



energetexbayern gmbh
simulation entwicklung consulting

Dr.-Ing. M. Schuster

Products and developments

Home automation for the KNX bus



Enertex® EibPC²



Logic machine and visualization for the KNX bus

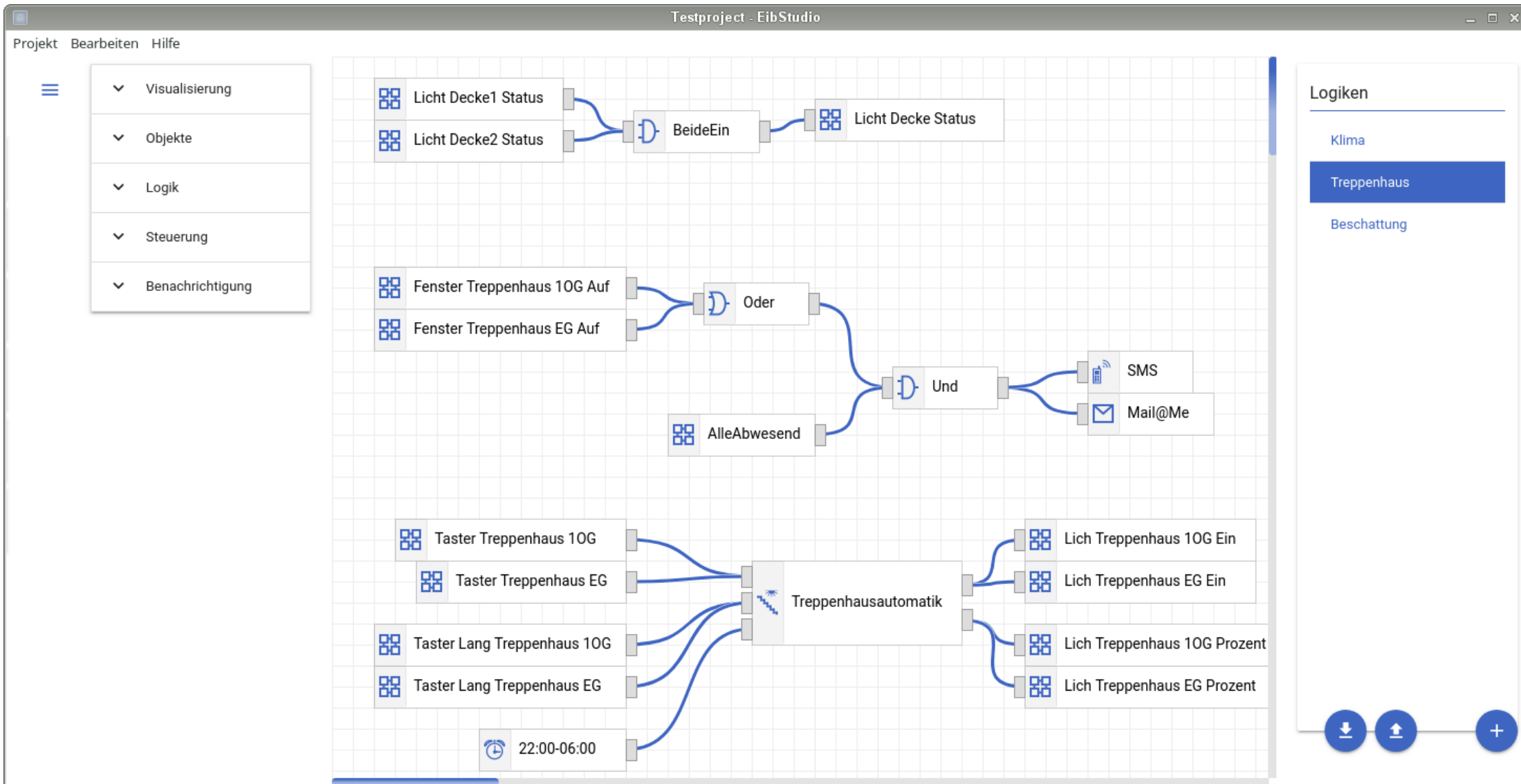
- DIN rail, dimension: 4 SU
- bus powered
- low power consumption: typ. 1.8 – 3.2 W
- integrated bus coupler, free KNX IP tunnel for ETS
- 2 port ethernet switch
- KNX and LAN functions, VPN, Webserver
- Free programming environment incl. bus monitor, debugger (Win 10, Linux, OSX)
- many predefined functions
- display makes commissioning easy, shows system status

Energetex® EibPC²

- encrypted web server
- 65,000 processing objects
- real time logic
- timers, stopwatches, astro functions, scenes
- diagnostic functions (phys. address, routing counter, raw data..)
- VPN Server
- Raw TCP/UDP connections
- http(s), XML, JSON parser to implement Web-APIs
- Modbus TCP Master and Slave
- telegram recording
- emails and FTP
- store variables in flash (8GB)

EibStudio 4

- graphical logic editor



EibStudio 4

- graphical visualization editor

Testproject - EibStudio

Projekt Bearbeiten Hilfe

- Elemente
- Funktionen
- Eigene Seiten
- Seiten

Raum

Wetter

enertex[®]EibPC Webserver

Wetter 1

Uhrzeit Datum Sonnenauf- und Sonnenuntergang

Licht in Lux Wind in km/h Außentemp.: Min und Max in °C

Vorhersage

Satellitenbild

Seiten

- Neue Gruppe 1
- Raum 1
- Wetter 1

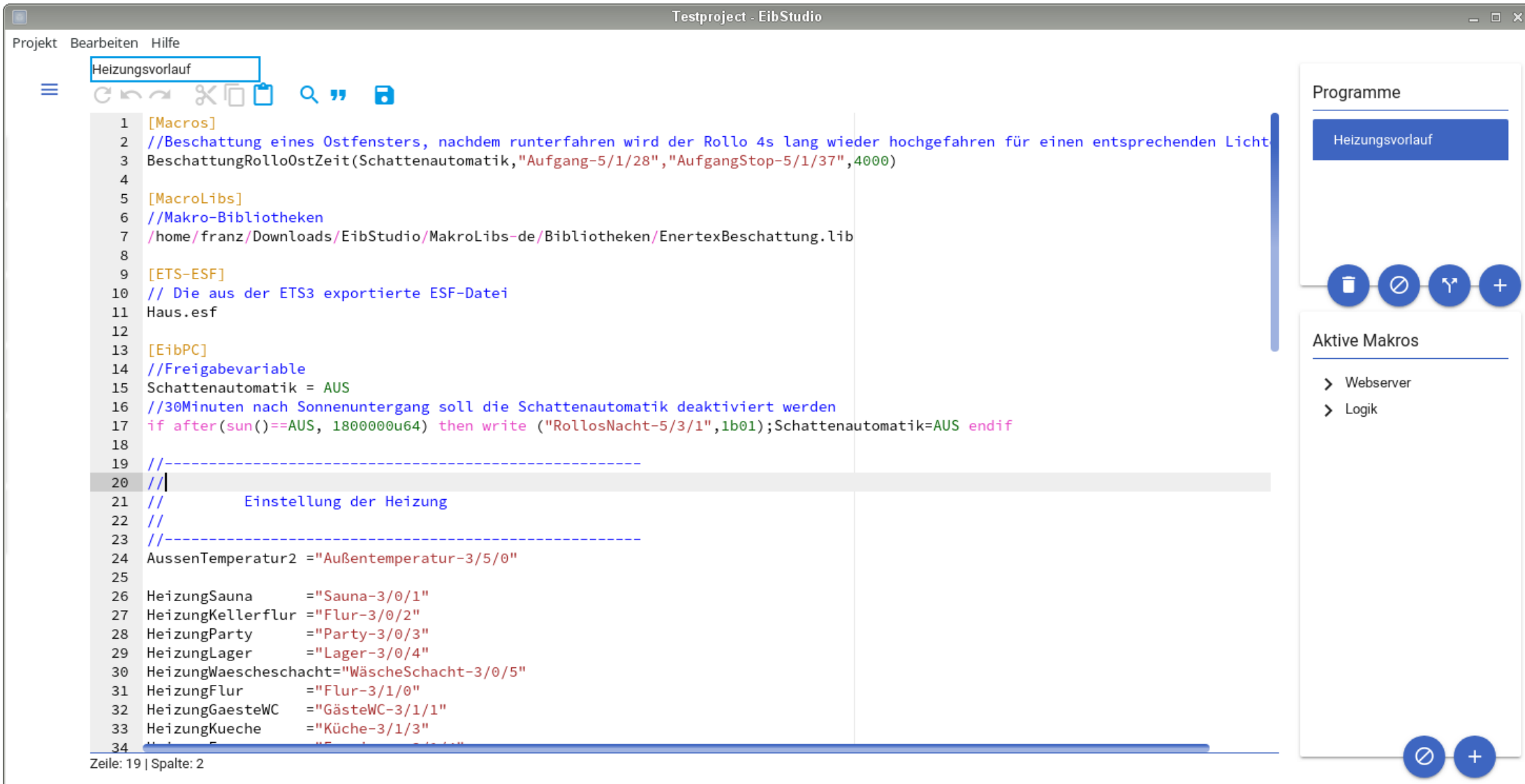
© enertex bayern gmbh 2010

enertexbayern gmbh
simulation entwicklung consulting

Elemente auf Seite: 0/60
Seitengröße: 763px x 668px

EibStudio 4

- code-based programming is possible



The screenshot displays the EibStudio 4 software interface. The main window shows a code editor with the following content:

```
1 [Macros]
2 //Beschattung eines Ostfensters, nachdem runterfahren wird der Rollo 4s lang wieder hochgefahren für einen entsprechenden Licht
3 BeschattungRolloOstZeit(Schattenautomatik,"Aufgang-5/1/28","AufgangStop-5/1/37",4000)
4
5 [MacroLibs]
6 //Makro-Bibliotheken
7 /home/franz/Downloads/EibStudio/MakroLibs-de/Bibliotheken/EnertexBeschattung.lib
8
9 [ETS-ESF]
10 // Die aus der ETS3 exportierte ESF-Datei
11 Haus.esf
12
13 [EibPC]
14 //Freigabevariable
15 Schattenautomatik = AUS
16 //30Minuten nach Sonnenuntergang soll die Schattenautomatik deaktiviert werden
17 if after(sun()==AUS, 1800000u64) then write ("RollosNacht-5/3/1",1b01);Schattenautomatik=AUS endif
18
19 //-----
20 //
21 //      Einstellung der Heizung
22 //
23 //-----
24 AussenTemperatur2 ="Außentemperatur-3/5/0"
25
26 HeizungSauna      ="Sauna-3/0/1"
27 HeizungKellerflur ="Flur-3/0/2"
28 HeizungParty      ="Party-3/0/3"
29 HeizungLager       ="Lager-3/0/4"
30 HeizungWaescheschacht="WäscheSchacht-3/0/5"
31 HeizungFlur        ="Flur-3/1/0"
32 HeizungGaesteWC    ="GästeWC-3/1/1"
33 HeizungKueche       ="Küche-3/1/3"
34
```

The interface includes a menu bar (Projekt, Bearbeiten, Hilfe) and a toolbar with various icons. On the right side, there is a sidebar with the following sections:

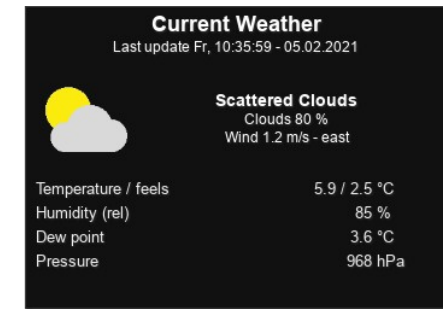
- Programme**: A list containing "Heizungsvorlauf".
- Aktive Makros**: A list containing "Webserver" and "Logik".

At the bottom left, the status bar indicates "Zeile: 19 | Spalte: 2".

EibPC² as universal KNX gateway

- integrate many of your ethernet devices into KNX
- most devices can be controlled via one of
 - http
 - raw TCP/UDP
 - Modbus TCP

PV inverters, EV charger, heat-pumps, gas boiler, AV receiver ...



