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

X3M

The Energy Data Manager

ELECTREX
the energy saving technology
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The X3M 96 is a microprocessor based Energy Data Manager with outstanding flexibility and accuracy designed to meet the most demanding applications of electrical parameters analyses and energy supply monitoring in the industrial environment.
The X3M 96 is equipped with a high capacity flash memory for the storage of data of the load profiles analyses as well for the recording of events related to the quality of the electrical energy supply per EN50160 standards.
The Electrex range of products suitable for harsh environments and with harmonics analysis is completed by the Flash analyzers and the transducers / analyzers Fast.

Versatile in application

The X3M 96 is suitable for virtually all type of electrical grid, 3- and 4-wire, symmetrical and asymmetrical, balanced or unbalanced, single- and bi-phase, Low Tension and High Tension, with 1, 2 or 3 CT as well as for 2 and 4 quadrant (import/export) measurement. A simple keyboard programming allows the setting of all the operational parameters.

Digital Outputs / Alarms and Hardware Options

The X3M 96 is equipped, as standard feature, with two optically isolated transistor outputs rated 27 Vdc 27 mA per DIN 43864 standards.
The two outputs are factory set to the transmission of pulses proportional to the Active energy and the Reactive energy: the pulse number and rate are user programmable.
The outputs may be used as 2 alarms adding maximum flexibility and adaption to different needs of application.
It is possible to expand the X3M's functionality through various additional hardware options: RS485, RS232, 2 4-20mA outputs, 2 digital inputs and 2 relay outputs.

Calendar / Clock

The X3M 96 is equipped with a real-time calendar clock supporting the time zone (GMT + DST) format and the rules for the automatic switching from Standard Time to Daylight Saving Time and vice versa.

Data Storage Memory

The X3M 96 is equipped with a 2 MB flash disk memory for the storage of numerous data and events. The large memory capacity supports the storage of up to 60 days' load profiles (with 15 min. samples) or over 50.000 logs as well as other repartition according to the type of events.

TOU Tariffs

The X3M 96 is designed to handle the most complex TOU systems, with up to 8 different tariffs with a maximum of 12 tariff changes per day. For proper handling of TOU tariff systems, the X3M 96 requires the up-load of a specific calendar file that may be generated by means of the Energy Brain or edited by the user in binary mode following the specifications. Energy Brain is the software created for networks of instruments, even very complex ones, both local and remote. It is suitable for all the Electrex instruments equipped with the communication port and provides all the needed functionalities for the management and accurate monitoring of energy consumption.

		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
01/01/09	Monday	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	Monday
02/01/09	Tuesday	3	3	3	3	3	3	3	2	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3	Monday
03/01/09	Wednesday	3	3	3	3	3	3	3	2	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3	Wednesday
04/01/09	Thursday	3	3	3	3	3	3	3	2	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3	Thursday
05/01/09	Friday	3	3	3	3	3	3	3	2	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3	Friday
06/01/09	Saturday	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	Saturday
07/01/09	Sunday	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	Sunday

Measures

Parameters	Type	L1	L2	L3	Σ	Range
Voltage	V L-N	●	●	●	●	20,0V...400 kV
	V L-L	●	●	●	●	
Current	I-phase	●	●	●	●	10 mA…10,0 kA
	I-neutral				●	
Power factor	PF	●	●	●	●	0,00ind...1,00…0,00cap
Frequency	Hz				●	45 … 65 Hz
Harmonic distort.	THD-V	●	●	●	●	0…199,9%
	THD-I	●	●	●	●	
Life time	h (1/100 h)				●	0,01…99.999,99 ore
Active power	P	●	●	●	●	± 0,00…1999 MW
	PAVG (1)				●	
	PMD (1)	●	●	●	●	
Reactive Power	Q				●	± 0,00…1999 Mvar
	QAVG-ind (1)				●	
	QAVG-cap (1)				●	
	QMD-ind (1)				●	
	QMD-cap (1)				●	
Apparent Power	S	●	●	●	●	± 0,00…1999 MVA
	SAVG (1)				●	
	SMD (1)				●	
Active energy	KWh (2)				●	0,1 kWh…99.999,9 MWh
Reactive Energy	Kvarh-ind (2)				●	0,1 kvarh…99.999,9 Mvarh
	Kvarh-cap (2)				●	
Apparent Energy	KVAh (2)				●	0,1kVAh…99.999,9 MVAh

X3M - D with FFT Harmonics Analysis Function or X3M-H

Harmonics Analysis	H Voltage	●	●	●		Value (H01), % (H02-H31)
	H Current	●	●	●		Value (H01), % (H02-H31)
	H Power & dir.	●	●	●		Value (H01), % (H02-H31)
Power Quality (EN50160)						
Dips and Swells		●	●	●		Events recorded in the internal memory with time reference
Over-voltage and over-current		●	●	●		
Under-voltage and interruptions		●	●	●		
Minimum and maximum values		●	●	●		

(1) Value on the integration time (1 .. 60 minutes programmable).
(2) The energies are displayed as 6 digit floating point values. The internal counters are memorized by minimum setting 0.1wh and maximum count 99,999,999.9999 KWH.

