Manual and Configuration

KNX PowerSupply 960

Notice

The contents of this document may be reproduced without prior written approval by Enertex® Bayern GmbH in any form, neither in whole nor in parts, copied, transmitted, distributed or stored.

Enertex® is a registered trademark of Enertex® Bayern GmbH. Other product and company names mentioned in this manual may be the marketing or trade names of their respective owners.

This manual may be changed without notification or announcement and makes no claim to completeness or accuracy.

Inhalt

Notices

- Installation and assembly of electrical equipment must be performed by qualified electricians.

- When connecting KNX/EIB interfaces skills are provided by KNX™-Training.

- Ignoring the instructions may damage the device as well as causing fire or other hazards.

- This manual is part of the product and must remain with the end user.

- The manufacturer is not liable for any costs or damages incurred by the user or third parties through the use of this device, misuse or malfunction of the connection, malfunction of the device or the subscriber equipment.

- Opening the case or other authorized changes or modifications will void the warranty!

- The manufacturer is not liable for improper use.

Function Description

The KNX power supply unit with integrated choke "Enertex Power Supply 960" is a rail-mounted device for supplying and monitoring of the EIB / KNX bus.

The EIB / KNX bus can be connected to the grey / red bus terminal. The power supply guarantees in connection with the integrated choke a rated current of 960 mA on the bus.

On the unchoked switching power supply output (white / yellow terminal) a peripheral device (30 V DC) or another line can be connected by using an additonal EIB / KNX choke. The total rated current (Bus + DC Aux) is permanently 1,6 A (notice Temperature - Derating!), short-term 2,1 A.

The integrated bus coupler allows the user reading the values of intern measured current, voltage, power, temperature. All electrial parameters are measured for the KNX™ output. The current at „DC Aux" output is not measured.
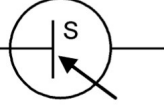
The LCD Display shows in two lines on one hand the actual values of current, voltage, power and on the other hand the maximum value of the current associated with time and date stamp.

By pressing the RESET button for at least 20s all bus users can be reset.

By pressing the PROG button the device is put into programming mode and can be programmed via ETS 3.0d or later.

In the „USB-garage" the delivered USB stick, with your ETS project data, can be plugged in and therewith it can be stored at the appropriate place.

Technical Data

	SMPS Switching Mode Power Supply
	SMPS containing a **short circuit proof safety transformer** (unconditional or conditional) (here: continuous short circuit)
Net voltage supply	Voltage: 230 V AC, 50 Hz
	Power consumption: max. 56 W
	power factor $\cos\varphi$ = 0,56 (at total rated current)
	Efficiency η at I_N=960 mA: ca. 87 %
Outputs	Voltage: 30 V DC SELV
	Rated current bus: 960 mA permanently
	Rated current total (Bus + DC Aux)
	permanently: 1,6 A (Notice the Temperature – Derating!)
	short term: 2,1 A
	Power failure buffering time: > 100 ms
Operating and display elements	LCD Display
	LEDs: „PROG", „RESET", POWER"
	Button: „PROG", „RESET"
Connectors	Net voltage supply: screw terminal, conductor cross-section: 0,2 - 2,5 mm² / AWG 24 – 14, stripping length: 6,5 mm
	EIB / KNX connector grey / red connecting terminal
	DC Aux: white / yellow connecting terminal
	„USB – garage"
Housing	DIN rail housing for 35 mm rail
	Width: 6 TE
	Dimensions: 107,4 x 89,6 x 62,9 mm (l x w x h)
	Flammability class: V0

| **Further**	Indoor use only
	Only for use in an electrical cabinet
	Highest ambient temperature t_a = 45 °C
	Lowest ambient temperature $t_{a\ min}$ = -5 °C
	Certification: EIB/KNX certified
	Safety: Tested according to the safety directives of DIN EN 61558-1
	Protection class I
	Over Voltage Category III
	IP-Number: IP20
	EMV: Tested according to the EMV-directives of DIN EN 61204-3

