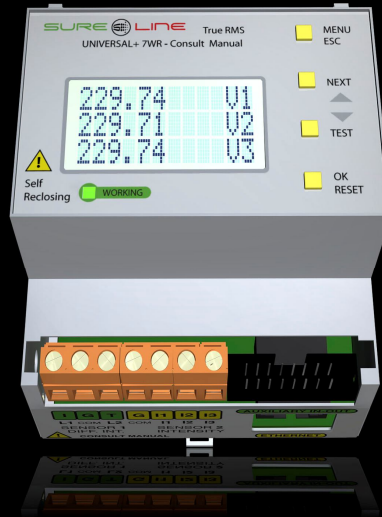
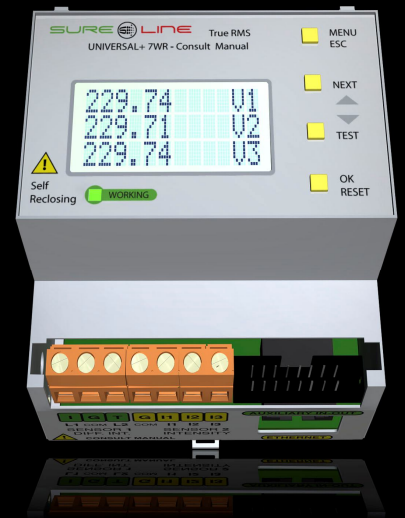


Universal tele-programmable, tele-controllable mains analysis unit with WebServer and Modbus TCP/IP
Graphic and numerical display in real time. RMS, Peak, AC and DC measurements
Oscilloscope event-logger in waveform with pre-trigger (built-in 600-event memory)
Graphic log of mean THD-HD-VAr at 5-minute intervals for analysis for
harmonics compensation and reactive power with built-in 14-month memory
64 harmonics with calculation of power, power factor, distortion range in % and value V – A, + THD
THD measurement and alarm as from 2-63, programmable by harmonic and harmonics bracket (v. HP)
64-harmonic spectrum with distortion range in % and V-A value, plus THD
Proactive measurements of 1600 electrical parameters + temperature and humidity
Relays with alarms, timers, time programmer, input control and manual control
Graphical history (months, days, hours and minutes) of energy, costs and emissions with built-in 3-year memory
Tele-management, sizing, surveillance, energy maintenance and I/O control



UNIVERSAL+ 7WR M4
2, 3 and 4-pole. Up to 10,000A



UNIVERSA+ 7WR Rogowski M4, 3 and 4-pole
Configurable measurement scales to the unit
Scales: 250A, 500A, 1000A and 2000A
With one single model of flexible Current Transformers
multi-range Rogowski coil calibrated for its unit



UNIVERSAL+ 7WR MINI M4
Single-phase up to 280A

Dimensions:
Single-phase (1 module, 18mm)
Three-phase (2 modules, 36mm)



UNIVERSAL+ 7WR MINI M4
Three-phase up to 10,000A

Generic UNIVERSAL+ 7WR M4, Rogowski M4 and MINI M4 manual
With software version V3.12

Generic user's/installer's manual - UNIVERSAL+ 7WR M4, Rogowski M4 and MINI M4

It is essential that the user/installer fully understand the present manual prior to using the unit. Should any doubt arise, please refer to the Authorised Distributor or the Manufacturer

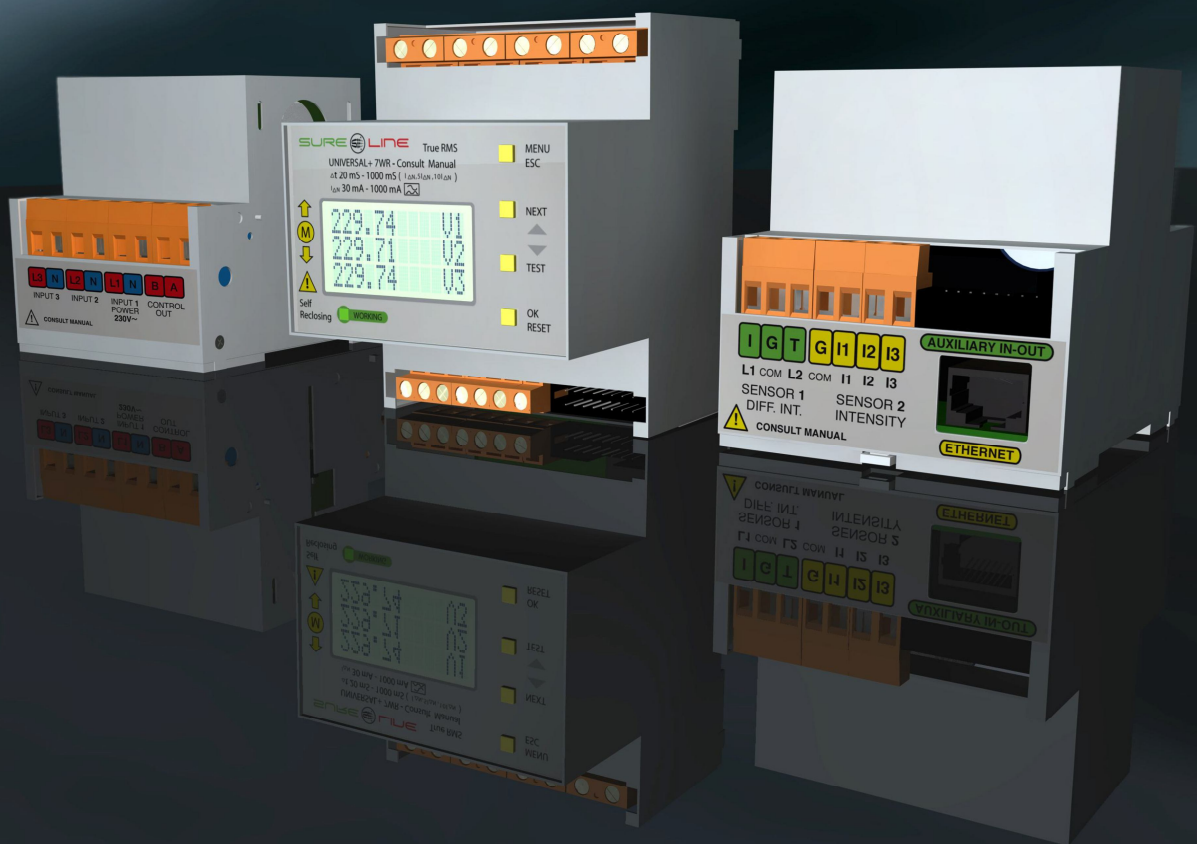
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Published in Spain by Safeline, S.L. 12th Edition (June 2020)



Consult appended manuals for specific models:

[Annex-manual - UNIVERSAL+ 7WR M4](#)

[Annex-manual - UNIVERSAL+ 7WR M4 VERSIONS](#)

[Annex-manual - UNIVERSAL+ 7WR Rogowski M4](#)

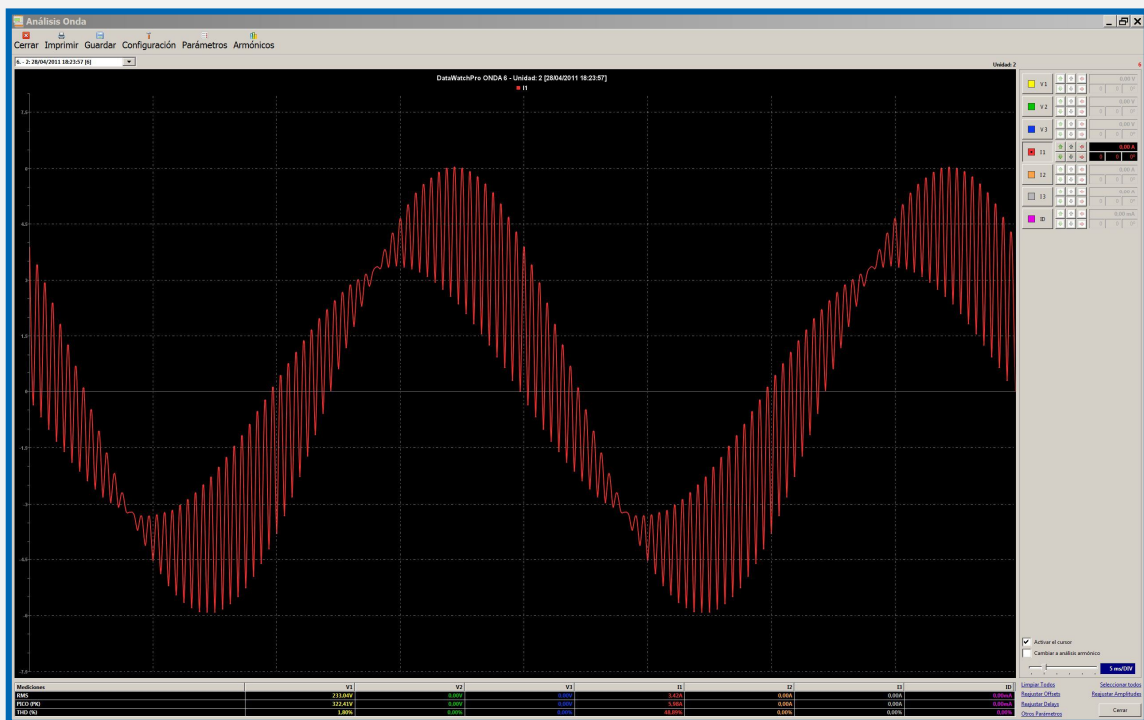
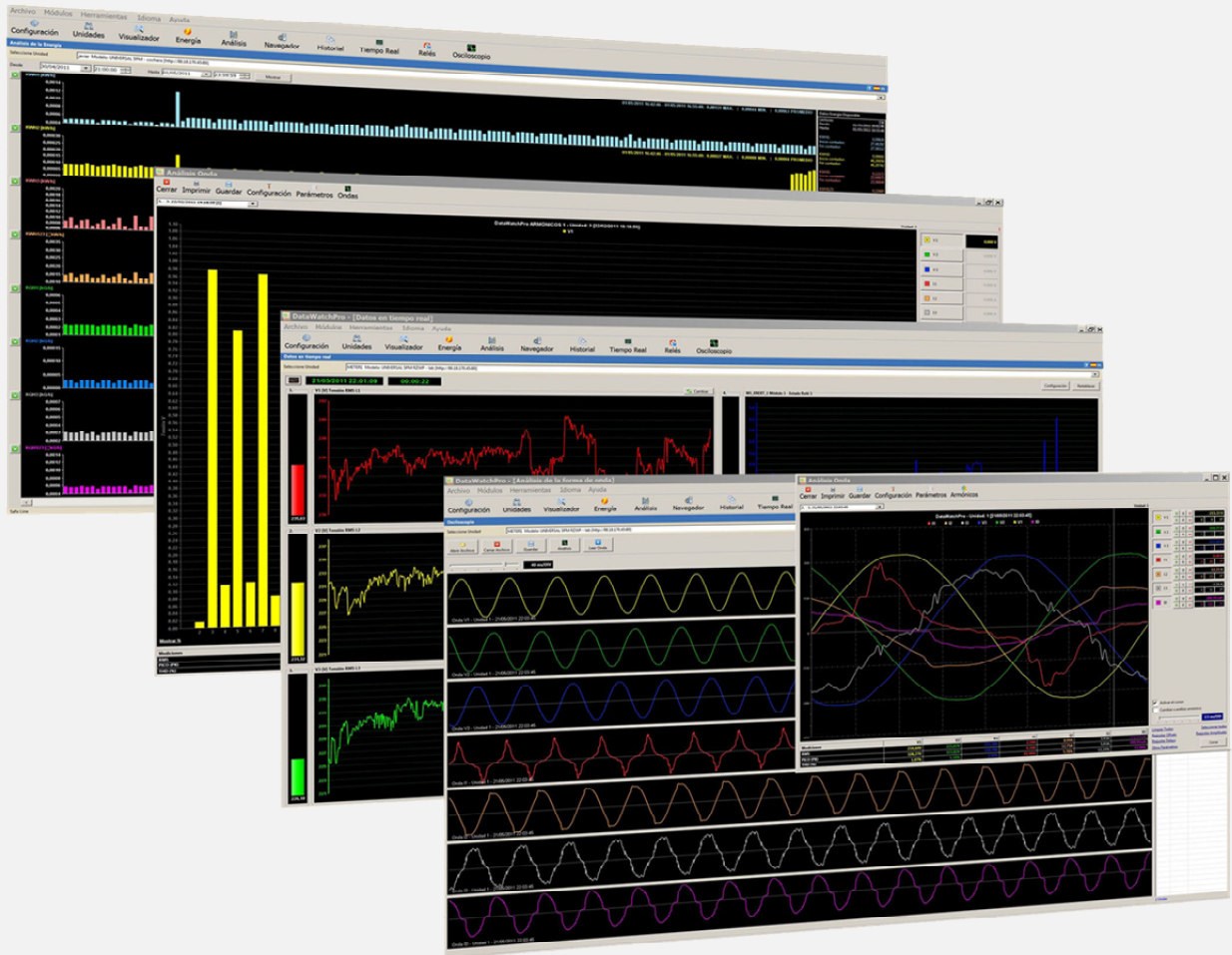
[Annex-manual - UNIVERSAL+ 7WR MINI M4](#)

[Manual Safeline Web Service](#)

[Instruction manual - DatawatchPro software](#)

[Instruction manual - UNIVERSAL+ 7WR IN OUT](#)

[Instruction manual - UNIVERSAL+ 7WR accessories](#)

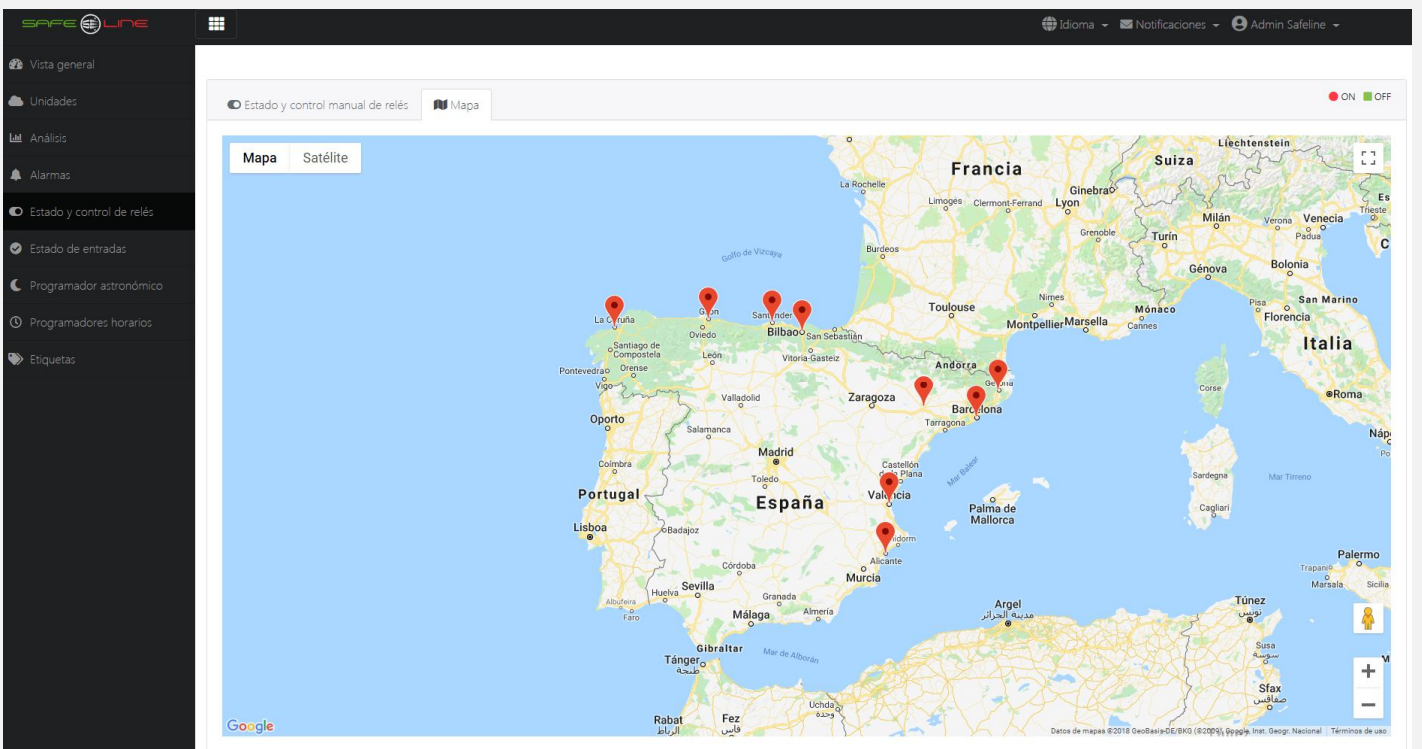
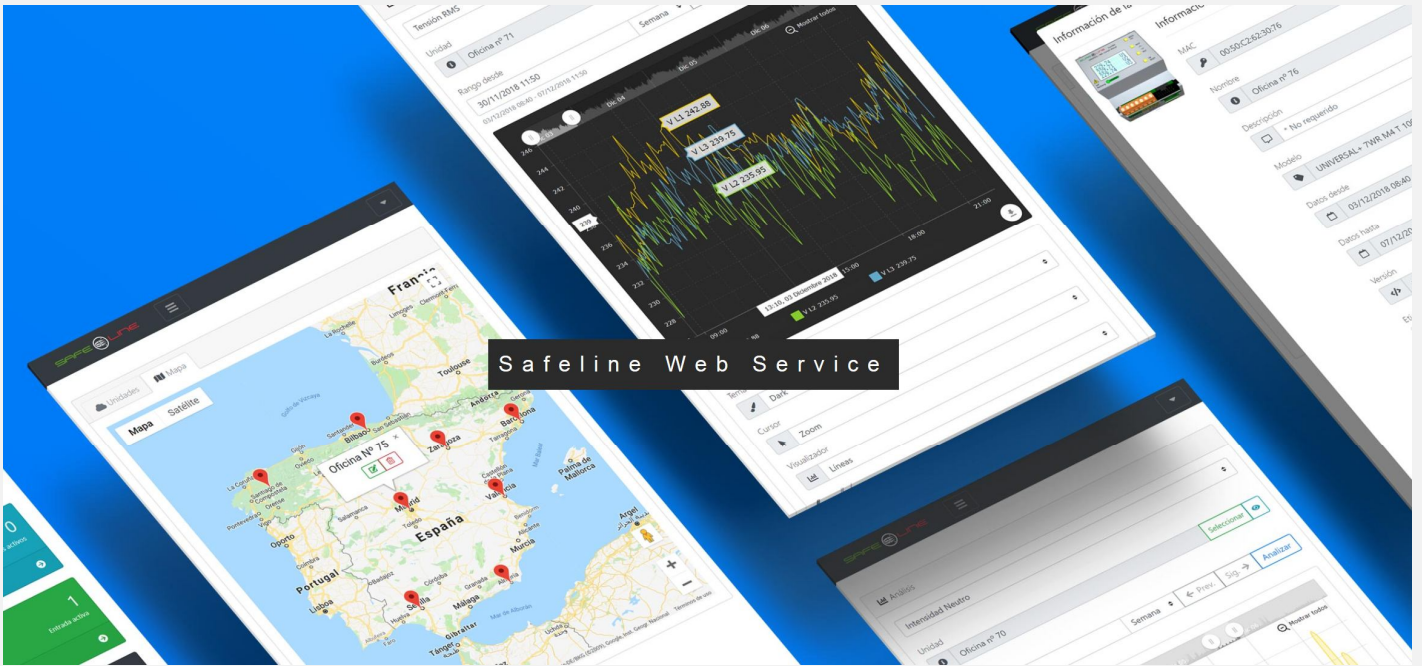


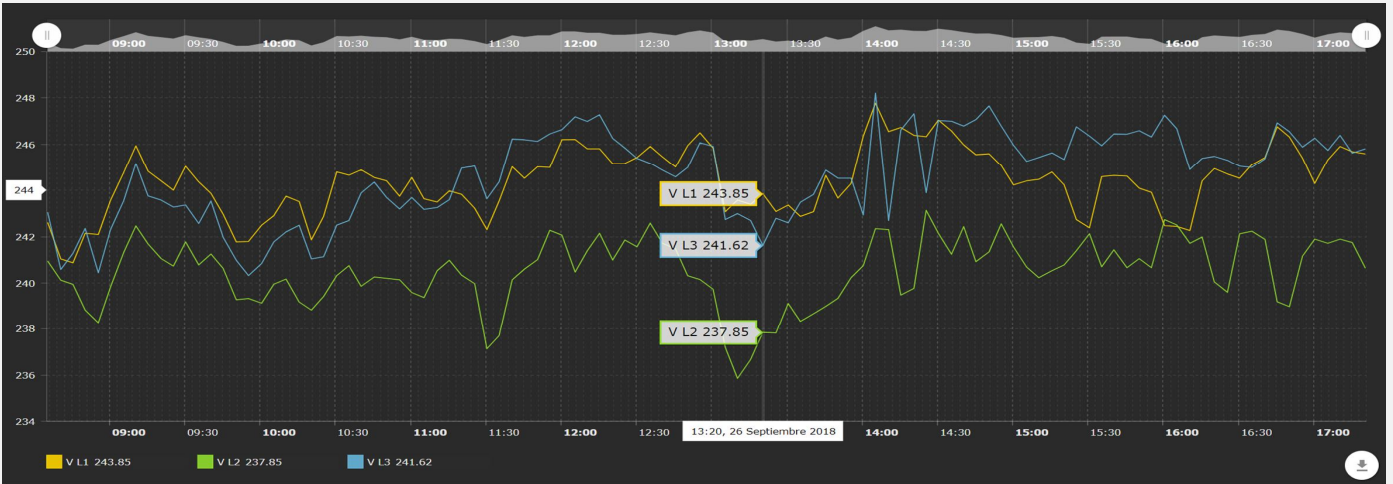
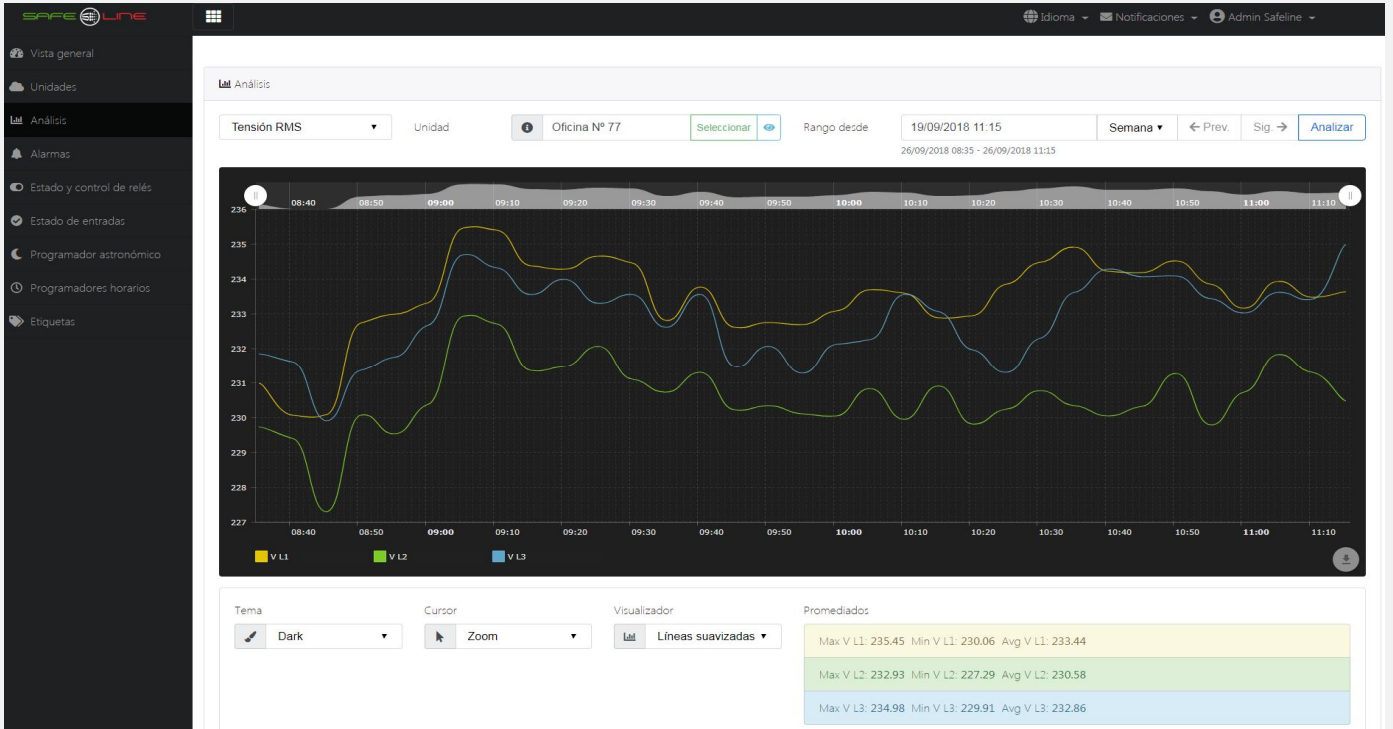
Important: Depending on the versions of the software and of the UNIVERSAL+ TWR model (consult these on the identifying label on the side of the unit and on its display and/or WebServer), different alarms, measurements and characteristics are included. These are to be found in the corresponding manuals and synoptic tables.

Specially designed for operation with “Safeline Web Service” administration software

Safeline Web Service V1.1.0

- Administration and control software via Internet/Intranet for Sureline Universal+ 7WR units
- Storage of measurement and I/O status data sent by the units
- Unit register and geographical location management from map via Google Maps
- Weekly astronomical programmer for each geographical location (output relays) assignable to groups of units
- Thousands of independent hourly programmers (assignable to groups of units):
 - Daily / weekly
 - Daily / monthly / yearly
 - Daily / monthly/ yearly (vacations and holidays)
- Output relay management and logical input management
- Graphical analysis of measurements
- Management of measurement alarms and logical input for each unit, with notifications via e-mail
- Unit management by labels. Attribute search engine.
- Auto-register of units in the server
- Administration capacity: 16000 Sureline units





Vista general

Unidades registradas: 9	Análisis: 1.055.068 Medidas almacenadas	Alarmas configuradas: 0
Relés activos: 16	Estado de entradas: 1 Entrada activa	Programas configurados: 0
Programas configurados: 0	Prog. diario/mensual/anual: 2 Programas configurados	Prog. vacaciones/festivos: 9 Programas configurados
Etiquetas configuradas: 10	Notificaciones no leídas: 0	

Mapa | Satélite

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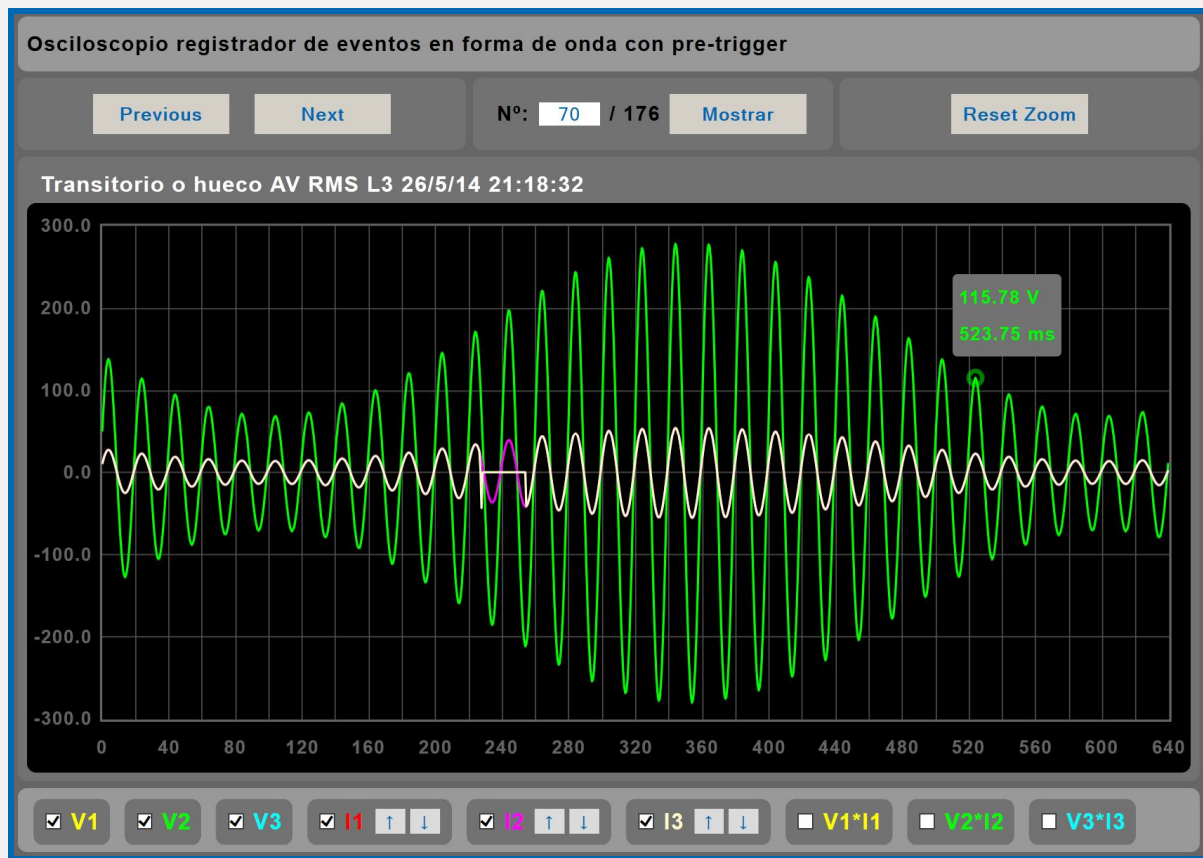
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Chapter 1 – Introduction

1.1 Introduction

The "UNIVERSAL+ 7WR" family is a series of units with WebServer designed to provide electrical protection, control and monitoring in real time via Internet/Intranet, permitting electrical installations to be protected and any process whatsoever to be automatised with inputs/outputs. These units are totally autonomous and, once configured, can communicate with each other via Internet/Intranet to enable or disable relays/functions/processes.

SURELINE incorporates a highly advanced and innovative technology. Presentation: standard (EN 50 022) enclosure for 35mm DIN rail. This is a compact unit monitored by a microcomputer and is highly stable due to its built-in double process monitor (Watchdog). Moreover, it affords useful operative and safety features such as: restoration of parameters to factory-set values, read-only mode in Internet/Intranet, customisable user code, easy installation, programmability, etc.

Universal concept, this UNIVERSAL+ 7WR unit brings together all the necessary functions for a correct and optimum protection, analysis, management, control, surveillance and maintenance of electrical installations

Alarms, programmable in both value and delay

Central measurement and data unit (mains analysis) 200 parameters

Oscilloscope cum event logger in wave-form with pre-trigger and autoscale (optional)

6 channels V1, V2, V3, I1, I2, I3, with captures for each event
 Three modes of record length in 6 channels 160ms, 320ms and 640ms (pre-trigger: 40ms, 80ms and 160ms).
 + three modes of record length in 6 channels 20s, 40s y 80s (pre-trigger 5s, 10s y 20s). Only HP versions
 600-event storage in built-in memory. Display via WebServer and DataWatchPro
 Trigger for alarms which can be enabled and are programmable in value and delay. Chronological record for each type of alarm.
 Display via WebServer with horizontal zoom functions. Multi-channel measurement, value and time cursor, etc.
 Display via DataWatchPro with offset control functions, amplitude, time base, horizontal shift zoom, multi-channel measurement, value and time cursor, etc.

Analysis of 7-channel harmonics spectrum (63 harmonics, range in % and V - A value)

Multi-channel measurement cursor and simultaneous analysis for 1, 2, 3, 4, 5, 6 and 7 channels

7-channel oscilloscope with autoscale

7-channel oscilloscope with autoscale and automatic or manual Y axis scale and 3 mathematical V*I. channels. Includes instantaneous value measurement cursor in all channels. Continuously refreshed display (every 1.5 secs.).

WebServer in real time. Display refreshment rate every 1.5 secs. for all variable parameters

Graphic log of meanTHD-HD-VAr at 5-minute intervals for analysis for harmonics compensation and reactive power with built-in 14-month memory

Graphic energy, costs and emissions log with built-in 3-year memory (optional)
Active and reactive energy consumption log. Bar and line graphic display via WebServer in monthly, daily, hourly and 5-minute intervals.

A reduced, independent alternative option for data recording as opposed to the professional software (DataWatchPro) .

Multi-interaction between remote units via Internet/Intranet for all the UNIVERSAL+ 4LOG (Universal logical relay) range

Automation/telecontrol multiplied by multiple logical functions which are programmable by means of :
 UNIVERSAL+ 4LOG Universal logical relay (4 analogical inputs 0-10V, 4 logical inputs, 4 logical relay outputs, 2 analogical outputs 0-10V).

Chronological historical data recorder for LOG alarms and conditions

Alarm central. Tele-management and automation via 10 logical outputs (relays) and 10 logical inputs

Alarms. Programmable enablement/disablement of 10 relays + 4 relays A, B, C and D of a remote UNIVERSAL+ 7WR unit via Internet/Intranet by one or more alarms

Reception of TCP/IP commands from other remote UNIVERSAL+ 7WR units via Internet/Intranet.
 For the enablement/disablement of relays A and B

Energy management, sizing and surveillance

Mains line quality analysis

Programmable automation/telecontrol for relays with level alarms in time frame

Maximum and minimum measurement logs and individual alarm counters

Multi-interaction between remote units via Internet/Intranet for all the UNIVERSAL+ 7WR M1, M2, M3, M4, Rogowski M4 and 7WR MINI ranges

Automation/telecontrol multiplied by other remote modules

Modbus TCP/IP communication protocol and TCP/IP. HTTP protocol. WebServer via Ethernet. For user application (customized software)

DataWatchPro: Professional software with data base and analysis of graphic data

Multi-thread communication with a multitude of remote units via Internet (reading and commando). Chronological recorder of 200 data in data base for each unit .

Simple, rapid WEB access via Internet with no need for Software

The WebServer permits all the unit's parameters to be displayed in real time on any PC, smartphone, tablet, PDA etc, and to be configured via Internet/Intranet conveniently, easily and clearly

Multi-interaction between remote units via Internet / Intranet

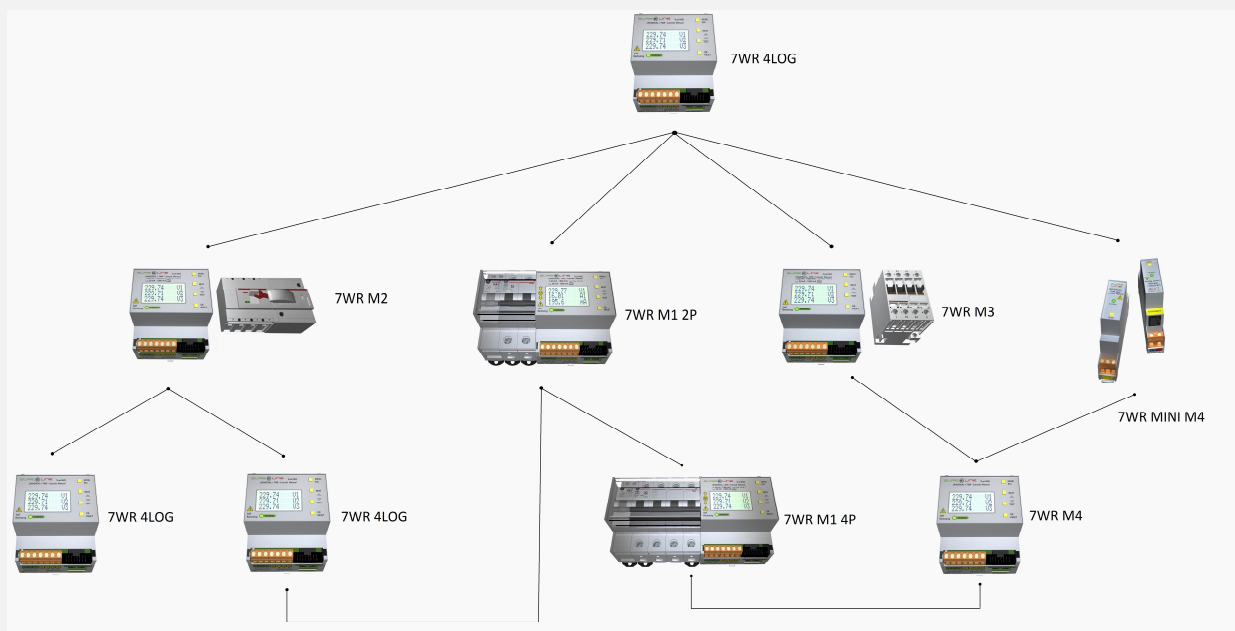
The different UNIVERSAL+ 7WR M1, M2, M3, M4, M5, Rogowski M4, MINI M4, 4LOG, XREM and 6LIR units are all compatible with each other. Hence, they all share the multi-interaction function between remote units via Internet. For example, when one or more alarms is enabled in the M1, M2, M3, M4, M5, Rogowski M4 and MINI M4 protection/metering units of the UNIVERSAL+ 7WR family, these can send an order to a 7WR 4LOG to enable an automated process.

