ELECTREX
the energy saving technology

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Pensato, progettato e prodotto in Italia

LOW ENERGY CONSUMPTION

Femto ECT D6 H e Femto 25A D D6 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

Femto ECT RJ45 D6 H is an Energy Analyzer & Data Manager with microprocessor (Cortex-M4 Dual Core) extremely versatile and precise designed to meet the most sophisticated applications of monitoring electrical parameters and electricity management in the tertiary, industrial, public and residential sectors. 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 (eg spot welders). The **Femto ECT D6 only work with the Electrex ECT Current Transformers**. The **Femto ECT RJ45 D6 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. It has a 128MB high capacity memory 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.

It is also equipped with an Expansion Bus, for the connection of digital and analog Input / Output modules, for environmental sensors and is equipped with NFC (Near Field Communication) technology.
Femto ECT net D6 H Web is an Energy Analyzer & Web Data Manager, the open platform connected to Ethernet / Internet via the RJ45 port (and Wi-Fi). 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.
The **Femto 25A D D6** measures directly the 'small' currents up to 25A without using external current transformers. It has the same features and expandability options of the Femto ECT D6.

Simplicity

Femto ECT D6 H and **Femto 25A D D6 H** are 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. The red LED pulsing under the ⊓ symbol by the Electrex logo indicates the functioning state. 2 additional LEDs positioned under the white band report instead the activity on the RS485 port. While for the Rj45 port the 2 built-in LEDs will indicate the Ethernet activity.
In order to reduce the energy consumption it is possible to configure the display's back-lighting and the LEDs in order to reduce consumption to the minimum.

Versatility

The **Femto ECT RJ45 D6 / Net D6** are suitable for LV, single phase systems (from 1 to 3 simultaneous measuring points), bi-phase, three phase 3- and 4-wires with various current full scales (e.g. up to 100A, 200A, etc.), while the **Femto 25A D** has the same insertions but for direct current inputs up to 25A. Both instruments measure over 2 and 4 quadrant (import/export). Configuration from the keyboard (and/or via Energy Brain software for also advanced operating parameters).

CEI EN 50470 and 62053-22

All versions of the **Femto ECT D6 H** and **Femto 25A D D6 H** meet the essential requirements of the standard CEI EN 50470-1 + 50470-3 as well as the 62053-22 as required for white certificates.

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Measures

Parameters	Type	L1	L2	L3	n	Σ	P(7)	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	•	•	•	•	•		20mA…100A … … (40mA …25A Direct)
	I MAX	•	•	•				
	I AVG THERM (1)	•	•	•				
	I MD THERM (1)	•	•	•				
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…100 GWh
	E a EXP (5)	•	•	•		•	•	
Reactive Energy	E r IND IMP (5)	•	•	•		•	•	0,1 kvarh…100 Gvarh
	E r CAP IMP (5)	•	•	•		•	•	
	E r IND EXP (5)	•	•	•		•	•	
	E r CAP EXP (5)	•	•	•		•	•	
Apparent Energy	E s IMP (5)	•	•	•		•	•	0,1kVAh…100 GVAh
	E s EXP (5)	•	•	•		•	•	
Pulse Counter	CNT (6)					•	•	
Analog Measure	(6)					•	•	

All the instantaneous measures are calculated mean over 10 cycles - eg: 200ms at 50Hz.
(1) Mean value over the integration time (1.. 60 min. program.) 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 max. average value.
(3) Import / Export max. power values.
(4) Lifetime counter (cannot be reset) and 4 partial 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) Three partial counters for each measure marked

Femto D6 H : Single Harmonics

Parameters		L1	L2	L3	Σ	Management
Harmonic Analysis	H Voltage	•	•	•		Valore (H01), % (H02-H51)
	H Current	•	•	•		Valore (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 **Femto D6 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 via RS485 communication

The **Femto D6 H** are equipped with a 10/100 Base-TX **Ethernet** (RJ45) Auto-MDIX port for "http" communications (instant 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 Femto ECT D6 H and Femto 25A D D6 H

- 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. The digital input is set to operate for external 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 4DI 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.