Events Log - Power quality

The instrument detects and memorizes several events, including date and / time of each event, useful for monitoring the quality of energy (EN 50160): voltage sags and dips/swells, current swells and flow direction, etc.

Description	Value
Threshold of voltage dips and undervoltage [V]	30
Voltage dip/sag and undervoltage restore threshold [V]	40
Max. duration of the voltage sag/dip [Cycles]	70
Voltage swell and overvoltage threshold [V]	260
Voltage swell and overvoltage restore threshold [V]	250
Voltage swell max. duration [Cycles]	70
Current peak and overcurrent threshold [A/100]	2500
Current peak and overcurrent restore threshold [A/100]	2000
Current peak max. duration [Cycles]	70

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FFT HARMONICS ANALYSIS (software option)

The X3M can, through the FFT harmonics option, introduce the measures of the H function for accurate Harmonic Analysis.
This allows to assess the possible consequences on the plant due to the Harmonics distortion. Furthermore, the detection of the line of origin of the harmonics is a powerful feature that allows you to identify whether the harmonics are exported or imported by the load under test.
Option Harmonics FFT can be implemented even after installation and does not require the use of tools or accessories.

General Features

The X3M manages the calculation of FFT by which you can get the measures for every harmonic component. It is necessary only to insert a PUK code (which should be ordered) and digit it through keyboard in the appropriate menu.

Harmonics survey

In case of X3M instruments with FFT option already installed, it is automatically activated a circular measurement survey, with data logging every two minutes, for date/time and value of the 42 default parameters. The files are organized in daily files and cover a period of 10 days (FIFO).

Technical Features

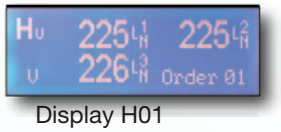
Measurement and calculation of even and odd harmonics up to 31st.
Measurement and calculation of HU, HI, HP & order, phase and direction.
Time of calculation.....round 1 s

MEASURES:
H01.....value with comma with automatic exponent K / M
H02-31 value in % on fundamental. (3,5 digit, from 0,0÷100,0 %)
Harmonics direction (+) o (-) shown on Hp
Available readings on Modbus
Harmonics of Voltage, Current, phase angle, order and phase

ACCURACY:
Hv & HI.....±(0,1% rng.+1LSD) for H01 to max. ± 2,0% for H31
HP.....±(0,2% rng.+2LSD) for H01 to max. ± 2,0% for H31
Phase Angel.....0,1° for H01 max. ± 3,0° for H31
Sampling freq.....64 x f (Freq. of network)
FFT dimension.....64 points
FFT measure risolution.....32 bits

Voltage Harmonics

H01: value in V per phase
- H02...31: value in % of the fundamental per phase



Display H01


To scroll from H02 to H31

Current & Harmonics

H01: Value in A per phase
- H02...31: value in % of the fundamental per phase

Display H01

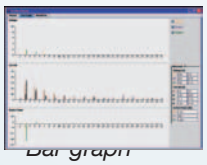
To scroll from H02 to H31

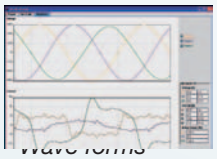
Harmonics direction indication

H01: value in W per phase
- H02...31: value in % of the fundamental per phase
- \+ or – for showing the coming direction of the harmonic (imported or generated) related to the measurement point.

Display H01

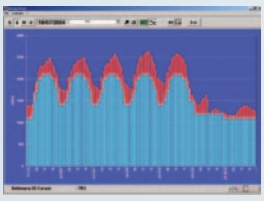
To scroll from H02 to H31

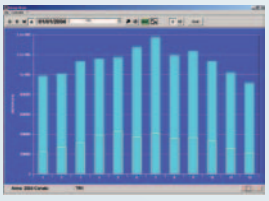

Bar graph


Wave forms


Vector diagrams

The ENERGY BRAIN software





Some main features

- Monitoring of Active Energy, Reactive, Apparent Power and PF.
- Daily, weekly and monthly consumption graphs, divided by periods.
- Power peaks graphs.
- Measurement survey displaying.
- Graphic and numerical prints.
- Daily load profiles on the 4 quadrants.
- Up to 60 days of memory for 15 min sampling period.
- Power peaks and energy data on the 4 quadrants and for each periods

FLASH e FAST

The Flash and Fast are instruments based on the same architecture which subsequently was used for the X3M, and as well suitable for harsh environments as the industrial one. The Flash, available in the DIN 6 rail mount format or 96x96, is a digital analyzer with display, while the Fast, available only in the DIN 6 rail mount format, is a digital transducer. Both the instruments are equipped with an extremely versatile and precise microprocessor. Perfectly suitable for any kind of three phase Star or Delta network, monophase network, balanced or unbalanced. The instruments have also 2 digital programmable outputs and 2 expansion ports for additional modules and hardware like: RS485, RS232, 2 4-20mA outputs, 2 Digital Inputs and only for the Flash 2 relay outputs. Both the instruments can be equipped with the FFT harmonics option.

