

English
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elcontrol®
energy net

**ELECTRICAL ENERGY ANALYZERS
MANAGEMENT SOFTWARES
POWER QUALITY INSTRUMENTS**



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STAR3 - Energy & Harmonics Analyser

96
x
96

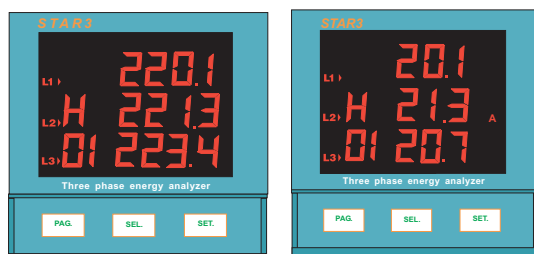
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STAR3 is a high quality 96x96 panel energy analyser providing brilliant features at a price never reached before. STAR3 is a perfect, professional and low cost solution for electrical panels, sub metering systems and OEM applications.

STAR3 is equipped with an exclusive reverse-LCD display, combining the advantages of LCD displays with the unrivalled visibility of "traditional" LED displays. The harmonic analysis, the wide set of measured parameters including the TDH (available in all the models), the multi-protocol capability of the RS485 port, the switching power supply and the high accuracy class 0.5% allow to consider STAR3 the new state of art of the of the panel analysers market.

The model including harmonic analysis allows a permanent based control of one of the most important aspects of power supply quality. Such important possibility, up to now, was reserved only to high-cost devices. STAR3 breaks this price barrier bringing, for the first time, harmonic analysis into the panel analyser market.



Main Features

- Digital energy and harmonics analyzer 96x96mm.
- True RMS measures.
- Displays 52 measures and 202 measures for model with harmonics.
- Unbalanced three phase systems delta or star, bi-phase single phase.
- High accuracy: Voltage, Current and Power error <0.5%.
- Bright backlit red number on dark background LCD display. It is visible in any lighting condition also from long distance.
- Cogeneration Counters.
- Total harmonic distortion factor per phase.
- Alarm, pulses and analogue outputs.
- RS485 communication port included in all models.
- Multi-protocol instrument.
- Easy and extremely flexible SETUP menu including CT and VT ratios selection.
- Password protection for setup and resets.
- Model with three phase Harmonic Analysis up to the 25th order and 202 measures.
- Switching Power Supply (90V to 230V AC or DC).

66 Measures

Further to all typical information provided by traditional analysers, Star3 monitors various additional parameters as:

The **THD% (Total Harmonic Distortion)** is a clear indication of an otherwise hidden problem: harmonic distortion. Current and voltage harmonics endanger the electrical installation (power transformer(s), neutral lines, circuit breakers and Power Factor Correction equipments) and such sensitive and expensive loads as for example IT loads.

The model including full **Harmonic Analysis**, allows a further, in-depth examination of the harmonic spectrum: voltage and current harmonics up to the 25th order are clearly displayed in numerical format, allowing a first-sight assessment of the causes of distortion.

The **Neutral Current** informs about the condition of the neutral cable, often overcharged as a consequence of unbalanced loads and harmonics.

The **Maximum Demand** of current tells you clearly if the components of the electrical network, cables, breakers, contactors, bus bars etc., are overcharged.

Cogeneration Energy Counters enable energy measurement of both active and reactive energy on 4 quadrants, for installations with Cogeneration Plants.

Available Models:

STAR3 basic model

Measures all parameters listed in the below table. Includes an RS485 port with multiprotocol capability: Modbus RTU (BCD and IEEE) and Modbus ASCII. The importance of the communication and the lower cost of the components allow today the inclusion of the RS485 port as a default feature. Even if you are not immediately interested in setting up a network of instruments, this possibility will remain always available for future developments.

STAR3 ALM: As the basic model + 2 relay outputs. The outputs can be set for either alarm signalling or pulses generation or to be remotely controlled via the RS485 port. The "Alarm" function can be associated with several measures including V, A, W, THD. The relay is triggered by a maximum and a minimum threshold; hysteresis and the delay time can be set. All the settings can be adjusted by means of the keyboard. If used in "Pulse" mode the relays generate pulses proportional to the associated measure. Also in this case the behaviour is adjustable via the setup menu.

In "remote control" the position of the relays is controlled by an external master device (PLC, PC, etc) via the RS485 line. This is very convenient for load shedding applications.

STAR3 4-20mA: As the basic model + 2 analogue outputs 0/4-20mA. The two analogue outputs are fully configurable by means of the Setup-Menu. The user can choose the measures to be linked with the outputs, configure the output range choosing between the 0-20mA or 4-20mA range and set the full scale value for the chosen measurements.

PARAMETERS	TOT	L1	L2	L3	N
Phase-neutral Voltage [V]	•	•	•	•	
Phase-phase Voltage [V]		L1-L2	L2-L3	L3-L1	
Current [A]	•	•	•	•	•
Power Factor	•	•	•	•	
Frequency [Hz]		•			
Average Current [A]		•	•	•	
Maximum Demand Current [I]	•	•	•	•	
Active Power [kW]	•		•	•	
Reactive Power [kvar]	•	•	•	•	
Apparent Power [kVA]	•	•	•	•	
Average Active Power [kW]	•				
Average Reactive Power [kvar]	•				
Average Apparent Power [kVA]	•				
Maximum Demand Active Power [kW]	•				
Maximum Demand Reactive Power [kvar]	•				
Maximum Demand Apparent Power [kVA]	•				
Positive (Imported) Active Energy [kWh]	•				
COG-negative (Exp.) Active Energy [kWh]	•				
Positive Reactive Energy [kvarh]	•				
COG-negative Reactive Energy [kvarh]	•				
Apparent Energy [kVAh]	•				
Current Tdh%	•	•	•	•	
Voltage Tdh%	•	•	•	•	

Standards and Regulations

STAR3 conforms to Directive 73/23/CEE (LVD) and 2004/108/CE (EMC). It has been designed with reference to EN 61010-1, EN 61326 including append. A1/A2/A3, EN 61000-6-2, EN 61000-6-3, EN 61000-3-2, EN 61000-3-3, EN 61000-3-3/A1, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-5/A1, EN 61000-4-6, EN 61000-4-6/A1, EN 61000-4-8, EN 61000-4-8/A1, EN 61000-4-11, EN 61000-4-11/A1.

STAR3 HARMO:

As Star3 ALM + three phase harmonics spectrum for voltage and current. In addition to the basic measures of the above table, this model displays complete information about the harmonic spectrum.

The instrument display also the harmonics using bar graph pages. For each harmonic order k the following values are available:

HARMONIC ORDER (k=1..25 @ 50Hz - k=1..20 @ 60Hz)	L1	L2	L3
Harmonic Voltage V _k	•	•	•
Harmonic Current I _k	•	•	•

The accuracy of the harmonic measures is totally independent from the frequency of the fundamental.

The instrument measures harmonics up to the frequency of 1250 Hz which is the 25th in case of fundamental at 50 Hz. In case of higher frequency value of the fundamental, the numbers of available orders decreases automatically.

General Technical Characteristics

Maximum dimensions (mm): instrumen 96 x 96 x115.4

Cut-out template: 91 x91mm.

Power supply: from 90 to 230 V AC/DC (0÷400Hz) + 15% -20% (5VA)

Display: reverse red LCD with LED backlight

Voltmeter inputs: VL1, VL2, VL3, N up to 350 V ~ phase-neutral, 600 V ~phase-to-phase, 35 ÷ 400Hz.

Voltmeter input impedance: 2 M ohm

Voltage input overload: max 850 V phase-neutral

Current inputs: AL1, AL2, AL3, COM; 5 A. Consumption 1 VA. /5A external curr. transf. required.

Measuring range: 0-120% nominal current

Sensitivity: current 20mA; voltage 10V

Overcurrent: withstands 50A for 1 sec.

Number of scales: 1 voltage scale, 2 current scales

Measurements: T.R.M.S. (true effective value) up to 25th harmonic = 1250Hz with fundamental @50 Hz

Sampling frequency: 2,5kHz

Accuracy: error <0.25% for V and I, <0.25% for Power (EN 62053-21)

Connection: Single-phase or three-phase star, three-phase delta, or diphas systems

Weight of the instrument: 0.6 Kg

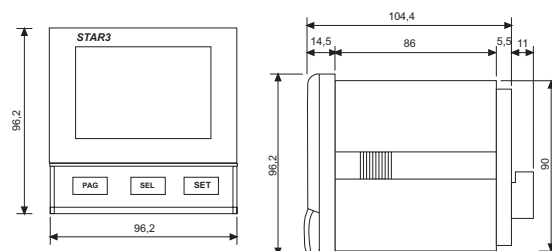
Protection level: instrument IP20, front panel IP40

Temperature range: -10°C ÷ + 50°C

Relative humidity range (R.H.): from 20% to 90%. **Condensation:** non condensing.

Relay output: V 250 max, 120 mA AC max

Dimensions (mm)



VIP 396 - Energy Analyser

ACCURATE, RELIABLE, PERFORMING

VIP396 is a 96x96mm panel mount multi-functional instrument ideal for the measurement and display of electrical parameters. The large clear LED displays showing the parameters and values are easily read under all lighting conditions. VIP396 displays up to 28 parameters (see table), and is suitable for installation in single phase, two phase and three phase systems. Connection is via sturdy 2.5 mm² terminals and 5A secondary CTs for current measurement. Operation is simple and straightforward; all measurements and settings can be done via 3 pushbuttons: PAG, SEL, SET. The SEL and SET keys, used only during setup, are hidden behind a hinged cover.

- ▣ Replaces many traditional instruments with one single digital package
- ▣ Improved accuracy and reliability
- ▣ Simple installation reducing costs
- ▣ Competitive pricing
- ▣ TrueRMS instrument: Superior performance on distorted waveforms
- ▣ Optional Outputs: Modbus/RS485, Lonworks/FTT10A; relay output; analogue outputs

Available Models

VIP396:

Displays shows all the measures listed in the below table.

VIP396 485:

Includes an RS485 serial port with multiprotocol capability : Modbus RTU, Modbus IEEE and Modbus ASCII

VIP396 485 ALM:

RS485 serial port + two relay outputs.

The outputs can be set for alarm signalling, pulses generation or to be remotely controlled via the RS485 port.

The "Alarm" function can be associated with several measures. The relay is triggered by a maximum and a minimum threshold; hysteresis and the delay time can be set. All the settings can be adjusted by means of the keyboard. If used in "Pulse" mode the relay generates pulses proportional to the associated measure. Also in this case the behaviour is adjustable with the setup menu. In "remote control" the position of the relays is decided by an external master device (PLC, PC, etc) via the RS485 line. This is very convenient for load shedding applications.

VIP396 485 4-20mA:

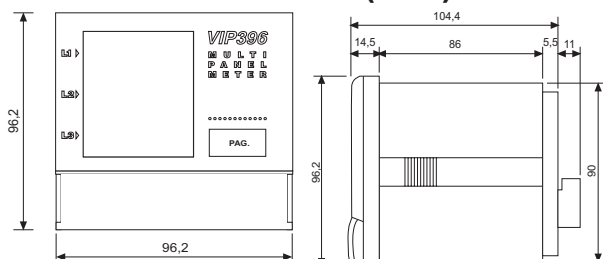
This model is equipped with 2 analogue outputs.

The current on each output varies proportionally to the measured value of the parameter associated to the output, within the 0-20mA or 4-20mA range. The outputs (0-20mA or 4-20mA, associated measure, full-scale value) are fully programmable by the user via the instrument's SETUP menu.

VIP396 LON/FTT10 ALM1:

The leading technology for the building and factory automation is now available in this Energy Analyser from Elcontrol Energy Net. This unique instrument can be connected to any LONWORKS system, ensuring full compatibility.

Dimensions (mm)



General Technical Characteristics

Maximum size (mm):

instrument: 96 X 96 X 115.4

Cut-out template: 91 X 91

Power supply: 230 V ~ or 115 V ~ ± 10% @ 50/60 Hz (4 VA)

Display: Seven-segment 13 mm red LED's, 3 digit on 3 lines

Voltmeter inputs: VL1, VL2, VL3, N up to 350 V ~ phase-neutral, 600 V ~ phase-to-phase, 35 ÷ 400 Hz.

Voltmeter input impedance: 2 MOhm

Voltage input overload: max 850 V phase-neutral

Amperometric inputs: AL1, AL2, AL3, COM 5A.

Consumption 1 VA; /5A external curr.transf. required

Measurement range: 0 - 120% nominal current

Current input overload: withstands 50A for 1sec.

Sensitivity: 20mA current; 10V voltage

Number of scales: 1 voltage scale, 2 current scales

Measurements: T.R.M.S. up to 24th harmonic (50 Hz), 20th (60 Hz)

Accuracy: error <0.5% for V and I, <1.0% for Power (EN 62053-21)

Suitable for connection to: Single phase or three phase star, three phase delta, or diphas systems

Weight of instrument: 0.6 Kg

Protection level: instrument IP20, front panel IP30

Ambient temperature range: -10°C + 60°C

Relative humidity range (R.H.): from 20% to 80%.

Condensation: not allowed

Relay output: V 250 max 120 mA A.C. max

PARAMETERS	TOT	L1	L2	L3	N
V	•	•	•	•	
A	•	•	•	•	•
kW	•	•	•	•	
kvar		•	•	•	
kVA	•	•	•	•	
P.F.	•	•	•	•	
Hz		•			
kWh	•				
kVAh	•				
kVAh	•				

Standards and Regulations

Vip 396 conforms to Directive 73/23/CEE (LVD) and 2004/108/CE (EMC). It has been designed with reference to EN 61010-1, EN 61326 including append. A1/A2/A3, EN 61000-6-2, EN 61000-6-3, EN 61000-3-2, EN 61000-3-3, EN 61000-3-3/A1, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-5/A1, EN 61000-4-6, EN 61000-4-6/A1, EN 61000-4-8, EN 61000-4-8/A1, EN 61000-4-11, EN 61000-4-11/A1.

VIP96 PLUS - Power and Harmonic Analyzer

For single-phase or balanced three-phase loads
MORE THAN 100 MEASUREMENT FUNCTIONS

INSTANTANEOUS MEASUREMENTS:

- Volt (rms), Amp (rms), P.F. $\cos\phi$, kW, kvar, kVA, Hz.
- \pm kWh (imported/exported energy), \pm kvarh (inductive/capacitive energy)
- kW, kVA, kvar average and peak values

HARMONIC ANALYSIS:

- Measurement of harmonic values (from 1st to 24th order) of V and I -expressed as absolute and percentage values- including phase angles.
- Total Harmonic Distortion (THD) of V and I referred to the fundamental and total RMS value.
- Crest Factor of V and I expressed as absolute and percentage values.



Vip96 Plus/Vip96

Main Features:

- Single-phase and three-phase (balanced loads) measurements.
- Measurements as true RMS value.
- Measurements with external CT (selectable from 5/5 to 3000/5A) or directly with internal CT up to 5 A max (VIP96). Direct measurement up to 30 A (VIP96 - 30A).
- High accuracy (Class 1).
- Very user-friendly.
- Backlit LCD display.

Available Models:

- **VIP96 PLUS 485:** RS485 serial port Modbus ASCII
- **VIP96 PLUS 485:** RS485 serial port Modbus ASCII + direct current input up to 30A

- **VIP96:** basic unit
- **VIP96 - RS232C:** RS232C serial port
- **VIP96 - APQ:**

with analog outputs proportional to Active (W) and Reactive (VAr) Power.

- **VIP96- RPQ:**

with pulsed outputs proportional to Active (W) and Reactive (VAr) Power.

- **VIP96 - 30A APQ:**

with analog outputs proportional to Active (W) and Reactive (VAr) Power.

VIP96 - Power Meter

For single-phase or balanced three-phase loads
9 MEASUREMENT FUNCTIONS IN 1

INSTANTANEOUS MEASUREMENTS:

- Volt (rms), Amp (rms), P.F. $\cos\phi$, kW, kvar, kVA, Hz
- kW, kVA, kvar average and peak values

Technical Data:

Maximum size (mm): instrument: 96 x 96 x 115.4

Cut-out template: 91 x 91

Power supply: 230 V ~ or 115 V ~ \pm 10% @ 50/60 Hz (4 VA)

Display: Backlit LCD

Voltmeter inputs: VL1, N up to 600 V rms, 35 \pm 600 Hz.

Voltage input impedance: 4M Ω m

Voltage input overload: max 850 V phase-neutral

Current input: Max 5Arms.

Measurement range: 0 - 120% nominal current

Number of scales: 3 voltage scales, 3 current scales

Measurements: T.R.M.S. up to 24th harmonic (50 Hz), 20th (60 Hz)

Accuracy: error <0.5% for V and I, <1.0% for Power (EN 62053-21)

Suitable for connection to: Single phase or balanced three phase

Weight of instrument: 1 Kg

Protection level: instrument IP20, front panel IP30

Ambient temperature range: -10°C + 50°C

Relative humidity range (R.H.): from 20% to 80%.

Condensation: not allowed

Standards and Regulations

Vip96 conforms to Directive 73/23/CEE (LVD) and 2004/108/CE (EMC). It has been designed with reference to EN 61010-1, EN 61326 including append. A1/A2/A3, EN 61000-6-2, EN 61000-6-3, EN 61000-3-2, EN 61000-3-3, EN 61000-3-3/A1, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-5/A1, EN 61000-4-6, EN 61000-4-6/A1, EN 61000-4-8, EN 61000-4-8/A1, EN 61000-4-11, EN 61000-4-11/A1.

STAR3 DIN - Energy and Harmonics Analyser

Top-performance at affordable Cost

STAR3 din It is a perfect, professional and low cost solution for electrical panels, sub metering systems and OEM applications.

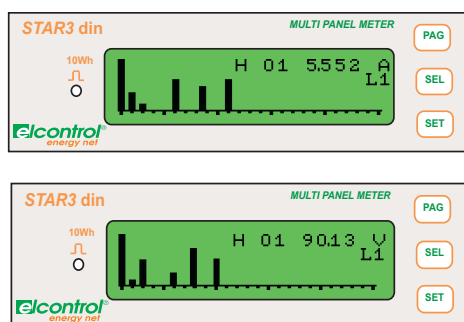


This high quality panel energy analyser provides brilliant features at a price never reached before. The bright LCD display, the harmonic analysis, the wide set of measured parameters including the TDH (available in all the models), the multi-protocol capability of the RS485 port and the high accuracy class 0.5% allow to consider STAR3 din the new state of art of the of the panel analysers market.

The model including harmonic analysis allows a permanent based control of one of the most important aspects of power supply quality. Such important possibility, up to now, was reserved only to high-cost devices. STAR3 din breaks this price barrier bringing, for the first time, harmonic analysis into the panel analyser market.

Main Features

- Digital Energy and Harmonics Analyzer 9 DIN modules.
- True RMS measures.
- Display 65 measures (215 measures for model with harmonic analysis).
- Measures unbalanced three phase systems with or without neutral, bi-phase, single-phase.
- High accuracy : Voltage, Current and Power error <0.5%.
- High resolution graphic LCD display.
- Cogeneration Counters (Imported / Exported Energy).
- Total Harmonic Distortion (THD) factor per phase.
- Rs485 communication port included in all models.
- Multi-protocol instrument: Modbus BCD, IEEE and ASCII.
- Easy and extremely flexible SETUP menu including CT and VT ratios selection.
- Password protection for setup and resets.
- Model with three phase Harmonic Analysis up to the 25th order and 215 measures.
- Alarm / Pulse / Remote-controlled output.
- 3 years warranty period.



66 Measures

Further to all typical information provided by traditional analysers, Star3din monitors various additional parameters as:

The THD% (Total Harmonic Distortion) is a clear indication of an otherwise hidden problem: harmonic distortion. Current and voltage harmonics endanger the electrical installation (power transformer(s), neutral lines, circuit breakers and Power Factor Correction equipments) and such sensitive and expensive loads as for example IT loads.

The model including full Harmonic Analysis, allows a further, in-depth examination of the harmonic spectrum: voltage and current harmonics up to the 25th order are clearly displayed in numerical and bar-graph format, allowing a first-sight assessment of the causes of distortion.

The Neutral Current informs about the condition of the neutral cable, often overcharged as a consequence of unbalanced loads and harmonics.

The Maximum Demand of current tells you clearly if the components of the electrical network, cables, breakers, contactors, bus bars etc., are overcharged.

Minimum and Maximum Voltage and Current readings per phase with bar graph indication allow immediate understanding of their variations.

Cogeneration Energy Counters enable energy measurement of both active and reactive energy on 4 quadrants, for installations with Cogeneration Plants.

Available Models:

STAR3 din basic model

Measures all parameters listed in the below table. Includes an RS485 port with multiprotocol capability: Modbus RTU (BCD and IEEE) and Modbus ASCII. The importance of the communication and the lower cost of the components allow today the inclusion of the RS485 port as a default feature. Even if you are not immediately interested in setting up a network of instruments, this possibility will remain always available for future developments.

STAR3 din ALM 1:

As the basic model + one relay output.

