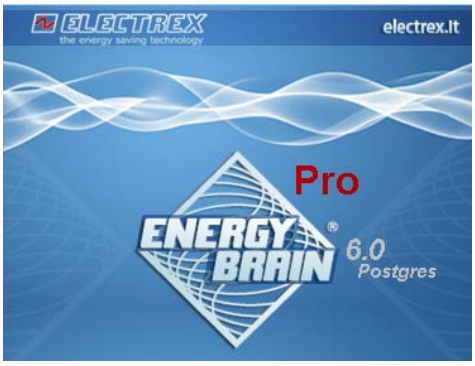
ELECTREX
the energy saving technology

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

LOW ENERGY CONSUMPTION

Energy Brain 6.x & Pro 6.x

Software for the monitoring and management of energy, environmental and process parameters



Energy Brain is the software for the management of energy (production / consumption), various energy carriers (gas, water, steam, compressed air, etc.) and environmental and process parameters (luminosity, temperature, calories, etc.).
Allows to manage historical data (trends, reports and graphs), real-time readings, Power Quality, calendars, measurement campaigns, log of events, alarms, cost center analysis, import/export of data, Baseline, EnPI - Energy Performance Indicator, KPI - Key Performance Indicators etc.
Using additional options it is possible to: generate and automatically send notification emails including various, customized reports; display and manage via a web browser from any device (PC, tablet , smart-phone) real-time and historical data retrieved from the Electrex devices.
Energy Brain and the Electrex devices are the ideal solution for energy audits, continuous monitoring (e.g. ISO 50001) and for energy efficiency projects (e.g. EU-Directive 2012-27 and White Certificates or Energy Efficiency Certificates).

New features of version 6.x and Pro 6.x

New features introduced with the version **6.x** there are:

- All the data are stored under the same database and under the same table
- The device's configuration files and the files with the formulas applied to the measurements are stored in the database
- Files related to Power Quality are stored in the database
- The virtual channels do not occupy additional space in the database and must not be re-calculated in case of modifying any their variable

While in the version **Pro 6.x** in addition to the above features are introduced are included:

- Navigator page: simpler navigation among locations and channels and direct access to editing
- Multi-tab view for the graphs section
- Validation / Editor of the data stored in the database
- Graphs displaying multiple periods
- Displaying on the same chart of import/export data
- Export of the device's data
- Import of external data (e.g. working hours, Baseline, etc.)
- Download of data saved in the Open Log memory services
- Management of the Virtual Special channels

Main features in Energy Brain 6.x and Pro 6.x

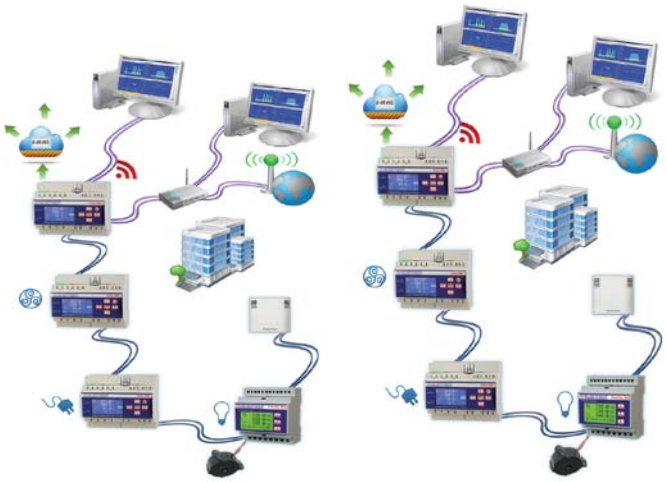
Among the main features of Energy Brain 6.x and Pro 6.x there are:

- Configuration of Electrex devices and scheduler
- Standard graphs and measures pages, showing real-time and customizable
- Formula editor for the calculation of cost of energy, Baseline, EnPI (Energy Performance Indicator), KPI (Key Performance Indicators), etc.
- Editable TOU tariffs and Calendar
- Multi parameter real-time view
- Log of events related to software and instruments
- Graph data export in Text or Excel files (charts & data)
- Power Quality management (sags, swells, micro-interruptions table)
- Operation hours of a load / appliance management

Communication

The communication between the software and the Electrex devices can be done via the following modalities:

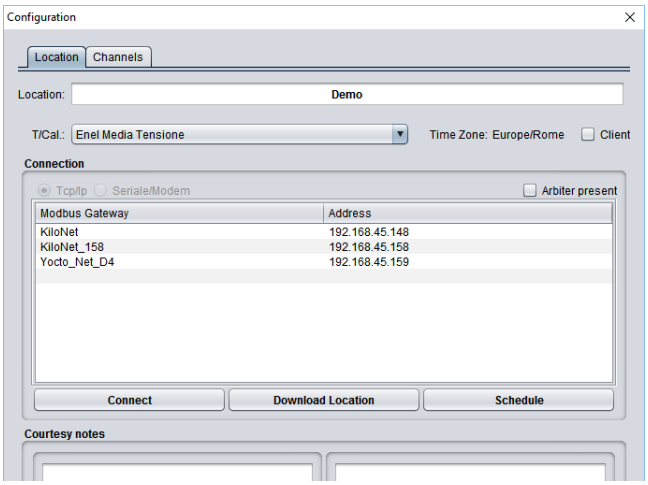
- Local – point-to-point or LAN (Ethernet or Wi-Fi)
- Remotely (Internet, GSM)
- Both option above simultaneously



Energy Brain 6.x features

Device setup and scheduler

This feature, available also as a stand-alone software named *Energy Brain 6.0 Configurator*, allows to configure the network of Electrex devices and the parameters of device (named channel in Energy Brain) such as: baud rate, Modbus address, CT ratio, etc.

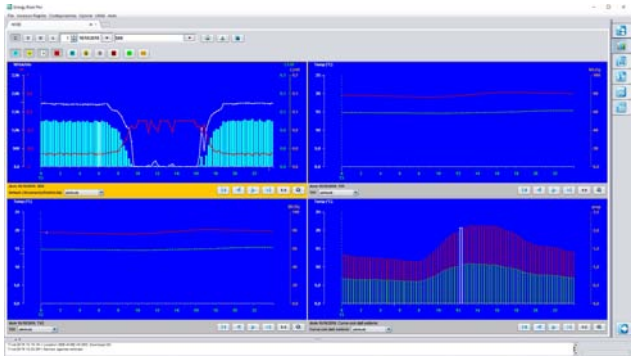


Every Location can be configured to use different communication modalities. The data collection can be done manually or automatically using a scheduler. The access to the configuration menu can be protected by a password.

