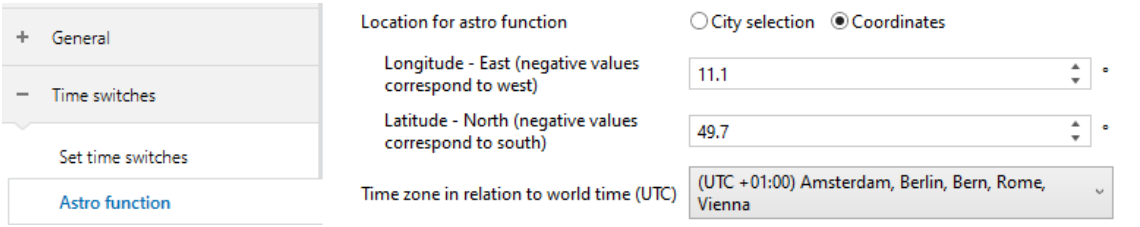


Figure 40: Timer astro function parameters - coordinates

Name	Options	Description
Location for astro function	**City selectionCoordinates**	Selection of the location to determine sunrise and sunset.
City selection	Madrid / .. **Forchheim** ... / Vienna	Only enabled if "City selection" is selected at "Location for astro function". Selection of the location based on a city.
Time zone in relation to world time (UTC)	UTC-12 ... **UTC+1 (Amsterdam, Berlin, Bern, Rome, Vienna)** ... UTC-10	Time zone in which the location is located.
Does summer and winter time exist at the location	**Yes** / No	If active, the time change between summer and winter time is taken into account when calculating sunrise and sunset.
Value for day/night status when night active	0 / **1**	Setting value for the communication object "Day/Night" (ID150) if it is night. According to KNX standard this is the value 1.
Send day/night status on change	Yes / **No**	If active, then the communication object "Day/Night" (ID150) is sent on the bus whenever it is changed. The object is also sent when the device is restarted. → Communication objects
Longitude - East (negative values correspond to West)	-180 .. **11,1** .. +180	Only enabled, if "Coordinates" is selected in "Location for astro function". An input of the value 3.7 would correspond to the longitude of Madrid, for example.
Latitude - North (negative values correspond to South)	-90 .. 49,7 .. +90	Only enabled, if "Coordinates" is selected in "Location for astro function". An input of the value 48.1 would correspond to the latitude of Munich, for example.

Time switch 1 ... 16

The parameters for the time switch tab 1 ... 16 are explained using time switch 1 as an example.

Timer 1 - Config

The following settings can be made under the tab "Timer 1-Config":