The output can be set for either alarm signalling or pulses generation or to be remotely controlled via the RS485 port. The "Alarm" function can be associated with several measures including V, A, W, THD. The relay is triggered by a maximum and a minimum threshold; hysteresis and the delay time can be set. All the settings can be adjusted by means of the keyboard. If used in "Pulse" mode the relay generates pulses proportional to the associated measure.

Also in this case the behaviour is adjustable via the setup menu. In "remote control" the position of the relay is controlled by an external master device (PLC, PC, etc) via RS485. This is very convenient for load shedding applications.

Measures

PARAMETERS	TOT	L1	L2	L3	N
Phase-neutral Voltage [V]	•	•	•	•	
Phase-phase Voltage [V]		L1-L2	L2-L3	L3-L1	
Minimum Voltage [V]		•	•	•	
Maximum Voltage [V]		•	•	•	
Current [A]	•	•	•	•	•
Power Factor	•	•	•	•	
Frequency [Hz]		•			
Average Current [A]		•	•	•	
Maximum Demand Current [I]		•	•	•	
Minimum Current [I]		•	•	•	
Maximum Current [I]		•	•	•	
Active Power [kW]	•	•	•	•	
Reactive Power [kvar]	•	•	•	•	
Apparent Power [kVA]	•	•	•	•	
Average Active Power [kW]	•				
Average Reactive Power [kvar]	•				
Average Apparent Power [kVA]	•				
Maximum Demand Active Power [kW]	•				
Maximum Demand Reactive Power [kvar]	•				
Maximum Demand Apparent Power [kVA]	•				
Positive (Imported) Active Energy [kWh]	•				
Cog-negative (Expo) Active Energy [kWh]	•				
Positive Reactive Energy [kvarh]	•				
Cog-negative Reactive Energy [kvarh]	•				
Apparent Energy [Kvah]	•				
Current Thd%	•	•	•	•	•
Voltage Thd%	•	•	•	•	•

Standards and Regulations

STAR3 DIN conforms to Directive 73/23/CEE (LVD) and 2004/108/CE (EMC). It has been designed with reference to EN 61010-1, EN 61326 including append. A1/A2/A3, EN 61000-6-2, EN 61000-6-3, EN 61000-3-2, EN 61000-3-3, EN 61000-3-3/A1, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-5/A1, EN 61000-4-6, EN 61000-4-6/A1, EN 61000-4-8, EN 61000-4-8/A1, EN 61000-4-11, EN 61000-4-11/A1.

STAR3 din HARMO:

As Star3 din ALM 1 + three phase harmonics spectrum for voltage and current. In addition to the basic measures of the above table, this model displays complete information about the harmonic spectrum.

The instrument display also the harmonics using bar graph pages. For each harmonic order k the following values are available:

HARMONIC ORDER (k=1..25 @ 50Hz - k=1..20 @ 60Hz)	L1	L2	L3
HARMONIC VOLTAGE VK	•	•	•
HARMONIC CURRENT IK	•	•	•

The accuracy of the harmonic measures is totally independent from the frequency of the fundamental. The instrument measures harmonics up to the frequency of 1250 Hz which is the 25th in case of fundamental at 50 Hz. In case of higher frequency value of the fundamental, the numbers of available orders decreases automatically.

General Technical Characteristics

Maximum size (mm):
instrument: 158.5 X 73 X 90.
(9 DIN module)

Power supply: from network
230 V ~ or 115 V ~ + 15% - 20% @ 35/400 Hz
(consumption: 4VA)

Display: LCD display, dot-matrix

Voltmeter inputs: VL1, VL2, VL3, N up to 430 V ~ phase-neutral, 600 V ~phase-to-phase, 35 ÷ 400Hz.

Voltmeter input impedance:
2 M ohm

Voltage input overload: max 850 V phase-neutral

Current inputs: AL1, AL2, AL3; 5A. Consumption 1 VA. External CT(s) required.

Measurement range: 0 - 120% nominal current

Sensitivity: 20mA current ; 10V voltage

Current input overload:
withstands 50A for 1sec.

Number of scales: 1 voltage scale, 2 current scales

Measurements: T.R.M.S. (true effective value) up to 25th harmonic = 1250 Hz with fundamental @50 Hz

Accuracy: error <0.5% for V, I and Power (EN 62053-21)

Suitable for connection to: Single-Phase, Three-Phase Star, Three-Phase Delta or Two-Phase systems

Weight of instrument: 0.6 Kg

Protection level: instrument IP20, front panel IP40

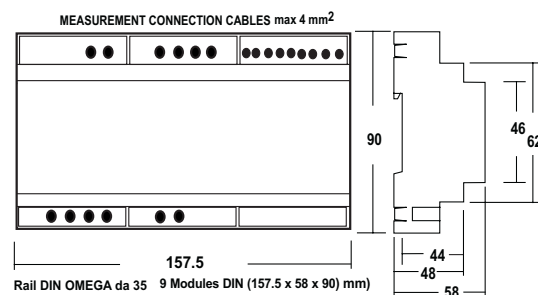
Ambient temperature range: -10°C ÷ + 50°C

Relative humidity range (R.H.): from 20% to 90%.

Condensation: condensation not allowed.

Relay output : 100VAC max, 120 mA AC max

Dimensions (mm)



DMM3 - Energy Analyser

ACCURATE, RELIABLE, PERFORMING

DMM3 is a 9 DIN module multi-functional instrument ideal for the measurement and display of electrical parameters. The large and clear LED displays are easily read under any lighting condition. DMM3 displays up to 28 parameters (see table) and is suitable for single-phase, two-phase, three-phase Star and three-phase Delta installation, via sturdy 2,5mm² terminals. Operation is simple and straightforward; all measurements and settings can be done via 3 pushbuttons: PAG, SEL, SET.

- ▣ Replaces many traditional instruments with one single digital package
- ▣ Improved accuracy and reliability
- ▣ Simple installation reducing costs
- ▣ Competitive pricing
- ▣ TrueRMS instrument: Superior performance on distorted waveforms
- ▣ Optional Outputs: Modbus/RS485, Lonworks/FTT10A; relay output; analogue outputs

General Technical Characteristics

Maximum size (mm):
instrument: 158.5 X 73 X 90. (9 DIN module)

Power supply: from network
230 V ~ or 115 V ~ ± 15% -20%
@ 35/400 Hz (consumption:
4VA)

Display: 7 segments red LED
Voltmeter inputs: VL1, VL2,
VL3, N up to 430 V ~ phase-
neutral, 600 V ~ phase-to-phase,
35 ÷ 400Hz.

Voltmeter input impedance: 2
M ohm

Voltage input overload: max
850 V phase-neutral

Current inputs: AL1, AL2, AL3;
5A. Consumption 1 VA. External
CT(s) required.

Measurement range: 0 - 120%
nominal current

Sensitivity: 20mA current ; 10V
voltage

Current input overload:
withstands 50A for 1sec.

Number of scales: 1 voltage
scale, 2 current scales

Measurements: T.R.M.S. (true
effective value) up to 25th
harmonic = 1250 Hz with
fundamental @50 Hz

Accuracy: error <0.5% for
V and I, <1.0% for Power (EN
62053-21)

Suitable for connection to:
Single-Phase, Three-Phase Star,
Three-Phase Delta or Two-
Phase systems

Weight of instrument: 0.6 Kg

Protection level: instrument
IP20, front panel IP40

Ambient temperature range:
-10°C ÷ + 50°C

Relative humidity range (R.H.):
from 20% to 90%.

Condensation: condensation
not allowed.

Relay output : 100VAC max,
120 mA AC max



28 Instruments in 1

Available Models

DMM3: Displays shows all the measures listed in the below table.
DMM3 485 ALM1: Includes an RS485 serial port with multiprotocol capability : Modbus RTU, Modbus IEEE and Modbus ASCII + one relay output. The output can be set for either alarm signalling or pulses generation or to be remotely controlled via the RS485 port. The "Alarm" function can be associated with several measures. The relay is triggered by a maximum and a minimum threshold; hysteresis and the delay time can be set. All the settings can be adjusted by means of the keyboard. If used in "Pulse" mode the relay generates pulses proportional to the associated measure. Also in this case the behaviour is adjustable with the setup menu. In "Remote Control" the position of the relay is controlled by an external master device (PLC, PC, etc) via the RS485 line. This is very convenient for load shedding application.

DMM3 4-20mA: This model is equipped with 2 analogue outputs. The current on each output varies proportionally to the measured value of the parameter associated to the output, within the 0-20mA or 4-20mA range. The outputs (0-20mA or 4-20mA, associated measure, full-scale value) are fully programmable by the user via the instrument's SETUP menu.

DMM3 LON/FTT10 ALM1: The leading technology for the building and factoring automation is now available in this Energy Analyser from Elcontrol Energy Net. This unique instrument can be connected to any LONWORKS system, ensuring the compatibility.

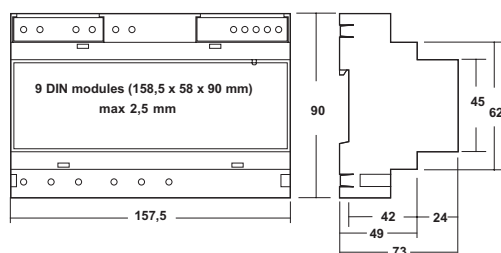
Measures

PARAMETERS	TOT	L1	L2	L3	N
V
A
W
var
VA
P.F.
HZ
A neutral
kWh
kVarh
kVAh

Standards and Regulations

DMM3 conforms to Directive 73/23/CEE (LVD) and 2004/108/CE (EMC). It has been designed with reference to EN 61010-1, EN 61326 including append. A1/A2/A3, EN 61000-6-2, EN 61000-6-3, EN 61000-3-2, EN 61000-3-3, EN 61000-3-3/A1, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-5/A1, EN 61000-4-6, EN 61000-4-6/A1, EN 61000-4-8, EN 61000-4-8/A1, EN 61000-4-11, EN 61000-4-11/A1.

Dimensions (mm)



ED39din - Multi-Tariff Analyser

Tariff-band / Multipurpose Counter and Analyser

ED39din 485 is a 9 DIN module multi-functional instrument ideal for the measurement and display of the electrical energy consumption and maximum demand. It measures energy consumption divided into up to four tariff bands, selectable by means of external digital signals. The digital inputs can be also used as a multipurpose pulse counters displaying consumption from any kind of meter (gas, water, production units, steam, etc.) equipped with pulse output.

All the data can be read via the RS485 interface. The large clear LED displays showing the parameters and values are easily read under all lighting conditions. The instrument displays up to 25 parameters (see table), and is suitable for installation in single phase, two phase and three phase systems. Connection is via sturdy 2.5mm² terminals and 5A secondary CTs for current measurement. Operation is via simple pushbuttons located on the front panel.

The set up pages can be password-protected.

- ▣ Tariff-band based energy accounting
- ▣ Possibility to display the consumption from external counters and make it available via RS485
- ▣ Improved accuracy and reliability
- ▣ Simple installation reducing costs
- ▣ Competitive pricing
- ▣ TrueRMS instrument: Superior performance on distorted waveforms

Displayed Measures:

ED39din 485 is equipped with an RS485 serial output with MODBUS ASCII, RTU (BCD) and IEEE protocol that can be selected into the setup menu. The serial line transmits a long list of information including several measurement not available into the display.

The ASCII protocol transmits all the measures listed in the table:

Measures

PARAMETERS	L1	L2	L3	TOT
kW
kW-Avg				.
kW-md				.
kvar
kvar-Avg				.
kvar-md				.
kVA
kVA-Avg				.
kVA-md				.
kWh				.
kWh-T1				.
kWh-T2				.
kWh-T3				.
kWh-T4				.
kVAh				.
kVArh				.



General Technical Characteristics

Maximum size (mm):

instrument: 157.5 X 73 X 90
(9 DIN module)

Power supply: from network
230 V ~ or 115 V ~ ± 10% @
50/60 Hz (4 VA)

Display: Seven-segment 13
mm red LED's, 3 digit on 1 line

Voltmeter inputs: VL1, VL2,
VL3, N up to 430 V ~ phase-
neutral, 600 V ~ phase-to-
phase, 35 ÷ 400 Hz.

Voltmeter input impedance:
2 M

Voltage input overload: max
850 V phase-neutral

Current inputs: AL1, AL2,
AL3; 5A. Consumption 1 VA.
Three /5A external current
transformer required 3 PH and
n, 3 PH

Current inputs overload:
withstands 50A for 1sec.

Digital inputs: 2 digital inputs
volt-free

Number of scales: 1 voltage
scale, 2 current scales

Measurements: T.R.M.S. (true
effective value) up to 24th
harmonic (50 Hz), 20th (60 Hz)

Accuracy: error <0.5% for
V and I, <1.0% for Power
(EN 62053-21)

Suitable for connection to:
Single phase or three phase
star, three phase delta, or two
phase systems

Weight of instrument: 0.6 Kg

Protection level: instrument
IP20, front panel IP40

Ambient temperature range:
-10°C ÷ + 60°C

**Relative humidity range
(R.H.):** from 20% to 80%.

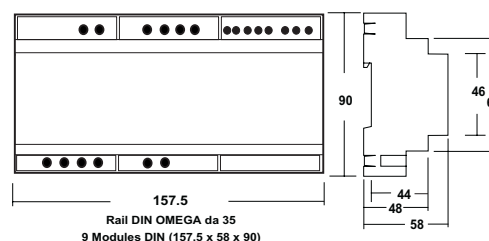
Condensation: non permitted.

Standards and Regulations

ED39din conforms to Directive 73/23/CEE (LVD) and 2004/108/CE (EMC). It has been designed with reference to EN 61010-1, EN 61326 including append. A1/A2/A3, EN 61000-6-2, EN 61000-6-3, EN 61000-3-2, EN 61000-3-3, EN 61000-3-3/A1, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-5/A1, EN 61000-4-6, EN 61000-4-6/A1, EN 61000-4-8, EN 61000-4-8/A1, EN 61000-4-11, EN 61000-4-11/A1.

Dimensions (mm)

MEASUREMENT CONNECTION CABLES max 4 mm²



Rail DIN OMEGA da 35
9 Modules DIN (157.5 x 58 x 90)

SIRIO 485 ALM

Energy Counter/Analyser



Compact, Low-cost Analyser

General Technical Characteristics

Maximum size (mm):

instrument: 70 x 58 x 90. (4 DIN modules)

Power supply: from network 230V or 115V $\pm 10\%$, 35÷400 Hz (2VA)

Display: LCD 128 segments 8 digits.

Voltmeter inputs: VL1, VL2, VL3, N up to 264V phase-neutral, 450V phase-phase, 35 ÷ 400 Hz.

Voltmeter inputs

Impedance: 2 Mohm

Voltage input overload:

max 600V phase-neutral

Number of scales: 1 voltage scale, 2 current scales.

Current inputs: AL1, AL2, AL3; 5A. Consumption 1 VA. Three external/5A

CurrentTrasf. necessary.

Current Input overload: 7A permanent, 15A for 1sec.

Measurements: T.R.M.S

(true root mean square) up to the 25th harmonics (50hz), 20th (60hz).

Accuracy: error $< 1.0\%$ for V and I, $< 2.0\%$ for Power (EN 62053-21)

Suitable for connection:

Single-phase, Three-phase Star, Three-phase Delta, Bi-phase

Weight of the instrument:

0,3 Kg

Protection level: instrument

IP20, front panel IP40

Ambient Temperature

Range: -10°C ÷ $+60^{\circ}\text{C}$

Relative Humidity Range

(R.H.): from 20% to 80%.

Condensation: not permitted

Output relays: 1 electronic relay 120 mA 100VAC + 1

mechanical relay 1 Amp 250V

SIRIO is a 4 DIN module multi-functional low cost instrument ideal for the measurement and display of the main electrical parameters.

SIRIO displays 7 major True-RMS measures on its 8 digits LCD display.

Over 40 measures are available on the integrated RS485 serial port supporting Modbus BCD, IEEE and ASCII.

SIRIO is equipped with two relay outputs, user-configurable as alarm-, pulse- or remote-controlled relays.

Sirio can be installed in single and three-phase unbalanced delta/star systems. Connection is via sturdy 4 mm² terminals for voltage and current measurement.

SIRIO can advantageously replace by itself several panel mounted traditional instruments saving space, simplifying cabling and offering improved performance in terms of reliability and accuracy at a very competitive price. All the parameters can be configured from the keyboard with the instrument already installed. The setup pages and the counters-reset can be password-protected.

Displayed Measures

PARAMETERS	TOT	L1	L2	L3
V	•			
A	•			
kW	•			
P.F.	•			
kW-Avg	•			
kW-md	•			
kWh	•			

RS485 PORT:

Multi-Protocol RS485 serial port supporting Modbus RTU (BCD and IEEE) and Modbus ASCII.

RELAY OUTPUTS:

The outputs can be set for either alarm signalling or pulses generation or to be remotely controlled via the RS485 port. The "Alarm" function can be associated with several measures.

The relay is triggered by a maximum and a minimum threshold; hysteresis and the delay time can be set. All the settings can be adjusted by means of the keyboard. If used in "Pulse" mode the relay generates pulses proportional to the associated measure.

Also in this case the behaviour is adjustable with the setup menu.

In "remote control" the position of the relays is decided by an external master device (PLC, PC, etc) via the RS485 line.

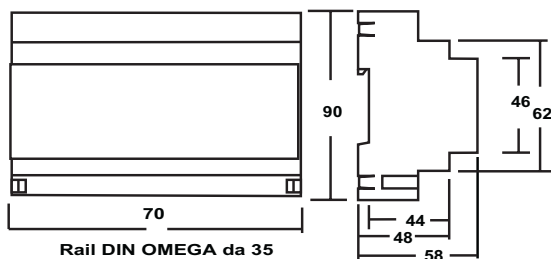
This is very convenient for load shedding application.

Standards and Regulations

Sirio conforms to Directive 73/23/CEE (LVD) and 2004/108/CE (EMC). It has been designed with reference to EN 61010-1, EN 61326 including append. A1/A2/A3, EN 61000-6-2, EN 61000-6-3, EN 61000-3-2, EN 61000-3-3, EN 61000-3-3/A1, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-5/A1, EN 61000-4-6, EN 61000-4-6/A1, EN 61000-4-8, EN 61000-4-8/A1, EN 61000-4-11, EN 61000-4-11/A1.

Dimensions (mm)

MEASUREMENT CONNECTION CABLES max 2,5 mm²



4 Modules DIN (68 x 58 x 90)

VIP ENERGY - Three-phase Energy Analyzers

43 Measures

VIP ENERGY is a measuring instrument in a 9 module DIN standard container allowing direct installation on a 35 mm DIN Rail.

The instrument can be used in three-phase systems with 3 or 4 wires (2 voltage and 2 current or 3 voltage and 3 current) in low voltage systems or (by means of connection to a voltage transformer) in medium and high voltage systems. The electrical parameters measurable are: Volt, Amp, CosPhi, P.F., kW, kVA, kVA_r, Hz, kWh, kVA_{rh}, kVA Peak, kW Peak, Average kW, Average kVA, Average kVA_r, THDF, Date, Time. The instrument also supplies the active and apparent power peak values with an integration time of 10, 15, 20, 30, 60, 1, 2, 5 minutes.

Main Features

- Digital Energy Analyzer 9 DIN modules.
- True RMS measures.
- Display 43 measures.
- Measures unbalanced three phase systems with or without neutral, bi-phase, single-phase.
- High accuracy : Voltage, Current and Power error <1.0%.
- Backlit LCD display.
- Cogeneration Counters (Imported / Exported Energy).
- Easy and extremely flexible SETUP menu including CT and VT ratios selection.
- Models equipped with:
- Rs485 communication port Modbus ASCII.
- Alarm / Pulse / Remote-controlled Relay-Outputs.

Technical Data:

Maximum size (mm): instrument: 157.5 X 73 X 90 (9 DIN module)

Power supply: from network 230 V ~ or 115 V ~ ± 10% @ 50/60 Hz (consumption: 8VA)

Display: LCD display with backlight

Voltmeter inputs: VL1, VL2, VL3, N up to 550 V ~ phase-neutral, 20 ÷ 600Hz

Voltage input overload: 2000 Vrms (for 60 seconds)

Current inputs: AL1, AL2, AL3 5A, 20 ÷ 600Hz

Current input overload: 100A for 1 second

Sensitivity: V - 111mV, I - 0,2mA

Number of scales: 2 voltage scale, 3 current scales

Accuracy: error <0.5% for V and I, <1.0% for Power (EN 62053-21)

Suitable for connection to: Single-Phase, Three-Phase Star, Three-Phase Delta or Two-Phase systems

Weight of instrument: 1 Kg

Protection level: instrument IP20, front panel IP40

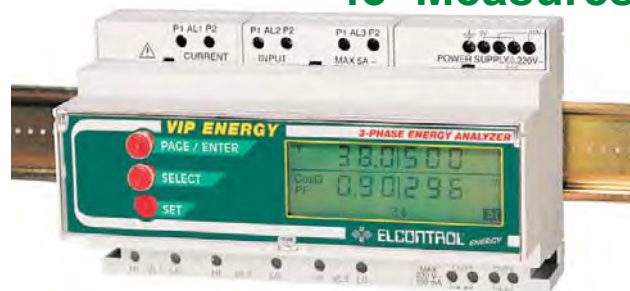
Ambient temperature range: -10°C ÷ + 60°C

Relative humidity range (R.H.): from 20% to 80%

Condensation: condensation not allowed

Standards and Regulations

Vip Energy conforms to Directive 73/23/CEE (LVD) and 2004/108/CE (EMC). It has been designed with reference to EN 61010-1, EN 61326 including append. A1/A2/A3, EN 61000-6-2, EN 61000-6-3, EN 61000-3-2, EN 61000-3-3, EN 61000-3-3/A1, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-5/A1, EN 61000-4-6, EN 61000-4-6/A1, EN 61000-4-8, EN 61000-4-8/A1, EN 61000-4-11, EN 61000-4-11/A1.