Environmental Sensors Inputs

The **..SI version** is equipped with a Sensor Bus I²C for connecting many sensors (up to 8 for the temperature and relative humidity or up to 1 for the temperature, 1 for the relative humidity, 1 for the luminosity and 1 for the air pressure). The max total distance of the Sensor Bus is 20 m.

Relay outputs

The **.. 2DI 1RO Self-Powered** and **.. 2RO** versions are equipped with relay outputs with changeover contact rated at 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 via serial port with 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 & NFC (Near Field Communication)

The **.. Wi-Fi** o **Wi-Fi EDA** versions (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.

Electrex ECT series current transformers

The **Femto ECT D6 H** use exclusively Electrex ECT series current transformers:

- **ECT TA 100A 13MM Power Quality Current Transformer** Code PFAE000-01: external CT for AC loads up to 100A. Plastic shell. Internal size 13 mm.

- **ECT CTS 16-100A Split Core Power Quality Current Transformer** Code PFAE000-02: external CT for AC loads up to 100A. Plastic shell. Equipped with a snap-on closing, screwless mounting system. Internal size 16 mm. Protection on the secondary circuit.

- **ECT CTS 17-200A Split Core Power Quality Current Transformer** Code PFAE000-03: external CT for AC loads up to 200A. Plastic shell. Equipped with a snap-on closing, screwless mounting system. Internal size 17 mm.

- **ECT CTS 36-400A Split Core Power Quality Current Transformer** Code PFAE000-04: Amperometric transformer which can be opened for alternating current up to 400A. Hole diameter 36x36 mm.

Load curves and consumption / production data

The **Femto D6 H** continuously log the data of 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 or via Http).

Astronomical Clock Calendar

The **Femto D6 H** 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.

| 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 counters

With appropriate programming the **Femto D6 H** can be configured in order to monitor and record not only the energy consumption/production but also the operating time of the load/device monitored considering as a trigger a threshold on the power or the status of a digital input.

Tariffs TOU

Activating the Calendars and Energy Automation options and configuring the device in a proper way the **Femto D6 H** can manage energy tariffs based on a calendar or on the digital inputs state.
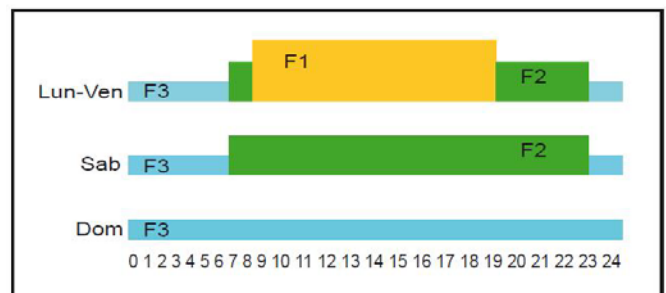
Example of a 3 Tariffs system

Firmware and Special versions on request

The **Femto ECT D6** 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

The **Femto ECT RJ45 D6** and **Femto ECT Net D6** are evolutionary instruments 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 **Femto ECT D6** manages up to 16 ExpBus Modules.

ExpBus Modules suitable for the Femto ECT D6

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 230-240Vac power supply (24Vdc 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*

How to order ExpBus Module

Description	Code

ExpBus Module D2 versions (2 DIN rail modules):
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):
Possible hardware combinations with 1 or 2 modules which can be 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 1DI 2DO *1*
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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Femto 25A D D6 H

For the monitoring of relatively small currents we have designed a specific version of Femto D6 with direct current input up to 25 Amp (requires no external current transformers). The direct connection versions are the **Femto 25A D RJ45 D6 H** and **Femto 25A D Net D6 H Web** that with the exception of the current input have the same features and expandable options available for the **Femto ECT D6 H**. In addition it is possible to upgrade, via the Upgrade PUK codes, from the **RJ45** to the **Net Web** version and from the **Net Web** to the **Master** version.