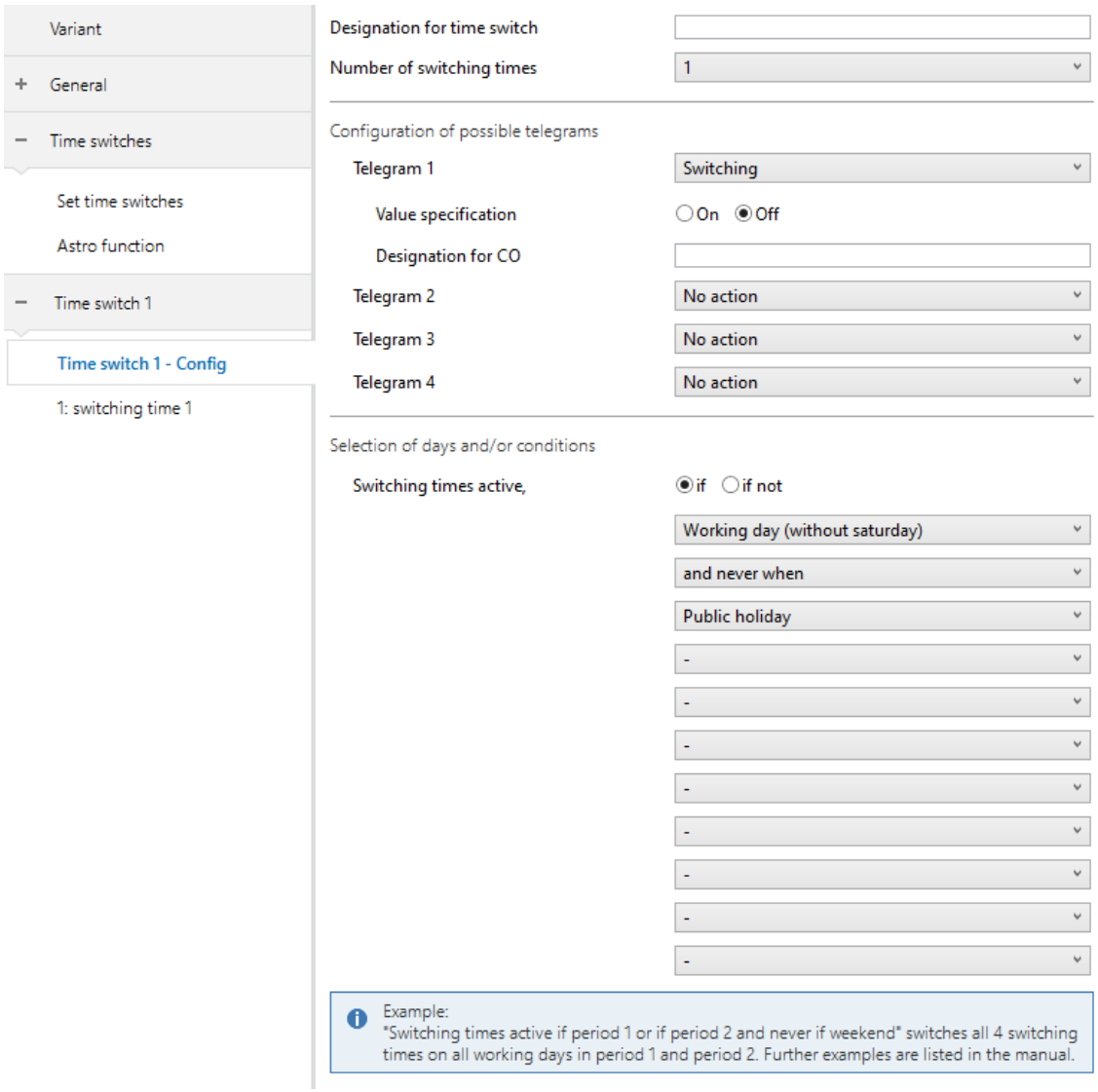


Figure 41: Timer 1-Config parameter

Name	Options	Description
Designation for time switch	String with max. 20 characters	Name displayed in the tab for period 1. This designation is only used for clarity within the ETS application.
Number of switching times	**1** .. 4	Number of switching times. One new tab is activated per defined switching time.
Telegram 1	**No action /** Switching / Dimming / Shutter / Value 1 byte / Value 2 byte / Call up a scene / Operating mode of the controller / Colour RGB / Colour HSV	Data type for telegram 1. Depending on the selection, different input possibilities are offered for the following value specification. The telegrams pre-parameterised here can be sent by the time switch on the Bus at the switching times. Which telegram is sent at which switching time can be set in the tab of the respective switching time. → Communication objects
Value specification		Value to be sent for telegram 1. The value depends on the data type selected above.
Designation for CO	String with max. 20 characters	Designation for the communication object "Time-switch telegram 1"(ID178). This designation only serves the purpose of clarity for the communication objects within the ETS application.
Telegram 2 - 4	see telegram 1	see telegram 1
Value specification	see telegram 1	see telegram 1
Designation for CO	see telegram 1	see telegram 1
Switching times active, (Logical operation 1)	**if** / if not	If "if", the following condition 1 is not negated. If "if not" the following condition is negated.
(condition 1)	Period 1 / Period 2 / Period 3 / Period 4 / Period 5 / Period 6 / Period 7 / Period 8 / Period 9 / Period 10 / Period 1 - 5 / Period 6 - 10 / **daily** / weekend / working day / Monday / Tuesday / Wednesday / Thursday / Friday / Saturday / Sunday / not Monday / not Tuesday / not Wednesday / not Thursday / not Friday / not Saturday / not Sunday / Public holiday / not public holiday / During summer season / During winter season / Global release object 1 is ON / Global release object 2 is ON / Global release object 3 is ON	Condition or day on which the time switch should switch. If the logic is fulfilled here, then all four switching times of this time switch are applied on this day. The condition "period 1 - 5" or "period 6 - 10" always applies as soon as one of the periods 1 - 5 or 1 - 6, respectively, are active.
(Logical operation 2)	- / or when / or if not / and never when	When "or if" is used, the following condition 2 is not negated and is combined with all other OR operations with a logical OR operation. If "or if not", the following condition 2 is negated and combined with all other OR operations with a logical OR operation. With "and never if" the following condition is subtracted from the total amount of OR-operations. Example: With "If Monday or if Wednesday and never if holiday or if Friday" the time switch is active on the three weekdays Monday, Wednesday and Friday minus all holidays. Logically, all "or if" operations are combined first and afterwards all "and never if" operations are subtracted.
(condition 2)	see condition 1	see condition 1
(Logical operation 3 - 6)	see operation 1	see link 1

Name	Options	Description
(condition 3 - 6)	see condition 1	see condition 1

Time switch 1 - switching time 1. 4

The parameters for the tabs Switching time 1..4 are explained using switching time 1 as an example.

The following settings can be made under the tab "Timer 1-switching time 1":