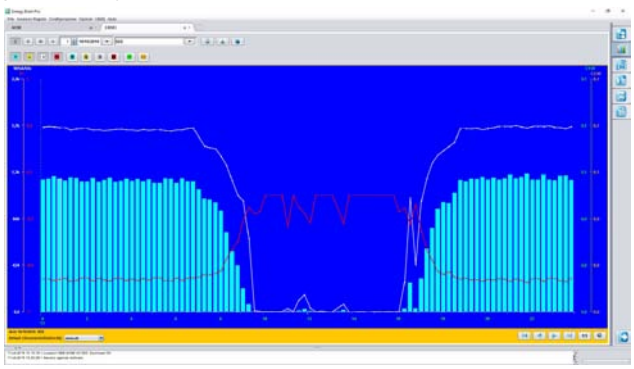
Standard graphs

Energy Brain 6.x can display the daily, weekly, monthly and yearly data series curves – trends of energy production / consumption. The data shown in the graph can be exported. Here below some graph examples:

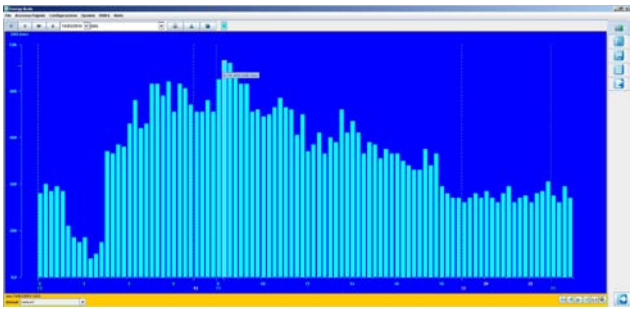
Dashboard for the analysis of 4 independent graphs:



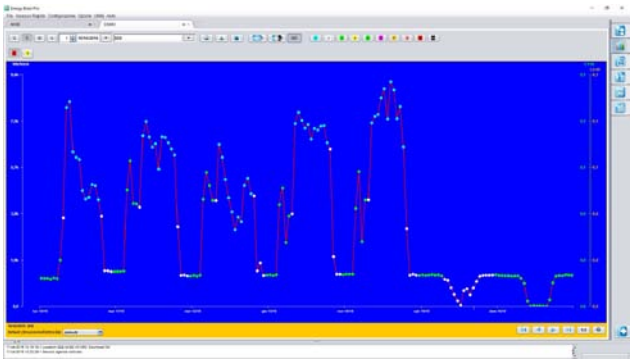
Daily energy purchase trend (including also PV system production):



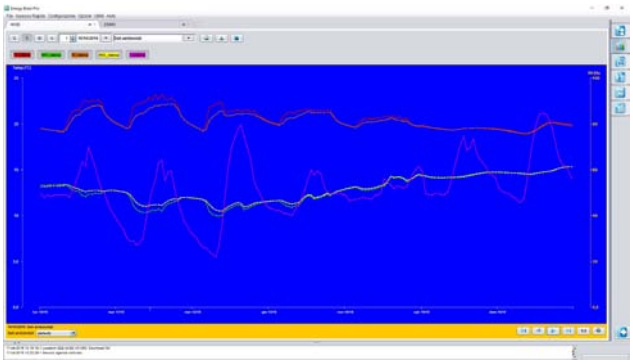
Daily gas consumption trend:



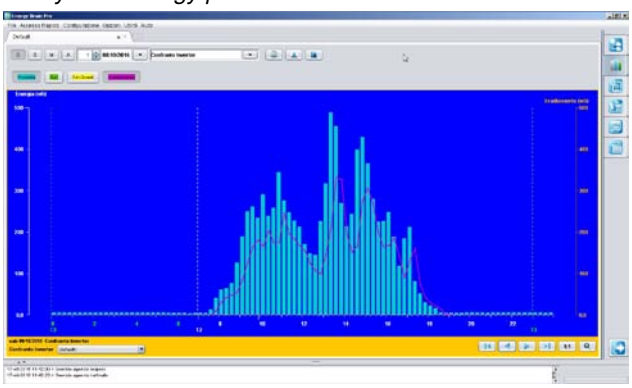
Weekly power peaks (Max Demand):



Weekly trend of temperature and humidity:



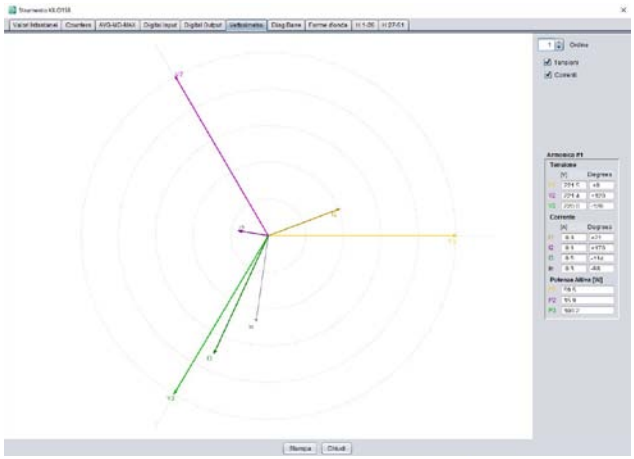
PV system energy production trend and irradiance:



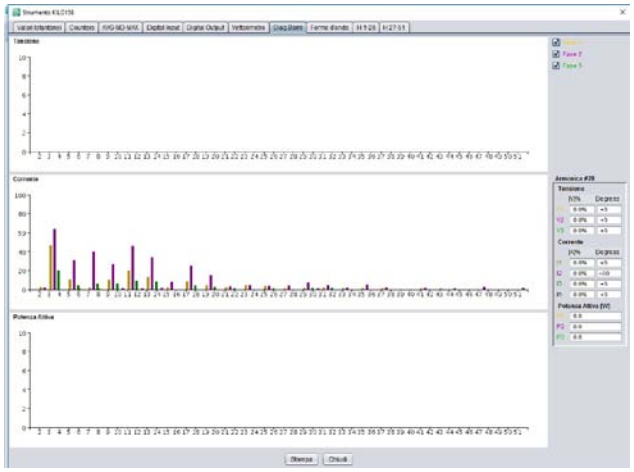
Power Quality real-time graphs

For the Power Quality enabled instruments Energy Brain can display the following graphs (instruments must be "on-line" and provide data in real-time):

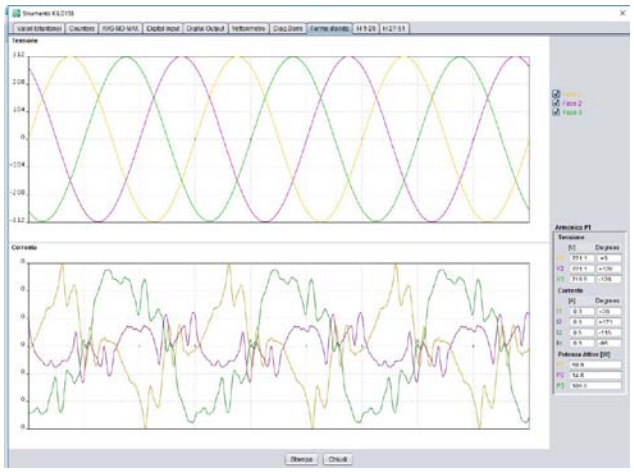
Vector diagram for current and voltage:



Harmonic distortion bar graphs



Wave form:

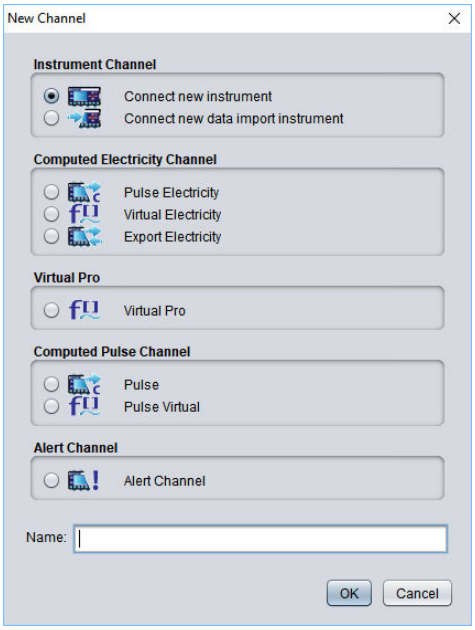


Custom graphs

The software allows to manage special, editable graphs with custom measure unit. This feature allows to display data retrieved from various energy types transducers (e.g. gas, water, luminosity, temp, humidity, steam, calories, pressure, etc.). The Electrex devices may be equipped with inputs where the above transducers can be connected.

Example of customized channels/ graphs:

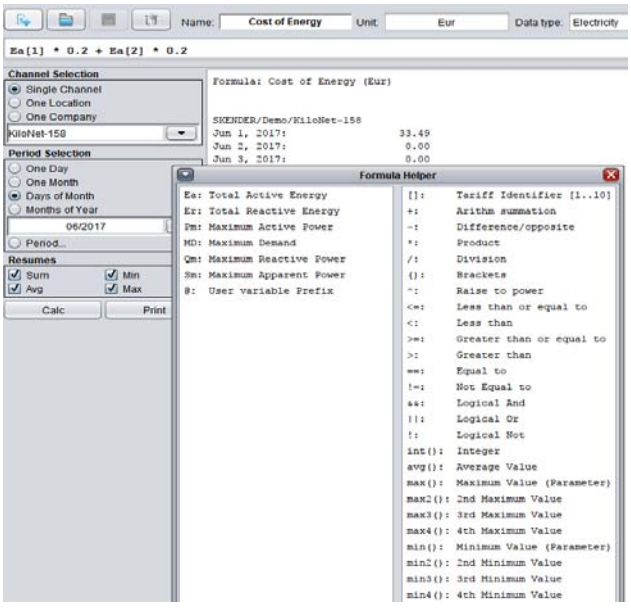
- Channel/graph of Pulse Electricity / 3i for use in applications where are counted pulses of the utility meter or from a device with 3 single phase inputs;
- Channel/graph of Virtual Electricity: for applications where it is needed to overlap multiple energy data series in the same graph;
- Channel/graph of Virtual Generic: for applications where it is needed to overlap various kinds of data series in the same graph. For e.g. energy, gas , temperature;
- Channel/graph of Pulse Virtual: applications where are counted pulses not related to energy: for e.g. gas, water, calories, etc.



Formulas

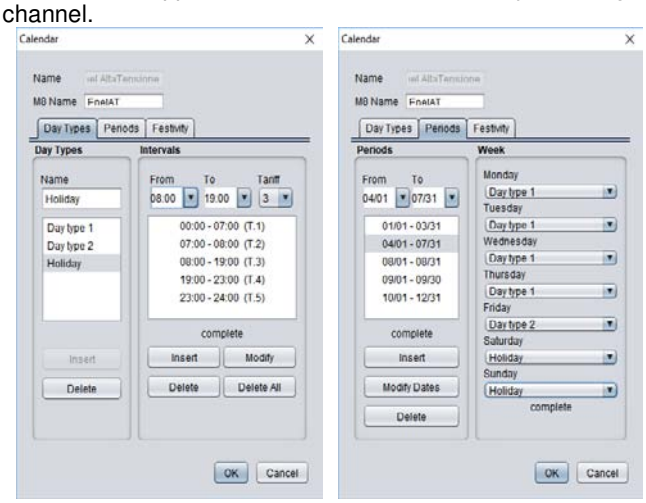
This feature allows to create and apply on the parameters measured math formulas. For e.g. calculate automatically the energy production/consumption and cost/revenue on a daily, monthly or yearly basis or a specific period. It can be used to make cost simulations using different TOU tariffs in order to evaluate the most convenient offer. Other main uses of this features are: cost center / allocation analysis, Baseline calculation, EnPI - Energy Performance Indicator, KPI - Key Performance Indicators, etc.

Formula and calculation for cost in Euro of energy:

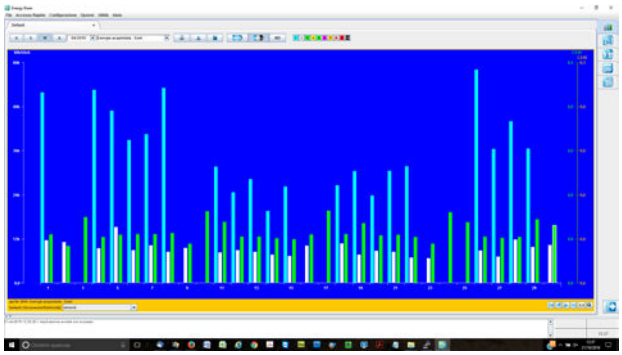


TOU Tariffs and editable calendar

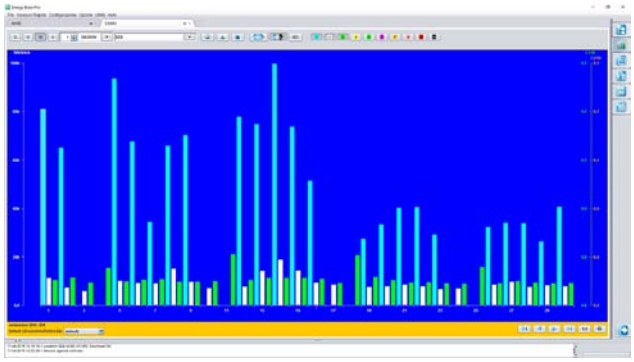
Energy Brain allows to configure and edit multiple calendars with custom day-types and tariffs per each day. The TOU tariffs can be applied to the whole location of to just a single channel.



