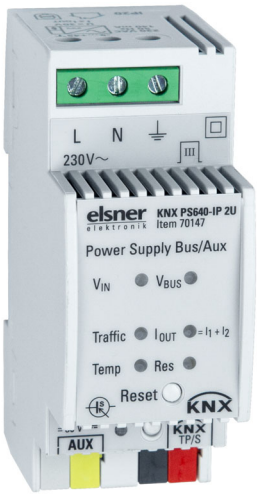
KNX PS640-IP 2U

Intelligent Power Supply KNX bus/ Auxiliary Voltage

Item number 70147



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Installation and Adjustment

1. Safety and usage instructions 3
2. Description 3
3. Commissioning 4
3.1. Addressing of the device at the bus 4
3.2. Default settings 4
4. Operation 5
4.1. Device/Busline Diagnostics Application 5
4.2. Diagnosis 5
4.2.1. Measurement Sources 5
4.2.2. Event Counters 5
4.2.3. Event Counter Reset 6
4.3. Parameter Structure for Measurement Sources 6
4.4. Programming 7
4.4.1. Programming Button 7
4.4.2. Individual Address Assignment 7
4.5. KNX Bus Reset Function 8
5. Transfer protocol 10
5.1. List of all communication objects 10
6. ETS Database Parameters 16
6.1. General 16
6.2. Measurements 16
6.3. Maximum Tracking 18
6.4. Telegram Traffic 19
6.5. Error Counters 20
6.6. Operational Counters 20
6.7. Alarm 1, 2, 3, 4 21

This manual is amended periodically and will be brought into line with new software releases. The change status (software version and date) can be found in the contents footer. If you have a device with a later software version, please check **www.elsner-elektronik.de** in the menu area "Service" to find out whether a more up-to-date version of the manual is available.

Clarification of signs used in this manual

Safety advice.

Safety advice for working on electrical connections, components, etc.

DANGER! ... indicates an immediately hazardous situation which will lead to death or severe injuries if it is not avoided.

WARNING! ... indicates a potentially hazardous situation which may lead to death or severe injuries if it is not avoided.

CAUTION! ... indicates a potentially hazardous situation which may lead to trivial or minor injuries if it is not avoided.

ATTENTION! ... indicates a situation which may lead to damage to property if it is not avoided.

ETS In the ETS tables, the parameter default settings are marked by underlining.

1. Safety and usage instructions

Installation, testing, operational start-up and troubleshooting should only be performed by an authorised electrician.

DANGER!
Risk to life from live voltage (mains voltage)!
There are unprotected live components inside the device.

- Inspect the device for damage before installation. Only put undamaged devices into operation.
- Comply with the locally applicable directives, regulations and provisions for electrical installation.
- Immediately take the device or system out of service and secure it against unintentional switch-on if risk-free operation is no longer guaranteed.

Use the device exclusively for building automation and observe the operating instructions. Improper use, modifications to the device or failure to observe the operating instructions will invalidate any warranty or guarantee claims.
Operate the device only as a fixed-site installation, i.e. only in assembled condition and after conclusion of all installation and operational start-up tasks, and only in the surroundings designated for it.
Elsner Elektronik is not liable for any changes in norms and standards which may occur after publication of these operating instructions.

For information on installation, maintenance, disposal, scope of delivery and technical data, please refer to the installation instructions.

2. Description

With a very small footprint of only 2 units (36 mm) the **Intelligent Power Supply KNX PS640-IP 2U** with diagnosis is highly efficient and features an additional auxiliary power output (e.g. to support individual components). The device has one choked and one non-choked output. The outputs are overload and short circuit protected. The **KNX PS640-IP 2U** generates a voltage of 30 V DC and the integrated choke decouples the KNX bus line from the 30 V DC auxiliary output. Any desired load distribution on the outputs is possible. The LED display indicates the state of the power supply unit and the bus line. The KNX bus reset can be triggered over the bus by a communication object or directly at the device by a single button press. Internal parts of the device are designed to ensure a long working life and work reliably also when the device temperature increases.