Data Memory Management and on request: versions for the quality of Electrical Energy

The **Femto D6 H** family manages 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. The configuration and display pages for both standard and customized pages also reside in the memory. **On request** it is possible to upgrade from the **Femto D6 H** to the **Femto D6 PQ** by purchasing the relative **Upgrade (PUK)** Code **PFSU940-81**. From the **Femto D6 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 **Femto D6 H** they store the consumption / production data continuously, organizing them into daily files composed of 96 quarters of an hour default.

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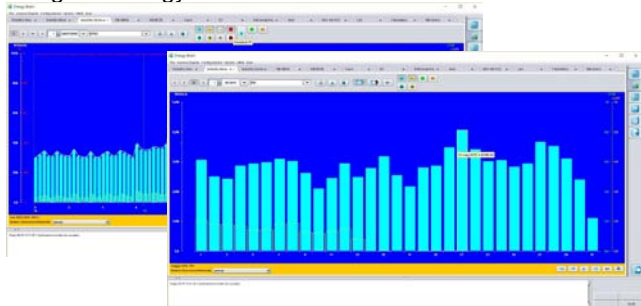
PQ VERSION ON REQUEST:

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

The Femto 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**

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

EVENT'S GRAPHIC DETAIL (FEMTO NET PQ)

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

includes 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).
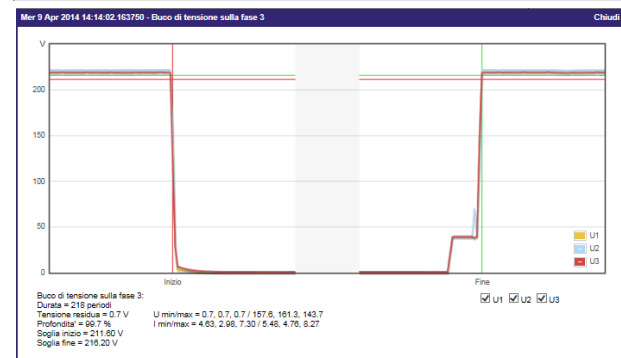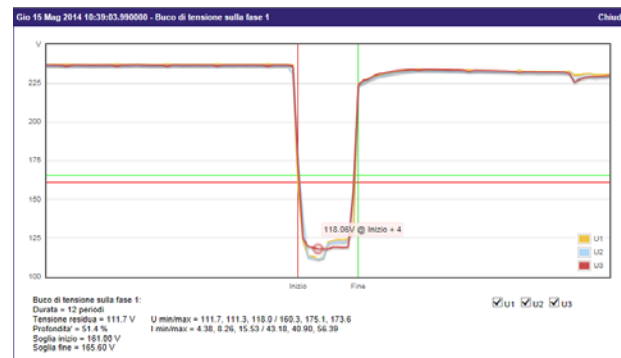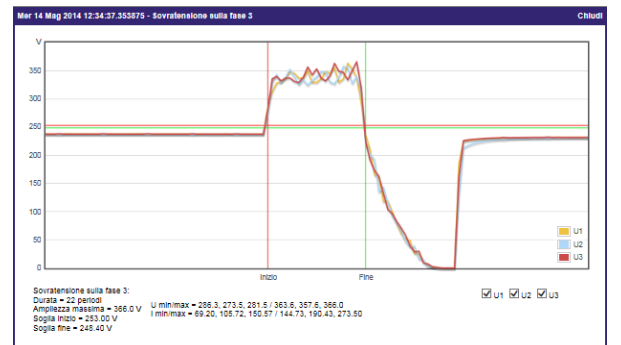
EVENTS TIMELINE AND THE UNIPEDE TABLE

The **Femto net D6 PQ Web Charts** can display a timeline of the succession of events

and maintain an event distribution scheme based on the percentage of the considered parameter with respect to its reference value and duration according to the dictates of the value and duration, according to the dictates of UNIPEDE (International Union of Producers and Distributors of Energy).

