ELECTREX
the energy saving technology

Engineered and manufactured in Italy
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Pensato, progettato e prodotto in Italia

LOW ENERGY CONSUMPTION
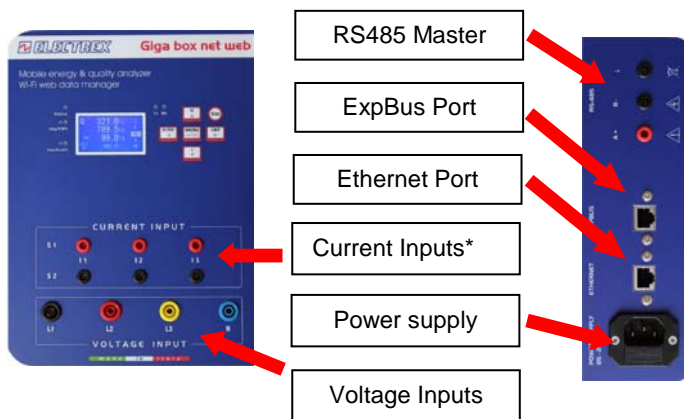
Giga PQ Box net Web Charts
Giga F PQ Box net Web Charts

► High Performance (accuracy class 0,5S)

► Measurements up to the 51st harmonic

► Flexibility (open platform)

► Reliability (high quality of components)

► Connectivity (Ethernet, RS485, ExpBus, NFC)

Power Quality Energy Analyzer & Web Data Manager

Giga PQ Box net Web (current inputs for CTs and Current Clamps ../1A or ../5A) and **Giga F PQ Box net Web** (current inputs for Electrex Flexible CTs output in mV) are transportable Power Quality Energy Analyzer & Web Data Manager for temporary monitoring of electric energy (quantity and quality) with the possibility, by adding other external Electrex devices (via RS485 master and ExpBus ports), to monitor in a synchronous way (same reference clock) also other energy parameters (such as gas, water, steam, etc.), environmental parameters (temperature, humidity, luminosity, CO2, etc.) and process parameters.
Designed for those who want to make a brief analysis of the energy situation in the industrial, commercial, civil sectors (for both consumption and production). Among the main features and functions: measurement of electrical parameters, storing data of load curves / consumption / production of electricity, storing events as max and min values, dips, swells, peaks, interruptions with also trigger functionality (showing the detail of the event) and their classification according to the Unipede table, the possibility of realizing measurement campaigns with programmable parameters (e.g. harmonics) and sampling time.
In the transportable kit is also included the software Energy Brain 4 PH PostgreSQL which, in addition to the functionalities, already pre-activated, of the internal web server (Log 8 + Log 8 + Log 8, Web, Charts and two Open Log), simplifies both operations of configuration / data download and those of analysis of real-time measurements and historical trends (graphs and tables).
The connection to the PC can be done either locally via the Ethernet cable, and remotely via the Internet (option UPS Router Giga Box).

| RS485 Master |
| ExpBus Port |
| Ethernet Port |
| Current Inputs* |
| Power supply |
| Voltage Inputs |

Communication ports: RJ45, RS485 master, ExpBus, NFC.

* Current Inputs: Attention
With the **Giga PQ Box net Web** must be used the **CT, Split CT and Clamps with secondary ../1A or .../5A** (not included) while with the **Giga F PQ Box net Web** must be used **only the Electrex Flexible CT series FCTS with a mV output** (not included).

The case contains, in addition to the portable instrument and software Energy Brain 4 PH PostgreSQL, also the power supply wire, the wires for the voltage and current connections, the jumper for the Aron insertion, an RS485 wire and an Ethernet wire.

General characteristics

The transportable instruments are based on the potentialities of the microprocessor Cortex-M4 Dual Core that allows the simultaneous management of measures and the user interface. This allows to achieve the high accuracy class 0.5S for active energy according to EN 62053-22 and the measurement of the single harmonics up to the 51st continuously sampling the waveforms of voltages and currents with a 'high resolution, thus ensuring the maximum accuracy even in the presence of rapidly changing loads (e.g. spot welding).

The devices are equipped with a 128 MB high capacity memory for implementing, through PUK codes, various features. Its architecture allows the firmware upload & update even remotely.

The quality of the energy is obtained by referring also to the parameters of the EN 50160 normative (peaks, swells, interruptions), for algorithms specified for class S of EN 61000-4-30 and relative functions of classification and detail of the event (series of values in the programmable window up to a second, referring to before and after the event duration period) in addition to the measurement campaigns with selectable parameters and programmable sampling frequency (e.g. the three voltages and three phase currents in true RMS and the 1st, 3rd, 5th, 7th and 9th harmonic).
   - Web Server (HTTP communication) and FTP Server
   - Communication also towards other Electrex devices via the master RS485 port and via the ExpBus port.
   - Dimensions rigid case (LxHxW): 335 x 145 x 300 mm.
   - Weight: 3.9 kg (rigid case including cables).