- Online services also provide data
 - weather forecast
 - garbage collection dates
 - fuel prices
- make them available to every KNX device

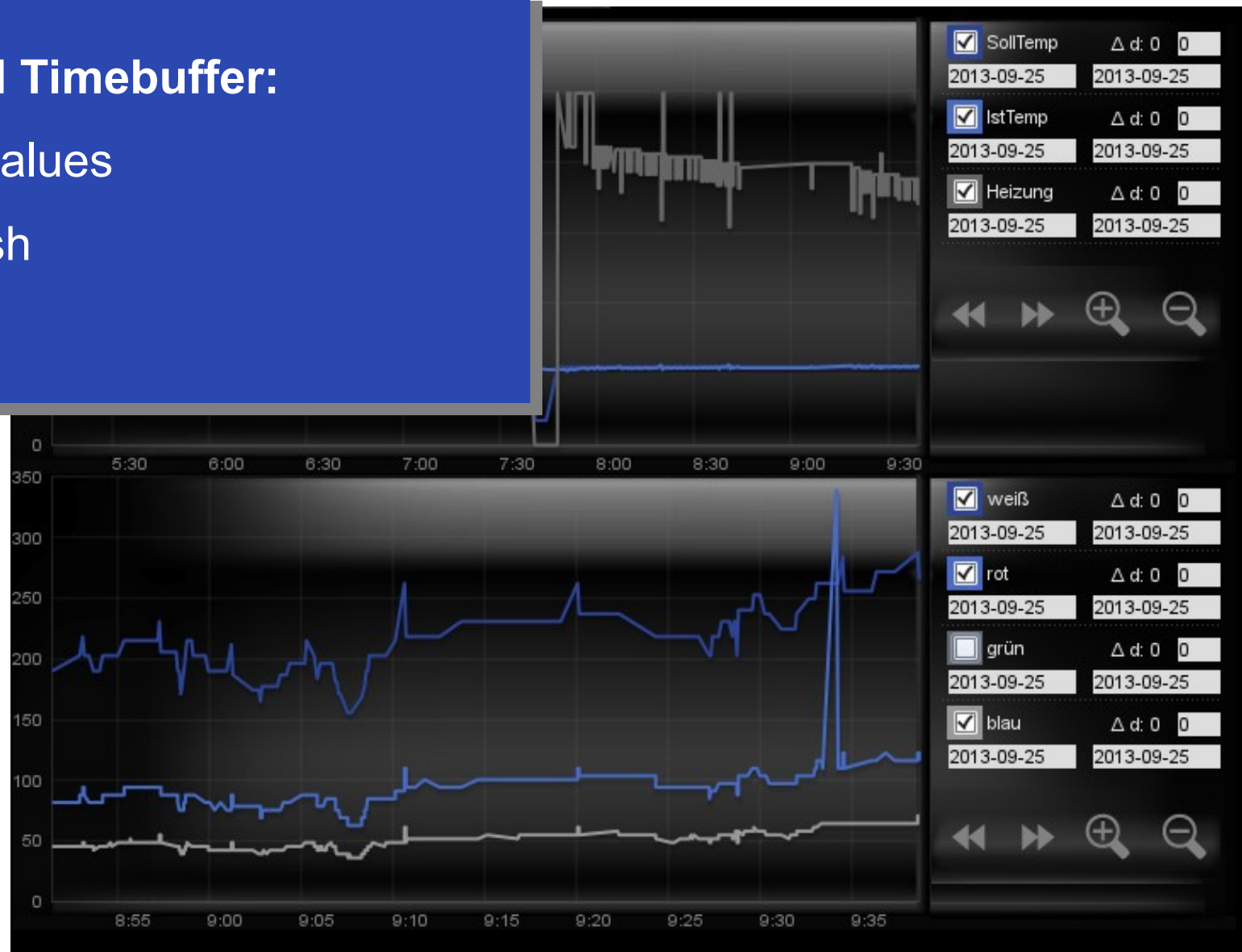
Web-Visu



Long-term recording

Timecharts and Timebuffer:

- up to 65.000 values
- storable in flash
- easy handling



Individualized ...



Sonos integration

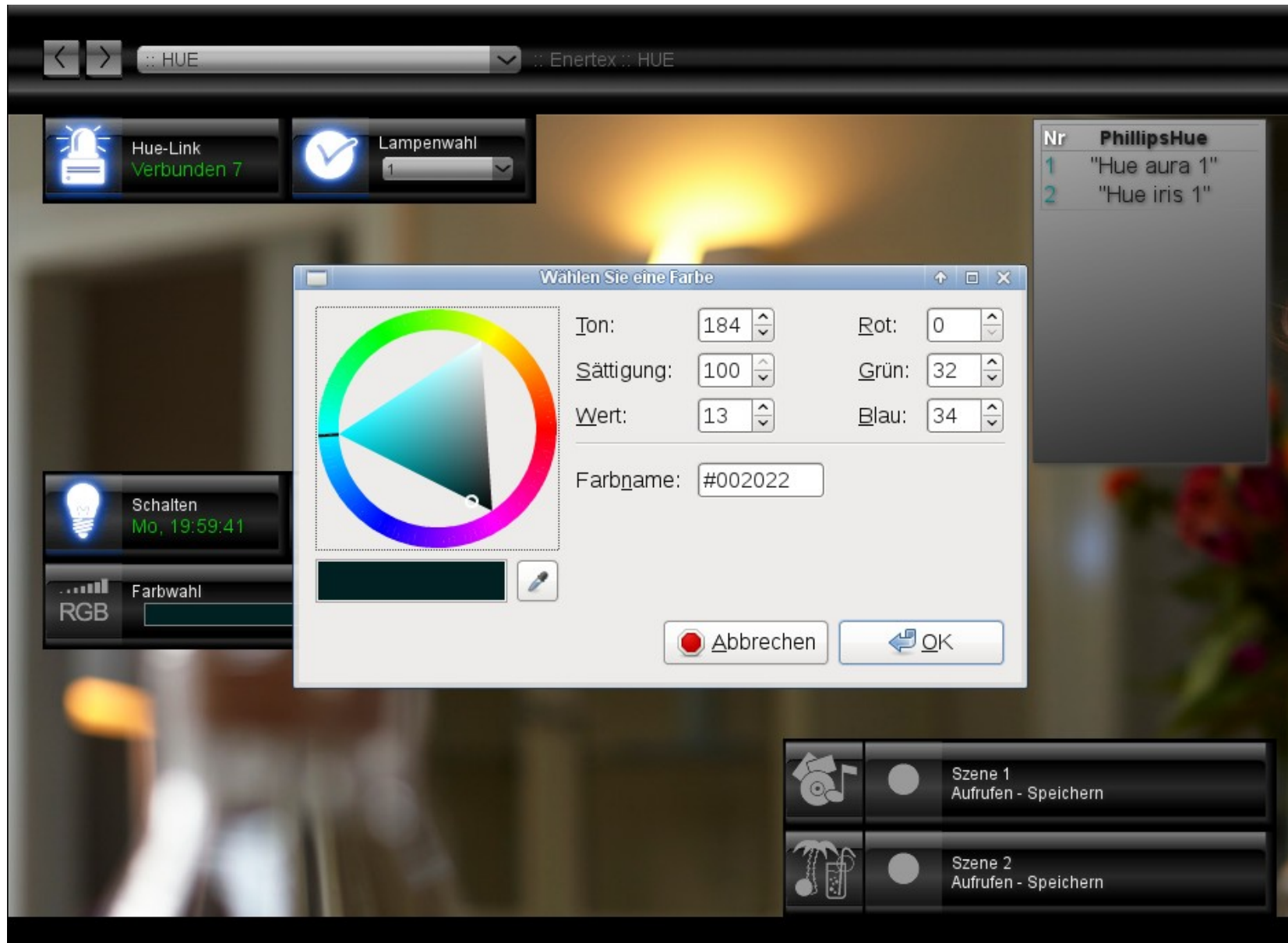


- control up to 4 zones in real time via browser
- integration in KNX: turn on via GA, choose songs, etc ..
- zone administration
- radio and playlists

Integration HUE



Integration HUE III



Cameras



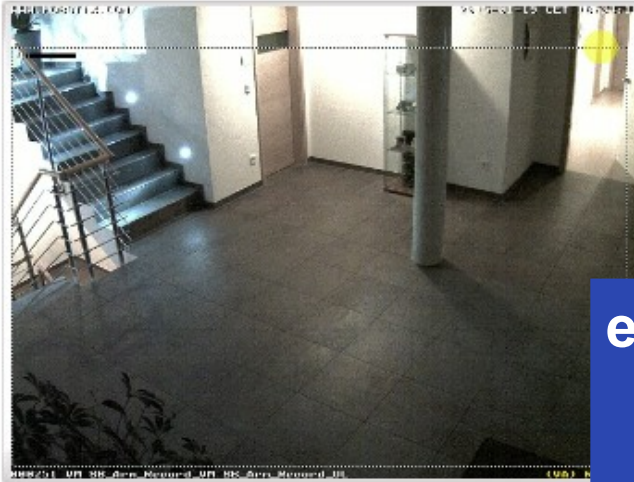
Kameras



Allgemein :: Kameras



Eingang



Eingang



Parkplatz



Hinten

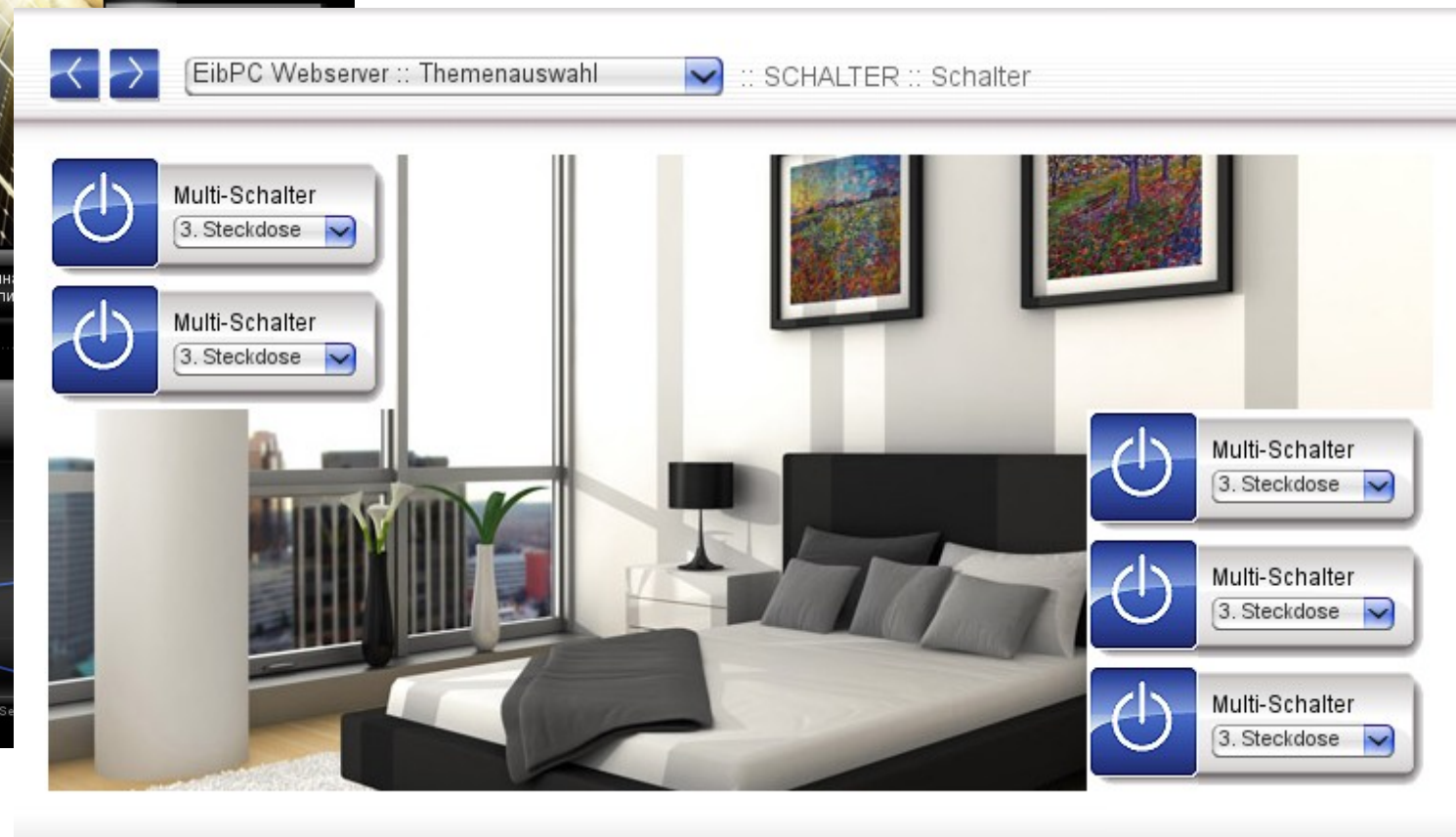
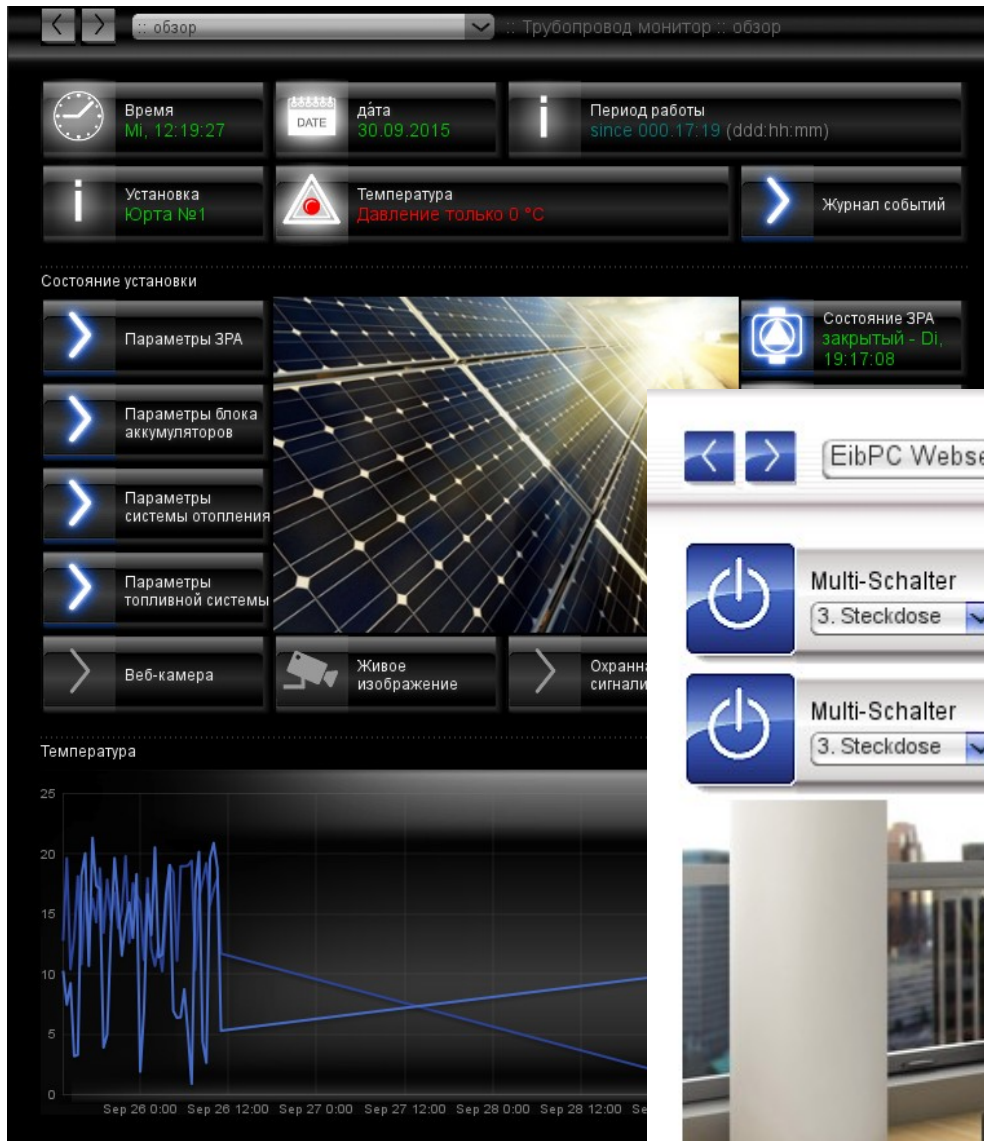
easy integration