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

Example: in the last column of the events table reported below the wording S1 corresponds to an overvoltage with duration between 10 and 500 mS (see above Unipede Table - International Union of Producers and Distributors of Energy), while X2 corresponds to a voltage hole with voltage dropped below 5% of the rated voltage and duration between 10 and 200 mS (see above Unipede Table).

Data/ora	Evento	Fase	Durata [comcs.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 12:34:37.333875	Sovratensione	2	0:00:00.440250	22	387.6	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 12:34:37.074250	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 12:34:37.074375	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 10:29:04.010000	Buco di tensione	2	0:00:00.220125	11	111.3	C2

Elementi: 33

MEASUREMENT CAMPAIGN

With the **Femto D6 PQ** it is possible to configure the measurement campaign with recording in memory of various parameters with programmable sampling frequency. From the factory, every minute for 10 days (FIFO) is recorded with daily files, the 3 phase voltages and the 3 phase currents (for each electrical parameter, the fundamental and% of the third, fifth, seventh and ninth are stored in% harmonic and THD).
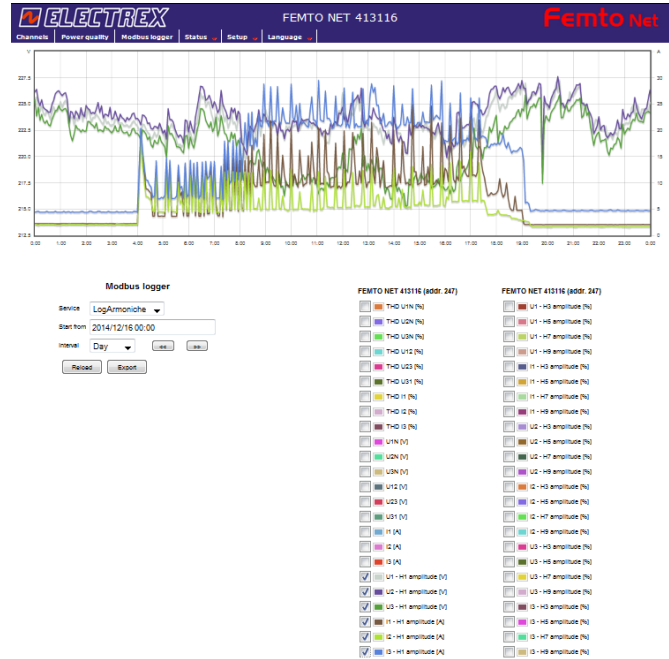Viewable via Energy Brain:
Example of a daily measurement campaign for currents:
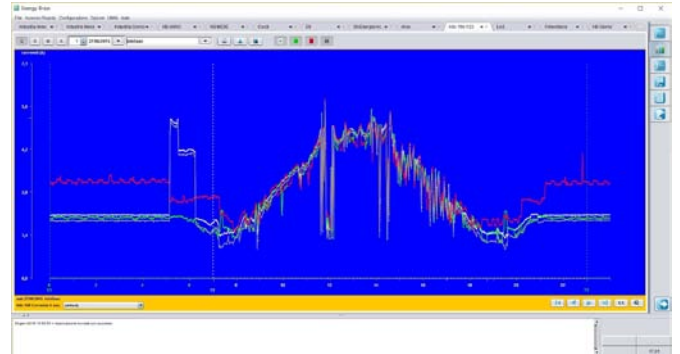
With the Femto net PQ Web Charts it is possible to view measurement campaigns on the web page.
Example of daily campaign of the three phase voltages every 15 seconds:

FUNCTIONAL LOG

The memory is also used for other operational functions of the instrument such as:

- Functional log with recording of all operations that alter the operation of the instrument from its birth.
- Calendar files for the management of tariff bands and other memory configuration files.

Given the amount and complexity of the data contained in the instrument memory, memory management and configuration of the various services are carried out only via Ethernet or Wi-Fi port using FTP and HTTP commands, more simply through web pages and / or software Energy Brain..