Likewise, when a pre-established condition is met in a 7WR 4LOG process, the unit can send an order to the different UNIVERSAL+ 7WR M1, M2, M3, M4, M5, Rogowski M4, MINI M4, 4LOG, XREM and 6LIR units to enable their remote relays via Internet.

The M1, M2, M3, M4, M5, Rogowski M4, MINI M4 y 4LOG units pertaining to the UNIVERSAL+ 7WR family can also communicate with a 7WR XREM or 7WR 6LIR unit in order to enable or disable any of their four remote relays (A, B, C and D) via Internet.

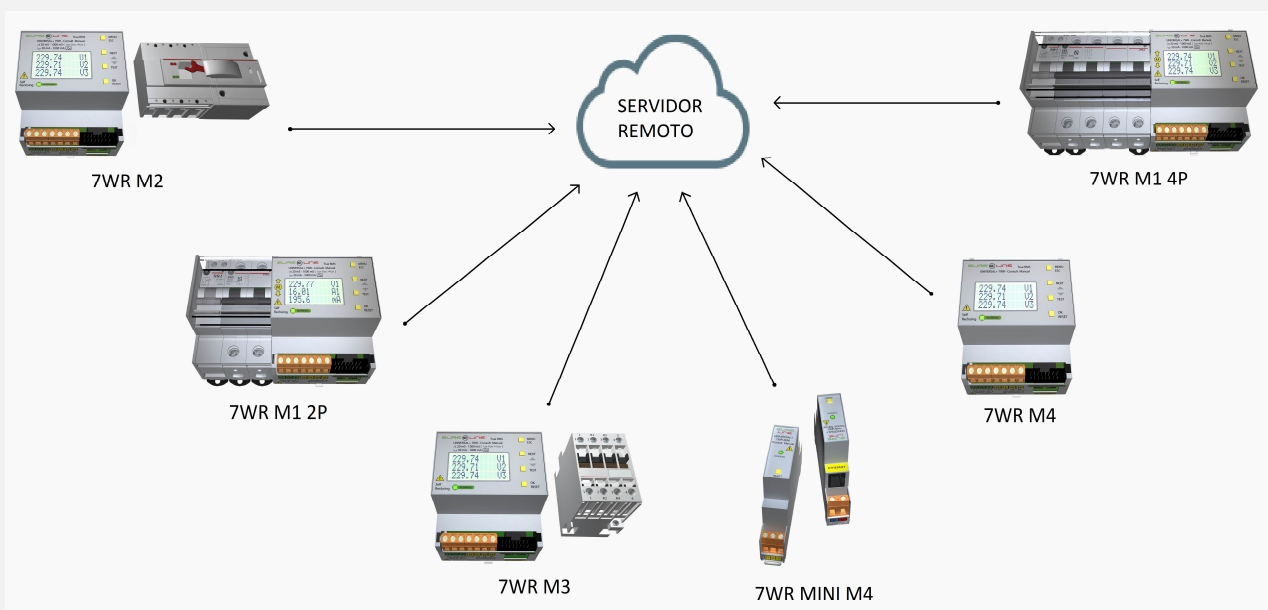
Each 7WR M1, M2, M3, M4, M5, Rogowski M4 and MINI M4 unit can communicate with another 7WR M1, M2, M3, M4, M5, Rogowski M4 or MINI M4 unit. They communicate with each other to enable or disable relays A and B remotely via Internet.

Each 7WR 4LOG unit can communicate with four more units and these, in turn, with four more and so on progressively. This increases the process and input/output power and scalability for specific requirements. These units can communicate with each other in order to enable inputs and processes in general, enable or disable relays, functions... etc.



Automatic data dispatch to a remote server via Internet:

By enabling "Remote server TCP/IP configuration", the unit automatically dispatches the data file (Slist.json) to a remote server. This file is dispatched every 5 minutes (in sync with the internal clock) and includes a complete list of measurements and I/O status in .json format.



1.2 Simplified nomenclature (line intensity transformers)

Please, refer to complete nomenclature in the corresponding manuals:

Annex-manual - UNIVERSAL+ 7WR M4

Annex-manual - UNIVERSAL+ 7WR Rogowski M4

Annex-manual - UNIVERSAL+ 7WR MINI M4

UNIVERSAL+ 7WR M4 (single-phase 2-pole, three-phase 3 and 4-pole)

7WR M4 – []

1

1 – Version: AC line intensity measurement transformer (single-phase: 1 unit, three-phase: 3 units)

[X] = Standard AC transformer, from 5A/5A up to 10,000A/5A (in 5A slots) HP version

[X] = Standard AC transformer, from 50A/5A up to 10,000A/5A (in 5A slots) non HP version

[E] = Solely AC transformers: TRIT7, TRIT14, TRIT18 and TRIT26 (5A, 70A, 140A and 280A)

UNIVERSAL+ 7WR Rogowski M4 (three-phase 3 and 4-pole)

7WR Rogowski M4 – []

1

1 – Version: AC line intensity measurement transformer. (three-phase: 3 units)

[R] = Multi-range Rogowski Coil Flexible Current Transformers, Consolidates measurements up to 250A, 500A, 1000A and 2000A

Configurable measurement scales to the unit. Scales up to 250A, 500A, 1000A and 2000A

With one single model of multi-range Rogowski transformer/probe flexible coil calibrated for its unit

UNIVERSAL+ 7WR MINI M4 (single-phase 2-pole, three-phase 4-pole)

7WR MINI – []

1

1 – AC line intensity measurement toroidal core (single-phase: 1 unit, three-phase: 3 units)

[TRIT7] = TRIT7 (internal Ø: 7 mm) (5A for standard transformer, from 50A/5A up to 10,000A/5A in 5A slots)

[TRIT14] = TRIT14 (internal Ø: 14 mm) (70A)

[TRIT18] = TRIT18 (internal Ø: 18 mm) (70A and 140A)

[TRIT26] = TRIT26 (internal Ø: 26 mm) (70A, 140A and 280A)

Chapter 2 – Synoptic tables of characteristics, UNIVERSAL+ 7WR M4, Rogowski M4 and MINI M4

UNIVERSAL+ 7WR (3-year guarantee)	UNIVERSAL+ 7WR				
	M4		Rogowski M4	MINI M4	
Version	M	T	T	T	M
Single-phase (M) only L1 / Three-phase (T) L1, L2, L3	M	T	T	T	M
Oscilloscope event-logger in waveform with pre-trigger and autoscale. 6 channels V1, V2, V3, I1, I2, I3, with captures for each event (optional) Three modes of record length in 6 channels 160ms, 320ms and 640ms (pre-trigger: 40ms, 80ms and 160ms) + three modes of record length in 6 channels 20s, 40s y 80s (pre-trigger 5s, 10s y 20s). Only HP versions 600-event storage in built-in memory. Display via WebServer and DataWatchPro Trigger for alarms which can be enabled and are programmable in value and delay. Chronological record for each type of alarm. Display via WebServer with horizontal zoom functions. Multi-channel measurement, value and time cursor, 3 mathematical V*I channels, etc. Display via DataWatchPro with offset control functions, amplitude, time base, horizontal shift zoom, multi-channel measurement, value and time cursor, etc.					
Alarm: ΔV Pk (voltage difference) L1, L2, L3, set delay (transients and fast micro-cuts)	•	•	•	•	•
Alarm: ΔV RMS (voltage difference) L1, L2, L3, set delay (transients and dips)	•	•	•	•	•
Alarm: RMS overvoltage L1, L2, L3	•	•	•	•	•
Alarm: Pk overvoltage L1, L2, L3	•	•	•	•	•
Alarm: RMS intensity L1, L2, L3	•	•	•	•	•
Alarm: Pk intensity L1, L2, L3	•	•	•	•	•
Alarm: Voltage THD (total harmonic distortion) L1, L2, L3	•	•	•	•	•
Alarm: Intensity THD (total harmonic distortion) L1, L2, L3	•	•	•	•	•
Alarm: Over-frequency L1, L2, L3 and Alarm: Low frequency L1, L2, L3	•	•	•	•	•
Remote input 1 and Remote input 2 (digital inputs). External trigger	•	•	•	•	•
Historical logger LOG. Alarm chronological logger. With measurement value and year, month, day, hour and minute.					
RMS overvoltage L1, L2, L3 and Pk overvoltage L1, L2, L3L1, L2, L3	•	•	•	•	•
RMS low voltage L1, L2, L3	•	•	•	•	•
RMS intensity L1, L2, L3 and Pk intensity L1, L2, L3	•	•	•	•	•
RMS differential intensity (IDn RMS) and Pk differential intensity (ID Pk)	•	•	•	•	•
Neutral intensity	•	•	•	•	•
Power1 W L1, L2, L3	•	•	•	•	•
Power2 W L1, L2, L3 (MDI, programmable from 10 secs. to 15 mins.)	•	•	•	•	•
Power factor L1, L2, L3	•	•	•	•	•
Voltage THD (total harmonic distortion) L1, L2, L3 and Intensity THD (total harmonic distortion) L1, L2, L3	•	•	•	•	•
Voltage unbalance L1, L2, L3 and Intensity unbalance L1, L2, L3	•	•	•	•	•
Phase sequence	•	•	•	•	•
Over-temperature and Low temperature	•	•	•	•	•
Over-humidity and Low humidity	•	•	•	•	•
Over-frequency L1, L2, L3 and Low frequency L1, L2, L3	•	•	•	•	•
Remote input 1 and Remote input 2 (digital inputs)	•	•	•	•	•
Time programmer	•	•	•	•	•
AC power failure (Power OFF) and Connection AC supply (Power ON)	•	•	•	•	•
7-channel oscilloscope with autoscale and offset control functions, amplitude, time base, delay/advance in degrees, multi-channel measurement cursor, Measurement of RMS, Pk, THD, etc. (display in DataWatchPro) 7-channel oscilloscope with autoscale and automatic or manual Y axis scale and 3 mathematical V*I channels. Includes instantaneous value measurement cursor in all channels. Continuously refreshed display (every 1.5 secs.). (Display via Webserver)					
Voltage V1, Intensity I1 (Continuously refreshed display only HP versions)	•	•	•	•	•
Voltage V2, Intensity I2 (Continuously refreshed display only HP versions)	•	•	•	•	•
Voltage V3, Intensity I3 (Continuously refreshed display only HP versions)	•	•	•	•	•
Differential intensity ID (Continuously refreshed display only HP versions)	•	•	•	•	•
Analysis of 7-channel harmonics spectrum with autoscale (63 harmonics, range en % and value V - A). Multi-channel measurement cursor and simultaneous analysis of 1, 2, 3, 4, 5, 6 and 7 channels. (display in DataWatchPro) Analysis: harmonics spectrum with autoscale (V1, V2, V3, I1, I2 and I3 with 64 harmonics, range in % and value V - A). Display with continuous refreshment (every 1.5 secs.). Includes measurement cursor (display on WebServer)					
Voltage V1, Intensity I1 (Display on WebServer and DataWatchPro)	•	•	•	•	•
Voltage V2, Intensity I2 (Display on WebServer and DataWatchPro)	•	•	•	•	•
Voltage V3, Intensity I3 (Display on WebServer and DataWatchPro)	•	•	•	•	•
Differential intensity ID (Display only on DataWatchPro)	•	•	•	•	•
Graphic log of meanTHD-HD-VAR at 5-minute intervals with built-in 14-month memory (optional) Analysis for harmonics compensation and reactive power of L1, L2, L3, ΣL1,2,3 y (ΣL1,2,3)/3 Fromharmonic 2 – 63, programmable by harmonic and harmonics bracket (HP version). Harmonics range: 2 – 63 (non HP version).					
Logs ThdV (%)	•	•	•	•	•
Logs ThdI (%)	•	•	•	•	•
Logs hdV (V)	•	•	•	•	•
Logs hdi (A)	•	•	•	•	•
Logs VAR VARL VARC	•	•	•	•	•
Graphic energy log, costs and emissions with (optional) built-in memory. Graphicactive and reactive energy bar and line display in WebServer. Includes measurement cursor. Option "G": Energy log (L1 single-phase or ΣL1,2 and 3 three-phase) with built-in 3-year memory					
5-minute interval active and reactive energy consumption log (3-year memory storage)	•	•	•	•	•
Hourly active and reactive energy consumption log (3-year memory storage)	•	•	•	•	•
Daily interval active and reactive energy consumption log (3-year memory storage)	•	•	•	•	•
Monthly interval active and reactive energy consumption log (3-year memory storage)	•	•	•	•	•
Graphic energy log, costs and emissions with (optional) built-in memory. Graphicactive and reactive energy bar and line display in WebServer. Includes measurement cursor. Opcción "G3": Energy log (L1, L2, L3 and ΣL1,2 and 3) with built-in 1.5-year memory (only 3-phase model)					
5-minute interval active and reactive energy consumption log (1.5-year memory storage)	•	•	•	•	•
Hourly active and reactive energy consumption log (1.5-year memory storage)	•	•	•	•	•
Daily interval active and reactive energy consumption log (1.5-year memory storage)	•	•	•	•	•
Monthly interval active and reactive energy consumption log (1.5-year memory storage)	•	•	•	•	•
Multi-interaction between remote units via Internet/Intranet for UNIVERSAL+ 7WR range, M1, M2, M3, M4, Rogowski M4, MINI M4, 4LOG, 4REM, 6LIR, 6PHAR and 6PHR. They are totally autonomous and, once configured, can communicate remotely with each other via Internet/Intranet to enable or disable their relays A, B, C and D when a programmed event occurs.					
WebServer in real time, display with continuous refreshment (every 1.5 secs.) of measurements, max/min measurements, energy counters, alarm counters, input/output status, event log (LOG), unit information and clock – for UNIVERSAL+ 7WR M1, M2, M3, M4, Rogowski M4 and MINI M4 units					
Alarm central, Tele-control and automation via 10 logical outputs (relays) and 10 logical inputs. For the whole UNIVERSAL+ 7WR M1 range, M2, M3, M4, Rogowski M4 and MINI M4 units, by means of a range of external modules.					

UNIVERSAL+ 7WR (3-year guarantee)	UNIVERSAL+ 7WR				
	M4		Rogowski M4	MINI M4	
Version	M	T	T	T	M
Single-phase (M) only L1 / Three-phase (T) L1, L2, L3					
WebServer in real time, display refreshed every 1.5 seconds for variable parameters					
Start-up WEB page, PIN	•	•	•	•	•
WEB page: Box "Measures and events", section "Measurements"	•	•	•	•	•
WEB page: Box "Measures and events", section "Energy counters"	•	•	•	•	•
WEB page: Box "Measures and events", section "Maximum and minimum values"	•	•	•	•	•
WEB page: Box "Measures and events", section "Alarm counters"	•	•	•	•	•
WEB page: Box "Measures and events", section "Event-logger counters in waveform"	•	•	•	•	•
WEB page: Box "Measures and events", section "Historical logger - LOG"	•	•	•	•	•
WEB page: Box "Event-logger" 600-event storage in built-in memory (optional)	•	•	•	•	•
WEB page: Box "Energy log" with 3-year built-in memory (optional)	•	•	•	•	•
WEB page: Box "Real time" 300-event graphic logger, 12 channels with autoscale	•	•	•	•	•
WEB page: Box "Oscilloscope" 7-channel oscilloscope with autoscale	•	•	•	•	•
WEB page: Box "Harmonics" Harmonics spectrum with autoscale (64 harmonics)	•	•	•	•	•
WEB page: Box "Input/output status"	•	•	•	•	•
WEB page: Box "Manual relay control"	•	•	•	•	•
WEB page: Box "Relay alarms"	•	•	•	•	•
WEB page: Box "Relay timers"	•	•	•	•	•
WEB page: Box "Time programmer"	•	•	•	•	•
WEB page: Box "Unit configuration"	•	•	•	•	•
WEB page: Box "Access configuration" and WEB page: Box "Close session"	•	•	•	•	•
WEB page: Box "Thd/Hd/VAr log" Graphic log of meanTHD–HD–VAR at 5-minute intervals with built-in 14-month memory Analysis for harmonics compensation and reactive power		•	•		
300-event graphic logger, 12 channels (46 measurements) with autoscale and variable refreshment (1-600 secs.) with temporary max. min. avg. measurements					
Current value for 46 measurements	•	•	•	•	•
Temporary maximum value (300 events, 1-60 secs.) for 46 measurements	•	•	•	•	•
Temporary minimum value (300 events, 1-60 secs.) for 46 measurements	•	•	•	•	•
Temporary average value (300 events, 1-60 secs.) for 46 measurements	•	•	•	•	•
Difference in value between maximum and minimum (Max value – Min value) of 46 measurements	•	•	•	•	•
Automatic data dispatch to a remote server via Internet (optional)					
By enabling "Remote server TCP/IP configuration", the unit automatically dispatches the data file (Slist.json) to a remote server. This file is dispatched every 5 minutes (in sync with the internal clock)	•	•	•	•	•

Measurements					
True RMS and Pk voltage L1, L2, L3	•	•	•	•	•
True RMS voltage between phases L1-2, L2-3, L3-1	•	•	•	•	•
True RMS and Pk intensity L1, L2, L3	•	•	•	•	•
Neutral intensity		•	•		•
True RMS and Pk differential intensity	•	•			
Voltage THD (total harmonic distortion) L1, L2, L3 and Intensity THD (total harmonic distortion) L1, L2, L3	•	•	•	•	•
Voltage THD L1, L2, L3 of intensity L1, L2, L3 as from harmonic 2 – 63, programmable by harmonic and harmonic range (HP versions)	•	•	•		
Voltage unbalance L1, L2, L3 and Intensity unbalance L1, L2, L3		•	•		•
Voltage crest factor L1, L2, L3 and Intensity crest factor L1, L2, L3	•	•	•	•	•
Temperature, relative humidity	•	•	•	•	•
Relative temperature and humidity of 6 remote UNIVERSAL+ 7WR TH sensors via Internet/Intranet (Only in HP versions)	•	•	•		
Line frequency L1, L2, L3	•	•	•	•	•
Line impedance L1, L2, L3	•	•	•	•	•
Apparent power L1, L2, L3, ΣL123	•	•	•	•	•
Active power L1, L2, L3, ΣL123	•	•	•	•	•
Requested power L1, L2, L3, L123 and Returned power L1, L2, L3, ΣL123	•	•	•	•	•
Reactive inductive power L1, L2, L3, ΣL123 and Reactive capacitive power L1, L2, L3, ΣL123	•	•	•	•	•
Power factor L1, L2, L3	•	•	•	•	•
Active power W L1, L2, L3, (Maximeter-integration programmable from 10 secs. to 15 mins.)	•	•	•	•	•
Active imported energy counters L1, L2, L3, ΣL123 from 0000000,00001 to 9999999,99999 kWh	•	•	•	•	•
Active exported energy counters L1, L2, L3, ΣL123 from 0000000,00001 to 9999999,99999 kWh	•	•	•	•	•
Reactive energy counters L1, L2, L3, ΣL123 from 0000000,00001 to 9999999,99999 kWh	•	•	•	•	•
DC voltage (Vdc) L1, L2, L3	•	•	•	•	•
AC voltage (Vac) L1, L2, L3	•	•	•	•	•
DC intensity (Idc) L1, L2, L3	•	•		•	•
AC intensity (Iac) L1, L2, L3	•	•	•	•	•
DC power(Wdc) L1, L2, L3	•	•		•	•
AC power (Wac) L1, L2, L3	•	•	•	•	•
Differential intensity DC (IDdc) (HP versions)	•	•			
Differential intensity AC (IDac) (HP versions)	•	•			
Voltage %HD (harmonic distortion) L1, L2, L3 of harmonic k 0 to 63 (64 harmonics)	•	•	•	•	•
Intensity %HD (harmonic distortion) L1, L2, L3, of harmonic k 0 to 63 (64 harmonics)	•	•	•	•	•
Power W L1, L2, L3, ΣL123, of harmonic k 0 to 63 (64 harmonics) Only NON HP versions	•	•		•	•
Power factor L1, L2, L3, of harmonic k 0 to 63 (64 harmonics) Only NON HP versions	•	•		•	•
Voltage L1, L2, L3, of harmonic k 0 to 63 (64 harmonics)	•	•	•	•	•
Intensity L1, L2, L3, of harmonic k 0 to 63 (64 harmonics)	•	•	•	•	•

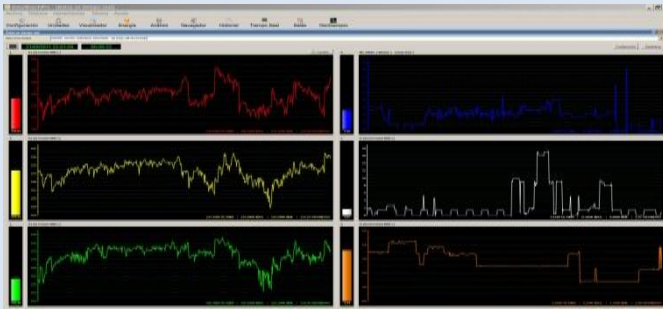
UNIVERSAL+ 7WR (3-year guarantee)	UNIVERSAL+ 7WR				
	M4		Rogowski M4	MINI M4	
Version	M	T	T	M	T
Single-phase (M) only L1 / Three-phase (T) L1, L2, L3	M	T	T	M	T
Alarms: programmable in value and delay					
RMS overvoltage L1, L2, L3	•	•	•	•	•
Pk overvoltage L1, L2, L3	•	•	•	•	•
RMS low voltage L1, L2, L3	•	•	•	•	•
RMS intensity L1, L2, L3	•	•	•	•	•
Pk intensity L1, L2, L3	•	•	•	•	•
RMS differential intensity (IDn RMS)	•	•			
Pk differential intensity (ID Pk)	•	•			
Neutral intensity		•	•		•
Power1 W L1, L2, L3	•	•	•	•	•
Power2 W L1, L2, L3 (Maximeter-integration programmable from 10 secs to 15 mins.)	•	•	•	•	•
Power factor L1, L2, L3	•	•	•	•	•
Voltage and Intensity THD (total harmonic distortion) L1, L2, L3. Only NON HP versions	•	•		•	•
Voltage and Intensity L1, L2, L3 From 2-63, programmable by harmonic and harmonics bracket. Only HP versions	•	•	•		
Voltage unbalance L1, L2, L3		•	•		•
Intensity unbalance L1, L2, L3		•	•		•
Over-temperature	•	•	•	•	•
Low temperature	•	•	•	•	•
Over-humidity	•	•	•	•	•
Low humidity	•	•	•	•	•
Over-frequency L1, L2, L3	•	•	•	•	•
Low frequency L1, L2, L3	•	•	•	•	•
Phase sequence		•	•		•
Remote input 1 (digital input)	•	•	•	•	•
Remote input 2 (digital input)	•	•	•	•	•
Time programmer	•	•	•	•	•
Individual alarm counters					
Event-counter for waveform logger L1, L2, L3.	•	•	•	•	•
Overvoltages V1, V2, V3.	•	•	•	•	•
Low voltages V1, V2, V3.	•	•	•	•	•
Intensity I1, I2, I3.	•	•	•	•	•
Differential intensity	•	•			
Neutral intensity.		•	•		•
Power1 L1, L2, L3	•	•	•	•	•
Power2 W L1, L2, L3 (Maximeter-integration programmable from 10 secs to 15 mins.)	•	•	•	•	•
Voltage unbalance V1, V2, V3.		•	•		•
Intensity unbalance I1, I2, I3.		•	•		•
Voltage THD (total harmonic distortion) V1, V2, V3.	•	•	•	•	•
Intensity THD (total harmonic distortion) I1, I2, I3.	•	•	•	•	•
Over-temperature.	•	•	•	•	•
Low temperature.	•	•	•	•	•
Over-humidity.	•	•	•	•	•
Low humidity.	•	•	•	•	•
Over-frequency V1, V2, V3.	•	•	•	•	•
Low frequency V1, V2, V3.	•	•	•	•	•
Power factor L1, L2, L3.	•	•	•	•	•
Time programmer.	•	•	•	•	•
Phase sequence.		•	•		•
Remote input 1 (digital input)	•	•	•	•	•
Remote input 2 (digital input)	•	•	•	•	•
Power OFF (AC power failure)	•	•	•	•	•
Total counter	•	•	•	•	•
Total accumulated counter (undeletable)	•	•	•	•	•
Precisions available in ± 0.1%, ±0.2%, ±0.4%, ±0.5% and ±1% in intensity and voltage					
Basic precision: ± 0.2% Only HP versions	•	•			
Basic precision: ± 0.4% Only HP versions	•	•			
Basic precision: ± 0.5% Only NON HP versions	•	•		•	•
Basic precision: ± 0.5% Only HP versions			•		
Basic precision: ± 1% Only HP versions			•		
Measurements for 64 harmonics, distortion factor, harmonic distortion (rango in % and valor V – A) +THD					
Graphic and numerical display in WebServer.	•	•	•	•	•

UNIVERSAL+ 7WR (3-year guarantee)	UNIVERSAL+ 7WR				
	M4		Rogowski M4	MINI M4	
	M	T	T	M	T
Version					
Single-phase (M) only L1 / Three-phase (T) L1, L2, L3	M	T	T	M	T
Modbus TCP/IP, Port 502, and TCP/IP. HTTP communication protocol . WebServer.					
Measurements (Reading)	•	•	•	•	•
Oscilloscope event-logger counters (Reading)	•	•	•	•	•
Alarm counters (Reading) and Energy counters (Reading)	•	•	•	•	•
Maximum and minimum measurements (Reading)	•	•	•	•	•
Digital outputs (relays) (Reading / Writing of 10outputs) and Digital inputs (Reading of 10 inputs)	•	•	•	•	•
Commands: Reset, reset to zero of counters, etc. (Writing)	•	•	•	•	•
Maximum and minimum measurement logs					
Maximum: voltage L1, L2 and L3	•	•	•	•	•
Maximum: voltage unbalance L1, L2 and L3	•	•	•	•	•
Maximum: intensity L1, L2 and L3	•	•	•	•	•
Maximum: differential intensity	•	•	•	•	•
Maximum: neutral intensity	•	•	•	•	•
Maximum: intensity unbalance L1, L2 and L3	•	•	•	•	•
Maximum: frequency V1, V2 and V3	•	•	•	•	•
Maximum: voltage THD (total harmonic distortion) L1, L2 and L3	•	•	•	•	•
Maximum: intensity THD (total harmonic distortion) L1, L2 and L3	•	•	•	•	•
Maximum: active power L1, L2 and L3 (Maximeter programmable from 10 secs to 15 mins.)	•	•	•	•	•
Maximum: apparent power L1, L2 and L3	•	•	•	•	•
Maximum: reactive inductive power L1, L2 and L3	•	•	•	•	•
Maximum: reactive capacitive power L1, L2 and L3	•	•	•	•	•
Maximum: temperature	•	•	•	•	•
Maximum: humidity	•	•	•	•	•
Minimum: voltage L1, L2 and L3	•	•	•	•	•
Minimum: frequency V1, V2 and V3	•	•	•	•	•
Minimum: temperature	•	•	•	•	•
Minimum: humidity	•	•	•	•	•
Alarms. Programmable enablement/disablement of 10 relays + 4 relays A, B, C and D of a remote UNIVERSAL+ 7WR unit via Internet/Intranet by one or more alarms					
Overvoltage	•	•	•	•	•
Low voltage	•	•	•	•	•
Intensity	•	•	•	•	•
Differential intensity	•	•	•	•	•
Neutral intensity	•	•	•	•	•
Power factor	•	•	•	•	•
Voltage THD (total harmonic distortion)	•	•	•	•	•
Intensity THD (total harmonic distortion)	•	•	•	•	•
Voltage unbalance	•	•	•	•	•
Intensity unbalance	•	•	•	•	•
Over-temperature and Low temperature	•	•	•	•	•
Over-humidity and Low humidity	•	•	•	•	•
Over-frequency and Low frequency	•	•	•	•	•
Phase sequence	•	•	•	•	•
Remote input 1 (digital input)	•	•	•	•	•
Remote input 2 (digital input)	•	•	•	•	•
Time programmer	•	•	•	•	•
Timer 1, 2, 3 and 4 of module 1 (digital input IN1, IN2, IN3 and IN4 of module 1)	•	•	•	•	•
Timer 1, 2, 3 and 4 of module 2 (digital input IN1, IN2, IN3 and IN4 of module 2)	•	•	•	•	•
Power1 W	•	•	•	•	•
Power2 W (Maximeter-integration programmable from 10 secs to 15 mins.)	•	•	•	•	•
Reception of TCP/IP commands from other remote UNIVERSAL+ 7WR units via Internet/Intranet.					
For the enablement/disablement of relays A and B	•	•	•	•	•
Outstanding characteristics					
True RMS, Peak (Pk), AC and DC measurement (DC in intensity with DC line transformer)	•	•	•	•	•
Averaged RMS display, programmable 100, 200, 300, 400 and 500ms	•	•	•	500ms	500ms
Backlit, 12x3-character screen. Intuitive menus. Long texts: easy to read scroll-down	•	•	•	•	•
4-digit protection PIN	•	•	•	•	•
Programmable acoustic warnings (enabled or disabled)	•	•	•	•	•
Ex-factory default configuration	•	•	•	•	•
WebServer display, programming and remote control via Internet/Intranet	•	•	•	•	•
Chronological log of last alarm. With value and year, month, day, hour and minute	•	•	•	•	•
Control external I/O modules: up to 14 logical outputs (relays) and 10 logical inputs, temperature and humidity probe, controls for logical inputs (Remotes In) programmable signal-action.	•	•	•	•	•
High-precision time programmer in hours and minutes	•	•	•	•	•
Language: configurable in Spanish or English	•	•	•	•	•
DataWatchPro: Professional software for PC with database ,graphic data analysis , etc.	•	•	•	•	•
Multi-range Rogowski Coil Flexible Current Transformers, Consolidates 250A, 500A, 1000A and 2000A			•		
Standard AC transformer, from 5A/5A up to 10.000A/5A (in 5A slots) HP version	•	•			
Standard AC transformer, from 50A/5A up to 10.000A/5A (in 5A slots) non HP version	•	•		•	•
AC transformers: TRIT7, TRIT14, TRIT18 and TRIT26 (5A, 70A, 140A and 280A)	•	•		•	•

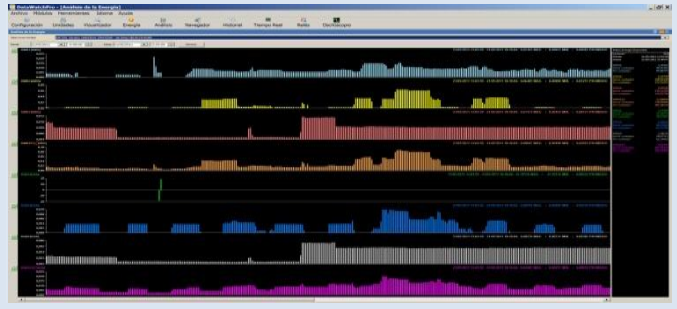
DataWatchPro included for all the UNIVERSAL+ 7WR M1, M2, M3, M5, M4, Rogowski M4 and 7WR MINI range
Professional software with database and graphic data analysis

- Multi-thread communication with a multitude of remote units via Internet/Intranet (reading and command)
- 200-parameter chronological logger in database for each unit.
- Independent notifications via e-mail of 249 programmable alarms for each unit
- Programmable automation/tele-control of relays with level alarms in time frame for each unit
- Module: numerical data analysis
- Module: graphic data analysis.
- Module: history analysis

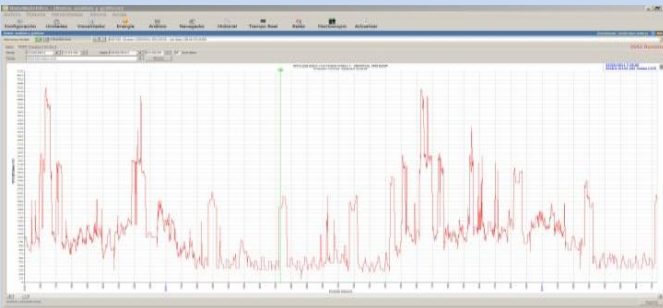
• Module: real time



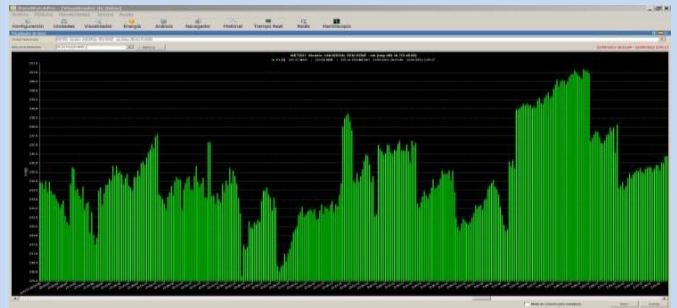
• Module: graphic energy analysis



• Module: graphic plotter (graphic long period analysis)



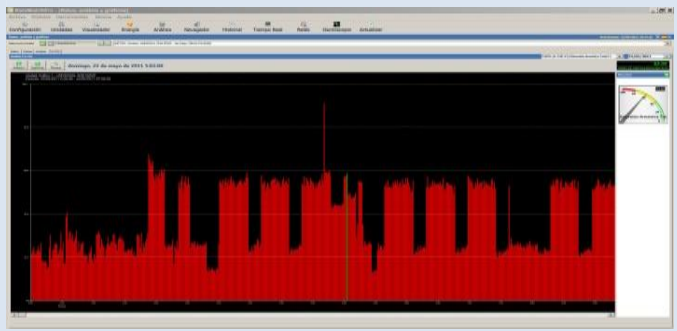
• Module: graphic display (rapid analysis)



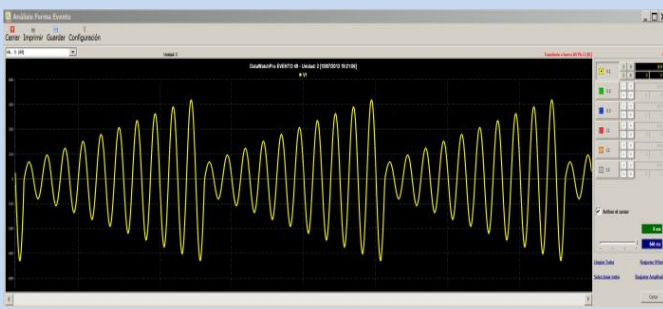
• Module: 7-channel oscilloscope. With autoscale and functions.



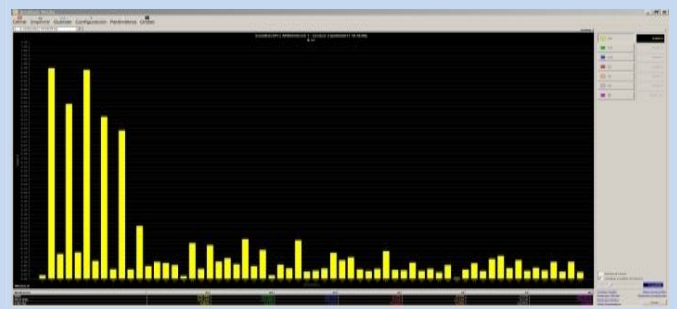
• Module: daily analysis



• Module: 6-channel oscilloscope event-logger in waveform with pre-trigger and autoscale (optional).



• Module: 7-channel harmonics spectrum with autoscale (63 harmonics, range in % and value V - A).



Chapter 3 – USER’S GUIDE (Surfing the WebServer through Internet/Intranet) (please, refer to synoptical tables of characteristics)

Quick and simple access via Internet / Intranet with no need for software.

WebServer in real time, display of all variable parameters continuously refreshed (every 1,5 secs.)

Permits all the unit’s parameters to be displayed and configured via Internet/Intranet on any PC, MAC, smartphone, tablet or PDA conveniently, easily and clearly.

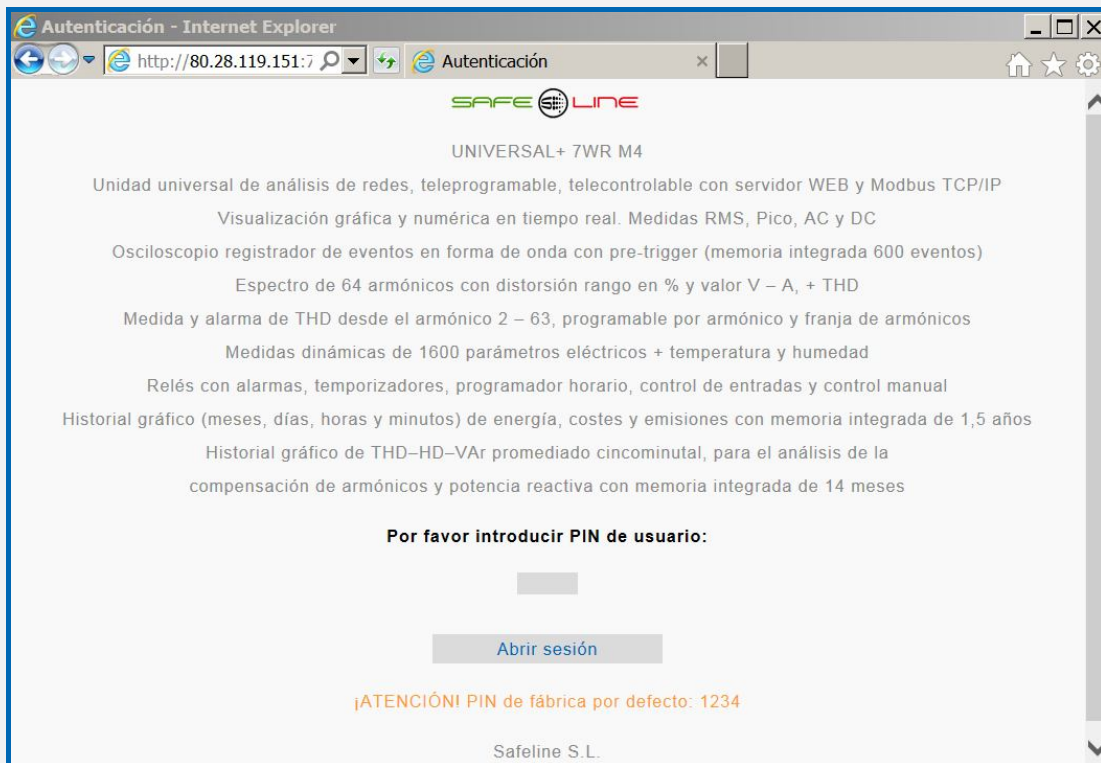
In order for the data dispatch and command reception of the WebServer to function correctly, a good quality Internet connection or an Internet line connection (optic fibre or similar) is imperative.