Configuring can be done with the ETS. 36 communication objects are available. For diagnostic purposes bus voltage, output current, device temperature and times of operation are monitored. All details (number, duration) on events like short circuit, over-

load, load disconnection, device startup and KNX bus reset are easily accessible. The data can be read out via the KNX bus. It can be sent on demand, periodically and after a certain change in value. It can also be sent after an error event and on crossing a pre-set threshold value. Number and duration of such over-threshold events are also available information. When the device returns to normal working condition (after KNX bus reset, device startup, short circuit) info telegrams are sent automatically. Additionally, extensive alarm and maximum tracking functionalities are available.

In this document, physically addressed telegrams are named Physical Telegrams.

In this document, group oriented telegrams are named Group Telegrams.

Functions:

- Slim 640 mA KNX power supply unit having only 2 M (36 mm)
- Cost reduction due to less space requirement
- Output overload and short circuit protected
- Additional unchoked auxiliary power output
- Device reset by on-device push button
- Remote reset function: reset via bus line by communication object
- Monitoring of output voltage, output current, telegram traffic and device temperature
- Monitoring of events (threshold, device startup, KNX bus reset)
- Monitoring of output failures (due to overload, short circuit, mains power outage)
- Configurable additional alarms
- Extensively configurable alarm/threshold functionality for further evaluation
- Switching of bus devices, electrical consumers or alarm indicators
- Informational readout: cyclic, on demand or after a pre-set change in value
- Device and bus line status indicated by six duo LED display
- Internal supply via externally-connected 230 V AC
- Database available for ETS4 and higher
- Installation on 35mm top-hat rails (DIN, TH35)

3. Commissioning

Configuration is made using the KNX software as of ETS 4. The **product file** can be downloaded from the ETS online catalogue and the Elsner Elektronik website on **www.elsner-elektronik.de** in the “Service” menu. There you will also find the product manual.

3.1. Addressing of the device at the bus

The equipment is delivered with the individual address 12.12.255. This can be changed via the ETS. A button and a control LED are located on the unit for this purpose.

3.2. Default settings

- All telegrams are blocked because the filter table is not defined
- The Manual Function switch-off time is 120 min

4. Operation

In network installations, **KNX PS640-IP 2U** supplies one KNX TP line and monitors all relevant data. With its default settings the **KNX PS640-IP 2U** operates as is supposed to.

4.1. Device/Busline Diagnostics Application

Communication objects are used to request device status and measurement values. The measured values can be sent after request, after a certain change (measured value, device status) and periodically. Here, a certain change of the measured value means the difference between actual value and last sent value. Number and duration of overloads are stored. The same applies for the number of short circuits, device startups, KNX bus resets and for the duration of load detachments. The total operating time of the device and its operating time since last device startup are stored, too. Threshold values can be set for the bus voltage (only in the additional alarms), total current, telegram traffic and internal device temperature. Regarding maximum current values and maximum device temperature values, a tracking period can be set. At the end of every tracking period the maximum measured value can be sent on the bus or just be set as value of the appropriate object. Four different Alarm tabs (see chapter 6.7.) can be used to send an info telegram (containing "0" or "1") about over/under threshold events and to switch other devices. After assignment of the measurement source ("Output current", "Device temperature", "Output Voltage") each alarm can be configured individually.

4.2. Diagnosis

The diagnostic measurement sources and event counters can be activated and deactivated. When activated, the device monitors the relevant values.

4.2.1. Measurement Sources

The bus voltage, bus current and internal device temperature are measured constantly. The telegram traffic extent is determined additionally. For each of these measurement sources a threshold value can be set. After setting the threshold value the threshold type can be selected (limit undercut/limit exceeded) and the behaviour on alarm activation/deactivation can be configured. A maximum value tracking feature with pre-settable tracking period can also be activated.

4.2.2. Event Counters

For diagnosis purpose, event counters provide number and duration of overloads. When there is a short circuit on the bus, the load will be disconnected from the output automatically. Number of short circuits and duration of load detachment are available details. The same applies for the number of KNX bus resets and of device startups, and for operating times. Additional alarms also provide the number of a value being in the threshold range and the duration of such event.