Femto ECT net H Web

Energy Analyzer & (Wi-Fi) Web Data Manager

Main functions of the Femto net D6 H Web

In addition to having all the features of the RJ45 H version, the **Femto net D6 H Web** is also a WEB Server for configuring 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 Femto RJ45 H** to the **Femto net H Web** by purchasing the corresponding **Upgrade (PUK)** Code **PFSU940-84**.

The **Femto 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).
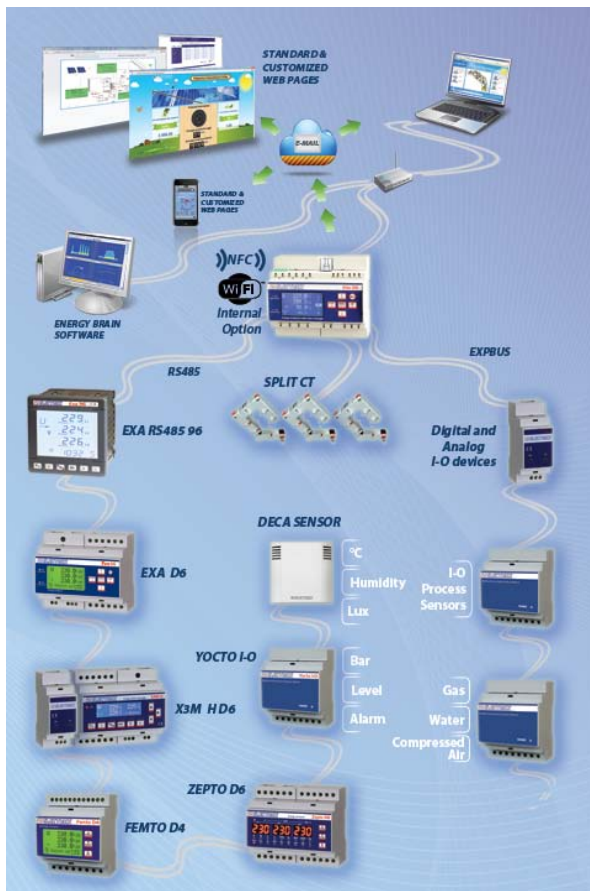
Enabling other functions via PUK codes

In the **Femto net D6 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 Femto ECT Net itself and each instrument connected to its RS485 port.

Net upgrade Open WEB (PUK) PFSU940-10

Adds to the Femto ECT Net the ability to upload and display custom Web pages.

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 for e.g. when performing a measurement campaigns. The sampling duration will depend on the sampling frequency set (minimum 5s or 10s) and the number of parameters selected. The Log 8 services must already be active and if, for example, it is necessary to modify two Log 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 Femto ECT 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)

Transforms the Femto ECT in **Femto ECT 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 Femto Net adding new features.

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Femto ECT D6 H e 25A D D6 H
Energy analyzer & wi-fi web data manager

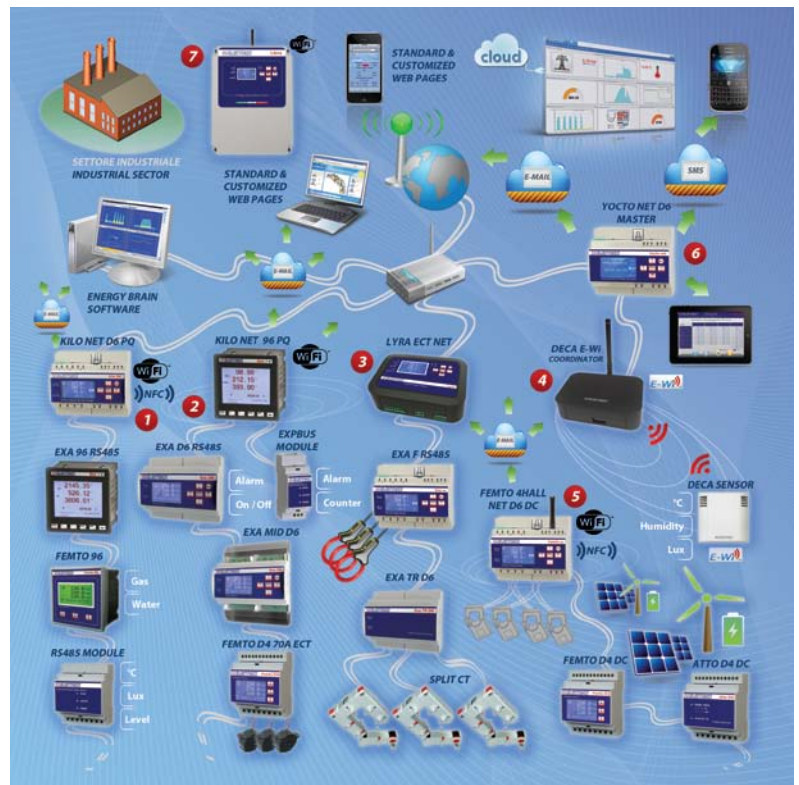## Monitoring network example for the Small Tertiary / Residential sectors