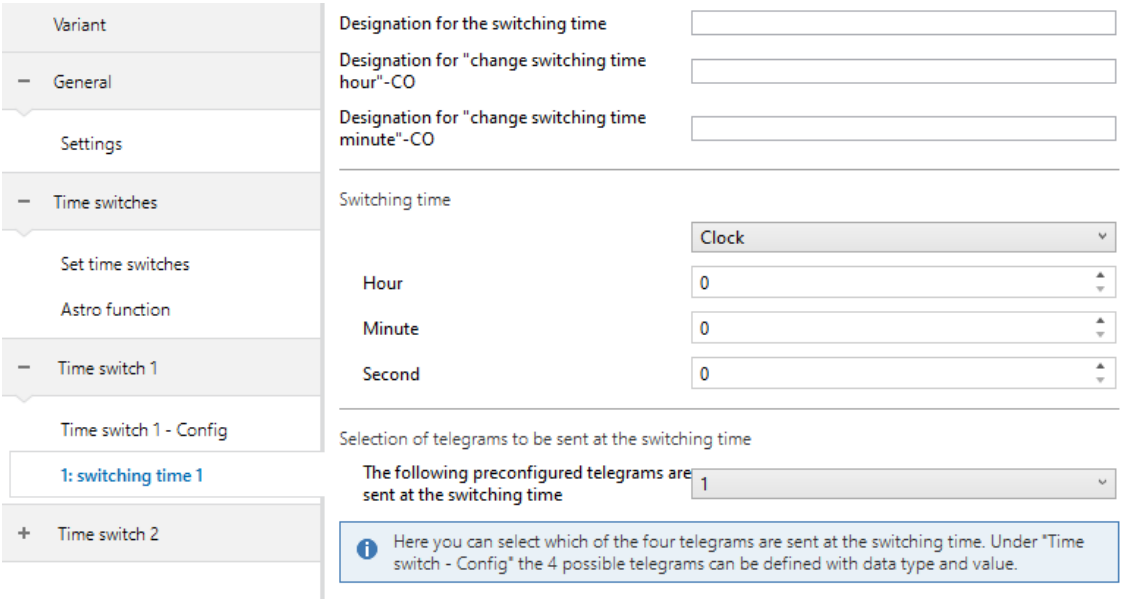


Figure 42: Parameter time switch 1- switching time 1 with option clock

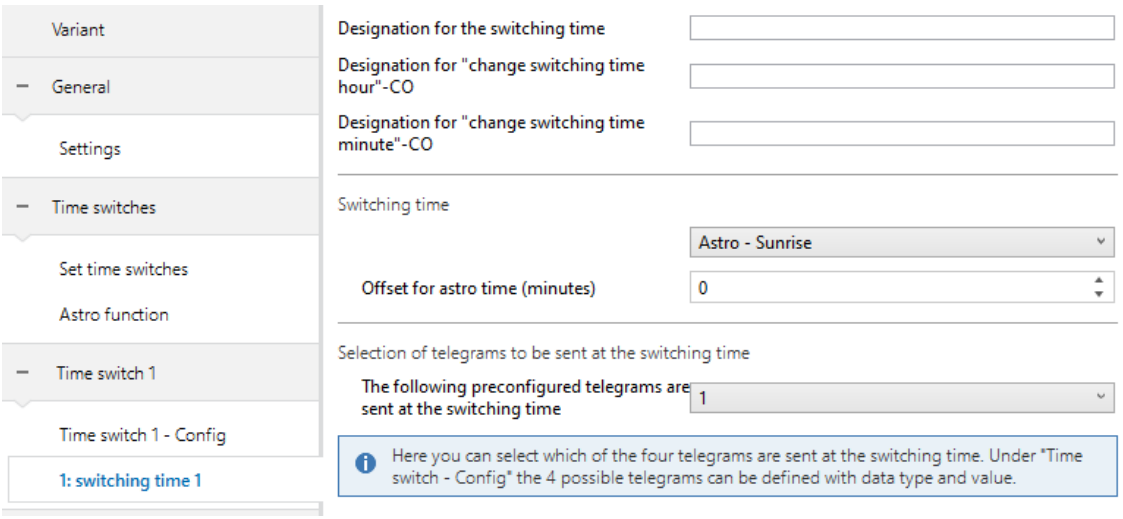


Figure 43: Time switch parameters 1- Switching time 1 with input option Astro function

Name	Options	Description
Designation for the switching time	String with max. 20 characters	Name displayed in the tab for period 1. This designation is only used for clarity within the ETS application.
Designation for "change switching time hour"-KO	String with max. 20 characters	Designation for the communication object "time switch1-time1 :HH"(ID174). This designation is only used for the clarity of the communication objects within the ETS application.

Name	Options	Description
		→ Communication objects
Designation for "change switching time minute"-KO	String with max. 20 characters	Designation of the communication object "time switch1-time 1 :MM"(ID175). This designation is only used for the clarity of the communication objects within the ETS application. → Communication objects
Switching time	**Clock** / Astro - Sunrise / Astro - Sunset	Selection whether a fixed switching time is entered or whether it is applied via the astro function.
Hour	**0** .. 23	Only enable, if "Clock" has been selected at the switching time. Hour at which the time switch becomes active. This value can be overwritten from the bus with the communication object "time switch1-time 1 :HH"(ID174). After a restart of the device, however, the original hour, which was parameterised via the ETS, is valid again.
Minute	**0** .. 59	Only enable, if "Clock" has been selected at the switching time. Minute at which the time switch becomes active. This value can be overwritten from the bus with the communication object "time switch1-time 1 :MM"(ID175). After a restart of the device, however, the original minute, which was parameterised via the ETS, is valid again.
Second	**0** .. 59	Only enable if "Clock" has been selected at the switching time. Hour at which the time switch becomes active. Second at which the time switch becomes active
Offset for astro time (minutes)	-720 .. **0** .. +720	Only enabled, if "Astro - Sunrise" or "Astro - Sunset" was selected at switching time. This value can be used to readjust the switching time relative to sunrise or sunset.
The following preconfigured telegrams are sent at the switching time	**1** / 2 / 3 / 4 1 & 2 / 1 & 3 / 1 & 4 / 2 & 3 / 2 & 4 / 3 & 4 / 1 & 2 & 3 / 1 & 2 & 4 / 1 & 3 & 4 / 2 & 3 & 4 / 1 & 2 & 3 & 4	Selection of the preconfigured telegrams, that are sent at the switching time. Up to four telegrams can be sent at the switching time.

Communication objects

Notes:

- Depending on the parameterisation, some objects may not be available.
- As all devices are subjected to an output test, the operating time and energy counters deviate from zero on delivery.

ID	Name	Object function	Description	Length	DptType
1	Number of power failures	Status	Counter, in which all voltage failures on Bus A during its lifetime are counted. The power failure can have several reasons: Failure of the mains voltage, short circuit on Bus A or triggering of the reset on Bus A.	2 bytes	[7.1] DPT_Value_2_Ucount bzw. [5.001]
2	Last power failure - clock	Status	Clock, at which the bus voltage on Bus A failed for the last time. The power failure can have several reasons: Failure of the mains voltage, short circuit on Bus A or triggering of the reset on Bus A.	3 bytes	10.001] DPT_TimeOfDay
3	Last power failure - date	Status	Date, on which the bus voltage on Bus A failed for the last time. The power failure can have several	3 bytes	[11.001] DPT_Date