Table 1: Available Event Counters

Event	Number Counter	Duration Counter
Overload	X	X
Short Circuit	X	
Load Detached		X
KNX Bus Reset	X	
Threshold Range	X	X
Operating Time (total/since last startup)		X
Device Startup	X	

4.2.3. Event Counter Reset

Counters for total operating time and device startups cannot be reset. Other counters for events can be reset by communication object. These counters (number and duration) are set to zero by writing a "1" to the communication object no. 33 "Counter reset".

The event counter of each individual alarm (1,2,3,4) is set to zero by writing a "0" to the related communication object "Duration X" (objects no. 21, 24, 27, 30). Both number and duration counters then will be reset.

4.3. Parameter Structure for Measurement Sources

On enabling a measurement source in the ETS tab "Measurements", the following parameter structure is available (exception: counters). An actual value can be sent over the bus after a certain value change ("Sending difference") or after a pre-set time period has elapsed ("Cyclic sending"). A value reaching the excess threshold range can be used to send telegrams containing "1" or "0" ("Behaviour on alarm activation"). Leaving this excess threshold range activates the "Behaviour on alarm deactivation". The additional alarms have an extended adjustment.

Table 2: General Menu Structure

ETS Parameter	Explanation
Object type	Selection of the datapoint type
Sending difference	The actual value is sent when the difference between last sent value and actual value reaches the pre-set difference
Cyclic sending	The actual value is periodically sent
Alarm settings	Enables/disables the threshold functionality and following options
Threshold	Crossing this limiting value executes the "Behaviour on alarm activation" function
Hysteresis	Passing the "Threshold"-"Hysteresis" value executes the "Behaviour on alarm deactivation" function
Behaviour on alarm activation	Set action on activation: Send a telegram or set the internal object value
Behaviour on alarm deactivation	Set action on deactivation: Send a telegram or set the internal object value

4.4. Programming

4.4.1. Programming Button

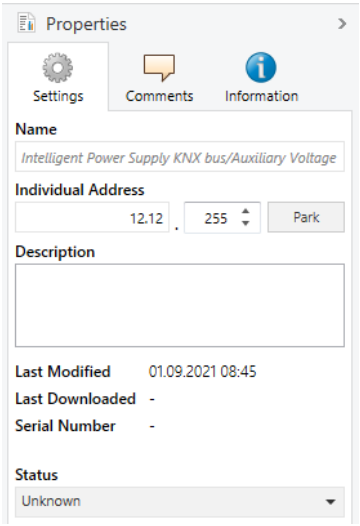
To download the desired Individual Address or an ETS setting the Programming Button must be pressed first. Successive pressing the Programming Button will turn on and off the Programming Mode. LED 7 lighting in red colour indicates Programming Mode is active. When Programming Mode is active, ETS recognizes the device of interest for downloading.

4.4.2. Individual Address Assignment

To configure the device an interface connection (IP, USB) to the KNX bus system is required. The device is supplied with the Individual Address 12.12.255. The KNX product database entry (available for ETS4 and higher) can be downloaded from the website and from the KNX Online Catalog.

With the ETS the Individual Address can be assigned to the device by setting the desired address in the properties window of the ETS. After starting the ETS download and then pressing the Programming Button the device restarts itself.

Fig. 1: ETS Properties Window



4.5. KNX Bus Reset Function

During a bus reset, the device disconnects the entire bus line from the supplying output and induces a short circuit for 20 seconds. LED 6 (KNX Bus Reset) lights up red and goes off after the reset process is accomplished. Other LEDs are off. The devices connected to the bus line restart during the reset process.

Bus Reset and Device Startup:

- Reset by push-button:
  The Reset Button activates the KNX Bus Reset function. Press the Reset Button on top of the device to reset the KNX bus line
- Reset by object:
  A remote reset can be triggered by communication object no.16
- Reset by disconnection:
  Removing the KNX bus terminals disconnects the entire bus line
- ETS programming:
  When there was a mains power outage or after an ETS download, the **KNX PS640-IP 2U** counts a device startup

A "KNX Bus Reset" is triggered after a reset by button press and after a reset by communication object. A "Device Startup" takes place when there was a mains power outage or after programming the device. The number of "Short circuits" is counted only by the counter that can be read out with communication object no.36 "Power supply is on".