In the figure below shows a monitoring network of a **branch** (but it could be a **store**, a **villa or another business with low voltage supply up to 25kW three-phase**).

In the specific case, the monitoring system consists of a Femto ECT net with 3 TA ECT 100A to monitor the pick-up point under the three-phase tax meter and to act as system head and data logger for the instruments / devices connected in subnet that control the more energy-intensive loads including a Femto D4 ECT for 3 single-phase loads (air conditioning, driving force and lighting), the RS485 Module for counting pulses from the gas, water and calories counters and the Deca Sensor to detect the ambient temperature.

An Energy Brain Cloud software for monitoring the consumption of all branches is installed at the head office; the software administrator authorizes each branch manager to visualize the consumption and measures relating to his branch office via web browser (PC, tablet, smartphone). In case of anomalies, the system warns the administrator, the branch manager and the maintenance technician with an e-mail to manage the intervention.

Production plant energy monitoring solution example

The figure above 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 Femto ECT Net. In the example on the side are shown the page with the instantaneous measurements and below that the average values of the power and energy meters of a Femto ECT net D6 that measures the general supply of a laboratory with offices.

Example of custom web page – PFSU940-10

Enabling the 'Net upgrade WEB open' functionalities it is possible to activate a memory part in the memory of the Femto ECT Net where can be uploaded custom web pages. Alongside are reported an example of real time monitoring of the electricity, gas and water of a production plant with the possibility of setting thresholds and alarms. The main page is linked to second level pages for more details on each load/monitoring point. The pages residing on the web server of the Femto ECT Net are easily accessible from any the browser of a PC, Smartphone, etc., typing just the IP address and password.
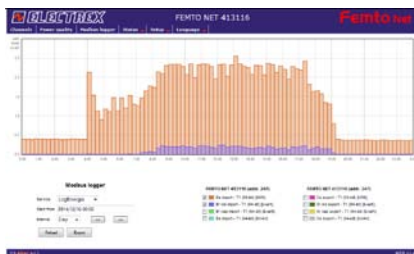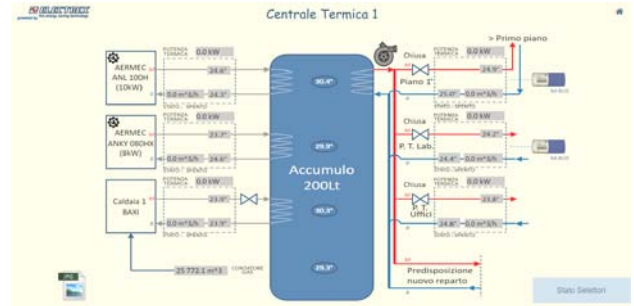
Example of Web chart – PFSU940-30