Available Models

VIP ENERGY: Standard model for unbalanced three-phase systems Measurements on STAR (4 wires) or DELTA (3 wires). Direct measurements up to 5A, 550V, or with external CT, PT up to 999999 A, 999999 V max.

Measures and displays Volts, Amps, W, P.F. cosφ, VAr, VA, Hz, kWh, kvarh, VA Peak, W Peak, Average kW, Average kVA, Average kvar, Crest Factor (1/THDF), Date, Time, replacing 43 instruments and using the space and connections of just one.

4-quadrant energy counters kWh, kvarh Import/Export. **VIP ENERGY ALM 485:** Standard model + 2 relay-outputs + RS485 port

ALARM-Mode: MINIMUM and MAXIMUM alarms on any 2 measurements chosen by the user from 27 of those displayed, with selection of the ON and OFF delay time (from 0 to 999 seconds) and of the MINIMUM and MAXIMUM threshold hysteresis (from 0 to 17.5% in steps of 2.5%) for each of the two relays which can be connected to the alarms.

PULSE-Mode: the relays generate pulses proportional to the associated measures. Also in this case the behaviour is adjustable via the setup menu.

REMOTE-Mode: the position of the relays is decided by an external master device (PLC, PC, etc) via the RS485 line. This is very convenient for load shedding application.

RS485-Port: RS485 serial port supporting Modbus ASCII.

VIP ENERGY ALM 485 30A: Standard model + 2 relay-outputs + RS485 port + direct current inputs up to 30A.

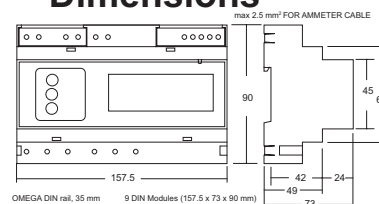
VIP ENERGY ALM 485 24VDC:

Standard model + 2 relay-outputs + RS485 port + 24Vdc Power Supply

Measures

Parameters	Tot	L1	L2	L3	N
Phase-neutral Voltage [V]	•	•	•	•	•
Phase-phase Voltage [V]	•	L1-L2	L2-L3	L3-L1	•
Current [A]	•	•	•	•	•
Power Factor	•	•	•	•	•
Frequency [Hz]	•	•	•	•	•
Active Power [kW]	•	•	•	•	•
Reactive Power [kvar]	•	•	•	•	•
Apparent Power [kVA]	•	•	•	•	•
Average Active Power [kW]	•	•	•	•	•
Average Reactive Power [kvar]	•	•	•	•	•
Average Apparent Power [kVA]	•	•	•	•	•
Maximum Demand Active Power [kW]	•	•	•	•	•
Maximum Demand Apparent Power [kVA]	•	•	•	•	•
Positive (Imported) Active Energy [kWh]	•	•	•	•	•
Cog-negative (Export) Active Energy [kWh]	•	•	•	•	•
Positive Reactive Energy [kvarh]	•	•	•	•	•
Cog-negative Reactive Energy [kvarh]	•	•	•	•	•
Date	•	•	•	•	•
Time	•	•	•	•	•

Dimensions



ENERGY MASTER - Modulo di Memoria Flash

Energy Master is a compact module that autonomously and actively performs all functions necessary to manage a RS485 network of Power & Energy Analysers, collecting all measurement data from a remote network of Power & Energy Analysers and storing them on its internal, non-volatile memory without need of any further control by the user.



The data collected on Energy Master's memory can be downloaded via Ethernet or via Modem (GSM Modem available) manually at any moment, automatically at scheduled intervals or whenever the memory is nearly exhausted. Further to the above, Energy Master allows the setting of user-defined alarm conditions and thus warns immediately of anomalous conditions or dangerous events on the power network.

Energy Master takes care of all operations necessary to supervise the Energy Monitoring Network, automatically providing ready-to-use data and warning the supervisor of the installation of any anomaly.

Main Technical Data:

Operating System: XP EMBEDDED

Communication ports: RS485, ETHERNET, RS232 (modem)

Maximum number of instruments: 128 analysers

Protocol RS485: MODBUS RTU (IEEE)

Minimum reading time: 1sec

Memory size: 200Mbyte

Duration of the memory:

Saving all the data every 15 minutes:

10 instruments = 21 months

50 instruments = 4 months

Saving only kWh, kVArh, kW, kVA, every 1 minute

10 instruments = 32 months

50 instruments = 6 months

Alarm messages:

1 message available per each instrument of the network checked every time the instrument is read.

1 high priority message for the whole network checked with high frequency (2 or 4 sec).

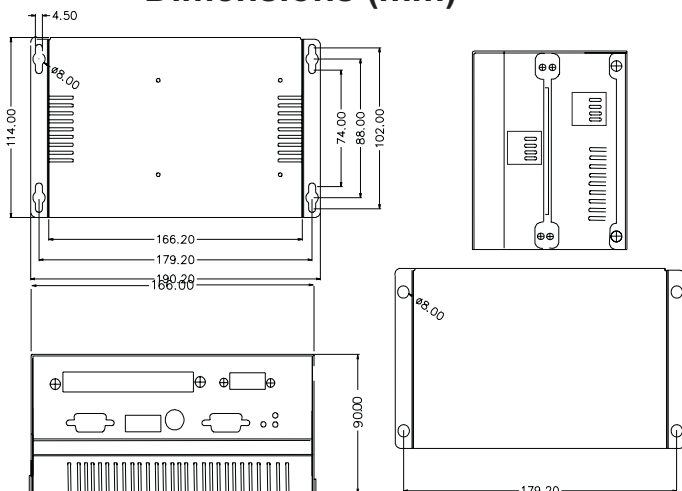
PC Software: software for controlling and downloading compatible with WINDOWS XP, WINDOWS NT.

Languages: English , Italian, French, German, Spanish.

External Modem: E.E.N.-Approved model available.

Power supply: 100-240VAC 50/60Hz 30VA

Dimensions (mm)



Standards and Regulations

"Energy Master" conforms to Directive 73/23/CEE (LVD), 2004/108/CE (EMC), 2002/95/CE (RoHS), 2002/96/CE and later changes 2003/108/CE; EN 55022: 1998 (Class A); EN 61000-3-3: 1995+A1: 2001; EN 55024: 1998+ A1: 2001.

It has been designed with reference to EN 61010-1, EN 61326 including append A1/A2/A3, EN 61000-6-2, EN 61000-6-3, EN 61000-3-2, EN 61000-3-3, EN 61000-3-3/A1, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-5/A1, EN 61000-4-6, EN 61000-4-6/A1, EN 61000-4-8, EN 61000-4-8/A1, EN 61000-4-11, EN 61000-4-11/A1.

ENERGY SAVING, MONITORING AND CONTROL OF THE ELECTRIC INSTALLATION

In an increasingly competitive market every company must put efforts into the optimization of resources. One of the most important objectives is cost control and rationalization, including the inevitable cost linked to the consumption of electrical energy. The installation of an energy monitoring network makes it possible to control and optimize this resource; but also other important objectives can be achieved, as-for example- complete control over the electrical parameters (voltage, current etc.) in key points of the installation. Such control guarantees production-continuity, as it enables a rapid intervention by the maintenance staff or even preventive maintenance.

The advantages provided by a monitoring network can be summarized as follows:

- Keep a continuously updated accounting of consumptions basing on tariff bands and production processes/shifts.
- Decide on the most convenient contract for the supply of electric energy.
- Identify malfunctioning and energy wastes in your system.
- Precise management of electric energy necessary to manufacture a product or provide a service makes it possible to know and minimize the cost for each produced unit.
- Eliminate penalties caused by low Power Factor and load peaks exceeding the contractual power.
- Centralize in a single location all information regarding different loads.
- Reliable historical records of the most significant electrical parameters.
- Control locally or remotely a possible malfunction of the monitored system with the possibility to set alarms.



The monitoring network will provide data necessary for industrial accounting as well as data of more technical nature, important for planning preventive maintenance of electrical systems. A network is composed of microprocessor based instruments capable of measuring energy consumption and important electrical parameters. This data can be read remotely over a dedicated RS485 serial line. Such instruments are commonly known as energy analysers. Elcontrol Energy Net S.p.A. has been active for decades in the field of energy monitoring and produces a series of high quality energy analysers of well-known reliability and accuracy. Quality is ensured by a strict verification procedure; each single instrument is placed for 48 hours in a climatic chamber at 50° centigrade in order to reveal possible faulty components and eliminate them; each instrument is calibrated singularly and supplied with the related calibration certificate. The supervisory software has been developed with the objective of being easy and user-friendly while providing clear and detailed measurement data of immediate interpretation.

The installation of an energy monitoring network leads to guaranteed advantages for the company, but the structure of the network must be carefully studied basing on your specific requirements and on the characteristics of your electric installation. Elcontrol Energy Net S.p.A. and its experience are at your disposal for guiding you in this choice.

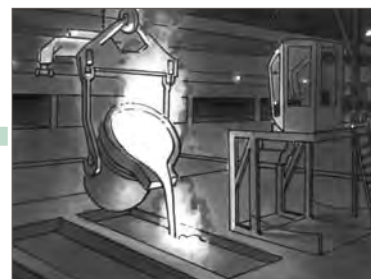
OFFICES



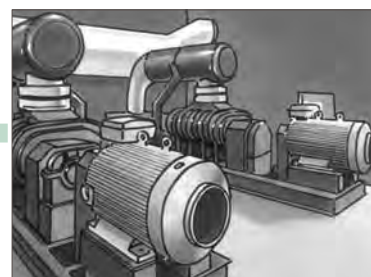
DATA PROCESSING CENTER



FOUNDRY



PLANT ROOM



WAREHOUSE



SWITCH ROOM

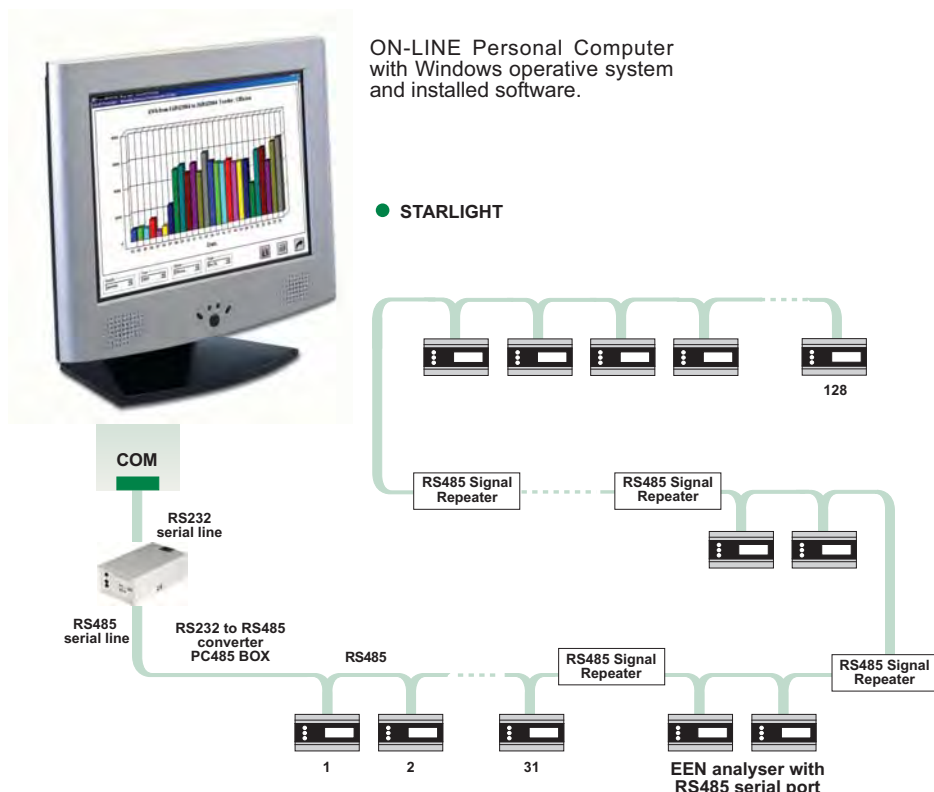


ON-Line or OFF-Line Monitoring?

ON-Line:

the Master-device is a PC continuously connected to the network, which remains permanently active. Thanks to a dedicated software, the instruments are regularly polled by the Master-PC and the result is a "continuous" flow of informations from the instruments to the PC.

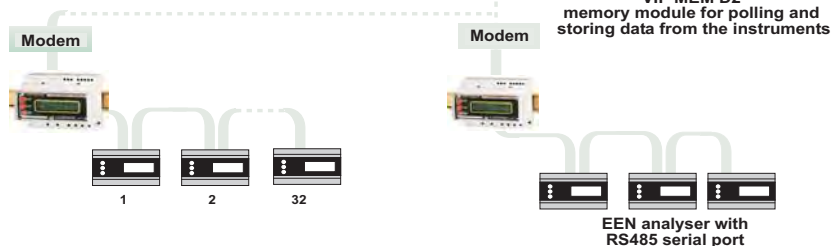
This solution is ideal for such applications where it is important to have a continuous control of the real-time measurements, for example for alarm-signaling. The data is also saved on the PC's hard disk for archiving and later processing. The key-stone of this system is represented by the PC Software controlling the network. Elcontrol Energy Net's experience has led to user-friendly and reliable solutions, ranging from simple and cost-effective up to powerful and sophisticated software.



OFF-Line:

this solution becomes important wherever a continuous connection of the PC to the network is impossible, unreliable or difficult; for example because the monitored network is in a remote location. For such situations, Elcontrol Energy Net has developed Vip Mem: Vip Mem can act as a Master for a network of up to 32 instruments connected to its RS485 port, independently polling the instruments and storing the data with time-stamps on a non-volatile 2Mb Flash-Memory. Connection to a PC is required only when the memory is to be downloaded. The connection can be either direct via Vip Mem's integrated RS232 port or remote over a telephone-line and Modem connection. Vip Mem includes Vip Mem SW a PC software, which allows remote configuration and data-download from the Vip Mem.

Remote supervisory station
OFF-LINE Personal Computer
with Windows operative
system and VIP MEM SW for
downloading the data from the
VIP MEM modules
Data elaboration package.



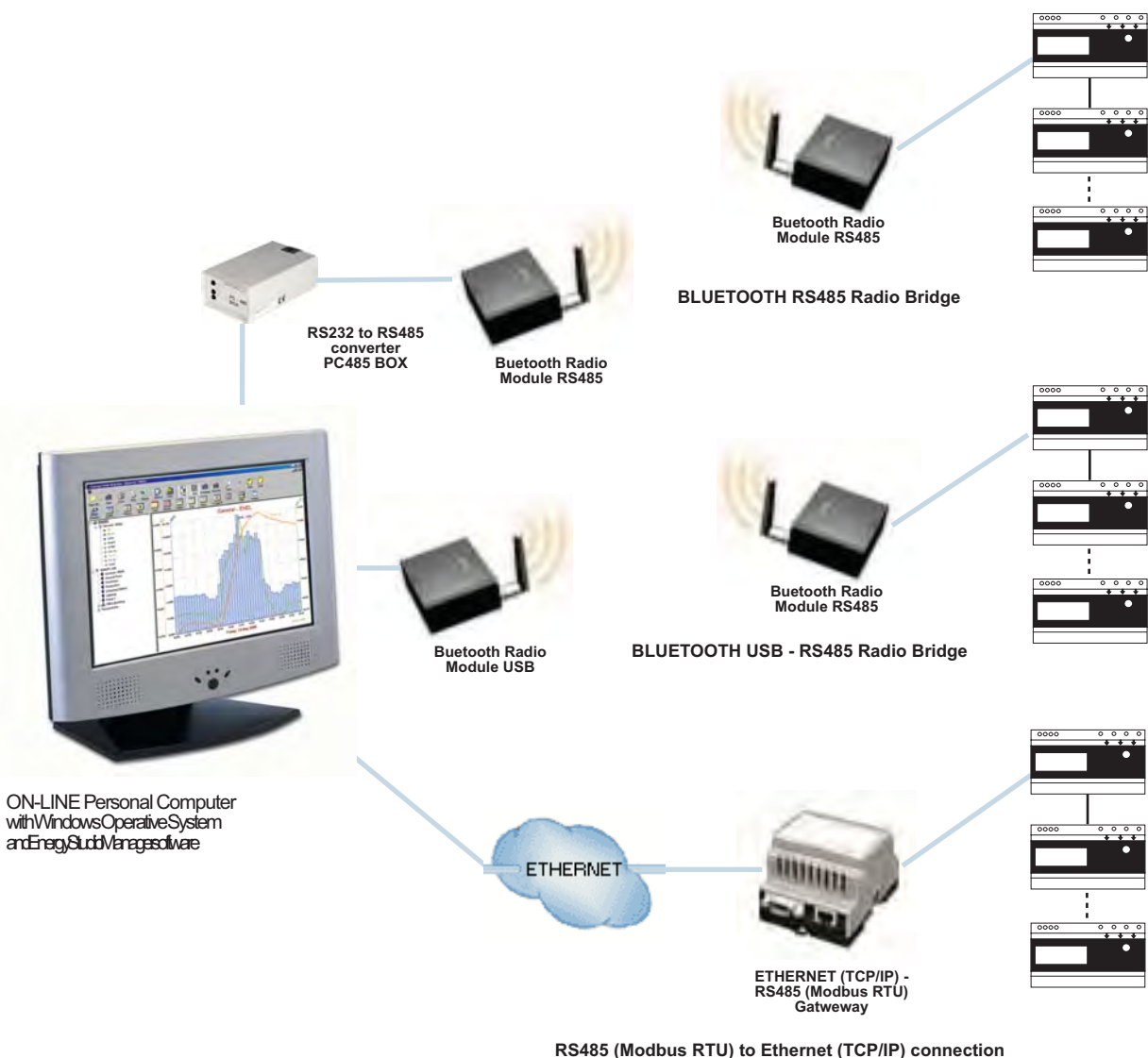
MONITORING NETWORKS

All Elcontrol Energy Net Power Analysers can be equipped with a RS485 serial port supporting Modbus RTU (BCD or IEEE) and ASCII.

The RS485 connection was chosen due to its high reliability in industrial environments and easy implementation. The standard multi-point RS485 allows connections of up to 247 devices with overall distances of up to 1200 metres, via a shielded, twisted signal-cable, like the Belden 3105A. Special Signal-Repeaters can be used for further extension of the mentioned distances.

Furthermore, the high diffusion of the RS485 standard in the industrial field guarantees the availability of a full spectrum of Converters and Gateways to all major data-communication standards, like Ethernet (TCP/IP), and wireless Signal-bridges, like Bluetooth.

In the following just a few typical examples:



ENERGY STUDIO MANAGER

COMPLETE, EASY-TO-USE, EXPANDABLE SUPERVISORY SOFTWARE

For Windows 9x, 2000 and XP

Languages: UK, IT, DE, FR, ES

ENERGY STUDIO MANAGER is the professional solution for management of a network of Elcontrol energy analysers. The Key-Word about E.S.M. is flexibility:

-Monitor, E.S.M.'s runtime-application, allows polling, visualization and saving to database of selectable data from any analyser of a network of up to 247 instruments. Moreover, at any moment its functions can be further expanded by installing additional modules:

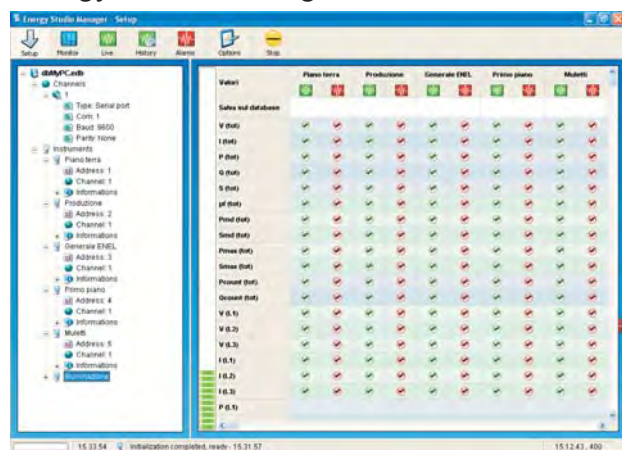
-Alarms&Graphics: adds full alarm-functions on any selected parameter (max/min thresholds with settable hysteresis) and real-time/historical graphics of selected parameters. The Alarm&Graphics module is ideal for real-time management and supervision

of your installation.