Table 3: Event Counter Readout by Communication Objects

CO Counter Readout	KNX Bus Resets	Device Startups	Short Circuits
CO no.36 "Power supply on"	X	X	X
CO no.17 "Number of restarts"	X		
CO no.20 "Number of startups"		X	
	Reset by button press Reset by object	Mains power outage ETS programming	Short circuits

The total number KNX Bus Resets, Device Startups and Short Circuits of can be read out by CO no.36. The counters for KNX Bus Resets and Device Startups can be read out by COs no.17 and no.20. For example: When there was no reset or startup and CO no.36 sends an info telegram on the bus to report an event, this event was a short circuit.

5. Transfer protocol

5.1. List of all communication objects

Abbreviations:
R Read
W Write
C Communication
T Transmit
U Update
DPT Data Point Type

No.	Name	Function	Description	Lenght	DPT	Flags
0	Output voltage	Send measured value	„With „“Cyclic sending““ the device sends the measured output voltage value in V (or mV).“	2 bytes 4 bytes	DPT9, DPT14	CR-T-
1	Output voltage threshold	Send alarm status	With the measured value entering the threshold range a telegram with value 0 or 1 is sent. After returning to normal operating a telegram with value 0 or 1 is sent.	1 bit		CR-T-
2	Output current	Send measured value	„With „“Sending difference““ and „“Cyclic sending““ the device sends the measured output current value in A (or mA).“	2 bytes 4 bytes	DPT7, DPT9, DPT14	CR-T-
3	Output current threshold	Send alarm status	With the measured value entering the threshold range a telegram with value 0 or 1 is sent. After returning to normal operating and passing hysteresis a telegram with value 0 or 1 is sent.	1 bit		CR-T-
4	Output current maximum	Send measured value	„After the expired tracking period with „“Automatic sending““ the device sends the measured output current value in A (or mA).“	2 bytes 4 bytes	DPT7, DPT9, DPT14	CR-T-
5	Temperature	Send measured value	„With „“Sending difference““ and „“Cyclic sending““ the device sends the measured temperature value in °C.“	2 bytes		CR-T-

No.	Name	Function	Description	Lenght	DPT	Flags
6	Temperature threshold	Send alarm status	With the measured value entering the threshold range a telegram with value 0 or 1 is sent. After returning to normal operating and passing hysteresis a telegram with value 0 or 1 is sent.	1 bit		CR-T-
7	Temperature maximum	Send measured value	„After the expired tracking period with „“Automatic sending““ the device sends the measured temperature value in °C.“	2 bytes		CR-T-
10	Telegram traffic	Send measured value	„With „“Sending difference““ and „“Cyclic sending““ the device sends the measured bus load value in %.“	1 byte		CR-T-
11	Telegram traffic threshold	Send alarm status	With the measured value entering the threshold range a telegram with value 0 or 1 is sent. After returning to normal operating and passing hysteresis a telegram with value 0 or 1 is sent.	1 bit		CR-T-
12	Overload number	Send counter value	„With „“Sending difference““ and „“Cyclic sending““ the device sends the number counter value of overloads.“	2 bytes		CR-T-
13	Overload duration	Send counter value	„With „“Sending difference““ the device sends the time counter value of overloads in s.“	4 bytes		CR-T-
14	Short circuit number	Send counter value	„With „“Sending difference““ and „“Cyclic sending““ the device sends the number counter value of short circuits.“	2 bytes		CR-T-
15	Load detached duration	Send counter value	When activated, the device sends the time counter value of load detachments (due to short circuit, device startup and KNX bus reset).	4 bytes		CR-T-