It has three customizable styles in six colours for its display on the website. These styles and colours are memorised in each browser through the use of cookies.

We recommend the Internet Explorer 11 browser for greater Internet/Intranet speed

3.1 WEB page: Home, PIN

Presentation and request for access PIN.



Surfing:

The first page displayed upon accessing the unit is the welcome page where the user’s PIN is requested. The default PIN enabled at the factory is “1, 2, 3, 4”. Once said PIN has been entered, the main page is accessed. Surfing with the WebServer is simple and intuitive since it is organized with the following 14 main buttons.



3.2 WEB page: Box “Measures and events”, section “unit information”

The following frame displays the current information in real time and is continuously refreshed (every 1,5 secs).

Safeline 🟢 🟡 🟠 🔴

Información del equipo (V3.12 Jan 30 2020)

Fecha - Hora:	Jueves 30/01/20 13:27
Estado alarma:	Ninguna Alarma
Ultima alarma:	Fallo, energía Vac OFF Jueves 23/17/42 0C:14

PIN

3.2.1. WEB page: Box “Measures and events”, section “Measurements”

The following frame displays the measurements in real time and is continuously refreshed (every 1,5 secs).

Medidas			
Tensión RMS	Tensión Pk	Tensión entre fases	Frecuencia
V L1 = 231.71 V L2 = 227.32 V L3 = 230.45	VPk L1 = 321.86 VPk L2 = 316.17 VPk L3 = 318.90	V L12 = 397.56 V L23 = 396.31 V L31 = 400.37	Hz L1 = 50.0 Hz L2 = 49.9 Hz L3 = 50.0
Intensidad RMS	Intensidad Pk	Intensidad Neutro	Intensidad diferencial RMS y Pk
A L1 = 1.09 A L2 = 10.06 A L3 = 10.17	APk L1 = 1.75 APk L2 = 13.55 APk L3 = 15.17	A LN = 5.67	mA = 262.4 mAPk = 407.0
Desequilibrio tensión	THD tensión $k_{(2-5)}$	Desequilibrio intensidad	THD intensidad $k_{(2-5)}$
% L1 = 0.8 % L2 = 1.0 % L3 = 0.2	% L1 = 1.4 % L2 = 1.4 % L3 = 1.5	% L1 = 84.6 % L2 = 41.6 % L3 = 43.2	% L1 = 28.6 % L2 = 4.0 % L3 = 15.2
Factor de cresta tensión	Factor de cresta intensidad	Impedancia	Temperatura y Humedad
L1 = 1.389 L2 = 1.390 L3 = 1.383	L1 = 1.612 L2 = 1.347 L3 = 1.492	Z L1 = 212.57 Z L2 = 22.59 Z L3 = 22.65	°C = +26.6 %RH = 65.9
Potencia Aparente	Potencia Activa	Potencia solicitada	Potencia retornada
VA L1 = 253.2 VA L2 = 2288.2 VA L3 = 2344.5 ΣL123 = 4885.9	W L1 = 160.1 W L2 = 2286.2 W L3 = 2128.9 ΣL123 = 4575.2	W+ L1 = 181.7 W+ L2 = 2286.3 W+ L3 = 2140.1 ΣL123 = 4608.1	W- L1 = 21.6 W- L2 = 0.0 W- L3 = 11.1 ΣL123 = 32.7
Potencia Reactiva Inductiva	Potencia Reactiva Capacitiva	Factor de Potencia	Máximetro Potencia Activa
VARL L1 = 0.0 VARL L2 = 0.0 VARL L3 = 0.0 ΣL123 = 0.0	VARC L1 = 196.2 VARC L2 = 0.0 VARC L3 = 982.0 ΣL123 = 1178.2	PF L1 = 0.631 PF L2 = 0.999 PF L3 = 0.907	W L1 = 0.0 W L2 = 0.0 W L3 = 0.0
Tensión AC	Intensidad AC	Potencia AC	Intensidad diferencial AC
Vac L1 = 231.70 Vac L2 = 227.31 Vac L3 = 230.44	Aac L1 = 1.08 Aac L2 = 10.05 Aac L3 = 10.16	Wac L1 = 160.5 Wac L2 = 2289.5 Wac L3 = 2128.9	mAac = 262.3
Tensión DC	Intensidad DC	Potencia DC	Intensidad diferencial DC
Vdc L1 = 0.04 Vdc L2 = 0.44 Vdc L3 = 0.25	Adc L1 = 0.02 Adc L2 = 0.12 Adc L3 = 0.04	Wdc L1 = 0.0 Wdc L2 = 0.0 Wdc L3 = 0.0	mAdc = 0.5

3.2.2 WEB page: Box “Measures and events”, section “Energy counters”

The following frame displays the measurements of the energy counters in real time and is continuously refreshed (every 1,5 secs).

Contadores de energía		
Activa Importada	Activa Exportada	Reactiva
kWh L1 = 34.77311	kWh L1 = 0.00000	kQh L1 = 17.62558
kWh L2 = 40.49160	kWh L2 = 0.00000	kQh L2 = 12.63903
kWh L3 = 21.48452	kWh L3 = 0.00000	kQh L3 = 8.26657
Σ L123 = 96.74923	Σ L123 = 0.00000	Σ L123 = 38.53118
PIN <input type="text"/> <input type="button" value="RESET"/>		

3.2.3 WEB page: Box “Measures and events”, section “Maximum and minimum values”

The following frame displays the maximum and minimum measurements in real time and is continuously refreshed (every 1,5 secs).

Valores máximos medidos			
Tensión RMS	Intensidad RMS	Desequilibrio tensión	THD tensión
V L1 = 238.81	A L1 = 16.29	% L1 = 1.9	% L1 = 2.6
V L2 = 236.11	A L2 = 26.47	% L2 = 3.8	% L2 = 3.4
V L3 = 238.63	A L3 = 15.45	% L3 = 2.8	% L3 = 2.4
Desequilibrio intensidad	THD intensidad	Intensidad Neutro	Intensidad diferencial RMS
% L1 = 189.9	% L1 = 92.0	A LN = 26.62	mA = 290.2
% L2 = 190.8	% L2 = 96.9		
% L3 = 180.1	% L3 = 136.3		
Potencia Aparente	Máximetro Potencia Activa	Potencia Reactiva Inductiva	Potencia Reactiva Capacitiva
VA L1 = 3706.4	W L1 = 2211.9	VARL L1 = 777.9	VARC L1 = 515.1
VA L2 = 5818.8	W L2 = 3560.8	VARL L2 = 2141.7	VARC L2 = 201.2
VA L3 = 3505.6	W L3 = 3333.5	VARL L3 = 755.2	VARC L3 = 662.3
Temperatura y Humedad	Frecuencia		
°C = +29.6	Hz L1 = 55.5	°C = +28.0	
%RH = 53.4	Hz L2 = 50.1		
	Hz L3 = 50.1		
PIN <input type="text"/> <input type="button" value="RESET"/>			
Valores mínimos medidos			
Tensión RMS	Frecuencia	Temperatura y Humedad	
V L1 = 224.44	Hz L1 = 49.9	°C = +28.0	
V L2 = 219.92	Hz L2 = 49.9		
V L3 = 224.71	Hz L3 = 49.9		
PIN <input type="text"/> <input type="button" value="RESET"/>			

3.2.4 WEB page: Box “Measures and events”, section “Alarm counters”

The following frame displays the values of the alarm counters in real time and is continuously refreshed (every 1,5 secs).

Contadores de alarmas			
SobreTensión	InfraTensión	Desequilibrio Tensión	THD Tensión
L1 = 0 L2 = 0 L3 = 0	L1 = 0 L2 = 0 L3 = 0	L1 = 0 L2 = 0 L3 = 0	L1 = 0 L2 = 0 L3 = 0
Intensidad	Intensidad neutro	Desequilibrio Intensidad	THD Intensidad
L1 = 0 L2 = 0 L3 = 0	LN = 0	L1 = 0 L2 = 0 L3 = 0	L1 = 0 L2 = 0 L3 = 0
Intensidad diferencial	Sobre Temperatura y Humedad	Infra Temperatura y Humedad	Prog. horario
Id = 0	°C = 0 %RH = 0	°C = 0 %RH = 0	PR.H = 0
SobreFrecuencia	InfraFrecuencia	Factor de Potencia	Secuencia de fases
L1 = 0 L2 = 0 L3 = 0	L1 = 0 L2 = 0 L3 = 0	L1 = 0 L2 = 0 L3 = 0	L123 = 0
Remote input 1 y 2		Fallo suministro red	Potencia Activa
Rin1 = 0 Rin2 = 0		POFF = 1	L1 = 0 L2 = 0 L3 = 0
Máximetro Potencia Activa	Total	Total acumulado	
L1 = 0 L2 = 0 L3 = 0	Total = 1	Acum = 1	
PIN <input type="text"/> RESET			

3.2.5 WEB page: Box “Measures and events”, section “Event-logger counters in waveform”

The following frame displays the values of counters of the oscilloscope event-logger in waveform with pre-trigger in real time and is continuously refreshed (every 1,5 secs). Remote input triggers 1 and 2 are not included.

Contadores de registros de eventos en forma de onda
L1 = 294 L2 = 1 L3 = 287
PIN <input type="text"/> RESET

3.2.6 WEB page Box: “Measures and events”, section “Remote temperature and humidity sensors”

The box below shows the six measurements for temperature and humidity sent via Internet/Intranet by the remote **UNIVERSAL+ 7WR TH** units. Real-time display with continuous refreshment (every 1.5 secs) of the data. Consult UNIVERSAL+ 7WR TH manual.

Sensores de temperatura y humedad remotos		
1: Sensor THr:1	10.0 °C	10.0 %RH
2: Sensor THr:2	20.0 °C	20.0 %RH
3: Sensor THr:3	30.0 °C	30.0 %RH
4: Sensor THr:4	40.0 °C	40.0 %RH
5: Sensor THr:5	50.0 °C	50.0 %RH
6: Sensor THr:6	60.0 °C	60.0 %RH

3.2.7 WEB page: Box “Measures and events”, section “Historical logger - LOG”

The following frame displays the data pertaining to the LOG (32 events FIFO battery), alarm connection/disconnection and information log. Chronological alarm and disconnection/connection logger. With measurement value and year, month, day, hour and minute. In real time and continuously refreshed (every 1,5 secs).

Registrador histórico (Log)
Alarma: Transitorio o hueco AV Pk L3 Sábado 17/06/17 13:18
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 13:22
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 13:23
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 13:36
Alarma: Transitorio o hueco AV Pk L3 Sábado 17/06/17 14:15
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 14:17
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 14:18
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 14:26
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 14:48
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 15:09
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 15:10
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 15:14
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 15:14
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 15:16
Alarma: Transitorio o hueco AV Pk L3 Sábado 17/06/17 15:17
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 15:20
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 15:20
Alarma: Transitorio o hueco AV Pk L3 Sábado 17/06/17 15:30
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 15:39
Alarma: Transitorio o hueco AV Pk L3 Sábado 17/06/17 16:00
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 16:03
Alarma: Transitorio o hueco AV Pk L3 Sábado 17/06/17 16:36
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 16:51
Alarma: Transitorio o hueco AV Pk L3 Sábado 17/06/17 16:52
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 17:04
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 17:08
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 17:22
Alarma: Transitorio o hueco AV Pk L3 Sábado 17/06/17 17:27
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 17:48
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 18:05
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 18:19
Alarma: Transitorio o hueco AV Pk L1 Sábado 17/06/17 18:27

PIN

3.3 WEB page: Box “Event-logger” (optional).

Oscilloscope event-logger in waveform with pre-trigger and autoscale

6 channels V1, V2, V3, I1, I2, I3, with captures for each event

Three modes of record length in 6 channels 160ms, 320ms and 640ms (pre-trigger: 40ms, 80ms and 160ms)

+ three modes of record length in 6 channels 20s, 40s y 80s (pre-trigger 5s, 10s y 20s). Only HP versions

600-event storage in built-in memory. Display via WebServer and DataWatchPro.

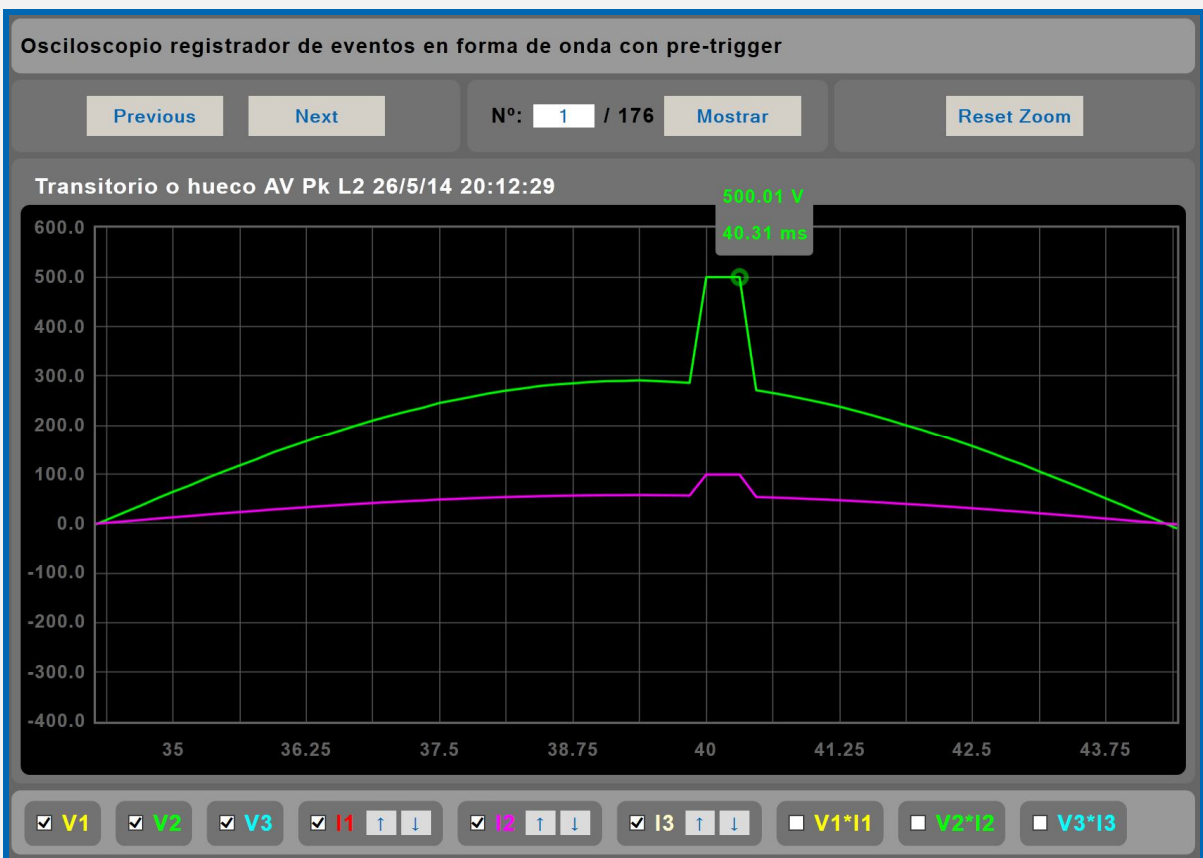
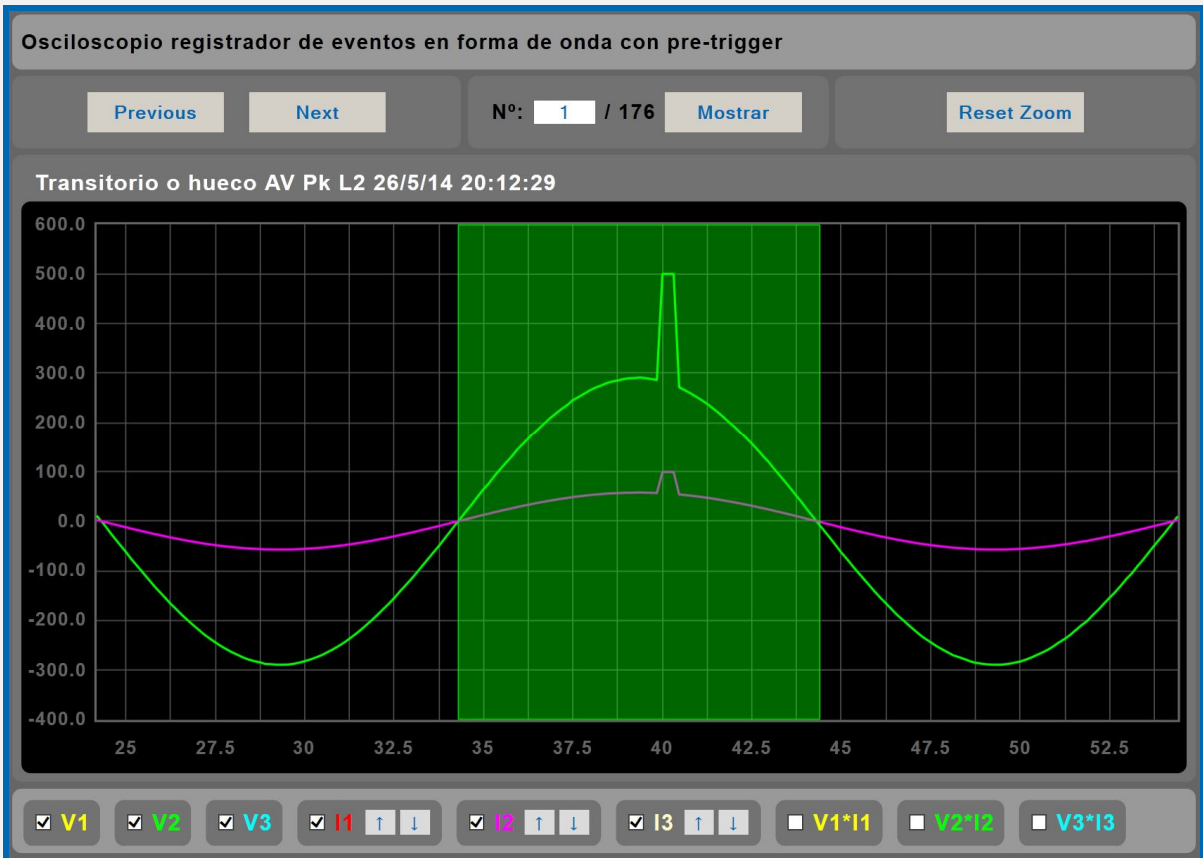
Trigger for alarms which can be enabled and are programmable in value and delay. Chronological record for each type of alarm.

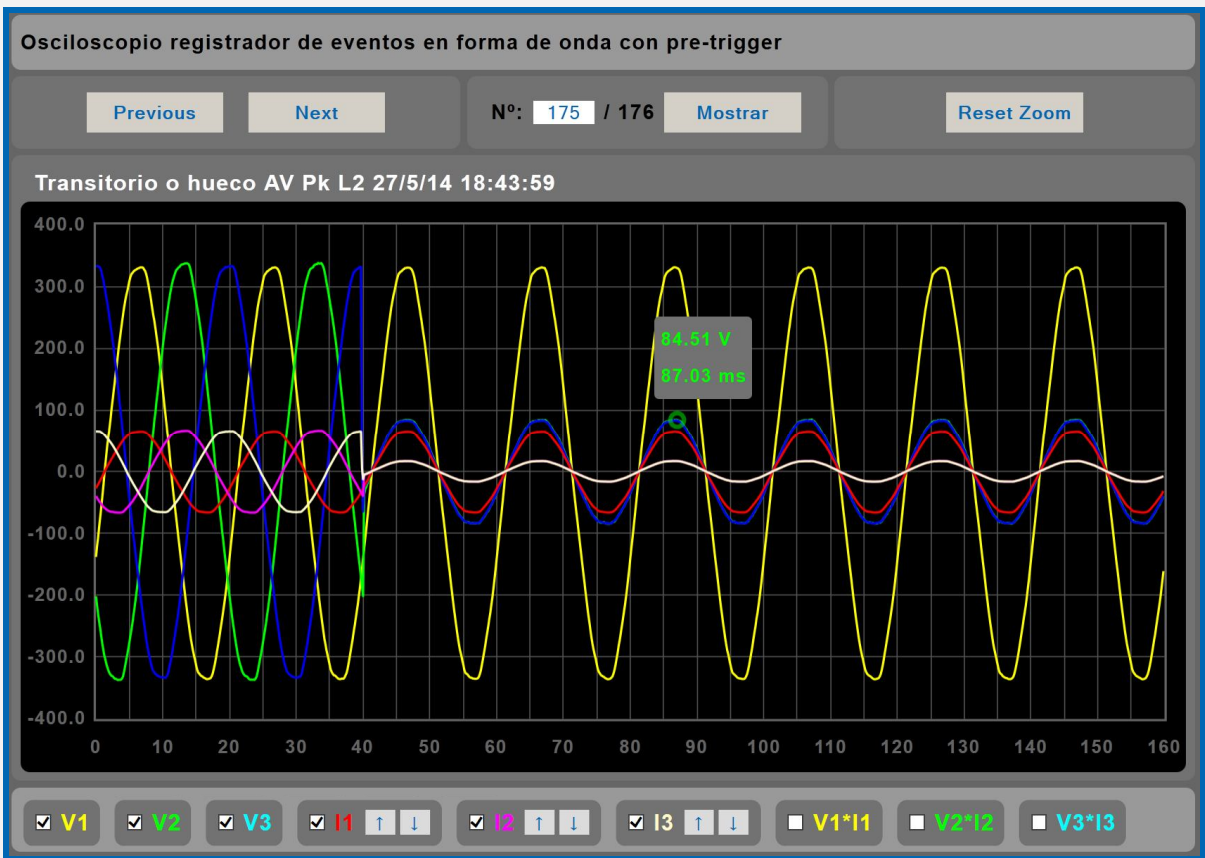
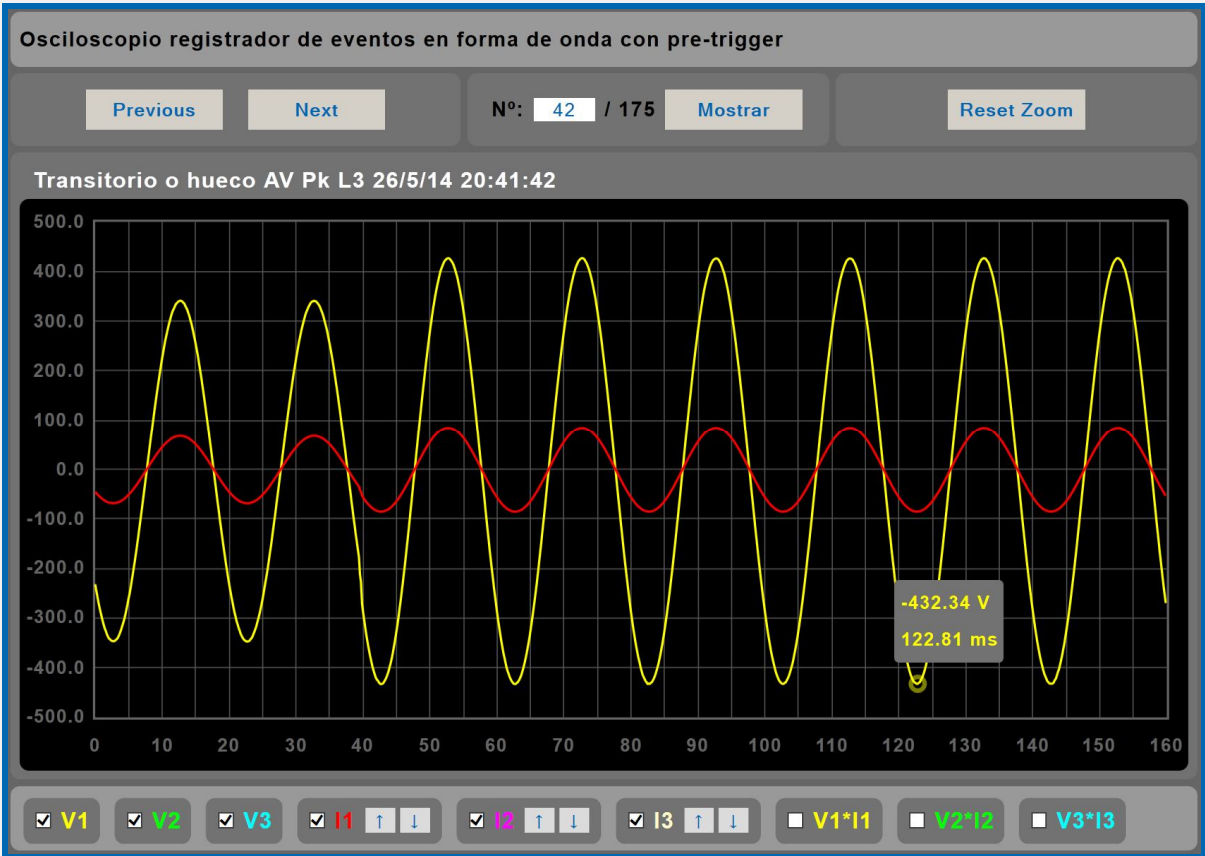
Display via WebServer with horizontal zoom functions. Multi-channel measurement, value and time cursor, 3 mathematical V*I channels, etc.

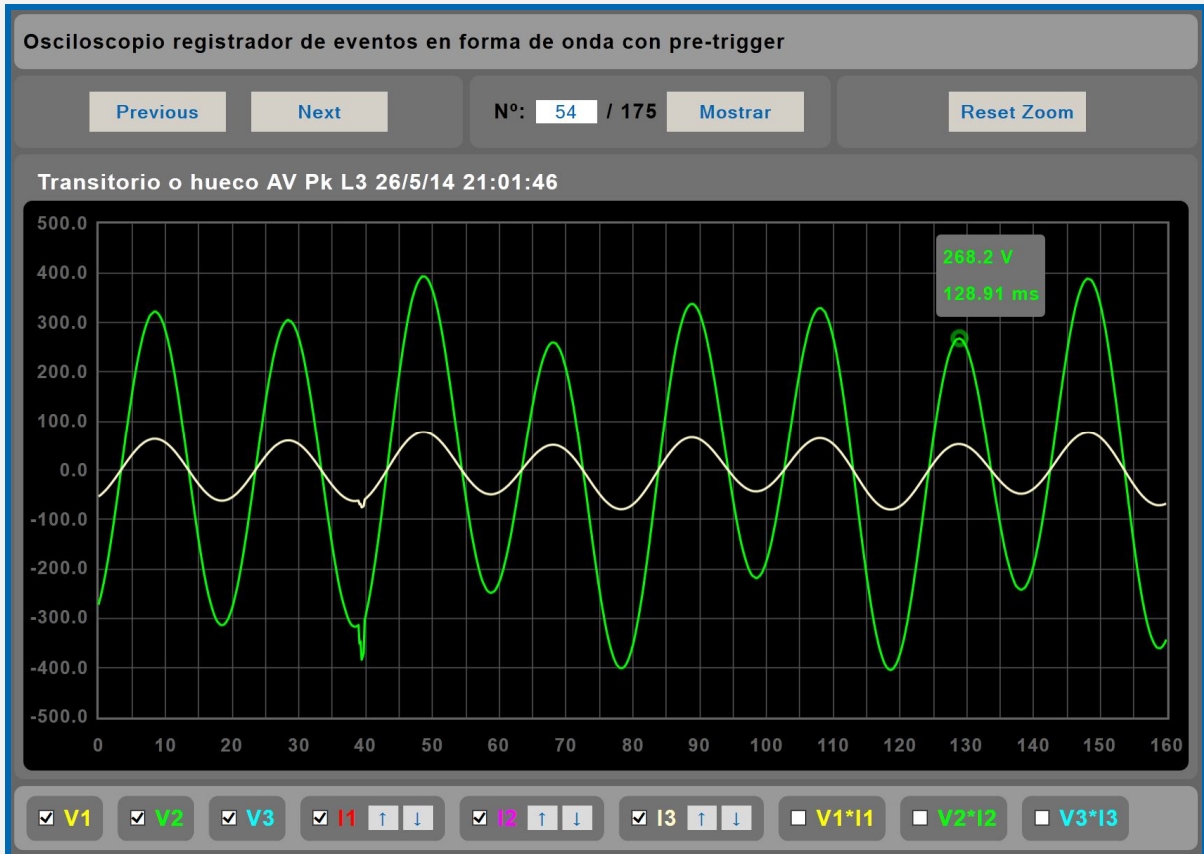
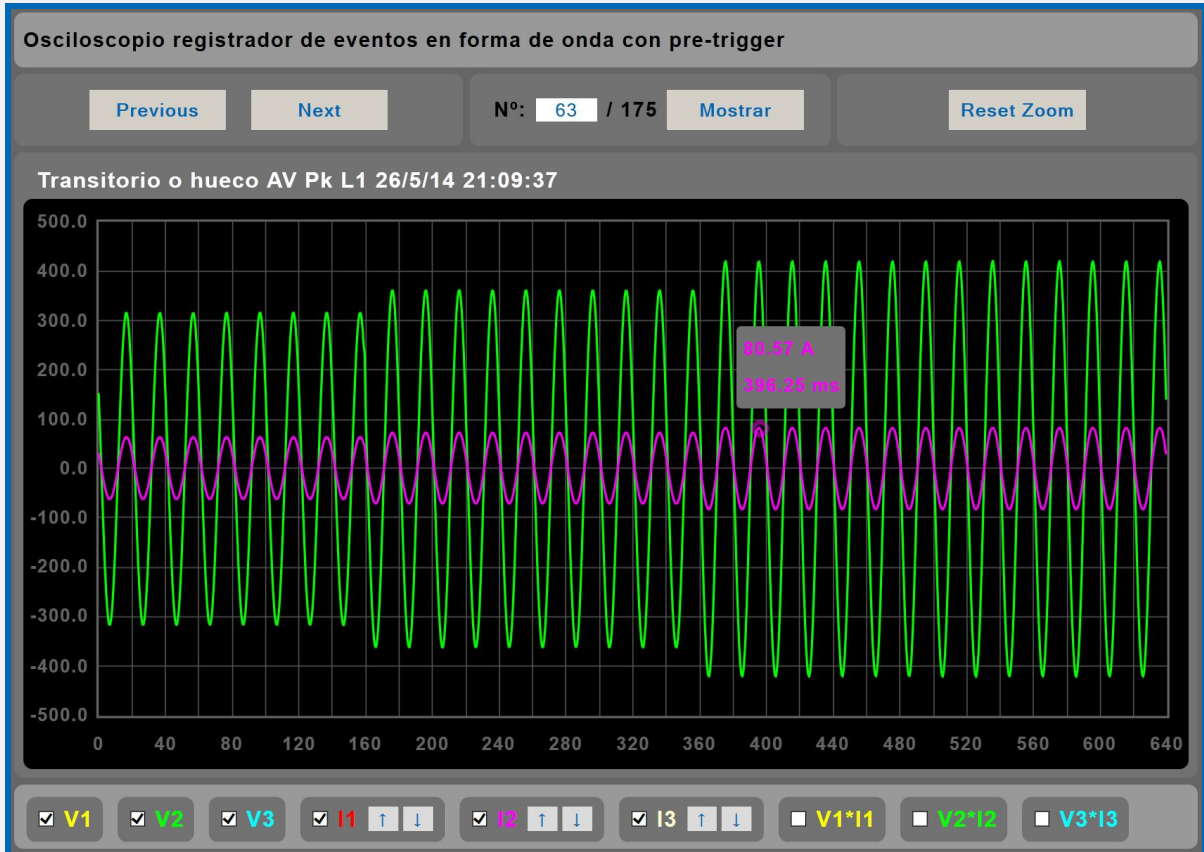
Display via DataWatchPro with offset control functions, amplitude, time base, horizontal shift zoom, multi-channel measurement, value and time cursor, etc.

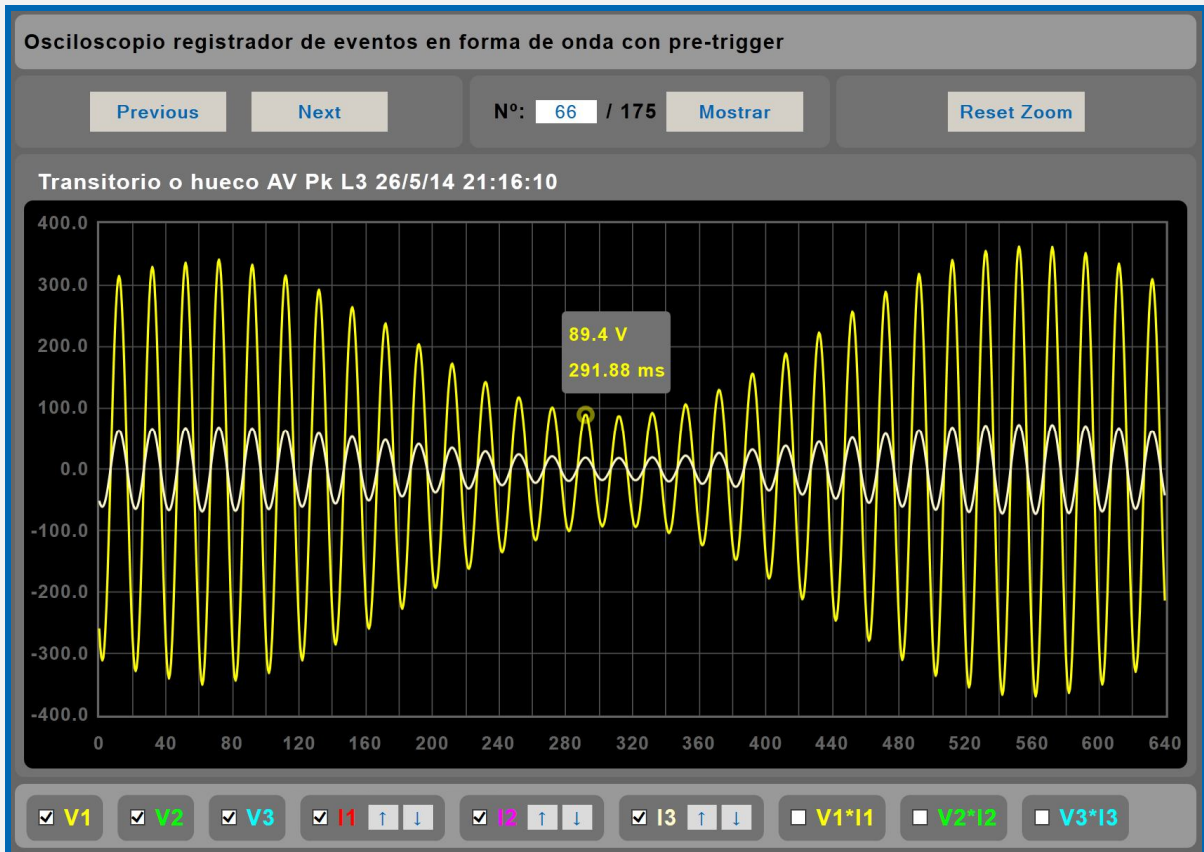
In order to view this WebServer page correctly, the PC, MAC, smartphone, tablet or PDA must have Internet access. If working on an Intranet network, one must have an Intranet server with its data files uploaded. These files are easily installed in any computer (consult UNIVERSAL+ Apache manual).