Temperature - Derating:
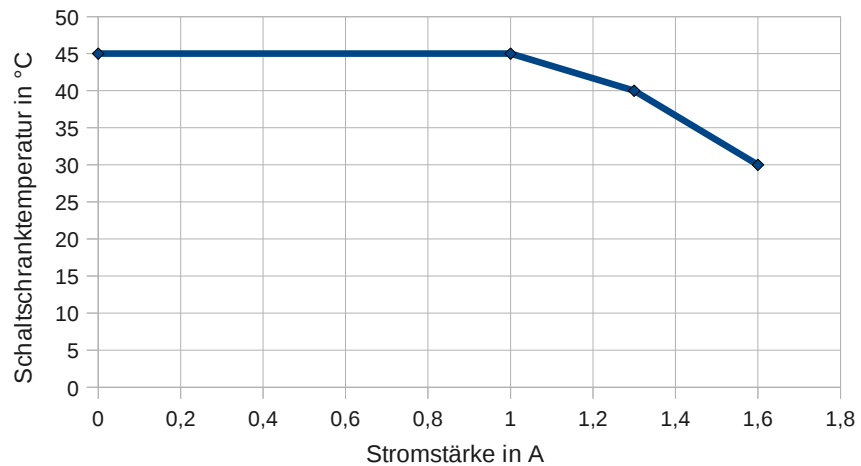
If the power supply is operated above the drawn ambient temperature the implemented overheat protection will be activated. The drawn current describes the entire load current $I = I_{Bus} + I_{Aux.}$

Connection Diagram
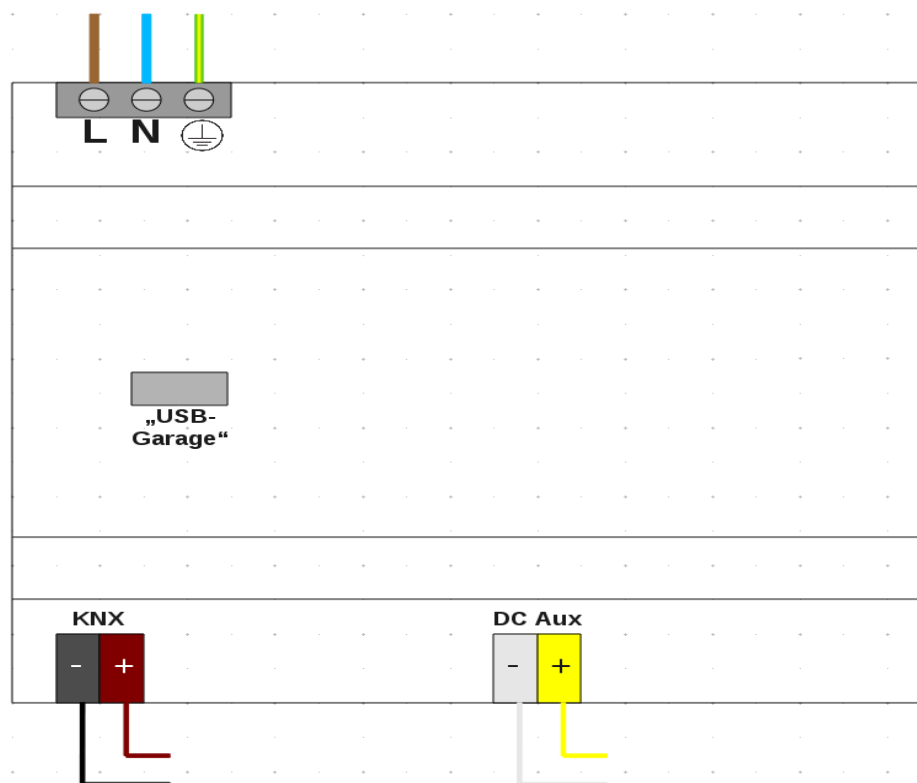
Picture 1: Connections

- The supply voltage is connected to the left overhead 3-pin- screw terminal. Phase, neutral conductor and protecting conductor have to be connected in the specified order (on the device too).

   The mains supply must be fused with a 16 A fuse.

   For security reasons, the grounding conductor must be connected!

   WARNING DANGER!

   Electrical shock by touching voltage leading parts. Electrical shock can cause death. Before working on the device unlock the connecting cables and cover voltage leading parts in the surrounding area!

- The EIB / KNX bus is connected to the left stated below grey / red clamp. Observe the polarity!

- Peripherals devices (30 V DC) or a choke for another EIB / KNX line can be connected to the right stated below white / yellow clamp. Observe the polarity!

- On the delivered USB stick customer spezified ETS project data can be stored. Afterwards it can be put in the „USB"-garage and it is therefore detectable in a central location.