Monthly energy consumption divided per tariffs:

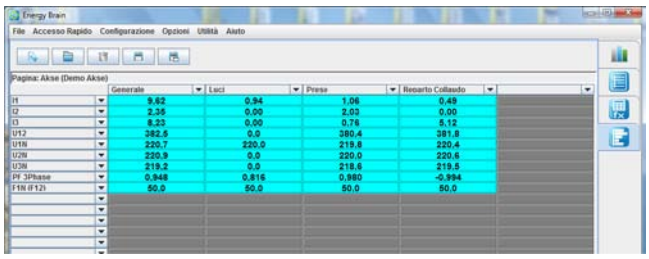


Annual energy consumption divided per tariffs:



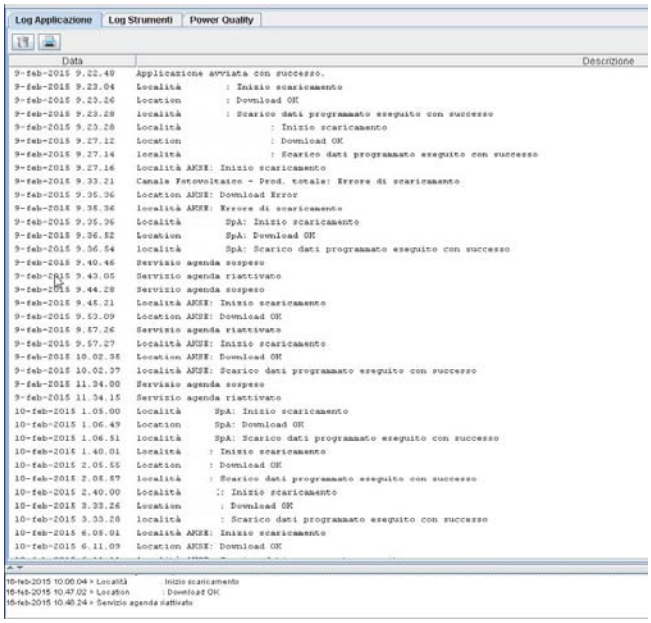
Multi parameters real-time view page

This section allows to set multiple, spreadsheet type, pages displaying live readings of various, selectable parameters coming from various, selectable Electrex devices. It is a useful feature for monitoring simultaneously different parts of the system.



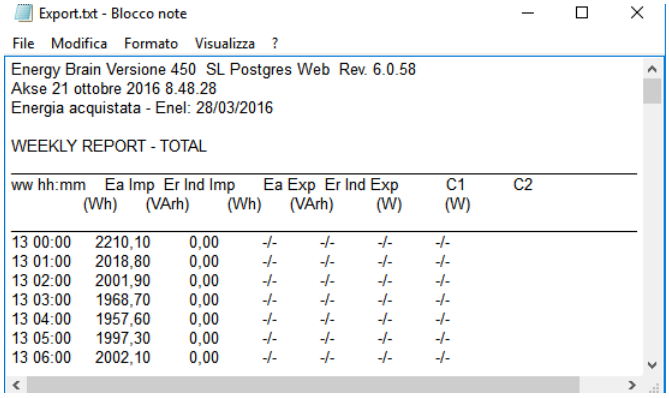
Software and instruments events log

In this section are listed all the events and operations related to the software and instruments configuration / functioning. It is a useful log for retrieving wrong settings or anomalies.



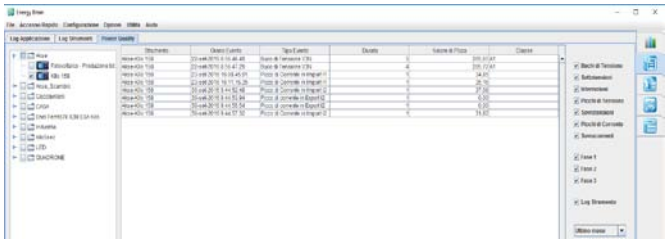
Graph data series export

By clicking on the Export button from the horizontal bar it is possible to export, as an .txt file, the data series displayed on the selected graph.



Power Quality management (sags, swells, etc.)

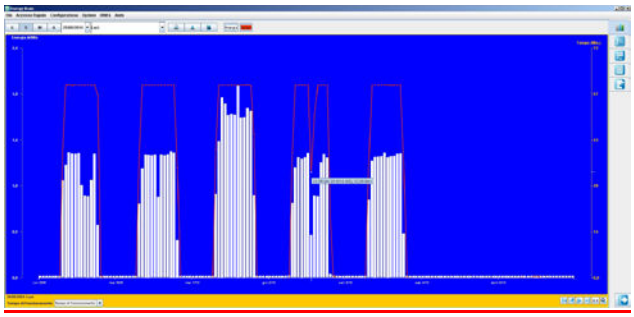
Energy Brain can download from the Power Quality analyzers and list on a table the events of Power Quality logged. This section can be accessed from the Status button of the right sidebar, third tab. The table with the events of Power Quality contains type of event, its duration and the peak values and allows to filter the vents per each phase or order those per each parameter listed in the table. The table can be easily exported by a simple copy & paste.



Operating time of a load management

Energy Brain 6.x permits to display on a graph the operating time of a load (electrical motor, machine, lighting systems, etc.) configuring the system to tigger time and energy counters via internal alarms or when a certain value threshold of any of the parameters measured is exeeded.

Energy consumption of an appliance related to its operating time:

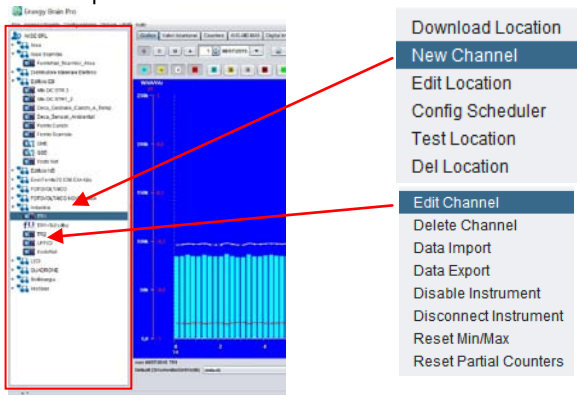


Additional features of the PRO 6.X version

Pro 6.x version includes the following additional features:

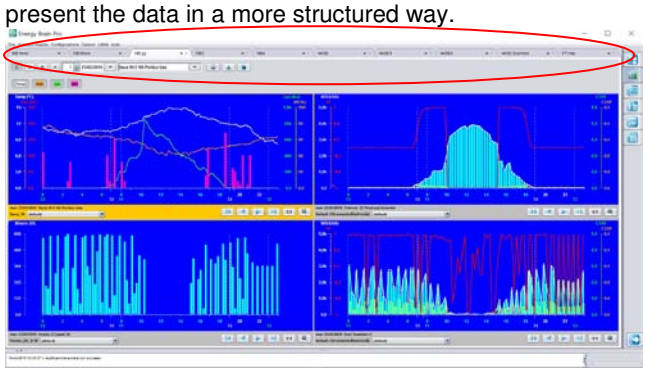
Navigator displaying modality

The Navigator displaying modality simplifies the navigation among channels and locations. The navigator button (first one on the buttons sidebar) will display on the left a column with a tree-view dropdown scheme of the locations and channels managed. A right click on any of the nodes will activate a fast access menu with various options:



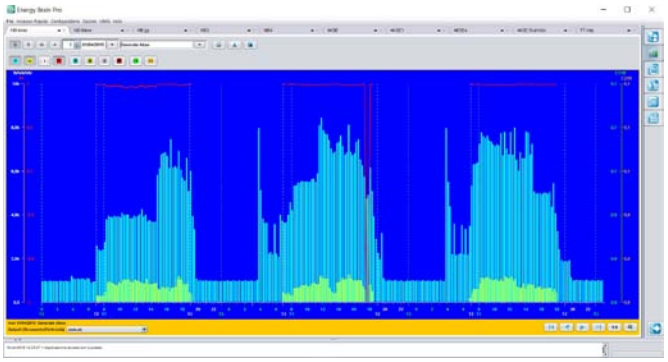
Multi-tabs view

In the Pro version it is possible to configure multiple tabs containing each up to 4 simultaneous graphs. This feature is very useful for medium/big monitoring systems helping to present the data in a more structured way.