- Mobotix
- any webcams (MJPEG)
- data streams

Individually personalized ...

as part of the design

- blue
- black



Status indicator...



KNX SmartMeter

- KNX energy meters



- dimension: 4 SU
- SD card for long-term recording
- supply only via KNX Bus, measurement voltage from 0 ... 230 VAC possible
- active and reactive power measurement resolution 0.4 W (0.4 VA)
 - 1) current range from 2mA to 85A
 - 2) current range from 10mA to 630A
- bidirectional power measurement
- 1- and 3-phase measurement
- balancing energy meter
- energy meter with lowest loss on the market
- measurement of the harmonics acc. to standard (THD-U and I)
- Indication of current and voltage peaks
- current measurement with external current sensors

Enertex® KNX SmartMeter

Lowest losses. Highest resolution.

Competitors: shunt resistor 0,5 ... 5 mOhm

Competitor direct measurement 16A (Mxx 3 mOhm)		Competitor direct measurement 85A (Exx 0,5 mOhm)	
losses current meas. per phase:	1.5 W	losses curr. meas. per phase:	3.6 W
losses voltage meas.:	1.8 W	losses voltage meas.:	1,8 W
sum of losses:	6.3 W	sum of losses:	12.6 W
min. possible measurement:	4.6 W	min. possible measurement:	19 W

Enertex Smartmeter

sum of losses:	0.5 W (bus powered)
min. possible measurement:	0.46 W (= 40-times better!)

Enertex® KNX SmartMeter



Version 1149-85

measurement range 2mA .. 85 A
with 230V 460mW .. 20kW (1-ph.)
accuracy class 1

accuracy: 1% in range from 10mA to 85A
accuracy: 10% in range from 2mA to 10mA
resolution: 0,2 mA



Version 1149-630

measurement range 10mA .. 630 A
with 230V 2.3W .. 145kW (1-ph.)
accuracy class 1

accuracy: 1% in range from 50mA to 630A
accuracy: 10% in range from 10mA to 50mA
resolution: 1.0 mA

Current sensor

- calibrated for the device, linear over the entire range
- integral accessory **without additional costs**
- 630-Version sensor can be opened

Enertex® KNX SmartMeter record and present



Recording to SD card

Different strategies (parameterize with ETS)

- energy
- power and power factor
- condition monitoring, current, voltage, THD, transients
- harmonics

+ Long-term recording on SD card

- + with battery-buffered real-time clock (variant RT) for operation without KNX
- + no parameterization necessary (delivery state is one record per minute)
- + also for conventional systems with a simple 24V supply

Energetex® KNX SmartMeter application examples KNX



Operation of a PV system

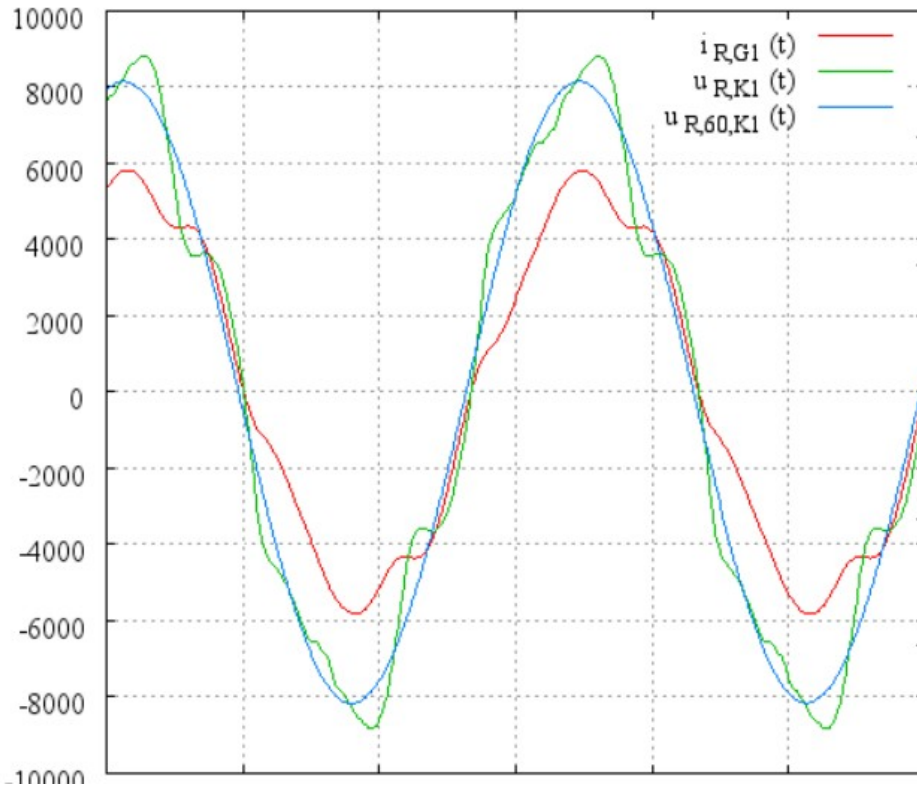
- consideration of different tariffs for generation and consumption
- consideration of tariff periods
- separate counters for generation and consumption
- separate counters for daily and total consumption

How much energy was consumed - today and in total?

How much generation in € - today and in total?

How much consumption in € - today and in total?

Energetex® KNX SmartMeter power quality



power quality

- calculation of distortions in mains
- determination of the THD according to DIN
- calculation of the harmonics
- determination of transient peaks

How "good sinusoidal" is my voltage / current (e.g., inverter, ECG, industry)?
Can my devices be damaged?
Do my devices pollute the voltage?

Energy Management for KNX with Energetext® KNX SmartMeter and Energetext® EibPC²



Network analysis



Harmonic component



Werte neu laden
Werte vom Do, 12:23:00

Spektrien der Ströme und Spannungen

Der "**Verschmutzungsgrad**" der Stromversorgung wird mit dem Enertex Smartmeter gemessen. Im Idealfall ist Strom und Spannung sinusförmig, Abweichungen davon werden mit sog. Oberschwingungen (ganzzahligen Vielfachen von 50 Hz, n=2 bedeute 100 Hz) angegeben - man kann sich den Zeitverlauf als Überlagerung der einzelnen Frequenzanteile vorstellen (Fouriertransformation).

Je mehr Oberschwingungsanteile vorhanden sind, desto verzerrter sind Strom und Spannung und desto "verschmutzt" ist die Stromversorgung.

Rechts sehen sie den gemessenen **Zeitverlauf** der ausgewählten Größe (Knopf Auswahl), wobei die Ströme in mA angezeigt werden. Unten rechts ist das Spektrum dieser Größe (in %). **Unten Links** werden die Grenzwerte, in der Tabelle daneben die **gemessenen Spektren** angezeigt. Stromgrenzwerte sind abhängig von der gewählten Klasse. Überschreitungen werden rot markiert

Stromoberschwingungen verursachen Überhitzung von Transformatoren, Schaden an Kondensatoren (Schaltnetzteile, Fernseher...), Fehlauslösung FI oder Leitungsschutz. Gemäß **DIN EN 50160** gelten in Deutschland folgende Grenzwerte in A, rechts: gemessen

n	Grenze	n	Grenze	n	Grenze	n	Grenze
2	1.080	3	2.300	4	0.430	5	1.140
6	0.300	7	0.770	8	0.230	9	0.400
10	0.184	11	0.330	12	0.153	13	0.210
14	0.131	15	0.150	16	0.115	17	0.132
18	0.102	19	0.118	20	0.092	21	0.107
22	0.083	23	0.098	24	0.077	25	0.090

n	U _n	n	U _n	n	U _n	n	U _n
2	0.000	3	0.008	4	0.000	5	0.010
6	0.000	7	0.008	8	0.000	9	0.005
10	0.000	11	0.003	12	0.000	13	0.002
14	0.000	15	0.001	16	0.000	17	0.001
18	0.000	19	0.001	20	0.000	21	0.002
22	0.000	23	0.001	24	0.000	25	0.001
26	0.000	27	0.001	28	0.000	29	0.001
30	0.000	31	0.004	32	0.000	33	0.001
34	0.000	35	0.001	36	0.000	37	0.003
38	0.000	39	0.001	40	0.000	41	0.001
42	0.000	43	0.001	44	0.000	45	0.001