-GSM Commander: when the highest degree of control is required, the GSM Commander module adds GSM capability to Energy Studio Manager. Alarms and commands can be completely managed by SMS or E-Mail via a GSM-Modem.

-Analysis is E.S.M.'s Data Management application, allowing complete postprocessing of the data collected by Monitor. Analysis allows graphical and numerical analysis and reporting of all stored energy and power data. Analysis includes an innovative, fully configurable tariff-band/cost management system, providing accurate cost-analysis and reproting of energy consumptions.

Energy Studio Manager MONITOR:



MONITOR provides a user-friendly and intuitive setup-environment for the monitoring network.

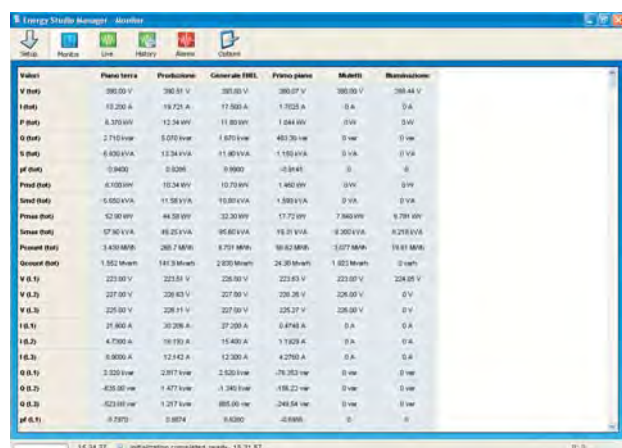
-Simply set up one or more communication channels, as for example the serial communication port, and start adding instruments. Each instrument can be assigned to its communication channel and freely named.

-Energy Studio Manager supports RS232/RS485 serial communication and Modbus TCP/IP (Ethernet) communication.

-For each instrument, the user can decide which measurement parameters shall be displayed and/or stored to database.

Once setup is completed, data acquisition can be started. E.S.M. automatically handles polling and data-synchronization/storage to hard disk.

A clear spreadsheet-display shows the most recent data for each instrument and selected measurement.

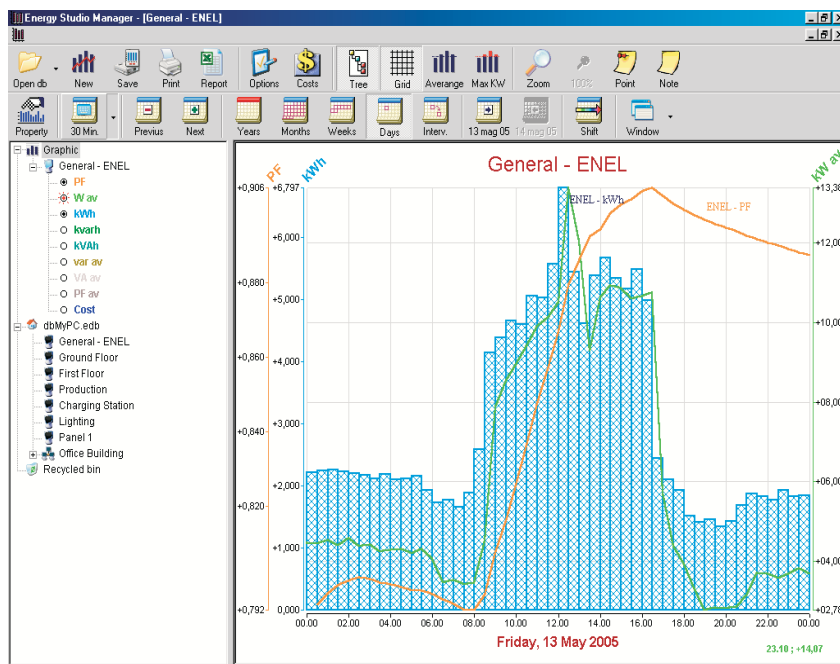


The Graphics&Alarms module adds real-time graphic display and alarms to Energy Studio Manager!

-Up to 9 selectable measurements can be displayed as real-time graphs. The measurement/instrument to be displayed can be selected at any moment by the user.

-Any measure can be associated to an alarm by setting an upper and/or lower threshold and optionally a hysteresis band. Alarms are signalled on Monitor's screen and handled following ISO rules.

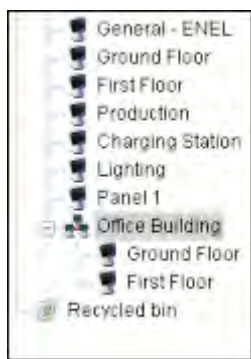
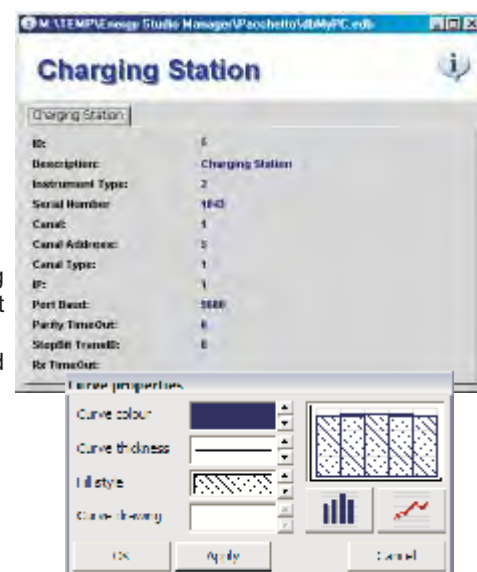
Energy Studio Manager ANALYSIS:



ANALYSIS is Energy Studio Manager's Data-Processing application. All data stored in the databases created by MONITOR, can be accessed anytime, from the same PC or from different workstations. Analysis has been designed to provide fast and efficient graphs and reports generation. Data can be analysed graphically to verify consumption trends and demand peaks.

While retaining a simple and intuitive approach, Analysis provides outstanding flexibility for the representation of the data. Graphs are fully configurable for what concerns displayed measurements, scales and appearance.

At any moment it is possible to recall the details and notes referring to the monitored load and add notes directly on the graphs.



The clear tree-view of the device connected to the network allows a fast selection of the data to be processed.

"Virtual Instruments", the sum of two or more instruments, can be created in a moment by using drag-and-drop.



A new and innovative Cost Management function allows to translate energy data into economical data. The innovative approach of Energy Studio Manager provides 100% flexibility in the definition of the tariff-bands and kWh costs. An Excel-powered application generates tariff/cost calendars with tariff-band changes up to every 15 minutes! No matter how complex your tariffs or shifts are, Energy Studio Manager will adapt to your needs.

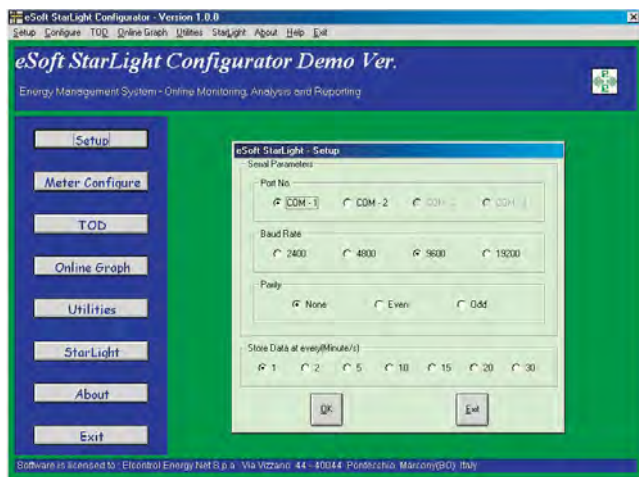
STARLIGHT

EASY-TO-USE, COST-EFFECTIVE MONITORING AND MANAGEMENT SOFTWARE

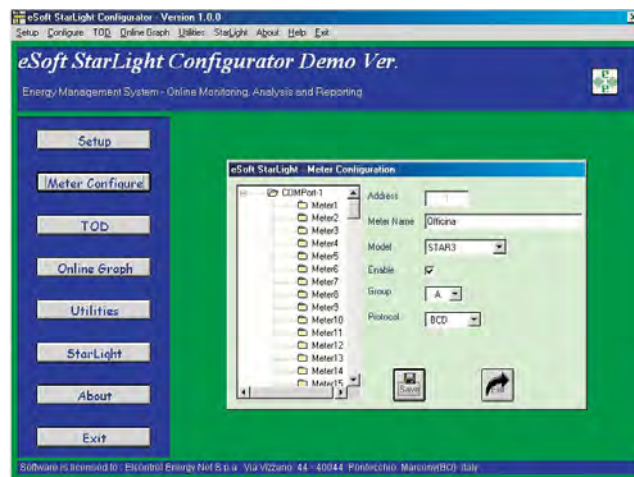
For Windows 9x, 2000 and XP

Languages: English, Italian

STARLIGHT is a new cost-effective software from Elcontrol providing all the most important features needed to achieve a complete control of the costs and of the measurements related with the electrical power supply systems. It allows the data collection and management of a network of up to 128 Elcontrol analyzers. It covers the whole range of Elcontrol instruments equipped with RS485 serial port. A new powerful report tool allows to obtain a clear view of the energy consumptions over the time. Historical measures and reports can be easily exported to Excel for further analysis.

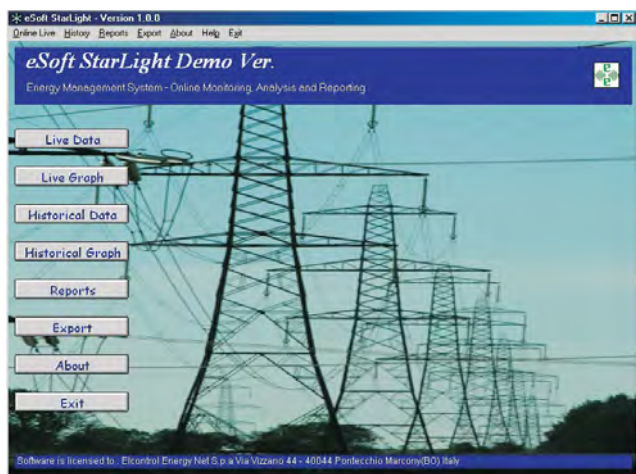


Starlight includes an interactive configurator and the runtime application. The interactive configurator provides easy and user-friendly configuration of the instrument network. First step : select the serial port from those available on the system and the communication parameters



Second step: from a simple tree-diagram, select both the model and the desired communication protocol of the instruments, assign the preferred name to identify the load or the cost area.

Ready to go ! Configuration of the system requires only a few clicks of the mouse.



Once the configuration of the network is complete the access to the Configurator is no longer required. The runtime application Starlight is ready to be used. From now on any operator can safely manage the real time data without possibility to interfere with the system configuration.



The Live Data window displays all the real time measurement values; two different display modes are available: 1) An easy to read page containing all measures from a selected load. Related readings are grouped in four separate fields: 3-phase values, averages and peaks, energy counters, phase L1-L2-L3 values.

eSoft StarLight - Online Reading of all Meters

Meter	V	I	W	VA _r	VA	Cos ϕ	Av-W
1. officina	331.00	13.20	3.74k	2.27k	4.37k	0.85	3.73k
2. VIP 396	0	0	0	0	0	0	0
3.	Disabled						
4.	Disabled						
5.	Disabled						
6.	Disabled						
7.	Disabled						
8.	Disabled						

26/01/2004 15:38:39

2) A spreadsheet-style table displaying simultaneously 8 instruments and their real time measures on 52 columns.

eSoft StarLight - Historical data

Meter: officina | lunedì 26 gennaio 2004

Time Stamp	V	I	W	VA _r	VA	Cos ϕ	Av-W	Av-VA	Ps-W	Ps-VA
26/01/2004 14:28	330	13.1	3.76k	2.21k	4.36k	0.86	0	0	70.2	70.2
26/01/2004 14:30	332	13.1	3.76k	2.22k	4.36k	0.86	750	872	70.2	70.2
26/01/2004 14:31	332	13.1	3.75k	2.22k	4.36k	0.86	3.75k	4.36k	3.75k	4.2
26/01/2004 14:33	333	13.1	3.75k	2.24k	4.37k	0.85	3.75k	4.36k	3.75k	4.2
26/01/2004 14:34	332	13.1	3.76k	2.24k	4.37k	0.86	3.76k	4.37k	3.76k	4.2
26/01/2004 14:35	332	13.2	3.77k	2.22k	4.37k	0.86	3.76k	4.36k	3.76k	4.2
26/01/2004 14:36	331	13.1	3.75k	2.21k	4.35k	0.86	3.75k	4.36k	3.75k	4.2
26/01/2004 14:37	332	13.2	3.76k	2.24k	4.37k	0.86	3.75k	4.36k	3.76k	4.2
26/01/2004 14:38	332	13.2	3.76k	2.23k	4.37k	0.86	3.76k	4.37k	3.76k	4.2
26/01/2004 14:39	332	13.2	3.75k	2.24k	4.37k	0.86	3.75k	4.37k	3.75k	4.2
26/01/2004 14:40	332	13.2	3.76k	2.23k	4.37k	0.86	3.75k	4.37k	3.76k	4.2
26/01/2004 14:41	332	13.2	3.76k	2.23k	4.38k	0.86	3.76k	4.38k	3.76k	4.2
26/01/2004 14:42	331	13.2	3.76k	2.24k	4.37k	0.86	3.76k	4.36k	3.76k	4.2
26/01/2004 14:43	332	13.2	3.75k	2.25k	4.38k	0.86	3.75k	4.37k	3.75k	4.2
26/01/2004 14:44	332	13.2	3.76k	2.24k	4.38k	0.86	3.76k	4.38k	3.76k	4.2
26/01/2004 14:45	332	13.2	3.77k	2.25k	4.38k	0.86	3.75k	4.37k	3.76k	4.2
26/01/2004 14:47	332	13.2	3.76k	2.26k	4.38k	0.86	3.76k	4.38k	3.76k	4.2
26/01/2004 14:48	332	13.2	3.76k	2.25k	4.37k	0.86	3.76k	4.37k	3.76k	4.2
26/01/2004 14:49	332	13.2	3.76k	2.25k	4.38k	0.86	3.76k	4.38k	3.76k	4.2
26/01/2004 14:50	332	13.2	3.75k	2.25k	4.38k	0.86	3.76k	4.38k	3.76k	4.2
26/01/2004 14:51	331	13.2	3.75k	2.24k	4.37k	0.86	3.75k	4.37k	3.76k	4.2
26/01/2004 14:52	332	13.2	3.75k	2.25k	4.38k	0.86	3.75k	4.37k	3.76k	4.2
26/01/2004 14:53	332	13.2	3.76k	2.25k	4.38k	0.86	3.75k	4.38k	3.76k	4.2
26/01/2004 14:54	332	13.2	3.75k	2.25k	4.37k	0.86	3.75k	4.38k	3.76k	4.2

26/01/2004 15:39:46

Historical Data and Historical Graph: stored data can be displayed both in spreadsheet format or as a graphical trend representation. The same information can be Exported to Excel.

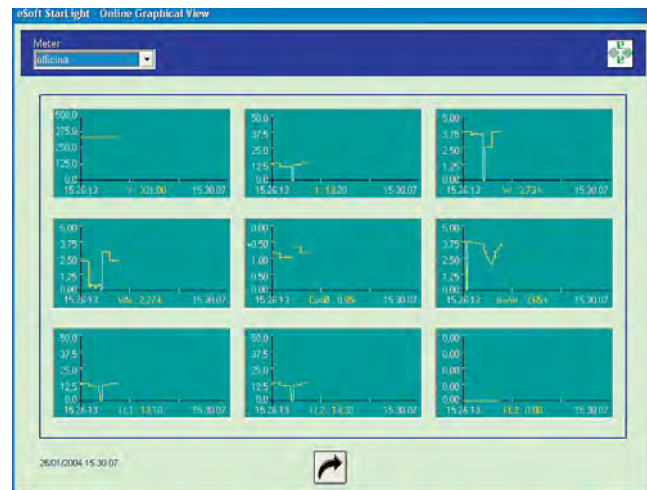
eSoft Time of Day Report

Report: consumption (kWh) (Overall Day Report) | Date: 26/01/2004

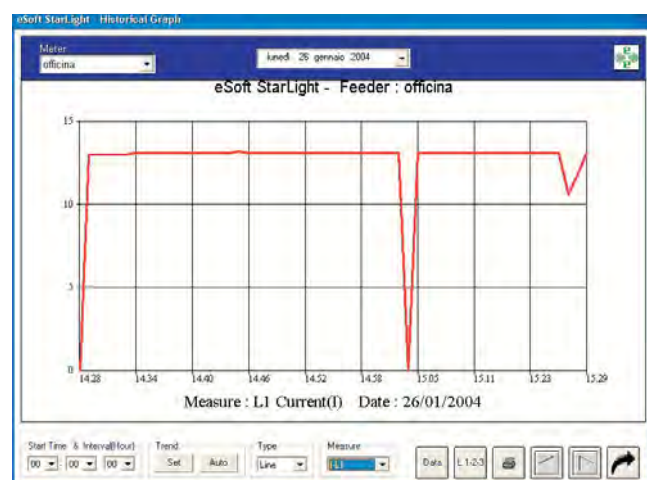
Time	00:00-01:00	01:00-02:00	02:00-03:00	03:00-04:00	04:00-05:00	05:00-06:00	06:00-07:00	07:00-08:00	08:00-09:00	09:00-10:00	10:00-11:00	11:00-12:00	12:00-13:00	13:00-14:00	14:00-15:00	15:00-16:00	16:00-17:00	17:00-18:00	18:00-19:00	19:00-20:00	20:00-21:00	21:00-22:00	22:00-23:00	23:00-00:00	Total	Group Total
Consumption	1.622,76	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1.622,76	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1.622,76	3.245,52

26/01/2004 | (Print) (Save) (Export) (Close)

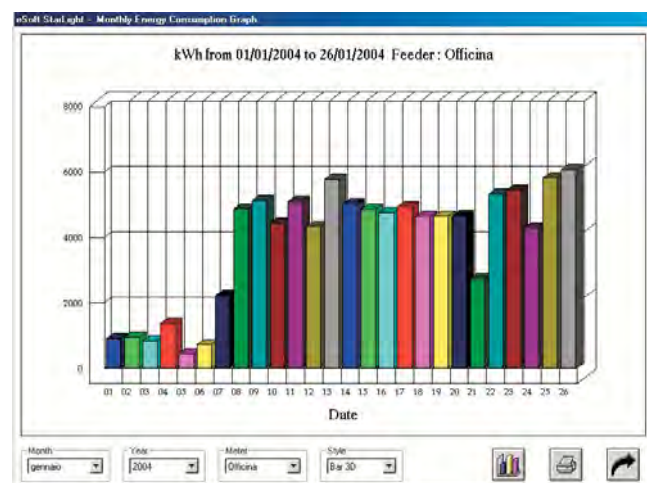
Reports: Starlight includes a powerful and easy to use Report generation utility. Just a few clicks of the mouse are enough to generate numerical and graphical energy consumption reports on flexible, daily, monthly, yearly and tariff bands/time-shifts basis. The report data can be exported to Excel.



The Live Graph function displays the trend of up to 9 selected values measured from any of load.



Historical Graph display mode, available for all measures with different graphic styles



Example of Flexible graphical report. The energy consumption of one department is visible per each single day over the requested period.

JUPITER

Professional Power Quality Analyser

Easily and quickly measure and identify all parameters and events related to the power supply!

The widespread diffusion of non-linear and switching loads, as well as load variations and malfunctioning determines the issue of Power Quality. As electrical power is the most important raw material in almost all industrial and commercial applications, a low Power Quality has a huge economical impact due to loss of efficiency and down-time of important equipment.

Elcontrol Energy Net's long-time experience in the field of measuring electrical power has led to the development of

JUPITER, a portable, lightweight Power Quality Analyzer, which -further to measurement of all traditional electrical parameters- is capable of analysing the major phenomena characterizing Power Quality: interruptions, voltage variations (dips & swells), harmonic and interharmonic distortion, transients and 3-phase voltage unbalance. Furthermore, Jupiter is also capable of verifying the compliance of the power supplied by the system with the limits set by the EN 50160 standard. The measurement methods are compliant to the EN 61000-4-30 standard CLASS A.

A large, colour LCD display allows a clear visualization of data-tables, real-time waveforms of the measured signals, voltage and current transients, vector diagrams and bar-graph display of the harmonic spectrum, while the alphanumeric keyboard makes it easy and user-friendly. With Jupiter it is possible to perform particularly detailed measurement surveys, saving the data on a COMPACT FLASH memory. The stored data can be successively analysed on a Personal Computer using the included PQ Studio software.