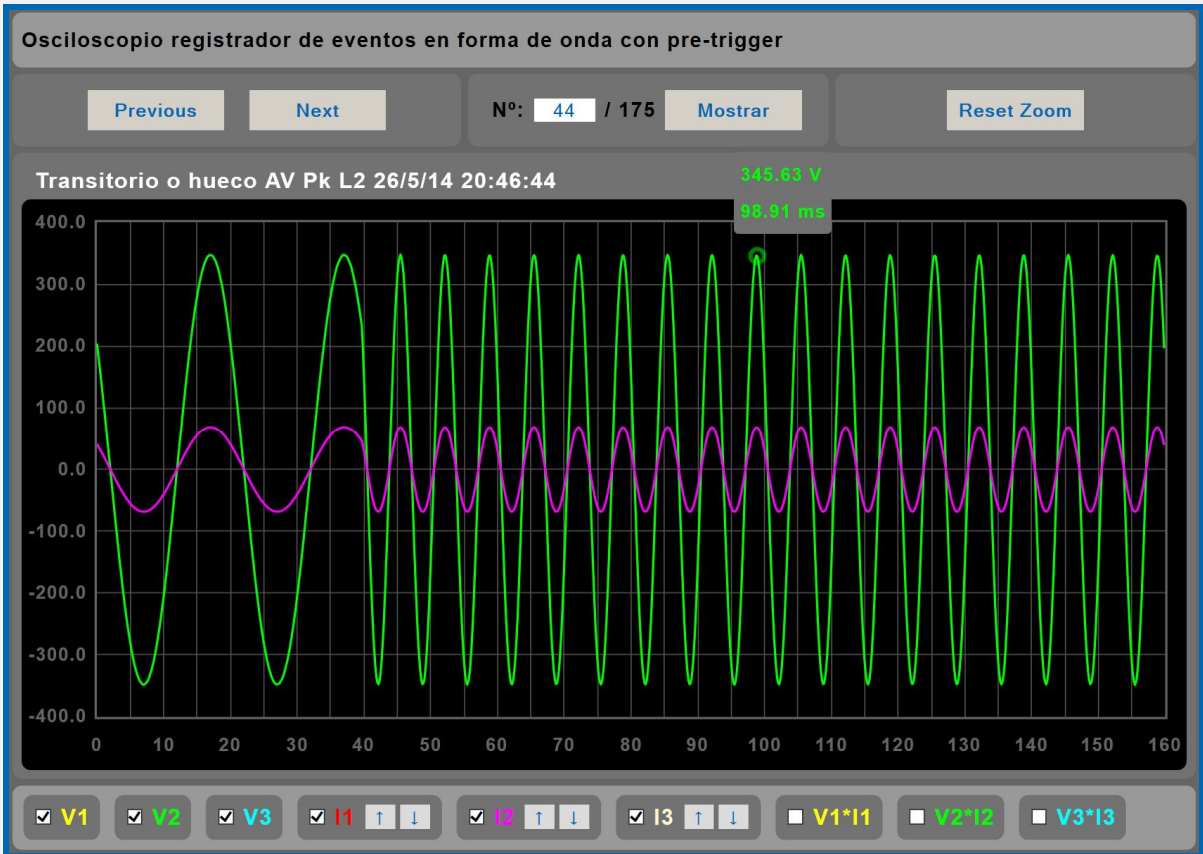
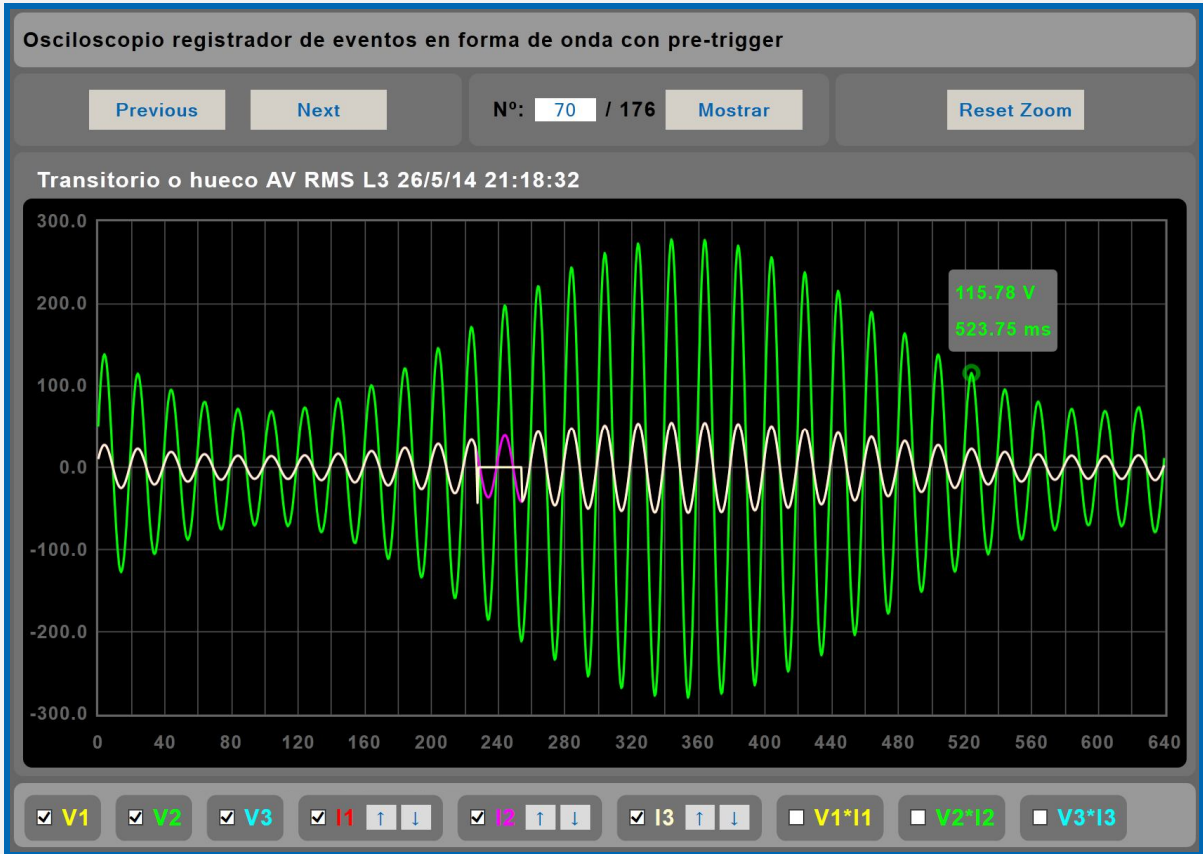












3.4 WEB page: Box “Harmonics”

Harmonics spectrum with autoscale (V1, V2, V3, I1, I2 y I3 with 64 harmonics)

Measurements of 64 harmonics with power, distortion factor (range in % and value V – A) and power factor +THD. Display continuously refreshed (every 1,5 secs.). Includes measurement cursor. In order to view this WebServer page correctly, the PC, MAC, smartphone, tablet or PDA must have Internet access. If working on an Intranet network, one must have an Intranet server with its data files uploaded. These files are easily installed in any computer (consult UNIVERSAL+ Apache manual).

Armónicos

V3 ▾ %hd_(k)
Guardar

k₀, k₁ = 0

Reading

Thd k₍₂₋₆₃₎ = 46.4%

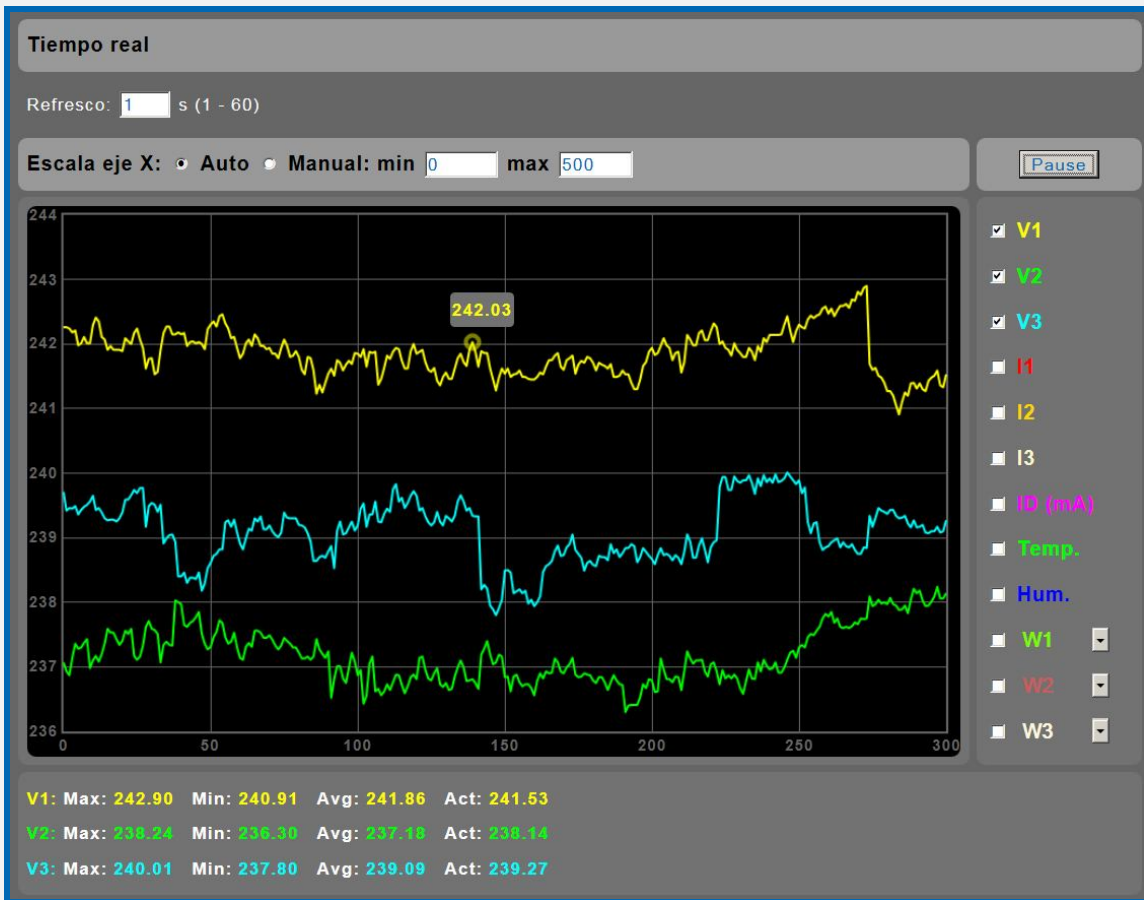
k	k	k	k	k	k	k	k
0: 0.0	8: 0.0	16: 0.0	24: 0.0	32: 0.0	40: 0.0	48: 0.0	56: 0.0
1: 100.0	9: 10.8	17: 5.4	25: 3.4	33: 2.4	41: 1.8	49: 1.3	57: 1.1
2: 0.0	10: 0.0	18: 0.0	26: 0.0	34: 0.0	42: 0.0	50: 0.0	58: 0.0
3: 33.2	11: 8.8	19: 4.8	27: 3.1	35: 2.2	43: 1.7	51: 1.3	59: 1.0
4: 0.0	12: 0.0	20: 0.0	28: 0.0	36: 0.0	44: 0.0	52: 0.0	60: 0.0
5: 19.8	13: 7.3	21: 4.2	29: 2.9	37: 2.1	45: 1.5	53: 1.2	61: 1.0
6: 0.0	14: 0.0	22: 0.0	30: 0.0	38: 0.0	46: 0.0	54: 0.0	62: 0.0
7: 14.1	15: 6.2	23: 3.8	31: 2.6	39: 1.9	47: 1.4	55: 1.1	63: 1.0

k = 1 (0 - 63)
Guardar
* Consultar manual

Tensión	Intensidad	Potencia *	Factor de Potencia *
V _k L1 = 234.84	A _k L1 = 0.00	W _k L1 = 0.0	PF _k L1 = 1.000
V _k L2 = 234.81	A _k L2 = 0.00	W _k L2 = 0.0	PF _k L2 = 1.000
V _k L3 = 207.24	A _k L3 = 0.00	W _k L3 = 0.0	PF _k L3 = 1.000
		ΣL123 = 0.0	

3.5 WEB page: Box “Real time”

300-event graphic logger, 12 channels (46 measurements) with autoscale and variable refreshment (1-600 secs.). With temporary maximum, minimum and average measurements. Includes 12-channel measurement cursor and alarm channels (V, I and ID). In order to view this WebServer page correctly, the PC, MAC, smartphone, tablet or PDA must have Internet access. If working on an Intranet network, one must have an Intranet server with its data files uploaded. These files are easily installed in any computer (consult UNIVERSAL+ Apache manual).

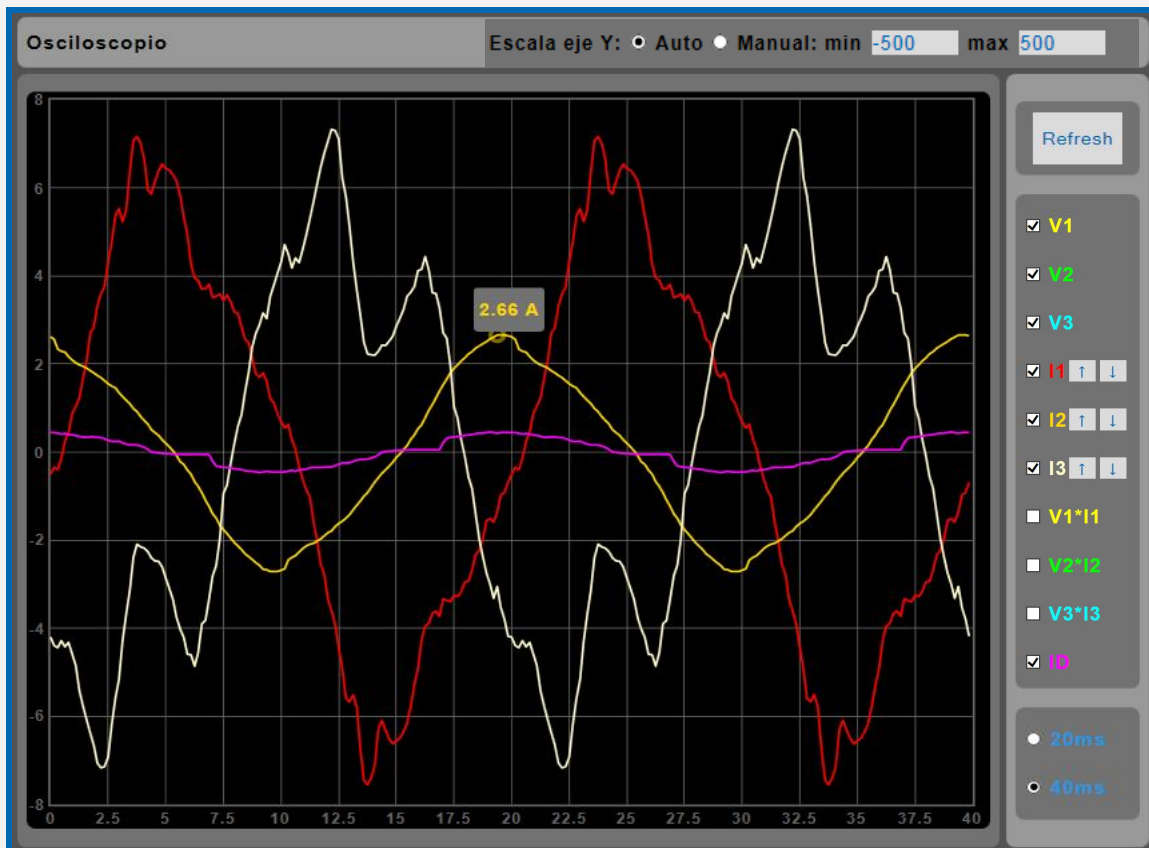
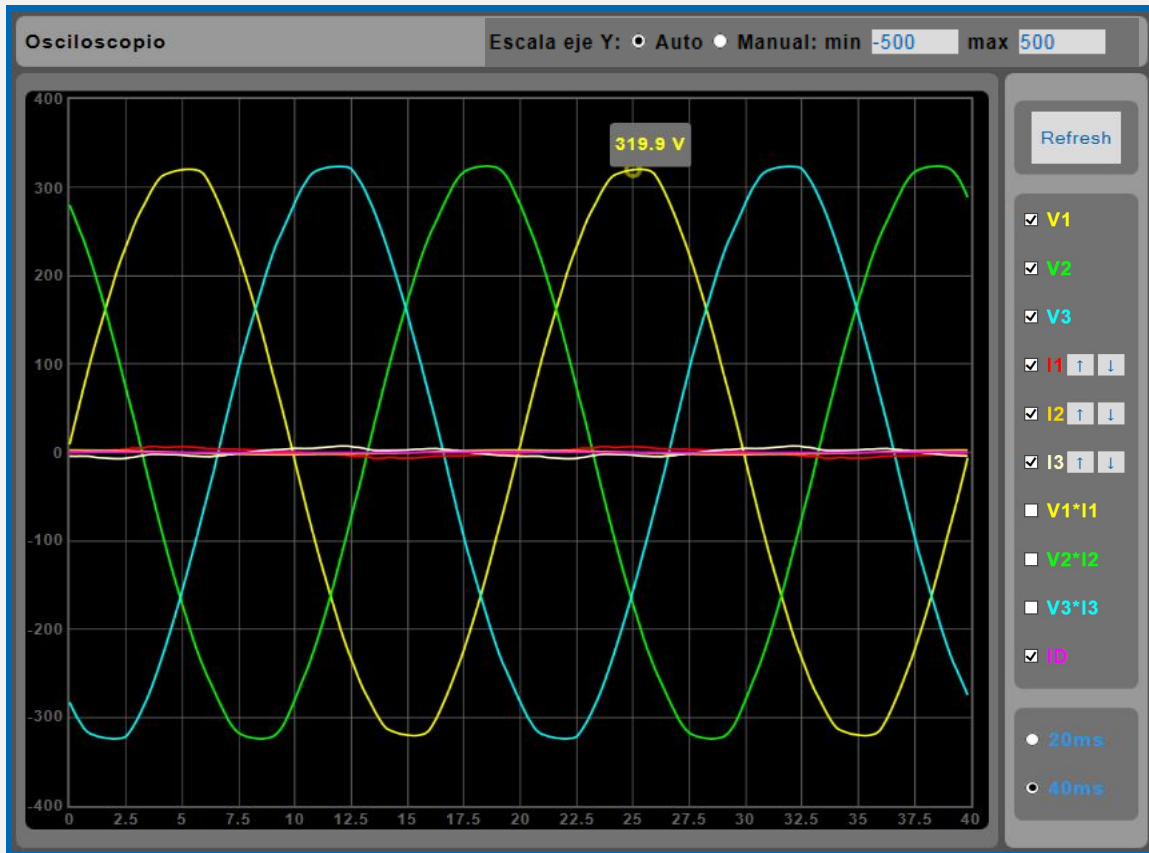




3.6 WEB page: Box “Oscilloscope”

7-channel oscilloscope with autoscale and automatic or manual Y axis scale and 3 mathematical V*I. channels. Includes instantaneous value measurement cursor in all channels. Continuously refreshed display (every 1.5 secs.).

In order to view this WebServer page correctly, the PC, MAC, smartphone, tablet or PDA must have Internet access. If working on an Intranet network, one must have an Intranet server with its data files uploaded. These files are easily installed in any computer (consult UNIVERSAL+ Apache manual).



3.7 WEB page: Box "Energy log" G3 version

Opción "G3": Energy log (L1, L2, L3 and Σ L1,2 and 3) with built-in 1.5-year memory (3-phase model)

Graphic log (months, days, hours and minutes) for energy, costs and emissions with (option G3) built-in memory.

Log for active and reactive energy consumption. Graphic bar and line display WebServer in months, days, hours and 5-minute slots.

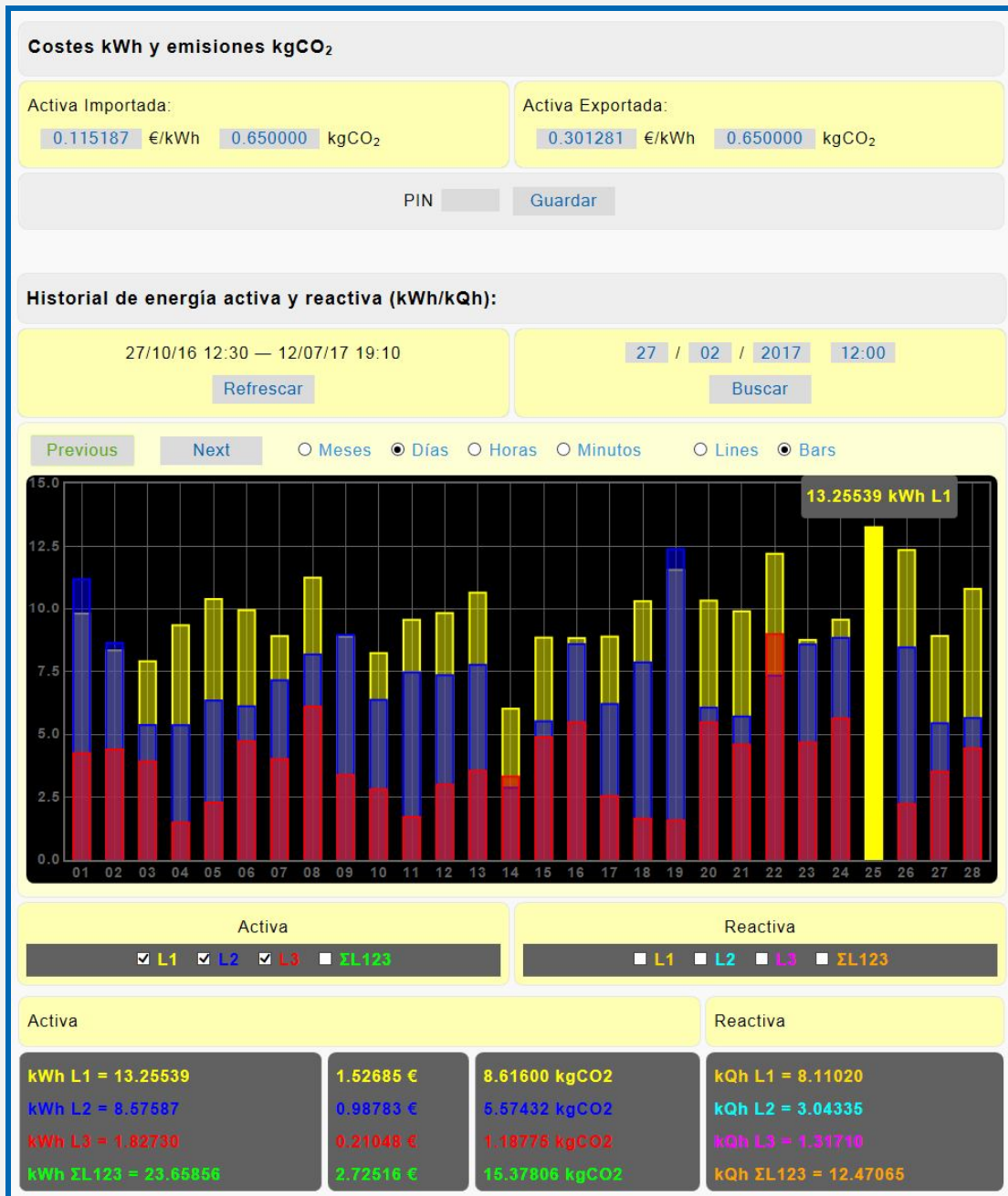
Option "G3" includes measurement cursor in all **four** (active and reactive) channels

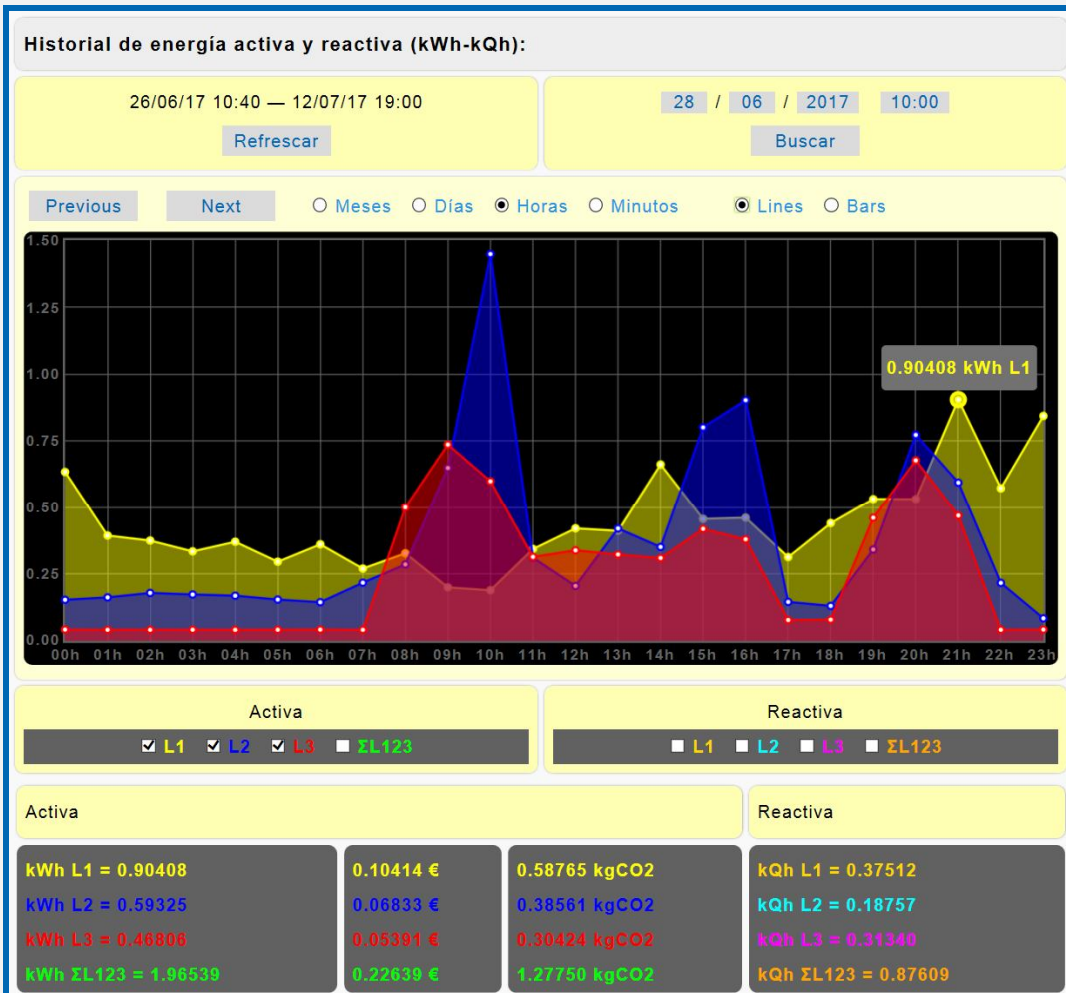
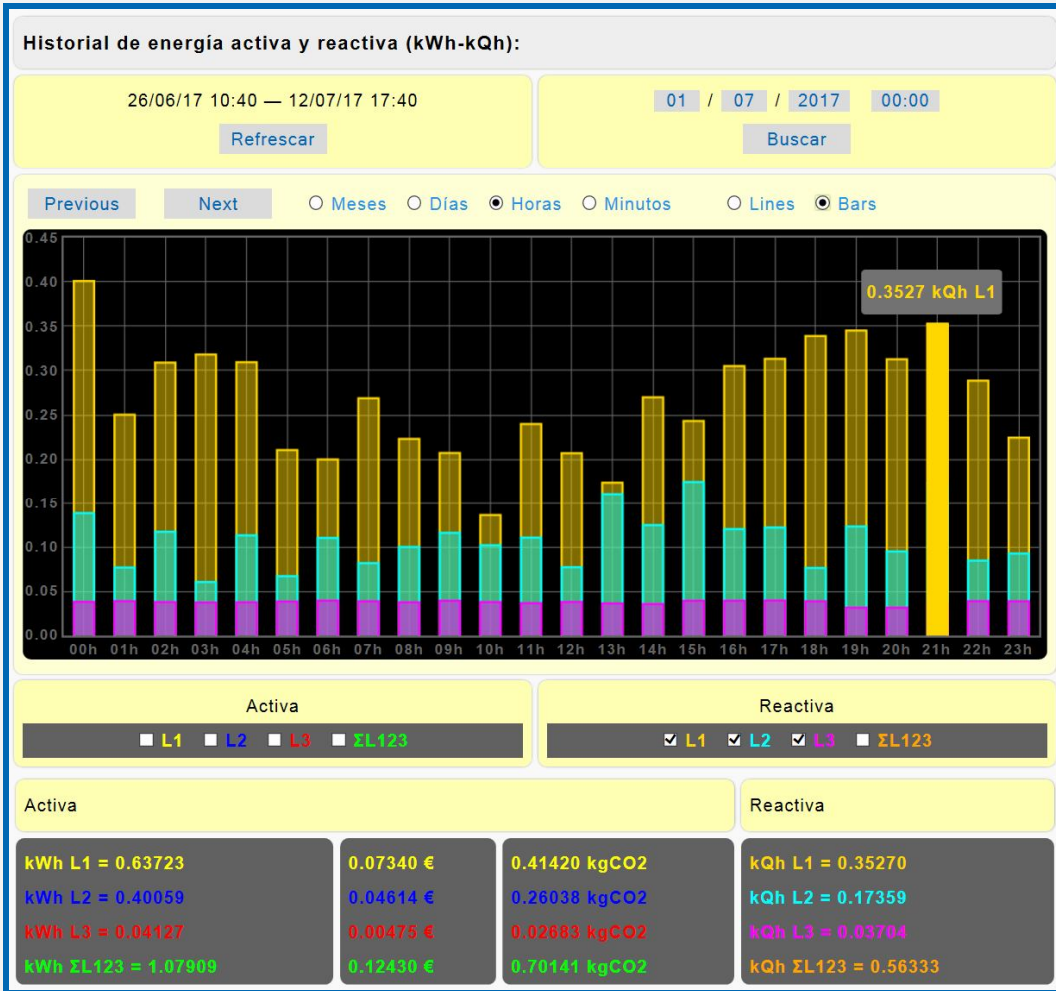
The emissions ratio is the amount of carbon emitted into the atmosphere to produce 1kWh.

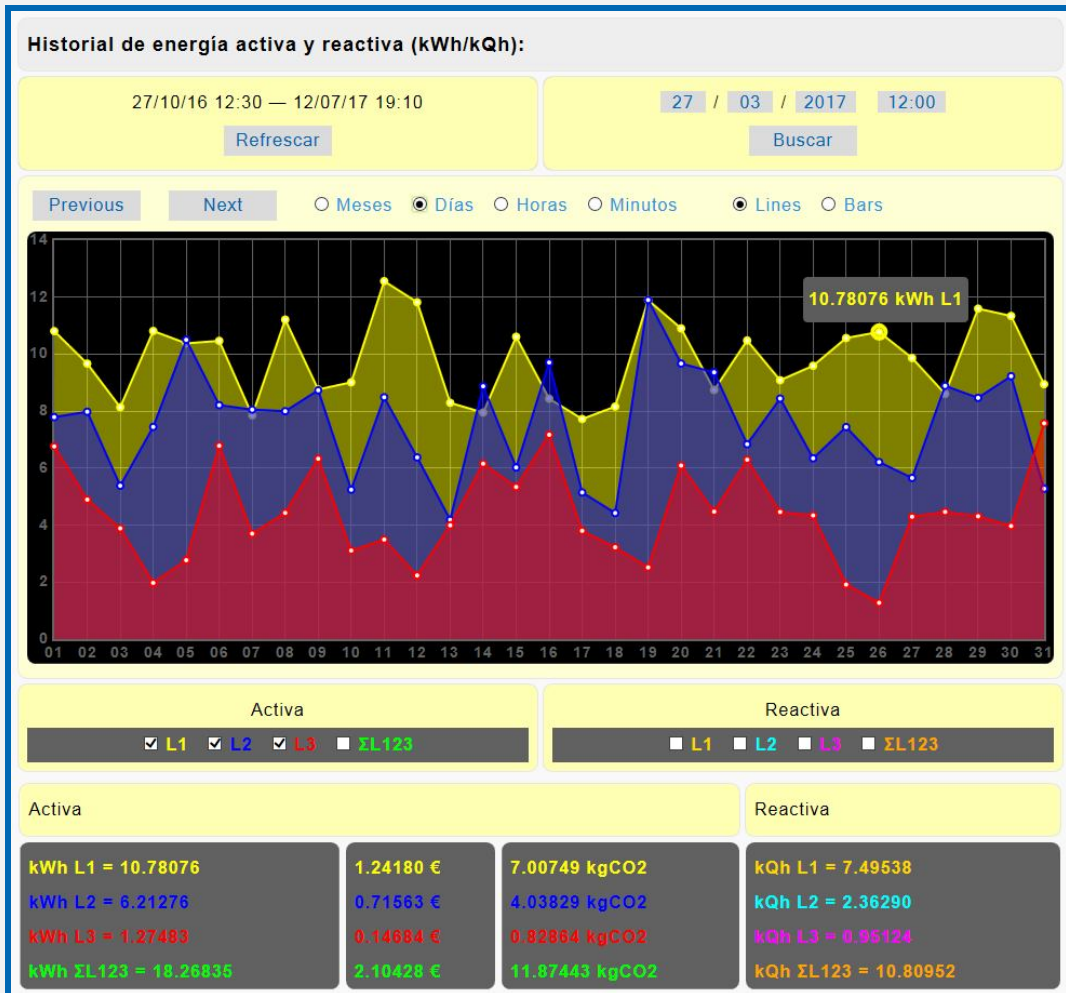
The European ratio is approximately 0.65 kg CO₂ per kWh.

The data from the energy log can be exported to EXCEL, PDF and DOC. Please, refer to "Extensions" on the website

In order to view all the pages correctly, the browser of the PC, MAC, smartphone, tablet or PDA must have Internet access. Should this not be the case, then there will have to be an Intranet server with the library files uploaded, These files are easily installed in any computer (consult UNIVERSAL+ Apache manual).







3.8 WEB page: Box “Energy log” G version

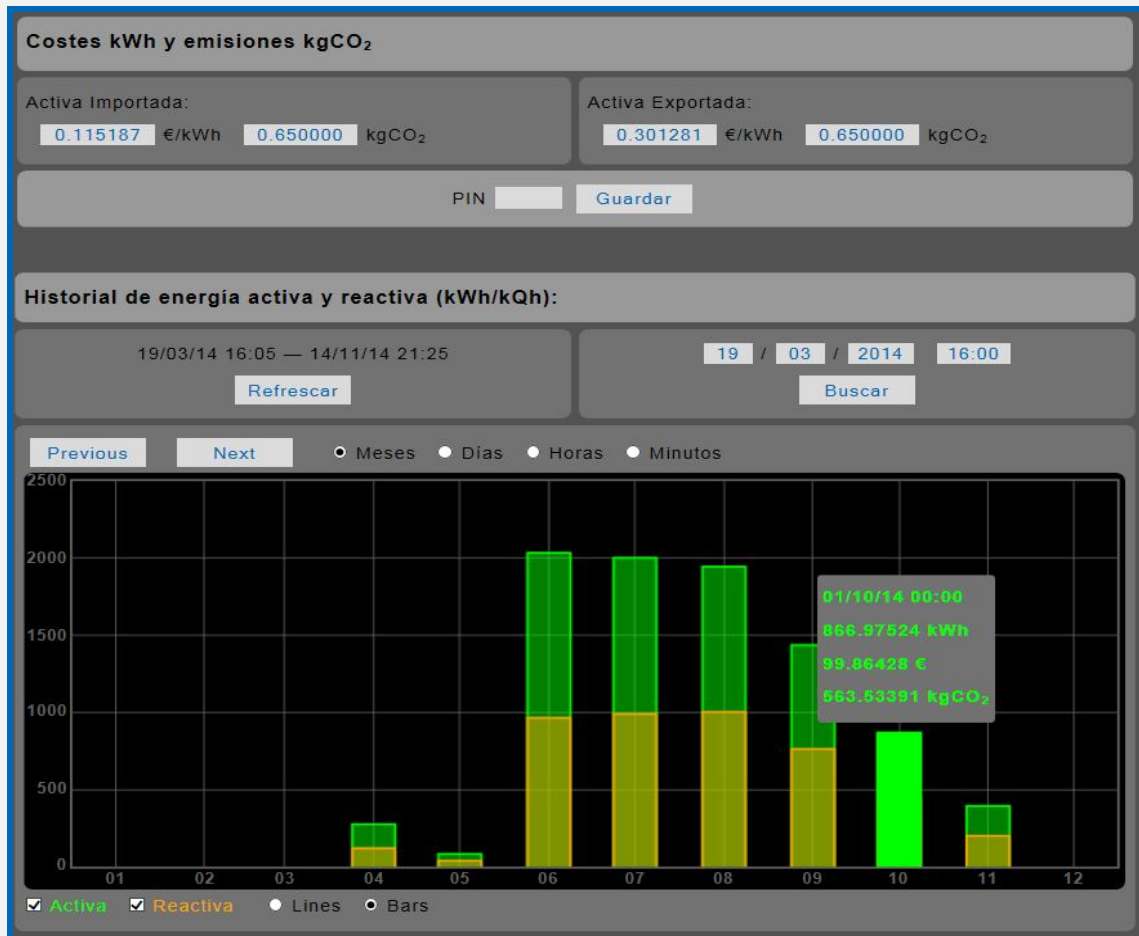
Option “G”: Energy log (L1 single-phase or Σ L1,2 and 3 three-phase) with built-in 3-year memory (Single-phase)

Graphic history (months, days, hours and minutes) for energy, costs and emissions with built-in 3-year memory (option G).