Software Descriptions

The power supply unit is measuring current and voltage on the bus and the power output is calculated. In addition the internal housing temperature is measured.

According to the parameter the measured values are sent cyclically and / or after change respectively an explicit request on the KNX bus.

For some dimensions the sending of a telegram is also provided when exceeding or falling below a threshold value.

The calculation of the measured values is taking place at intervals of one second. The sending process is distributed over a period of one second in order to reduce the bus load.

In addition the output power is calculated and can be output referring on different starting points (lifetime, switch-on point, final analysing reset).

Moreover via an implemented efficiency curve the calculated absorbed energy can be given out.

All measurements refer to the components connected to the BUS terminal. Devices, which are connected to the AUX terminal are not acquired.

Specification

Bus Coupler: E981.03

KNX-type class: 3b

Number of communication objects: 33

Configuration: S-mode without plug-in

ETS: from Version 3.0d, Patch A

Database File

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

ETS Application - Parameter

Notice: Depending on the parameterization some settings can not be available. They are not shown in the cases in the ETS.

General

Under the tab „General" the following settings can be done:

Picture 2: General settings

Description of parameters:

Name	Options	Description
Cyclic analysis reset	Daily / Weekly / Monthly / Yearly / Never	Cycle in which the saved extreme values and energy counters are reset; the cycle starts at turn-on time
Request the time after bus voltage return	Yes / No	Request the time after voltage return (e.g. after power failure)
Value of communication object „request time"	0 / 1	The time can be requested via the parameterized value of the communication object
Request date after bus voltage return	Yes / No	Request date after bus voltage return (e.g. after power failure)
Value of the communication object „Request date"	0 / 1	The date can be requested via the parameterized value of the communication object

Measurement

Under the tab „Measurement" the following settings can be done (Part 1):

Picture 3: Parameters Measurement (Part 1)

Description of parameters:

Name	Options	Description
Release the communication object „Request measurement values"	Yes / No	Measurement values can be requested via communication object „Request Measurement Values"
Value of the communication object „Request Measurement"	0 / 1 / 0 or 1	Measurement values can be requested via the parameterized value of the communication object
Release cyclic measurement output	Yes / No	Measurement values can be output cyclically; 0=no cyclic output
Period cyclical output (s)	0 to 172800	Measurement values are sent with the set cycle to the bus
Sending via changing a value in percentage	Yes / No	Measurement values can be output via changing of a variable percentage
Sending via changing a value in percentage	0 to 100	Setting percentage value; 0=no output

Continuation of the settings under the tab „measurement" (Part 2)

Picture 4: Parameters Measurement (Part 2)

Description of parameters:

Name	Options	Discription
Release the output of measurement value when exceeding the limited value / falling below the limit value	Yes / No	Measurement values can be output when exceeding / falling below the fixed limited values
Telegram when exceeding the limited value / falling below the limited value (voltage)	Yes / No	When exceeding / falling below the fixed limited value of the bus voltage a telegram is issued
Limited value (mV)	0 to 35000	When exceeding / falling below the limited value bus voltage a telegram should be issued
Hysteresis (mV)	0 to 2000	No new telegram is issued, if the bus voltage only changes in the hysteresis area around the limited value
Telegram when exceeding the limited value / falling below the limited value (current)	Yes / No	When exceeding / falling below the fixed limited value of the current a telegram is issued
Limited value (mA)	0 to 2000	When exceeding / falling below the limited value current a telegram should be issued
Hysteresis (mA)	0 to 255	No new telegram is issued, if the current only changes in the hysteresis area around the limited value
Telegram when exceeding the limited value / falling below the limited value (temperature)	Yes / No	When exceeding / falling below the fixed limited value of the temperature a telegram is issued
Limited value (°C)	0 to 100	When exceeding / falling below the limited value temperature a telegram should be issued

Hysteresis (°C)	0 to 20	No new telegram is issued, if the temperature only changes in the hysteresis area around the limited value

Extreme values

Under the tab „Extreme Value" the following settings can be done:

Picture 5: Parameters Extreme values

Description of parameters:

Name	Auswahlmöglichkeiten	Beschreibung
Release the output of extreme values	Yes / No	Extreme values can be output cyclic or when changing
Output extreme values cyclic (s)	0 to 172800	Extreme values can be output cyclically (unit: s); 0=no cyclic output
Output when changing	Yes / No	Output extreme values when chaning

Energy

Under the tab „Energy" the following settings can be done:

Picture 6: Parameters Energy

Description of parameters:

Name	Auswahlmöglichkeiten	Beschreibung
Release the output of energy values	Yes / No	Energy values can be output cyclic or when changing
Output energy values cyclic (s)	0 to 172800	Energy values can be output cyclically (unit: s); 0=no cyclic output

Communica-
tions Objects

Notice:

- Depending on the configuration some objects may not be available.