ID	Name	Object function	Description	Length	DptType
			reasons: Failure of the mains voltage, short circuit on Bus A or triggering of the reset on Bus A.		
4	Number of bus resets - Bus A	Status	Counter, in which all bus resets of the device at Bus A during its lifetime are counted.	2 bytes	[7.1] DPT_Value_2_Ucount bzw. [5.001]
5	Last bus reset - Bus A - clock	Status	Clock, at which the bus reset on Bus A was triggered last time.	3 bytes	10.001] DPT_TimeOfDay
6	Last bus reset - Bus A - date	Status	Date, on which the bus reset on Bus A was triggered last time.	3 bytes	[11.001] DPT_Date
7	Number of bus resets - Bus B	Status	Counter, in which all bus resets of the device at Bus B during its lifetime are counted.	2 bytes	[7.1] DPT_Value_2_Ucount bzw. [5.001]
8	Last bus reset - Bus B - clock	Status	Time, at which the bus reset on Bus B was triggered last time.	3 bytes	10.001] DPT_TimeOfDay
9	Last bus reset - Bus B - date	Status	Date, on which the bus reset on Bus B was triggered last time.	3 bytes	[11.001] DPT_Date
10	Number of bus restarts - Bus A	Status	Counter, in which all voltage failures on Bus A during its lifetime are counted. A restart on Bus A can have several reasons: Failure of the bus voltage on Bus A, triggering of the reset on Bus A, short circuit on Bus A, "reset device" function of the ETS, programming of the ETS application.	2 bytes	[7.1] DPT_Value_2_Ucount bzw. [5.001]
11	Last bus restart - Bus A - clock	Status	Clock, at which the bus restart on Bus A was triggered last time. A restart on Bus A can have several reasons: Failure of the bus voltage on Bus A, triggering of the reset on Bus A, short circuit on Bus A, "reset device" function of the ETS, programming of the ETS application.	3 bytes	10.001] DPT_TimeOfDay
12	Last bus restart - Bus A - date	Status	Date, at which the bus restart on Bus A was triggered last time. A restart on Bus A can have several reasons: Failure of the bus voltage on Bus A, triggering of the reset on Bus A, short circuit on Bus A, "reset device" function of the ETS, programming of the ETS application.	3 bytes	[11.001] DPT_Date
13	Analysis reset	Trigger	When sending to the object, all stored extreme values and energy counters (except those marked with lifetime and the energy counters since the last restart) are reset.	1 bit	[1.017] DPT_Trigger
14	Output Status Information	Text message	Status message in text form. The format, content and transmission can be parameterised. If several status values are parameterised for the status message, these are sent in text form one after the other on the bus at a parameterisable time interval. This allows the status messages to be shown one after the other on a display. → Parameters	14 bytes	16.1] DPT_String_8859_1
15	Operating hours lifetime	Status	Operating hours of the device. Value cannot be changed / reset by the user.	2 bytes	[7.] 001DPT_Value_2_Ucount
16	Operating seconds lifetime	Status	Operating seconds of the device. Value cannot be changed / reset by the user.	4 bytes	13.001]DPT_Value_4_Count
17	Remote bus reset - Bus	Trigger	When sending to the object, the voltage on Bus A	1 bit	[1.017]

ID	Name	Object function	Description	Length	DptType
	A		is short-circuited to bus GND for 20 s. This triggers a bus reset as when the reset button is pressed on the power supply. → Bus Reset		DPT_Trigger
18	Remote bus reset - Bus B	Trigger	When sending to the object, the voltage on Bus B is shorted to bus GND for 20 s. This triggers a bus reset as when the reset button on the power supply is pressed. → Bus Reset	1 bit	[1.017] DPT_Trigger
34	Clock	Set/query time	Communication object for setting the internal time or querying the internal time. The internal clock is buffered internally (via supercap capacitor) for approx. 36 hours. The internal clock can deviate from the real time by up to 2 minutes per year. Therefore it should be synchronised regularly with an accurate clock (e.g. an NTP time server). This is done by writing the exact time into this communication object. If the device is parameterised as a timer, then the communication object "Time valid" (ID38) is set to 1 as soon as the exact time has been written to this communication object at least once. → Parameters	3 bytes	10.001] DPT_TimeOfDay
35	Date	Set/query time	Communication object for setting the internal date or querying the internal date. The internal date is buffered internally (by supercap capacitor) for approx. 36 hours. If the device is parameterised as a timer, the communication object "Date valid" (ID39) is set to 1 as soon as this communication object has been written to at least once. → Parameters	3 bytes	[11.001] DPT_Date
36	Send clock request	Trigger	The device can use this communication object to send the command to request the time on the bus. The power supply can be parameterised in a way, that the device sends this communication object on the bus, when it is restarted. A KNX clock on the bus must then respond with a telegram to the "Clock" communication object (ID34). The object is only available if the device is parameterised as a time receiver. → Parameters	1 bit	[1.017] DPT_Trigger
37	Send date request	Trigger	The device can use this communication object to send the command to request the date on the bus. The power supply can be parameterised in a way, that the device sends this communication object on the bus, when it is restarted. A KNX clock on the bus must then respond with a telegram to the communication object "Date" (ID35). The object is only available if the device is parameterised as a time receiver. → Parameters	1 bit	[1.017] DPT_Trigger
38	Clock valid	Status	Indicates whether the internal clock is valid. Value 1 means valid, value 0 invalid. The communication object can be sent automatically after each restart via the parameterisation. When the device is in delivery state, the communication object is 0. The clock becomes valid when the communication object "Time" (ID34) has been written to by the bus. After a restart or ETS programming of the device, the value remains valid. Only in the case that the internal buffer capacitor has been discharged too much due to a power failure lasting several days, the clock becomes invalid again. The object is only available, if the device is parameterised as a KNX clock. → Parameters	1 bit	1.2] DPT_Bool
39	Date valid	Status	Indicates whether the internal date is valid. Value	1 bit	1.2]