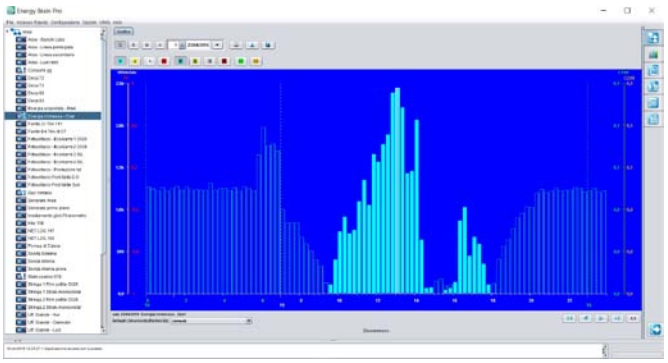
Multi-period graphs

The multi-period display mode permits to have extended period graphs related to multiple days, weeks, etc.
Example of a 3 days, energy consumption graph:



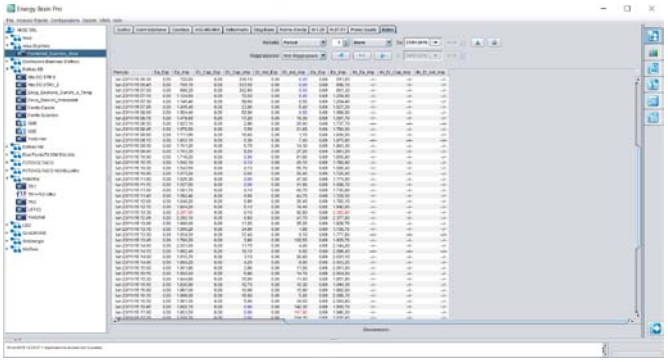
Overlapping Import/Export energy data

With Energy Brain Pro 6.x it is possible to display on the same graph the data series of energy imported and exported (while in the version 6.x it can be done in two separate graphs). This is a valuable feature in case we are measuring energy just below the utility meter and we have in our system a solar panel or bio-gas powered electricity generator:



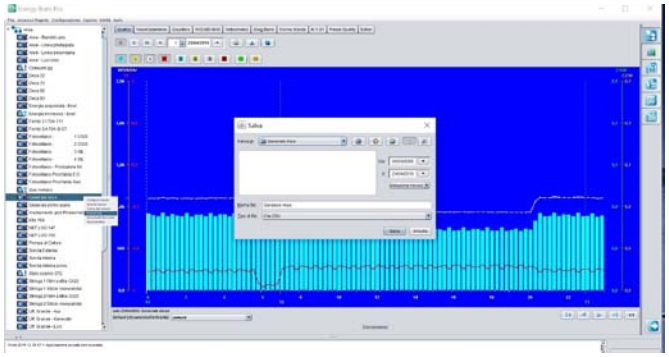
Validation data editor

It may happen to have missing data for a certain short period (for e.g., involuntarily the instrument was turned off) or have incorrect data (for e.g. wrong CT ratio or multiplier). In these cases Energy Brain permits to access its database (password requested) and amend the missing data with estimated ones. The data edited will be saved in a different format in order to allow identification. This feature allows to preserve a normal patterns in the overall data series.



Export applying data filters

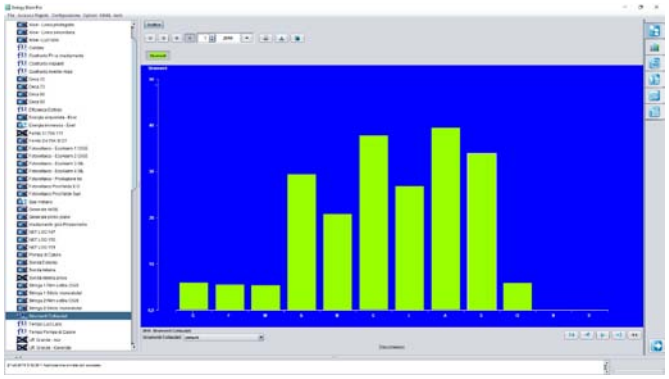
From the fast access menu of an instrument listed in the Navigator bar it is possible to select Export Data. A new window will appear allowing to select period, parameter, file type (for e.g. .csv) and where to save that file.



Import of external data

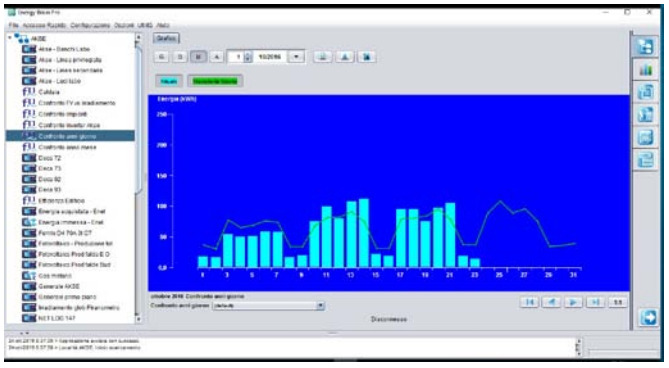
In the Pro version it is possible to import an external CSV /Excel file, following a specific format, representing data from an external system (operating hours, units produced, baseline, etc.). That series of data can be displayed on a graph showing data from an Electrex channel/device.

Example of graph showing data related to "daily units calibrated" coming from an external Excel file:



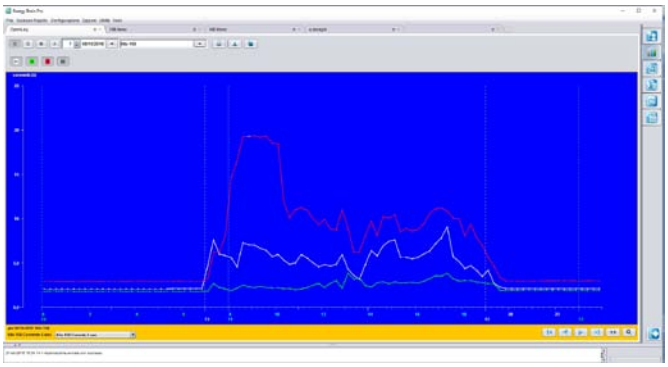
It is also possible to export from Energy Brain (Excel file) historical data, elaborate considering current period influencing variables, correct those and re-import the Excel file as a benchmark data series.

