ELECTREX
the energy saving technology

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Made in Italy
Pensato, progettato e prodotto in Italia

LOW ENERGY CONSUMPTION

Exa net D6 H & Exa net 96 H

▶ High Performance (0.5S accuracy class)

▶ Flexibility (open platform)

▶ Reliability (high quality of components)

▶ Connectivity (Ethernet, Wi-Fi, RS485, ExpBus, NFC)

Energy Analyzer & (Wi-Fi) Data Manager
Energy Analyzer & (Wi-Fi) Web Data Manager

Exa RJ45 H (6 DIN rail or 96x96) is an Energy Analyzer & Data Manager with microprocessor (Cortex-M4 Dual Core) extremely versatile and precise designed to meet the most sophisticated applications of electrical parameter monitoring and power management in industrial, tertiary, public and residential. The high accuracy class 0.5S for the Active Energy and the measurements of the single harmonics up to the 51st order are obtained by continuously sampling the waveforms of voltages and currents with a very high resolution, thus ensuring maximum accuracy even in the presence of rapidly variable loads over time (e.g. spot welders). **Exa RJ45 H** is equipped with an RS485 slave port and an Ethernet port (optional **Wi-Fi**) and, depending on the version, can be equipped internally with an input / output card or with an environmental sensor card. **Exa RJ45 H** has a high capacity memory of 128MB for the implementation through PUK codes of multiple functionalities and has an architecture that allows you to modify the firmware by up-loading even remotely.

Exa RJ45 H is also equipped with an expansion bus, ExpBus, for the connection of digital and analogue input / output modules, for environmental sensors and is equipped with NFC (Near Field Communication) technology.

Exa net H Web is an Energy Analyzer & Web Data Manager, the open platform connected to Ethernet / Internet via the RJ45 (and Wi-Fi) port. Starting point for the continuous monitoring of energy efficiency through the measurement and management of energy parameters (electricity, gas, water, etc.), environmental (temperature, humidity, luminosity, CO_2, etc.) and process. Internal analyzer for measuring energy quantity and quality; Web server and FTP server. Communication also to other devices via the master RS485 and the ExpBus.

The **Wi-Fi** versions allow you to manage / view data with all Wi-Fi devices with a browser (PC, smartphone, tablet, etc.) in an existing Wi-Fi network.

Simplicity

Exa D6 H is equipped with a high contrast dot matrix FSTN display with white LED backlighting while **Exa 96 H** is equipped with a 320x240 TFT display with 24bit of color. Both allow the simultaneous reading of 4 measurements and their identification symbol with high visibility characters.

The 6-key keyboard and the display menu column for configuration allow a simple and rational use of the instrument, while the page displayed at start-up can be defined by the user.
Present on the front one / two red calibration control LEDs that pulse with a frequency proportional to the active (and reactive) energy

imported for the verification of the field calibration through optical instruments. A red LED that flashes below the symbol next to Electrex indicates its functioning, while 2 LEDs below the white band indicate the communication activity of the RS485 port and another 2 LEDs on the RJ45 port indicate the Ethernet communication activity.
To save energy, it is possible to program the backlighting of the display, the operating LED and those for the RS485 in order to reduce consumption to a minimum.

Versatility

The **Exa H** can be inserted on any type of network: single-phase, up to 3 single-phase, two-phase, 3-wire and 3-wire inputs, symmetric or asymmetric, balanced or unequalibrated, low and medium voltage, with 1, 2 or 3 CTs as well as for measurements on 2 and 4 quadrants (import / export). A simple keyboard programming (or via Energy Brain software) allows you to set all the operating parameters such as network type, BT / MT, CT ratio and any TV (free value), integration time (1-60 min.) and alarms (thresholds, delay, hysteresis), digital outputs and configuration parameters of the connected optional modules.

Compliance with EN 50470 and 62053-22 standards

All versions of the **Exa RJ45 D6** and **net D6** (and **96**) meet the essential requirements of the CEI EN 50470-1 + 50470-3 standard as well as the 62053-22 as required for white certificates.

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Measures

Parameters	Type	L1	L2	L3	n	Σ	P(8)	Range
Voltage	U_{L-N}	•	•	•		•		20,0V…400 kV
	U_{L-L}	•	•	•		•		
	$U_{L-N\ MAX}$	•	•	•				
	$U_{L-L\ MAX}$	•	•	•				
	$U_{L-N\ MIN}$	•	•	•				
	$U_{L-L\ MIN}$	•	•	•				
Current	I	•	•	•	•	•		10 mA…10,0 kA
	I_{MAX}	•	•	•				Flexible Electrex CT(3):
	$I_{AVG\ THERM}$ (1)	•	•	•				1A … (5A - 500A)
	$I_{MD\ THERM}$ (1)	•	•	•				4A … (20A - 2000A)
								8A … (80A - 4000A)
Power Factor	PF	•	•	•		•		0,00ind..1,00..0,00cap
Frequency	F	•						45 … 65 Hz
Phase sequence	132 CCW	•	•	•				
Harmonic Distortion	THD-U_{L-N}	•	•	•		•		0…199,9%
	THD-U_{L-L}	•	•	•		•		
	THD-I	•	•	•		•		
Active Power	P	•	•	•		•		± 0,00…1999 MW
	P_{AVG} (2)					•		
	P_{MD} (2)					•		
	P_{MAX} (3)	•	•	•				
Reactive Power	Q_{IND}	•	•	•		•		± 0,00…1999 Mvar
	Q_{CAP}	•	•	•		•		
	$Q_{AVG\ IND}$ (2)					•		
	$Q_{AVG\ CAP}$ (2)					•		
	$Q_{MD\ IND}$ (2)					•		
	$Q_{MD\ CAP}$ (2)					•		
Apparent Power	S	•	•	•		•		± 0,00…1999 MVA
	S_{AVG} (2)					•		
	S_{MD} (2)					•		
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)	•	•	•		•	•	
Pulse Counter	CNT (6)					•	•	
Analog Measure	(6)					•	•	

All the instantaneous measures are calculated over 10 cycles - example: 200ms at 50Hz.
(1) Mean value over the integration time (1..60 min. programmable) and peak (MD).
(2) 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.
(3) Import / Export max. power values.
(4) Non-resettable life time and four operating time counters.
(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.
(6) Only for versions with digital or analog inputs
(7) With Flexible Electrex CT, accuracy Class, for current values as above in brackets.
(8) Three partial counters for each measure marked.

Exa H : Single Harmonics

Parameters		L1	L2	L3	Σ	Management
Harmonic Analysis	H Voltage	•	•	•		Value (H01), % (H02-H51)
	H Current	•	•	•		Value (H01), % (H02-H51)

(1) Calculation with FFT method of the amplitude and phase harmonics up to the 51st for the 3 phase voltages and the 3 phase currents (accumulated for 10 periods).

Measure Harmonics up to the 51st order

The Exa H display the individual harmonics up to the 51st order of the 3 phase voltages and the 3 phase currents. The harmonics are calculated with the FFT method in amplitude and phase.

Phase sequence

On the three phase voltages and the frequency menu page, is displayed also the phase sequence, the correct one is L132.

Ethernet and/or serial RS485 communication

The **Exa H** are equipped with a 10/100 Base-TX **Ethernet** (RJ45) Auto-MDIX port for "http" communications (instantaneous measurements and memory logs) and "Modbus over IP" (instantaneous measurements only). They are also equipped with an **RS485 serial port** (Master or Slave depending on version) with overvoltage protection, for "full compliant" Modbus-RTU communication (instant measurements) and the processed data are read as numeric registers composed of mantissa and exponent in IEEE format. The communication speed of the configurable RS485 port reaches up to 115.200bps with max. 125 records that can be requested (equal to about 62 parameters) without waiting times between two requests.