Auswahl

I3

Stromspektrum L3



Klasse A

3-phasige Geräte,
Haushaltsgeräte P>600W



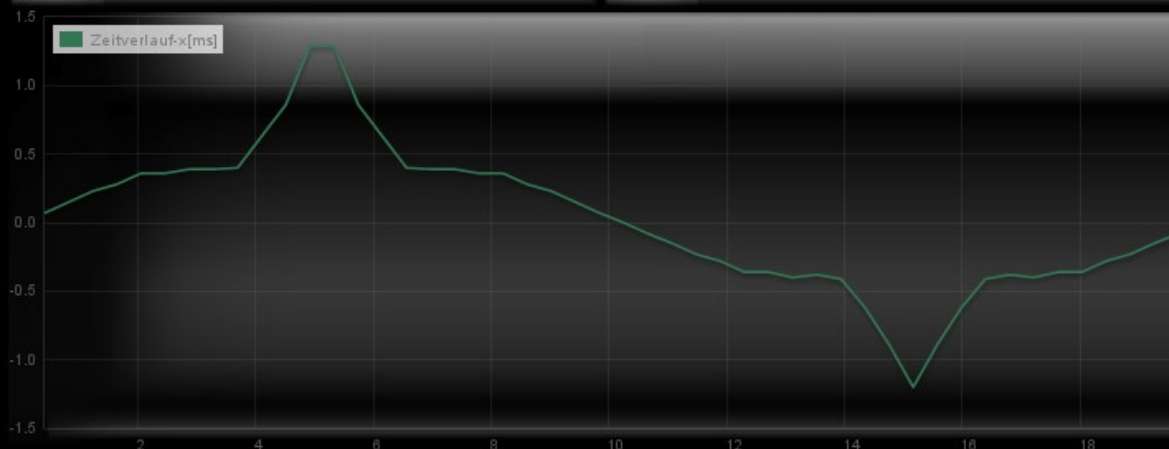
Darstellung: Kleinste Oberschwingung

2

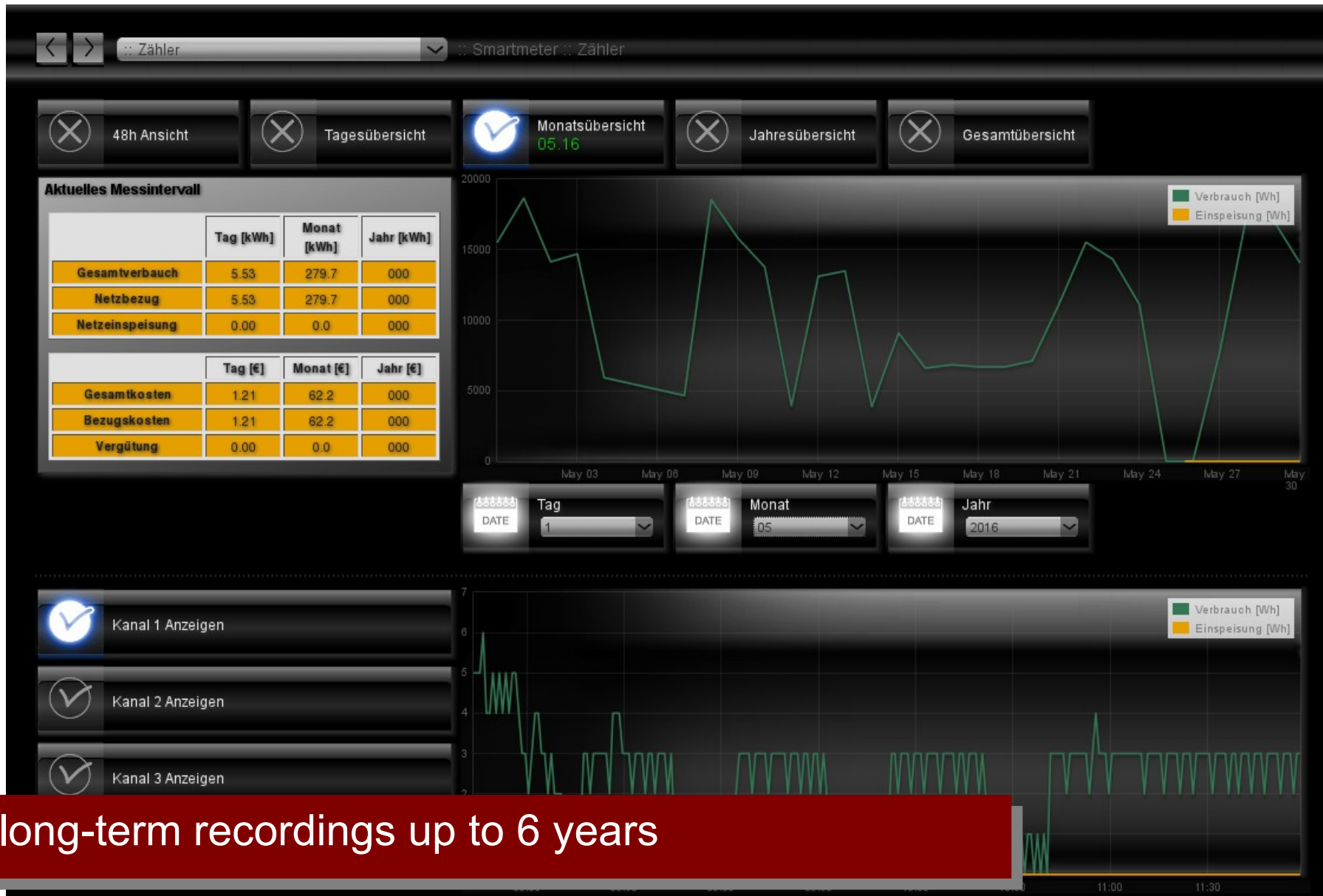


Darstellung: Größte Oberschwingung

49



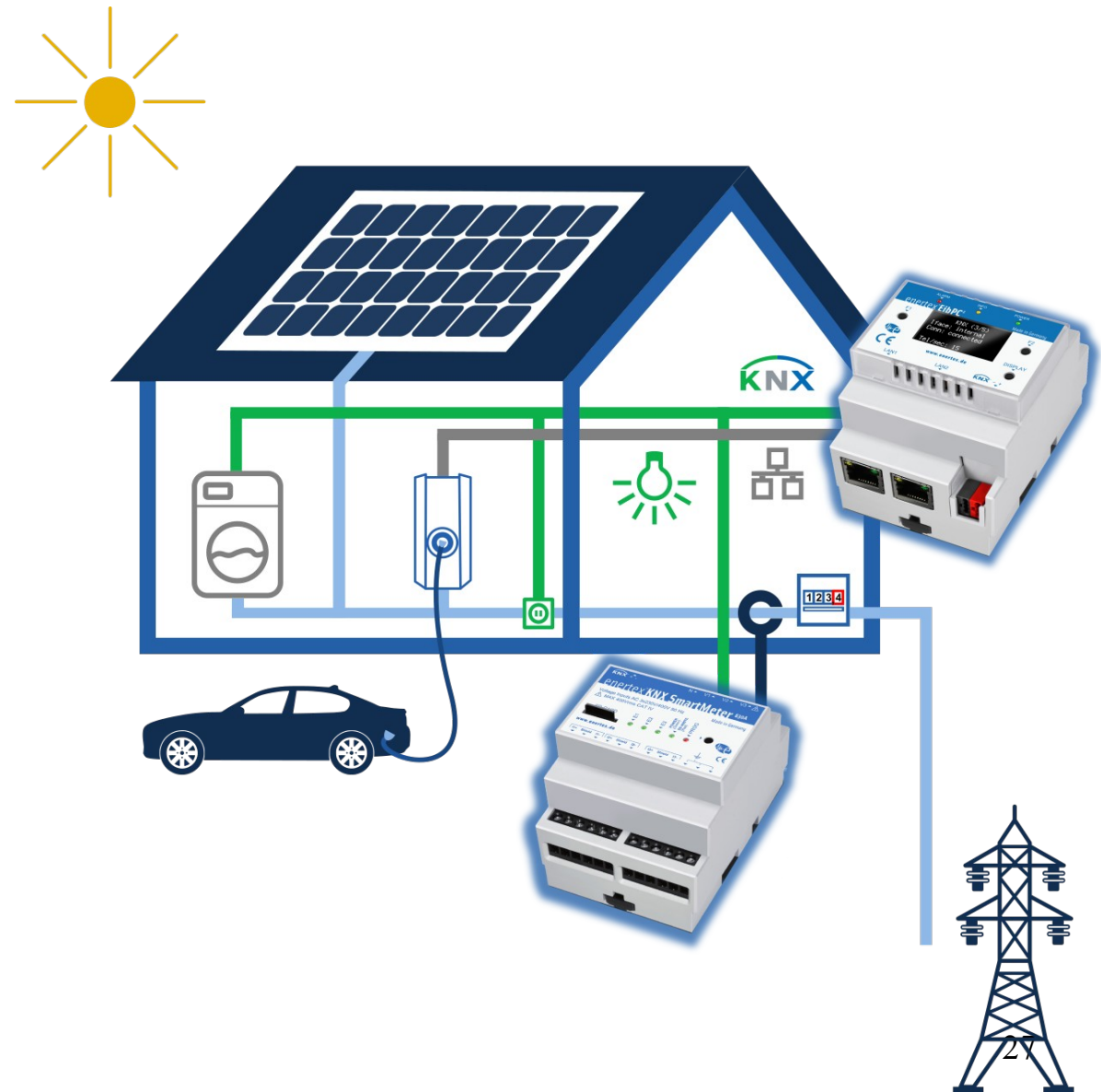
Data logger



+ long-term recordings up to 6 years

Measure and control

- turn consumers on/off depending on PV and power consumption
- control EV charge current to maximize self-consumption
- use weather forecast to decide when to start charging
- synchronize charging of EV and energy storage
- implement your own strategies

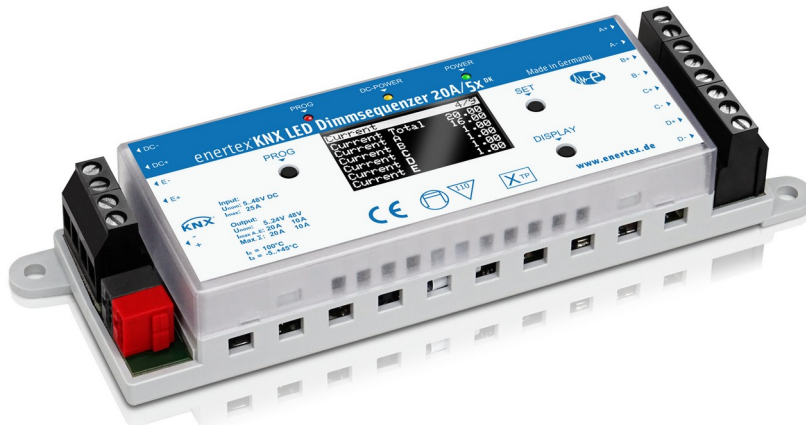


Control EV Charger



- control charging of EV with KNX group objects
 - Start/stop charging + status
 - Is charging/idle
 - fill level in kWh, %
 - current and power
 - remaining charge time
- Different charging modes
 - maximize self-consumption of PV energy
 - optional time limit
 - limit current

Enertex® KNX LED Dimmsequenzer 20A/5x REG or DK



REG and recessed ceiling (DK) Variants with identical features Hardware features:

- 5 channels, each up to 20 A
- 480W total dimming power
- 5 .. 48V lighting voltage
- Hardware protection against
 - overcurrent / short circuit (per channel and total)
 - over- and undervoltage
 - overtemperature
 - wrong polarity
- Extensive commissioning functions by the use of integrated display

Enertex® KNX LED Dimmsequenzer 20A/5x REG or DK

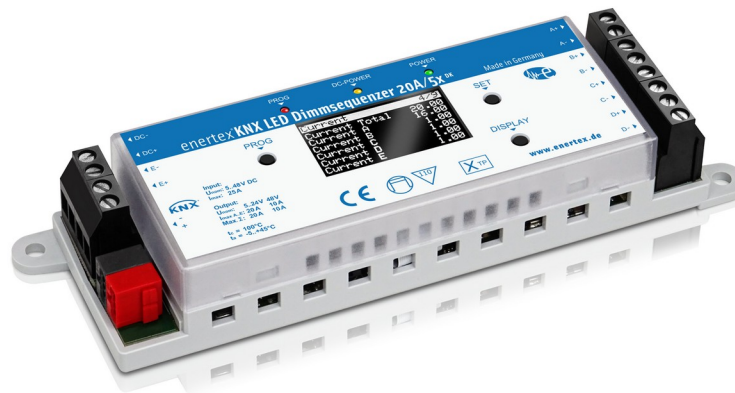


REG and recessed ceiling
5 channels, 20A, 5 - 48 V
for LED constant voltage

Software features:

- operating modes:
 - RGB(W)
 - Tunable White
 - RGB CCT: Extended RGB / TW
 - Single Channel
- RGB and/or HSV colours
- different PWM frequencies and dimming curves for perfect adjustment to lighting and user preference
- RGB or HSV colours
- scenes, bit scenes and lock functions

Enertex® KNX LED Dimmsequenzer 20A/5x REG or DK

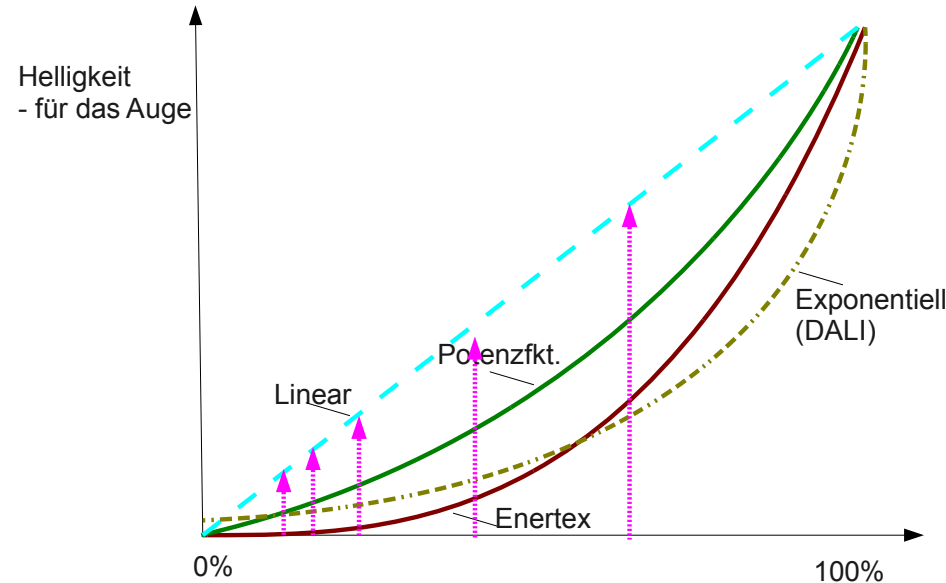
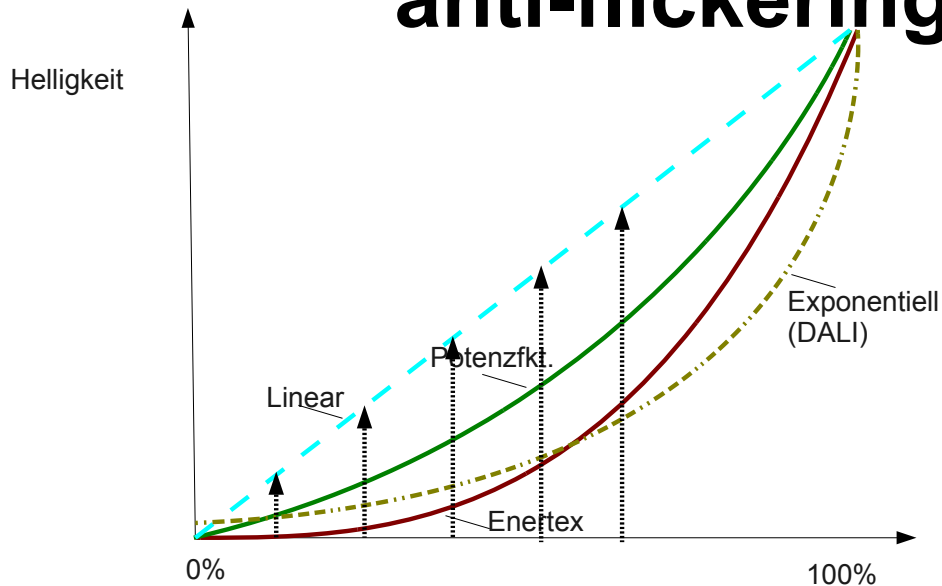