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Simplicity

Equipped with a FSTN dot matrix display with high contrast, back-lighted, white LEDs allowing the simultaneous displaying of 4 measurements and of their identification symbol with high visibility characters.

The 6 keys keypad Joystick positioned and menu list type on the display for configuration provide a simple and rational use of the instrument, while the default page displayed when powering on is user definable.
On the front panel 2 calibration and control LEDs pulse with a frequency proportional to the imported Active and Reactive Energy for the on-field calibration with optical devices. A red LED pulsing indicates the functioning state while 2 additional LEDs report instead the activity on the RS485 port. In order to reduce the energy consumption it is possible to configure the display's back-lighting, the state LED and the ones related to the RS485 port.

Versatility

Both versions of the Giga Box are suitable for virtually all type of electrical grid systems, single phase, bi-phase, three phase 3- and 4-wire, symmetrical and asymmetrical, balanced or unbalanced, Aron (only for Giga PQ Box) LV/MV, with 1, 2 or 3 CTs as well as for 2 and 4 quadrant (import/export) measurement. A simple configuration from the keyboard (or via our Energy Brain software) allows to configure all the operating parameters like network type, CT and VT (if present) ratio, integration time (1-60m) and alarms (threshold, delay, hysteresis) and other configuration parameters.

Phase sequence

Both versions of the Giga Box permit the identification of the correct phase sequence (vector diagram).

Ethernet and/or serial via RS485 communication

Both versions of the Giga Box are equipped with an **Ethernet port** for "HTTP and Modbus-TCP" communication.
The presence of **NFC** (Near Field Communication) opens the possibility for the creation of specific APPs for mobile devices on the energy management.

Harmonics

Both versions of the Giga Box can show on their display also the single harmonics up to the 51-st order for the 3 voltages and currents per each phase. FFT method calculation of the harmonics, for amplitude and phase.

Firmware

The **Giga Box** allow remote updates of the firmware in order to add new functionalities or replace the existing one.

Measures

Parameters	Type		L1	L2	L3	n	Σ	P	Range
Voltage	U_{L-N}		•	•	•		•		20,0V...400 kV
	U_{L-L}		•	•	•		•		
	$U_{L-N\ MAX}$	(1)	•	•	•				
	$U_{L-L\ MAX}$	(1)	•	•	•				
	$U_{L-N\ MIN}$	(1)	•	•	•				
	$U_{L-L\ MIN}$	(1)	•	•	•				
Current	I		•	•	•	•		•	20 mA…10,0 kA Electrex Flexible CT (3): 1A … (5A - 500A) 4A … (20A - 2000A) 16A … (80A – 8000A)
	I_{MAX}	(1)	•	•	•				
	$I_{AVG\ THERM}$	(2)	•	•	•				
	$I_{MD\ THERM}$	(2)	•	•	•				
Power Factor	PF		•	•	•		•		0,00ind..1,00..0,00cap
Frequency	f		•						45 … 65 Hz
Harmonic Distortion	THD-U_{L-N}		•	•	•		•		0…199,9%
	THD-U_{L-L}		•	•	•		•		
	THD-I		•	•	•		•		
Active Power	P		•	•	•		•		± 0,00…1999 MW
	P_{AVG}	(4)					•		
	P_{MD}	(4)					•		
	P_{MAX}	(1)	•	•	•		•		
Reactive Power	Q_{IND}		•	•	•		•		± 0,00…1999 Mvar
	Q_{CAP}		•	•	•		•		
	$Q_{AVG\ IND}$	(4)					•		
	$Q_{AVG\ CAP}$	(4)					•		
	$Q_{MD\ IND}$	(4)					•		
	$Q_{MD\ CAP}$	(4)					•		
Apparent Power	S		•	•	•		•		± 0,00…1999 MVA
	S_{AVG}	(4)					•		
	S_{MD}	(4)					•		
Life Time	h, h/100						•	•	0,01…99.999,99 hours
Active Energy	$E_{a\ IMP}$	(5)	•	•	•		•	•	0,1 kWh…99.999,9 MWh
	$E_{a\ EXP}$	(5)	•	•	•		•	•	
Reactive Energy	$E_{r\ IND\ IMP}$	(5)	•	•	•		•	•	0,1 kvarh…99.999,9 Mvarh
	$E_{r\ CAP\ IMP}$	(5)	•	•	•		•	•	
	$E_{r\ IND\ EXP}$	(5)	•	•	•		•	•	
	$E_{r\ CAP\ EXP}$	(5)	•	•	•		•	•	
Apparent Energy	$E_{s\ IMP}$	(5)	•	•	•		•	•	0,1kVAh…99.999,9 MVAh
	$E_{s\ EXP}$	(5)	•	•	•		•	•	

(1) Mean value over 10 cycles - example: 200ms at 50Hz.