Versions of Exa D6 RJ45 and Exa Net D6

- Basic: no inputs and outputs;
- 1DI 2DO Self-Powered: 1 self powered digital input and 2 digital outputs rated at 250V 100mA;
- 2AO 4-20mA: 2 analog self-powered 4-20mA outputs for loads up to 250 ohm, power supply needed for higher loads;
- 2DI 1RO Self-Powered: 2 self-powered digital inputs and 1 relay (24VDC);
- 2RO24VDC: 2 relay outputs (24VDC);
- 4DI: 4 digital inputs;
- 4DO: 4 digital outputs;
- 2DI 2DO: 2 digital inputs and 2 digital outputs;
- 2DI2DO 4COMMON(or 4DI or 4DO) con separate commons;
- 4AI: 4 analog inputs 0÷10V (4÷20mA);
- 4PT100 or 4PT1000 or 4NTC: for the relative sensors
- SI: for environmental sensors (T, H, L, P, etc);

Digital Inputs

The versions**.. 1DI o 2DI o 4DI** are equipped with an optically insulated digital input with programmable filter for input glitches that is normally used for pulse count of, example, water meters, gas meters (insulation to meet the ATEX requirements), water meters, quantity count, etc. For the 1DI or the 2DI 1RO the max sampling frequency is 100Hz (5ms), while for the 2DI 2DO and the 4DO 500Hz (1ms). Other user selectable operative modes are ON/OFF state input (example for reading the ON/OFF state of machines and switches) and tariff change input (example for day-night tariff changeover). The digital input requires an external 10-30Vdc power supply.

The **..1DI 2DO Self-Powered** and **..2DI 1RO Self-Powered** versions instead are provided with self powered digital inputs.

Analog Inputs and PT100 or PT1000 or NTC

The **.. 4AI** version is equipped with 4 analog inputs rated at -10÷10V (compatible with 0÷10V, 0÷5V, -5÷5V, 4÷20mA at 200 ohm). While the **.. 4PT100** or **4PT1000** or **4NTC** versions have 4 independent inputs for the relative sensors.

Inputs for environmental sensors

The **SI** version is equipped with an I^2C Sensor Bus to connect several sensors with various combinations (eg up to 8 parameters between temperature and relative humidity or 1 for temperature, 1 for relative humidity, 1 for brightness and 1 for air pressure). The max. total distance of the Sensor Bus is 20m.

Relay outputs

The 2DI 1RO Self-Powered and .. 2RO 24Vdc versions are equipped with one and two relay outputs, respectively, with changeover contact max 30V max 2A (resistive load).

Digital outputs

The **.. 2DO o 4DO** versions are equipped with two optically insulated transistor outputs rated 27 Vdc 27 mA according to DIN 43864 standards. The outputs may be set for the transmission of pulses or alternatively configured as outputs of the internal alarms (see Alarms) or as remote output devices controlled via serial line and Modbus commands.

The **1DI 2DO Self-Powered** version instead is equipped with two opto-mos outputs rated at max 250V 100mA AC/DC.

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Internal alarms

The versions **.. 2DO** or **4DO** or **1RO** or **2RO** are equipped with outputs which can be related to the internal alarms. Each alarm can be linked to any one of the parameters available, for example, either as a minimum and/or as a maximum. All the alarm outputs can be linked to the same parameter in order to have more alarm thresholds. It is possible to set a delay on the activation / deactivation of each alarm (from 1s to 99 min), the hysteresis (% of the threshold value) and the polarity of the output contact (NA, NC, except for the **1RO** which is always NC). The alarms state information is always available on serial communication as Modbus "*coils*". Due to the numerous combinations available, only a part of them are programmable by keyboard while are entirely programmable from the Web page or the Energy Brain software.

Analog outputs 4-20mA and / or 0-10V

The .. **2AO4-20mA** version is equipped with 2 galvanic insulated analogue outputs 4-20 mA or 0-20 mA providing an extremely high accuracy and signal stability. The outputs are active for resistor loads up to 250 ohm, for higher loads an external power supply (12Vdc) will be needed (up to 750 ohm). To transform the output into 0-10V, a 500 ohm resistor must be paralleled to the output. The outputs ensure a response time of max. 200 ms. Each output can be associated to any of the parameters.

Wi-Fi EDA and NFC (Near Field Communication)

The **Wi-Fi EDA** version (with a connector for an external antenna) communicates using the Wi-Fi network without the need to be connected to an Ethernet cable while the presence of **NFC** opens the possibility for the creation of specific APPs for mobile devices on the energy management.

Exa F H versions for Flexible Electrex TA (FACTS)

The **Exa F H** are equipped with current inputs exclusively for the Electrex Flexible split core current transformers FCTS (mV output and appropriate internal linearization in order to maximize measurement accuracy).
WARNING: Do not connect to these current inputs of CT with output in current (eg. ../1A or ../5A) because it may damage both the Exa F and the CT.
Selectable Full Scale independent from the internal diameter of the Flex CT used: 500A or 2.000A or 4.000A (8.000A on request). With calibrated and correctly installed flex CT, Class 1 accuracy (flexible CT + Exa F) between the full scale of current and its 1/100. Minimum measurable current around 2% of the full scale. The accuracy of the measurement is influenced by several factors including the correct positioning that may cause a +/- 3% difference.

FCTS 070-500 Flexible split CT, internal diameter 4 cm
FCTS 120-1000 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

Astronomical Clock Calendar

Exa H is 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.
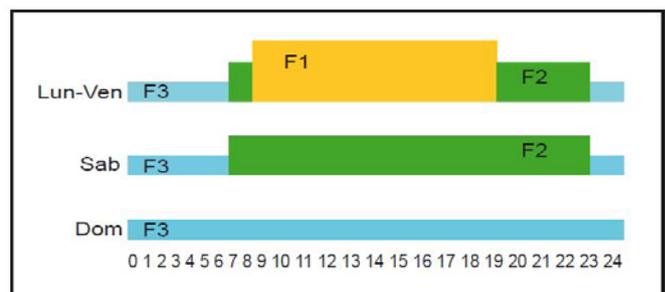
16:41
Thu 10/11/2016

System clock	
UTC time	Thu 10 Nov 2016 15:41:23
Local time	Thu 10 Nov 2016 16:41:23
UTC offset	+01:00
DST offset	+00:00
Next DST change	Sun 26 Mar 2017 02:00:00
Easter day	Sun 27 Mar 2016
Day begin	07:07
Day end	16:55
Solar noon	12:01
Day duration	9:48
NTP synchronization state	Synced!
Next NTP synchronization	Thu 17 Nov 2016 08:49:55

Operating time

With appropriate programming, the **Exa H** in addition to energy consumption / production is able to memorize four operating times both in relation to the exceeding of a threshold, for example the power, and based on the status of a digital input.

Tariffs TOU

Activating the Calendars and Energy Automation options and configuring the device in a proper way the **Exa net** can manage energy tariffs based on a calendar or on the digital inputs state.

Example of a 3 Tariffs system

Load profiles and consumption / production data

Exa H continuously stores the data of energy consumption / production and power by organizing them into separate daily files, containing the data necessary for the reconstruction of the load profile and the analysis of the trend of buying/selling of energy (downloadable via RJ45 port / Ethernet or Wi-Fi using Energy Brain software or via HTTP protocol).

Firmware and Special versions on request

The **Exa** can be provided also with other power supply or hardware versions and the firmware is upgradeable, remotely, at any time, in order to add and/or replace the existing characteristics with new and different functions.