ID	Name	Object function	Description	Length	DptType
			1 means valid, value 0 invalid. The communication object can be sent after each restart via the parameterisation. When the device is in delivery state, the communication object is set to 0. The date becomes valid when the communication object "Date" (ID35) has been written to by the bus. After a restart or ETS programming of the device, the value remains valid. Only in the case that the internal buffer capacitor has been discharged too much due to a power failure lasting several days, the date becomes invalid again. The object is only available, if the device is parameterised as a KNX clock. → Parameters		DPT_Bool
40	Send time	Trigger	When sending at the object, the power supply unit sends its internal clock via the communication object "Clock"(ID34) and its internal date via the "Date"(ID35). The object is only available if the device is parameterised as a KNX timer. → Parameters	1 bit	[1.017] DPT_Trigger
41	Working day (Mon - Fri)	Status - Calendar	Communication object has the value 1 from Monday at 00:00:00 until Friday at 23:59:59. Otherwise it has the value 0.	1 bit	1.2] DPT_Bool
48	Request measured values	Trigger	When sending to the object, the power supply unit sends all measured values (ID51 - 61): "Voltage - Bus A" (ID50), "Voltage - Bus B" (ID51), "Voltage - Aux" (ID52), "Current - Bus A" (ID53), "Current - Bus B" (ID54), "Current - Aux" (ID55), "Current - Total" (ID56), "Power - Bus A" (ID57), "Power - Bus B" (ID58), "Power - Aux" (ID59), "Power - Total" (ID60), "Temperature" (ID61)	1 bit	[1.017] DPT_Trigger
49	Request extreme values	Trigger	When sending to the object, the power supply unit sends all extreme values (ID98-122).	1 bit	[1.017] DPT_Trigger
50	Voltage - Bus A	Measurement - Bus A	Actual voltage Bus A (unit: mV or V). Data type depends on parameter "Select data type for voltages". → Parameters	4 bytes or 2 bytes	[9.020] DPT_Value_Volt bzw. [14.027]
51	Voltage - Bus B	Measurement - Bus B	Actual voltage Bus B (unit: mV or V). Data type depends on parameter "Select data type for voltages".	4 bytes or 2 bytes	[9.020] DPT_Value_Volt bzw. [14.027]
52	Voltage - Aux	Measurement - Aux	Current voltage Aux (unit: mV or V). Data type depends on parameter "Select data type for voltages".	4 bytes or 2 bytes	[9.020] DPT_Value_Volt bzw. [14.027]
53	Current - Bus A	Measurement - Bus A	Actual current at Bus A (unit: mA or A). Data type depends on parameter "Select data type for currents". → Parameters	4 bytes or 2 bytes	[9.021] DPT_Value_Curr bzw. [14.019]
54	Current - Bus B	Measurement - Bus B	Actual current on Bus B (unit: mA or A). Data type depends on parameter "Select data type for currents".	4 bytes or 2 bytes	[9.021] DPT_Value_Curr bzw. [14.019]
55	Current - Aux	Measurement - Aux	Current at the Aux output (unit: mA or A). Data type depends on parameter "Select data type for currents".	4 bytes or 2 bytes	[9.021] DPT_Value_Curr bzw. [14.019]
56	Current - Total	Measurem	Current total current (unit: mA or A). Data type	4 bytes	[9.021]

ID	Name	Object function	Description	Length	DptType
		ent	depends on parameter "Select data type for currents".	or 2 bytes	DPT_Value_Curr bzw. [14.019]
57	Power - Bus A	Measurement - Bus A	Actual power on Bus A (unit: W).	4 bytes	[14.056] DPT_Power
58	Power - Bus B	Measurement - Bus B	Actual power on Bus B (unit: W).	4 bytes	[14.056] DPT_Power
59	Power - Aux	Measurement - Aux	Actual power at Aux output (unit: W).	4 bytes	[14.056] DPT_Power
60	Power - Total	Measurement	Actual total power over the three outputs (unit: W)	4 bytes	[14.056] DPT_Power
61	Temperature	Measurement	Actual device temperature (unit: °C). Data type depends on parameter "Select data type for temperatures".	4 bytes or 2 bytes	[9.001] DPT_Value_Temp bzw. Dpt [14,068].
62	Current telegram rate (per second) - Bus A	Measurement - Bus A	Actual telegram rate at Bus A (unit: telegrams/second or bus load in %). Data type depends on parameter "Select data type for telegram rate". A bus load of 100% corresponds to a telegram rate of 50 telegrams/second. → Parameters	2 bytes	[7.1] DPT_Value_2_Ucount bzw. [5.001]
63	Average telegram rate (per second) - Bus A	Measurement - Bus A	Average telegram rate at Bus A since last restart (unit: telegrams/second or bus load in %). Data type depends on parameter "Select data type for telegram rate". A bus load of 100% corresponds to a telegram rate of 50 telegrams/second.	2 bytes	[7.1] DPT_Value_2_Ucount bzw. [5.001]
74	Voltage - Bus A - limit value	Set limit value	Setting the limit value of the voltage of Bus A (unit: mV or V). Data type depends on parameter "Select data type for voltages". If this value is written from the bus, then this limit value is valid instead of the limit value from the ETS parameterisation. After a restart of the device the limit value from the ETS parameterisation becomes valid again.	4 bytes or 2 bytes	[9.020] DPT_Value_Volt bzw. [14.027]
75	Voltage - Bus A - limit value above/below	Status	Communication object, which is sent with the value 1 or 0, if the bus voltage limit value has been exceeded or fallen below	1 bit	1.2] DPT_Bool
76	Voltage - Bus B - limit value	Set limit value	Setting the limit value of the voltage of Bus B (unit: mV or V). Data type depends on parameter "Select data type for voltages". If this value is written from the bus, then this limit value is valid instead of the limit value from the ETS parameterisation. After a restart of the device the limit value from the ETS parameterisation becomes valid again.	4 bytes or 2 bytes	[9.020] DPT_Value_Volt bzw. [14.027]
77	Voltage - Bus B - limit value above/below	Status	Communication object, which is sent with the value 1 or 0, if the bus voltage limit value has been exceeded or fallen below	1 bit	1.2] DPT_Bool
78	Voltage - Aux - limit value	Set limit value	Setting the limit value of the voltage of Aux (unit: mV or V). Data type depends on parameter "Select data type for voltages". If this value is written from the bus, then this limit value is valid instead of the limit value from the ETS parameterisation. After a restart of the device the limit value from the ETS parameterisation becomes valid again.	4 bytes or 2 bytes	[9.020] DPT_Value_Volt bzw. [14.027]
79	Voltage - Aux - limit	Status	Communication object, which is sent with the	1 bit	1.2]