Enabling the 'Net upgrade Charts' option in the Femto ECT Net log it is possible to display on a web page, charts obtained from the files stored in the same Femto ECT Net. In the example the graph shows the quarter-hour trend of the active and reactive energy used in a building but in the same way it is possible to visualize consumption / production graphs of energy parameters (for example gas and water) and environmental (for example temperatures 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 Femto ECT net it is possible to carry out measurement campaigns with any parameters acquired by the Electrex devices connected to it and with a sampling time chosen. The example shows a campaign to measure the three voltages and three currents every minute.
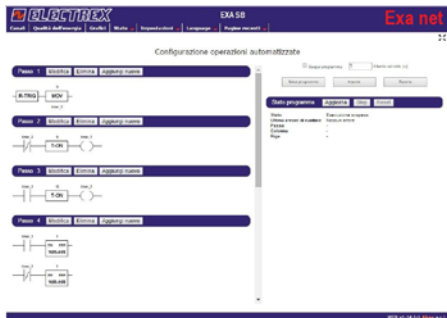
Example of Energy Automation – PFSU940-16

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).
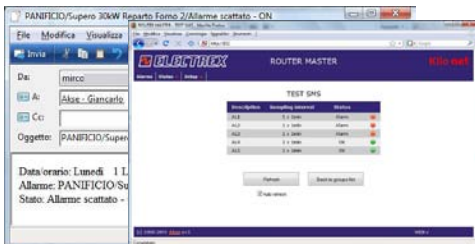
Example of an e-mail alarm - PFSU940-15 (SMS - PFSU940-17)

Enabling the 'Net upgrade eMail' function it is possible to configure the Femto ECT net 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 Femto ECT net.

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Net upgrade Net to Master Version – PFSU940-86

Implementing this option the Femto ECT 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, for example, when one or more personalized supervision web pages are required to display measurements and / or alarms from devices inserted in different Ethernet nodes and / or RS485 subnets or when a single IP address is required that can be reached from outside in the presence of a network of tools composed of multiple gateways.

Immissione codici di attivazione opzioni

Codice
Opzioni abilitate
✓ Server Modbus/TCP (opzione NET)
→ ✓ Client Modbus/TCP (opzione MASTER)
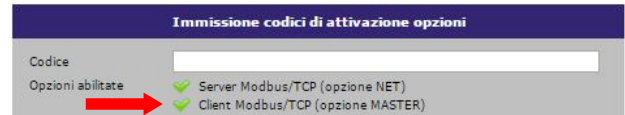
Technical Specifications Femto ECT D6 H and 25° D D6 H

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
Harmonics (FFT)   ....H_{U1}, H_{U2}, H_{U3} (1-51st order)
.... H_{I1}, H_{I2}, H_{I3} (1-51st order)
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 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
Load profile and consumption/production (via Ethernet port)
Calendar bands
Eventi memorizzati (**Femto PQ** - EN 50160 and 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 log
Harmonic Measure Campaign (**Femto PQ**):   U and I

Electrical characteristics

Connection ... 3-phase, 1-phase (1, 2 or 3points) and 2-phase,
          LV and MV, balanced, unbalanced, 3- and 4-wires
Voltage inputs   ....from 20 to 500V phase-phase
                      (max. 1,7 crest factor
                      With external TV (max 400 kV primar.)
                      Value of TV programmable)
          Overload ..... max, 900 Vrms peak per 1 sec.
Current Inputs..........................external CT ECT (non included)
      Primary:.............. full scales 32Ao100A; 64Ao200A; 128Ao400A
              Secondary (ratio 1,000 / 1): output in mA
Power supply ....85÷265 Vac/100÷374 Vdc
          or others on request e.g. 15÷36 Vac/18÷60 Vdc
          ....e.g. 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
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 under the symbol ∿
Communication RS485 LED...1 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: .... Class 0,5S for Active Energy - EN 62053-22
        (Class 1 overall accuracy including also the ECT CT)
.... Class C according to EN 50470-3 (EN 50470-1)
        Class 1 for Reactive Energy - 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 Femto D6............106,2 x 90,5 x 62 mm (6 DIN modules)
Mounting Femto D6 ....DIN rail
Terminals:...... screw connector cables max. section up to 4 mm^2
Weight ....about 260 gr. net