REG and recessed ceiling
5 channels, 20A, 5 - 48 V
for LED constant voltage

Software features (cont.):

- sequences and time based dimming
Human Centric Lighting (HCL)
- protection functions accessible via display and group objects
- power supply protection
- lighting protection
- measurement of voltage, current, power, temperature, telegramrate
- energy and cost meters
- Switch ext. switching actuator to switch off LED Power Supply

Enertex® KNX LED Dimmsequenzer 20A/5x REG or DK anti-flickering



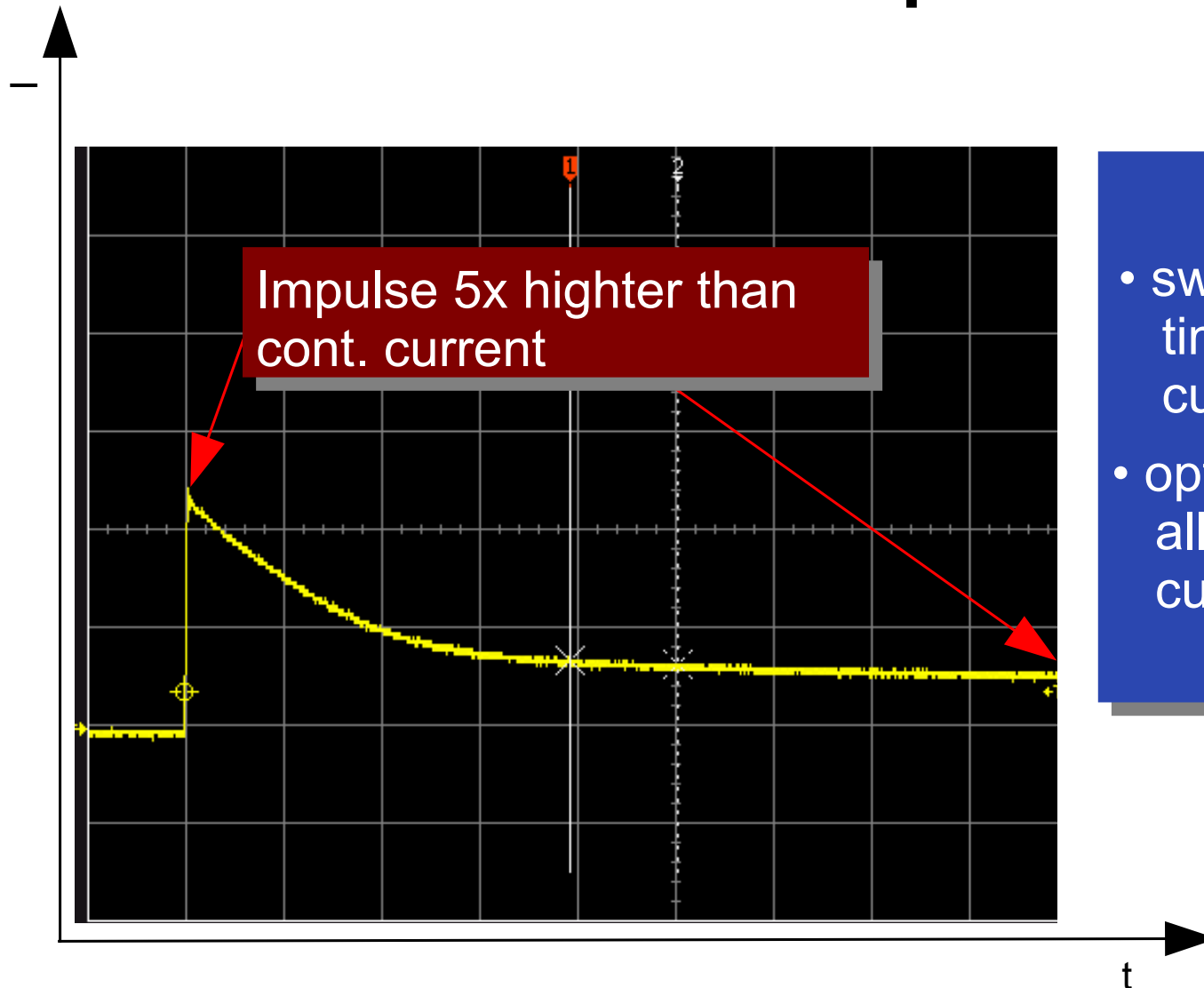
„flickering“

- 0 .. 255 steps acc. to KNX standard
- dimming through the steps
- depending on the lamps
- optical illusion at fast pass through the steps: flickering

Enertex® approach: Softdimming algorithm

- no flickering
- no steps

Enertex® KNX LED Dimmsequenzer 20A/5x REG or DK Switch on impulse current

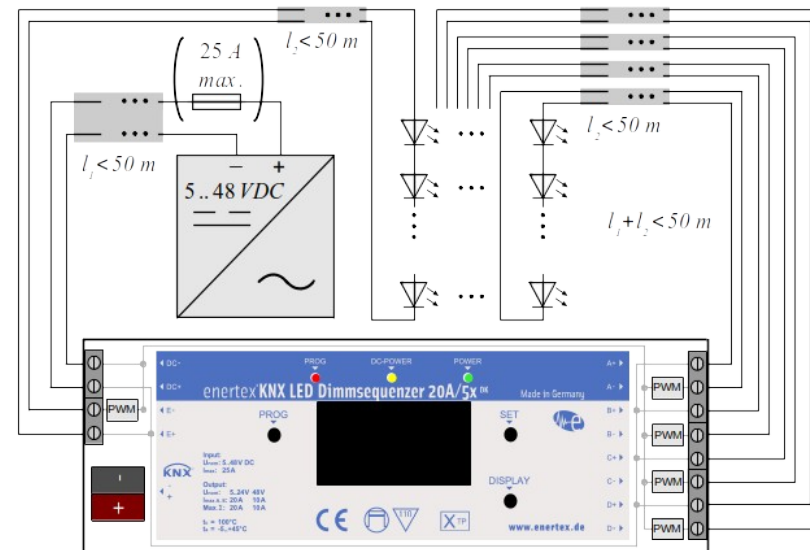
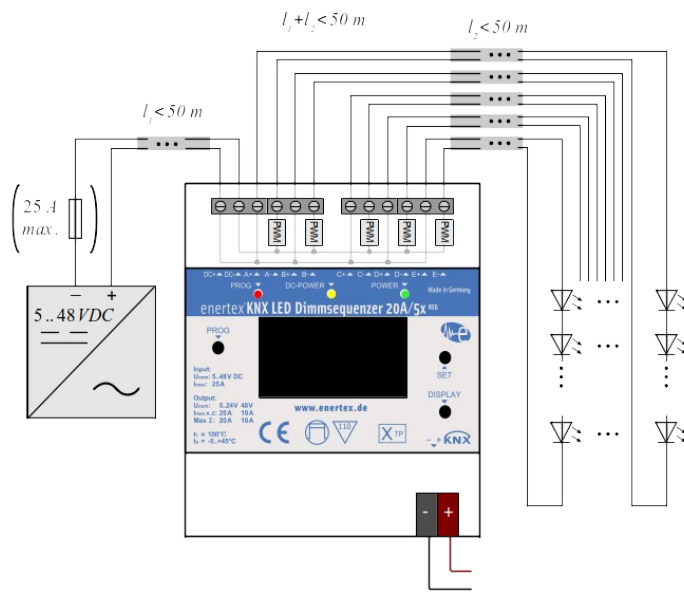


- switch-on-current often a few times higher than continuous current
- optimized over-current-protection allows switch-on-impulse-currents up to 100 A

Enertex® KNX LED Dimmsequenzer 20A/5x REG or DK commissioning

Commissioning made easy

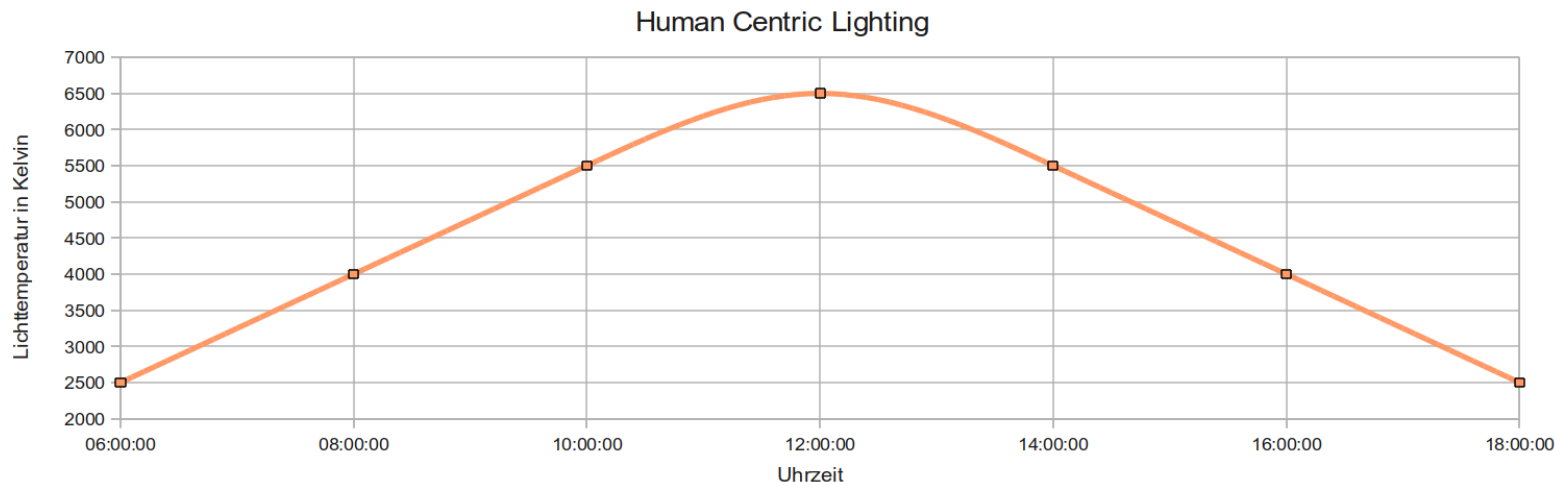
- one + and – connector for each channel → no external connectors required
- test of the whole installation (power supply, dimmer, lighting) without a PC only by the use of the display and buttons
- „1-click-commissioning“ with report



Energetext® KNX LED Dimmsequenzer 20A/5x REG or DK Human Centric Lighting

Human Centric Lighting

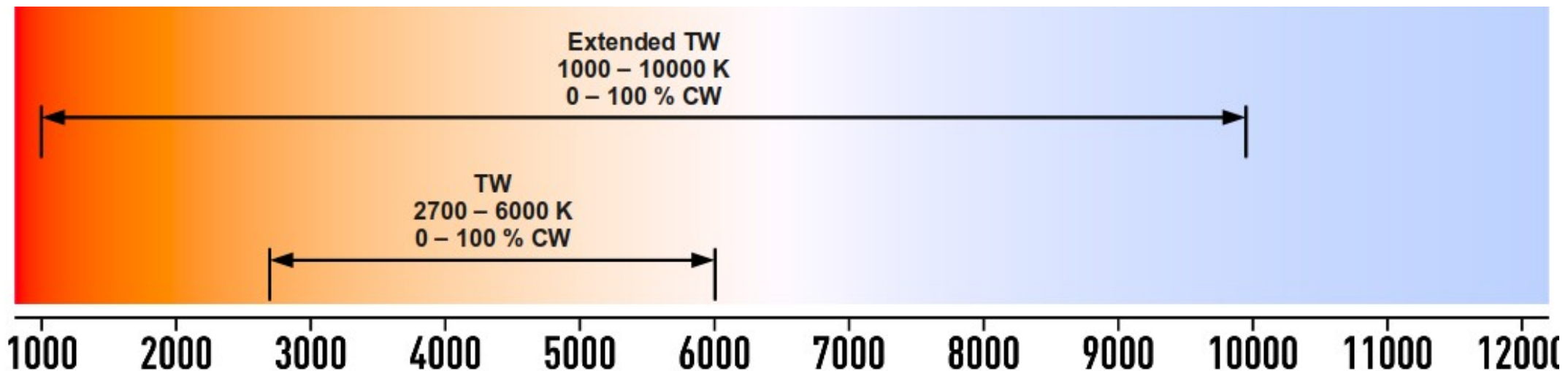
- daytime based tunable white brightness and colour temperature
- use of abs. times oder relative to sunset/sunrise
- use preset or customize by yourself
- time-based dimming also available for RGB or single channel operating modes



Enertex® KNX LED Dimmsequenzer 20A/5x REG or DK RGBCCT

RGBCCT: Use of 5-channel lightings

- Extended TW
- Extended RGB



Enertex® KNX LED Dimmsequenzer

20A/5x REG or DK

safety

Available via KNX objects and integrated display

- reverse polarity protection
- overcurrent protection per channel and total
- over- and undervoltage protection
- overheating protection

In case of fault, the output will be switched off (self-healing)

Additional protection functionality for power supply and lighting

- by parameterization of continuous power and overload capabilities the dimmsequencer can also switch off the output(s) to protect the power supply and / or lighting(s)

Despite many features, very good overview due to ETS5 features as table layout

Leuchtmittelschutz

Hinweis: Da einige LED Streifen nicht mit maximalem Summenstrom betrieben werden können, können hier Alarm- und Schutzfunktionen parametrisiert werden.

i Da die Leistungsmessung im Dimmer erfolgt, müssen im Menü "Messungen und Zähler" zwingend die Angaben zur Leitung gemacht werden, um die Leistung am Leuchtmittel berechnen zu können.

i Wird eine Überlastfähigkeit > 0 % parametrisiert und eine Maximaldauer Überlast 0 s, bedeutet das, die LED kann dauerhaft überbelastet werden. Ist das nicht der Fall, bitte Maximaldauer parametrisieren.