ID	Name	Object function	Description	Length	DptType
	value above/below		value 1 or 0, if the voltage limit value has been exceeded or fallen below		DPT_Bool
80	Current - Bus A - limit value	Set limit value	Setting the limit value of the current of Bus A (unit: mV or V). Data type depends on parameter "Select data type for currents". If this value is written from the bus, then this limit value is valid instead of the limit value from the ETS parameterisation. After a restart of the device the limit value from the ETS parameterisation becomes valid again.	4 bytes or 2 bytes	[9.021] DPT_Value_Curr bzw. [14.019]
81	Current - Bus A - limit value above/below	Status	Communication object, which is sent with the value 1 or 0, if the current limit value has been exceeded or fallen below	1 bit	1.2] DPT_Bool
82	Current - Bus B - limit value	Set limit value	Setting the limit value of the current of Bus B (unit: mV or V). Data type depends on parameter "Select data type for currents". If this value is written from the bus, then this limit value is valid instead of the limit value from the ETS parameterisation. After a restart of the device the limit value from the ETS parameterisation becomes valid again.	4 bytes or 2 bytes	[9.021] DPT_Value_Curr bzw. [14.019]
83	Current - Bus B - limit value above/below	Status	Communication object, which is sent with the value 1 or 0, if the current limit value has been exceeded or fallen below	1 bit	1.2] DPT_Bool
84	Current - Aux - limit value	Set limit value	Setting the limit value of the current of Aux (unit: mV or V). Data type depends on parameter "Select data type for currents". If this value is written from the bus, then this limit value is valid instead of the limit value from the ETS parameterisation. After a restart of the device the limit value from the ETS parameterisation becomes valid again.	4 bytes or 2 bytes	[9.021] DPT_Value_Curr bzw. [14.019]
85	Current - Aux - limit value above/below	Status	Communication object, which is sent with the value 1 or 0, if the current limit value has been exceeded or fallen below	1 bit	1.2] DPT_Bool
86	Current - Total - limit value	Set limit value	Setting the limit value of the total current (unit: mV or V). Data type depends on parameter "Select data type for currents". If this value is written from the bus, then this limit value is valid instead of the limit value from the ETS parameterisation. After a restart of the device the limit value from the ETS parameterisation becomes valid again.	4 bytes or 2 bytes	[9.021] DPT_Value_Curr bzw. [14.019]
87	Current - Total - limit value above/below	Status	Communication object, which is sent with the value 1 or 0, if the current limit value has been exceeded or fallen below	1 bit	1.2] DPT_Bool
88	Temperature - limit value	Set limit value	Setting the limit value of the temperature (unit: °C). Data type depends on parameter "Select data type for temperatures". If this value is written from the bus, this limit value is valid instead of the limit value from the ETS parameterisation. After a restart of the device, the limit value from the ETS parameterisation becomes valid again.	4 bytes or 2 bytes	[9.001] DPT_Value_Temp bzw. Dpt [14,068].
89	Temperature limit value over/undershot	Status	Communication object, which is sent with the value 1 or 0, if the temperature limit value has been exceeded or fallen below	1 bit	1.2] DPT_Bool
90	Telegram rate (per second) - Bus A - limit value	Set limit value	This communication object can be used to set the limit value of the telegram rate at Bus A for the value of the communication object "Current telegram rate"(ID62) (unit: telegrams/second or bus load in %). Data type depends on parameter "Select data type for telegram rate". A bus load of 100% corresponds to a telegram rate of 50 telegrams/second. If this value is written from the bus, this limit value is valid instead of the limit value from the ETS parameterisation. After a restart of the device, the	2 bytes	[7.1] DPT_Value_2_Ucount bzw. [5.001]

ID	Name	Object function	Description	Length	DptType
			limit value from the ETS parameterisation becomes valid again.		
91	Telegram rate - Bus A - limit value above/below	Status	Communication object which is sent with the value 1 or 0 if the limit value for the telegram rate is exceeded or not reached.	1 bit	1.2] DPT_Bool
98	Voltage - Bus A - min	Extreme value - Bus A	Minimum bus voltage at Bus A since last restart or last analysis reset (unit: mV or V). Data type depends on parameter "Select data type for voltages".	4 bytes or 2 bytes	[9.020] DPT_Value_Volt bzw. [14.027]
99	Voltage - Bus A - max	Extreme value - Bus A	Maximum bus voltage at Bus A since last restart or last analysis reset (unit: mV or V). Data type depends on parameter "Select data type for voltages".	4 bytes or 2 bytes	[9.020] DPT_Value_Volt bzw. [14.027]
100	Voltage - Bus B - min	Extreme value - Bus B	Minimum bus voltage at Bus B since last restart or last analysis reset (unit: mV or V). Data type depends on parameter "Select data type for voltages".	4 bytes or 2 bytes	[9.020] DPT_Value_Volt bzw. [14.027]
101	Voltage - Bus B - max	Extreme value - Bus B	Maximum bus voltage at Bus B since last restart or last analysis reset (unit: mV or V). Data type depends on parameter "Select data type for voltages".	4 bytes or 2 bytes	[9.020] DPT_Value_Volt bzw. [14.027]
102	Voltage - Aux - min	Extreme value - Aux	Minimum voltage at the Aux output since last restart or last analysis reset (unit: mV or V). Data type depends on parameter "Select data type for voltages".	4 bytes or 2 bytes	[9.020] DPT_Value_Volt bzw. [14.027]
103	Voltage - Aux - max	Extreme value - Aux	Maximum voltage at the Aux output since last restart or last analysis reset (unit: mV or V). Data type depends on parameter "Select data type for voltages".	4 bytes or 2 bytes	[9.020] DPT_Value_Volt bzw. [14.027]
104	Current - Bus A - min	Extreme value - Bus A	Minimum current at Bus A since last restart or last analysis reset (unit: mA or A). Data type depends on parameter "Select data type for currents".	4 bytes or 2 bytes	[9.021] DPT_Value_Curr bzw. [14.019]
105	Current - Bus A - max	Extreme value - Bus A	Maximum current at Bus A since last restart or last analysis reset (unit: mA or A). Data type depends on parameter "Select data type for currents".	4 bytes or 2 bytes	[9.021] DPT_Value_Curr bzw. [14.019]
106	Current - Bus B - min	Extreme value - Bus B	Minimum current at Bus B since last restart or last analysis reset (unit: mA or A). Data type depends on parameter "Select data type for currents".	4 bytes or 2 bytes	[9.021] DPT_Value_Curr bzw. [14.019]
107	Current - Bus B - max	Extreme value - Bus B	Maximum current at Bus B since last restart or last analysis reset (unit: mA or A). Data type depends on parameter "Select data type for currents".	4 bytes or 2 bytes	[9.021] DPT_Value_Curr bzw. [14.019]
108	Current - Aux - min	Extreme value - Aux	Minimum current at the Aux output since the last restart or analysis reset (unit: mA or A). Data type depends on parameter "Select data type for currents".	4 bytes or 2 bytes	[9.021] DPT_Value_Curr bzw. [14.019]
109	Current - Aux - max	Extreme value - Aux	Maximum current at the Aux output since the last restart or analysis reset (unit: mA or A). Data type depends on parameter "Select data type for currents".	4 bytes or 2 bytes	[9.021] DPT_Value_Curr bzw.