No.	Name	Function	Description	Lenght	DPT	Flags
16	KNX bus reset	Initialize	Triggered by a telegram with value 0 or 1, the device starts a reset process.	1 bit		C-WTU
17	KNX bus reset number	Send counter value	„With „“Cyclic sending““ the device sends the number counter value of KNX bus resets.“	2 bytes		CR-T-
18	Total operating time	Send counter value	„With „“Sending difference““ the device sends the time counter value of the total operating time in s.“	4 bytes		CR-T-
19	Operating time since startup	Send counter value	„With „“Sending difference““ the device sends the time counter value of the time elapsed since last device startup in s.“	4 bytes		CR-T-
20	Startup number	Send counter value	„With „“Cyclic sending““ the device sends the number counter value of device startups.“	2 bytes		CR-T-
21	Duration 1	Send counter value	„With „“Sending difference““ the device sends the time counter value (in s) of a pre-selected variable (output current, output voltage, temperature) being in the threshold range.“	4 bytes		CR-T-
22	Counter 1	Send counter value	„With „“Sending difference““ and „“Cyclic sending““ the device sends the number counter value (in s) indicating the number of threshold events (for output current, output voltage, temperature).“	2 bytes		CR-T-
23	Threshold 1	Send alarm status	With the measured value entering the threshold range a telegram with value 0 or 1 is sent. After returning to normal operating and passing hysteresis a telegram with value 0 or 1 is sent.	1 bit		CR-T-

No.	Name	Function	Description	Lenght	DPT	Flags
24	Duration 2	Send counter value	„With „“Sending difference““ the device sends the time counter value (in s) of a pre-selected variable (output current, output voltage, temperature) being in the threshold range.“	4 bytes		CR-T-
25	Counter 2	Send counter value	„With „“Sending difference““ and „“Cyclic sending““ the device sends the number counter value (in s) indicating the number of threshold events (for output current, output voltage, temperature).“	2 bytes		CR-T-
26	Threshol d 2	Send alarm status	With the measured value entering the threshold range a telegram with value 0 or 1 is sent. After returning to normal operating and passing hysteresis a telegram with value 0 or 1 is sent.	1 bit		CR-T-
27	Duration 3	Send counter value	„With „“Sending difference““ the device sends the time counter value (in s) of a pre-selected variable (output current, output voltage, temperature) being in the threshold range.“	4 bytes		CR-T-
28	Counter 3	Send counter value	„With „“Sending difference““ and „“Cyclic sending““ the device sends the number counter value (in s) indicating the number of threshold events (for output current, output voltage, temperature).“	2 bytes		CR-T-
29	Threshol d 3	Send alarm status	With the measured value entering the threshold range a telegram with value 0 or 1 is sent. After returning to normal operating and passing hysteresis a telegram with value 0 or 1 is sent.	1 bit		CR-T-

No.	Name	Function	Description	Lenght	DPT	Flags
30	Duration 4	Send counter value	„With „“Sending difference““ the device sends the time counter value (in s) of a pre-selected variable (output current, output voltage, temperature) being in the threshold range.“	4 bytes		CR-T-
31	Counter 4	Send counter value	„With „“Sending difference““ and „“Cyclic sending““ the device sends the number counter value (in s) indicating the number of threshold events (for output current, output voltage, temperature).“	2 bytes		CR-T-
32	Threshol d 4	Send alarm status	With the measured value entering the threshold range a telegram with value 0 or 1 is sent. After returning to normal operating and passing hysteresis a telegram with value 0 or 1 is sent.	1 bit		CR-T-
33	Counter reset	Reset all	All number counter values and duration counter values (except total operating time and device startup number) are set to zero by a telegram with “1”.	1 bit		C-WT-
34	Measure d values	Send all	Measured values of output current, output voltage and temperature are sent as response to a “1” telegram.	1 bit		C-WT-

No.	Name	Function	Description	Lenght	DPT	Flags
35	Counter values	Send all	Event counter values (overload number, overload duration, load detached duration, total operating time, operating time since last device startup, Duration 1-4, Counter 1-4) are sent as response to a “1” telegram.	1 bit		C-WT-
36	Power supply is on	Send info value 1	After device startup and after recovery from output failure, a “1” telegram to announce that the device is on the bus is sent (according to the pre-set delay).	1 bit		CR-T-
37	Heartbeat	Send info value 1	According to the pre-set heartbeat period, an info telegram with value 1 is sent regularly on the bus indicating the power supply is on.			