	Dauerleistung		Überlastfähigkeit		Maximaldauer Überlast
Kanal A	20	W	0	%	0 s
Kanal B	20	W	0	%	0 s
Kanal C	20	W	0	%	0 s
Kanal D	20	W	0	%	0 s
Kanal E	60	W	50	%	20 s

Schutzabschaltung aktivieren

Beim Überschreiten der Maximalleistung oder des I²t Werts

LED PowerSupply 160

LED power supply with 160W

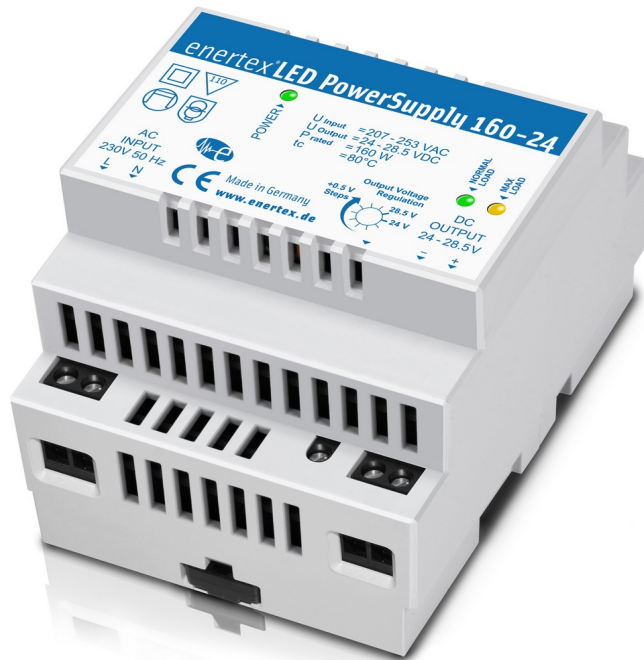


A lot of power

- DIN rail mount (dimension: 4 SU)
- voltage input: 230 V AC (50 Hz)
- voltage output: 24 – 28.5 V DC (adjustable in 0.5 V steps)
- max. DC power: 160 W
- maximum efficiency: 94.5%; meets “80Plus Platinum” in all load conditions
- standby power consumption: typ. 0.1 W

LED PowerSupply 160

LED power supply with 160W

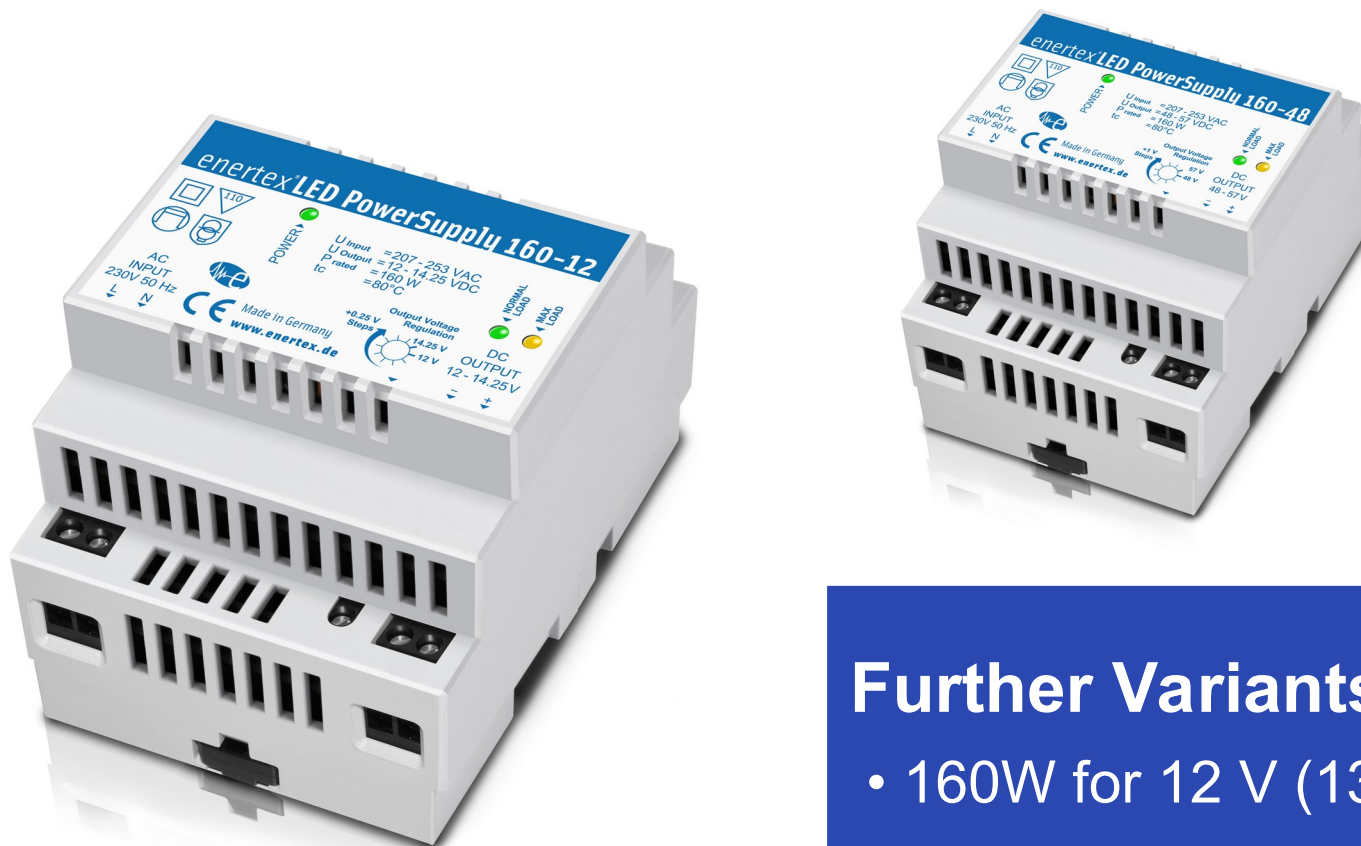


and even more...

- parallel operation with automatic load balancing
- LEDs: power, partial load, full load
- Protection functions: Short-circuit protection, overload protection and overtemperature protection
- Active PFC function
- fulfills all requirements according to IEC 61347-1 and 61347-2-13

LED PowerSupply 160

- additional variants for 12 and 48V



Further Variants:

- 160W for 12 V (13.3 A)
- 160W for 48 V (3.3 A)

Energetext® ENA²

Der optimale Schutz für
Ihre KNX-Installation und
Ihr Netzwerk.

*The perfect protection of
your KNX installation and
your LAN.*




CLOUDFREE

Enertex® ENA²

Remote access and network protection with IPv4/IPv6



- DIN rail, 4 SU
- bus powered
- low power consumption: typ. 1.8 W
- End-to-end encryption of remote access
- (Un)lock VPN with KNX group objects
- free and optional DDNS and relay service
- OpenVPN on demand on iOS

Two modes of operation



Switch-mode

- normal client to your LAN
- ethernet ports work as switch
- remote access, DDNS

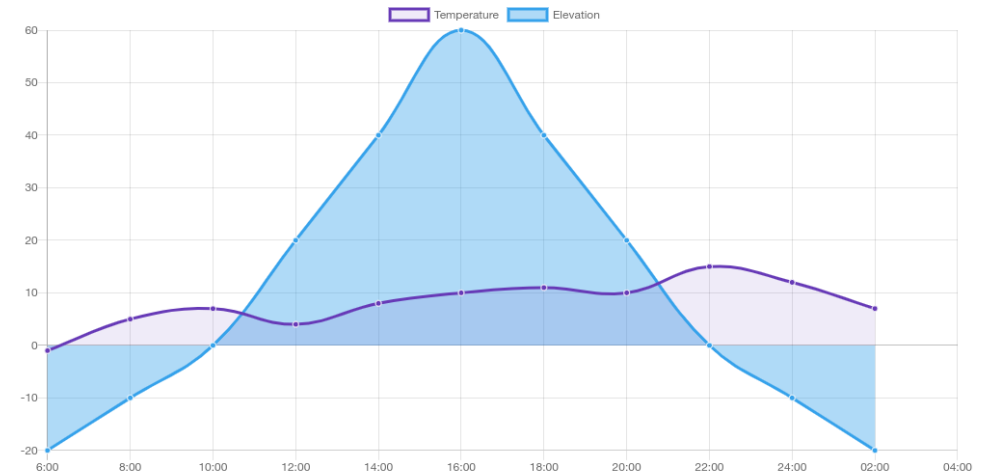
„Protected-network“ mode

- two separate ethernet ports
- normal client to your LAN
- remote access, DDNS
- manage a private network for critical network devices (KNX IP secure router, KNX IP secure interface, EibPC², ...)
- easy to configure firewall to control access in and out

Telegram logger

- logs all your KNX bus traffic into internal database
- Database is stored in flash (up to ~7 GiB of telegrams)
- minimal configuration – import your ETS project and „go“
- on-device telegram analysis with predefined filters and graphical visualization of recorded values

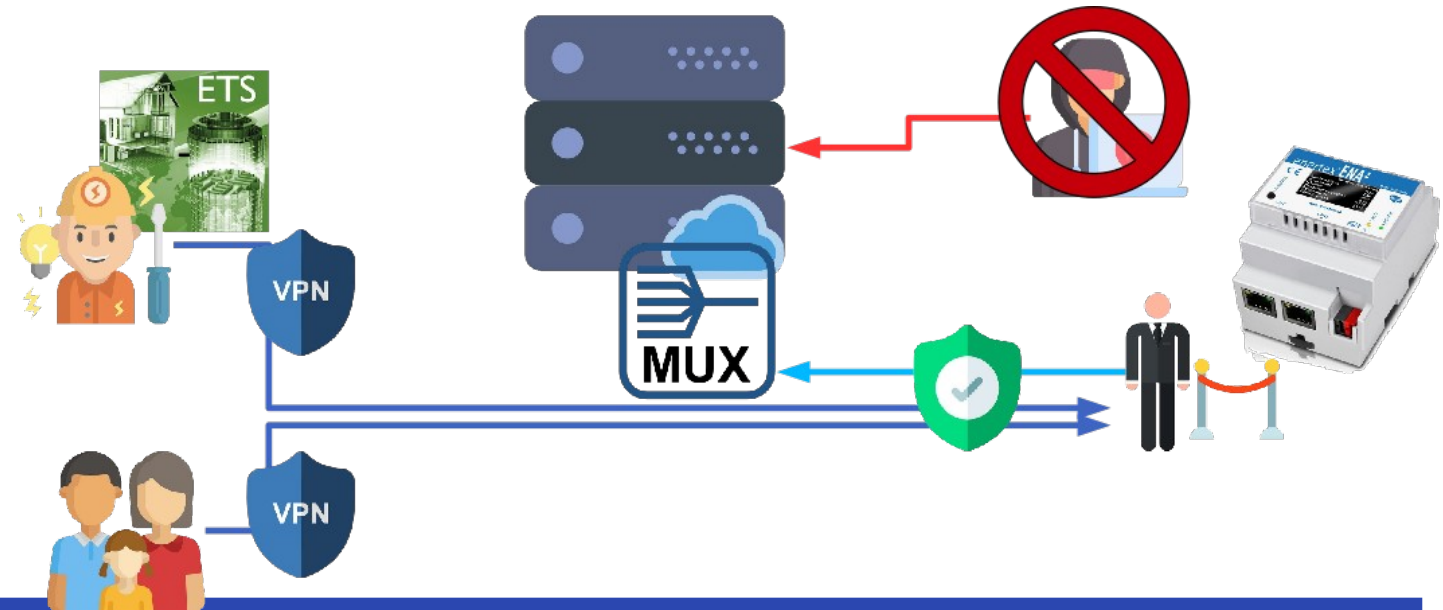
Chart



Telegram log

Date	Source Individual Address	Group Address	Data type	Decoded value	Raw data
23.02.2021, 15:40:00	0.1.255	0.1.104	DPT9.001	1131567907	0x008043725b230000
23.02.2021, 15:40:01	4.13.1	1.4.108	DPT9.001	0.0	0x0080202020202020
23.02.2021, 15:40:11	4.13.1	1.4.108	DPT9.001	0.0	0x0080202020202020
23.02.2021, 15:40:13	0.14.2	0.5.11	DPT9.001	23.6399993896480x00800c9e00000000	
23.02.2021, 15:40:15	3.4.1	12.4.14	DPT9.001	18.7000007629390x0080074e00000000	

Relay server



- no port forwarding and local router configuration required
- avoid problems with IPv4, IPv6, DS-Lite
- ENA² and VPN client both connect to relay server and send encrypted data
- Server forwards encrypted data
- data can only be decrypted by ENA² and VPN client
- End-to-End – E2E encryption
- optional

Energetex DDNS Service

my-customer.ddns.energetex.de

192.168.178.15



- easy to configure and change in device configuration
- device keeps your domain name automatically up-to-date
- no additional costs, no registration process, no time limits
- IPv4, IPv6 optional

Enertex® ENA² OpenVPN on demand



Only the App needs to be opened (e.g. Gira App, JUNG App, Mobotix App, ...) – “openVPN” connection opens immediately in the background, which greatly **simplifies** the use of apps in everyday use.