(2) Mean value (rolling average) over the integration time (1.. 60 min. program.) and peak (MD).

(3) With Flexible Electrex CT, accuracy Class 1, within the current ranges denoted above with brackets.

(4) Average value (moving average) in both import and export over the integration time (1..60 min programmable) and peak (MD) that is the maximum average value.

(5) Import/Export energies displayed as 9 digits in floating-point readings; internal energy counters are logged with a 64 bit resolution which assures a minimum definition of 0,1 Wh and a max count of 100 GWh

Harmonics (EN 61000-4-30)

Parameters		L1	L2	L3	Σ	Management
Harmonics analysis (6)	H Voltage	•	•	•		Value (H01), % (H02-H51)
	H Current	•	•	•		Value (H01), % (H02-H51)

(6) FFT method calculation of the harmonics, amplitude and phase, up to the 51-st for the 3 voltages and currents per each phase (accumulated in 10 periods).

Events/Classification (EN 61000-4-30) Campaigns

Parameters (7) (8)(9)	L1	L2	L3	Σ	Management
Dips and peaks.	•	•	•		Events logged in the internal memory with time-stamp
Overvoltage and overcurrent	•	•	•		
Sags and interruptions	•	•	•		
Max and Min values	•	•	•		

(7) Event logging with date and time, duration, max/min value. Programmable thresholds.

(8) Event's graphic detail: nr. of samples (programmable e.g. 1 second) retrieved previously and after the event (dips, peaks and interruptions).

(9) Distribution table of the events based on the threshold exceeded and duration following UNIPEDE (http://www.eurelectric.org/) and Timeline of the events.

(10) Programmable measurement campaigns (choice of parameters and of the sampling time). See Memory Management section.

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Astronomical Clock Calendar

The **Giga Box** are equipped with a clock / calendar with astronomical real time management of the Coordinated Universal Time (UTC). It manages also the rules for the automatic switching from Standard Time at summer time (Daylight Saving Time) and vice versa. Automatic synchronization via NTP.

Tariffs TOU

Activating the Calendars and Energy Automation options and configuring the device in a proper way the **Kilo H** can manage energy tariffs based on a calendar or on the digital inputs state.
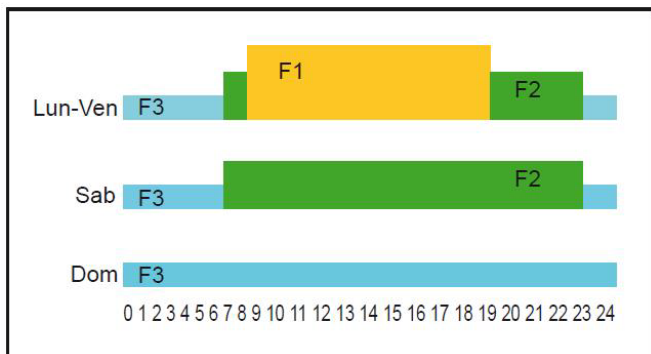
Example of a 3 Tariffs system

Expansions via ExpBus

It is possible to add via the ExpBus port other Electrex external devices with digital and analog inputs / outputs and for measuring environmental parameters.

The **ExpBus** port, configurable via the Ethernet port from Web pages, allows a multi-master (multicast) communication to 250kb/sec with collision management. The max lenght of the Bus is 10 meters and can be managed up to 16 nodes (modules) with specific Modbus address. The connecting cable is a UTP where 4 wires are used: 2 for the power supply and 2 for the bidirectional communication. The cable is connected in the in-out modality (multi-drop) as for the RS485 Bus and each module powers the ExpBus bus (for further details please visit our website www.electrex.it).

RS485 Modbus sub-network

It is possible to add to the Giga Box other external Electrex devices: Atto, Femto, Exa, Flash, X3M, Deca, Yocto I-O, Kilo D6 (for further details please visit our website www.electrex.it) for the monitoring and management of other parameters via the RS485 Modbus Master port (insulated and protected from over-voltages).

The protocol used is the Modbus-RTU "*full compliant*". The data are read as numerical registers composed by mantissa and exponent in the IEEE format. The communication speed of the RS485 port is configurable, up to 38.400 bps, with a max. 125 registers requested (equivalent to 62 parameters) with no waiting time between two requests, ensuring an insuperable communication speed.