- Since all devices are subjected to an initial test, the operating time and energy meters differ from zero at delivery.

ID	Name	Objekt Function	Length	Type	Flags
0	General	Time	3 Bytes	[10.001] DPT_TimeOfDay	C-W-U
Communication object for setting the time of power supply					

ID	Name	Object Function	Length	Type	Flags
1	General	Date	3 Bytes	[11.001] DPT_Date	C-W-U
Communication object for setting the date of power supply					

ID	Name	Object Function	Length	Type	Flags
2	General	Request time	1 Byte	[1.xxx] (1-Byte)	C--T-
Request the current time from a clock on the KNX Bus					

ID	Name	Object Function	Length	Type	Flags
3	General	Request date	1 Byte	[1.xxx] (1-Byte)	C--T-
Request the current date from a clock on the KNX Bus					

ID	Name	Object Function	Length	Type	Flags
4	General	Turn-on time	3 Bytes	[10.001] DPT_TimeOfDay	CR-T-
Communication object with turn-on time					

ID	Name	Object Function	Length	Type	Flags
5	General	Turn-on date	3 Bytes	[11.001] DPT_Date	CR-T-
Communication object with turn-on date					

ID	Name	Object Function	Length	Type	Flags
6	General	Operating hours life time	2 Bytes	[7.007] DPT_TimePeriodHrs	CR-T-
Output of the operating hours of the device					

ID	Name	Object Function	Length	Type	Flags
7	General	Analyses reset	1 Byte	[1.017] DPT_Trigger	C-W--
Reset all stored extreme values and energy counters					

ID	Name	Object Function	Length	Type	Flags
8	General	Operating seconds life time	4 Byte	[13.100] DPT_LongDeltaTimeSec	CR-T-
Output of the operating seconds of the device					

ID	Name	Object Function	Length	Type	Flags
16	Measurement	Request measurement values	1 Byte	[1.xxx] (1-Byte)	C--T-
Request all measured values if they are paremeterized with the option „on request". The measurements are including: „Voltage" (ID17) „Current" (ID18) „Power" (ID19) „Temperature" (ID20)					

ID	Name	Object Function	Length	Type	Flags
17	Measurement	Voltage	2 Bytes	[9.020] DPT_Value_Volt	CR-T-
Communication object with the last determined bus voltage (unit: mV)					

ID	Name	Object Function	Length	Type	Flags
18	Measurement	Current	2 Bytes	[9.021] DPT_Value_Curr	CR-T-
Communication object with the last determined amperage on the bus (unit: mA)					

ID	Name	Object Function	Length	Type	Flags
19	Measurement	Power	4 Bytes	[9.024] DPT_Power	CR-T-
Communication object with the last determined power on the bus (unit: W)					

ID	Name	Object Function	Length	Type	Flags
20	Measurement	Temperature	2 Bytes	[9.001] DPT_Value_Temp	CR-T-
Communication object with the last determined internal housing temperature (unit: °C)					

ID	Name	Object Function	Length	Type	Flags
21	Measurement	Voltage – Set a limited value	2 Bytes	[9.020] DPT_Value_Volt	C-W--
Set a limited value of the voltage (unit: mV)					

ID	Name	Object Function	Length	Type	Flags
22	Measurement	Voltage – Exceeding / falling below a limited value	1 Byte	[1.xxx] (1-Bit)	C--T-
Communication object which is sent with the value 1 respectively 0 if the limited value of the bus voltage has been exceeded or fallen below					

ID	Name	Object Function	Length	Type	Flags
23	Measurement	Current – Set a limited value	2 Bytes	[9.021] DPT_Value_Curr	C-W--
Via this communication object the limited value of the current can be set (unit: mA)					