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Expansions via ExpBus

Exa H is an evolutionary instrument capable to be adapted to the needs of the customer, even after the installation.
The system architecture is designed to allow the implementation on the field of hardware expansions thanks to the ExpBus, providing therefore to the customers the ability to modulate the investment and /or to respond to new needs.

UTP cable for the ExpBus (max 10m)	
VCC	Blue
Exp L	White & Blue
Exp H	Brown
GND	White & Brown

ExpBus

The **ExpBus,** configurable via the Ethernet port from Web pages:

- allows a multicast communication to 250kb/sec with collision management
- has a maximum length of 10 meters
- manages up to 8 nodes (modules) but technically it can manage up to 126

The connecting cable is a UTP where 4 wires are used:
  2 for the power supply at 9 Vdc
  2 for the bidirectional communication
The modules power the ExpBus
The cable must be connected in the in-out modality (multidrop) as for the RS485 Bus.
Each node must have an unique Modbus address

The **Exa H** is able to manage up to 16 ExpBus Modules.

ExpBus Modules suitable for Exa family

ExpBus Module D2

The *ExpBus Module D2* must be used with an external power supply of 24Vdc (e.g. Switching Power Supply D1 24VDC 400mA code PFTP100-Q2) and can contain up to 2 modules similar to the one shown here at the (of which, however, only one of the two types can be self powered, therefore only one for 1DI 2DO Self-Powered or 2AO4-20mA or 2DI 1RO Self Powered). Configuration via Web page. Max. weight 45 gr.

ExpBus Module D4

The ExpBus Module D4 have a built-in 230Vac power supply (other power supply version on request) and can contain up to 2 modules also self-powered. Configuration via Web page. Max. weight 100 gr..

UTP cable for the I2C Bus (max 20m)	
VCC	Orange
SCL	White Orange
SDA	Green
GND	White Green

ExpBus Module catalog codes

Type	Code
ExpBus Module D2 24VDC 4DI 4DO	PFAB20E-N5P
ExpBus Mod. D2 24VDC 2DI 2DO 2AO4-20mA..	PFAB20E-Q56
ExpBus Mod. D2 24VDC 4AI 2DI 2DO................	PFAB20E-R5Q
ExpBus Mod. D2 24VDC 2DI 2DO SI..................	PFAB20E-Q5T
ExpBus Mod. D4 230V 4DI 4DO	PFAB40E-N2P
ExpBus Mod. D4 230V 2DI 2DO 2AO4-20mA.....	PFAB40E-Q26
ExpBus Mod. D4 230V 4AI 2DI 2DO	PFAB40E-R2Q
ExpBus Mod. D4 230V 2DI 2DO SI	PFAB40E-Q2T

Other versions of ExpBus Module

Description	Code
ExpBus Module D2 versions (2 DIN rail modules):	
ExpBus Module D2 24VDC 4DI 4DO	*PFAB20E-N5P*

Possible hardware combinations with 1 or 2 modules (of which, however, only 1 can be a self-powered type, e.g. only one 1DI 2DO Self-Powered or 2AO4-20mA or 2DI 1RO Self Powered module). Requires external power supply 24Vdc: Switching Power Supply D1 24VDC 400mA…..PFTP100-Q2

ExpBus Module D4 versions (4 DIN rail modules):
ExpBus Mod. D4 230V 2DI 2DO 2AO4-20mA *PFAB40E-Q26*
Possible hardware combinations with 1 or 2 modules also self-powered type.
Internal power supply 230Vac or other power supplies on request, see building code diagram below.

BUILDING CODE: .... PFAB 4 0 E – N 2 P
PFAB = External modules
Dimension in DIN modules: **4** = 4 modules
                                            2 = 2 modules
Bus Type: .... **E** = ExpBus
Internal modules*:........................Characters for code:*
No module..*0*
Module 2DI 1 RO Self Powered *2*
Module 2RO24VDC *5*
Module 2AO4-20mA *6*
Module 2RO230V *8*
Module 1DI 2DO Self Powered ....*E*
Module 4DI ....*N*
Module 4DO ....*P*
Module 2DI 2DO ....*Q*
Module 4AI ....*R*
Module SI *(Sensors bus* I^2C)...............................*T*
Module 4PT100 ....*U*
Module 4PT1000 ....*X*
Module 4NTC...*Y*
Power Supply:
24Vdc +/- 10% *only for Module* D2 ....*5*
230Vac +/- 10% *only for Module* D4 ....*2*
15÷36Vac/18÷60Vdc *only for Module* D4..............*8*
9÷24Vac/ 9÷36Vdc *only for Module* D4...............*7*

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Memory Management and on request versions with Power Quality Analysis

The **Exa H** family manages the 128MB flash memory in a flexible way for recording various storage and event log services. Each storage service can contain a maximum of 255 files and is characterized by a predetermined sampling frequency; The number of channels (eg instruments) that can be stored for each service depends on the activation Puk purchased and the amount of free memory. The configuration and display pages for both standard and customized pages also reside in the memory. **On request** it is possible to evolve from the **Exa H** to the **Exa PQ** purchasing the relative **Upgrade (PUK)** Code **PFSU940-81**. From the **Exa PQ** version, the memory is also used for recording events and for measurement campaigns. The memory can be read by an **Ethernet** or Wi-Fi port using the Energy Brain software and / or HTTP protocol.

CURVES OF STORED PARAMETERS

The **Exa RJ45 H** and the **Exa net H** store the consumption / production data continuously, organizing them into daily files composed of a default of 96 quarters of an hour.

The stored data can be viewed by day, week, month and year using the Energy Brain software:
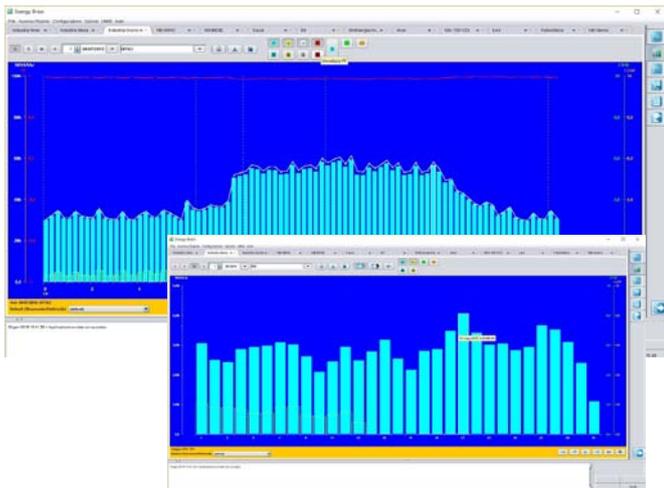
'PQ' VERSIONS ON REQUEST:

POWER QUALITY (Class S - EN 61000-4-30): Events Log

The instrument **Exa RJ45 PQ** detects and logs 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**