Current inputs of Giga PQ Box net Web

The **Giga PQ Box net Web** is equipped with current inputs suitable with closed CT, Split CT and Clamps with secondary ../1A or .../5A.

Current inputs of Giga F PQ Box net Web

The **Giga F PQ Box net Web** is equipped with current inputs suitable exclusively with the Electrex Flexible CT series FCTS with a mV output and appropriate internal linearization to maximize measurement accuracy.

ATTENTION: do not connect to this current inputs CT with current output because both the Giga F PQ Box and the CT will be damaged.

The measurement full scale can be set at 500A, 2000A and 8000A. Class 1 accuracy (overall accuracy flexible CT + measuring instrument) between the full scale and a hundredth of the full scale. Minimum measurable current equal to one five-hundredth of the full scale.

FCTS 040-500 Flexible split CT, internal diameter 4 cm

FCTS 100-1000 Flexible split CT, internal diameter 10 cm

FCTS 200-2000 Flexible split CT, internal diameter 20 cm

FCTS 280-4000 Flexible split CT, internal diameter 28 cm

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Memory management via Ethernet port

The **Giga PQ Box** and **Giga F PQ Box** manage the 128 MB flash memory in a flexible way for the storing of the different log services and event logs. Each log service can contain a maximum of 255 files; the memory is also used for recording events (with the details of each event) and their classification according to the UNIPEDE table (EN 50160). In the same memory are hosted also the web pages for the configuration and display of measures (standard and customized).
The memory can be read from **Ethernet port or Wi-Fi** network using the Energy Brain software and / or the HTTP protocol.

The **Giga Box** instruments continuously log the data on the consumption/production of energy in daily files containing by default the 96 quarters of hour. The data logged can be displayed on the chart on a daily, weekly, monthly and yearly basis.
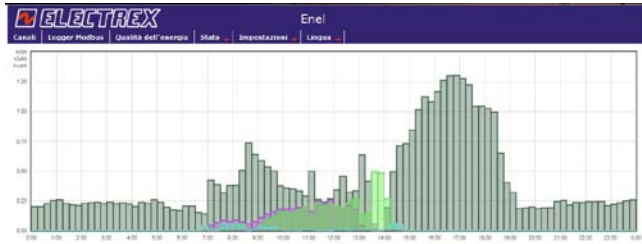
POWER QUALITY (Class S - EN 61000-4-30): Events Log

The **Giga Box** detect and log various events with a resolution of one cycle (with date / time * of each event, type of event, phase involved, duration, min / max value reached during the event and UNIPEDE classification) useful for monitoring the quality of energy (functions related also to the EN 50160 and EN 61000-4-30 standards for the S class). The parameters for defining abnormal events are programmable. Event types:

- **Voltage Dip**
- **Voltage Swell**
- **Over current and its direction**
- **Interruption**

Example:

(*) Date/hour expressed in hours, minutes, seconds and milliseconds referring to the instruments' (local time). In the table are displayed also some functioning logs as the ones related with the start and configuration settings.
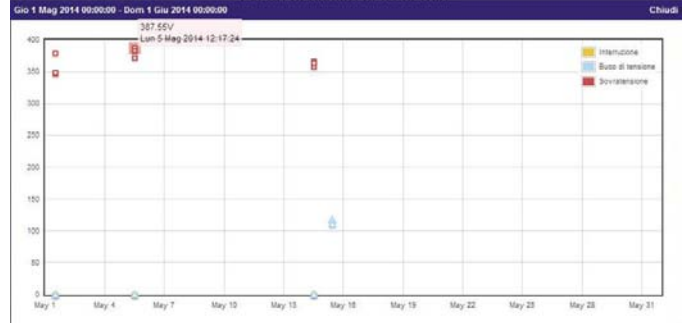
EVENT'S GRAPHIC DETAIL

The **Giga Box** include the functionality named "event's graphic detail" that allows to record and display the trends of the beginning and end of the event with a time frame (for both beginning and end) of a second (programmable).
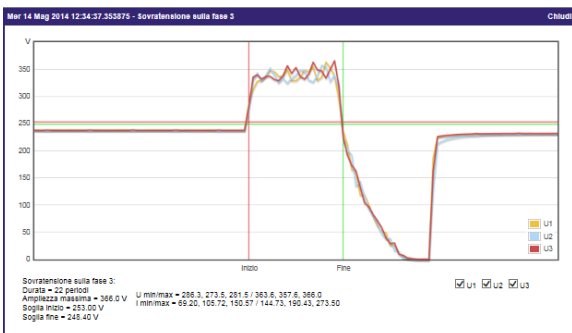
EVENTS TIMELINE AND THE UNIPEDE TABLE

The **Giga Box** can display a timeline of the succession of events

and maintain a diagram of distribution of events based on the % of the parameter considered in relation to its reference value and duration, according to the dictates of UNIPEDE (Int. Union of Producers and Distributors of Energy - http://www.eurelectric.org/).