6. ETS Database Parameters

The default settings of the parameter are labelled by an underscore.

6.1. General

The "General" tab contains the parameters related to the presence message sending and the KNX bus reset that can be initialized by communication object no.16. With use of the communication object no.37 "Heartbeat" the device periodically sends out a telegram with "1". With use of the communication object no.36 "Power supply is on" the device sends out a telegram with "1" after a KNX bus reset, a device startup and a short circuit. After returning to normal working condition during the time delay no telegrams are sent. Then, the "Power supply is on" telegram is the first one that is sent.

Heartbeat period [s]	10…32,000 s; 60 s
Info telegram (with "1") is regularly sent after this time period.	
Induce a KNX bus reset	with 0 • with 1 • with 0 and 1
Set type of telegram to trigger (remotely) a KNX bus reset.	
Delay time for "Power supply on" (obj. 36)	disabled • 1 min • 2 min…5 min • 10 min • 15 min…30 min • 1 h • 2 h…8 h
When returning to normal operation, after this time delay, the info telegram (containing "1") is sent by CO no.36.	

6.2. Measurements

The "Measurements" tab contains the menus "Output voltage", "Output current" and "Device temperature". The excess threshold range of the "Output voltage" is fixed and located outside the working range (28-31V). For example, with no "Output voltage" hysteresis the "Behaviour on alarm deactivation" function is executed on just entering the working range. The "Output current" and the "Device temperature" excess threshold ranges both are located above the working range.

Output voltage	
Output voltage [V]	disable • enable
Enable/disable group associations, measurement and following settings.	
Object type	2-byte (DPT9) • 4-byte (DPT14)
Select datapoint type.	
Cyclic sending	disabled • 1 min • 2 min…5 min • 10 min • 15 min…30 min • 1 h • 2 h…8 h
Info telegram is sent regularly.	
Threshold alarm	disable • enable
Enable/disable the alarm function.	

Behaviour on alarm activation	• disabled • send value 0 • send value 1 • set value to 0 • set value to 1
Leaving the working range.	
Behaviour on alarm deactivation	• disabled • send value 0 • send value 1 • set value to 0 • set value to 1
Entering the working range.	

Output current	
Output current [mA]	disable • enable
Enable/disable group associations, measurement and following settings.	
Object type	• 2-byte (DPT7, integer) • 2-byte (DPT9, float) • 4-byte (DPT14)
Select datapoint type.	
Sending difference	disabled • 5 mA • 10 mA..25 mA • 50 mA
Difference between actual and last sent value which triggers the sending.	
Cyclic sending	disabled • 1 min • 2 min…5 min • 10 min • 15 min…30 min • 1 h • 2 h…8 h
Info telegram is sent regularly.	
Threshold alarm	disable • enable
Enable/disable the alarm function.	
Threshold	0…800 [mA]; 640
Select threshold value to execute the "Behaviour on alarm activation".	
Hysteresis	0…640 [mA]; 1
Select hysteresis interval value to execute the "Behaviour on alarm deactivation".	
Behaviour on alarm activation	• disabled • send value 0 • send value 1 • set value to 0 • set value to 1
Select action on entering the threshold range.	
Behaviour on alarm deactivation	• disabled • send value 0 • send value 1 • set value to 0 • set value to 1
Select action on leaving the threshold (+hysteresis) range.	