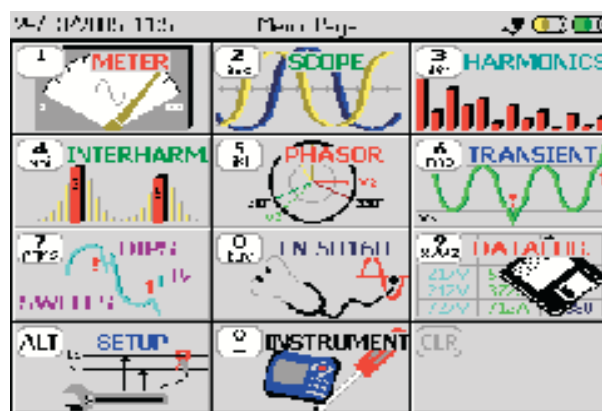
The full set of accessories included with Jupiter's supply kit make this a truly complete system!

-Setup and measurement pages are clear, straightforward and based on graphical icons. Every page displayed by Jupiter includes full indication of the possible commands/functions and the associated keys. Jupiter is characterized by a simple, easy menu-structure; an always visible indicator shows which page is currently displayed and special keys allow an immediate return to the main measurements menu or the setup menu: stop with the endless browsing of menus and sub-menus to find the required measurement!

18/05/2005 13:42	L1	L2	L3	3-phase
V line	225.0V	226.0V	228.0V	225.7V
V fase	398.7V	391.4V	397.4V	390.9V
THDV %	0.00 %	0.00 %	0.00 %	0.00 %
I	5.16 A	5.09 A	2.71 A	4.32 A
THDI %	0.00 %	0.00 %	0.00 %	0.00 %
cosφ	0.94 ind	0.96 ind	0.93 ind	0.94 ind
Freq	50 Hz	50 Hz	50 Hz	50 Hz
Aux	0.00 A			

Protect your Investments!

JUPITER's long operational life-time is guaranteed by its open-source LINUX Operative System, continuously updated and made available to the users by Elcontrol's development team upon any modification of the Power Quality Standards (files are downloadable to the Compact Flash from the Internet).



-All measurements are displayed on Jupiter's bright, color-graphic display in numerical or graphical format and color-coded basing on the standard red, yellow, blue sequence. The alphanumeric rubber-keyboard guarantees easy and safe operation on the field.

Clear, detailed view of your system at a glance!

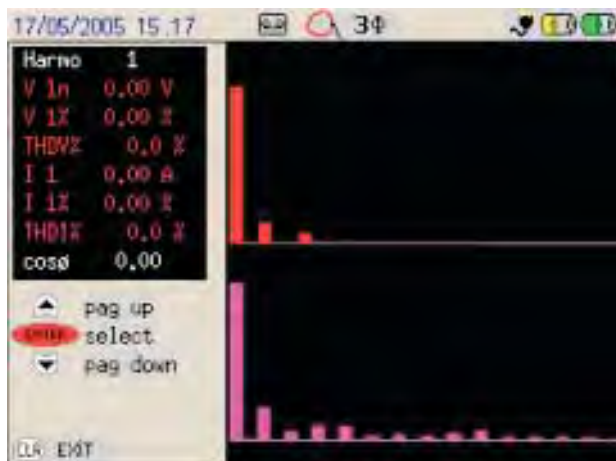
SCOPE Function:

When set to SCOPE, Jupiter displays the real-time waveforms of the measured voltage and current signals, as well as their instantaneous RMS values and phase angles. Users can choose from different visualization screens as well as adjust zooming for both amplitude and time-axis.



PHASOR Diagram:

Phase vector diagrams provide a clear and immediate representation of the three-phase systems of voltages, currents and their phase-angles. Additionally, this page includes a further important Power Quality parameter, the Unbalance% of the voltage, providing a numerical information proportional to the phase and amplitude variations, respective to a correct, symmetrical three-phase system.



Easy detection and investigation of Power Quality Parameters and Events!

HARMONICS/INTERHARMONICS:

Harmonics are certainly the best known phenomena related to Power Quality. They are the result of distortions in the waveforms of voltages and/or currents. Jupiter is capable of analyzing those waveforms and calculate harmonics up to the 31st order, following IEC 61000-4-7. The results are displayed as bar-graphs and in numerical format. For each harmonic order the absolute and percentage values are displayed, as well as the phase-shift between harmonic voltage and current, which provides the power related to the examined harmonic. Interharmonics are a "closer look" to harmonic distortion, dividing each harmonic into 10 interharmonic-orders.

TRANSIENTS:

This operating mode is fundamental in order to analyze single or recurrent transient events in the waveforms of voltages and currents. A very easy and straightforward context-setup allows to set triggers on the desired channels; Jupiter will capture and display any event releasing the triggers, as well as the evolution of the other channels in correspondence of the event.

The captured waveforms can be analyzed in detail using zoom-functions.

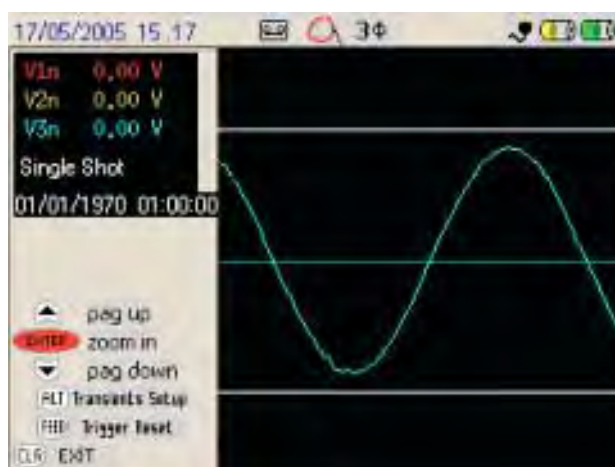
DIPS, SWELLS & MICROINTERRUPTIONS:

Dips and swells are classified by the IEC 61000-4-30 reference standard as variations of the instantaneous voltage(s) influencing the RMS value even of a single cycle. Dips refer to a reduction and Swells to an increase of the mentioned RMS value.

Microinterruptions are defined in a similar way to Dips, but in this case the decrease of the voltage value is so severe, as to be considered a complete loss of power.

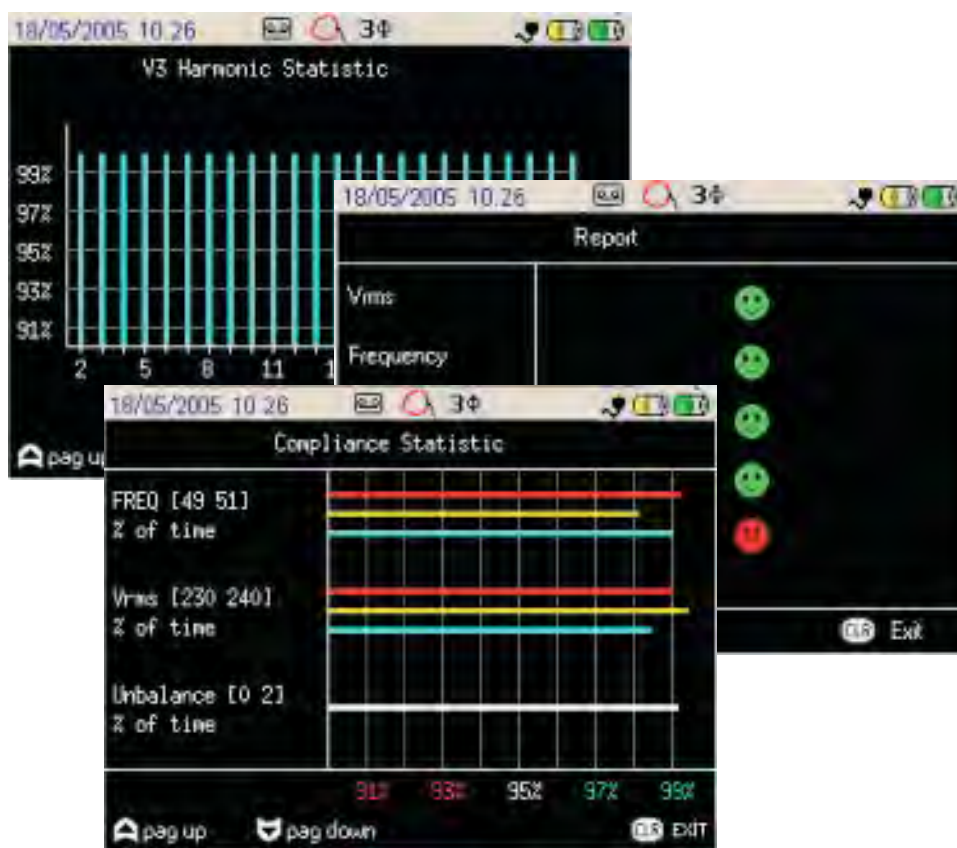
The above events remain hidden from usual measurement techniques, but determine the vast majority of failures in sensitive and expensive devices and systems: Computers, Drives, etc.

Jupiter detects such events in accordance to the IEC 61000-4-30 and provides the user with full information about them: time, duration, value and phase(s) of each event are recorded, classified and displayed, both on analytical and statistical pages.



Monitoring, Characterization and Reporting: The EN50160 Analysis

EN 50160 is the reference standard indicating the procedures and limits of the parameters measured according to IEC 61000-4-30 to be considered when evaluating the Quality of the Power in an installation. EN50160 Analysis becomes easy and immediate with Jupiter. Simply by pressing a key, Jupiter can start the analysis, both using the standard limits imposed by EN50160 or using specific, user-defined parameters. The results of the EN50160 analysis are displayed both as immediately understandable pass/fail icons and in detail. Moreover, the analysis can be recorded on Jupiter's memory, thus adding information about the evolution of the analysis and allowing to trace events that determined the final results of the analysis. Discover EN 50160 compliance / non-compliance at a glance!



DATALOGGING:

Jupiter is equipped with a very powerful and flexible memory system, based on removable and exchangeable standard Compact Flash cards, completely dedicated to the storage of measurement data.

-The unique datalogging functions and the massive memory of Jupiter, allow particularly accurate and detailed measurement surveys.

-Compact Flash guarantees a high degree of safety and portability for your data.

-The detailed data-management functions, including fully editable survey-names and note-fields, guarantee clear and safe retrieval of the stored data.

-The integrated SCHEDULER allows to program an unlimited number of surveys.

Flexibility is guaranteed by three types of possible surveys:

-Time-based Surveys:

in this mode the actual samples are stored on the memory. The user can choose if the storage should be continuous (storage of all samples) or if a buffer of samples (corresponding to 60 cycles) should be stored on a time-base.

As samples represent the highest content of information, the continuous storage equals to a "high-resolution film" of all events during the measurement survey. On the other hand, the timed storage equals to a set of "high resolution photographs" of the system, taken at regular intervals.

-Triggered Surveys:

this survey-type is similar to the timed waveform survey, but instead than storing a buffer of samples at regular intervals, the storage of a 60-periods buffer occurs whenever a trigger-

condition (set by the user) occurs. A typical example is the investigation of overvoltages, where the user wants to "take pictures" of the evolution of voltages and currents in correspondence to each overvoltage event.

-EN50160 Surveys:

like suggested by the name of this survey-type, this option allows to start an EN50160 analysis of the installation and store the results at regular intervals. These storages are the "partial-results" leading to the final result of the complete EN50160 analysis and are of capital importance when it is not only necessary to determine the compliance or non-compliance of the power-supply, but also IF and WHEN critical Power Quality situations appeared.

Main Technical Data:

● Instrument/Dimensions:

Self-extinguishing ABS case with rubber-coated grips
Alphanumeric rubber-keyboard
Dimensions (mm): 290x210x55

● Display:

320x240 pixel, color, graphic LCD screen (mm. 115.2 X 89.3)

● Power Supply:

Mains: Desktop Power Supply
Battery: 2 independent battery compartments, 5 AA rechargeable NiMH batteries each. 2300mAh

● Voltage Inputs:

3 voltage inputs: double scale 500/1000Vrms; accuracy $\pm 0.2\%$ $\pm 0.05\%$ f.s.
Maximum input voltage: 600V CAT III.
Transients (maximum Vpk 1400V) with duration over 500 μ s.

● Current Inputs:

3 current inputs for exchangeable flexible current transducers without external amplifiers (1000Arms), or CT clamps (1000A/1Vac or 3000A/1Vac); accuracy $\pm 0.2\%$ $\pm 0.05\%$ f.s. (\pm Current Transducer error).
1 auxiliary channel for clamps with 0-1Vac output; accuracy $\pm 0.2\%$ $\pm 0.05\%$ f.s. (\pm clamp error).

● **Fundamental Frequency Range:** from 40 to 80 Hz. Harmonics up to the 31st order, max 80Hz.

● Main Functions:

SCOPE function (Oscilloscope) for the visualization of waveforms and transients (single or recurrent events).
Vector-diagram visualization of voltage and current phase-sequence.
Graphical visualization of voltage and current harmonics.
Measurement display (full 3-phase analysis: V, A, VA, W, VAR, P.F., Hz, KWh, KVAR, Cog, KVAh, THD%, etc).
Power Quality Analysis following EN50160: frequency, voltage variations, voltage dips, phase-to-phase voltage swells, short and long interruptions, supply voltage unbalance, harmonics).
Event memorization (samples memorization, memorization of the processed data).

● Internal Software:

LINUX Operative System.
Software updatable / upgradable by the user via Internet.

● Memory:

Removable Compact Flash
(512Mb included, supports up to 2 Gb or more according to available sizes)

● Languages:

Italian, English, French, German, Spanish

● Standards and Regulations:

Compatible with Power Quality Standards IEC 61000-4-30; IEC 61000-2-8; EN 61000-4-15; EN 61000-4-7; EN 50160 ; EN 60868; EN 60868-0.

JUPITER KIT: a complete system for on-the-field measurement!

Current and Voltage measurement:

JUPITER KIT includes a set of 3 flexible current probes with 5A - 1000A measuring range and 41cm of length (please refer to the following for more data). Thanks to a particular input circuit, Jupiter avoids the necessity of the usual external amplifier/integrator box for the flexible current captors. The elimination of the external circuit-box highly improves the accuracy and eliminates the short autonomy caused by the amplifier's battery supply, as well as enhancing the natural ease-of-use of the flexible clamps.

For voltage measurement JUPITER KIT includes a set of 6 measuring cables, color-coded and with extractable crocodile clips

Memory:

JUPITER KIT already includes a massive 512Mb Compact Flash Card, allowing immediate use of Jupiter for measuring surveys.
PC Software:

the professional PC software PQ Studio, specially developed

for the in-depth analysis of data recorded by Jupiter, is freely included with JUPITER KIT. (Please see the following section for more information on PQ Studio)

Power Supply:

JUPITER KIT comes with a desktop power supply (supply of the instrument and recharge of the batteries) and a set of 10 rechargeable, heavy-duty NiMh batteries (AA type, overall capacity 2300mAh).

Transport and Protection:

Particular care was taken to ensure both high-protection and high-transportability for the JUPITER KIT. JUPITER KIT is supplied with a shock- and water-proof IP67 plastic carrying case, resistant to corrosion and suitable for airplane-transport. The above case is equipped with an internal, detachable soft-bag containing all the JUPITER KIT.

Standards and Regulations

Star3din conforms to Directive 73/23/CEE (LVD) and 2004/108/CE (EMC). It has been designed with reference to EN 61010-1, EN 61326 including append. A1/A2/A3, EN 61000-6-2, EN 61000-6-3, EN 61000-3-2, EN 61000-3-3, EN 61000-3-3/A1, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-5/A1, EN 61000-4-6, EN 61000-4-6/A1, EN 61000-4-8, EN 61000-4-8/A1, EN 61000-4-11, EN 61000-4-11/A1.

JUPITER KIT



JUPITER-KIT

KIT COMPLETE WITH:

- n.1 JUPITER PQA
- n.1 Set of 3 flexible current probes 1000A
- n.1 Set of 6 voltage meas. leads crocodile clips
- n.1 Set of 6 crocodile clips
- n.1 Compact Flash 512Mb
- n.1 Set of 10 rechargeable NiMh AA batteries
- n.1 Desktop power supply
- n.1 CD-Rom with PQ Studio PC Software
- n.1 Shock- and Waterproof IP67 Carrying Case + Integrated Soft-Bag
- n.1 Warranty certificate
- n.1 Calibration certificate
- n.1 User manual

Spare parts and additional accessories can be found on page 41-42.

JUPITER PLUS

Jupiter Plus is an advanced tool for monitoring and detecting Power Quality disturbs of the Power Supply System.

Jupiter provides all functions and features of Jupiter and adds:

Ethernet-TCP/IP communication: Jupiter Plus allows a full control of the measurement and of surveys from a remote PC via LAN connection. A easy-to-use, included software provides on-line reading of the measurements, programming and performing surveys and downloading the recorded data.

Flicker Analysis: Jupiter Plus includes PST and PLT Analysis of Flicker, both as a single measurement functions and integrated in the EN50160 PQ Analysis.



Ethernet-TCP/IP:

The integrated network interface allows immediate connection to any LAN network. PQStudio can be used as a remote interface for real-time display and analysis of the data measured by Jupiter Plus, or for the management of measurement surveys and the resulting data.

PQStudio can therefore be used for:

- Displaying and Analysing Real-Time Data
- Scheduling measurement surveys
- Starting/Stopping manual surveys
- Downloading and Analysing executed surveys



Flicker:

Variations of important loads can lead to variations of the Power Supply's voltage level. This phenomena is know as Flicker due to its optical perception, as the voltage variation cause –in turn- variations of the lighting fixtures' luminosity and spectral distribution. Jupiter Plus performs the Analysis of the Flicker following the EN 61000-4-15, with measurement of the PST and PLT values of Flicker.

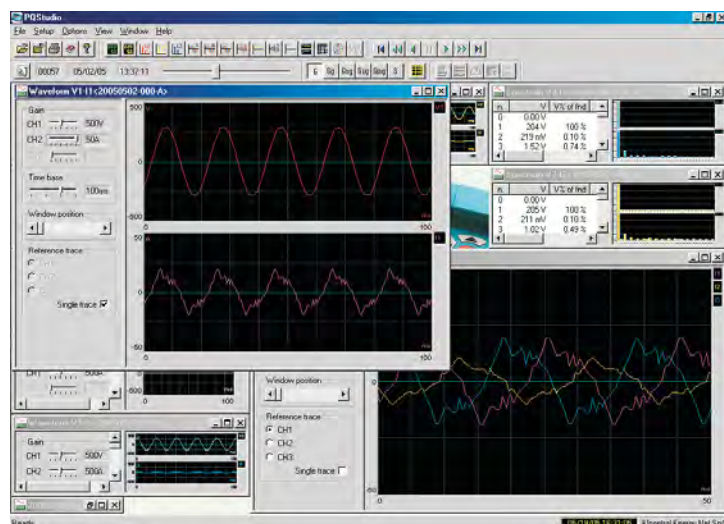
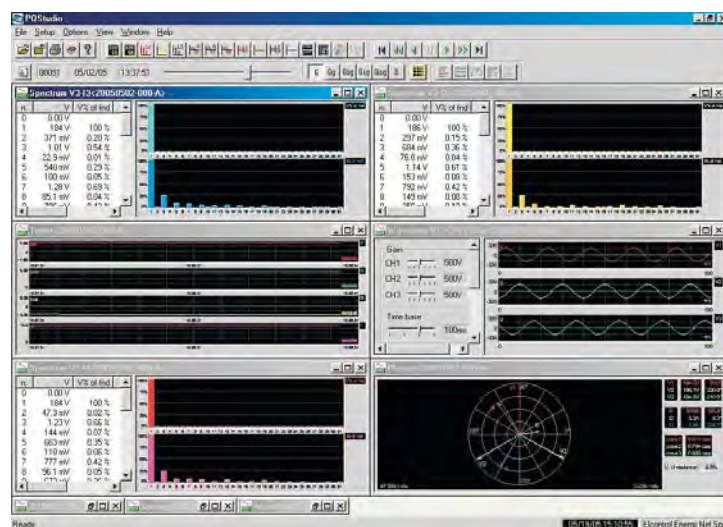
PQ STUDIO - Software for JUPITER

Analysis & Data-Management Software for Windows 9x/NT/2000/XP developed for
Jupiter portable Power Quality Analyzer.

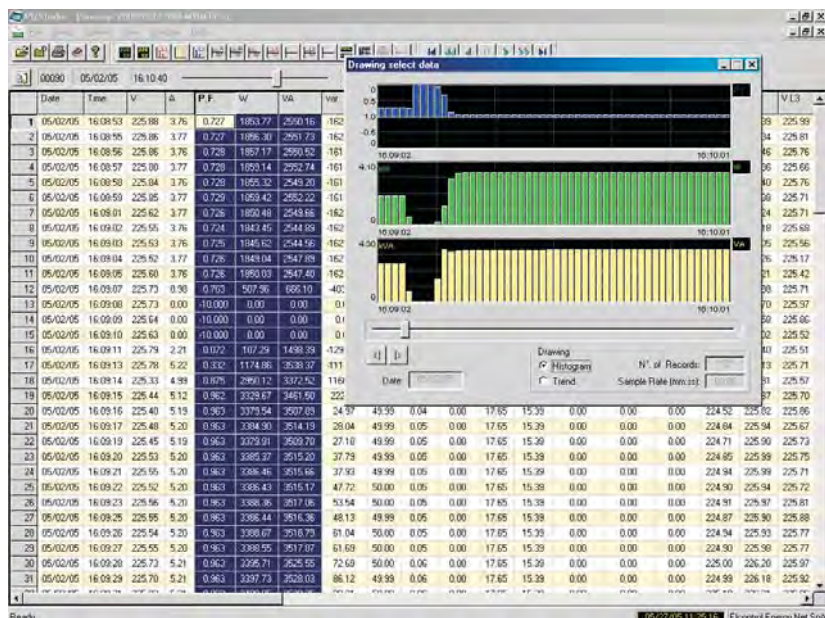


Jupiter Kit includes the powerful PC software PQ Studio, which makes full use of Jupiter's unique datalogging functions and safe data-storage on Compact Flash to provide extensive analysis and reporting of Power Quality.