Example of forecasting graph of energy consumption between the current year - line, and the past year - bars:



Download and display of customized parameters

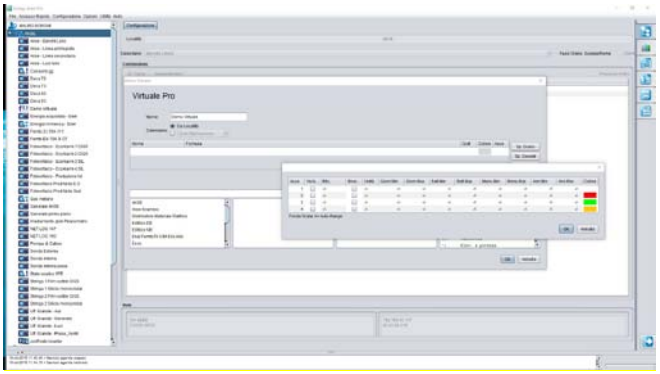
Energy Brain Pro can store also parameters that are different from the standard energy carriers and using a different logging interval (see Open Log feature in Electrex devices). For example it can display a chart of the currents per each phase logged every 1 minute as in the image here below:



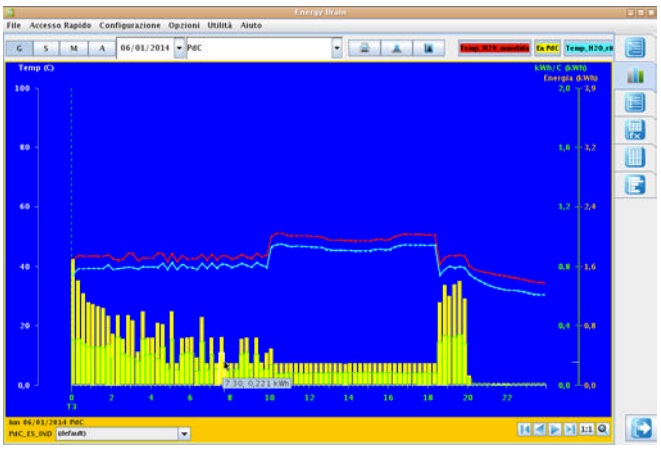
Virtual special channels

In the Pro 6.x it is possible to add virtual special channels containing formulas: arithmetical, algebraic, conditional, etc. This feature is critical for advanced graphs as the EnPI (Energy Performance Indicator) or KPI (Key Performance Indicator).

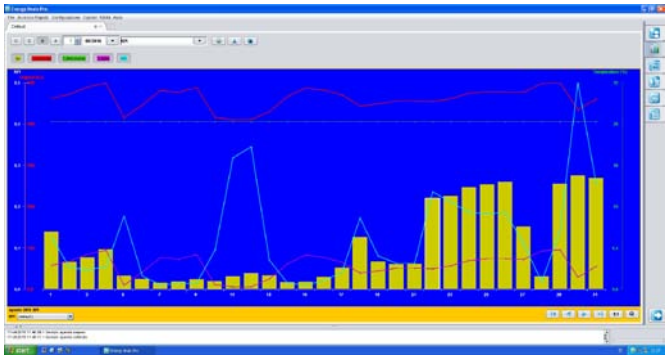
Example of the configuration of a special, customized graph:



Yield graph of a heat generator intended as the ratio between the temperature delta and the generator's energy consumption:



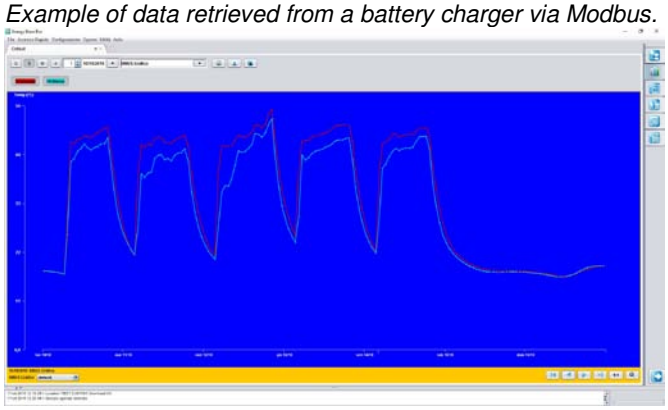
KPI (Key Performance Indicator) calculation of a natural gas powered generator:



Energy Brain Pro 6.x Custom

Option of Energy Brain PRO allowing to integrate up to 4, same type, third-party Modbus RTU standard devices in the Energy Brain Pro 6.X (same number of channels must be available in the same software license). For different types of third party Modbus devices must be activated one Option Custom 4 per each device type. The Modbus mapping and the specific registers must be provided from the user.

Example of data retrieved from a battery charger via Modbus.



Energy Brain Master or Client type

The software is available in the versions **Master** or **Client**.
If in the network there are multiple PCs with Energy Brain only one can have a **Master** type of software.
The **Energy Brain Client** version cannot configure the devices or change the clock/calendar, while it has the other features seen previously.

Energy Brain Client can be used in the following modality:

- *Client Instruments*: same features of the Master version, but cannot change the instruments configuration. Can configure the network structure, download the data automatically or manually and generate its own databse. The network structure can be partial or same as the Master;
- *Client Data Base*: this version will use the same data contained in the Master's database and its network structure.

Versions – per max number of channels managed

The software is available in the following versions considering the max number of channels that each version can manage (are considered channels the instruments and the physical devices):

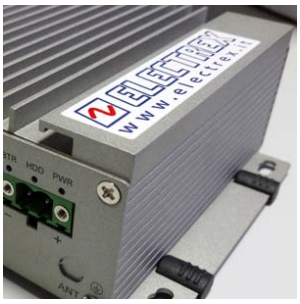
- **Energy Brain 4**: management of up to 4 channels;
- **Energy Brain 8**: management of up to 8 channels;
- **Energy Brain 16**: management of up to 16 channels;
- **Energy Brain 32**: management of up to 32 channels;
- **Energy Brain 300**: management of up to 300 channels;
- **Energy Brain > 300**: please contact our offices for more details.

It is possible to start from the basic version, Energy Brain 4, and expand it, also at a later time, up to Energy Brain 300 or >300.

Energy Brain is available in the versions with a hardware protection – USB dongle key – or software protection associated with the only PC on which has been installed.

EB Box and EB Pro Box

Energy Brain 6.x or Energy Brain Pro 6.x can be supplied also pre-installed in a fan-less embedded computer on which are pre-installed in a Linux environment the software Energy Brain 6.x or Energy Brain Pro 6.x, Option Energy Brain Personal Report, Option Energy Brain Log Report and Option Energy Brain Counters.



Minimum System requirements

Minimum hardware requirements: PC Processor 2 GHz, 4GB, 500GB HD, USB port, network interface card, Monitor VGA 1024x768.

Software Requirements: Windows 10, Windows 8.1, Windows 7 SP1 (32 and 64 bit), Windows XP (32 and 64 bit), Windows Vista SP2 (32 and 64 bit), Windows Server 2008 (32 and 64 bit), Windows Server 2012 (64 bit).