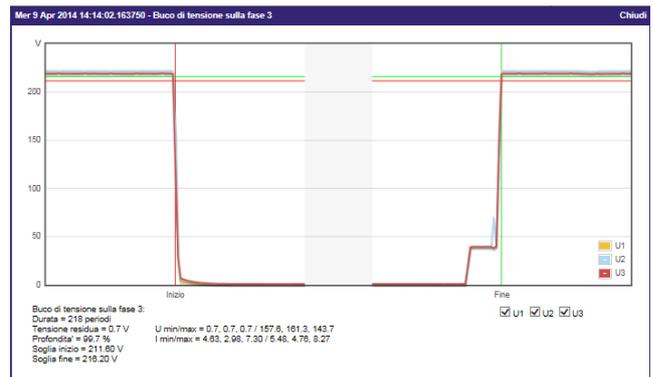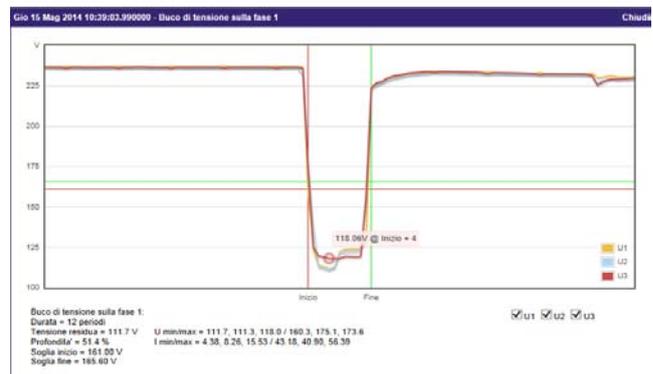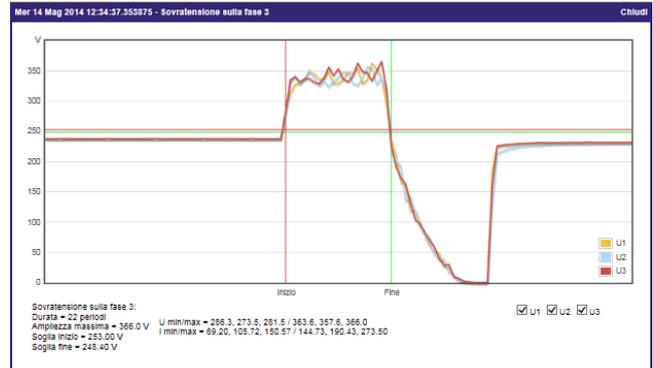| Data/ora	Evento	Fase	Durata [o:m:s.us]	Durata [periodi]	Valore [V]	Classificazione UNIPEDE
2014-05-12 16:15:10.986375	Avvio logger	---	---	---	---	-
2014-05-14 12:34:37.353875	Sovratensione	1	0:00:00.440250	22	363.6	S1
2014-05-14 12:34:37.353875	Sovratensione	2	0:00:00.440250	22	357.6	S1
2014-05-14 12:34:37.333875	Sovratensione	3	0:00:00.440250	22	366.0	S1
2014-05-14 12:34:37.854250	Buco di tensione	1	0:00:00.360125	18	0.2	X2
2014-05-14 12:34:37.854250	Buco di tensione	2	0:00:00.380250	19	0.3	X2
2014-05-14 12:34:37.874250	Buco di tensione	3	0:00:00.360250	18	0.2	X2
2014-05-14 12:34:38.054375	Interruzione	3	0:00:00.160000	8	0.2	-
2014-05-14 12:34:38.074375	Interruzione	1	0:00:00.140000	7	0.2	-
2014-05-14 12:34:38.074375	Interruzione	2	0:00:00.140000	7	0.3	-
2014-05-15 10:39:03.990000	Buco di tensione	1	0:00:00.240125	12	111.7	C2
2014-05-15 10:39:04.010000	Buco di tensione	2	0:00:00.220125	11	111.3	C2

Elementi: 33

(*)Date/hour expressed in hours, minutes, seconds and milliseconds referring to the instruments' (local time).

EVENT'S GRAPHIC DETAIL (EXA NET PQ)

In the **Exa net PQ Web Charts**, in addition to the list of events on the web page, also visible with the Exa net PQ Web

Data/ora	Evento	Fase	Durata [o:m:s.us]	Durata [periodi]	Valore [V]	Classificazione UNIPEDE
2014-05-12 16:15:10.986375	Avvio logger	---	---	---	---	-
2014-05-14 12:34:37.353875	Sovratensione	1	0:00:00.440250	22	363.6	S1
2014-05-14 12:34:37.353875	Sovratensione	2	0:00:00.440250	22	357.6	S1
2014-05-14 12:34:37.353875	Sovratensione	3	0:00:00.440250	22	366.0	S1
2014-05-14 12:34:37.854250	Buco di tensione	1	0:00:00.360125	18	0.2	X2
2014-05-14 12:34:37.854250	Buco di tensione	2	0:00:00.380250	19	0.3	X2
2014-05-14 12:34:37.874250	Buco di tensione	3	0:00:00.360250	18	0.2	X2
2014-05-14 12:34:38.054375	Interruzione	3	0:00:00.160000	8	0.2	-
2014-05-14 12:34:38.074375	Interruzione	1	0:00:00.140000	7	0.2	-
2014-05-14 12:34:38.074375	Interruzione	2	0:00:00.140000	7	0.3	-
2014-05-15 10:39:03.990000	Buco di tensione	1	0:00:00.240125	12	111.7	C2
2014-05-15 10:39:04.010000	Buco di tensione	2	0:00:00.220125	11	111.3	C2

Elementi: 33

the "graphical detail of the event" function is activated, which allows you to record and display the trends of the start and end of the event on a web page with a time window (both for the beginning and for the end) of a second (programmable).

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Exa Net D6 H ed Exa Net 96 H
Energy analyzer & wi-fi web data manager

EVENTS TIMELINE AND THE UNIPEDE TABLE

The **Exa net PQ Web Charts** can display a timeline of the succession of events

and maintains 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 (International Union of Producers and Distributors of Energy).

Example: in the last column of the table here below , the S1 denotes a Voltage Swell with a duration between 10 and 500 mS (refer to the UNIPEDE table above),while the X2 denotes a Voltage Dip lower than 5% of the nominal voltage value with a duration between the 10 and 200 mS (refer to the UNIPEDE table above).

MEASUREMENT CAMPAIGN

In the **Exa PQ** 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. Data logged: U, I per each phase (per each parameter will be logged the nominal value and the % value of the fundamental; while the % value for the 3°,5°,7°,9° harmonic and THD). The data can be displayed using Energy Brain software.
Example of a daily measurement campaign of the 3 currents:
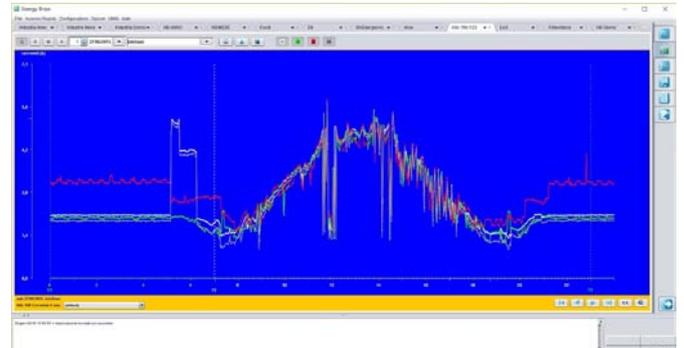
With the **Exa net PQ Web Charts** it is possible to display on the web interface the measurement campaigns.
Example of a daily measurement campaign of the 3 voltages every 15 seconds:
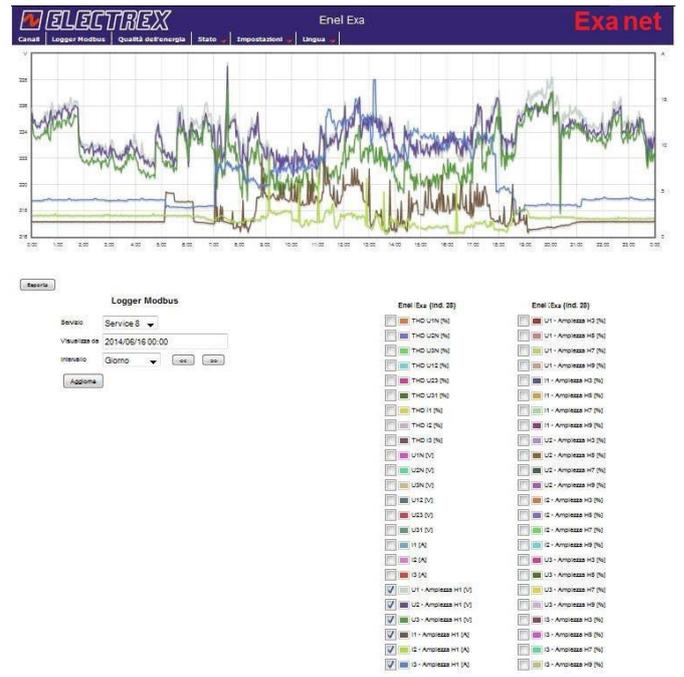
FUNCTIONAL LOG

The instrument's memory is used also for other operative functions such as:
- Functional log for the recording of all the operations that alter the functioning of the instrument since the first use.
- Tariff Calendar file for the management of the tariffs and other files for memory configuration.