PQ Studio allows to review all data recorded by Jupiter during a survey, up to the maximum detail levels: all measures and events can be re-played and immediately identified.



All graphs and display-modes are easily configurable by the user in order to meet the required visualization and reporting standards and highlight the desired parameters/events.



PQ Studio's outstanding performance is not limited only to "Replay" and Analysis of measurement surveys.

Measurement results must -in the end-be used to generate clear and understandable reports. PQ Studio features many effective and powerful tools simplifying the task of reporting.

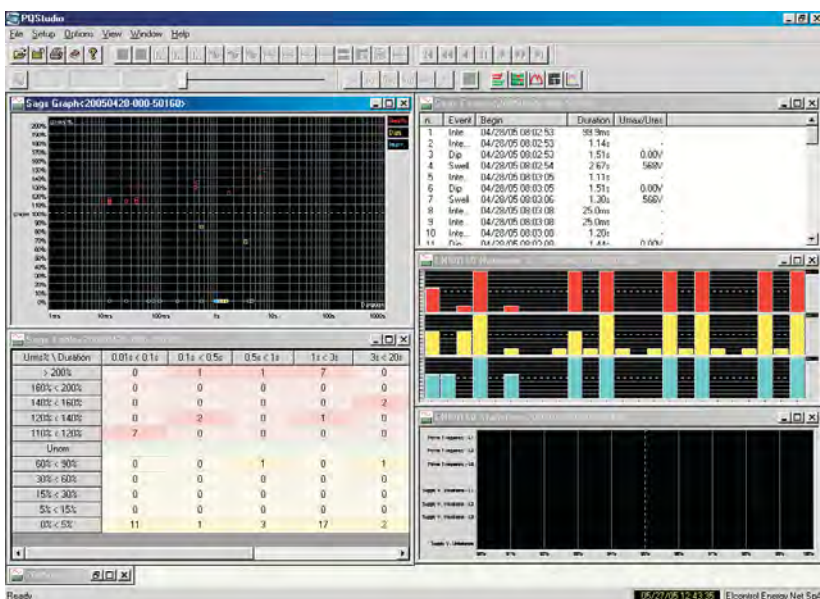
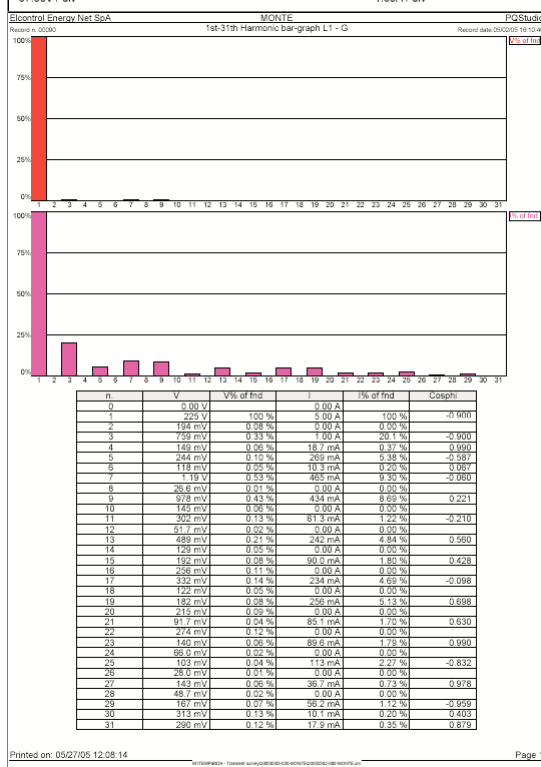
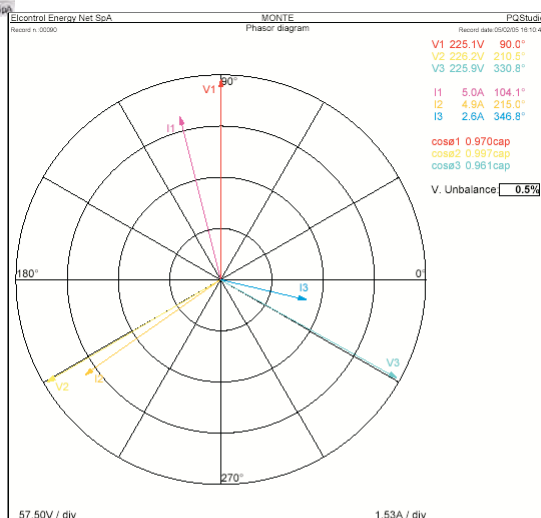
PQ Studio focuses on analysis of your measurement data but also on reporting.

- PQ Studio's clear and information-rich graphs can be easily imported onto Word-files for your Reports.

- A flexible printing function allows easy printout of your data. Simply select the window containing the desired information and PQ Studio will do the rest.

- All measurement records are available on PQ Studio's spreadsheet display. With a few clicks of the mouse are enough to select, export to Excel or graph any set of records/measures.

-Jupiter's EN50160 Analysis Surveys can be reviewed and used to generate clear reports of immediate effect.



Energy Explorer Professional Power & Harmonics Analyser

ENERGY EXPLORER, is an advanced Power Analyser, designed for use by electricians, plant engineers and energy professionals.

Energy Explorer provides fast and accurate measurement of all standard parameters characterizing the power consumption of electrical loads, such as the TrueRMS values of Voltage, Current, Frequency, Powers, Power Factor/CosPhi, Energy. Energy Explorer extends the analysis also to transient conditions of the load, thanks to the built-in Inrush Current function allowing voltage and current monitoring with pre-triggering.

The load's consumption can be kept under close control thanks to the availability of fully configurable Average and Maximum Demand functions, user-settable alarms and configurable tariff-band energy analysis.

Real-Time and Historical trend diagrams provide immediate understanding of how parameters change during a settable time frame.

In addition to the above, Energy Explorer provides also state-of-the-art analysis of dangerous and hidden phenomena such as Harmonics, Microinterruptions, Voltage Unbalance. The analysis of such phenomena is nowadays an indispensable troubleshooting tool, helping to minimize downtimes and malfunctions of increasingly complex electrical systems.



Main Functions:



RMS Meter: 3-Phase TRMS measurements of all electrical parameters characterizing the load's supply and power consumption, such as: Voltages, Currents, Powers, Energies, Frequency, Power Factor, CosPhi, Crest Factor, THD-V, THD-I, etc.

RMS Measures can be displayed as instantaneous, Min/Max or Average values with configurable integration time and mode:

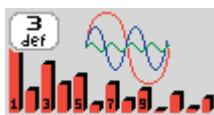
-Fixed: fixed integration time-frame; the Average and MD values are updated at the end of each fixed time-frame.

-Sliding: sliding integration time-frame; the Average and MD values are constantly updated on the basis of a sliding time-frame.

-Synchro: synchronized time-frame; the time-frame is synchronized by external control-signals, such as provided by the energy utilities



Scope: Real-Time display of the measured voltages' and currents' waveforms, their instantaneous RMS values and Phase-Angles.



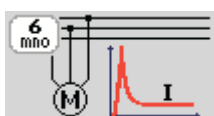
Harmo: Fully IEC61000-4-7 compliant measurement of voltage and current harmonics up to the 31st order.

The harmonics' data is displayed both graphically, as bar-graphs, and numerically. Each harmonic order is displayed as absolute value and percentage of the fundamental and includes the displacement angles between the harmonic voltage and currents, providing the power of the examined harmonic order.



Tarif-Band Management: Allows the configuration of up to 4 Tarif Bands with accounting of kWh, kVAh, cost and necessary reactive energy for PF correction.

Phase Vector Display: The Phase-Vector diagram provides a clear and immediate representation of the 3-Phase system's voltages, currents and phase angles, as well as the system's unbalance.



Inrush / Start-Up Current capture: Fully IEC61000-4-30 compliant capture and display of transient current events with pre-triggering functions. This function provides fast and reliable analysis of the start-up of motors / loads, connection of capacitor banks, etc.



Alarm Functions: Energy Explorer provides the possibility to set configurable alarm thresholds on any measured value, for immediate display and logging of the alarm conditions. Additionally, Energy Explorer is equipped with 2 Relay Outputs that can be linked to any of the set alarms or configured to become Pulse-Outputs.

Measurement Surveys / Datalogging: Energy Explorer's extremely flexible memory system, based on extractable and exchangeable Compact Flash cards, allows to perform long and detailed measurement surveys. The surveys can be started/stopped at any time or scheduled to start and stop at a later time. Measurement surveys can be of two types:

- RMS:** Surveys storing the RMS values of all measured parameters with a settable frequency.
- Waveform:** Surveys storing the actual digital samples of voltages and currents with a settable frequency. When analysing such a survey on PC, not only the RMS values but also the actual waveforms of the signals will be available.

Main Features:

Current & Voltage Measurement: Energy Explorer Kit includes a set of 3 flexible current probes with 5A-1000A measuring range and 41cm of length. Thanks to its special input circuit, Energy Explorer avoids the necessity of the usual external amplifier/integrator box for the flexible current probes. The elimination of the external circuit-box greatly improves the measurement accuracy, eliminates the short autonomy due to the amplifier's battery supply and enhances the natural ease-of-use of the flexible clamps. For the voltage measurement Energy Explorer Kit includes a set of 6 measuring cables, color-coded and equipped with extractable crocodile clips.

Memory: Energy Explorer is already delivered with a massive 512Mb Compact Flash Card, allowing immediate use of Energy Explorer's survey capabilities.

PC Software: PESTudio, a powerful and easy-to-use PC Software, specially designed to for the complete analysis and reporting of all data recorded by Energy Explorer, is included with Energy Explorer Kit.

Power Supply: Energy Explorer Kit comes with a desktop power supply (for the supply of the instrument and recharge of the batteries) and a set of 10 rechargeable, heavy-duty NiMH batteries (AA type, overall capacity 2300mAh).

Transport & Protection:

Special care was taken to ensure both high-protection and high-transportability for the Energy Explorer Kit. Energy Explorer is supplied with a shock- and water-proof IP67 plastic carrying case, resistant to corrosion and suitable for airplane transport. The above case is equipped with an internal, detachable soft-bag containing all the Energy Explorer Kit.

Main Technical Data:

•Instrument / Dimensions:

Self-Extinguishing ABS case with rubber-coated grips
Alphanumeric rubber keyboard
Dimensions (mm): 290x210x55

•Display:

320x240 pixel, colour, graphic LCD screen (mm.115,2x 89,3)

•Power Supply:

Mains: Desktop Power Supply
Battery: 2 independent battery compartments, 5 rechargeable AA NiMH batteries each, 2300mAh

•Voltage Inputs:

3 Voltage Inputs: double scale 500/1000V; accuracy 0.2%rdg. $\pm 0.05\%f.s.$
Voltage Inputs rating: 600V / CAT III

•Current Inputs:

3 Current Inputs for exchangeable flexible current transducers without external amplifiers (1000Arms) or CT Clamps

(1000A/1Vac or 3000A/1Vac); accuracy : $\pm 0.2\%rdg \pm 0.05\%f.s.$ (\pm clamp error) 1 Auxiliary/Neutral Input Channel for CT Clamps with 0-1V; accuracy: $\pm 0.2\%rdg \pm 0.05\%f.s.$ (\pm clamp error).

•Fundamental Frequency Range:

From 40 to 80Hz. Harmonics/Interharmonics up to 31st order.

•Internal Software:

LINUX Operative System.
Software up-datable / up-gradable by user via Internet.

•Memory:

Removable Compact Flash (512Mb included, supports up to 4Gb and more according to available sizes)

•**Languages:** English, Italian, French, Spanish, German.

Standards & Regulations:

ENERGY EXPLORER conforms to Directive 73/23/CEE (LVD) and 2004/108/CE (EMC). 2002/95CE (RoHS), 2002/96/CE (RAEE) and later changes 2003/108/CE. It has been designed with reference to EN 61010-1, EN 61326 including append. A1/A2/A3, EN 61000-6-2, EN 61000-6-3, EN 61000-3-2, EN 61000-3-3, EN 61000-3-3/A1, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-5/A1, EN 61000-4-6, EN 61000-4-6/A1, EN 61000-4-8, EN 61000-4-8/A1, EN 61000-4-11, EN 61000-4-11/A1.

VIP SYSTEM3 KIT FULL OPTIONAL Professional Power & Harmonics Analyser

82 instruments in 1

VIP-SYSTEM3 is a power&harmonics analyser for professional use. Portable, lightweight and with built-in printer, the Vip System3 takes full three-phase measurements and calculates the equivalent three-phase values.

The VIP-SYSTEM3 measures and prints 82 parameters including voltages, currents, power levels, $\cos\phi$ and waveform distortion. It measures total and time-band energy consumption. Further to instantaneous measurement readings it also provides average values and records maximum values for powers and distortion. Using the included BLACK BOX HARMONICS, Vip System3 is capable of performing FT Harmonic Analysis up to the 25th harmonic order, providing data in graphical, numerical and statistical formats. Further, optional Black Box expansions are available adding further functions to Vip System3, as for example leakage current measurement or cogeneration (4 quadrant) energy counters. All measured parameters can be displayed on the Vip System3's backlit, graphical LCD display. The built-in printer can provide automatic and manual print-outs of parameter trends and alarm states in graph form. Additionally, the measured data can be stored into removable MEMORY PACKS for later evaluation using the included PC Software. Memory Packs can also be programmed (locally or remotely) to carry out automatic measurement surveys.



- AC and DC Measurements
- Built-in printer for measurements, alarms and microinterruptions
- Graphic representation of measurements
- Rs232 port for PC connection
- Windows software included
- High accuracy (class 0,5)
- Expandable to other measuring functions using special Black Boxes
- Black Box Harmonics included
- Automatic measurement campaigns programming and storage on removable Memory Packs
- Memory Pack 512k included
- MP-PI-1 parallel interface for Memory Pack download
- 2 Relay alarm outputs

Main Technical Data:

- Power supply
Mains: $230 \pm 10\%$ at 50 Hz or 60 Hz (115V version available)
Internal: Rechargeable 1300mAh Ni-Cd battery.
Expected lifetime: 500 cycles
Recharge time: 48h
Autonomy: 3h
- Inputs
Voltage: L1 - L2 - L3 - N: 600 Volt AC between phase and neutral @ $20 \div 1000$ Hz; or 600 Volt DC
Input Impedance: 4M Ω

Current: L1 - L2 - L3: 1 Volt AC at $20 \div 1000$ Hz; or 1 Volt DC
Auxiliary: AUX 1V/1mA
Input Impedance: 6k Ω
- Display
Multiplexed LCD with backlight. 256x64pixels; 8 lines, 40 columns.
- Accuracy Class 0.5 (EN 62053-21)
- Overload of voltage inputs: Max 720 Vrms - Surge voltage 1200 Volt (cut-out tripped at 720 Vrms)
- Overload of current inputs: 5 times full scale value (cut-out tripped at limit values)
- Relay outputs: 2 - Type A - Contacts for 30 Volt / 0,5 A / 10 W
- Number of scales: 4 voltage scales 4 current scales
- Automatic scale change
- Scale change response time: 1 sec.
- Display refresh rate: 1 sec.
- Instrument dimensions: 240 x 220 x 115 mm.
- Weight 2.250 Kg.
- Operative temperature range: $+5^{\circ}\text{C}$ $+40^{\circ}\text{C}$
- Storage temperature range: -20°C $+60^{\circ}\text{C}$
- Relative Humidity Range (RH%): 20% - 80%
- Condensation: not allowed

PARAMETER	TO	1	2	3	N
Phase angle
Phase voltage
Current
Active power
Apparent power
Reactive power
Active power factor
Apparent power factor
Reactive power factor
Average power
Average active power
Average reactive power
THD%
THD% voltage
THD% current
Average voltage
Average current
Resistance
Resistance
Resistance
Resistance

PARAMETER	L1	L2	N
Voltage	.	.	.
Current	.	.	.
Power	.	.	.
Power factor	.	.	.
Reactive power	.	.	.
Apparent power	.	.	.
THD%	.	.	.
THD% voltage	.	.	.
THD% current	.	.	.
Resistance	.	.	.
Resistance	.	.	.
Resistance	.	.	.
Resistance	.	.	.

Standards and Regulations

Vip System3 conforms to Directive 73/23/CEE (LVD) and 2004/108/CE (EMC). It has been designed with reference to EN 61010-1, EN 61326 including append. A1/A2/A3, EN 61000-6-2, EN 61000-6-3, EN 61000-3-2, EN 61000-3-3, EN 61000-3-3/A1, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-5/A1, EN 61000-4-6, EN 61000-4-6/A1, EN 61000-4-8, EN 61000-4-8/A1, EN 61000-4-11, EN 61000-4-11/A1.

VIP-SYSTEM3 KIT



VIP-SYSTEM3-KIT

KIT complete with:

- n.1 VIP SYSTEM3
- n.1 Shock- and Water-proof IP67 carrying case
- n.1 Set of voltage meas. leads with crocodile clips
- n.1 Black Box Harmonics
- n.1 Memory Pack 512
- n.1 MPPI1 parallel interface

MEASUREMENTS on low/medium voltage single-phase and three-phase (3-wires and 4-wires) systems
MEASUREMENTS for each phase and corresp. 3-phase measurements.
MEASUREMENTS on DC systems using Hall-effect CT clamps
MEASUREMENTS of current values from 30 mA to 999 kA with suitable CTs



Manual PRINT-OUT of measurements shown on DISPLAY.
Overall manual PRINT-OUT of all the latest measurements available.
Automatic PRINT-OUT of parameters selected by the operator at preset time intervals.
Automatic PRINT-OUT at shorter intervals within preset time bands.
PLOTTER PRINT-OUT in bar-graph form showing trends of two parameters selected by operator.
Immediate PRINT-OUT of measurements when values cross minimum and maximum alarm thresholds preset by operator.
More frequent PRINT-OUT of selected parameters while it remains in alarm state.
PRINT-OUT of micro-interruptions and interruptions in line power.



The working day is divided into TIME BANDS programmed by the operator to provide separate measurements of power consumed at different tariffs.
IMMEDIATE PRINT-OUT if average power values for a TIME BAND pass maximum alarm threshold.



TWO OUTPUT RELAYS activated when selected parameters pass a preset maximum



PROGRAMMABLE RS232 SERIAL OUTPUT:

- For connection to remote printer
- For (on line) connection to HOST COMPUTER for storage and processing of measured data.
- For connection (by MODEM) to a telephone network for connection to remote Computer or Printer.

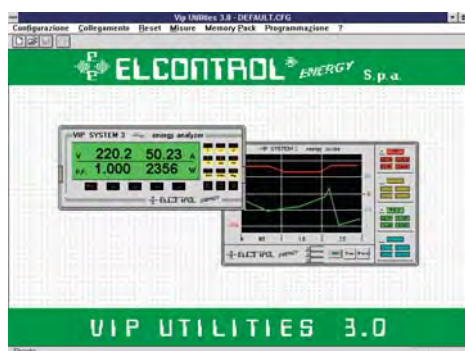


OPTION of MEMORY PACK for automatic measurement surveys, with recording of data for all parameters.
OPTION of modifying instrument functions using BLACK BOXES.
OPTION of measurement, print-out and alarm monitoring of auxiliary parameters using BLACK BOXES.