ID	Name	Object function	Description	Length	DptType
					[14.019]
110	Current - Total - min	Extreme value	Minimum total current since last restart or last analysis reset (unit: mA or A). Data type depends on parameter "Select data type for currents".	4 bytes or 2 bytes	[9.021] DPT_Value_Curr bzw. [14.019]
111	Current - Total - max	Extreme value	Maximum total current since last restart or last analysis reset (unit: mA or A). Data type depends on parameter "Select data type for currents".	4 bytes or 2 bytes	[9.021] DPT_Value_Curr bzw. [14.019]
112	Power - Bus A - min	Extreme value - Bus A	Minimum power at Bus A (unit: W) since last restart or last analysis reset.	4 bytes	[14.056] DPT_Power
113	Power - Bus A - max	Extreme value - Bus A	Maximum power at Bus A (unit: W) since last restart or last analysis reset.	4 bytes	[14.056] DPT_Power
114	Power - Bus B - min	Extreme value - Bus B	Minimum power at Bus B (unit: W) since last restart or last analysis reset.	4 bytes	[14.056] DPT_Power
115	Power - Bus B - max	Extreme value - Bus B	Maximum power at Bus B (unit: W) since last restart or last analysis reset.	4 bytes	[14.056] DPT_Power
116	Power - Aux - min	Extreme value - Aux	Minimum power at the Aux output (unit: W) since last restart or last analysis reset.	4 bytes	[14.056] DPT_Power
117	Power - Aux - max	Extreme value - Aux	Maximum power at the Aux output (unit: W) since last restart or last analysis reset.	4 bytes	[14.056] DPT_Power
118	Power - Total - min	Extreme value	Minimum total power across the three outputs (unit: W) since last restart or last analysis reset.	4 bytes	[14.056] DPT_Power
119	Power - Total - max	Extreme value	Maximum total power across the three outputs (unit: W) since last restart or last analysis reset.	4 bytes	[14.056] DPT_Power
120	Temperature - min	Extreme value	Minimum device temperature (unit: °C) since last restart or last analysis reset. Data type depends on parameter "Select data type for temperatures".	4 bytes or 2 bytes	[9.001] DPT_Value_Temp bzw. Dpt [14,068].
121	Temperature - max	Extreme value	Maximum device temperature (unit: °C) since last restart or last analysis reset. Data type depends on parameter "Select data type for temperatures".	4 bytes or 2 bytes	[9.001] DPT_Value_Temp bzw. Dpt [14,068].
122	Telegram rate (per second) - Bus A - max	Extreme value - Bus A	Maximum telegram rate on Bus A since last restart or last analysis reset (unit: telegrams/second or bus load in %). Data type depends on parameter "Select data type for telegram rate". A bus load of 100% corresponds to a telegram rate of 50 telegrams/second. This maximum represents the maximum of the measured value "Current telegram rate (per second) - Bus A"(ID62).	2 bytes	[7.1] DPT_Value_2_Ucount bzw. [5.001]
139	Total emitted energy lifetime	Energy meter	Energy emitted by all three outputs (unit: Wh) in the lifetime.	4 bytes	[13.010] DPT_ActiveEnergy
140	Total emitted energy since power-on	Energy meter	Energy emitted via all three outputs (unit: Wh) since last unit restart.	4 bytes	[13.010] DPT_ActiveEnergy
141	Total emitted energy	Energy	Energy emitted via all three outputs (unit: Wh)	4 bytes	[13.010]

ID	Name	Object function	Description	Length	DptType
	since last analysis reset	meter	since last analysis reset.		DPT_ActiveEnergy
142	Total consumed energy lifetime	Energy meter	Energy consumed from the mains (unit: Wh) in the lifetime.	4 bytes	[13.010] DPT_ActiveEnergy
143	Total consumed energy consumed since power-on	Energy meter	Energy consumed from the mains (unit: Wh) since the last device restart.	4 bytes	[13.010] DPT_ActiveEnergy
144	Total consumed energy since last analysis reset	Energy meter	Energy consumed from the mains (unit: Wh) since last analysis reset.	4 bytes	[13.010] DPT_ActiveEnergy
150	Day/night	Status	Communication object indicates whether it is currently day or night. The values for day or night can be parameterised. The current value for the day/night object is based on the times for sunrise and sunset of the astro function. By setting a parameter, the object can be sent, when it changes. → Parameters	1 bit	1.2] DPT_Bool
152	Summer time (1=Summer time 0=Winter time)	Status - Calendar	Communication object specifies whether summer or winter time is currently valid. By setting a parameter, the object can be sent, when it changes.	1 bit	1.2] DPT_Bool
153	Holiday	Status - Calendar	Communication object specifies whether the current day is a parameterised public holiday. On a public holiday, the object is 1, otherwise it is 0. The day begins at 00:00:00 and ends at 23:59:59 at night. By setting a parameter, the object can be sent, when it is changed.	1 bit	1.2] DPT_Bool
154	Period 1	Status - Calendar	Communication object has the value 1, if the current day is within the parameterised period 1, otherwise it has the value 0. By setting a parameter, the object can be sent, when it changes.	1 bit	1.2] DPT_Bool
155	Period 2 ... 10	Status - Calendar	See period 1	1 bit	1.2] DPT_Bool
164	Global release object 1	Timer Logic input	Communication object, that can be set via the Bus. It can be used as input for the conditions/logic of the time switches.	1 bit	1.2] DPT_Bool
165	Global release object 2	Timer Logic input	Communication object, that can be set via the Bus. It can be used as input for the conditions/logic of the time switches.	1 bit	1.2] DPT_Bool
166	Global release object 3	Timer Logic input	Communication object, that can be set via the Bus. It can be used as input for the conditions/logic of the time switches.	1 bit	1.2] DPT_Bool
173	Time switch 1-lock object	Locking the time switch	Locking object for time switch 1, which can be set via the bus. If the object is 1, then all switching times of time switch 1 are inactive. If 0 or not linked, then the switching times of time switch 1 are active.	1 bit	1.2] DPT_Bool
174	Time switch 1-switching time1 :HH	Change switching time	Changes the hour of switching time 1 of time switch 1 (unit: hrs). If this value is written from the bus, this value is valid instead of the value from the ETS parameterisation. After a restart of the device the value from the ETS parameterisation becomes valid again. If the switching time has been configured for sunrise or sunset, then the change in the switching time via this communication object is ignored.	1 byte	[5.010] DPT_Value_1_Ucount
175	Time switch 1-switching time1 :MM	Change switching time	Changes the minute of switching time 1 of time switch 1 (unit: minute). If this value is written from the bus, this value is valid instead of the value from the ETS parameterisation. After a restart of	1 byte	[5.010] DPT_Value_1_Ucount