Tabella UNIPEDE (classificazione per valore e durata)

Classificazione dei buchi di tensione

Tensione residua u [%]		Durata t [ms]				
		1 10 <= t <= 200	2 200 < t <= 500	3 500 < t <= 1000	4 1000 < t <= 5000	5 5000 < t <= 60000
A	90 > u >= 80	0	0	0	0	0
B	80 > u >= 70	0	0	0	0	0
C	70 > u >= 40	0	3	0	0	0
D	40 > u >= 5	0	0	0	0	0
X	5 > u	0	7	2	0	0

Classificazione delle sovraelevazioni di tensione

Sovraelevazione di tensione u [%]		Durata t [ms]		
		1 10 <= t <= 500	2 500 < t <= 5000	3 5000 < t <= 60000
S	u >= 120	9	0	0
T	120 > u > 110	0	0	0

MEASUREMENT CAMPAIGN

With the **Giga Box** it is possible to configure the measurement campaign in order to log, in the built-in memory, the various parameters with a programmable sampling rate, for example every 1 min. for 10 days (FIFO) in daily files.

Example of a daily measurement campaign of the 3 phase-voltages every 15 seconds:
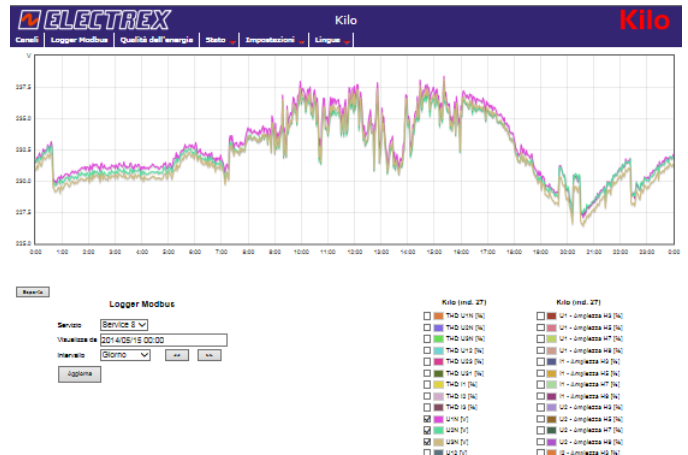
Main Web Functionalities

The Giga Box include also a Web Server allowing, via a web browser, its configuration and that of any other Electrex device connected. The communication for the management of the real time measurements and the logging fiels is made using the HTTP protocol. The instrument include also a: Server FTP for file transmission; acting as a bridge between the Ethernet network (Modbus-TCP protocol for the instantaneous measures) and the RS485 port; Arbiter function between the Ethernet port and the expansion bus ExpBus. The synchronization of the internal clock is made via NTP server. Static or dynamic IP address (DHCP protocol) available.

Already activated three upgrade Log 8 (PUK) - PFSU940-01

In the **Giga Box** have been already activated three upgrade Log 8 that can be used for three different logging (e.g. a daily logging service and two services for logging meas campaigns with different parameters and/or sampling frequency). Each logging service is characterized by a unique time base (sampling frequency).
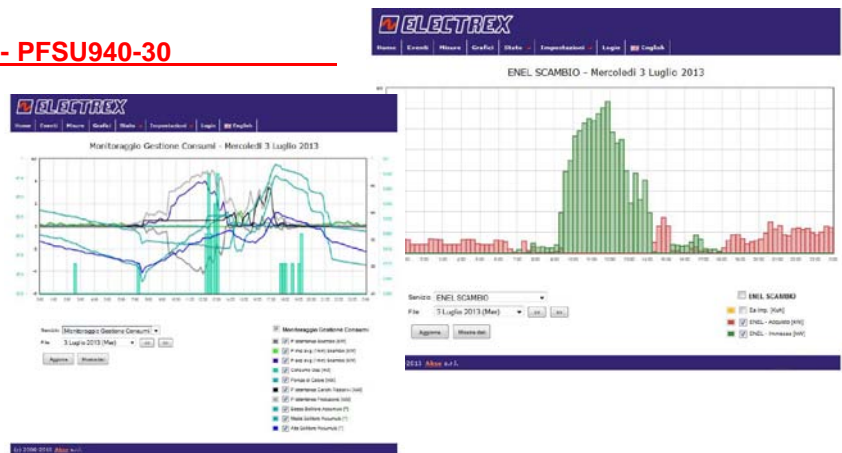
## Already activated upgrade WEB (PUK) - PFSU940-05

Enables the display of the measures on Web pages of the internal instrument and of each instrument connected to the RS485 port of the Giga Box. Beside are shown two examples of Web pages, one with instantaneous measurements and the other with the maximum and medium values of measurements as well as the total counters values.