Considering the quantity and the complexity of the data contained in the memory, the memory management and the configuration of the services can be made exclusively via Ethernet port or Wi-Fi using FTP and HTTP commands, more simply by using Web pages and/or the software Energy Brain.

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Exa net H Web

Energy Analyzer & (Wi-Fi) Web Data Manager

Main functions of the Exa net H Web

The **Exa net H Web** in addition to having all the features of the Exa RJ45 H is also a WEB Server for the configuration of itself and the tools in the subnet via WEB Browser. "Http" communication for instant measurements and memory logs.

FTP server for file transmission.

Modbus-TCP server with bridging function between Ethernet network (Modbus-TCP protocol for instantaneous measurements) and RS485 line and referee function between Ethernet port (optional Wi-Fi) and ExpBus expansion bus.

Clock synchronization via NTP server.

Static or dynamic IP address (DHCP protocol).

It is possible to evolve from the **Exa RJ45 H** to the **Exa net H Web** by purchasing the corresponding **Upgrade (PUK)** Code **PFSU940-84**.

The **Exa net H Web** records the trend over time of the energy / environmental data parameters acquired by Electrex instruments (also called channels) connected to its RS485 port. It has a Log 8 service for storing, typically every quarter of an hour, energy / environmental data (for example, the Exa net plus 7 instruments in RS485 subnet). Each service is characterized by a single time base (sampling frequency).

Enabling other functions via PUK codes

In the Exa net H Web you can implement the following functions by ordering the Net upgrades (PUK codes to be entered via the Web page).

Enabled - Net upgrade WEB (PUK) PFSU940-05

Enables the display of measures on web pages for the Exa Net itself and each instrument connected to its RS485 port.

Net upgrade Open WEB (PUK) PFSU940-10

Adds to the Exa Net the ability to upload and display custom Web pages that can be realized by the technicians who have carried out a specific course.

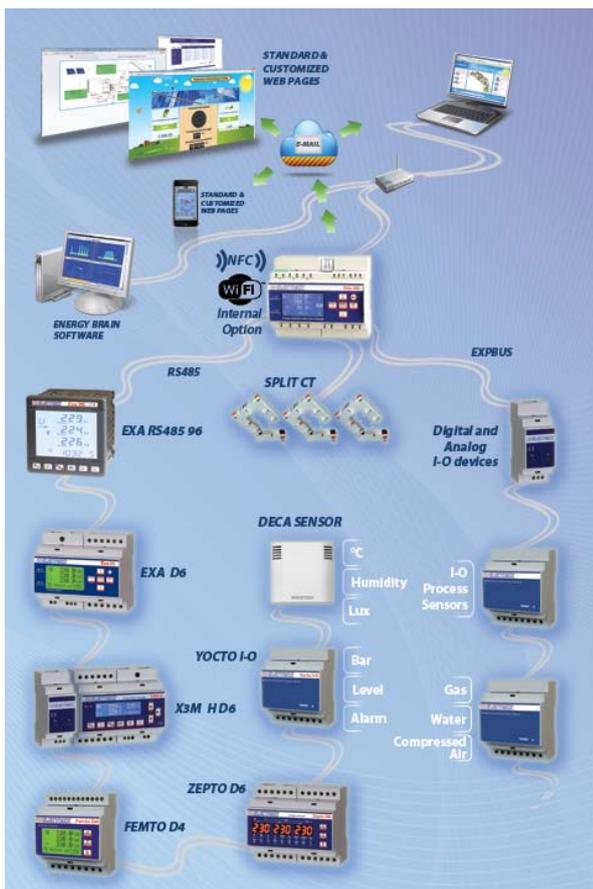### Enabled - Net upgrade Log 8 (PUK) PFSU940-01

Each Log 8 enables 1 logging service (e.g. log of 8 instruments/Modbus registers, power / energy just in import).

It is possible to activate up to 8 upgrade Log 8.

Net upgrade Open Log(PUK) PFSU940-25

Allows to modify the sampling frequency and the choice of parameters to be logged for an existing Log 8 service. The sampling duration will depend on the sampling frequency set (minimum 5s or 10s) and the number of parameters selected. The Log 8 services to be modified must already be active and if, for example, it is necessary to modify two Logs 8, two PUK Open Logs must be activated. For example, an Open Log can be activated to make a measurement campaign every minute for 10 days for the three phase voltages and the three phase currents both THD and the individual harmonics of 1st, 3rd, 5th, and 7th 9th order.

Net upgrade Charts (PUK) PFSU940-30

Allows to display on a web page charts, related to a programmable period of time, of electricity, temperature, humidity, luminosity, etc. obtained from the files stored in the Exa Net with the possibility to export to CSV files.

Net upgrade Energy Automation (PUK) PFSU940-16

Adds the ability to manage Energy Automation tasks using the Ladder programming language for implementing ON/OFF switches, alarm and notifications and automations related to events and/or calendars (the Calendars option must be active) and/or the sending of e-mail/sms (E-Mail / SMS option must be active).

Net upgrade Calendars (PUK) PFSU940-20

Allows to create calendars to be used for the time tariffs and / or in combination with the Energy Automation option (if active).

Net upgrade eMail PFSU940-15 (& Sms PFSU940-17)

Adds the function of sending notification / alarm emails (and/or SMS by adding a specific modem/router PFC3510 code with data SIM and activating the Puk). It can also be used in combination with the Energy Automation option (if active).

Net upgrade Sending Files – PFSU940-50

Adds the ability to send standard xml files (custom on request) through the function 'ftp report' or json strings through the 'http report' function. Additional costs for customizations. Requires activation of Energy Automation.

Net upgrade Net to Net Master (PUK) PFSU940-86

Transforms the Exa in **Exa Net Master** which is able to communicate with all the Electrex in the Ethernet network and their relative sub-nodes.

Net upgrade New Features – PFSU940-40

Upgrade to new versions of the firmware of the Exa Net adding new features.

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Monitoring network example for the Tertiary sector

The figure on the side shows a part of the monitoring network of a supermarket (but it could be a **metalworking workshop**, a **dairy**, an **office building** or **another activity with Low Voltage supply**).

In this specific case, the monitoring system consists of a branch. The Exa net D6 in addition to monitoring the pick-up point is the system head for the instruments in the sub-network that control the most energy-intensive loads (the Exa D6 RS485 instrument for the refrigeration units and the relative energy quality, the Exa TR D6 for the air conditioning system, others not shown for the loads and lighting and the RS485 Module for alarms In the RS485 network there is also a Deca Coordinator RS485 E-Wi 868 that via radio E- Wi controls the temperature and the brightness level in several points of the building thanks to the Deca Sensor E-Wi 868 TH Battery.

The supermarket manager uses Energy Brain software to monitor energy consumption trends while alarms due to anomalies and instantaneous measurements on Web pages are useful for maintenance personnel.