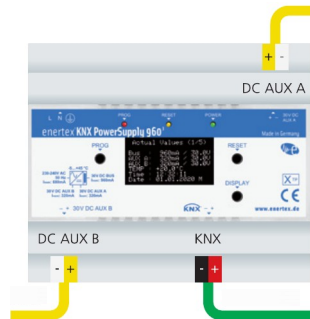
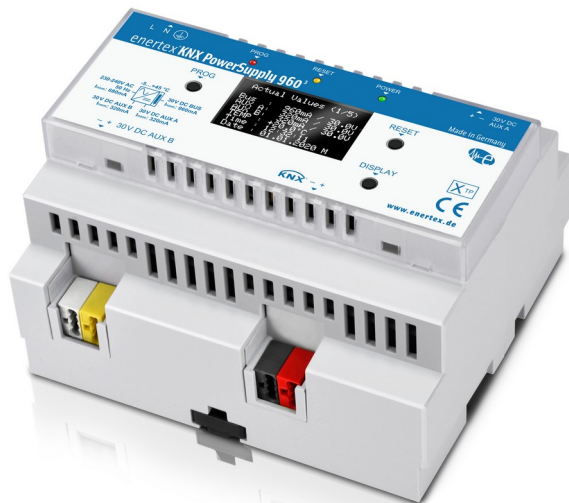
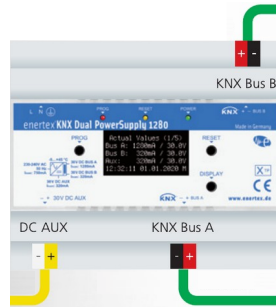
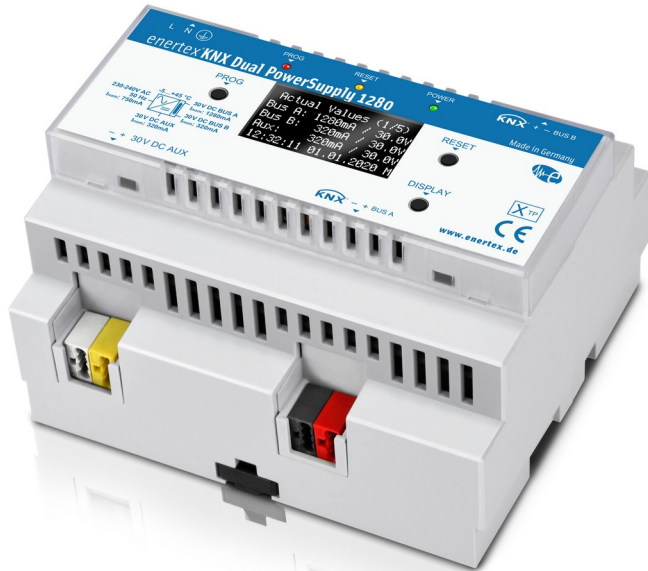
Enertex® ENA²

KNX remote maintenance made easy



Via the integrated KNX bus connection the user can grant and supervise remote access.

KNX PowerSupply 960³ and KNX Dual PowerSupply 1280



A lot of power

- Three outputs, each with separate overcurrent protection
- PowerSupply 1280:
 - Bus A: 1280 mA (choked)
 - Bus B: 320 mA (choked)
 - AUX: 320 mA (unchoked)
- PowerSupply 960³ :
 - Bus A: 960 mA (choked)
 - AUX A: 320 mA (unchoked)
 - AUX B: 320 mA (unchoked)
- Size: 6 SU

KNX PowerSupply 960³ and KNX Dual PowerSupply 1280



Integrated bus coupler:

- Measuring and diagnostic functions
- OLED-Display shows important Information:
 - current U, I at each output
 - max. current at each output
 - telegram rate, phys. address, software version, serial no., ...
- KNX Data Secure communication
- Separate remote reset function for both KNX lines
- Energy meter for KNX buses

KNX PowerSupply 960³ and KNX Dual PowerSupply 1280

1.1.1 Enertex KNX Power Supply > Schaltuhr 1 > 1: Morgens

+ Allgemein	Bezeichnung für die Schaltzeit	Morgens
+ Zeit	Bezeichnung für Schaltzeit Stunde ändern-KIO	
+ Messwerte	Bezeichnung für Schaltzeit Minute ändern-KIO	
+ Extremwerte	Schaltzeitpunkt	Uhrzeit
+ Energiewerte	Stunde	6
+ Feiertage	Minute	30
+ Zeiträume	Sekunde	0
- Schaltuhren	Auswahl zu sendender Telegramme zum Schaltzeitpunkt	
Schaltuhren festlegen	Folgende vorkonfigurierte Telegramme werden zum Schaltzeitpunkt gesendet	1 & 3
Astrofunktion	Hier kann gewählt werden, welche der vier Telegramme zum Schaltzeitpunkt gesendet werden. Unter "Schaltuhr - Konfig" können die 4 möglichen Telegramme mit Datentyp und Wert definiert werden.	
- Schaltuhr 1		
SchaltuhrArbeitsTag		
1: Morgens		

timer application

- integrated KNX clock, buffered against power failure (power reserve 36 h)
- 64 switching times
- extensive logic functions
- holiday calendar
- astro function
- integrated easter calculation
- timer can trigger telegrams for: switching, dimming, blinds, scene, colour RGB, heating controller's operating mode

Enertex® KNX IP Secure Router



KNX IP Secure Router

- dimension: 2 SU
- authenticates and encrypts KNX and IP telegrams
- up to eight tunnel connections
- up to 49 telegrams per second
- can be used encrypted or unencrypted
- suitable as a line or area couple
- buffered real-time clock and SNTP server
- OLED display
- telnet interface for diagnostics and configuration
- bus powered

Enertex® KNX IP Secure Interface



KNX IP Secure Interface

- dimension: 2 SU
- authenticates and encrypts KNX and IP telegrams
- up to eight tunnel connections
- up to 49 telegrams per second
- can be used encrypted or unencrypted
- buffered real-time clock and SNTP server
- OLED display
- telnet interface for diagnostics and configuration
- bus powered

Enertex® KNX TP Secure Coupler



KNX TP Secure Coupler

- dimension: 2 SU
- authenticates and encrypts KNX TP telegrams
- can be used encrypted or unencrypted
- area/line coupler
- up to 49 telegrams per second
- switchable telegramrate limitation
- max. telegram length up to 248 bytes
- up to 64 group address filters
- topology error detection
- temporary filter deactivation
- OLED display
- bus powered

SynOhr® MultiSense KNX



enertex **SynOhr® MultiSense KNX™**

Der weltweit erste KNX Touch-Raumkontroller
mit integrierter Spracherkennung und Bus-Speisung*



SynOhr® MultiSense KNX



KNX room controller with built in voice recognition

- built-in voice recognition
- low power consumption
80..450 mW (160..900 mW) from KNX bus
- humidity measurement
- temperature measurement
- RGB-light intensity measurement
- built-in speaker (to play wav-sounds)
- SD card
- RGB light ring
- LCD with dot matrix
- certified KNX device / ETS parameterized

ETS Application

Gerät: 0.1.101 SynOhr MultiSense KNX

Allgemein

Sollwert

Stellgröße

Temperatursensor

Feuchtigkeitssensor

Lichtsensor

Sprachkommandos

Taster

Anzeige

Lizenz

Temperaturregler

Heizen / Kühlen

Typ des Heizreglers

Parameter des Heizreglers

Modus nach Reset oder Download

Betriebsmodus vorgeben über

Tür- oder Fensterkontakt verwenden

Anwesenheitsmelder verwenden

Premium

Ein

Heizen

PI-Regler mit stetiger Stellgröße

Warmwasserheizung (5 K / 150 min)

Standby

Byte-Objekt

Ja

Nein

Vommands

Allgemein	Master / Slave	Master
Sollwert		
Stellgröße	Sprachkommando 1	Schalten
Temperatursensor	Aktion	Umschalten
Feuchtigkeitssensor	Kommentar	DECKE LICHT
Lichtsensord	Sprachkommando 2	SynOhr-Wert
Sprachkommandos	Kommentar	DIMMER PROZENT
Taster	Sprachkommando 3	Szene
Anzeige	Aktion	Aktivieren
	Szenennummer	2
	Kommentar	SZENE FERNSEHER

„Slots“ for detection:

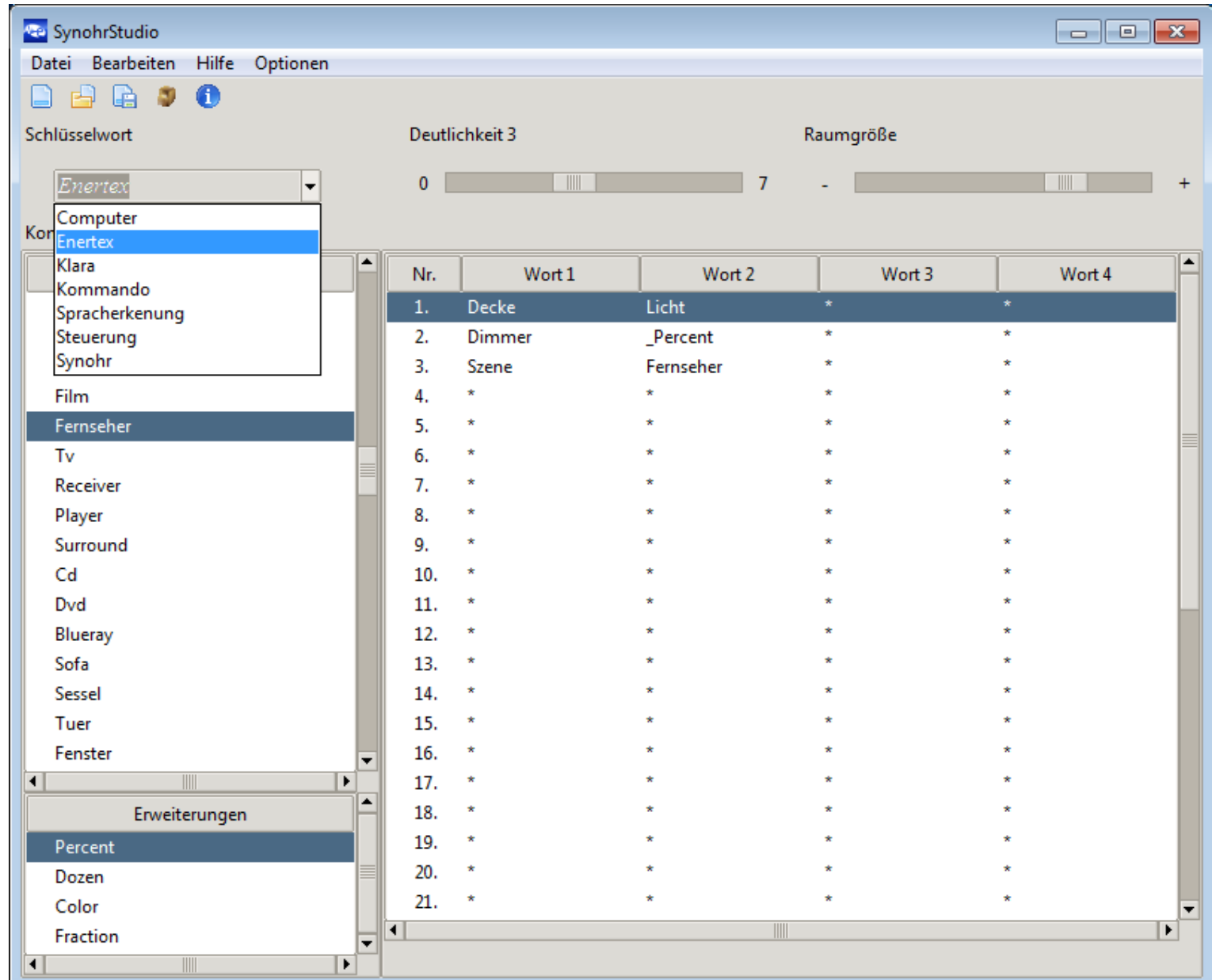
- KNX telegrams switching, dimming, values, scenes ...
- linking the language in SynOhrStudio

SynOhrStudio

keyword

vocabulary

„wildcards“



SynOhr® MultiSense KNX



Starter: 368 € LP, PG1
Standard: 478 € LP, PG2
Premium: 537 € LP, PG2

Complete, with bus coupler, cover etc.