Already activated upgrade Charts (PUK) - PFSU940-30

Allows to display on a Web page the graphs of the data stored in the logging services, such as electricity and other parameters logged by Electrex devices connected to the Giga Box as gas, water, temperature, humidity, luminosity, etc. The data can be exported in a CSV file format. Beside, examples of web charts:

Already activated two upgrade Open Log (PUK) - PFSU940-25
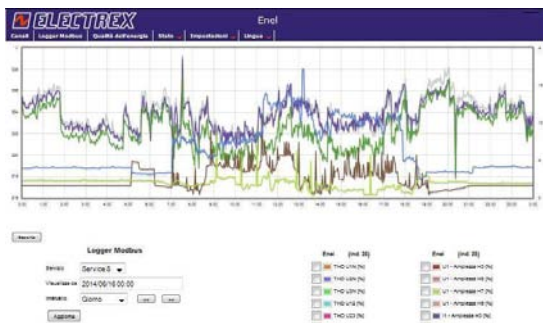
Each upgrade Open Log allows to modify 1 existing Log 8 logging service (2 upgrade Open Log allow to modify 2 existing Log 8, already active on the device). If it is needed to modify also the third Log 8 the user needs to purchase an additional PUK Open Log). A configurator indicates the available memory. The Open Log allows to perform measuring campaigns with any parameter acquired by the Giga Box and / or Electrex devices connected to it defining also the sampling frequency. Beside and example of measurement campaign:

Activation of additional functionalities via PUK code

It is possible to implement additional functionalities ordering the relative PUK code to be inserted via Web interface of the device (for further details visit our website www.electrex.it).

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The software Energy Brain 4 6.x HK PostgreSQL

The Giga Box are equipped with the software Energy Brain 4 6.x HK PostgreSQL to be installed on a PC. The software can connect to the device both locally or remotely.

It is suitable for applications with Electrex instruments equipped with a communication port, and provides all the necessary functions for monitoring and accurate management of energy efficiency (consumption / production of electricity, gas, water, etc.), environmental parameters (temperature, humidity, luminosity, CO2, etc.) and process parameters.

Main features
Configuration

- The available options allow for maximum flexibility in adapting the software to the network instruments (even to different types of networks connected simultaneously) and the operator needs.
  - Remote set-up of the devices (CT, alarms, etc.)
  - Network configuration (per each device, per each client, per groups, per locations) with individual setting of the local connection (direct RS485, E-Wi, Ethernet) or remote (Internet, Wi-Fi) and of the communication parameters (speed, etc.).
  - Configuration of scheduled downloading specific for each location and customer, on a daily, weekly or monthly basis through a programmable agenda.

Load chart and curves of consumption/production

- Charts of the daily, weekly, monthly, yearly power curves.
- Charts of the daily, weekly, monthly, yearly consumption curves.
- Charts of powers, power peaks and energy per each tariff.
- Up to 4 simultaneous charts.
- Zoom and selection of measures functions.
- Numerical and graphical data print.
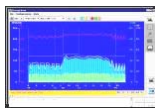
Parameters displaying

- Displays on-line all the measures provided by each of the instruments on the field

Data archive

- Automatic or manual download of the data of power, energy and other variables from the devices connected and automatic archiving in the internal database (Access®,PostgresSQL® or MySQL®).
- Export data to other DB via ODBC module or .txt or .xls format files.
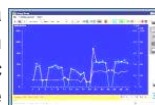
Tariffs

- Management of the data per each tariff
- Configuration Editor for tariffs and calendars
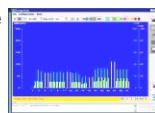
Virtual and Multiple Channels

- Creating virtual channels, so of "groups" of instruments (e.g. "summation" of various departments) and display those, on graphical form, in the same way of a physical channel
- Creation of multiple channels in order to view curves of more instruments in the same chart for a quick comparison.
- Inclusion of variables and mathematical formulas, even highly complex ones, particularly useful, for example, to perform simulations.
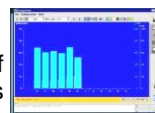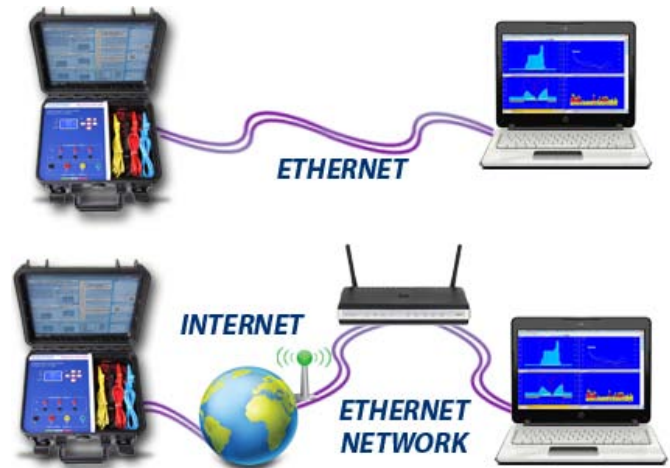
Other types of Energies / Measurements