Virtual servers: same as the requirements above. For the Energy Brain versions using the hardware protection USB dongle key, must be verified the availability of a physical USB port.

Update of the version prior to 6.x

The Energy Brain software versions prior to the 6.X (for. e.g. 5.21) can be updated to the version 6.x or Pro 6.x after their database is converted to the current structure of PostgreSQL type database and possible replacement of the USB dongle key. For "very old" Energy Brain versions is needed a double conversion so we suggest to contact before our sales team in order to evaluate the best options.

Additional options

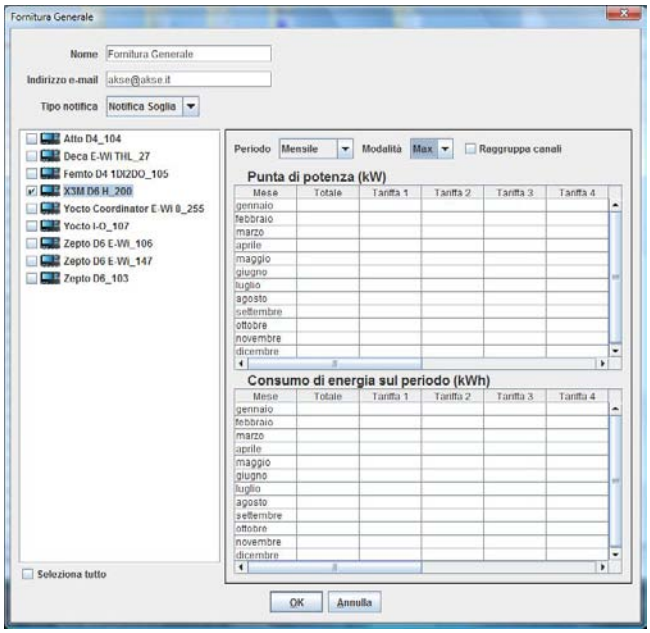
Energy Brain can be expanded adding the following options:

Option Energy Brain Log Report

Energy Brain option that allows the automatic sending of e-mails with three types of reports:

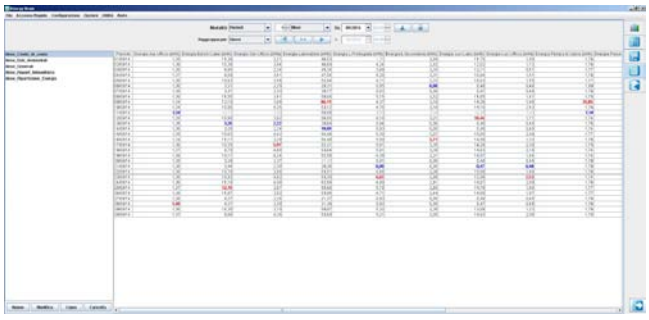
- Reports related to "download failures"
- Report on threshold values set by the user (MD, E)
- Report on the energy consumed / produced

For more info please refer to the specific datasheet.



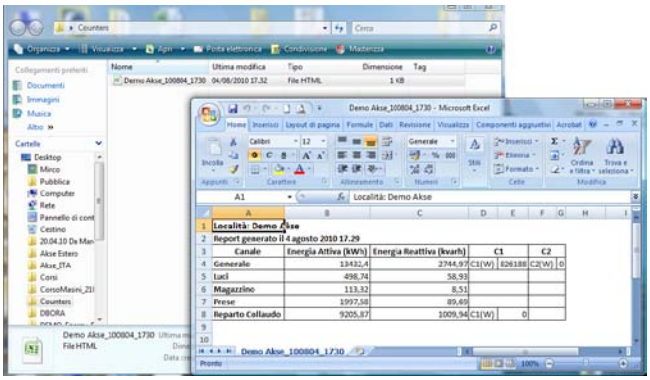
Option Energy Brain Personal Report

Energy Brain option conceived for those who want to automate the sending of energy reporting, such as energy consultants. It prepares and automatically sends periodic reports (daily, weekly, monthly and annual) based on data collected in the database of Energy Brain. From the 5.12 version of Energy Brain it is possible to configure the data selected for the report directly from the Energy Brain software. The report exported as Excel/CSV file (containing also data from different channels and locations) is then available for the final layout using ad hoc templates containing logos, graphics, images, etc. The report exported to the Excel/CSV file can also be included as an attachment in the e-mail or saved automatically in a remote FTP location.
For more info please refer to the specific datasheet.



Energy Brain Counters

Option of Energy Brain but also stand alone software. Allows to generate and send reports containing the values of the energy counters of all instruments of any location on the network. The generated report can be exported in HTML or CSV format and imported into an Excel file. It is possible to schedule the agenda of Windows to launch the application at regular intervals.



Energy Brain Cloud

Energy Brain Cloud is the NEW, browser-based software that allows you to view and manage via a web browser on various devices such as PC, tablet, smart-phone data, measures and instantaneous and historical charts acquired by Electrex instruments. For more info please refer to the specific datasheet.