Production plant energy monitoring solution example

The diagram shows a part of the monitoring network of a production plant that is powered by Medium Voltage and is equipped with 2 MV / LV transformers (one of which recently replaced) that serve as many production lines, while the offices have a supply in Low Voltage. The monitoring system consists of branches 1 and 2 to monitor the Trafo and a part of the production lines, while branches 3, 4, 6 and 7 take care of the building with the offices, the testing department, a Photovoltaic on the roof and R & D building. These branches are connected to the company Ethernet network via the Kilo net D6 PQ (branch 1), the Lyra ECT net (branch 3) and the Yocto net D6 Master (branch 6) and via Wi-Fi the Kilo net Wi-Fi EDA 96 PQ (branch 2) and the Femto 4Hall net Wi-Fi EDA D6 DC (branch 5). The various instruments and sensors inserted in each branch are responsible for monitoring the relevant main users.

- In **branch 1** the Kilo net D6 PQ (gateway and datalogger) monitors the **quantity and quality of the energy** under the Trafo 1 and the Exa 96 RS485 in sub-grid Rs485 to the Kilo net controls a machining center, while the Femto 96 is equipped with digital inputs in addition to taking care of lighting consumption counts gas and water. The RS485 Module detects some parameters from existing analogue probes.

- In **branch 2** the Kilo net Wi-Fi EDA 96 PQ (gateway datalogger) monitors the quantity and quality of the energy under the Trafo 2; one of the

several Exa D6 RS485 in sub-network Rs485 at Kilo 96 detects a compressor while the Exa MID D6 is used to **de-tax** the energy of a galvanic processing. The ExpBus module connected to the Kilo net 96 deals with alarms and counting. There is also a Femto D4 ECT for monitoring an area with **LED lighting**. In Kilo net 96 the Energy Automation was activated to automate and make more efficient the switching on and off of three **compressors** by piloting the digital outputs of the same number of Exa D6 RS485.

- In **branch 3** that starts from the technical room there is a Lyra ECT net (gateway datalogger) that takes care of the general lighting of the offices with in Rs485 sub-network an Exa F D6 Rs485 TA opening flexible (easier to insert) for the desk testing of large engines and an Exa TR D6 for testing smaller engines.

- In **point 4** there is a Deca Coordinator E-Wi 868 that acts as an E-Wi 868MHz radio gateway for a Deca Sensor E-Wi 868 that detects the environmental parameters of a laboratory. The Deca Coordinator is connected in RS485 to the Yocto net Master which acts as the datalogger of the branch.

- **Branch 5** deals with continuous side monitoring (Femto 4Hall net DC, Femto D4 DC and Atto D4 DC) of a 50kWp photovoltaic system placed on the roof of the building.
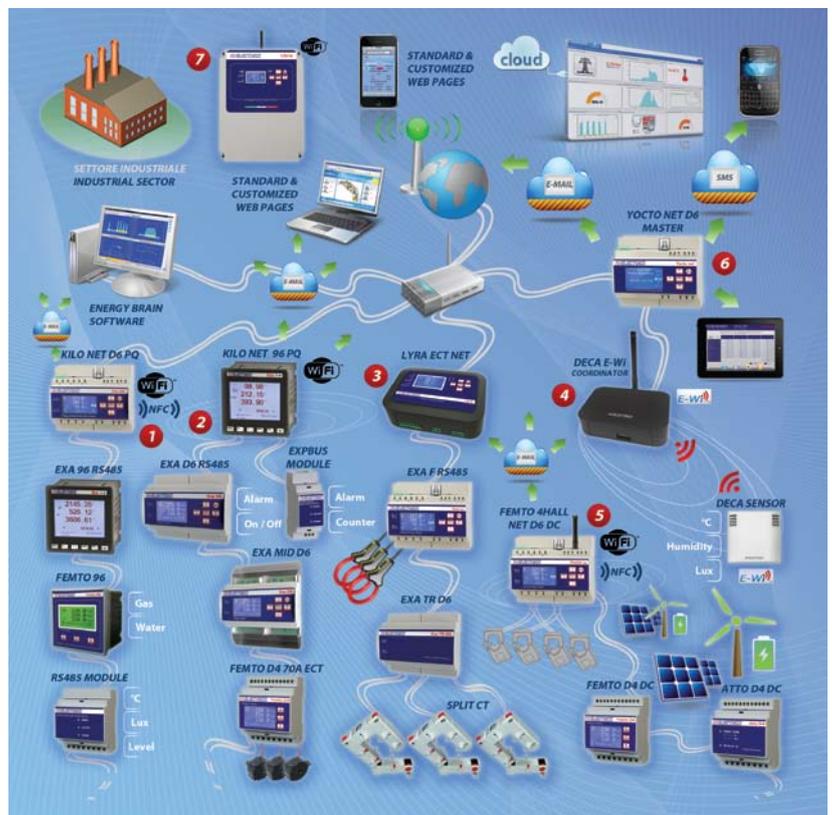
In the Ethernet network, the Yocto Net D6 Web Master, **branch 6**, has enabled customized web pages (including those of the **HVAC**) to display the supervision pages on the PCs, tablets and smartphones of the managers and maintainers as well as sending **alarms** via eMail to warn in case of anomalies.

To monitor the Research & Development building across the street, a Libra (quick to install) panel was used connected to a router with data SIM, **item 7**.

The Energy Manager uses his Notebook both when it is in the plant (locally) and when it is out (remotely), to connect to the company Lan network and evaluate the effectiveness of energy efficiency interventions through data that Energy software Brain PRO periodically downloads from Electrex devices. Recently, in order to continuously improve in terms of energy efficiency (**ISO 50001**), the Energy Manager has also involved in the Energy Management System the department managers, making available their consumption data that can be viewed from a PC, tablet and smartphone at any time via the Energy Brain Cloud which is also active in the **Control Room**. The management is implementing different levels of interconnection (hardware and software) with a view to **Industry 4.0.**

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Example of a standard web page – PFSU940-05

Enabling the 'Net upgrade WEB' functionality it is possible to view the standard web pages displaying real-time measurements, the average values and the energy counters both of the internal instrument and of every instrument connected in the RS485 sub-network to the Exa Net. In the example on the side there is the page with the instantaneous measurements and below that with the total and partial energy meters (and the 4 operating times) related to the general supply of a laboratory with offices.

Example of custom web page – PFSU940-10

Enabling the 'Net upgrade WEB open' functionality it is possible to insert in the memory of the Exa Net some custom web pages. On the side there is an example of the visualization of all the parameters measured in a heating plant composed of two heat pumps, a gas boiler, a storage tank and the valves for the heating or cooling management of various departments. It is then possible to connect to the detail sub-pages through the links inserted in the synoptic. The pages that reside on the web server of the Exa net are easily reachable from the browser of any PC, smartphone, etc., by typing in the IP address and password.
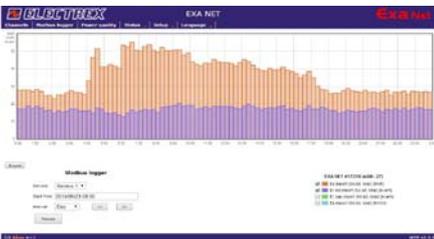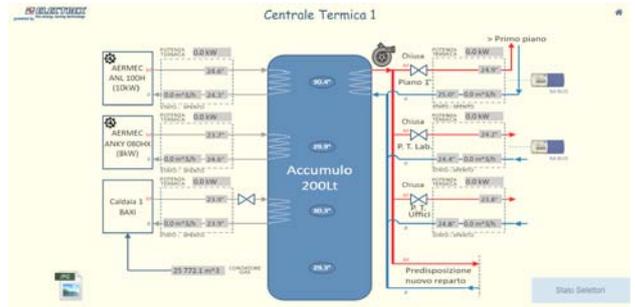
Example of web chart – PFSU940-30

Enabling the 'Net upgrade Charts' option in the Exa Net log it is possible to display on a web page, charts obtained from the files stored in the same Exa Net log. In the examples, the first chart shows the load profile for each 15 min. of active and reactive energy consumed in a shopping mall, but in the same way it is possible to visualize consumption / production graphs of energetic parameters (for example gas and water) and environmental parameters (for example temperature and brightness).