- Creating charts of data obtained from Electrex Deca Sensors and / or third party transducers with pulse output (e.g. luminosity, temperature, gas, calories, etc.).

Connections between PC and Giga Box

direct Ethernet Rj45 port, Ethernet network, Internet).

ETHERNET

INTERNET

ETHERNET NETWORK

Specific functions for the Giga Box

- Downloads, stores and displays the events logged in the memory with reference also to the parameters of the standards EN 50160 and EN 61000-4-30.

Graphical display of the instantaneous measures

- Manages the graphs of instantaneous waveforms, of the single harmonics and the Vector Diagram.

Wave form

Bar chart

Vector Diagram
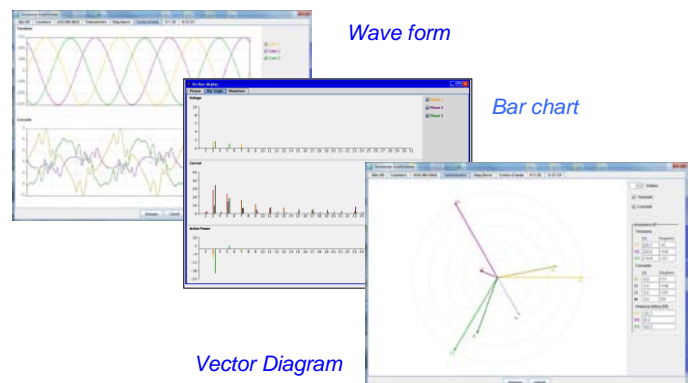
Harmonics measurement campaign and other parameters

- It is possible to configure a measurement campaign, e.g. with a sampling frequency of 2 min. and date/time stamp for different parameters, for a period of 10 days.
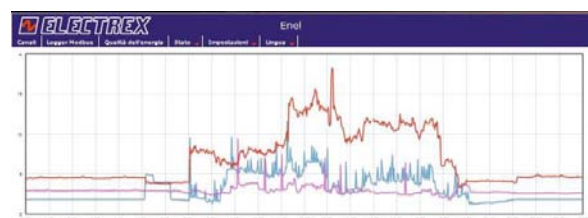
Energy Brain software is expandable and it is available in different versions according to the functions and the number of channels required.
For more details about the software:

www.electrex.it/en

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Technical Specifications Giga Box

Measurements

Voltage ....U_{1-N}, U_{2-N}, U_{3-N}, U_{1-2}, U_{2-3}, U_{3-1}, $U_{LL\ \Sigma}$, $U_{LN\ \Sigma}$
  Max (ABSOLUTE VALUE): .. U_{L1-N}, U_{L2-N}, U_{L3-N}, U_{L1-L2}, U_{L2-L3}, U_{L3-L1}
  Min (ABSOLUTE VALUE): U_{L1-N}, U_{L2-N}, U_{L3-N}, U_{L1-L2}, U_{L2-L3}, U_{L3-L1}
Current ....I_1, I_2, I_3, I_Σ, $I_{neutral}$
  Max (ABSOLUTE VALUE): ....I_1, I_2, I_3
  Therm: ....I_1, I_2, I_3
Power Factor ....PF_1, PF2, PF_3, PF_Σ
Frequency ....f
Voltage THD ....$THD-U_1$, $THD-U_2$, $THD-U_3$, $THD-U_\Sigma$
Current THD ....$THD-I_1$, $THD-I_2$, $THD-I_3$, $THD-I_\Sigma$
Instantaneous Power... P_1,P_2,P_3,P_Σ - Q_1,Q_2,Q_3,Q_Σ - S_1,S_2,S_3,S_Σ
Average Power .... $Pm\Sigma$, $Qm\Sigma$(ind), $Qm\Sigma$(cap), $Sm\Sigma$ (imp/exp)
           $Pm\Sigma$, $Qm\Sigma$(ind), $Qm\Sigma$(cap), $Sm\Sigma$ (imp/exp)
Powers peak ....$Pmd\Sigma$, $Qmd\Sigma$(ind), $Qmd\Sigma$(cap), $Smd\Sigma$ (imp/exp)
Active Energy (also per each phase)..........Ea (import/export)
Reactive Energy (also per each ph.) Er(ind/cap)(import/export)
Apparent Energy (also per each phase) ..... Es (import/export)
Life Time: .... h, h/100
Pulse counting (per each digital input): ....$C_{NT\ T}$, $C_{NT\ Part.}$
Analog measure(per each analog input): .... Instantaneous
Harmonics (FFT) ....H_{U1}, H_{U2}, H_{U3} (1-51° order)
                                    H_{I1}, H_{I2}, H_{I3} (1-51° order)