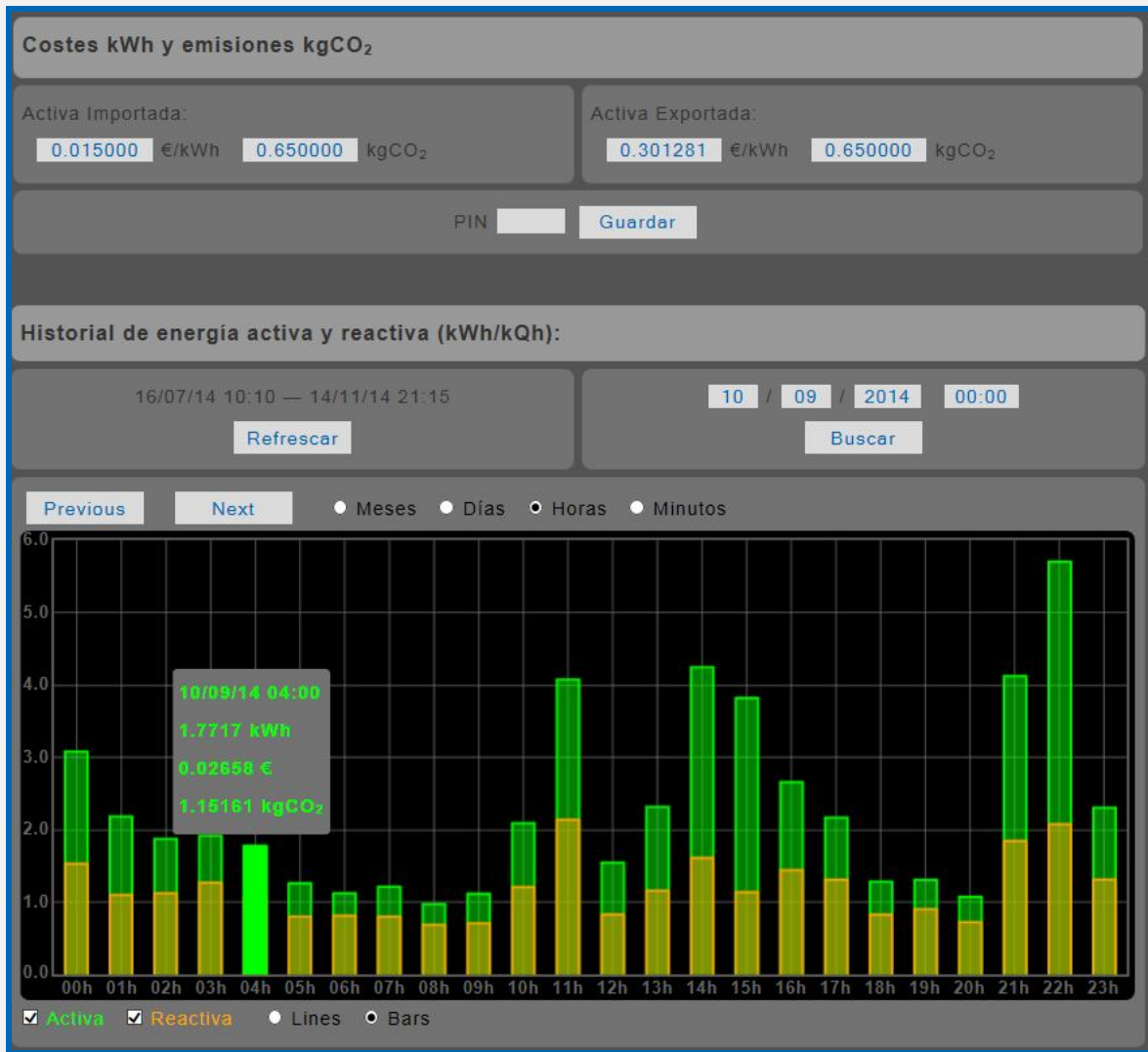
Active and reactive energy consumption log. Bar and line graphic display in WebServer showing months, days, hours and 5-minute intervals. Includes measurement cursor in both (active and reactive) channels.

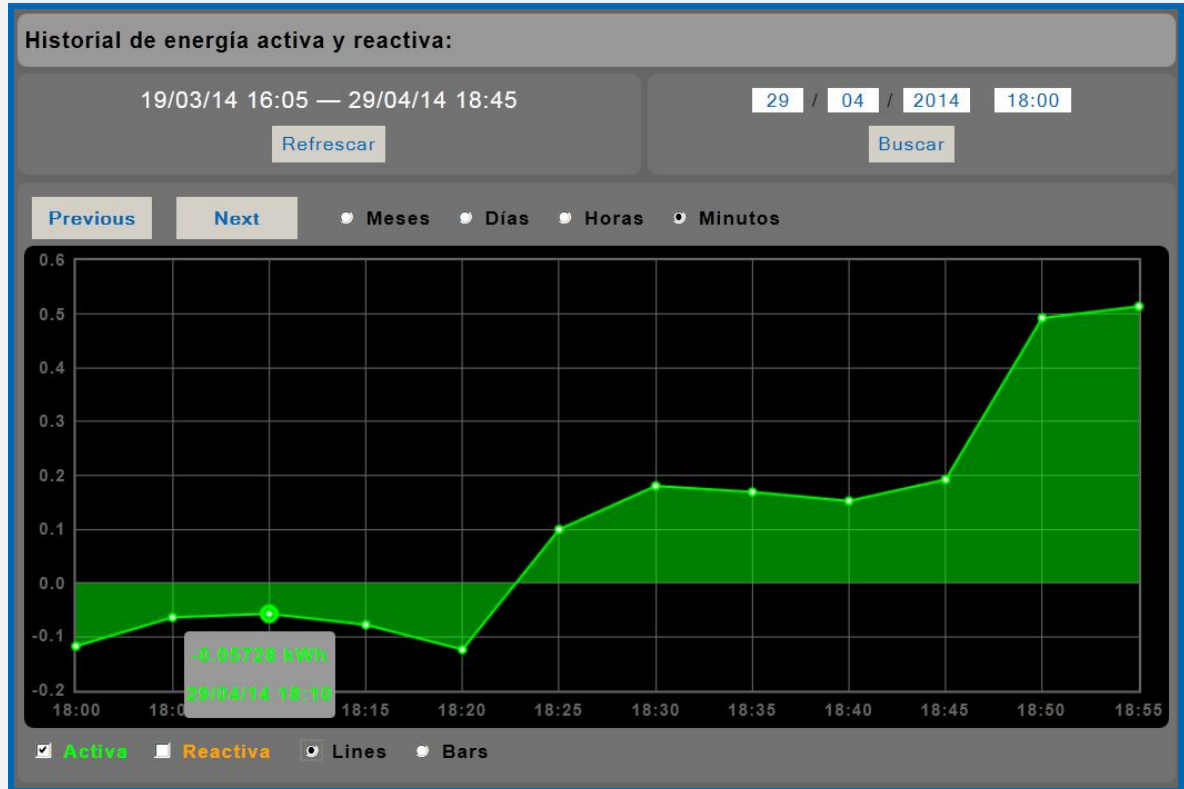
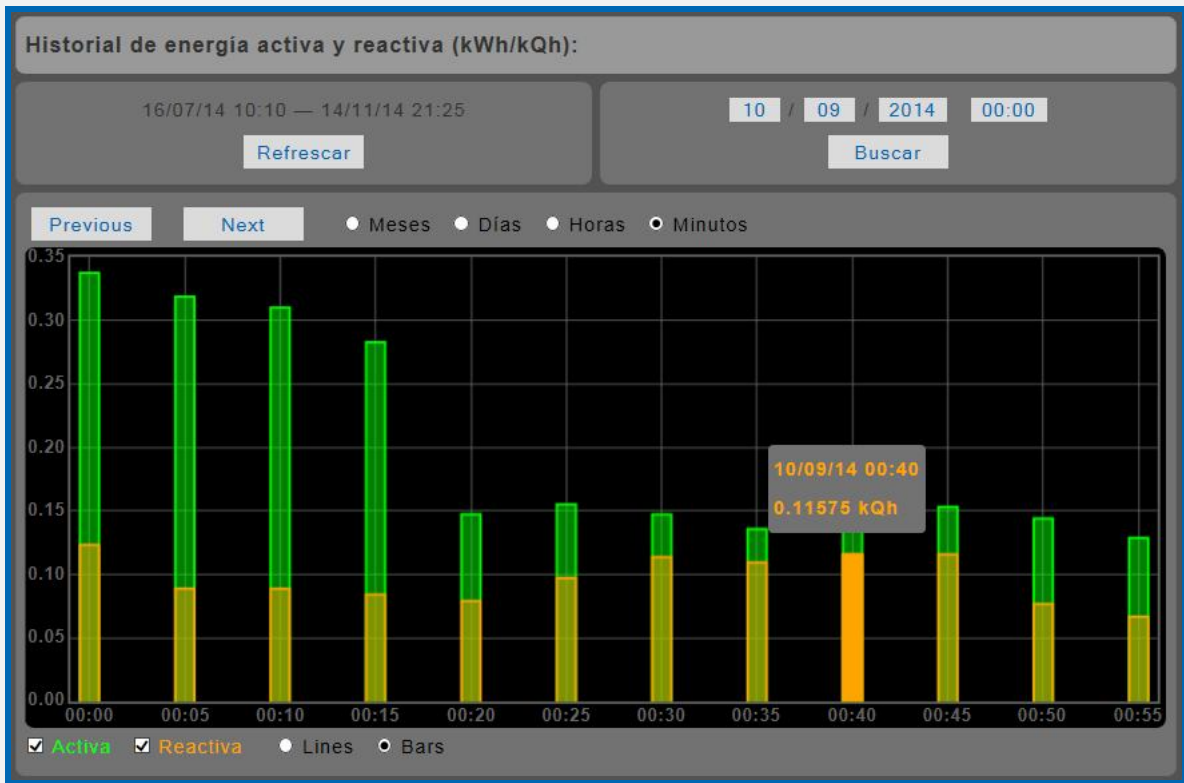
The emissions ratio is the amount of carbon emitted into the atmosphere to produce 1kWh. The European ratio is approximately 0.65 kgCO₂ per kWh. The data in the energy log can be exported to EXCEL, PDF and DOC files. cf. WEB page box “Extensions”.

In order to view this WebServer page correctly, the PC, MAC, smartphone, tablet or PDA must have Internet access. If working on an Intranet network, one must have an Intranet server with its data files uploaded. These files are easily installed in any computer (consult UNIVERSAL+ Apache manual).










3.9 WEB page: Box “Extensions” button (G3 version)

This opens a window with the Web apps hosted on the www.safeline.es server.

Remote customisable measurements, report generator and energy report generator..

The Web app and energy report generator permit the user to export the data stored in the unit to Excel, .pdf and .doc files for their subsequent treatment in Excel or Word or to generate a .pdf file directly and also to make valuation reports.

In order to view this page correctly, it is necessary for the PC, Mac, smartphone, tablet or PDA to have Internet access.


Configurar unidades

Complementos - Extensiones BL123 V2.0


Classic ▾
Español ▾
Consultar manual

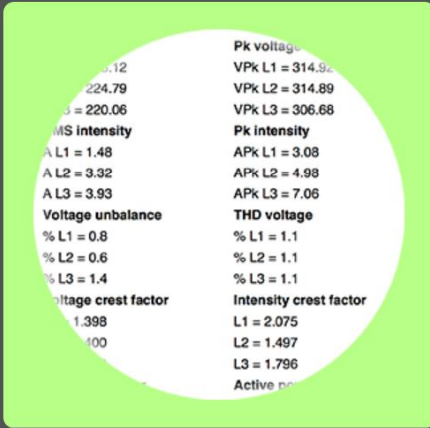
Complementos BL123


Medidas personalizables remotas

Generador de informes

Generador de informes energéticos







Este nuevo complemento permite personalizar y organizar las medidas que necesite de multitud de equipos, para así poderlas comparar entre ellas en tiempo real.

Genere un informe sobre la información del equipo, las medidas y el registrador log de multitud de equipos y expórtelos a pdf, excel o doc de una manera rápida e intuitiva.

Esta aplicación permite generar un informe sobre el historial de energía. Podrá exportar a pdf, excel o doc los consumos, costes y emisiones de multitud de equipos.

Safeline S.L.


3.10 WEB page: Box “Extensions” (G version)

A window with the web apps hosted on the server www.safeline.es is opened.

Remote customisable measurements, remote energy poli-comparator, report generator and energy report generator.. These useful web apps include an explanatory video.

The web apps and report generators permit the user to export the data stored in the unit to EXCEL, PDF and DOC files for further processing in EXCEL, Word or for generating a PDF file directly. Likewise, assessment reports can be made.

In order to view this website correctly the PC, MAC, smartphone, tablet or PDA browser must have Internet access

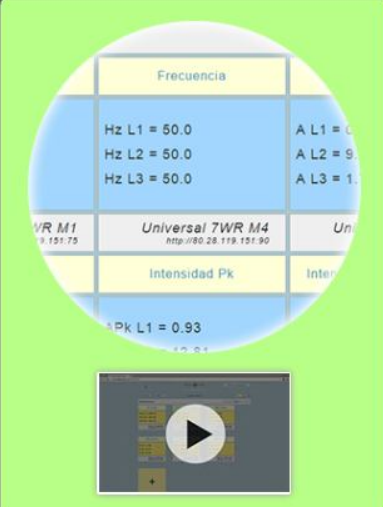

Configurar unidades

Complementos - Extensiones V2.0
ir a la versión V1.0

Classic Español Consultar manual

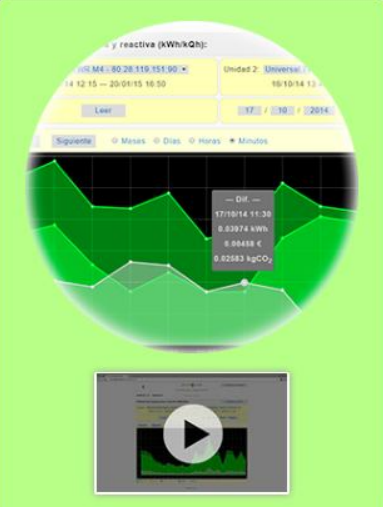
Complementos

Medidas personalizables remotas



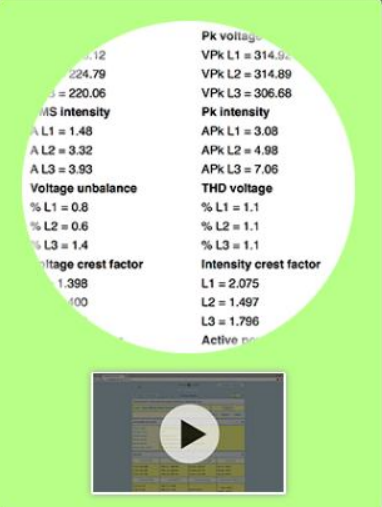
Este nuevo complemento permite personalizar y organizar las medidas que necesite de multitud de equipos, para así poderlas comparar entre ellas en tiempo real.

Policomparador energético remoto




¿Ha pensado en comparar el consumo de varios lugares? con este complemento solo tendrá que añadir las IPs de los equipos a comparar y listo!

Generador de informes




Genere un informe sobre la información del equipo, las medidas y el registrador log de multitud de equipos y expórtelos a pdf, excel o doc de una manera rápida e intuitiva.

Generador de informes energéticos



Esta aplicación permite generar un informe sobre el historial de energía. Podrá exportar a pdf, excel o doc los consumos, costes y emisiones de multitud de equipos.

Multigenerador de informes energéticos



¡Novedad! Genera un informe sobre el historial de energía de multitud de equipos Universal+ en paralelo y permite exportar el informe a pdf, excel o doc (Word, Open office etc.). Incluye totales de todas las unidades.

3.11 WEB page: Box “Thd-Hd-VAr log”

Graphic log of meanTHD–HD–VAr at 5-minute intervals with built-in 14-month memory (optional)
Analysis for harmonics compensation and reactive power of L1, L2, L3, $\sum L_{1,2,3}$ y $(\sum L_{1,2,3})/3$

Harmonics range: $k_{min} - k_{max}$ From harmonic 2 – 63, programmable by harmonic nad harmonics bracket (HP version).

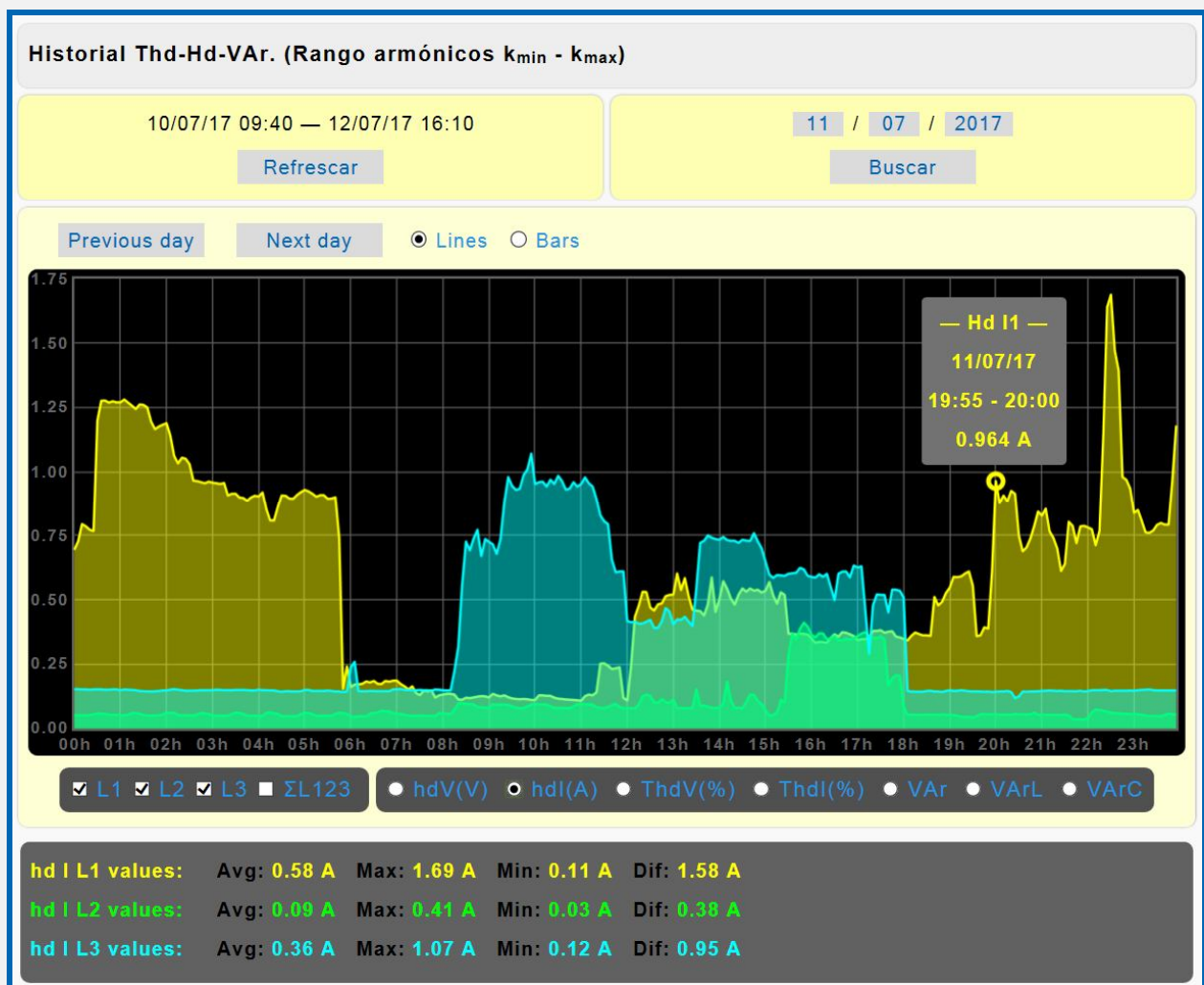
Harmonics range: 2 – 63 (non HP version).

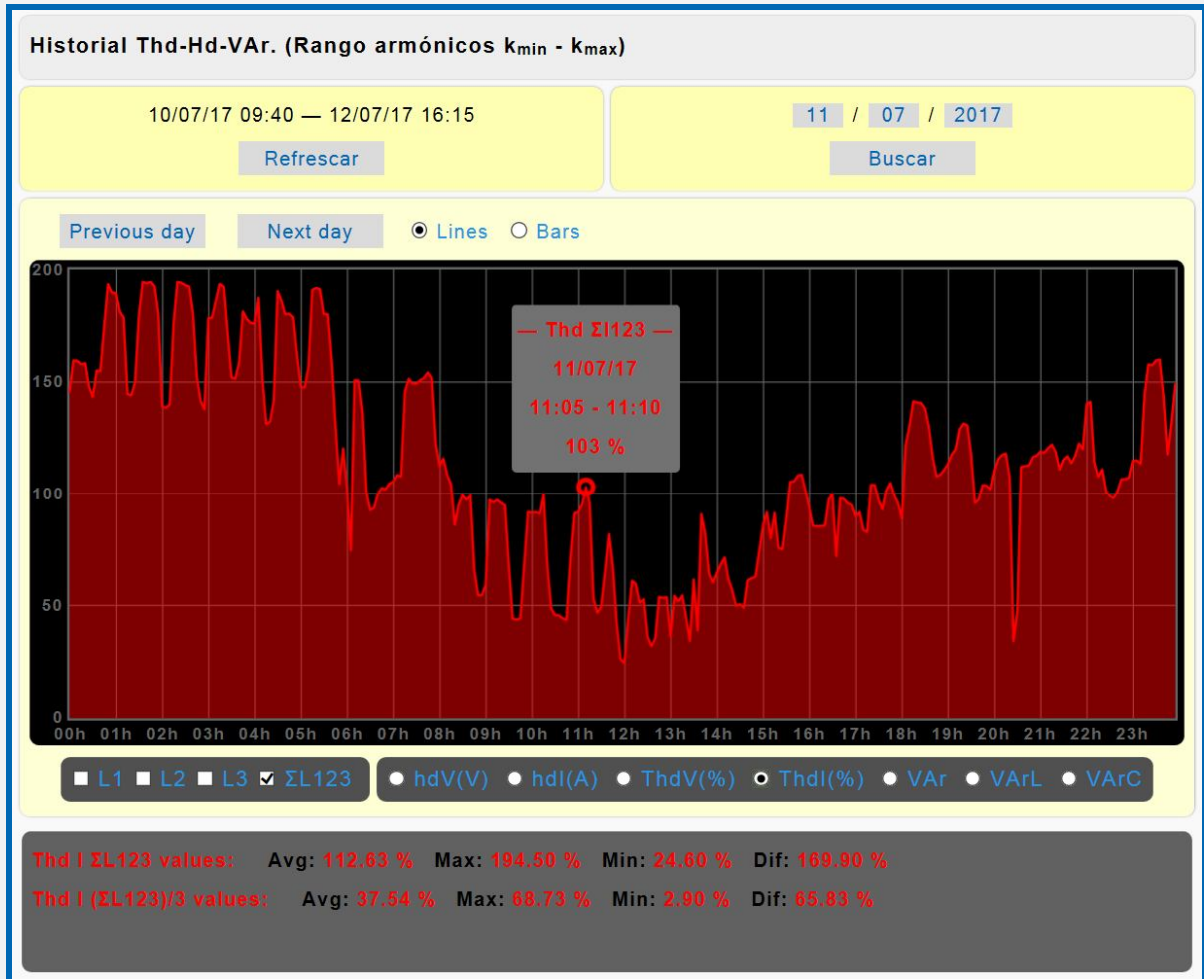
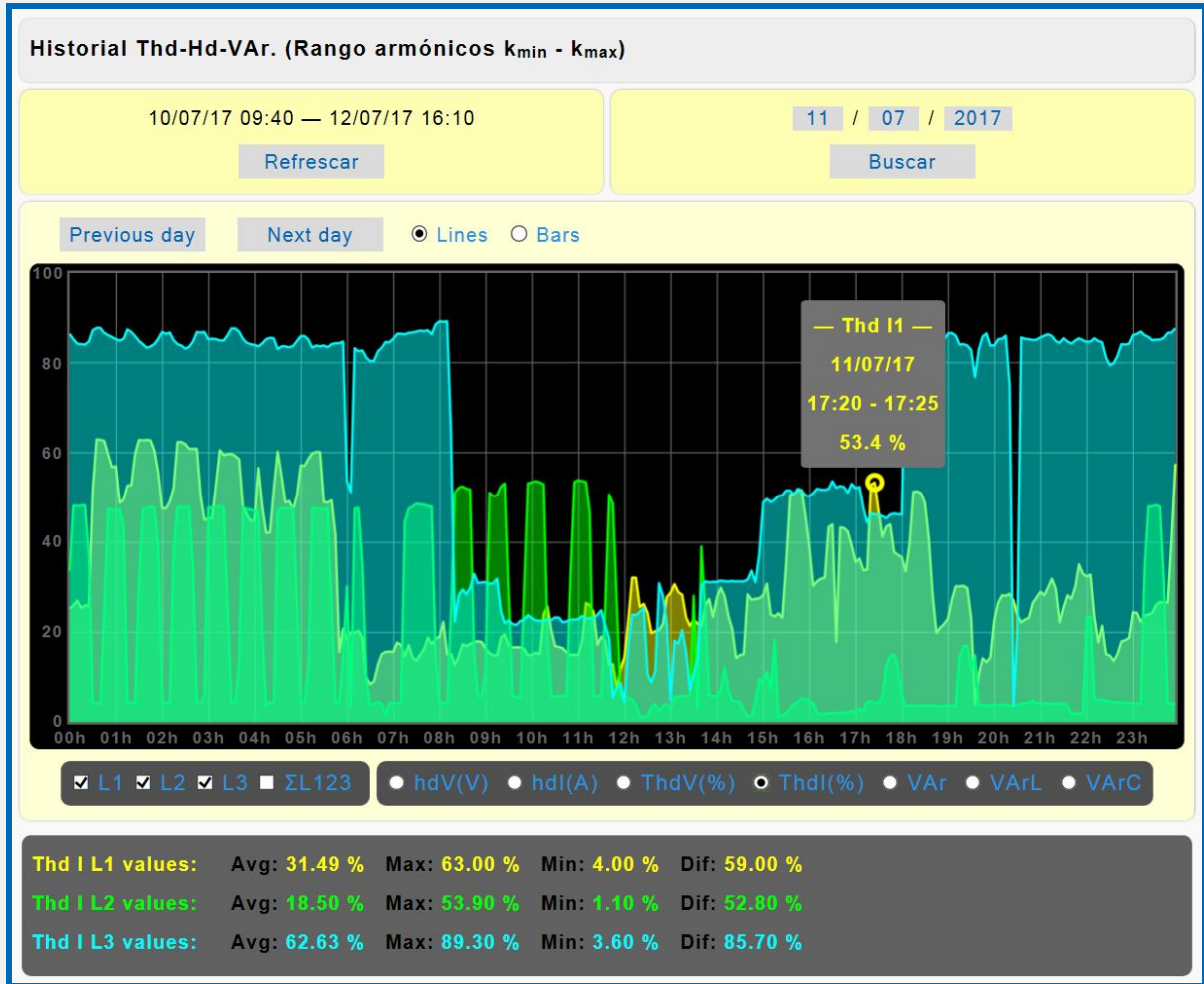
Mean graphic log at 5-minute intervals, viewing in days of:

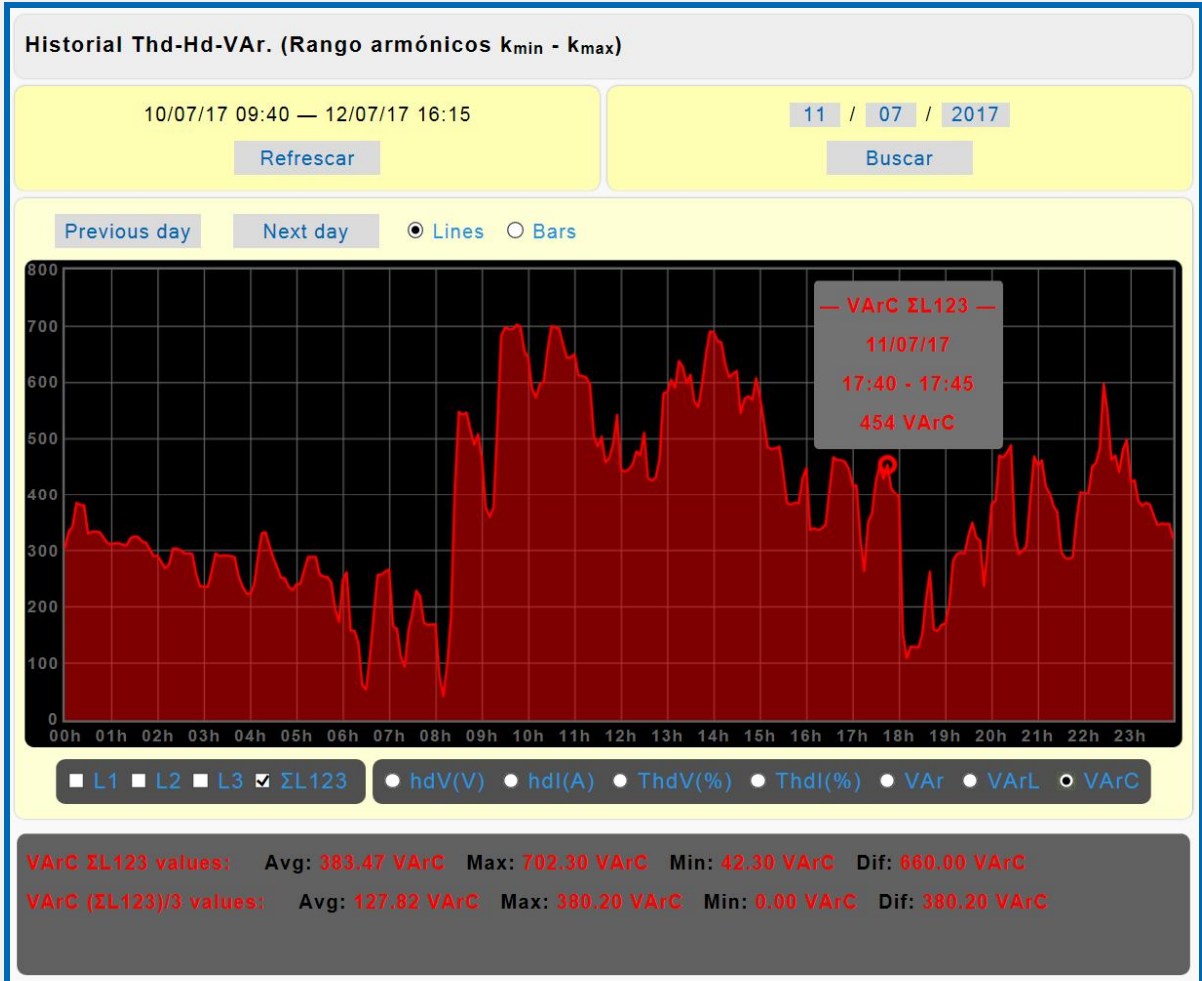
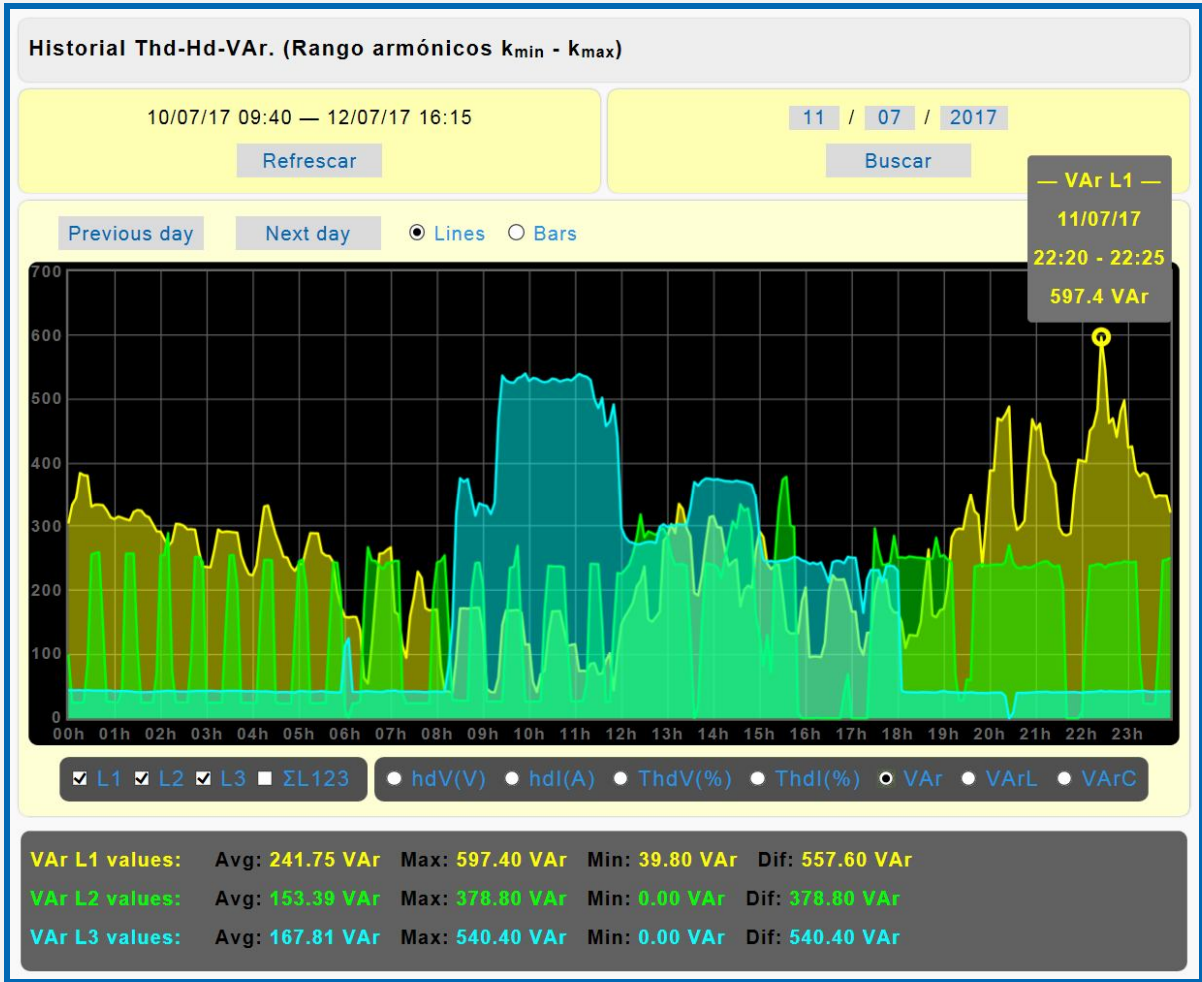
Log: hdV(V)	$(L1, L2, L3 - \sum L_{1,2,3} - (\sum L_{1,2,3})/3)$
Log: hdl(A)	$(L1, L2, L3 - \sum L_{1,2,3} - (\sum L_{1,2,3})/3)$
Log: ThdV(%)	$(L1, L2, L3 - \sum L_{1,2,3} - (\sum L_{1,2,3})/3)$
Log: ThdI(%)	$(L1, L2, L3 - \sum L_{1,2,3} - (\sum L_{1,2,3})/3)$
Log: VAr	$(L1, L2, L3 - \sum L_{1,2,3} - (\sum L_{1,2,3})/3)$
Log: VArL	$(L1, L2, L3 - \sum L_{1,2,3} - (\sum L_{1,2,3})/3)$
Log: VArC	$(L1, L2, L3 - \sum L_{1,2,3} - (\sum L_{1,2,3})/3)$

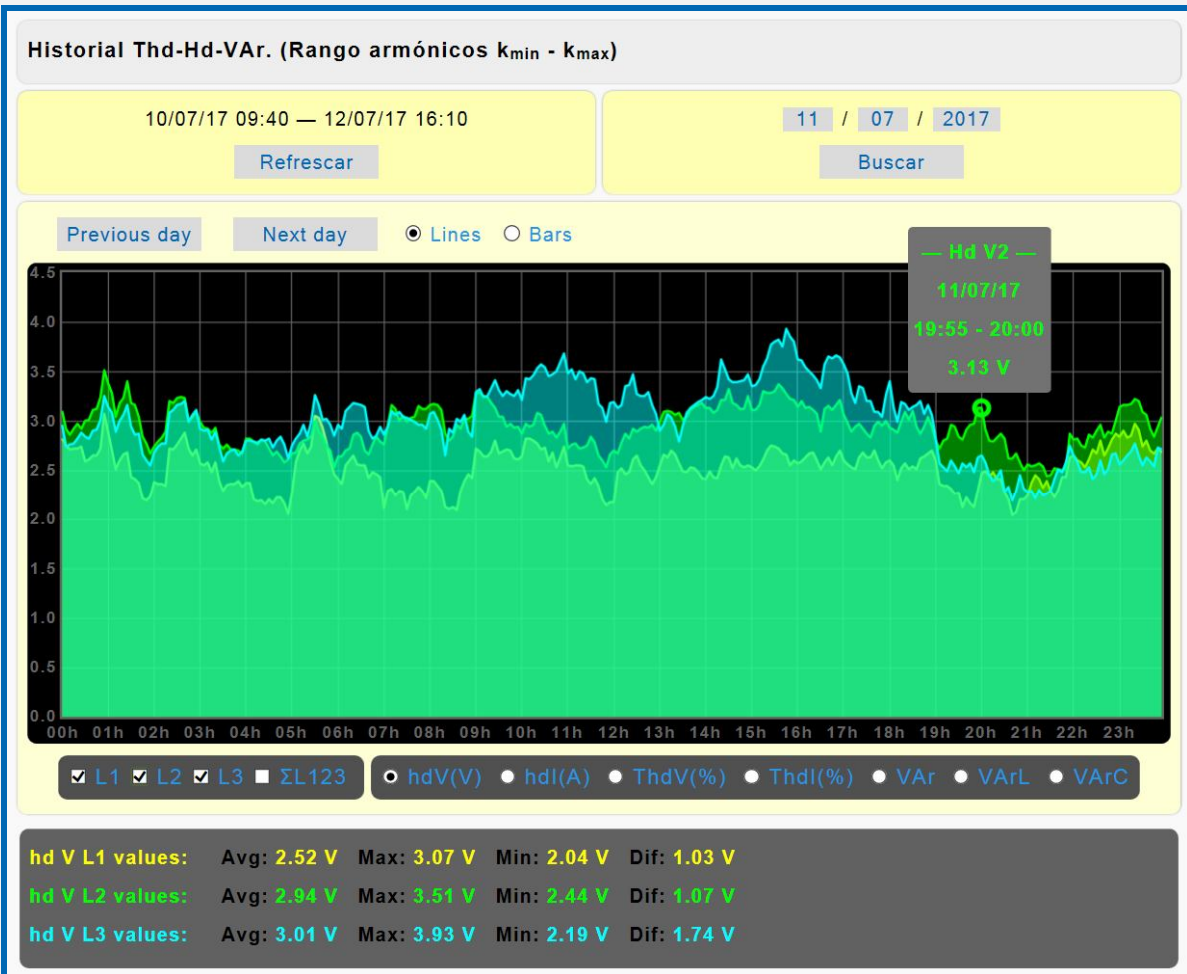
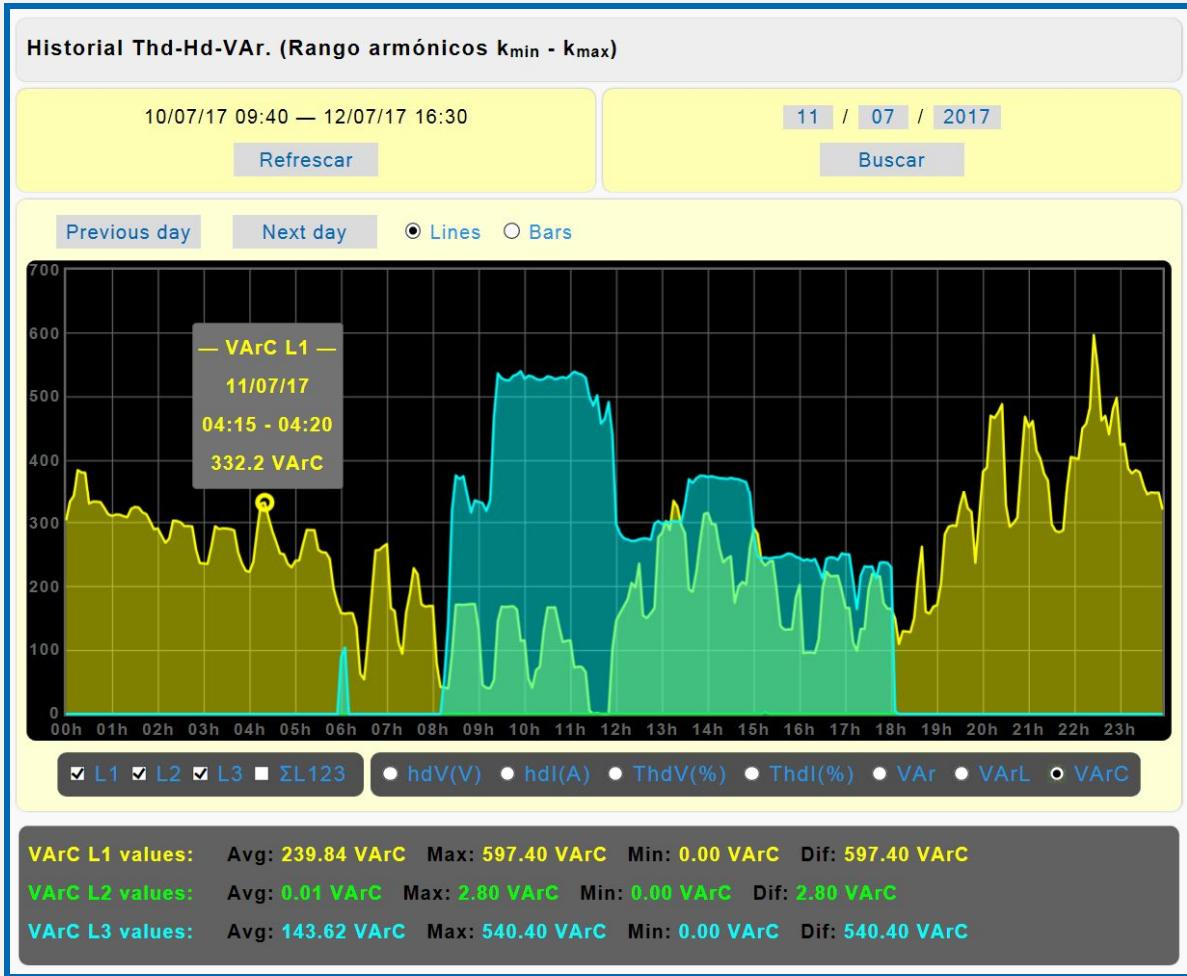
The data in the energy log can be exported to EXCEL, PDF and DOC files. cf. WEB page box “Extensions”.