Example of a measurement campaign – PFSU940-25

By enabling the PUK 'Net upgrade Open Log' in a Log 8 storage service active in the Exa net, it is possible to make measurement campaigns with any parameters acquired by the Electrex devices connected to it and with a chosen sampling time. The example shows a campaign to measure the three voltages and three currents every minute.
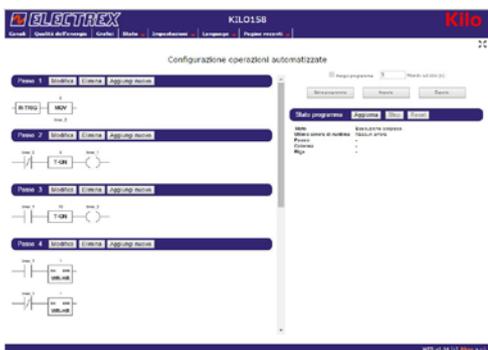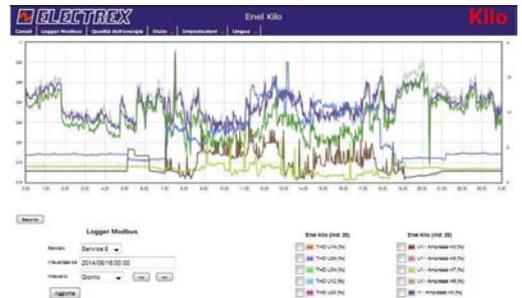
Example of Energy Automation – PFSU940-16

Enabling the 'Net upgrade Energy Automation' option it is possible to automate even complex operations such as power on / off, alarms / alerts and operations triggered by events. The programming of the logic is in Ladder language. It is possible to combine the programming features also with customized calendars (if implemented Upgrade Calendars option) and / or with the sending of e-mail / SMS (if implemented Upgrade E-Mail / SMS option).

Net upgrade Calendars – PFSU940-20

Enabling the 'Upgrade Calendars' option it is possible to configure Calendars to be used for e.g. for tariffs and/or combined with the Energy Automation option for scheduled tasks of power ON/OFF. The astronomic type clock is synchronized via NTP server (connection via Internet or to an internal LAN one).
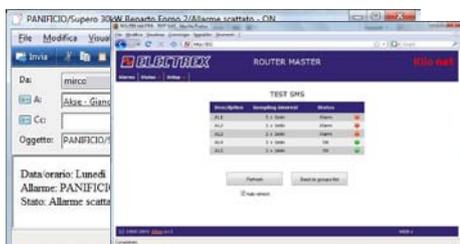
Example of an e-mail alarm - PFSU940-15 (SMS - PFSU940-17)

Enabling the 'Net upgrade eMail' function, it is possible to configure the Exa net Web to send notification / alarm emails both in relation to the exceeding of the threshold of a measured parameter and in relation to the situation of an input. With the appropriate Modem Router it is also possible to send SMS by enabling the relative PUK. The example shows the alarm email of a department in a bakery and a graphical display on the specific web page of the Exa net Web.

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Net upgrade Net to Master Version – PFSU940-86

Implementing this option the Exa net Web becomes a Master device capable of communicating with all the Electrex gateways and devices connected to the same Ethernet network (LAN or WAN). The option is very useful in case of customized web pages displaying measurements/alarm status from different nodes of the network or when a single public IP address is given for a multitude of gateways present in the network.

Immissione codici di attivazione opzioni
Codice
Opzioni abilitate   Server Modbus/TCP (opzione NET)
                           Client Modbus/TCP (opzione MASTER)

Technical Specifications Exa H

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_Σ
Current THD .... THD-I_1, THD-I_2, THD-I_3, THD-I_Σ
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)
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 TOTAL and 3 PARTIALS: .... 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° ordine)
                  H_{I1}, H_{I2}, H_{I3} (1-51° ordine)
Load profile and consumption/production (via Ethernet port)
Calendar bands
Stored events (**Exa PQ** - EN 50160 e EN 61000-4-30):
        Voltage hole (sags / dips)
        Overvoltage and temporary peaks
        Temporary peaks of current and direction
        Voltage interruption
        overcurrent
        Event graph (programmable time)
        Event classification
Functional logs
Harmonic Measure Campaign (**Exa PQ**):   U and I

Electrical characteristics

Connection ....3-phase, 1-phase and 2-phase, LV,MV,HV
           balanced, unbalanced, 3- and 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
      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
For the Exa F Net versions suitable with Electrex flexible CT: max. 500/2000/4000A primary .../mV secondary
Power supply ....85÷265 Vac/100÷374 Vdc
      or others on request e.g. 15÷40 Vac/18÷60 Vdc
            or 9÷24 Vac/ 9÷36 Vdc
Power supply toward other modules, max:.....................5 VA
Self consumption……………………………………………< 2 W
Frequency:………………………………… 45-65 Hz

Front panel

Display...........................LCD, FSTN dot-matrix 128 x 64 points
.....................................(a-Si TFT 320x240, 24bit di colore)
Visible area HxL D6 (96)....................................22x44 mm (52,5x70)
Backlight ....White Led
Keyboard D6 (96) .... 6 keys keypad Joystick positioned
Calibration LED .... 2 red for the Ea and Er (1 forEa)
Functioning / State LED................. 1 red under the symbol 〜
Communication RS485 LED1 green and 1 red under the white band

Functional characteristics

Measurement.....................True-RMS up to the 51st harmonic
Quadrants................................ 2 or 4 quadrants (programmable)
Accuracy: ....
.... Active Energy: Classe 0,5S according to EN 62053-22
                  Class C according to EN 50470-3
.... Reactive Energy: Class 1 according to EN 62053-24
Sampling: ....at 8kHz of voltage and current waveforms
Compensation .... Automatic of the amplifiers' offsets
Insulation ....Galvanic on all the inputs and outputs
Standards: - Safety: ....IEC EN 61010 class 2
            - E.M.C.: ....IEC EN 61326-1A

Mechanical characteristics

Working temperature ....-20/+60 °C
Humidity... 95% R.H. non condensing
Enclosure....................Self-extinguishing plastic class UL 94 V0
Protection degree ...... Front panel IP40, IP20 (Terminals side)
Size Exa H D6 ....106,3 x 90,5 x 62 mm (6 moduli DIN)
Mounting Exa H D6...DIN rail
Terminals:...... screw connector cables max. section up to 4 mm^2
Weight ....about 260 gr. net

45 mm
62 mm
90,5 mm
106,2 mm
90,5 mm
62 mm
49 mm
32 mm

Size Exa 96..96 x 96 x 78 mm
Panel cutout... 92 x 92 mm
Terminals: ..plug-in connector (cables max. section up to 4 mm^2)
Weight   circa. 260 gr. Net

96 mm
91 mm
96 mm
80,3 mm

The Energy Brain 6.x and PRO 6.x software (to be installed on a PC, optional)