Device temperature	
Device temperature [°C]	disable • enable
Enable/disable group associations, measurement and following settings.	
Sending difference	2...10 °C
Difference between actual and last sent value which triggers the sending.	
Cyclic sending	disabled • 1 min • 2 min…5 min • 10 min • 15 min…30 min • 1 h • 2 h…8 h
Info telegram is sent regularly.	
Alarm settings	disable • enable
Enable/disable the alarm function.	
Threshold	0…110 [°C]; 70
Select threshold value to execute the "Behaviour on alarm activation".	
Hysteresis	0…40; 1 [°C]
Select hysteresis interval value to execute the "Behaviour on alarm deactivation".	
Behaviour on alarm activation	• disabled • send value 0 • send value 1 • set value to 0 • set value to 1
Select action on entering the threshold range.	
Behaviour on alarm deactivation	• disabled • send value 0 • send value 1 • set value to 0 • set value to 1
Select action on leaving the threshold (+hysteresis) range.	

- Using the "Sending difference" function with the "Output voltage" is possible only within the "Alarm 1,2,3,4" tabs like described in chapter 3.7.
- The "Output voltage" value is valid only if most of the load is on the KNX bus output
- If the "Output current" value is < 10 mA, for calculations, the input voltage is assumed to be at 230 V AC

6.3. Maximum Tracking

With setting the "Tracking period" a certain period of time is tracked in order to find the maximum observed value contained. After each expired period this value can be sent over the bus. The maximum tracking function is available for the measurement sources "Output current" and "Device Temperature".

Tracking period [s]	10…32,000 [s]; 1,800
Determination of the time period for maximum value tracking.	
Maximum value of Output current	
Output current maximum [mA]	disable • enable

Enable/disable group associations, measurement and following settings.	
Object type	• 2-byte(DPT7, integer) • 2-byte (DPT9, float) • 4-byte(DPT14)
Select datapoint type.	
Automatic sending	do not send • send at end of period
Info telegram containing the maximum measured output current value is sent after an expired tracking period.	
Maximum value of Device temperature	
Device temperature maximum [°C]	disable • enable
Enable/disable group associations, measurement and following setting.	
Automatic sending	do not send • send at end of period
Info telegram containing the maximum measured device temperature value is sent after an expired tracking period.	

6.4. Telegram Traffic

The "Telegram traffic" measurement source is similar to the measurement sources in the ETS tab "Measurements". The excess threshold range of the "Telegram traffic" is located only above its working range.

Telegram traffic	
Telegram traffic [%]	disable • enable
Enable/disable group associations, measurement and following settings.	
Sending difference	0…100 [%]; 10
Difference between actual and last sent value which triggers the sending.	
Cyclic sending	disabled • 1 min • 2 min…5 min • 10 min • 15 min…30 min • 1 h • 2 h…8 h
Info telegram is sent regularly.	
Alarm settings	disable • enable
Enable/disable the alarm function.	
Threshold	0…100 [%]; 80
Select threshold value to execute the "Behaviour on alarm activation".	
Hysteresis	0…70 [%]; 10
Select hysteresis interval value to execute the "Behaviour on alarm deactivation".	
Behaviour on alarm activation	• disabled • send value 0 • send value 1 • set value to 0 • set value to 1
Select action on entering the threshold range.	

Behaviour on alarm deactivation	• disabled • send value 0 • send value 1 • set value to 0 • set value to 1
Select action on leaving the threshold (+hysteresis) range.	

6.5. Error Counters

The "Error Counters" tab contains the menus "Overload number counter", "Overload time counter", "Short circuits number counter" and "Load detached time counter". Activation of the parameters also activates the related communication objects. Info telegrams containing actual values can be sent regularly or according to a pre-set value difference. Error counters can be set to zero by writing a "1" to the communication object no.33 "Counter reset" (see also chapter 4.2.3.).

Overload number counter	
Number of overloads	disable • enable
Enable/disable group associations, number counter and following settings.	
Sending difference	0…1,000 (0 = disabled)
Info telegram is sent regularly after this number of overloads.	
Cyclic sending	disabled • 1 min • 2 min…5 min • 10 min • 15 min…30 min • 1 h • 2 h…8 h
Info telegram is sent regularly.	
Overload time counter	
Duration of overloads [s]	disable • enable
Enable/disable group associations, time counter and following setting.	
Sending difference	0…32,000 [s] (0 = disabled)
Difference between actual and last sent value which triggers the sending.	
Short circuit number counter	
Number of short circuits	disable • enable
Enable/disable group associations, number counter and following setting.	
Sending difference	0…500 (0 = disabled)
Difference between actual and last sent value which triggers the sending.	
Cyclic sending	disabled • 1 min • 2 min…5 min • 10 min • 15 min…30 min • 1 h • 2 h…8 h
Info telegram is sent regularly.	
Load detached time counter	
Duration of load detached [s]	disable • enable
Enable/disable group associations and time counter.	