In order to view this WebServer page correctly, the PC, MAC, smartphone, tablet or PDA must have Internet access. If working on an Intranet network, one must have an Intranet server with its data files uploaded. These files are easily installed in any computer (consult UNIVERSAL+ Apache manual).









3.12 WEB page: Box “Input/output status”

The following frame displays the status of the 10 logical outputs (relays), 10 logical inputs and values of the timers in real time and is continuously refreshed (every 1,5 secs).

Safeline <input type="checkbox"/>		
Estado relés A y B		
RA:	PUERTA G1	Desactivado
RB:	ILUMINACION I33	Desactivado
Estado E/S módulo externo 1		
R1:	HORNO 1	Desactivado
R2:	HORNO 2	Desactivado
R3:	HORNO 3	Desactivado
R4:	HORNO 4	Desactivado
IN1:	PUERTA A	Desactivado
IN2:	PUERTA B	Desactivado
IN3:	PUERTA C	Desactivado
IN4:	PUERTA D	Desactivado
	Temporizador 1	0min:0s
	Temporizador 2	0min:0s
	Temporizador 3	0min:0s
	Temporizador 4	0min:0s
Estado E/S módulo externo 2		
R1:	VENTILADOR 1	Desactivado
R2:	VENTILADOR 2	Desactivado
R3:	VENTILADOR 3	Desactivado
R4:	VENTILADOR 4	Desactivado
IN1:	HUMO	Desactivado
IN2:	GAS	Activado
IN3:	AGUA	Desactivado
IN4:	SENSOR CO2	Desactivado
	Temporizador 1	0min:0s
	Temporizador 2	0min:0s
	Temporizador 3	0min:0s
	Temporizador 4	0min:0s
Estado remote input 1 y 2		
RIN1:	-	Desactivado
RIN2:	-	Desactivado

3.13 WEB page: Box “Manual relay control”

Name / Edit each relay. The following frame permits the user to manually change the status of the 10 logical outputs (relays) and the four remote relays A, B, C and D (multi-interaction between remote units via Internet/Intranet). Name / Edit each relay.

Safeline

Relés A y B

Nombre: Estado de los relés:

RA: Activar Desactivar y liberar
 RB: Activar Desactivar y liberar

PIN

Relés A,B,C,D remotos (internet). (-)

Nombre: Enviar: Estado de los relés:

RA: RA: Activar Desactivar
 RB: RB: Activar Desactivar
 RC: RC: Activar Desactivar
 RD: RD: Activar Desactivar

PIN

Relés módulo externo 1

Nombre: Estado de los relés:

R1: Activar Desactivar y liberar
 R2: Activar Desactivar y liberar
 R3: Activar Desactivar y liberar
 R4: Activar Desactivar y liberar

PIN

Relés módulo externo 2

Nombre: Estado de los relés:

R1: Activar Desactivar y liberar
 R2: Activar Desactivar y liberar
 R3: Activar Desactivar y liberar
 R4: Activar Desactivar y liberar

PIN

3.14 WEB page: Box “Relay alarms”

The following frame permits the user to allot one or more alarms for the enablement/disablement of 10 relays and of relays A, B, C and D of a remote unit via Internet/Intranet.

Alarmas relés

Seleccionar: Relé A ▼

Relé A activado/desactivado por:

- SobreTensión
- InfraTensión
- Intensidad
- Intensidad diferencial
- Intensidad neutro
- Factor de Potencia
- THD Tensión
- THD Intensidad
- Desequilibrio tensión
- Desequilibrio intensidad
- SobreTemperatura
- InfraTemperatura
- SobreHumedad
- InfraHumedad
- SobreFrecuencia
- InfraFrecuencia
- Secuencia de fases
- Remote input 1
- Remote input 2
- Programador horario
- Temporizador 1 módulo 1
- Temporizador 2 módulo 1
- Temporizador 3 módulo 1
- Temporizador 4 módulo 1
- Temporizador 1 módulo 2
- Temporizador 2 módulo 2
- Temporizador 3 módulo 2
- Temporizador 4 módulo 2
- Potencia Activa
- Máximetro Potencia Activa

Relés internos

Relé A

Relé B

Relés equipo remoto

Relé A (Equipo remoto)

Relé B (Equipo remoto)

Relé C (Equipo remoto)

Relé D (Equipo remoto)

Relés módulo externo 1

Relé 1 (Mod.ext.1)

Relé 2 (Mod.ext.1)

Relé 3 (Mod.ext.1)

Relé 4 (Mod.ext.1)

Relés módulo externo 2

Relé 1 (Mod.ext.2)

Relé 2 (Mod.ext.2)

Relé 3 (Mod.ext.2)

Relé 4 (Mod.ext.2)

PIN
Guardar

3.15 WEB page: Box “Relay timers”

The following frame permits the user to program the timing value of each of the 8 logical inputs (optocoupled or potential-free contact or direct at 230 V AC) and to associate the timing to the 10 output relays (enablement/disablement timers). Likewise, to edit/rename each input and display the status of each. To associate relays, please refer to “Relay alarms”.

Safeline

Módulo externo 1

Nombre: IN1 <input type="text" value="PUERTA A"/> IN2 <input type="text" value="PUERTA B"/> IN3 <input type="text" value="PUERTA C"/> IN4 <input type="text" value="PUERTA D"/>	Estado de las entradas: Desactivado Desactivado Desactivado Desactivado
Temporizador 1 <input type="text" value="00:00"/> (00m:00s - 99m:59s)	<input checked="" type="radio"/> A la activación de: IN1 <input type="radio"/> A la desactivación de: IN1
Temporizador 2 <input type="text" value="00:00"/> (00m:00s - 99m:59s)	<input checked="" type="radio"/> A la activación de: IN2 <input type="radio"/> A la desactivación de: IN2
Temporizador 3 <input type="text" value="00:00"/> (00m:00s - 99m:59s)	<input checked="" type="radio"/> A la activación de: IN3 <input type="radio"/> A la desactivación de: IN3
Temporizador 4 <input type="text" value="00:00"/> (00m:00s - 99m:59s)	<input checked="" type="radio"/> A la activación de: IN4 <input type="radio"/> A la desactivación de: IN4
PIN <input type="text"/> <input type="button" value="Guardar"/>	

Módulo externo 2

Nombre: IN1 <input type="text" value="HUMO"/> IN2 <input type="text" value="GAS"/> IN3 <input type="text" value="AGUA"/> IN4 <input type="text" value="SENSOR CO2"/>	Estado de las entradas: Desactivado Activado Desactivado Desactivado
Temporizador 1 <input type="text" value="00:00"/> (00m:00s - 99m:59s)	<input checked="" type="radio"/> A la activación de: IN1 <input type="radio"/> A la desactivación de: IN1
Temporizador 2 <input type="text" value="00:00"/> (00m:00s - 99m:59s)	<input checked="" type="radio"/> A la activación de: IN2 <input type="radio"/> A la desactivación de: IN2
Temporizador 3 <input type="text" value="00:00"/> (00m:00s - 99m:59s)	<input checked="" type="radio"/> A la activación de: IN3 <input type="radio"/> A la desactivación de: IN3
Temporizador 4 <input type="text" value="00:00"/> (00m:00s - 99m:59s)	<input checked="" type="radio"/> A la activación de: IN4 <input type="radio"/> A la desactivación de: IN4
PIN <input type="text"/> <input type="button" value="Guardar"/>	

3.16 WEB page: Box “Time programmer”

The following frame permits the user to configure the clock and the time programmer, with some exceptions. Configuration of the 6 programs for each day of the week.. General enablement/disablement of the time programmer and individual enablement/disablement of each program. Configuration of the 15 exceptions - day, month, hour and minute of the 6 programs with individual enablement/disablement of each program. The time programmer's activity is associated to the 10 output relays and/or the main disconnection device (circuit-breaker or relay/contact control) and/or the **4 relays A, B, C and D of a remote unit via Internet/Intranet**. In order to associate relays, one must go to the “Relay alarms” button. The internal clock (date and time) is programmed manually or automatically (synchronizing date and time with PC, laptop, etc...) Automatic DST time switch (Winter/Summer) can be enabled or disabled manually.

Safeline

Configuración reloj

Fecha: 17 / 06 / 17 * Día: Sábado Hora: 19:10

Cambio de hora automático: Si No

* Aviso: Si cambia la "Fecha" se perderán todos los datos energéticos guardados en memoria.

PIN

Programador horario

ON OFF

PIN

Seleccionar: Lunes

Lunes

Enable / Disable	ON Time	OFF Time
P1 <input type="checkbox"/>	00:00	00:00
P2 <input type="checkbox"/>	00:00	00:00
P3 <input type="checkbox"/>	00:00	00:00
P4 <input type="checkbox"/>	00:00	00:00
P5 <input type="checkbox"/>	00:00	00:00
P6 <input type="checkbox"/>	00:00	00:00

PIN

Seleccionar: Excepción.1

Día 01 / Mes 01

Enable / Disable	ON Time	OFF Time
P1 <input type="checkbox"/>	00:00	00:00
P2 <input type="checkbox"/>	00:00	00:00
P3 <input type="checkbox"/>	00:00	00:00
P4 <input type="checkbox"/>	00:00	00:00
P5 <input type="checkbox"/>	00:00	00:00
P6 <input type="checkbox"/>	00:00	00:00

PIN

3.16 WEB page: Box “Unit configuration”

The frame below permits the user to edit unit's name (or rename), determine language, intensity transformer ratio, etc

Nombre de este equipo

Test1

[Guardar](#)

Idioma

Español Inglés

[Guardar](#)

Relación transformador de intensidad

70 /5 A (5 - 10000)

Relación transformador de tensión

1 Vp/Vs (1 - 100)

Invertir canales de intensidad

I1
 I2
 I3

3.17.1 WEB page: Box “Unit configuration”

Oscilloscope event-logger in waveform with pre-trigger and autoscale (6 channels V1, V2, V3, I1, I2, I3, with captures for each event).

Three modes of record length in 6 channels 160ms, 320ms and 640ms (pre-trigger: 40ms, 80ms and 160ms)

+ three modes of record length in 6 channels 20s, 40s and 80s (pre-trigger 5s, 10s y 20s). Only HP versions

Trigger for alarms which can be enabled and are programmable in value and delay. Chronological record for each type of alarm.

ΔV Pk (Pk voltage difference) alarm. Set delay: 156,25 μ s.

ΔV RMS (RMS voltage difference) alarm. Set delay: 20 ms.

Osciloscopio registrador de eventos en forma de onda con pre-trigger

Longitud de registro y resolución:
 160 ms. Pre-trigger 40 ms. (x4)
 320 ms. Pre-trigger 80 ms. (x2)
 640 ms. Pre-trigger 160 ms. (x1)
 20 s. Pre-trigger 5 s. (x4)
 40 s. Pre-trigger 10 s. (x2)
 80 s. Pre-trigger 20 s. (x1)

Seleccionar triggers:
 ΔV Pk (30 - 200) 100 V
 ΔV RMS (1 - 300) 25 V
 SobreTensión RMS
 SobreTensión PK
 Intensidad RMS
 Intensidad PK
 THD Tensión
 THD Intensidad
 SobreFrecuencia
 InfraFrecuencia
 Remote input 1 - Trigger externo
 Remote input 2 - Trigger externo

3.17.2 WEB page: Box “Unit configuration”

The following frame permits the user to configure the alarms indicated in value and delay. The RMS delay goes in 20ms steps and the Pk delay in 156,25 μ s and the “s” steps are seconds. To associate relays, please refer to “Relay alarms”. The alarms can be enabled/disabled.

Máximetro Potencia Activa

Promedio: s (10 - 900)

[Guardar](#)

Alarma por SobreTensión. RMS

Activado Desactivado

V (50 - 320) (1-500). Delay = 980.00mS.

Alarma por SobreTensión. Pk

Activado Desactivado

V Pk (70 - 450) (1-58). Delay = 1.875mS.

Alarma por InfraTensión. RMS

Activado Desactivado

V (50 - 320) (1-500). Delay = 5000.00mS.

[Guardar](#)

Alarma por Intensidad diferencial. RMS

Activado Desactivado

mA (30 - 1000) (1-500). Delay = 60.00mS.

Alarma por Intensidad diferencial. Pk

Activado Desactivado

mA Pk (42 - 1414) (1-58). Delay = 4.062mS.

[Guardar](#)

Alarma por Intensidad. RMS

Activado Desactivado

A (1.4 - 63.0) (1-500). Delay = 5000.00mS.

Alarma por Intensidad. Pk

Activado Desactivado

A Pk (1.9 - 89.0) (1-58). Delay = 8.593mS.

Alarma por Intensidad de neutro. RMS Activado Desactivado

40.0 A (1.4 - 63.0)

10 s (1 - 180)

Guardar

Alarma por Potencia Activa Activado Desactivado

1000 W (1 - 9999999)

10 s (1 - 180)

Alarma por Máximo Potencia Activa Activado Desactivado

1000 W (1 - 9999999)

Guardar

Factor de Potencia Activado Desactivado

0.40 PF (0.99 - 0.01)

10 s (1 - 180)

Secuencia de fases Activado Desactivado

10 s (1 - 180)

Guardar

Alarma por desequilibrio de tensión Activado Desactivado

50 % (5 - 99)

10 s (1 - 180)

Alarma por desequilibrio de intensidad Activado Desactivado

90 % (5 - 99)

10 s (1 - 180)

Guardar

Alarma por THD Tensión Activado Desactivado

Rango armónicos (2 - 63):

K_{min} 2 ≥ K_{max} 63

10 % (1 - 90)

10 s (2 - 180)

Alarma por THD Intensidad Activado Desactivado

Rango armónicos (2 - 63):

 K_{min} 2 \geq K_{max} 63

80 % (1 - 90)

10 s (2 - 180)

Guardar

Alarma por Sobre Temperatura Activado DesactivadoAlarm \geq +50 °C (-40 - +100)NO alarm $<$ +45 °C

10 s (2 - 180)

Alarma por Infra Temperatura Activado DesactivadoAlarm $<$ -10 °C (-40 - +100)NO alarm \geq -5 °C

10 s (2 - 180)

Guardar

Alarma por Sobre Humedad Activado DesactivadoAlarm \geq 90 %RH (10 - 90)NO alarm $<$ 80 %RH

10 s (2 - 180)

Alarma por Infra Humedad Activado DesactivadoAlarm $<$ 10 %RH (10 - 90)NO alarm \geq 20 %RH

10 s (2 - 180)

Guardar

Alarma por Sobre Frecuencia Activado DesactivadoAlarm \geq 55 Hz (51 - 55)NO alarm $<$ 54 Hz

10 s (2 - 180)

Alarma por Infra Frecuencia Activado DesactivadoAlarm $<$ 45 Hz (45 - 49)NO alarm \geq 46 Hz

10 s (2 - 180)

3.17.3 WEB page: Box “Unit configuration”

The following frame permits the user to configure the digital inputs Remote in 1 and 2 as indicated. These logical inputs are commanded by a potential-free contact.

The external module 1, external module 2 and the temperature/humidity probe can be enabled/disabled.

The (DataWatchPro, software for PC) initializes maximum and minimum measurements after each reading. If this option is enabled (Yes), after each DWP reading, the unit initializes these measurement logs. Thus, should the reading configuration be set at 30 secs., the maximum and minimum measured in each 30 sec-period would be obtained. In this way, the DWP level alarms can be configured so as to act without losing information in the unallotted time slots.

Remote input 1

Activado Desactivado

Nombre -

Tipo:
 Normal Basculante

Remote input 2

Activado Desactivado

Nombre -

Tipo:
 Normal Basculante

[Guardar](#)

Módulo externo 1

Si No

Módulo externo 2

Si No

[Guardar](#)

Sonda de temperatura y humedad

Si No

DWP inicializa medidas máx. y mín. después de cada lectura

Si No

Aceptar y guardar cambios

PIN [Guardar](#)

3.17.4 WEB page: Box “Unit configuration”

The following frame, through its PIN security code, accepts and saves all changes carried out during the programming process. By means of this PIN, the user can also enable the default ex-factory configuration, erase event-logger memories, energy consumptions and the Thd-Hd-VAr. log.

Aceptar y guardar cambios

PIN

Inicializar memoria del registrador de eventos

Aviso: Se perderán todos los datos guardados en memoria.
PIN

Inicializar memoria de consumos energéticos

Aviso: Se perderán todos los datos guardados en memoria.
PIN

Inicializar memoria del historial de Thd-Hd-VAr

Aviso: Se perderán todos los datos guardados en memoria.
PIN

Configuración de fábrica por defecto

PIN

3.18 WEB page: Box “Access configuration”

Configuration for TCP/IP parameters. Disablement of Modbus. Disablement of programming via Internet/Intranet (WebServer in read-only mode) and change of user PIN.

Modbus

Activado Desactivado (Aumenta de 4 a 5 los sockets TCP/IP)

PIN

Permitir el acceso a los relés de este equipo por TCP/IP

Relés A y B
 RA
 RB
 Relés módulo externo 1
 R1
 R2
 R3
 R4
 Relés módulo externo 2
 R1
 R2
 R3
 R4

PIN

TCP/IP Configuración (Este equipo)

Nombre	-
Dirección IP	192.168.2.10
Máscara de subred	255.255.255.0
Puerta de enlace	192.168.2.1
Puerto	80
MAC	00:50:C2:62:30:70

PIN

3.18.1 WEB page: Box “Access configuration”

Configuration for TCP/IP parameters. Disabling of Modbus. Disabling of programming via Internet/Intranet (WebServer in read-only mode) and change of user PIN.

TCP/IP Configuración (Equipo remoto)

Nombre

Dirección IP

Puerto

PIN

TCP/IP Configuración (Servidor remoto)

Activada Desactivada

Nombre

URL

Puerto local

Usuario

Contraseña

Deshabilitar programación por Web? (¡ATENCIÓN! No reversible. Consultar manual)

Si No

Cambiar PIN

PIN

Nuevo PIN

Repetir nuevo PIN

Ubicación de la carpeta de gráficos

3.19 WEB page: Box “Close session”

Closes the session. The session having been closed, the next time the user attempts to access the content, the access PIN will be requested. For security reasons, an automatic session closure is generated every 30 minutes should the session have been quitted without “close session” having been pressed.

Chapter 4 – DataWatchPro professional software

Warning: Manually update the time and date in the unit's clock before using the DatawatchPro software

4.1 Module – Oscilloscope event-logger in waveform with pre-trigger and autoscale (optional)

6 channels V1, V2, V3, I1, I2, I3, with captures for each event

Three modes of record length in 6 channels 160ms, 320ms and 640ms (pre-trigger: 40ms, 80ms and 160ms)

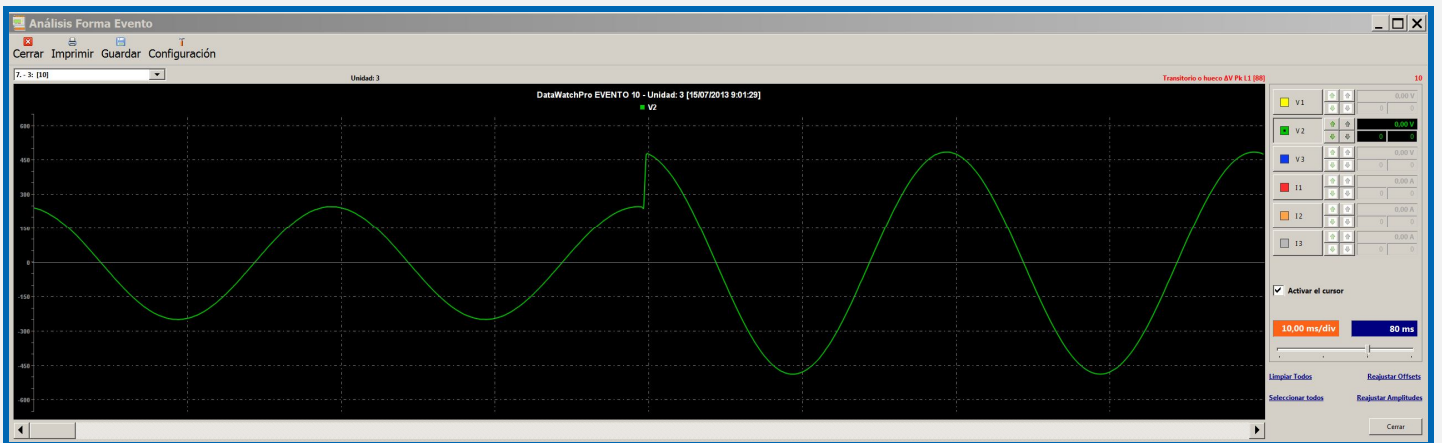
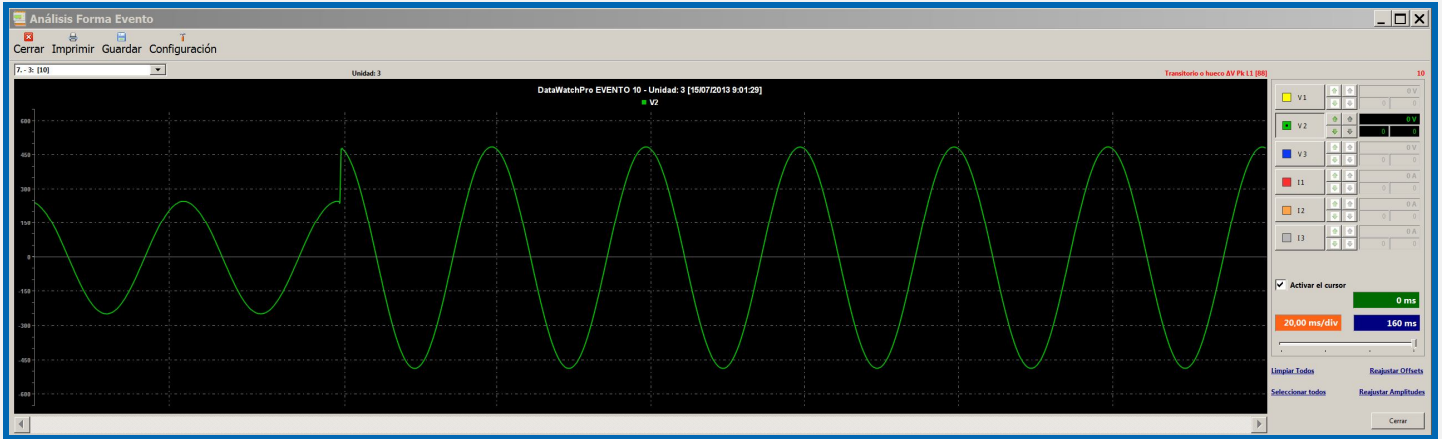
600-event storage in built-in memory. Display via WebServer and DataWatchPro.

Trigger for alarms which can be enabled and are programmable in value and delay. Chronological record for each type of alarm.

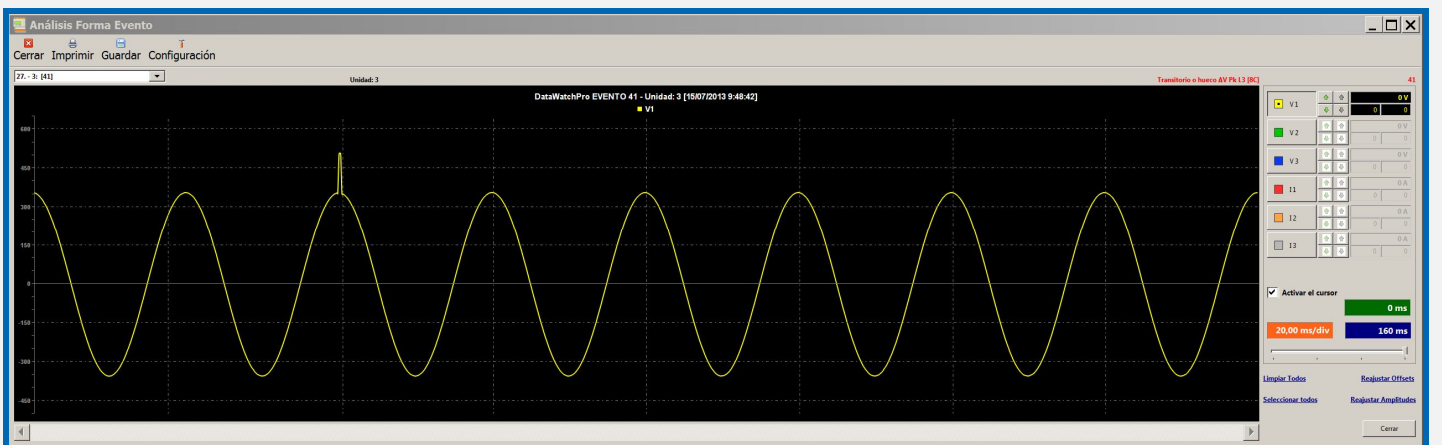
Display via WebServer with horizontal zoom functions. Multi-channel measurement, value and time cursor, etc.

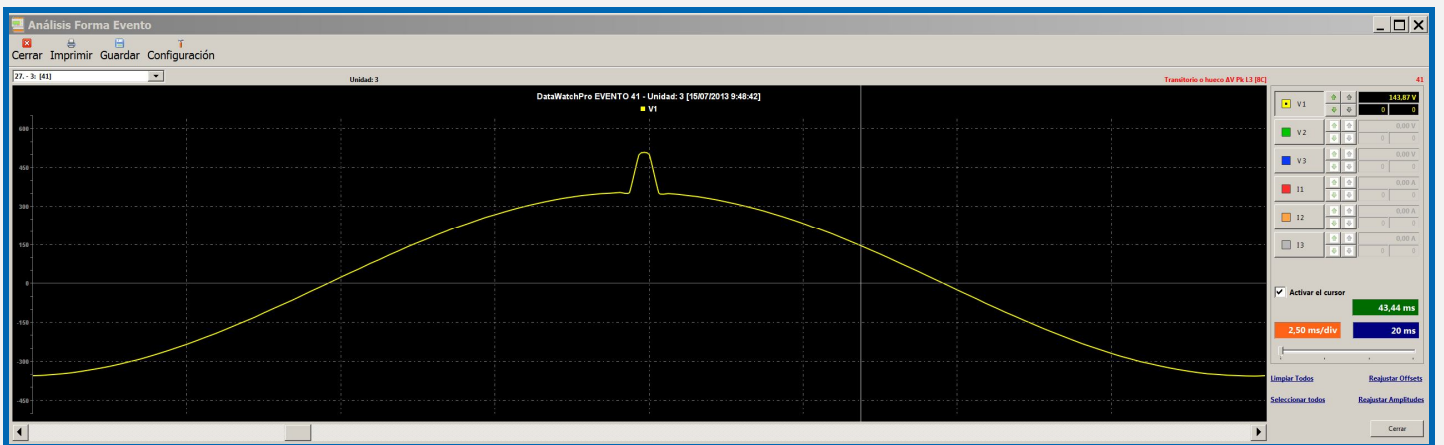
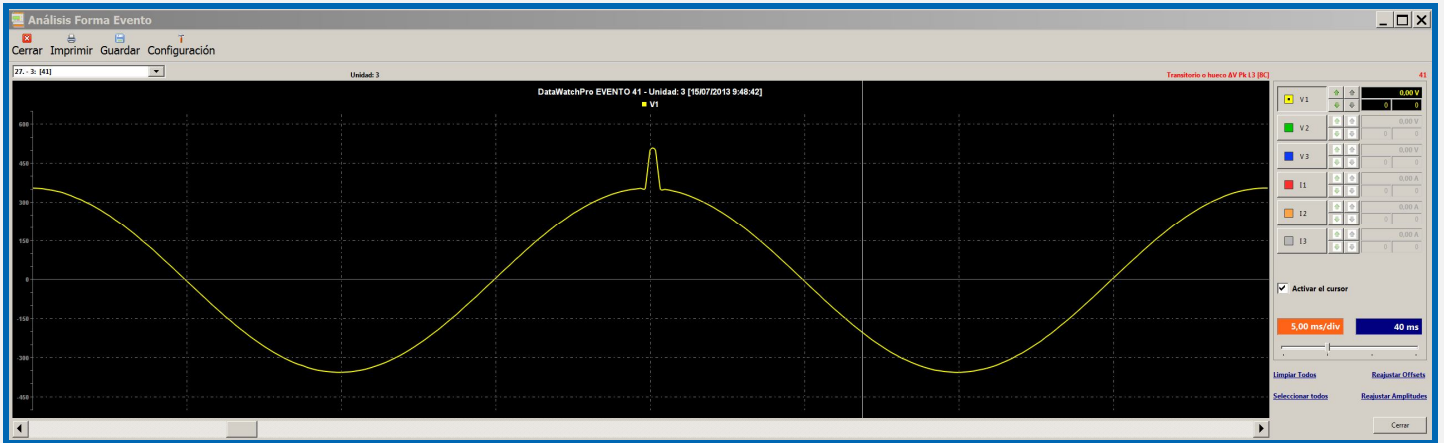
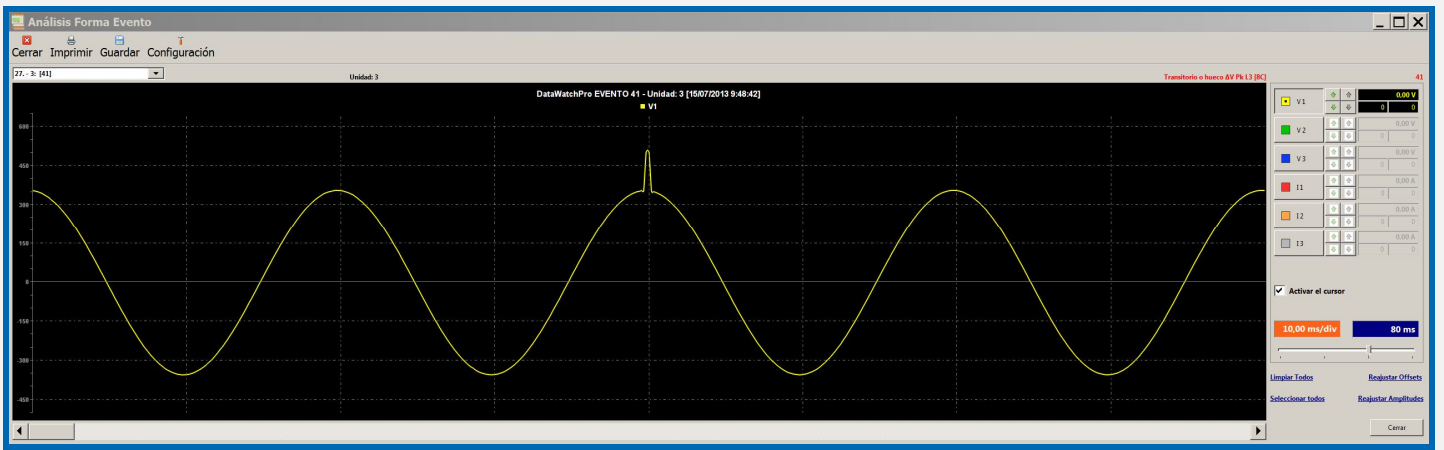
Display via DataWatchPro with offset control functions, amplitude, time base, horizontal shift zoom, multi-channel measurement, value and time cursor, etc.