The Energy Brain software is used for the management of instrument networks, also very complex ones, 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, CO_2, etc.) and process parameters.
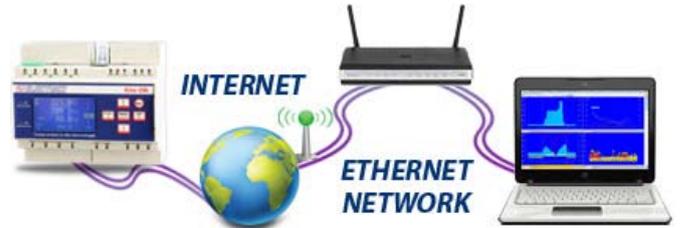
Main features

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, VT, 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.
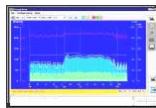
Parameters displaying

- 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 PostgreSQL® database.
- Export data to other DB via ODBC module or .txt or .xls format files.
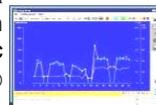
Tariffs

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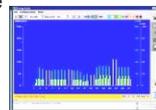
Virtual and Multiple Channels

- 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.
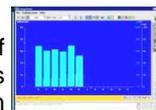
Other types of Energies / Measurements

- 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 Exa RJ45 or Exa Net

direct Ethernet Rj45 port, Wi-Fi, Ethernet network, Internet

The software Energy Brain PRO 6.x

- For more info on the additional functions found in the PRO 6.x version please refer to the Energy Brain software datasheet.

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

Energy Brain Cloud

Energy Brain Cloud is the software that allows to display and manage via a web browser, on a variety of devices such as PCs, tablets, Smartphones, data, measures and real-time and historical charts acquired by Electrex instruments.
Taking advantage of the technology of cloud computing, users can manage the data collected through a standard Internet browser without installing any software on their computer or mobile device.
Energy Brain Cloud can be used in three modalities:

1. Energy Brain Cloud is installed and managed directly by the end user of the Electrex monitoring networks

2. A third party (Energy Consultants, Energy Saving Company, associations, etc.). Installs and manages Energy Brain Cloud and makes available to its customers/members the access to their data as a service

3. Electrex provides to end users of the Electrex monitoring networks access to their data through Energy Brain Cloud as a service

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How to order Exa RJ45 and Exa Net

Type	Code
Exa RJ45 D6 H 85÷265V *PFNE6-1H709-0M0*	

The **Exa RJ45 H** o **Exa F RJ45 H** can evolve in **Exa net H Web or Exa F net H Web** by activating the following Upgrade (PUK):
Upgrade RJ45 to net Web version......................... PFSU940-84

Exa net D6 H Web Log 8 85÷265V *PFNE6-1H509-110*	

The **Exa net H Web** o **Exa F net H Web** can evolve in **Exa net Master H Web or Exa F net Master H Web** activating the following Net upgrade (PUK):
Net Upgrade Net to Master version PFSU940-86

Exa net Wi-Fi EDA D6 H Web Log 8 85÷265V	
.... *PFNE6-1HA09-110*	
Exa net D6 H Web Log 8 18÷60VDC *PFNE6-1H508-110*	
Exa net D6 H Web Log 8 85÷265V 2DI 2DO *PFNE6-1H5Q9-110*	

Exa F RJ45 D6 H 85÷265V *PFNE6-FH709-0M0*	
Exa F net D6 H Web Log 8 85÷265V *PFNE6-FH509-110*	
Exa F net Wi-Fi EDA D6 H Web Log 8 85÷265V	
.... *PFNE6-FHA09-110*	
Exa F net D6 H Web Log 8 18÷60VDC *PFNE6-FH508-110*	
Exa F net D6 H Web Log 8 85÷265V 2DI 2DO	
.... *PFNE6-F15Q9-110*	

The sequence of codes listed above is repeated for the **Exa 96** *(9 - the 5th digit of the code and 1 - the 7th digit of the code) and the* **Exa F 96** *(9 - the 5th digit of the code and F - the 7th digit of the code). For e.g.:*
Exa RS485 96 H 85÷265V *PFNE9-1H109-000*
Exa F RJ45 96 H 85÷265V *PFNE9-FH709-0M0*

The **Exa net** *and* **Exa F net** *can implement additional features in subsequent times after the purchase by activating the following Net upgrade (PUK):*
Net Upgrade Log 8 (PUK)...*PFSU940-01*
Net Upgrade Open Web (PUK)..*PFSU940-10*
Net Upgrade Charts (PUK) *PFSU940-30*
Net Upgrade Open Log (PUK) *PFSU940-25*
Net Upgrade Energy Automation (PUK)............................*PFSU940-16*
Net Upgrade eMail (PUK) *PFSU940-15*
Net Upgrade Sms (PUK) *PFSU940-17*
Net Upgrade Calendars (PUK) *PFSU940-20*
Net Upgr. Bundle En. Autom., Calendars, eMail (PUK) *PFSU940-22*
Net Up. Bundle En. Autom., Calendars, eMail, Sms (PUK) *PFSU940-23*
Net Upgrade Sending Files (PUK) *PFSU940-50*
Net Upgrade New Features (PUK)....................................*PFSU940-40*

Upgrade RJ45 to Net Web version (PUK).........................PFSU940-84
Net Upgrade Net to Master version (PUK)......................... PFSU940-86

Upgrade H to PQ version (PUK) – on request....................PFSU940-81

Electrex Flexible CT

Type	Code
FCTS 070-500 Flex Split Current Transformer *PFCF021*	
FCTS 120-1000 Flex Split Current Transformer *PFCF022*	
FCTS 200-2000 Flex Split Current Transformer *PFCF023*	
FCTS 280-4000 Flex Split Current Transformer *PFCF024*	

Other versions of Exa RJ45 and Exa Net

CODE	P	F	N	E		-								

Description	*Code*

BUILDING CODE .... *PFN E 6 - 1 H 5 0 9 - 1 1 0*

Family Exa = **E**

Dimension 6 modules DIN = **6**
Flush mount 96x96 = **9**

Current Input ../5A e ../1A = **1**
CT Flexible Split Core = **F**

Display of single harmonics = **H**

Communication ....
RJ45 .... **7**
Net **5**
Wi-Fi EDA..**A**

Internal module ....
No internal module *0*
Module 2DI 1 RO Self Powered *2*
Module 2RO24VDC *5*
Module 2AO4-20mA *6*
Module 1DI 2DO Self Powered.......... *E*
Module 4DI .... *N*
Module 4DO .... *P*
Module 2DI 2DO 4COMMON .... *D*
Module 4DI 4COMMON .... *B*
Module 4AI .... *R*
Module SI (Sensor Bus I^{2}C) .... *T*
Module 4PT-NTC .... *U*

Power Supply:..
85÷265Vac/100÷374Vdc **9**
15÷40Vac/18÷60Vdc **8**
9÷24Vac/9÷36Vdc **7**

NOT Master version...................................... -
Master .... **M**
Sending Files ....**F**
Master e Sending Files .... **N**

Additional functionality: ....
No additional functionality..................................... *0*
Functionality Web *1*
Functionality Web Charts....................................... *A*
Functionality Web Energy Automation.................... *5*
Functionality Web eMail.. *7*
Functionality Web Calendars................................. *8*
Fun. Web Energy Automation eMail Calendars..... *9*
Fun. Web Full (Charts Autom. eMail Calendars) ... *F*
Functionality Open Web *2*
Functionality Open Web Charts............................. *C*
Fun. Open Web Automation eMail Calendars....... *B*
Functionality Open Web Full................................. *D*

Log service for the internal analyzer .... **M**
N. of active Log 8 services (Net vers.)...**1 - 8**

Open Log for the internal analyzer
NO Open Log (*Net vers.*)........................... **0**
Net: N. of active Open Log .... **1 to 8**

Subject to modification without prior notice   Data sheet Exa D6 H and 96 H 2019 11 13-ENG

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