6.6. Operational Counters

The "Operational counters" tab contains the menus "KNX bus reset number counter", "Device startup number counter", "Total operating time" and "Operating time since last

device startup". Activation of the parameters also activates the related communication objects. Info telegrams containing the actual number counter value can be sent regularly. Info telegrams containing the actual time counter value can be sent according to the pre-set value difference. The operational counters can be set to zero by writing a "1" to the communication object no.33 "Counter reset" (see also chapter 4.2.3.).

KNX bus reset number counter	
Number of KNX bus resets	disable • enable
Enable/disable group associations, measurement and following setting.	
Cyclic sending	disabled • 1 min • 2 min…5 min • 10 min • 15 min…30 min • 1 h • 2 h…8 h
Info telegram is sent regularly.	
Device startup number counter	
Number of device startups	disable • enable
Enable/disable group associations, measurement and following setting.	
Cyclic sending	disabled • 1 min • 2 min…5 min • 10 min • 15 min…30 min • 1 h • 2 h…8 h
Info telegram is sent regularly.	
Total operating time	
Total operating time [s]	disable • enable
Enable/disable group associations, measurement and following setting.	
Sending difference	0…2,600,000 [s] (0 = disabled) (1 month ≈ 2,600,000s) (1 day ≈ 86,000s)
Difference between actual and last sent value which triggers the sending.	
Operating time since last device startup	
Operating time since last device startup [s]	disable • enable
Enable/disable group associations, measurement and following setting.	
Sending difference	0…2,600,000 [s] (0 = disabled) (1 month ≈ 2,600,000s) (1 day ≈ 86,000s)
Difference between actual and last sent value which triggers the sending.	

6.7. Alarm 1, 2, 3, 4

After enabling the alarm function the measurement source can be chosen. With the menu item "Alarmtype" the threshold range can be set. The alarm activation/ deactivation can also be used to switch other devices. With the additional alarms 1-4, durations and numbers of threshold events can be sent on the bus. After changing the alarm´s measurement source, both number counter and time counter are reset to zero automatically. The counters can be set to zero by writing "1" to the communication object no.33 "Counter reset" or by writing "0" to one of the related communication objects "Duration 1", "Duration 2", "Duration 3", "Duration 4"(objects no. 21, 24, 27, 30).

Alarm 1	disable • enable
Enable/disable group associations, measurement and following settings.	
Measurement source	• Output current • Device temperature • Output voltage
Selection of the measurement source.	
Threshold	10…800
Select threshold value to execute the "Behaviour on alarm activation".	
Hysteresis	5…500
Select hysteresis interval value.	
Alarmtype	• Threshold undercut • Threshold exceeded
Select threshold region either to lie above (limit exceeded) or to lie below (limit undercut) the threshold value.	
Behaviour on alarm activation	• disabled • send value 0 • send value 1 • set value to 0 • set value to 1
Select action on entering the threshold range.	
Behaviour on alarm deactivation	• disabled • send value 0 • send value 1 • set value to 0 • set value to 1
Select action on leaving the threshold (+hysteresis) range.	
Duration 1	
Sending difference	0…2,600,000 [s] (0 = disabled) (1 month ≈ 2,600,000s) (1 day ≈ 86,000s)
Info telegram is sent regularly when the time counter of threshold exceedance(s) reaches the pre-set value.	
Counter 1	
Sending difference	0…500 (0 = disabled)
Info telegram is sent regularly when the number counter of threshold exceedance(s) reaches the pre-set value.	
Cyclic sending	disabled • 1 min • 2 min…5 min • 10 min • 15 min…30 min • 1 h • 2 h…8 h
Info telegram is sent regularly.	

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