X3M Energy Data Manager (Harmonics)

Digital Energy Data Manager, high-brightness display and memory for analysis and recording of electricity and its quality. Designed for harsh environments and based on firmware upgradeable remotely. Universal suitability (single, bi and three phase, star and delta, BT and MT) and continuous and simultaneous sampling on the three phases. Hundreds of measures. Equipped with perennial, battery powered, clock and 2 Mbytes of nonvolatile memory that can store up to 255 days (programmable) of data, two calendars fare (updated) measurement campaigns (eg, harmonics up to 31A, voltage, current) , events and other information. In addition to the 2 programmable digital outputs, 2 expansion ports for optional modules (RS232, RS485, 2x4-20mA, 2in-2out). Basic version or with analysis of Harmonics. DIN Rail mount size 6 and 9 modules or 96x96. 3 years warranty.

FLASH (Harmonics)

Digital Analyzer with high-brightness display. Designed for harsh environments and based on firmware upgradeable remotely. Universal suitability (single, bi and three phase, star and delta, BT and MT) and continuous and simultaneous sampling on the three phases. Hundreds of measures among energy, THD and the peaks on the 4 quadrants, the neutral current, operating time and the single harmonics value up to the 31st. Besides the 2 digital programmable outputs other 2 expansion ports allow the connection of optional modules (RS232, RS485, 2x4-20mA, 2In-2Out). Basic version or with analysis of Harmonics. DIN Rail mount size 6 and 9 modules or 96x96. 3 years warranty.

FAST (Harmonics)

Energy transducer / analyzer without display and with the same characteristics of the basic version of Flash. DIN Rail mount size 6 modules. 3 years warranty.

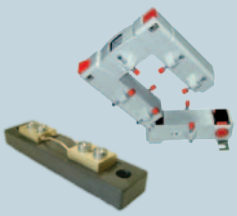
OPTIONS

Expansion options RS485, RS232, Output 2x4-20mA, 2 digital inputs and 2 relay outputs for X3M, Flash and Fast in DIN 6 modules or 96x96 version. 3 years warranty.

NET WEB X3M H BOX

Portable instrument in a hard plastic carry case can be used also for the management of the quality of the energy. Includes 1 Energy Data Manager X3M D6 H with FFT harmonics readings, 1 Yocto net with Web pages, Energy Brain 4 software. RJ45 and RS232 ports. Voltage and current cables included. 3 years warranty.

Split CT and Shunt



Split CT current transformers feature, an innovative fast snap-on system with no screws. Wide range from 100A to 2500A with secondary 5A.

Shunt 0,5 % class. 60mV voltage drop. 10A and 25A version are provided with a plastic socket. All models are conform to the DIN 43703 Standard.

Distributor

FEMTO

A family of energy analyzers / counters with LCD display. Universal suitability (single, bi and three phase, star and delta, BT and MT) and continuous and simultaneous sampling on the three phases. Over 60 measures including: max and min, temperature, import/export, phase active energy, THD, RMS up to the 31st harmonics. RS485 port included, 1 digital input and 2 digital outputs, programmable. DIN Rail mount size 6 modules or 96x96. 3 years warranty. Special version for DC measurement.

ATTO

Energy Transducer / analyzer without display and the same characteristics of the Femto. RS485 Port included. Two versions: 2 analog outputs 4-20mA or 1 digital input and 2 digital outputs. DIN Rail mount size 4 modules.

ZEPTO

Multimeters / counters / analyzers family with a LED display. Universal suitability (single, bi and three phase, star and delta, BT and MT) and continuous and simultaneous sampling on the three phases. Over 50 measures including: total and partial active energy, AVG powers and peaks, THD of voltage and current. RS485 Port included. DIN Rail mount size 6 modules or 96x96.

YOCTO NET, YOCTO NET LOG END YOCTO GATE

The Yocto net is a network bridge which can connect one or more Electrex instruments in a Modbus network to a Ethernet port. The network bridge can be interrogated through Energy brain software or by specific HTML pages via Ethernet/ Internet. Features like e-mail alarms and live measures on-line through HTML pages can be activated by PUK entry.

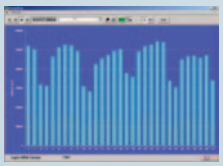
Yocto net log, available in different versions, adds to the previous features the possibility to record the parameters red from the instruments and/or digital or analog interfaces Electrex. With specific PUK updates it is also possible to customize the instrument with features such as measurement survey.

Yocto gate is a gateway GSM with inputs and outputs. It allows to interface via GSM with the Electrex instruments but especially it manages the Modbus alarms and the forward of remote commands. DIN Rail mount size 4 modules.

ETTO

Energy counter with pulse output. Etto can be sealed with a tamper proof kit provided with the instrument. Performs the measure of the active energy on a single phase network with direct connection up to 32A. DIN Rail mount size 2 modules

ENERGY BRAIN



Energy Brain is Electrex's software developed for data retrieving and managing consumption of electrical energy, gas, water, steam, illumination, compressed air, temperature, calories, etc. The software allows to control energy costs, also divided for cost centers. It is the starting point for a perfect and correct energy saving plan.

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