How to order

Type	Code
Energy Brain 6.0 Configurator	PFSW300-006
Energy Brain 4 6.X HK PostgreSQL	PFSW312-PH6
Energy Brain 4 6.X SK PostgreSQL	PFSW312-PS6
Energy Brain 8 6.X HK PostgreSQL	PFSW310-PH6
Energy Brain 8 6.X SK PostgreSQL	PFSW310-PS6
Energy Brain 6.X 16 HK PostgreSQL	PFSW315-PH6
Energy Brain 6.X 16 SK PostgreSQL	PFSW315-PS6
Energy Brain 6.X 32 HK PostgreSQL	PFSW200-PH6
Energy Brain 6.X 32 SK PostgreSQL	PFSW200-PS6
Energy Brain 6.X 300 HK PostgreSQL	PFSW190-PH6
Energy Brain 6.X 300 SK PostgreSQL	PFSW190-PS6
Energy Brain Pro 8 6.X HK PostgreSQL	PFSWP310-PH6
Energy Brain Pro 8 6.X SK PostgreSQL	PFSWP310-PS6
Energy Brain Pro 6.X 32 HK PostgreSQL	PFSWP200-PH6
Energy Brain Pro 6.X 32 SK PostgreSQL	PFSWP200-PS6
Energy Brain Pro 6.X 300 HK PostgreSQL	PFSWP190-PH6
Energy Brain Pro 6.X 300 SK PostgreSQL	PFSWP190-PS6
Energy Brain 8 Client 6.X HK PostgreSQL	PFSW320-PH6
Energy Brain 8 Client 6.X SK PostgreSQL	PFSW320-PS6
Energy Brain 32 Client 6.X HK PostgreSQL	PFSW250-PH6
Energy Brain 32 Client 6.X SK PostgreSQL	PFSW250-PS6
Energy Brain 300 Client 6.X HK PostgreSQL	PFSW240-PH6
Energy Brain 300 Client 6.X SK PostgreSQL	PFSW240-PS6
Energy Brain Pro 8 Client 6.X HK PostgreSQL	PFSWP320-PH6
Energy Brain Pro 8 Client 6.X SK PostgreSQL	PFSWP320-PS6
Energy Brain Pro 32 Client 6.X HK PostgreSQL	PFSWP250-PH6
Energy Brain Pro 32 Client 6.X SK PostgreSQL	PFSWP250-PS6
Energy Brain Pro 300 Client 6.X HK PostgreSQL	PFSWP240-PH6
Energy Brain Pro 300 Client 6.X SK PostgreSQL	PFSWP240-PS6
Upgrade EB 4 to EB 4 6.X PostgreSQL	PFSW396-006
Upgrade EB 8 to EB 8 6.X PostgreSQL	PFSW396-016
Upgrade EB 16 to EB 16 6.X PostgreSQL	PFSW396-026
Upgrade EB 32 to EB 32 6.X PostgreSQL	PFSW396-036
Upgrade EB 300 to EB 300 6.X PostgreSQL	PFSW396-046
Upgrade EB 8 Client to EB 8 Client 6.X PostgreSQL	PFSW396-C16
Upgrade EB 32 Client to EB 32 Client 6.X PostgreSQL	PFSW396-C36
Upgrade EB 300 Client to EB 300 Client 6.X PostgreSQL	PFSW396-C46
Upgrade EB 300 to EB 300 PostgreSQL	PFSW396-046
Upgrade EB 4 to EB Pro 4 6.X PostgreSQL	PFSWP397-006
Upgrade EB 8 to EB Pro 8 6.X PostgreSQL	PFSWP397-016
Upgrade EB 16 to EB Pro 16 6.X PostgreSQL	PFSWP397-026
Upgrade EB 32 to EB Pro 32 6.X PostgreSQL	PFSWP397-036
Upgrade EB 300 to EB Pro 300 6.X PostgreSQL	PFSWP397-046
Upgrade EB 8 Client to EB Pro 8 Client 6.X PostgreSQL	PFSWP397-C16
Upgrade EB 32 Client to EB Pro 32 Client 6.X PostgreSQL	PFSWP397-C36
Upgrade EB 300 Client to EB Pro 300 Client 6.X PostgreSQL	PFSWP397-C46
Upgrade EB 4 6.X PostgreSQL to EB Pro 4 6.X PostgreSQL	PFSWP398-006
Upgrade EB 8 6.X PostgreSQL to EB Pro 8 6.X PostgreSQL	PFSWP398-016
Upgrade EB 16 6.X PostgreSQL to EB Pro 16 6.X PostgreSQL	PFSWP398-026
Upgrade EB 32 6.X PostgreSQL to EB Pro 32 6.X PostgreSQL	PFSWP398-036
Upgrade EB 300 6.X PostgreSQL to EB Pro 300 6.X PostgreSQL	PFSWP398-046
Upgrade EB 8 Client 6.X PostgreSQL to EB Pro 8 Client 6.X PostgreSQL	PFSWP398-C16
Upgrade EB 32 Client 6.X PostgreSQL to EB Pro 32 Client 6.X PostgreSQL	PFSWP398-C36
Upgrade EB 300 Client 6.X PostgreSQL to EB Pro 300 Client 6.X PostgreSQL	PFSWP398-C46
Upgrade EB 4-8	PFSW332-00
Upgrade EB 8-16	PFWS335-00
Upgrade EB 16-32	PFSW337-00
Upgrade EB 32-300	PFSW350-00

Upgrade EB Client 8-32 ..... *PFSW340-00*
Upgrade EB Client 32-300 ..... *PFSW355-00*

Option Energy Brain Log Report *PFSW430-00*
Option Energy Brain Personal Report *PFSW400-00*
Bundle Option Energy Brain Personal Report,.....
Log Report, Counters *PFSW440-00*

Option Energy Brain Pro 6.X Custom 4 ..... *PFSPW399-006*
Option Energy Brain Pro 6.X Custom 8 ..... *PFSPW399-016*
Option Energy Brain Pro 6.X Custom 16 ..... *PFSPW399-026*
Option Energy Brain Pro 6.X Custom 32 ..... *PFSPW399-036*

EB 32 6.X Bundle PostgreSQL, Personal Report, ...
..... *PFSW0E0-016*
EB 32 6.X Bundle PostgreSQL, Personal Report .....
e Log Report, Counters *PFSW0E0-026*
EB 300 6.X Bundle PostgreSQL, Personal Report .....
e Log Report, Counters *PFSW0E0-036*

EB 32 Client 6.X Bundle PostgreSQL, Personal Report ....
e Log Report, Counters *PFSW0E0-C26*
EB 300 6.X Bundle PostgreSQL, Personal Report .....
e Log Report, Counters *PFSW0E0-C36*

EB 32 6.X Bundle PostgreSQL, Personal Report, ...
..... *PFSPW0E0-016*
EB 32 6.X Bundle PostgreSQL, Personal Report .....
e Log Report, Counters *PFSW0E0-026*
EB 300 6.X Bundle PostgreSQL, Personal Report .....
e Log Report, Counters *PFSW0E0-036*

EB 32 Client 6.X Bundle PostgreSQL, Personal Report .....
e Log Report, Counters *PFSW0E0-C26*
EB 300 6.X Bundle PostgreSQL, Personal Report .....
e Log Report, Counters *PFSW0E0-C36*

EB Pro 32 6.X Bundle PostgreSQL, Personal Report,.....
..... *PFSWP0E0-016*
EB Pro 32 6.X Bundle PostgreSQL, Personal Report.....
e Log Report, Counters *PFSWP0E0-026*
EB Pro 300 6.X Bundle PostgreSQL, Personal Report .....
e Log Report, Counters *PFSWP0E0-036*

EB Pro 32 Client 6.X Bundle PostgreSQL, Personal Report,
Log Report, Counters..... *PFSWP0E0-C26*
EB Pro 300 Client 6.X Bundle PostgreSQL, Personal Report,
Log Report, Counters..... *PFSWP0E0-C36*

EB Box 32 6.X Bundle PostgreSQL, Personal Report ....
e Log Report, Counters *PFSW0E0-B26*
EB Box 300 6.X Bundle PostgreSQL, Personal Report .. ..
e Log Report, Counters *PFSW0E0-B36*
EB Pro Box 32 6.X Bundle PostgreSQL, Personal Report ....
e Log Report, Counters *PFSWP0E0-B26*
EB Pro Box 300 6.X Bundle PostgreSQL, Personal Report ..
e Log Report, Counters *PFSWP0E0-B36*

Energy Brain Cloud 2.X 32-100 SK *PFSWEC1-SK2*
Energy Brain Cloud 2.X 32-100 HK *PFSWEC1-HK2*
Energy Brain Cloud 2.X 300-1000 SK *PFSWEC2-SK2*
Energy Brain Cloud 2.X 300-1000 HK *PFSWEC2-HK2*

Notes

ELECTREX the energy saving technology

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Subject to modification without prior notice
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Distributor