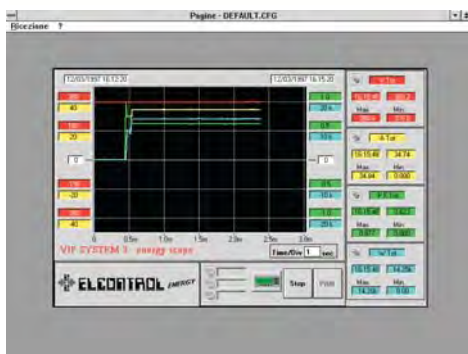
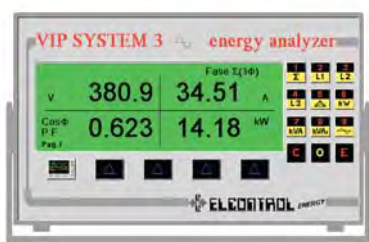


- n.1 VIP SYSTEM3 software Windows
- n.1 power supply cable
- n.1 RS232 PC cable
- n.2 Rolls of printer paper (spare)
- n.1 Ink ribbon (spare)
- n.2 Fuses 5x20 160mA (spare)
- n.1 Warranty certificate
- n.1 Calibration certificate
- n.1 User manual

VIP SYSTEM3 SOFTWARE



Page: DEFAULT.CFG

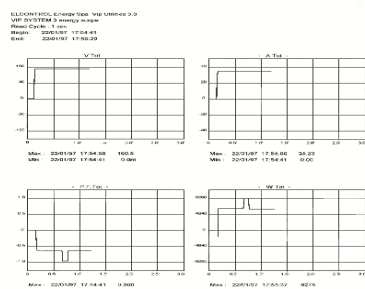


Page: DEFAULT.CFG

VIP SYSTEM3

12/03/1997 16:24:02

	L1	L2	L3	Tot	ff	L1-L2	L2-L3
1 V	220.0	220.1	219.9	220.0	31.53	381.1	381.1
2 A	44.8	44.8	0.000	34.47			
3 P.F.	0.418	0.150	0.000	0.622			
4 W	4.12h	10.04h	0.000h	14.16h			
5 Avg W	2982	7060	0	5947			
6 Max W	8300	8315	8360	24.54h			
7 VA	9.88h	18.36h	0.00h	22.75h			
8 Avg VA	8979	9425	0	16.30h			
9 Max VA	9300	9425	6375	24.56h			
10 VAR	2.96h	3.84h	0.000h	17.80h			
11 Avg VAR	6240	6240	0	12.43h			
12 Max VAR	6240	6240	57.55h	12.43h			
13 %	1.96	0.34	0.00	0.46			
14 Avg %	0.78	0.45	0.00	0.41			
15 Max %	5.92	1.31	0.23	3.09			
16 kWh	124.4217h	35.01832h	48.04750h	243.10761h			
17 kWh	13.905917h	38.318563h	50.025214h	23.253014h			
18 Avg P.F.	0.894	0.993	1.000	0.996			



Vip Utilities3.0 - VIP SYSTEM 3 Management Software for Windows 9X/NT/2000/XP 9x 9x/NT/2000/XP

VIP UTILITIES 3.0 is a software package developed by ELCONTROL ENERGY NET that realizes continuous bi-directional communication between a Personal Computer and the VIP SYSTEM3 power analyzer.

VIP SYSTEM3 is equipped with a RS232 communication port that makes it possible to control the instrument via PC. This operating mode is particularly useful when VIP SYSTEM3 is performing measurements in a point of the installation of difficult access. VIP UTILITIES makes it possible to perform many important operations by transferring all functions of the instrument to the PC's keyboard.

VIP UTILITIES 3.0 can work with VIP SYSTEM3 basing on 2 different operating modes: ON-LINE, OFF-LINE.

ON-LINE:

Complete operative control from PC over RS232 direct connection and MODEM.

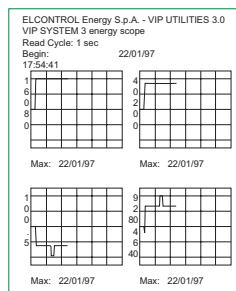
The following operations can be performed:

- o Display of all measurement pages of the "Energy Analyzer" mode (Fig. 2)
- o Display of measurement graphs in "Energy Scope" mode (Fig. 3)
- o Printout of measurement graphs in "Energy Scope" mode (Fig. 4)
- o Display and printout of all measures (Fig. 5)
- o Display and printout of settings
- o Real-time data acquisition and storage on hard disk of the data from automatic measurement campaigns (Fig. 6)
- o Transfer of programming
- o Keyboard enabling / disabling
- o Reset

OFF-LINE:

- o MEMORY PACK transfer
- o Instrument programming
- o Memory Pack campaign programming
- o Measurement campaign processing
- o Configuration

When VIP SYSTEM3 is equipped with MEMORY PACK, VIP UTILITIES can be used to program measurement campaigns; after the campaigns have been performed, all data and measures can be downloaded to PC, displayed, printed and exported to files for further processing. The same functions can be performed remotely on a VIP SYSTEM3 connected to a PC via Modem and telephone line.



Elcontrol Energy Net Spa - Vip Utilities 3.0

VIP SYSTEM3

Read Cycle: 1 sec

Begin: 17:56:41

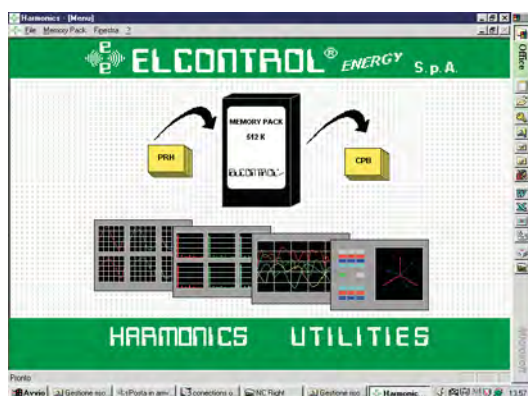
22/01/97

ReadCycle 00:00:15

	Hz	V1	V2	V3	V7	V1-L1-2	V2-L1-3	V3-L1-1	A1
13/03/97	14.03.02	50.0	217.30	217.40	217.50	376.50	376.60	376.50	26.60
13/03/97	14.03.17	50.0	215.50	215.90	215.40	373.40	373.60	373.50	26.470
13/03/97	14.03.32	50.0	215.50	215.70	215.70	373.50	373.40	373.60	26.480
13/03/97	14.03.47	50.0	215.60	216.0	215.60	373.70	373.80	373.40	26.480
13/03/97	14.04.02	50.0	216.10	216.10	215.20	373.80	374.30	373.50	26.520
13/03/97	14.04.17	50.0	216.0	215.80	215.60	373.80	373.90	373.80	26.510
13/03/97	14.04.32	49.90	216.30	216.50	216.20	374.70	374.80	374.70	26.520
13/03/97	14.04.47	49.90	215.30	215.40	214.90	372.80	373.0	372.70	26.470
13/03/97	14.05.02	50.0	216.0	216.10	215.50	373.90	374.20	373.80	26.480
13/03/97	14.05.17	50.0	215.90	215.70	215.50	373.60	373.80	373.40	26.50
13/03/97	14.05.32	50.0	215.90	216.10	215.80	374.0	374.10	373.90	26.520
13/03/97	14.05.47	49.90	217.60	217.90	217.50	377.0	377.20	377.10	26.620
13/03/97	14.06.02	49.90	220.60	221.10	220.90	382.60	382.50	382.40	26.830
13/03/97	14.06.17	49.90	220.30	220.30	220.40	381.70	381.60	381.70	26.830

VIP SYSTEM3 SOFTWARE

Harmonic Utilities3.0 - Harmonic Analysis Software for Windows 9X/NT/2000/XP



Elcontrol Energy has released a software package for use with the VIP SYSTEM3 configured as a HARMONICS ANALYZER via the BLACK BOX HARMONICS option with either the 128K or 512K MEMORY PACK.

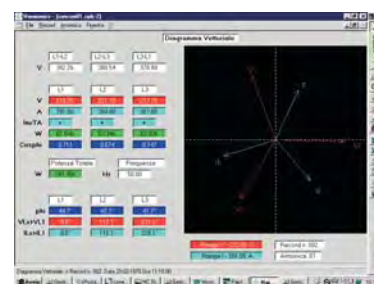
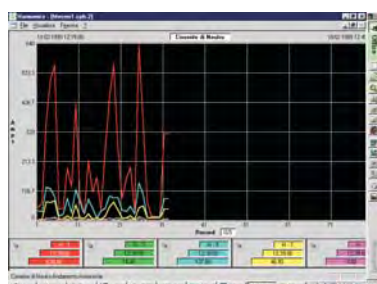
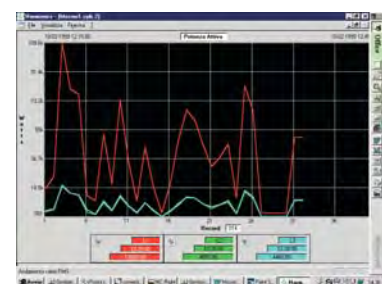
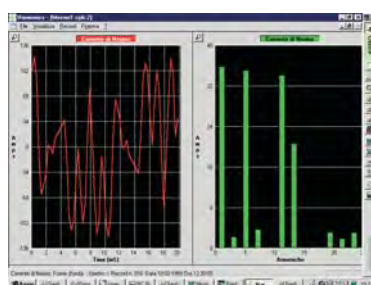
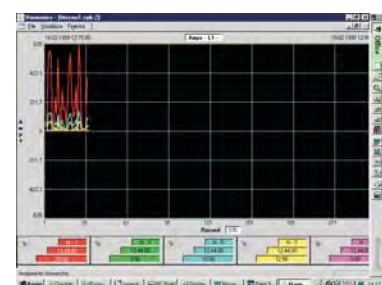
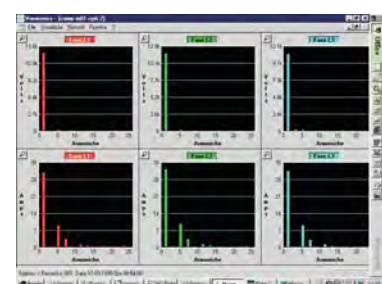
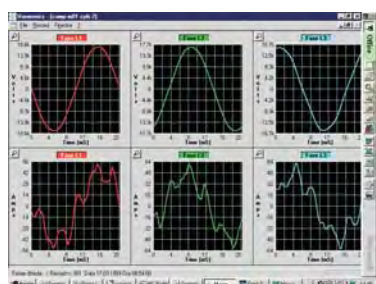
HARMONICS UTILITIES 3.0 permits a complete elaboration of the data stored on MEMORY PACK.

In order to transfer and successively process the data on a PC, it is sufficient to extract the MEMORY PACK from the VIP SYSTEM3 and insert it into the MP-PI-1 parallel interface, connected to a PC by a Centronics cable.

HARMONICS UTILITIES 3.0 can also be used to program automatic measurement surveys.

Available functions include:

- Programming of automatic measurement surveys.
- Transfer of the survey programming to MEMORY PACK.
- Transfer of all the measurement data from MEMORY PACK to PC via MP-PI-1 and saving in a compact data format.
- Exportation (conversion) of the survey data –RMS measures, Harmonics, Statistics, Neutral current, Peak current- into text files.
- Printouts: RMS measures; Harmonics graphs for V, I and Cosphi, Harmonics graphs on record basis, Statistics, Neutral current (RMS total, distortion factor DF% and harmonics), Peak current (with selection of phase and release current).



MICROVIP3 PLUS - Power&Harmonics Analyser

189 instruments in 1



Microvip3 Plus is a compact but powerful portable Power & Harmonics Analyser for both single-phase and three-phase systems.

The crisp high-contrast backlit LCD displays True-RMS values for up to 33 parameters, while the large 1MB on-board memory allows data storage over extended survey periods including waveform capture for current and voltage.

The on-board, programmable 42 columns graphic printer adds visualization of additional 156 parameters of data including V&I harmonics to 24th order with both DC component and displacement factor, and waveform/harmonic bar chart printout with manual or time-based printout.

The integrated high-speed RS232 serial port and the included PC software Microwin add further power to Microvip3 Plus, allowing full graphical display and analysis of all measurement data, both with real-time connection or by downloading the internal memory. Clear, graphical reports have never been easier to produce!

Main Features:

- AC and DC Measurements
- Built-in printer for measurements and graphs
- Integrated Harmonic Analysis up to the 24th order
- Integrated 1Mb Flash Memory
- Rs232 port for PC connection
- Windows software included
- Cogeneration (4-Quadrant) energy counters
- High accuracy (class 1,0)
- Mains or Battery operation

Main Technical Data:

- Power supply
Mains: $230 \pm 10\%$ at 50 Hz or 60 Hz (115V version available)
Internal: Rechargeable 940mAh Ni-Cd battery.
Expected lifetime: 500 cycles
Recharge time: 24h
Autonomy: 7h
- Inputs
Voltage: L1 - L2 - L3 - N: 600 Volt AC between phase and neutral @ 0÷ 600 Hz; or 600 Volt DC
Input Impedance: 4MOhm

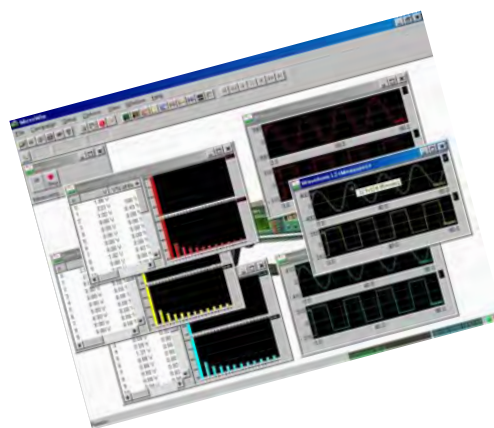
Current: L1 - L2 - L3: 1 Volt AC at 0 ÷ 600 Hz
Input Impedance: 10kOhm
- Display
LCD with backlight.
- Accuracy Class 1.0 (EN 62053-21)
- Overload of voltage inputs: Max 625 Vrms - Peak voltage 825 Volt (cut-out tripped at 720 Vrms)
- Overload of current inputs: 5 times full scale value (cut-out tripped at limit values)
- Number of scales: 3 voltage scales, 3 current scales
- Automatic scale change
- Scale change response time: 1,2 sec.
- Display refresh rate: 1 sec.
- Internal Memory: 1Mb non-volatile Flash
- Instrument dimensions: 251 x 239 x 104 mm.
- Weight 2.900 Kg.
- Operative temperature range: -10°C $+50^{\circ}\text{C}$
- Storage temperature range: -20°C $+60^{\circ}\text{C}$
- Relative Humidity Range (RH%): 20% - 80%
- Condensation: not allowed

MICROWIN - Software for MICROVIP3 PLUS

**Data management software for Windows 9x/NT/2000/XP developed for MICROVIP 3 Plus harmonics and power portable analyzers.
Included with MICROVIP3 PLUS KIT**

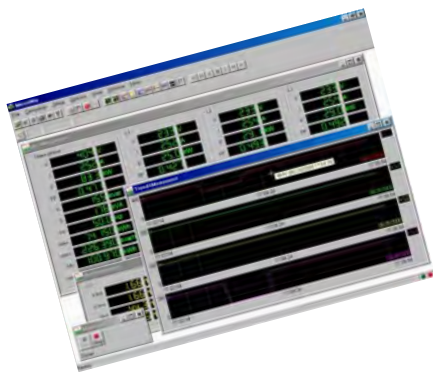


MicroWin allows real-time reading and display of all instrument measures or performing measuring campaigns in two modes: Manual or Automatic. Graphical display includes measuring trends over time, the waveforms and the harmonic spectrum of voltages and currents, etc.

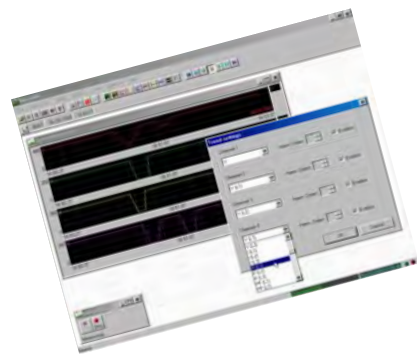


MicroWin allows downloading, classifying and archiving of any measuring campaign stored in the instrument's internal memory. These campaigns are processed in the same way as the numeric or waveform campaigns run on a PC by MicroWin in Remote mode.

Moreover, you can create waveform campaigns displaying the three-phase voltages and currents in Graphic mode. In the Harmonics spectrum display, all Voltage, Current and CosPhi measures for all the harmonics available on the instrument (0-24) appear both in numeric and in percentage values calculated on the basis of the first harmonic.



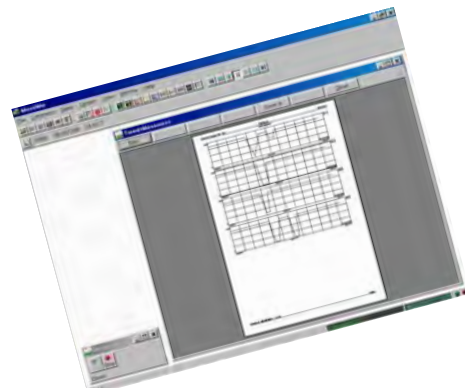
During a campaign it is possible to display the real-time measuring trend for up to four measures.



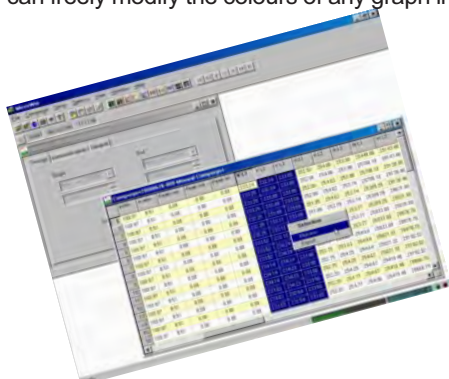
MicroWin allows real-time selection of the number of tracks to be displayed and the type of measure of each channel.



The user can freely modify the colours of any graph in the program.



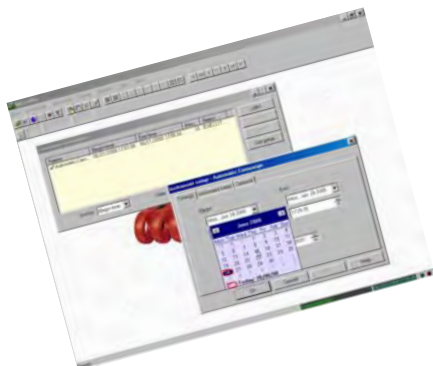
The Print preview shows a preview of the print output for each window.



For a detailed analysis of the measuring campaign in off-line mode all campaign records are available in an EXCEL-style spreadsheet.



From the spreadsheet, historical data can be graphed up to a maximum of four measures. Besides, the user can freely select the measures and records to be displayed.



Configuring campaigns is a very intuitive procedure. MicroWin simply provides one Configuration window, where all the basic parameters (such as date and time of campaign start and end, the frequency time, the instrument setup and a descriptive label for each measuring campaign) are set.



It is possible to have access to the scheduler at any time, so as to add, modify or delete measuring campaigns.

NANOVIP PLUS

Hand-Held Power & Harmonic Analyzer

More than 100 measures including Harmonic Analysis

Highest Performance in a Compact Package

NANOVIP PLUS is a truly hand-held portable power analyser for single-phase and balanced three-phase systems.

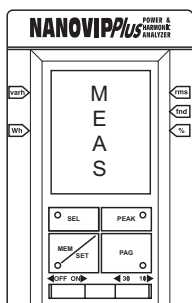


NANOVIP PLUS is capable of measuring over 100 fundamental parameters for display via a large, high-contrast LCD. Measurements include full Harmonic Analysis up to the 24th order and DC measures (with a suitable DC current clamp).

Moreover, the high-speed serial port and the included PC software NANOWIN add further power to Nanovip Plus, allowing full graphical display and analysis of all measurement data, both as real-time measures or by performing measuring campaigns storing data on the PC's hard-disk.

The extreme portability, the excellent performances -not only in terms of available functions but also for accuracy and reliability- and the unbeatable price/performance ratio: Nanovip Plus should be included in every electrician's toolkit!

Instantaneous Measurements



Volt, Amps, Watts, VAr, VA,W, Hz pos/neg kWh (import/export), pos/neg kvarh (inductive/capacitive)

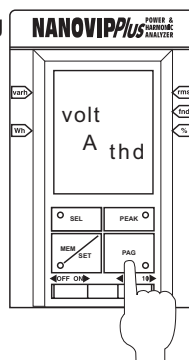
All measurements are True-RMS, with accuracy class 1.0.

DC measurement capability (requires Hall effect clamp for current).

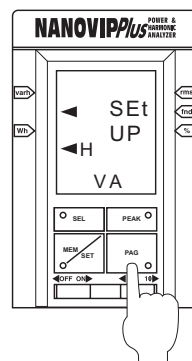
Automatic recognition of clamp type in use (200A or 1000A) - removes the need for additional set-up by the user.

- PEAK feature captures max current/power values or min voltage value (user selectable).

- MEM function provides data hold and allows realtime comparison of new readings against stored values.

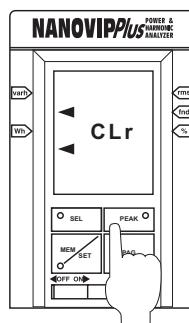


- Measurement of harmonic values of V & I (1 st to 24th) expressed as absolute and percentage values, plus their DC component and displacement values
- Total Harmonic Distortion (THD) of V & I with reference to the fundamental or total RMS value
- Crest factor for V & I expressed as absolute and percentage values
- DC ripple component for V & I as RMS percentage values
- V & I ripple as RMS value



User-friendly Set-up

- Auto set-up for standard current clamps
- Manual override facility for non-standard ratios - fully programmable for any CT
- Standard or co-generation energy metering
- 50/60Hz fundamental selection for harmonics analysis
- DC selection
- RS232 parameter set-up for serial communication to PC



Reset

- Reset of energy meters

NANOVIP PLUS MEM

Hand-Held Power & Harmonic Analyzer with Memory

Unbeatable Performance in a Compact Package

NANOVIP PLUS MEM has all the capabilities and advantages of Nanovip Plus, but adds further functions and a large 1Mb integrated Flash-Memory for extended measuring surveys.