Sampling frequency (samples/period): ....160 at 50Hz
Display value update: .... every 1s
Load profile and consumption/production (via Ethernet port)
Tariff calendar (upload via Ethernet port)
Logged Events (Kilo Q - EN 50160 and EN 61000-4-30):
           Voltage Dip (sags/dips)
           Voltage swell and peaks
           Current peaks and direction
           Interruptions
           Overvoltage/Undervoltage
           Overcurrent and direction
           Trigger function (programmable time)
           Event classification
Functional logs - Harmonics measurement
Campaign Measurement with programmable sampling frequency in seconds, minutes, hours and days (minimum 5s)

Electrical characteristics

Connection:. 3-phase, Aron 1-phase and 2-phase, LV,MV,HV,
 Aron (only in Giga PQ Box), balanced, unbalanced, 3- & 4-wires
Voltage inputs ....from 20 to 500V phase-phase
                                    (max. 1,7 crest factor)
           With external VT   (max. 400 kV primar.)
                                    VT value: programmable
           Overload ..... max, 900 Vrms peak per 1 sec.
Current Inputs.. 1, 2 or 3 CT external
  PQ Version: max. 10kA primary .../1A and ../5A secondary
                                    CT value: programmable
           Overload .... max, 100 Arms peak per 1 sec..
           Load on the CT .... < 0,5 VA
           F PQ Version for Electrex Flexible Split CT:
           max. 500/2000/8000A primary .../mV secondary
Power supply ....85÷265 Vac/100÷374 Vdc
Power supply for max. 5VA, Self consumption ………….< 2W
Frequency ……………………………………… 45-65 Hz

Mechanical characteristics

Working temperature..-20/+60 °C
Humidity....................................... 95% R.H. non condensing

Front panel

Display...........................LCD, FSTN dot-matrix 128 x 64 points
Visible area ....22 x 44 mm
Backlight ....White Led
Keyboard .... 6 keys keypad Joystick positioned
On the front panel:
Calibration LED .... 2 red for the Ea and Er
Functioning / State LED............................. 1 red for the Status
Communication RS485 LED... 1 green and 1 red under Tx & Rx

Functional characteristics

Measurement....................True-RMS up to the 51st harmonic
Quadrants................................. 2 or 4 quadrants (programmable)
Accuracy: .... Class 0.5S for Active Energy - EN 62053-22
                    Class 1 for Reactive Energy - EN 62053-23
Sampling: Continuous sampling of voltage and current waveforms
Compensation .... Automatic of the amplifiers' offsets
Scale Change: ....Automatic on the current inputs
                                    (highest resolution)
Insulation ....Galvanic on all the inputs and outputs
Standards: - Safety: ....IEC EN 61010 class 2
           - E.M.C.: ....IEC EN 61326-1A
Accuracy: …………………………………………EC EN 61036

Hardware characteristics

N.1 Ethernet Port 10/100 BASE-TX (RJ45) Auto-MDIX
N.1 NFC Port - Near Field Communication
N. 1 Master Serial port RS-485 galvanically insulated for connection of Electrex devices in the sub network
N. 1 ExpBus Port for the management of ExpBus modules
Microprocessor: Cortex-M4 Dual Core
Astronomical Clock / Calendar with battery backup.
128MB Flash memory (non volatile) available for the measurements management, for the Web pages and/or data logging and/or other functionalities as e-mail alarms.
RJ45 Ethernet port protocols: Modbus RTU over IP for the instantaneous meas, Ftp for the managing of the logging files and HTTP for the management of instantaneous meas and files.

How to order

Type	Code
Giga PQ Box net Web Charts.............................. PKAR100-00	
For CT, Split CT and Clamps with .../1A o .../5A output refer to our website www.electrex.it	
Giga F PQ Box net Web Charts........................... PKAR101-00	
FCTS 040-500 Flexible split CT.................................PFCF005	
FCTS 100-1000 Flexible split CT...............................PFCF002	
FCTS 200-2000 Flexible split CT...............................PFCF003	
FCTS 280-4000 Flexible split CT...............................PFCF004	

Distributor

ELECTREX
the energy saving technology

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