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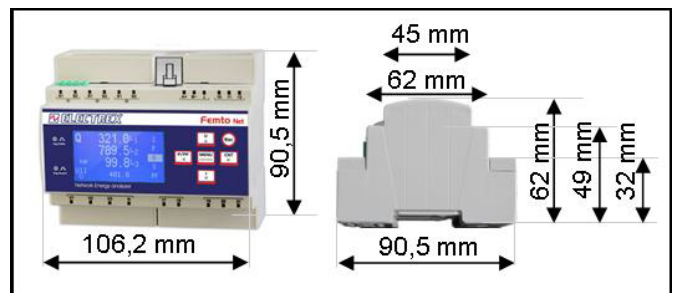
The Energy Brain 6.x and PRO 6.x software (to be installed on a PC, optional)

The Energy Brain software is uesd 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, 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, 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.
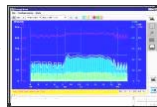
Parameters displaying

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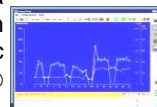
Tariffs

- 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.
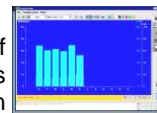
Other types of Energies / Measurements

- 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 Femto ECT D6

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

The software Energy Brain PRO 6.x

- For a description of all the additional functions introduced by the PRO 6.x version, refer to the product sheet of the Energy Brain software.

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 www.electrex.it/en
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 Femto ECT D6 & Femto 25A D D6

Description	Code
Femto ECT RJ45 D6 H 85÷265V *PFN66-EH719-0M0*	

*The **Femto ECT RJ45** or **Femto 25A D RJ45** can evolve in **Femto ECT net Web** or **Femto 25A D net Web** activating the following Upgrade (PUK):*
Upgrade RJ45 to Net Web version PFSU940-84

Femto ECT net D6 H Web Log 8 85÷265V *PFN66-EH509-110*

*The **Femto ECT net Web** or **Femto 25A D net Web** can evolve in **Femto ECT net Master Web** or **Femto 25A D net Master Web** activating the following Net upgrade (PUK):*
Net Upgrade Net to Master version PFSU940-86

Femto ECT net Wi-Fi EDA D6 H Web Log 8 85÷265V ....
.... *PFN66-EHA09-110*
Femto ECT net D6 H Web Log 8 18÷60VDC ....
....*PFN66-EH508-110*
Femto ECT net D6 H Web Log 8 85÷265V 1DI 2DO ....
....*PFN66-EH519-110*

Femto 25A D RJ45 D6 H 85÷265V........... *PFN66-DH709-0M0*
Femto 25A D net D6 H Web Log 8 85÷265V ....
.... *PFN66-DH509-110*

*The **Femto ECT net** and **Femto 25A D 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

How to order ECT current transformers series

Type	Code
ECT TA 100A 13MM Current Transformer *PFAE000-01*	
ECT CTS 16-100A Split Core C. T. Mini Series.. *PFAE000-02*	
ECT CTS 17-200A Split Core C. T. Mini Series.. *PFAE000-03*	
ECT CTS 36-400A Split Core C. T. Mini Series.. *PFAE000-04*	
Short-Circuitable Terminal Box for ECT Types *PCALM0-01*	

ELECTREX
the energy saving technology

Electrex is a brand of Akse srl
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Tel : +39 0522 924244 - Fax : +39 0522 924245
www.electrex.it - email: info@electrex.it

Other versions of Femto ECT D6 H & 25A D D6 H

CODE **P F N 6 6 -** ☐☐☐☐☐☐☐☐☐

Description	Code

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

Family Femto = **6**

Dimension 6 modules DIN = **6**

Current Input   25A Direct = **D**
ECT (Electrex Current Transformer) = **E**

Viewing 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 version*).......................**0**
Net: N. di Open Log attivati ....**1 a 8**

Subject to modification without notice - Data sheet Femto ECT D6 H & 25A H 2019 01 31-ENG

Distributor