"Standalone" - "only" bus connection, no ext. power

"High quality" housing made of full aluminum

Made in Germany

SynOhr® MultiSense KNX Design variants



White powder-coated
(RAL9010)



black anodized



brushed aluminum

In premium version without extra costs - **Made in Germany**

Enertex® MeTa® KNX Der multilevel Raumcontroller

Enertex® MeTa® KNX – the multilevel room controller



Enertex® MeTa Raumcontroller Premium



Enertex® META Raumcontroller Starter / Standard



Enertex® MeTa® KNX Premium

MeTa Premium

- sensors for temperature, humidity, light intensity (RGBW)
- room controller
- 32-way buttons / 16 rockers
- dynamically labelable by ETS or GA
- produced from solid aluminium (black anodized / white powder coated / brushed aluminum)
- external switching contact (input)
- 4x (dynamic) inscribable rockers in four levels plus menu button
- intuitive operation

LP 477 € PG2



Warum MeTa?



**MeTa =
menu button**

switching through
the menu levels

Enertex® MeTa® KNX

Variante	
Regler	
Sollwert	
Stellgröße	
Sensoren	
Temperatursensor	
Feuchtigkeitssensor	
Lichtsensor	

Wippen

Anzeigemodus
☒ Ohne Statusanzeige (A1, A2)
☐ Mit Statusanzeige (A1, A2)

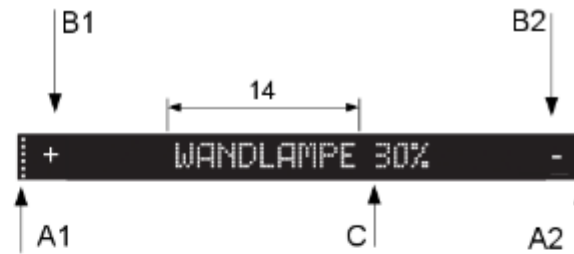
Aktivierung Wippenbeschriftung
 EIN mit Zeitkonstante

Automatisch abschalten
 Alles ausblenden

Bei beliebigem Tastendruck aktivieren
☐ Nein ☒ Ja

Anzeigen bei Deaktivierung dunkler dimmen (%)
 25

Aktivierungszeit
 10 s



rocker displays

- + intuitive operation with feedback, operator displays and labeling
- + automatic brightness control
- + automatic dimming function

Enertex® META room controller

Starter / Standard



MeTa Standard/Starter

- sensors for temperature (only standard), humidity (only standard), light intensity
- room controller application
- 16-way buttons / 8 rockers
- dynamically labelable by ETS or GA
- produced from solid aluminium (black anodized / white powder coated / brushed aluminum)
- external switching contact (input)
- 2x (dynamic) inscribable rockers in four levels plus menu button
- intuitive operation

Standard LP 309 € PG2, Starter LP 276 PG1

Enertex® META

	Starter	Standard	Premium
Roomcontroller Heating and Cooling	-	yes	yes
Measurement Temperature and humidity	-	yes	yes
Measurement of light intensity and light color	yes	yes	yes
Rocker/Switch, one Menuswitch	2/4	2/4	4/8
Number of rockers/switches	8/16	8/16	16/32
Display-Label for each rocker	yes	yes	yes
LCD Display with symbols and dotmatrix for roomcontroller etc.	-	-	yes
Auto scroll with max. 28 character at dotmatrix	-	-	yes
Dotmatrix with graphical support	-	-	yes
External switch	yes	yes	yes
Bus powered	yes	yes	yes
Length/Width (mm)	90/90	90/90	180/90
Height (mm)	8,6	8,6	8,6

Enertex® META room controller

- Our product family



Enertex® AluRa



Aluminium frame: Alu / SW / WS
Single
Double
Triple

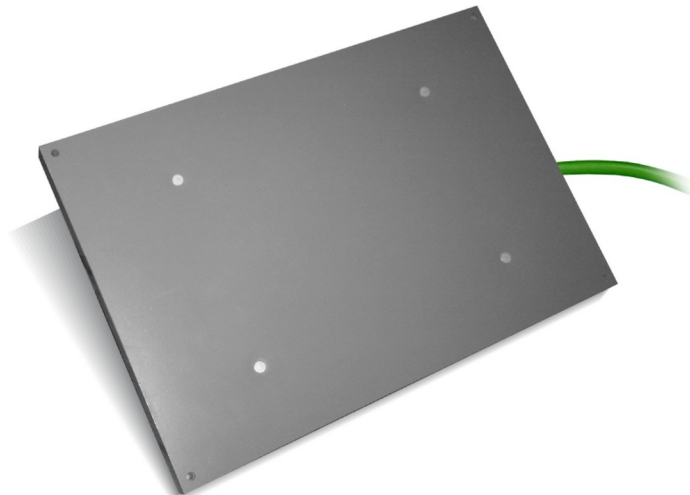
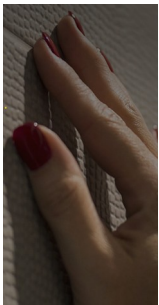
Enertex® ProxyTouch KNX Der «unsichtbare» Berührungssensor

Die unauffälligste Art
Ihre KNX Hausinstallation
zu bedienen.

*The most unremarkable
way to control your KNX
home installation.*

enertex ProxyTouch KNX

Energetex® ProxyTouch KNX



swipe and/or button

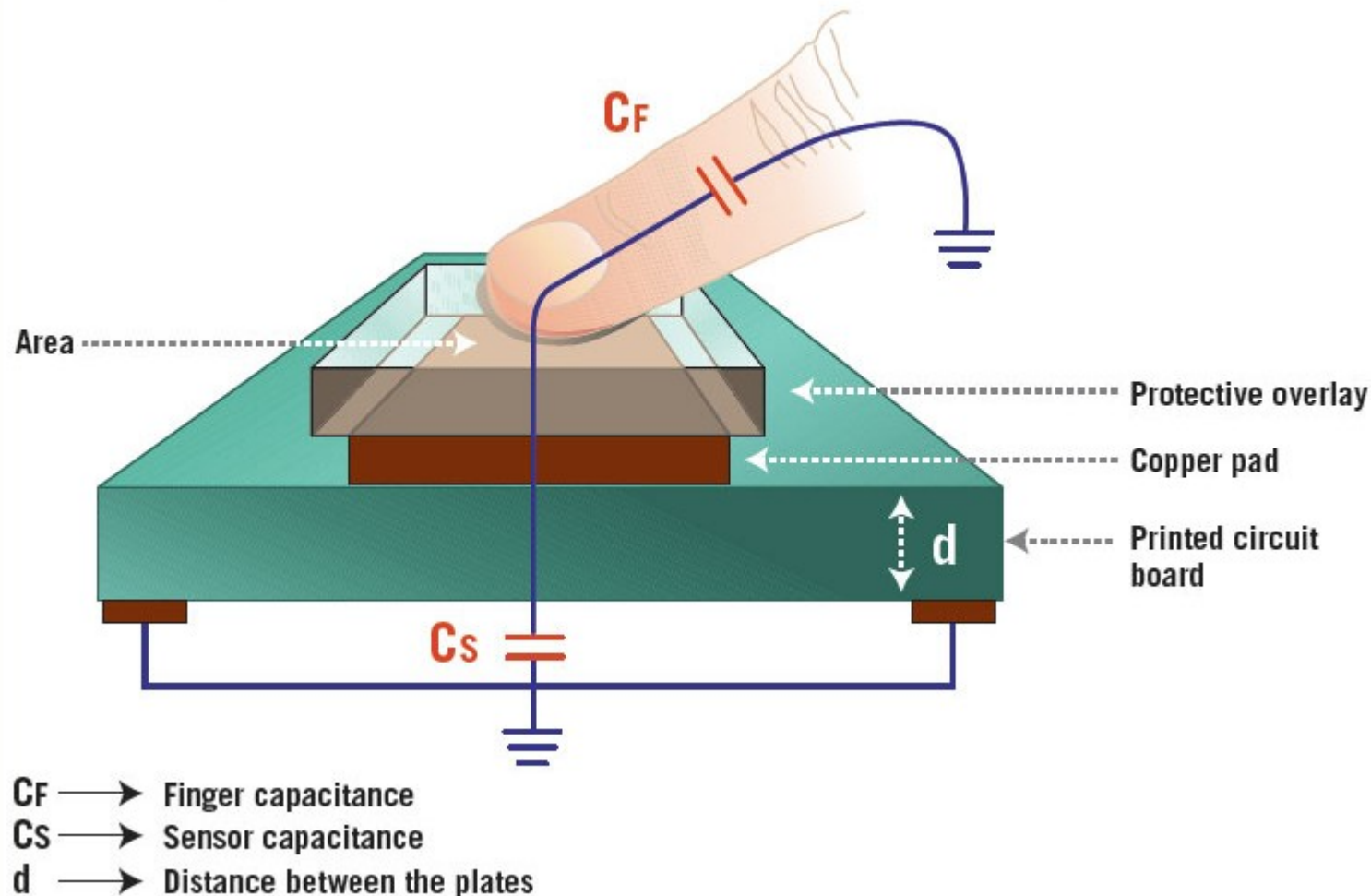
software

- single-click, double-click, swipe
- blocking object for cleaning with sound information on actuation
- Feedback objects (buzzer) for each operation
- splash-proof IP54
- 210x140x12mm
- bus powered
- 25 mm max. reach
- 238 € LP, PG2

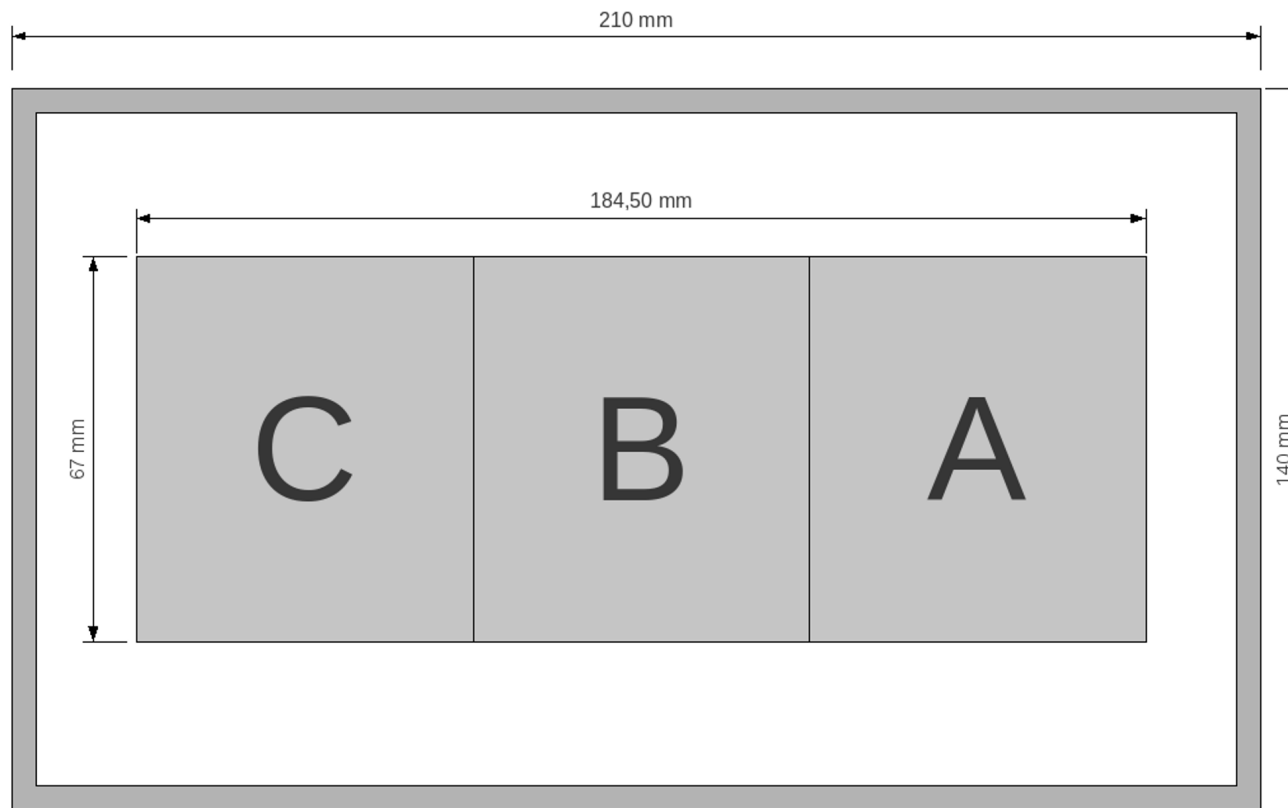
Enertex® ProxyTouch KNX

"Switch" under tile, glass, wood ...

The principles of capacitive touch sensing.



Enertex® ProxyTouch KNX fields and operation



Hardware

- bus powered
- prog-mode by magnet

Handling

- 1-click and double click as total field
- 1-click and double click as 3 single fields
- max. configuration: 2x swipe, 1x one-click and 3x double click
- glass, wood, tile

surfaces

surfaces

	Standard	PE connected
wood:	14mm	20 mm
glass:	10mm	25 mm
tile:	10mm	25 mm

Surroundings

Humidity (wet fingers, water on the surface) is not a problem.

Direct water jet should be avoided (false-triggers possible).

Housing is splash-proof.

Device

Bus powered (no problems with electrical safety)

Programming via magnetic button

Suitable adhesive (tile, glass) and screws (wood) are included

1m cable supply