All the performance of the Nanovip Plus and:

- Automatic data storage to 1MB internal memory (4032 records)
- Internal clock/calendar
- Backlit LCD with auto/manual control
- kW for each harmonic frequency
- Fast data download to PC via 38.4kbaud serial port.
- "One touch" set-up for default values (CT set-up, VT set-up, fundamental frequency, comms set-up etc)
- Realtime link to PC in addition to memory download
- Nanowin software included.



* Optional power supply, part no 4AAQI.

Main Technical Data:

PARAMETERS	1F/3
Voltage [V]	•
Current [A]	•
Power Factor	•
Active Power [kW]	•
Reactive Power [kvar]	•
Apparent Power [kVA]	•
Frequency [Hz]	•
Positive (Imported) Active Energy [kWh]	•
COG-negative (Expo) Active Energy [kWh]	•
Positive Reactive Energy [kvarh]	•
COG-negative Reactive Energy [kvarh]	•
Apparent Energy [kvarh]	•
Voltage Thd%	•
Voltage Thdrms%	•
Current Thd%	•
Current Thdrms%	•
Vi (I=0-24@50Hz, I=0-20@60Hz)	•
Ai (I=0-24@50Hz, I=0-20@60Hz)	•
Cosφ I (I=0-24@50Hz, I=0-20@60Hz)	•
Kwi** (I=0-24@50Hz, I=0-20@60Hz)	•
Crest Factor V	•
Crest Value V	•
Crest Factor A	•
Crest Value A	•
DC Voltage Ripple dU	•
DC Current Ripple dA	•
* Single-phase Or Balanced Three-phase	
Nanovip Plus Mem Only	

- Power supply
Battery: 4 1,5V AA Batteries
Autonomy: 50 ÷ 60h (40 ÷ 50h with PEAK-function)
(Optional power supply available for Nanovip Plus MEM)
- Inputs
Voltage: L1 - N: 600 Volt AC between phase and neutral @ 0÷ 600 Hz; or 600 Volt DC Input Impedance: 4MΩ
- Current: L1: 1 Volt AC at 0 ÷ 600 Hz
Input Impedance: 10kΩ
- Display:
Nanovip Plus: LCD
Nanovip Plus MEM: LCD with backlight
- Accuracy Class 1.0 (EN 62053-21)
- Overload of voltage inputs: Max 825 Vrms - Peak voltage 1,17kV
- Overload of current inputs: 5 times full scale value (cut-out tripped at limit values)
- Number of scales: 3 voltage scales, 3 current scales
- Automatic scale change
- Scale change response time: 1 sec.
- Display refresh rate: 1 sec.
- Internal Memory: 1Mb non-volatile Flash (only Nanovip Plus MEM)
- Instrument dimensions: 80 x 175 x 32,5 mm.
- Weight 400g (including batteries)
- Protection level: IP40
- Operative temperature range: - 10°C +50°C
- Storage temperature range: - 20°C +60°C
- Relative Humidity Range (RH%): 20% - 80%
- Condensation: not allowed

NANOVIP - Hand-Held Power Analyser



Simple and Cost-Effective Power Analyser

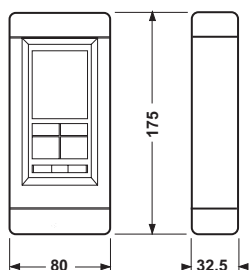
NANOVIP is the most simple and cost-effective solution providing just the 7 most important measures of a single-phase or balanced three-phase system. In addition it allows recording of the measurements in correspondence with peaks of voltage, current or power and measurement of parameters respective to recorded values.

7 MEASUREMENT FUNCTIONS IN THE PALM OF YOUR HAND

- Volt (rms), Amp (rms) P.F, W Cos ϕ , var, VA, Hz
- PEAK function for storing the measurements in correspondence to the V, A, W peaks (selectable)
- MEM functions for measurements of deviations of V, A, W, Cos ϕ with respect to the recorded values.
- Measurements from 7W to 150kW (750kW with 1000A clamp meter)
- Measurements as true RMS value
- Automatic voltage and current scale change
- AC and DC measurements (with DC clamp meters)
- High accuracy.
- Very user-friendly.

PARAMETERS	1F/3F*
Voltage [V]	•
Current [A]	•
Active Power [kW]	•
Power Factor	•
Reactive Power [kvar]	•
Apparent Power [kVA]	•
Frequency [Hz]	•
* Single-phase Or Balanced Three-phase	

DIMENSIONS (mm)



NANOVIP/PLUS/MEM KIT



Standards and Regulations

Nanovip conforms to Directive 73/23/CEE (LVD) and 2004/108/CE (EMC). It has been designed with reference to EN 61010-1, EN 61326 including append. A1/A2/A3, EN 61000-6-2, EN 61000-6-3, EN 61000-3-2, EN 61000-3-3, EN 61000-3-3/A1, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-5/A1, EN 61000-4-6, EN 61000-4-6/A1, EN 61000-4-8, EN 61000-4-8/A1, EN 61000-4-11, EN 61000-4-11/A1.

NANOVIP PLUS KIT NANOVIP PLUS MEM KIT

KIT complete with:

- n.1 NANOVIP PLUS / PLUS MEM
- n.1 NANOVIP carrying case
- n.1 Set of voltage meas. leads with crocodile clips
- n.1 Nanowin software Windows
- n.1 RS232 PC cable
- n.4 1,5V AA Batteries
- n.1 Warranty certificate
- n.1 Calibration certificate
- n.1 User manual

NANOVIP KIT

KIT complete with:

- n.1 NANOVIP
- n.1 NANOVIP carrying case
- n.1 Set of voltage meas. leads with crocodile clips
- n.4 1,5V AA Batteries
- n.1 Warranty certificate
- n.1 Calibration certificate
- n.1 User manual

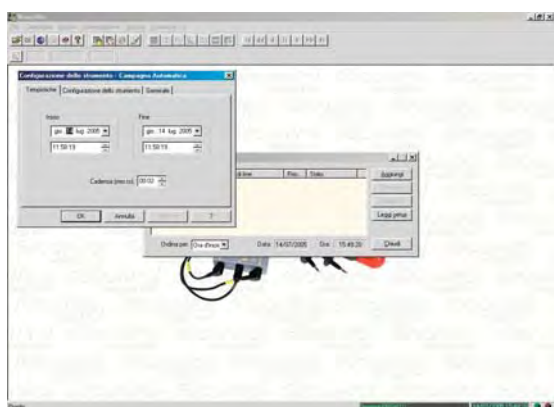
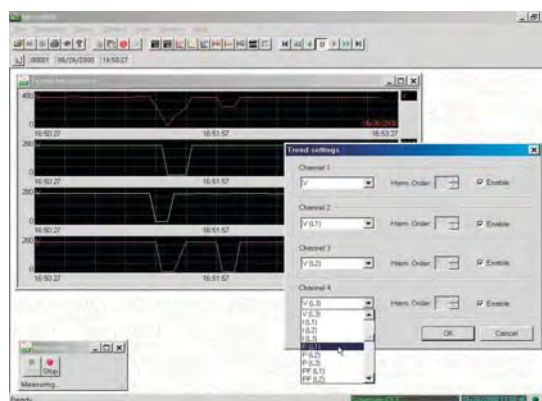
NANOWIN

**Data management software for Windows 9x, NT, 2000 and XP
for hand-held analysers NANOVIP Plus and NANOVIP Plus MEM**

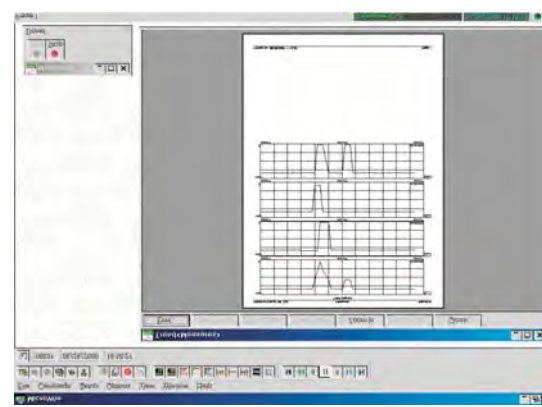


Harmonic Spectrum display. The Voltage, Current and CosPhi of each harmonic (0-24) are displayed both as a numerical value and as a percentage with respect to the basic one.

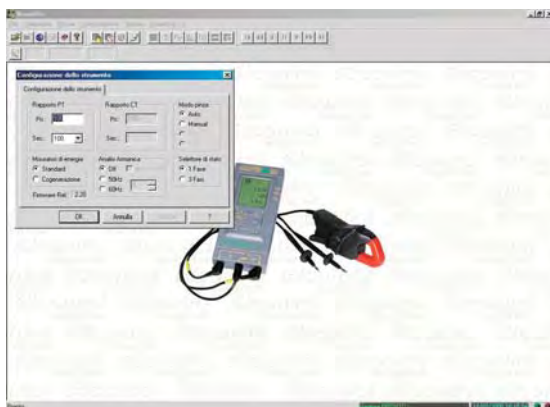
NanoWin is a Windows 9x, NT4.0, 2000, XP data visualization, management and processing software for Nanovip Plus and Nanovip Plus Men instruments. It allows visualization of all measurements on the instruments and performing measuring surveys in both Manual and Automatic (scheduled) modes. Measurement trends over time, waveforms, voltage and current harmonics spectrum etc. can be displayed.



Configuration of surveys is very straightforward. A single configuration window allows the main parameters to be set, e.g. campaign beginning and end date and time, frequency time, instrument set-up and label describing each measuring campaign.



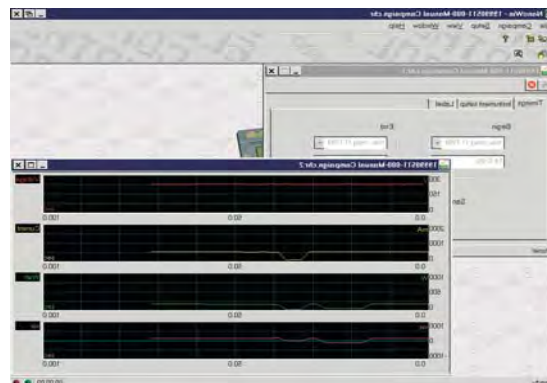
During a campaign, it is possible to display the real-time trend of up to measurement parameters.



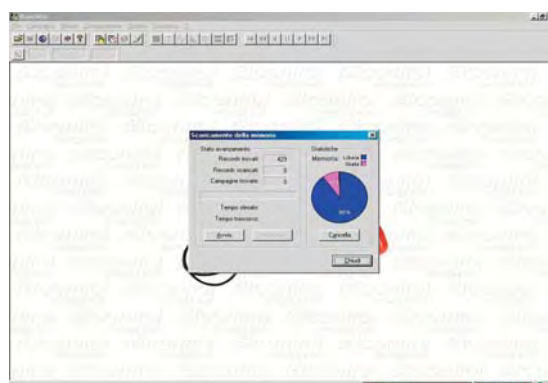
Instrument set-up Window



The digital format measurement display is divided according to four types of data: RMS, Peaks-Memory-Sweep, Thd-Crest Factor-Ripple and Harmonics Spectrum. Each one of the listed windows can be displayed or hidden independently.



It is also possible to carry out waveform campaigns, by displaying the voltage and current measured by the instrument in the Graphic mode.



When Nanowin is used with NANOVIP Plus MEM, the program enables to download, classify and file measuring campaigns' data stored in the instrument's internal memory. Such campaigns are handled just like numerical campaigns executed on PC by the NanoWin program in the remote mode.

DM8135 - AC / DC Digital Clamp Meter



Compact, Lightweight & Cost-Effective

DM8135 is a battery-operated, auto-range AC/DC digital clamp meter for professional use.

The supply kit includes a plastic carrying case, measurement leads and temperature probe.

9 Measurement Functions

- AC / DC Current
- AC / DC Voltage
- Frequency
- Duty Cycle
- Resistance
- Capacitance
- Diode Test
- Temperature
- Continuity Test

Main Technical Data

- Display: 3999 counts
- Jaw capability: Ø 42mm
- Voltage Measurement scales/ranges and accuracy:
Max Voltage: 600Vrms CAT III, 1000Vrms CAT II
AC: 4 / 40 / 400V 0.7%, 700V 1.0%
DC: 0.4 / 4 / 40 / 400V 0.7%, 1000V 0.8%
- Current Measurement scales/ranges and accuracy:
AC: 400 / 1000A 3.0%
DC: 400 / 1000A 3.0%
Overload: Max 120% for 60 seconds
- Frequency Measurement range and accuracy:
10Hz to 100kHz 2.0%
- Resistance Measurement scales/ranges and accuracy:
400 / 4k / 40k / 400k / 4M 1.2%, 40M 2.0%
- Capacitance Measurement scales/ranges and accuracy:
4n / 40n / 400n / 4F 4.0%
- Temperature Measurement range and accuracy:
-40°C to 750°C 1.0%
- Operating temperature: 5 – 35°C
- Dimensions: 250x99x43mm
- Weight: approx. 480g

Standards and Regulations

Safety reference standards: EN 61010-1, 600V CAT II.
EMC reference standards: 89/336/EEC, 73/23/EEC, 93/68/EEC.

DM8135 SUPPLY KIT



DM8135 KIT

KIT complete with:

- n.1 DM8135
- n.1 DM8135 carrying case
- n.1 Set of voltage meas. leads with crocodile clips
- n.1 9V Battery
- n.1 Temperature probe
- n.1 Warranty certificate
- n.1 User manual

ACCESSORIES

CURRENT CLAMPS FOR PORTABLE ANALYSERS

Types	Ref.	Description	Star3 Din	Dmm3	Ed39 Din	Sirio	Vip Energy	Vip Mem	Star 3	Vip 396	Vip 96	Vip 96 Plus	JUPITER	Vip System3	Microvip3 Plus	Microvip3	Nanovip-Plus	Nanovip-Plus Mem
PINZA-10A/1VAC	4AABM	CLAMP CT 10A/1V-AC											●	●	●	●	●	●
PINZA-200A/1VAC	4AAR1	Clamp CT 200A/1V-AC											●	●	●	●	●	●
PINZA-1000A/1VAC	4AAWS	Clamp CT 1000A/1V-AC											●	●	●	●	●	●
PINZA-3000/1-D6	4AAC3	Clamp CT 3000A/1A-AC (to be used with INTA/1)											●	●	●	●	●	●
PINZA-400A/0.4V-40A/0.4V-AC-DC	4AABU	Clamp CT 400A/1V-AC/DC (to be used with ADAPTA)												●	●	●	●	●
PINZA-1000A/1V-100A/1V-AC-DC	4AABW	Clamp CT 1000A/1V-AC/DC (to be used with ADAPTA)												●	●	●	●	●
AMPFLEX-1000A/1VAC-45CM	4AAQB	Flexible Current Transformer 1000A - length 45 cm											●	●	●	●	●	●
AMPFLEX-1000A/1VAC-80CM	4AAQC	Flexible Current Transformer 1000A - length 80 cm											●	●	●	●	●	●
AMPFLEX-3000A/1VAC-80CM	4AAQD	Flexible Current Transformer 3000A - length 80 cm											●	●	●	●	●	●
AMPFLEX-3000A/1VAC-120CM	4AAQE	Flexible Current Transformer 3000A - length 120 cm											●	●	●	●	●	●
3 AMPFLEX-1000A/1V	4AABN	Set of three Flexible Current Transformer 1000A L=61cm. one amplifier											●	●	●	●		
PINZA_LMA-DIAM55	4AADM	Clamp CT for leakage current measurement												●				
PINZA-10/1V-AC-DC	4AASA	Clamp CT PR20 (to be used with ADAPTA)											●	●			●	●

INTERFACES AND ADAPTERS FOR MEASURES INPUTS

ADAPTA-1V/1V	4AACQ	Clamp CT connectors adapter 1V/1V											●	●	●	●	●	●
INTA/1	4AABB	Converter 1A to 1V for CT with 1A output											●	●	●	●	●	●
INTA/5	4AABD	Converter 5A to 1 V for CT with 5A output											●	●	●	●	●	●
SEPA/5X1	4AAER	Galvanically isolated converter 5A/1V											●	●	●	●	●	●
DSC-400VAC	4AANY	Delta Star CONVERTER input max 400V											●	●	●	●		
DSC-MT	4AAC4	Delta Star CONVERTER for input max 100V for PT output											●	●	●	●		
DSCD 2	4AAHG	Delta Star CONVERTER input max 700V din rail											●	●	●	●		

ACCESSORIES AND CONVERTERS FOR SERIAL COMMUNICATION

INTERFACE-OF-RS232	4AAFH	Kit with 5m of OF fibre+Adapter 25/9 pin + converter OF/232															●	
CONVERT.OF/RS232-9P	4AAFQ	MONODIRECTIONAL RS232-OF SIGNAL CONV.															●	
RS485-SIGNAL REPEATER	4AAJY	bi-directional amplifier for RS485 serial line	●	●	●	●	●	●	●	●	●	●						
PC-485-BOX 220 VAC	4AAK4	RS232-RS485 signal converter	●	●	●	●	●	●	●	●	●	●						

SOFTWARE

Energy Studio Manager		Software Energy Studio Manager. see description at page 3.	●	●	●	●	●	●	●	●	●	●						
STARLIGHT	4AAX9	easy to use monitoring sw. 128 instr. WIN 9.x/2000/XP Italian-English	●	●	●	●	●	●	●	●	●	●						
VIP VISION - 32-IT/UK	4AATG	SCADA sw up to 32 instruments; Win 9.x/NT4	●	●	●	●	●	●	●	●	●	●						
VIP VISION-247- IT/UK	4AATH	SCADA sw up to 247 instruments; Win 9.x/NT4	●	●	●	●	●	●	●	●	●	●						
PQ STUDIO	4AAXT	Software for JUPITER Win 9X/NT/2000, 5 languages											●					
VIP SYSTEM3 SOFTWARE	4AATB	Software for VIP SYSTEM3 Win 9X/NT/2000, 5 languages												●				
NANOWIN	4AARQ	Software for NANOVIP PLUS Win 9.X, NT, 2000,XP ; 5 Languages															●	●
MICROWIN	4AASK	Software for MICROVIP3PLUS; Win 9.X, NT, 2000,XP ; 5 Lang.													●			

ACCESSORIES

CABLES

			Star3 Din	Dimm3	Ed39 Din	Sirio	Vip Energy	Vip Mem	Star 3	Vip 396	Vip 96	Vip 96 Plus	JUPITER	Vip System3	Microvip3 Plus	Microvip3	Nanovip-Plus Mem	Nanovip-Plus
CONNET. CAVO DISPER.	4AAAM	SHIELED CONNECTION CABLE for black box lma												●				
CAVO-MISURA-1000V	4AABG	Voltage LEADSET for meas.up to 1000Vrms without crocodiles												●	●	●	●	●
CAVI-MISURA-1000+COCCOD	4AAQK	Voltage LEADSET for meas. up to 1000Vrms with crocodiles												●	●	●	●	●
CAVO-RS232-EPSON	4AACW	Connection cable System3 to serial printer.												●				
CAVO-RS232-IBM-PC-XT	4AACF	PC Connection cable 25 pin												●	●	●	●	●
CAVO-RS232-IBM-PC-AT	4AAL5	PC Connection cable 9pin												●	●	●	●	●
CAVO-RS232-MODEM	4AACN	Connection cable VIP SYSTEM 3 with modem												●				
CAVO-ADAPT-25P-9P	4AACM	ADAPTER RS232 9pin female/25 pin male												●	●	●	●	●
CAVO CENTRONIC	E1ADV	CENTRONICS standard cable												●				

JUPITER ACCESSORIES

COMPACT FLASH 512Mb	4AAVX	Compact Flash Memory Card 512Megabyte												●				
COMPACT FLASH 1Gb	4AAWV	Compact Flash Memory Card 1Gigabyte												●				
ADD. BATTERY PACK	4AAUX	Package of 10 rechargeable NiMH batteries type AA												●				
AMPFLEX 1000A 80CM	4AAXX	Flexible Current Transormer 1000A-80cm, with direct connection												●				

BLACK BOXES AND MEMORY PACKS FOR VIP SYSTEM3

MEMORY-PACK-128K	4AABF	Memory for Measurements Surveys												●				
MEMORY-PACK-512K	4AADJ	Memory for Measurements Surveys												●				
MP-PI-1	4AACP	Parallel Interface for Memory Pack Reading from Pc												●				
BLACK-BOX-CENTRONICS	4AACX	Box for Connection To External Parallel Printer												●				
BLACK-BOX-COGENERAT.	4AAES	Measures of Exported Energy Counters (Cogeneration)												●				
BLACK-BOX-HARMONICS	4AADG	Harmonic Analysis												●				
BLACK-BOX-LMA	4AACA	Measures of Leakage Current												●				
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CURRENT TRANSFORMERS

CURRENT TRANSFORMERS /5

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