4.1.1 Event capture - overvoltage

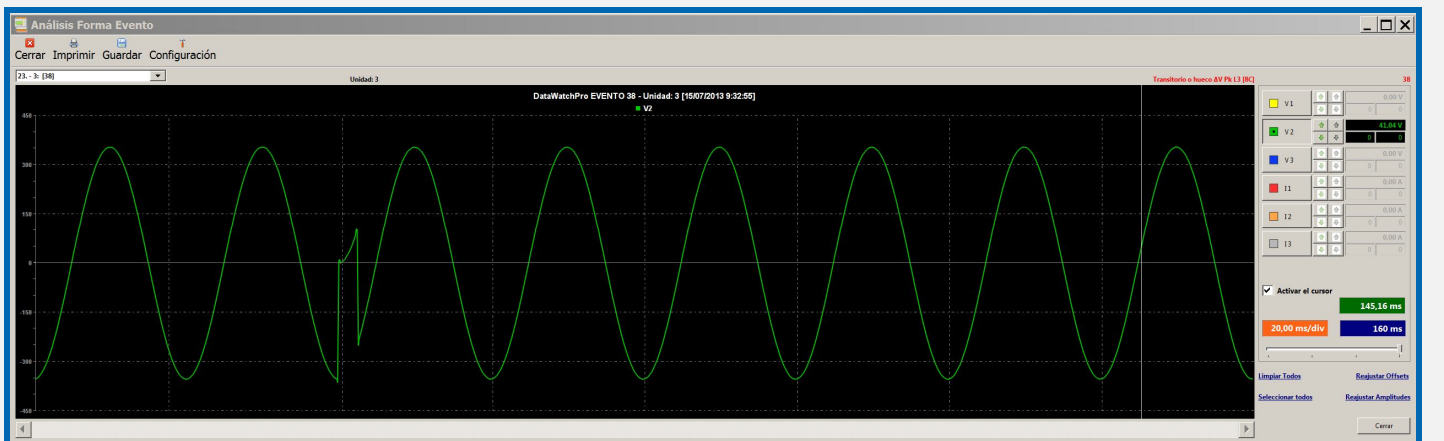


4.1.2 Event capture - transient

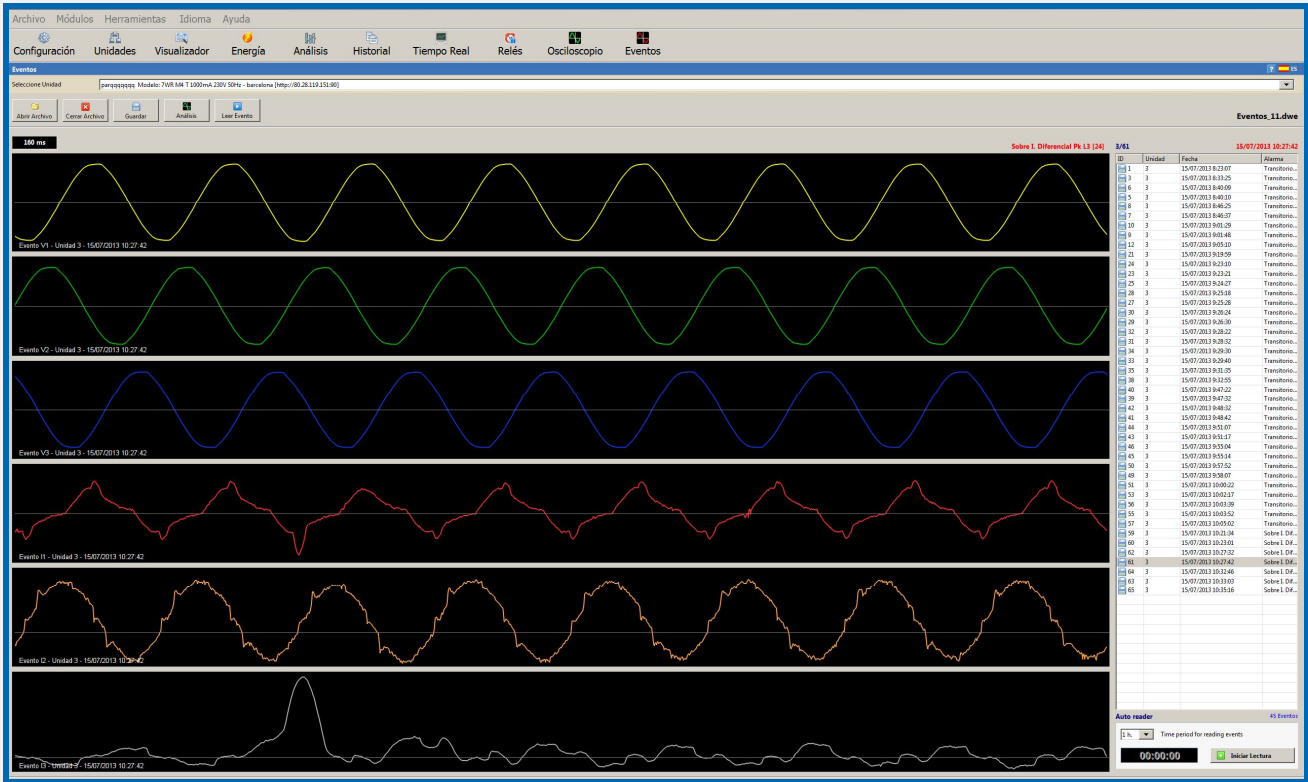




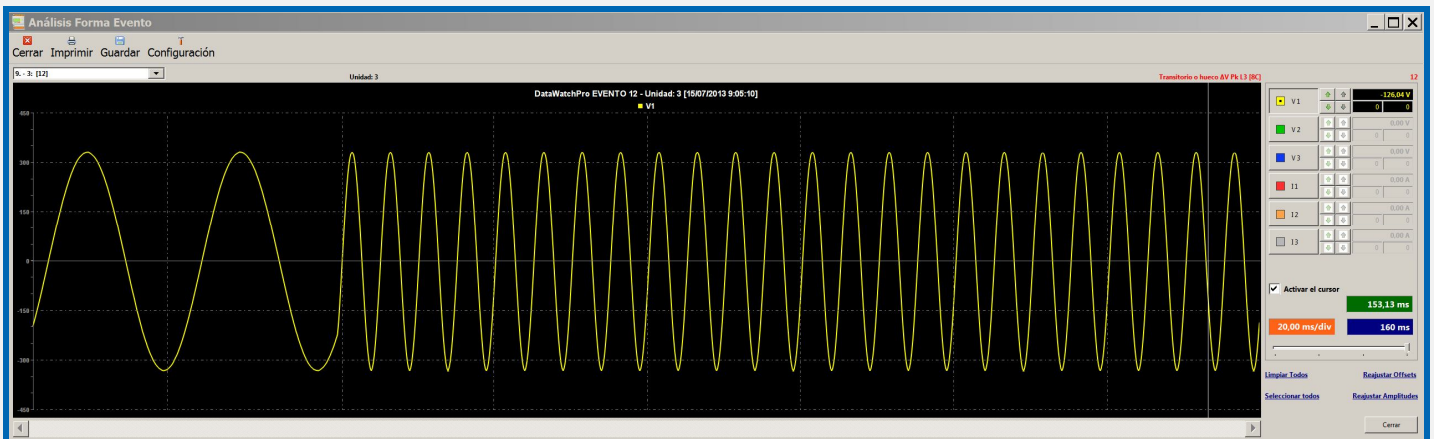
4.1.3 Event capture - voltage dip



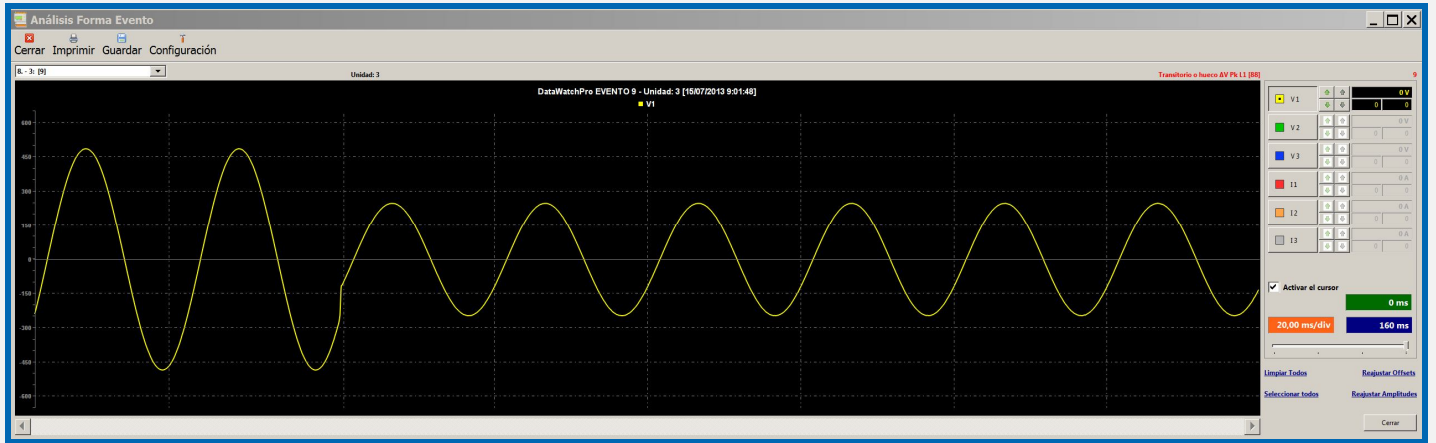
4.1.4 Event capture - over-intensity



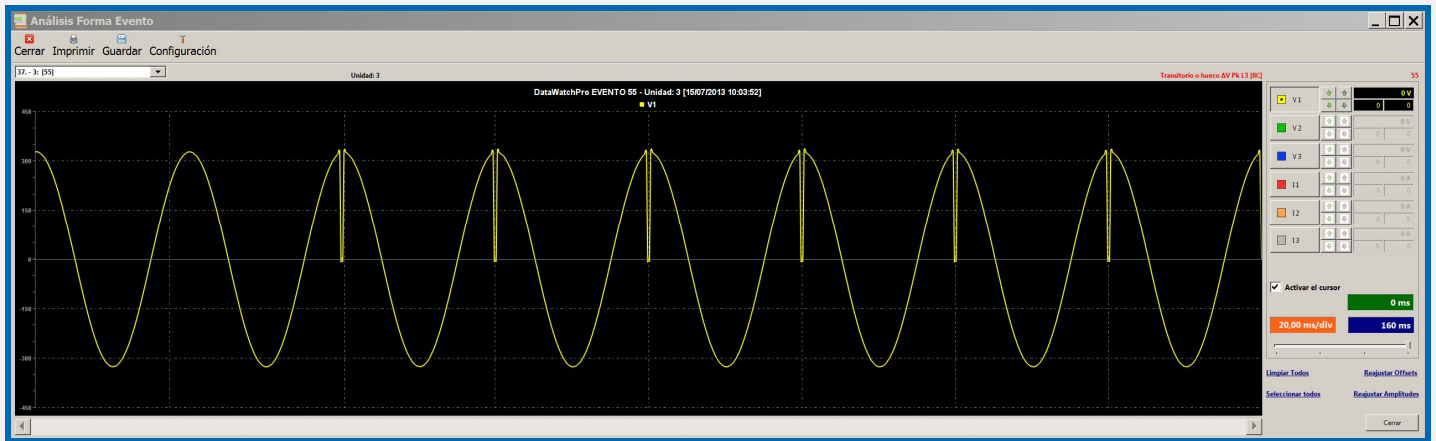
4.1.5 Event capture - over-frequency



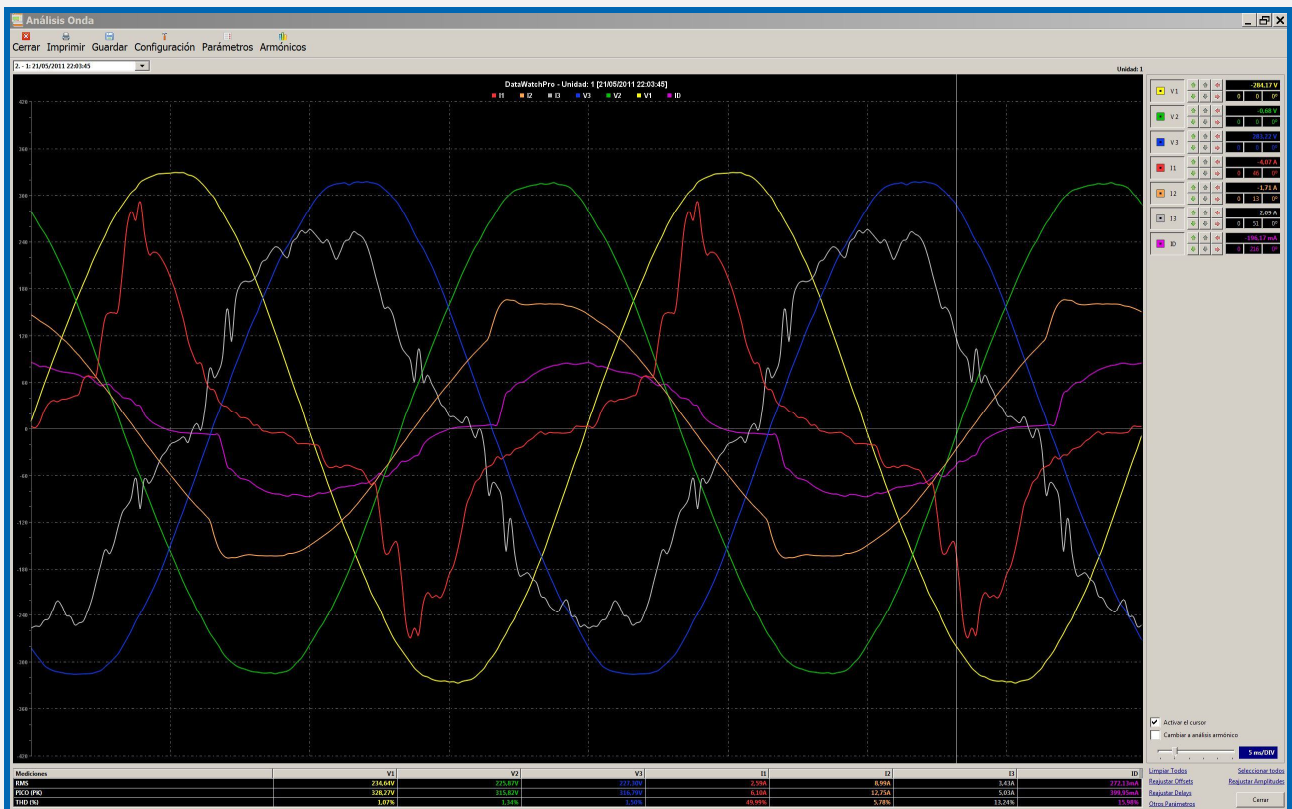
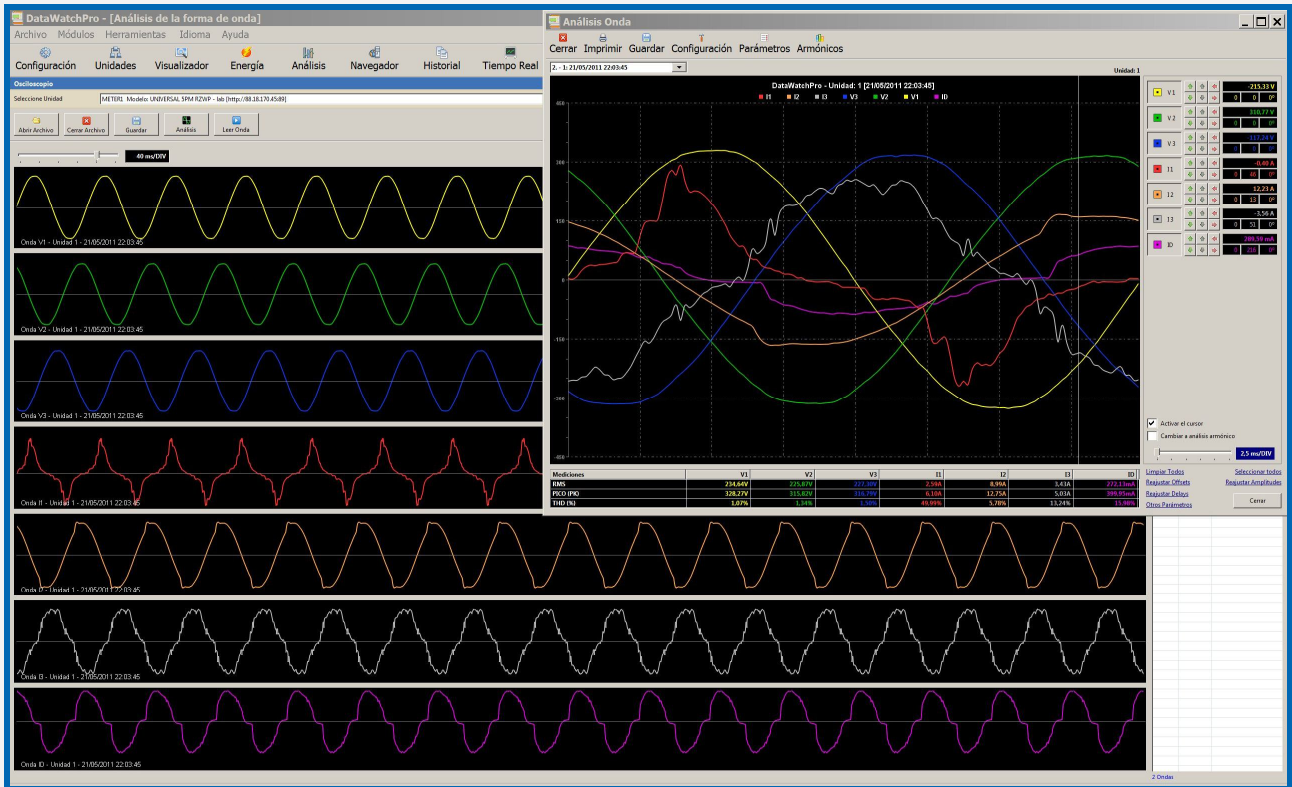
4.1.6 Event capture – low voltage

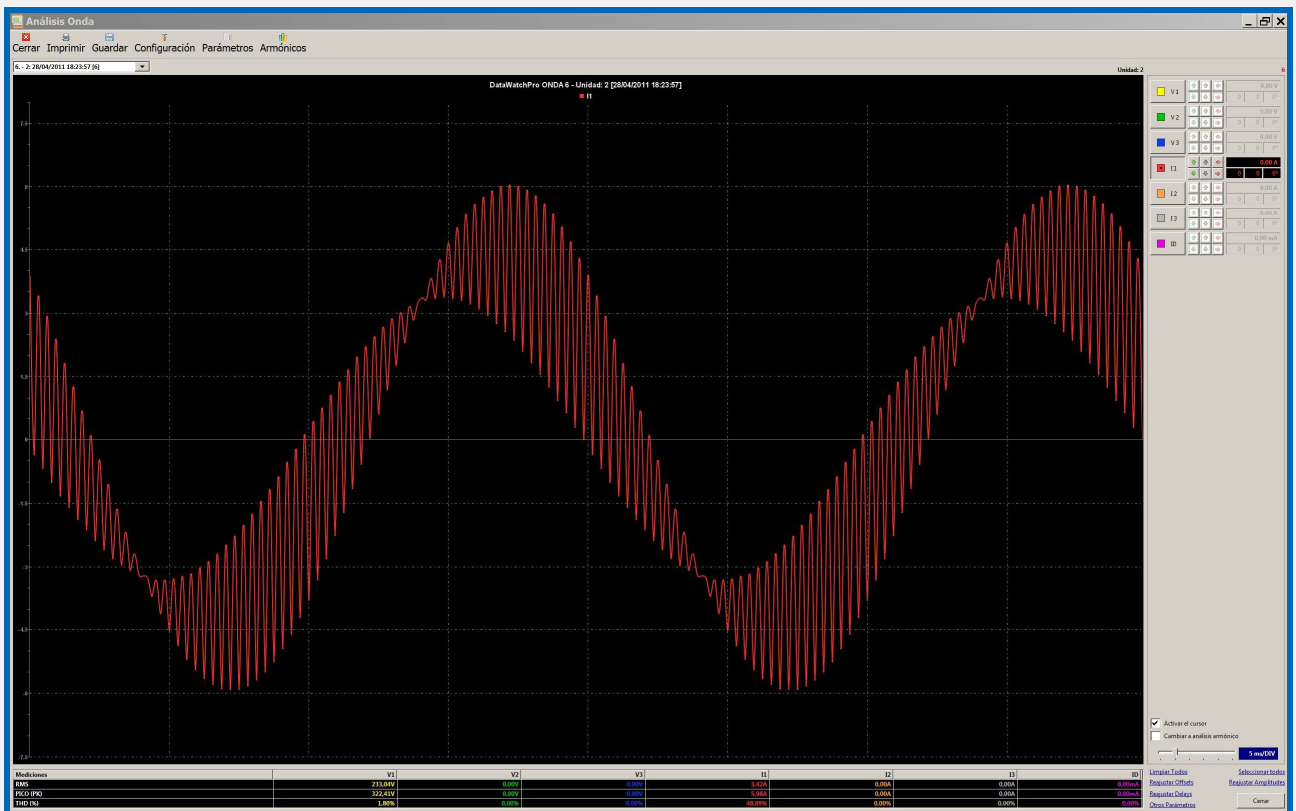
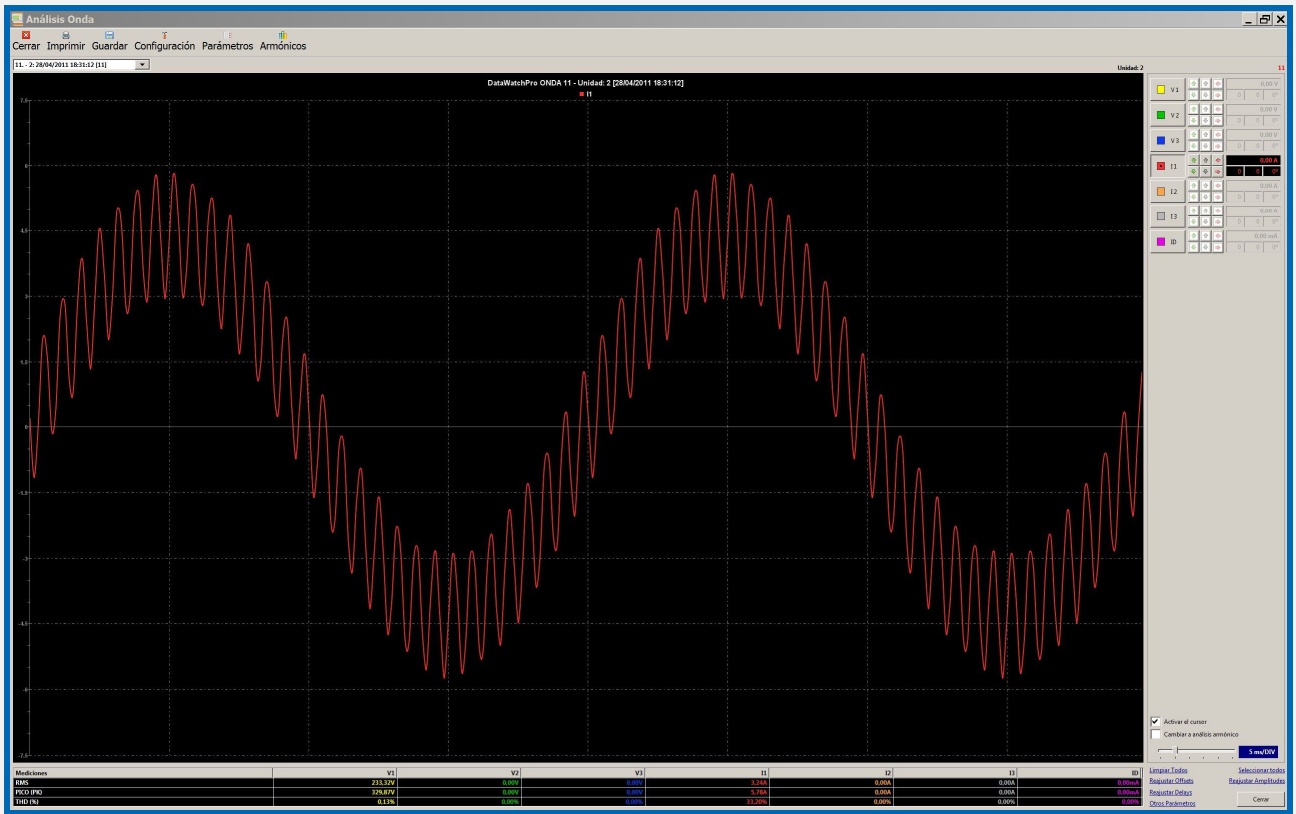


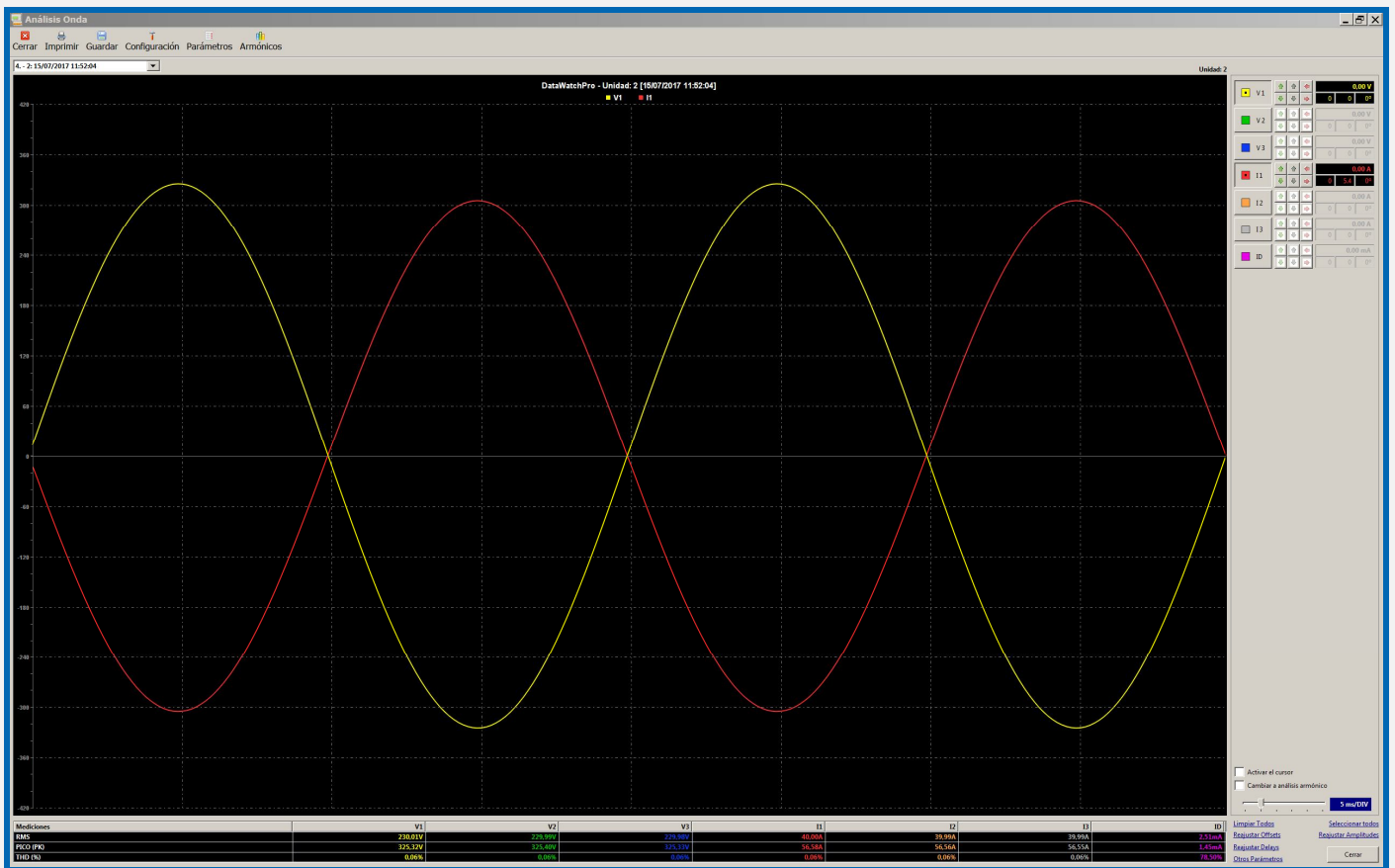
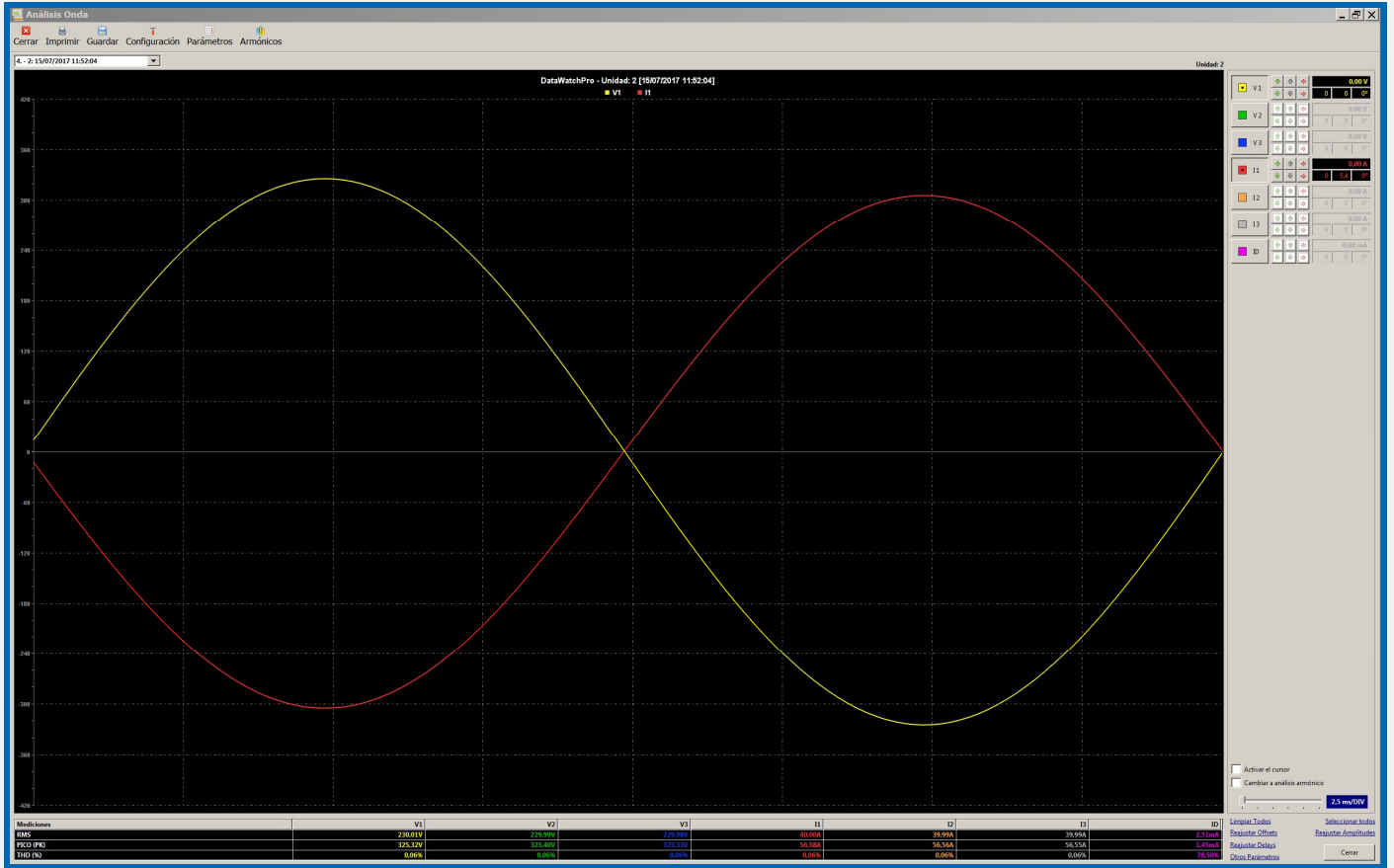
4.1.7 Event capture – repetitive microcuts



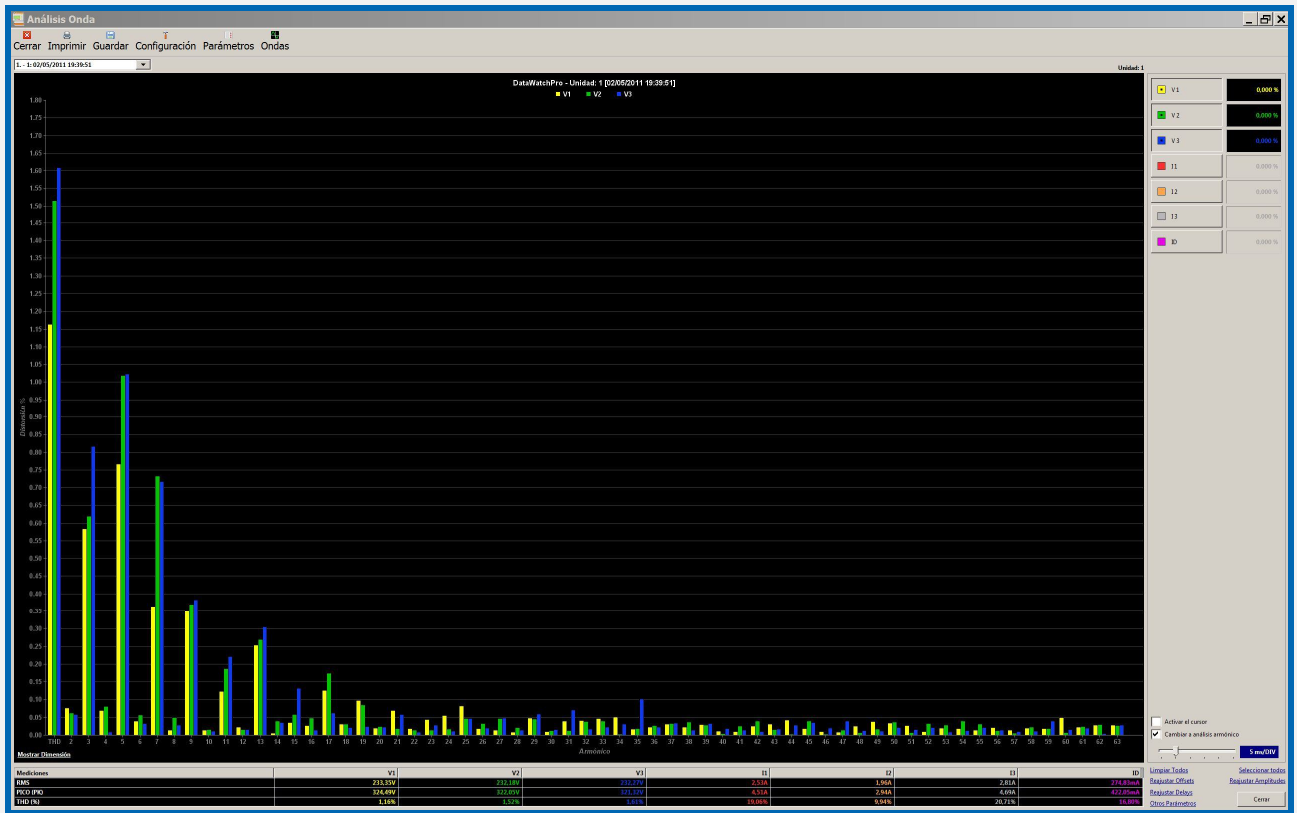
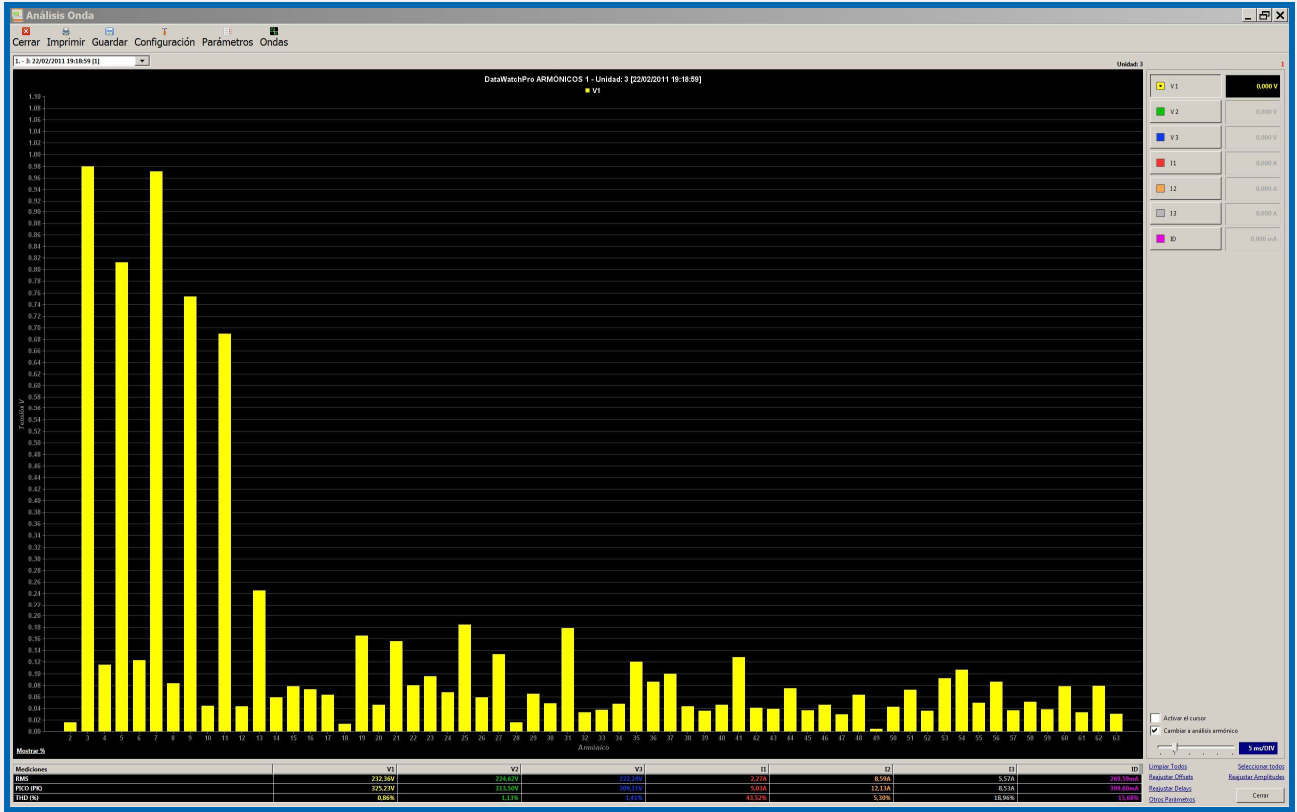
4.2 Module - 7-channel oscilloscope with autoscale and offset control, amplitude, time base, delay/advance in degrees, multi-channel measurement cursor, measurement of RMS, Pk, THD, etc.