ID	Name	Object Function	Length	Type	Flags
24	Measurement	Current – Exceeding / falling below a limited value	1 Byte	[1.xxx] (1-Byte)	C--T-
Communication object which is sent with the value 1 respectively 0 if the limited value of the current has been exceeded or fallen below					

ID	Name	Object Function	Length	Type	Flags
25	Measurement	Temperature – Set a limited value	2 Bytes	[9.001] DPT_Value_Temp	C-W--
Via this communication object the limited value of the temperature can be set (unit: °C)					

ID	Name	Object Function	Length	Type	Flags
26	Measurement	Temperatur – Exceeding / falling below a limited value	1 Byte	[1.xxx] (1-Byte)	C--T-
Communication object which is sent with the value 1 respectively 0 if the limited value of the temperature has been exceeded or fallen below					

ID	Name	Object Function	Length	Type	Flags
35	Extreme value	Voltage – Minimum	2 Bytes	[9.020] DPT_Value_Volt	CR-T-
Communication object with the minimal bus voltage (unit: mV)					

ID	Name	Object Function	Length	Type	Flags
36	Extreme value	Voltage – Maximum	2 Bytes	[9.020] DPT_Value_Volt	CR-T-
Communication object with the maximum bus voltage (unit: mV)					

ID	Name	Object Function	Length	Type	Flags
37	Extreme value	Current – Minimum	2 Bytes	[9.021] DPT_Value_Curr	CR-T-
Communiction object with the minimum current on the bus (unit: mA)					

ID	Name	Object Function	Length	Type	Flags
38	Extreme value	Current – Maximum	2 Bytes	[9.021] DPT_Value_Curr	CR-T-
Communication object with the maximum current on the bus (unit: mA)					

ID	Name	Object Function	Length	Type	Flags
39	Extreme value	Power – Minimum	2 Bytes	[9.024] DPT_Power	CR-T-
Communication object with the minimum power on the bus (unit: W)					

ID	Name	Object Function	Length	Type	Flags
40	Extreme value	Power – Maximum	4 Bytes	[9.024] DPT_Power	CR-T-
Communication object with the maximum power on the bus (unit: W)					

ID	Name	Object Function	Length	Type	Flags
41	Extreme value	Temperature – Minimum	4 Bytes	[9.001] DPT_Value_Temp	CR-T-
Communication object with the minimum internal housing temperature (unit: °C)					

ID	Name	Object Function	Length	Type	Flags
42	Extremwert	Temperature – Maximum	2 Bytes	[9.001] DPT_Value_Temp	CR-T-
Communication object with the maximum internal housing temperature (unit: °C)					

ID	Name	Object Function	Length	Type	Flags
75	Energy	Delivered Energy Lifetime	4 Bytes	[13.010] DPT_ActiveEnergy	CR-T-
Communication object with the delivered energy in lifetime (unit: Wh)					

ID	Name	Object Function	Length	Type	Flags
76	Energy	Delivered Energy since turn-on	4 Bytes	[13.010] DPT_ActiveEnergy	CR-T-
Communication object with the delivered energy since turn-on (unit: Wh)					

ID	Name	Object Function	Length	Type	Flags
77	Energy	Delivered Energy since the newest analysis reset	4 Bytes	[13.010] DPT_ActiveEnergy	CR-T-
Communication object with the delivered energy since the newest analysis reset (unit: Wh)					

ID	Name	Object Function	Length	Type	Flags
78	Energy	Received energy lifetime	4 Bytes	[13.010] DPT_ActiveEnergy	CR-T-
Communication object with the received energy in the lifetime (unit: Wh)					

ID	Name	Object Function	Length	Type	Flags
79	Energy	Received energy since turn-on	4 Bytes	[13.010] DPT_ActiveEnergy	CR-T-
Communication object with the received energy since the turn-on (unit: Wh)					

ID	Name	Object Function	Length	Type	Flags
80	Energy	Received energy since newest analysis reset	4 Bytes	[13.010] DPT_ActiveEnergy	CR-T-
Communication object with the received energy since the newest analysis reset (unit: Wh)					

Communication flags according the KNX Specification with the following functions:

- C = Communication: Bus communication possible

- R = Read: Reading of one value of the communication object is possible

- W = Write: Writing of one value of the communication object is possible

- T = Transmit: Transferring of one value is possible

- U = Update: erlaubt das Aktualisieren eines Kommunikationsobjekt- werts bei einer beliebigen Rückmeldung ("listen and synchronize" - function)