ID	Name	Object function	Description	Length	DptType
			the device, the value from the ETS parameterisation becomes valid again. If the switching time has been configured for sunrise or sunset, then the change in the switching time via this communication object is ignored.		
176	Time switch 1-switching time2 :HH	Change switching time	Changes the hour of switching time 2 of time switch 1 (unit: hrs). If this value is written from the bus, this value is valid instead of the value from the ETS parameterisation. After a restart of the unit the value from the ETS parameterisation becomes valid again. If the switching time has been configured for sunrise or sunset, then the change in the switching time via this communication object is ignored.	1 byte	[5.010] DPT_Value_1_Ucount
177	Time switch 1-switching time2 :MM	Change switching time	Changes the minute of switching time 2 of time switch 1 (unit: minute). If this value is written from the bus, this value is valid instead of the value from the ETS parameterisation. After a restart of the device, the value from the ETS parameterisation becomes valid again. If the switching time has been configured for sunrise or sunset, then the change in the switching time via this communication object is ignored.	1 byte	[5.010] DPT_Value_1_Ucount
178	Time switch 1-Telegram 1	Send telegram	Communication object, that can be sent by time switch 2. The telegram is always sent, when the corresponding switching time occurs and the logic of the time switch is fulfilled. The type of the communication object depends on the parameterised function in the "Configuration of possible telegram" parameter. The value to be sent must also be specified there. → Parameters	max. 3 bytes	konfi-can be strapped
179	Time switch 1-Telegram 2	Send telegram	Communication object, that can be sent by time switch 2. The telegram is always sent, when the corresponding switching time occurs and the logic of the time switch is fulfilled. The type of the communication object depends on the parameterised function in the "Configuration of possible telegram" parameter. The value to be sent must also be specified there.	max. 3 bytes	konfi-can be strapped
180	Time switch 1-Telegram 3	Send telegram	Communication object, that can be sent by time switch 3. The telegram is always sent, when the corresponding switching time occurs and the logic of the time switch is fulfilled. The type of the communication object depends on the parameterised function in the "Configuration of possible telegram" parameter. The value to be sent must also be specified there.	max. 3 bytes	konfi-can be strapped
181	Time switch 1-Telegram 4	Send telegram	Communication object, that can be sent by time switch 4. The telegram is always sent, when the corresponding switching time occurs and the logic of the time switch is fulfilled. The type of the communication object depends on the parameterised function in the "Configuration of possible telegram" parameter. The value to be sent must also be specified there.	max. 3 bytes	konfi-can be strapped
182	Time switch 2 ...		Communication objects for time switches 2 to 8. For a description, please refer to the objects of time switch 1.		

Table 3: Communication objects

Technical data

Power supply	Voltage: 230 V - 240V AC, 50 Hz Current: max. 750 mA Power factor cosφ at nominal load: 0.56 Power consumption: max. 65 W Efficiency η at nominal load: > 90 Fuse rating: max. 16 A
Outputs	BUS A: Voltage: 30 V DC SELV Nominal current: 1280 mA Continuous current: 2000 mA Peak current: 2700 mA Short circuit current limitation : max. 3 A BUS B: Voltage: 30 V DC SELV Nominal current: 320 mA Continuous current: 500 mA Peak current: 700 mA Short circuit current limitation : max. 1 A AUX: Voltage: 30 V DC SELV Nominal current: 320 mA Continuous current: 500 mA Peak current: 700 mA Short circuit current limitation : max. 1 A Max. sum of continuous current over all outputs: 2000 mA Power failure bridging time: > 100 ms
Operating and display elements	OLED display LEDs: "PROG", "RESET", POWER Push-buttons: "PROG", "RESET", "DISPLAY
Connections	Mains: Type: 3 pole screw terminal Conductor cross section: 0,5 - 4,0 sqmm solid wire Conductor cross section: 0,5 - 2,5 sqmm stranded wire EIB / KNX connection: Type: black / red connector Conductor cross section: 0.8 sqmm solid conductor DC Aux connection: Type: white / yellow connector Conductor cross section: 0.8 sqmm solid conductor
Housing	DIN rail housing for 35 mm mounting rail Width: 6 SU Dimensions: 107.4 x 89.6 x 62.9 mm (L x W x H) Flammability class: UL94-V0 (Housing) UL94-V2 (Cover)
Further information	For indoor use only Only for operation in the control cabinet Highest ambient temperature ta = 45 °C Lowest ambient temperature ta min = -5 °C Protection class I Protection class: IP20 Overvoltage category III Certifications: EIB/KNX certified Safety: Tested according to IEC 62368-1, IEC 63044-3 EMV: Tested according to DIN EN 61558-1, IEC 63044-5-2 (residential, commercial and light-industrial environments), IEC 63044-5-3 (industrial environments), Environment: Tested according to DIN EN 50491-2

Support

E-mail product support is available at the address support@enertex.de.