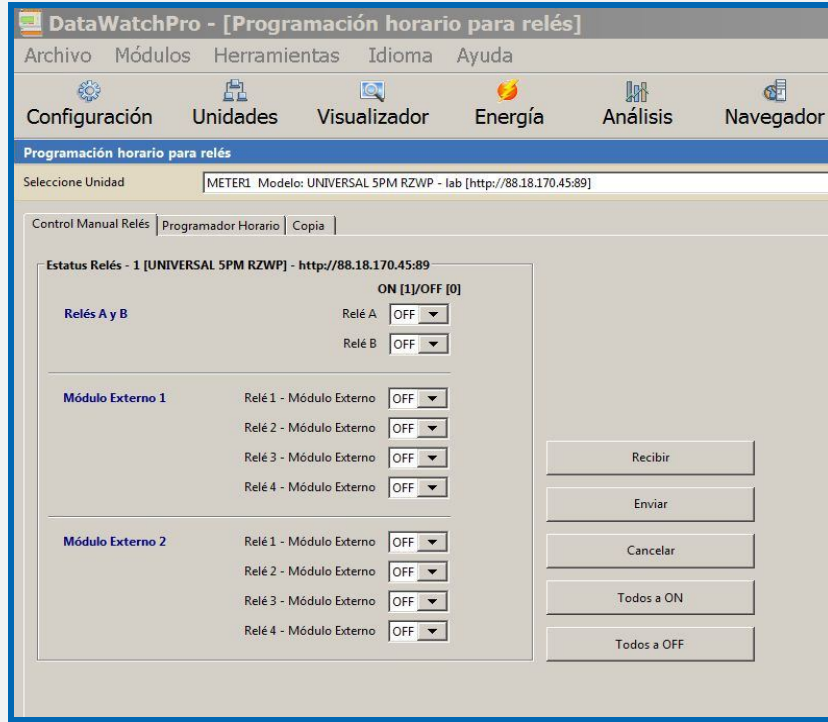




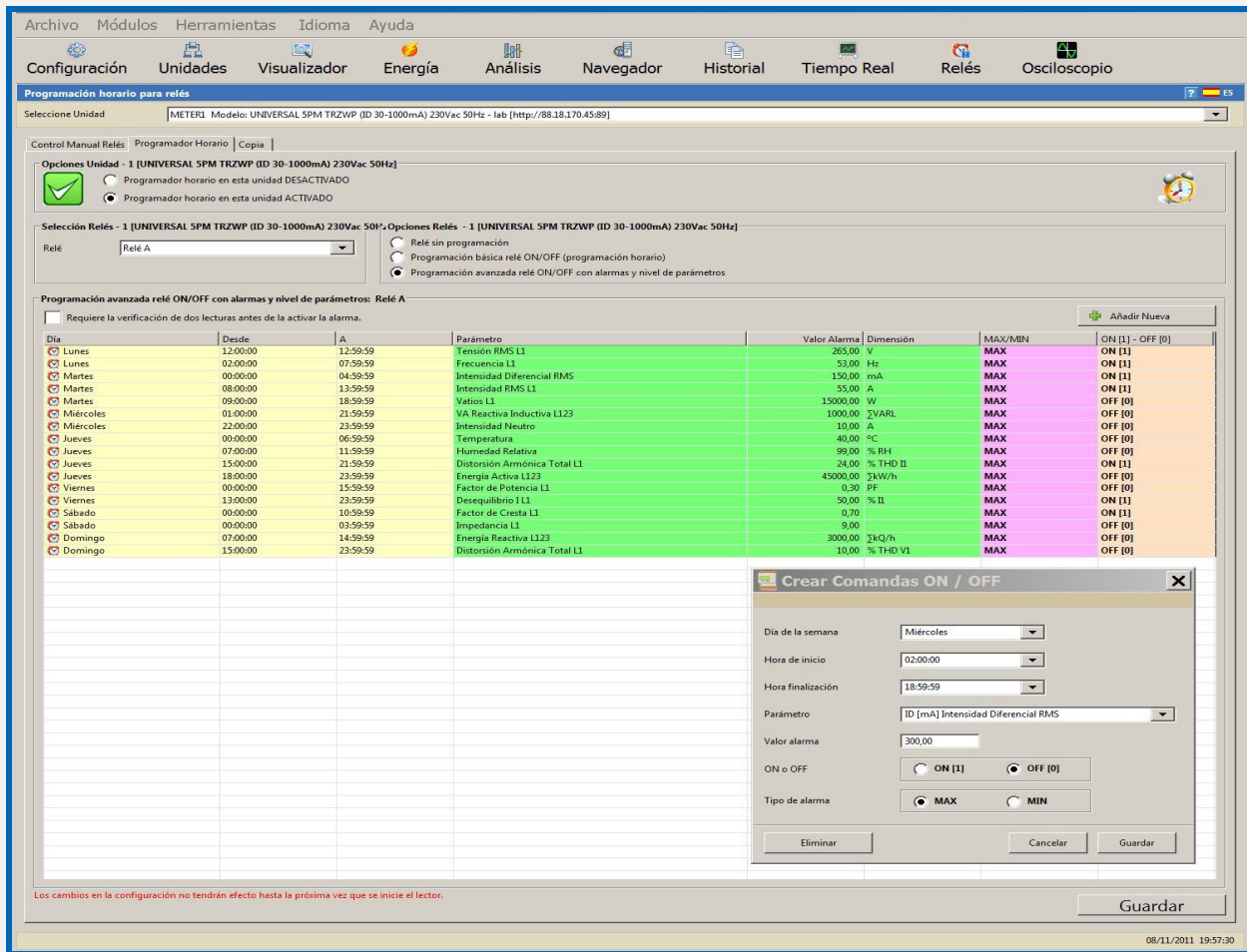
4.3 Module – 7-channel harmonics spectrum with autoscale (63 harmonics, range in % and value V - A).
Multi-channel measurement cursor and simultaneous analysis of 1, 2, 3, 4, 5, 6 and 7 channels



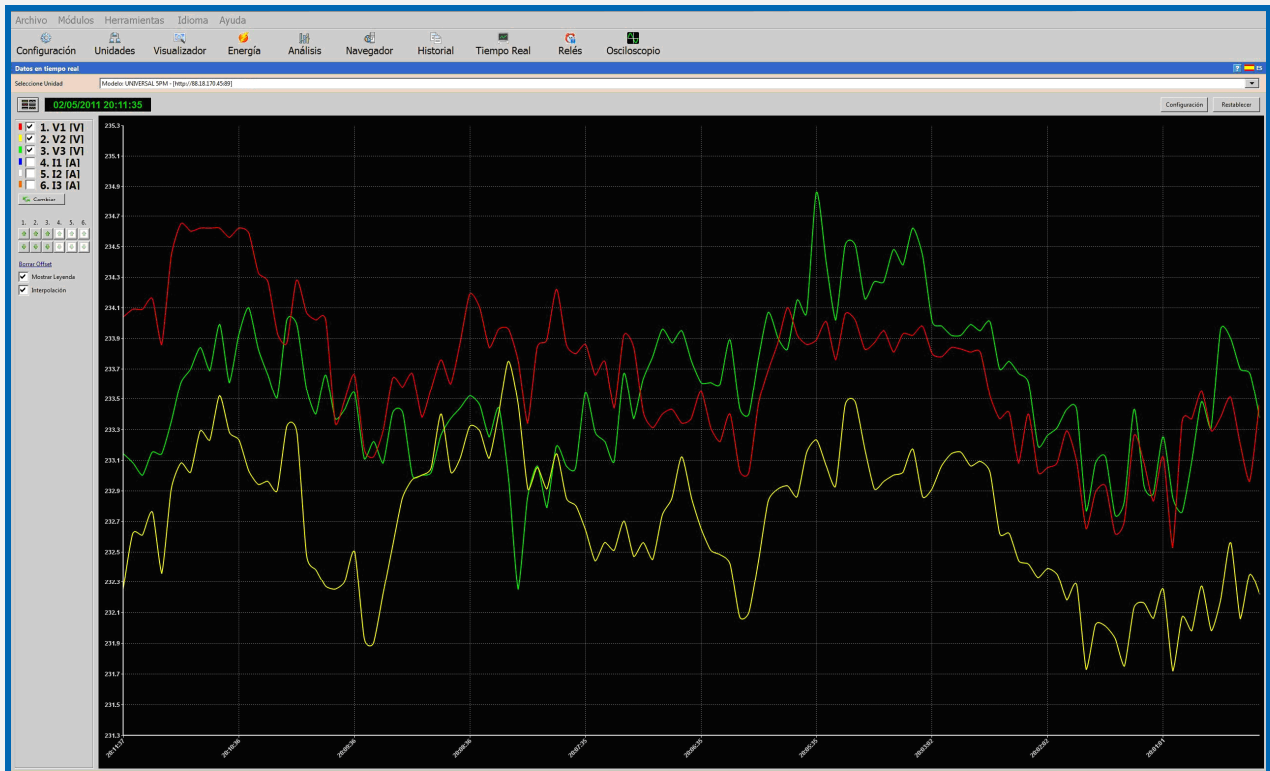
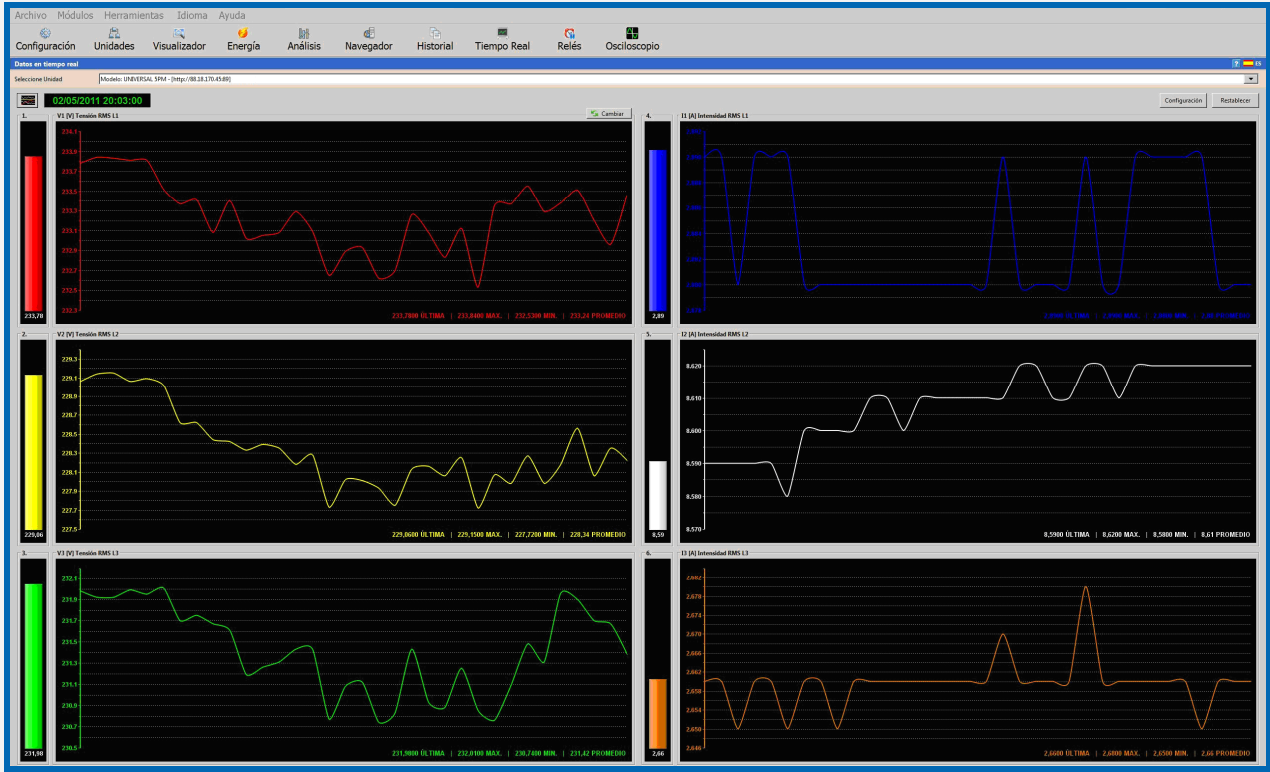
4.4 Manual relay control

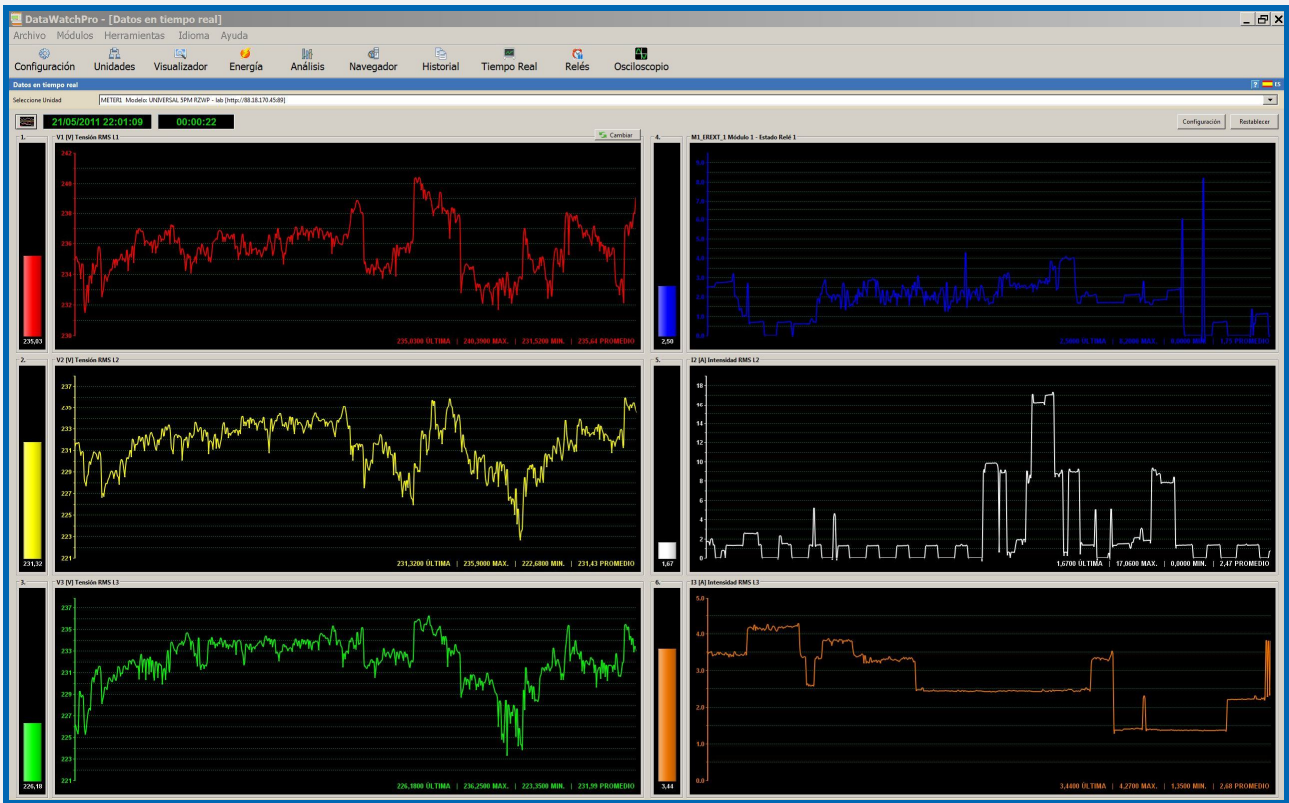


4.5 Automation/ programmable remote control of relays with level alarms in time frame



4.6 Module - Real time



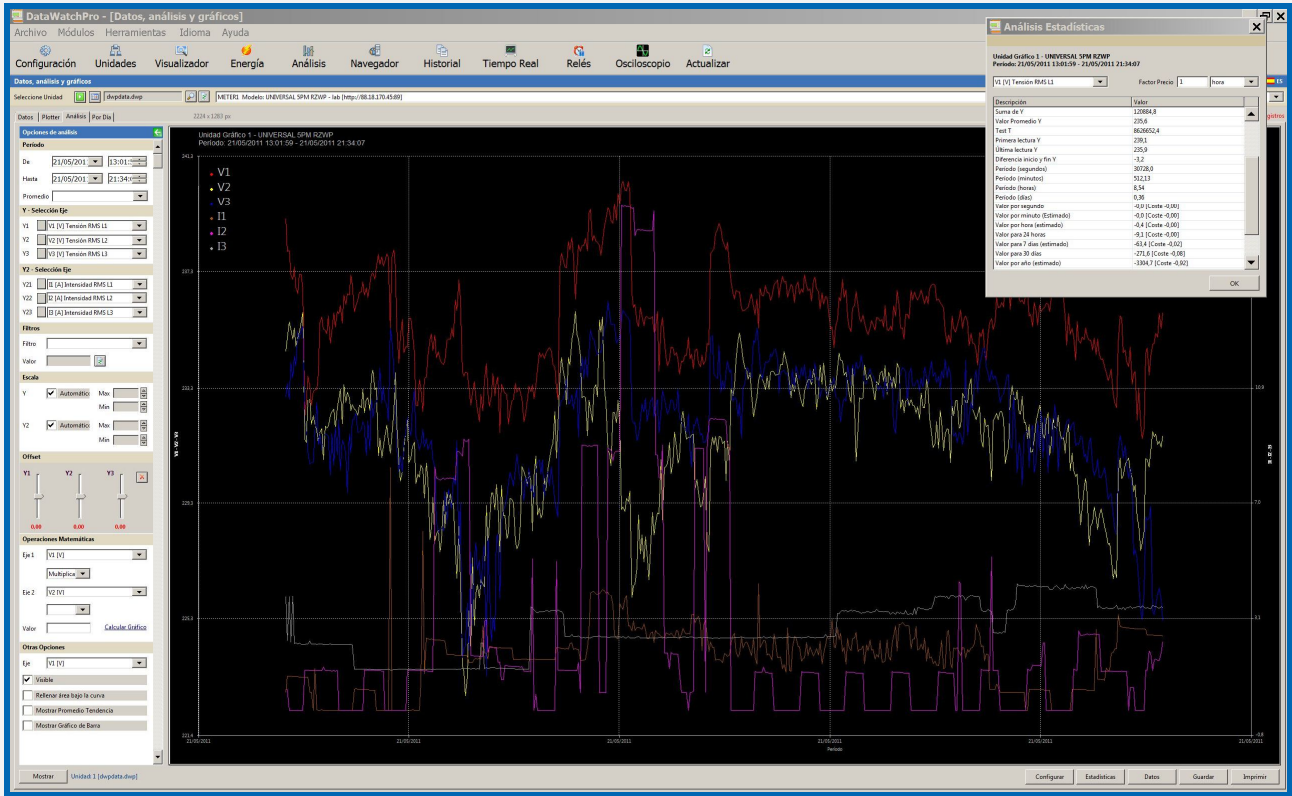


4.7 Module – numerical data analysis

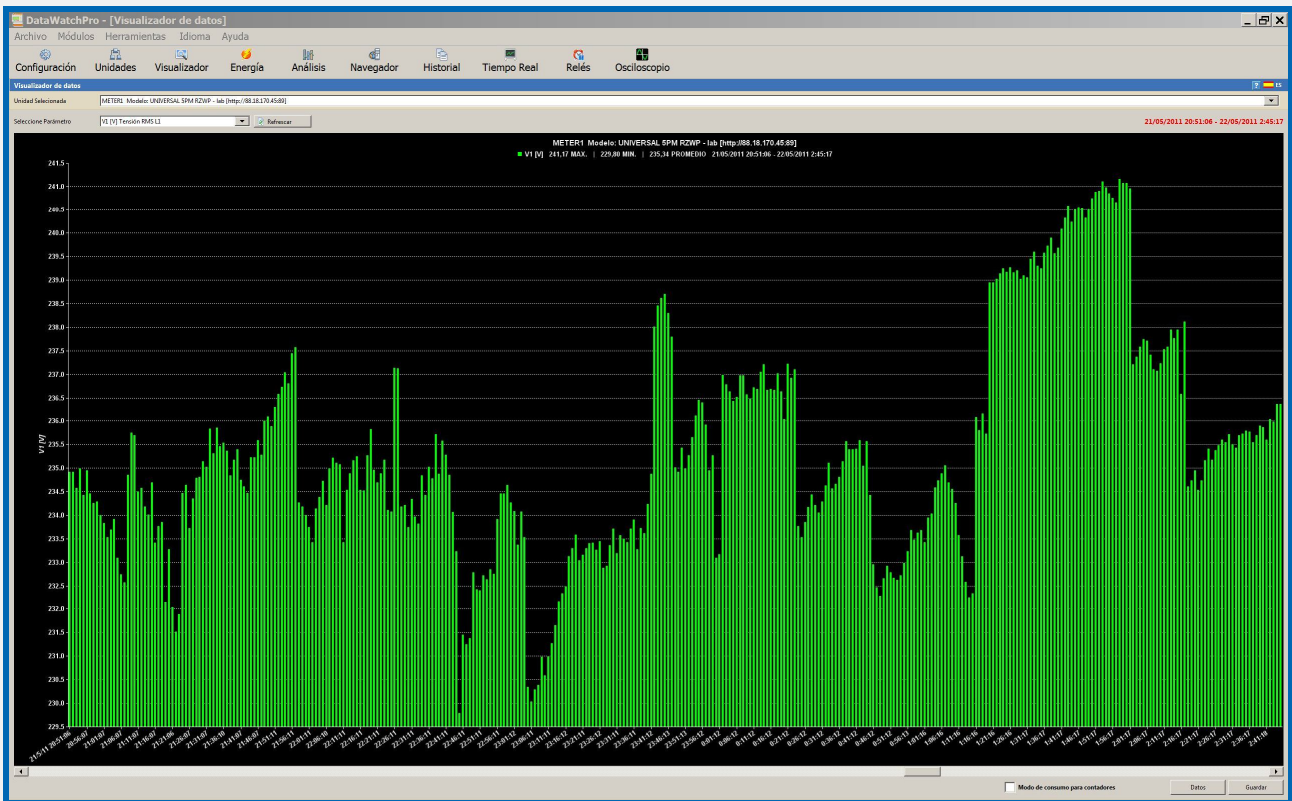
The screenshot displays the DataWatchPro interface with a numerical data analysis table. The table has the following columns: **Fecha** (Date), **Hora** (Time), **Medida** (Measurement), **Unidad** (Unit), **Valor** (Value), **Unidad** (Unit), **Valor** (Value), **Unidad** (Unit), **Valor** (Value).

Fecha	Hora	Medida	Unidad	Valor	Unidad	Valor	Unidad	Valor
21/05/2011	13:01:59	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	239,08	V	234,56		
21/05/2011	13:02:59	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	237,96	V	235		
21/05/2011	13:03:59	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	237,98	V	235,65		
21/05/2011	13:04:59	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	237,18	V	235,31		
21/05/2011	13:05:59	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	237	V	234,97		
21/05/2011	13:06:44	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	237,44	V	234,74		
21/05/2011	13:07:59	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	236,73	V	234,73		
21/05/2011	13:08:59	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	236,63	V	235,02		
21/05/2011	13:10:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	237,18	V	235,2		
21/05/2011	13:11:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	237,18	V	235,57		
21/05/2011	13:12:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	236,65	V	235,87		
21/05/2011	13:13:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	232,24	V	231,51		
21/05/2011	13:14:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	232,76	V	231,38		
21/05/2011	13:15:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	233,69	V	232,86		
21/05/2011	13:16:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	233,35	V	232,89		
21/05/2011	13:17:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	232,67	V	232,02		
21/05/2011	13:18:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	233,18	V	232,31		
21/05/2011	13:19:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	233,21	V	232,04		
21/05/2011	13:20:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	233,26	V	231,8		
21/05/2011	13:21:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	233,78	V	231,37		
21/05/2011	13:22:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	235,52	V	231,73		
21/05/2011	13:23:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	235,72	V	231,87		
21/05/2011	13:24:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	235,31	V	230,8		
21/05/2011	13:25:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	235,26	V	231,95		
21/05/2011	13:26:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	235,15	V	231,89		
21/05/2011	13:27:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	235,75	V	231,95		
21/05/2011	13:28:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	236,45	V	232,51		
21/05/2011	13:29:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	235,22	V	232,44		
21/05/2011	13:30:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	235,86	V	232,53		
21/05/2011	13:31:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	235,37	V	231,89		
21/05/2011	13:32:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	235,9	V	232,59		
21/05/2011	13:33:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	235,84	V	232,91		
21/05/2011	13:34:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	236,12	V	233,25		
21/05/2011	13:35:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	235,51	V	232,04		
21/05/2011	13:36:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	236,47	V	233,4		
21/05/2011	13:37:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	236,15	V	232,77		
21/05/2011	13:38:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	236,5	V	232,15		
21/05/2011	13:39:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	236,47	V	232,97		
21/05/2011	13:40:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	237,15	V	232,48		
21/05/2011	13:41:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	236,83	V	232,68		
21/05/2011	13:42:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	235,9	V	232,53		
21/05/2011	13:43:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	236,99	V	233,2		
21/05/2011	13:44:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	236,3	V	232,33		
21/05/2011	13:45:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	236,36	V	232,67		
21/05/2011	13:46:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	236,57	V	232,59		
21/05/2011	13:47:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	236,91	V	232,26		
21/05/2011	13:48:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	236,47	V	232,41		
21/05/2011	13:49:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	236,71	V	232,89		
21/05/2011	13:50:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	236,38	V	232,97		
21/05/2011	13:51:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	236,85	V	232,5		
21/05/2011	13:52:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	237,17	V	233,66		
21/05/2011	13:53:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	237,22	V	233,9		
21/05/2011	13:54:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	237,02	V	233,23		
21/05/2011	13:55:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	237,41	V	233,31		
21/05/2011	13:56:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	237,86	V	233,94		
21/05/2011	13:57:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	237,52	V	231,54		
21/05/2011	13:58:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	237,78	V	230,88		
21/05/2011	13:59:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	237,66	V	231,61		
21/05/2011	14:00:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	237,87	V	231,98		
21/05/2011	14:01:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	237,75	V	231,48		
21/05/2011	14:02:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	235,29	V	233,02		
21/05/2011	14:03:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	237,05	V	231,63		
21/05/2011	14:04:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	237,51	V	231,63		
21/05/2011	14:05:00	UNIVERSAL SP4 R2WP	V1.0 May 9 2011	237,40	V	232,45		

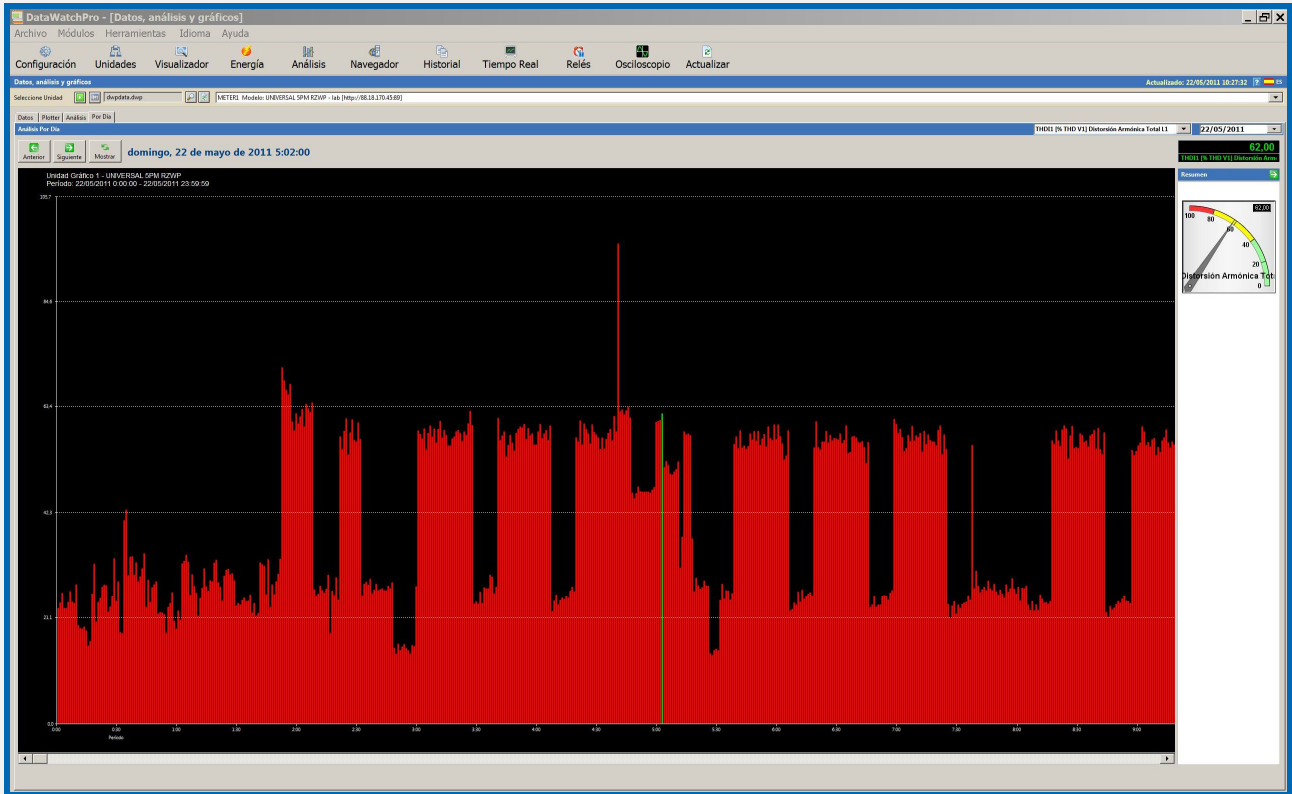
4.8 Module – graphic data analysis



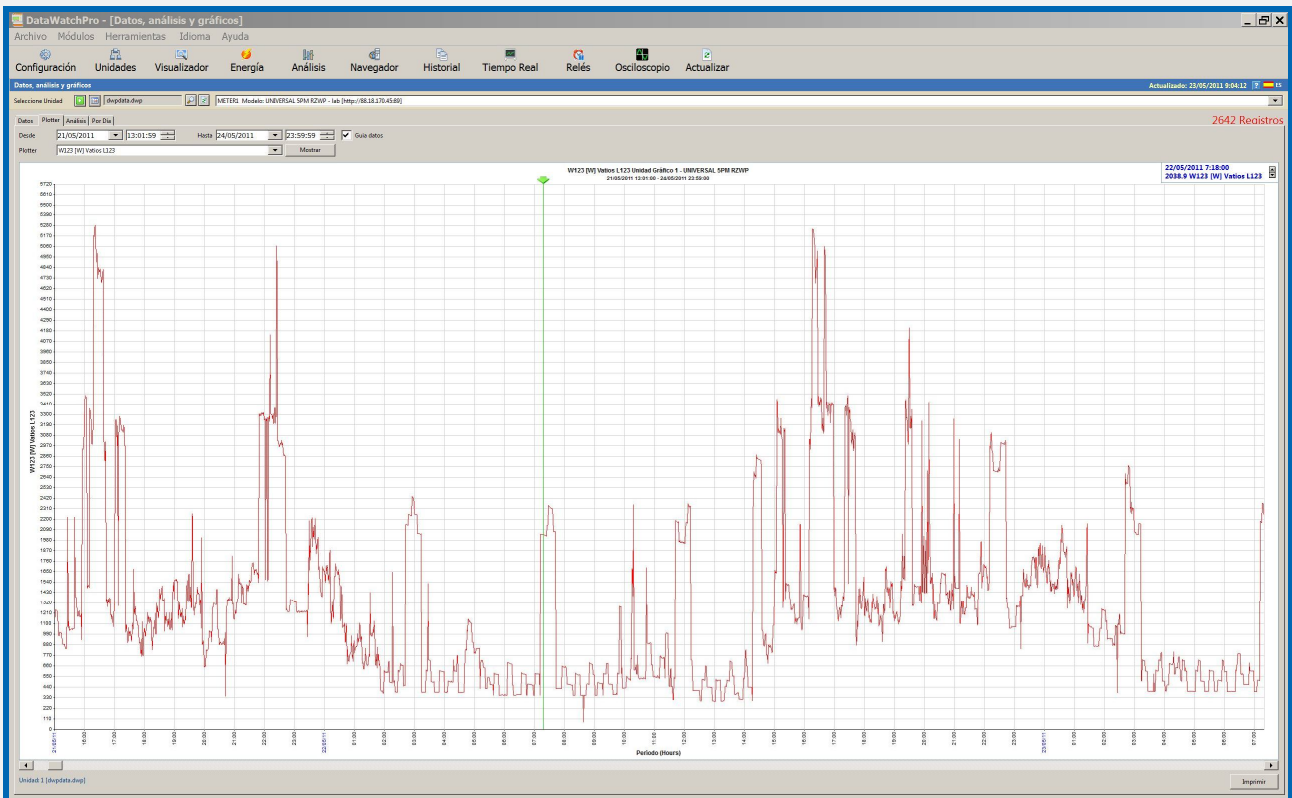
4.9 Module – Graphic display (rapid analysis)

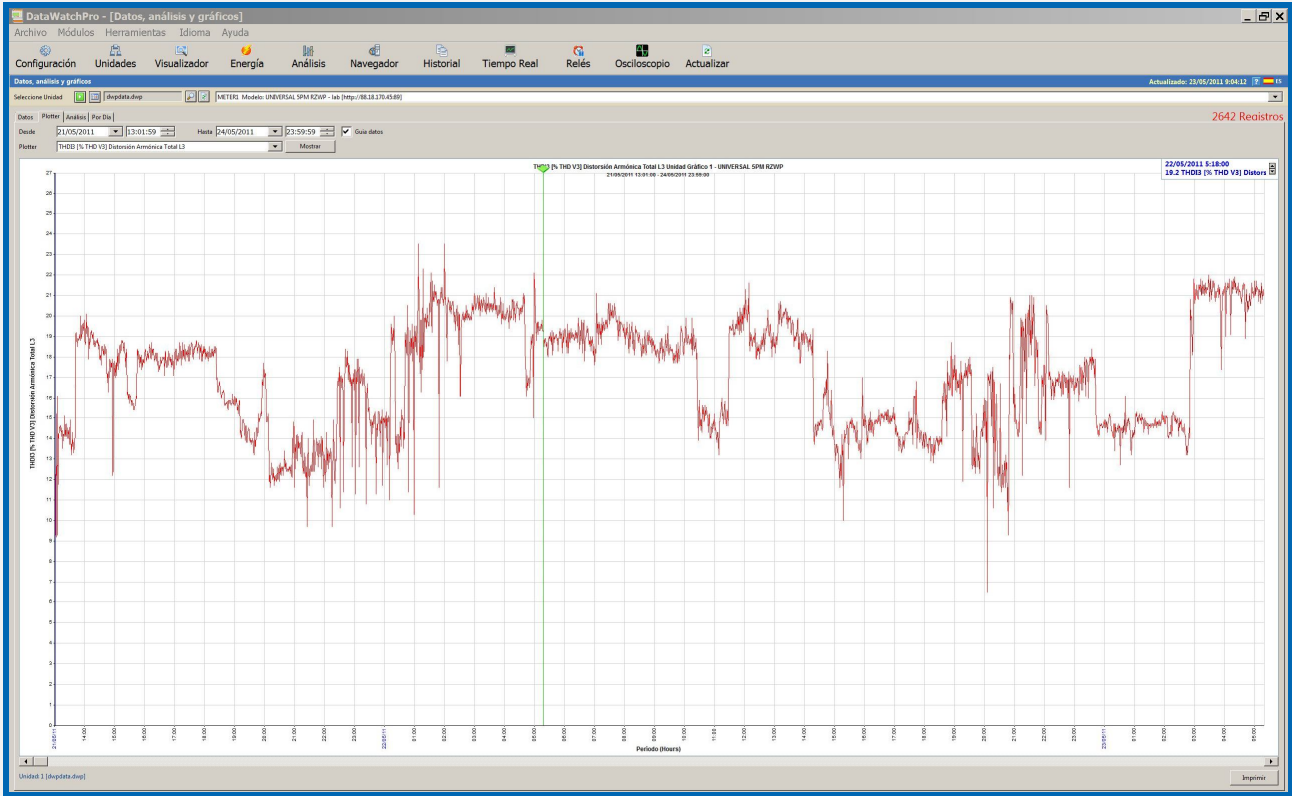


4.10 Module – daily analysis

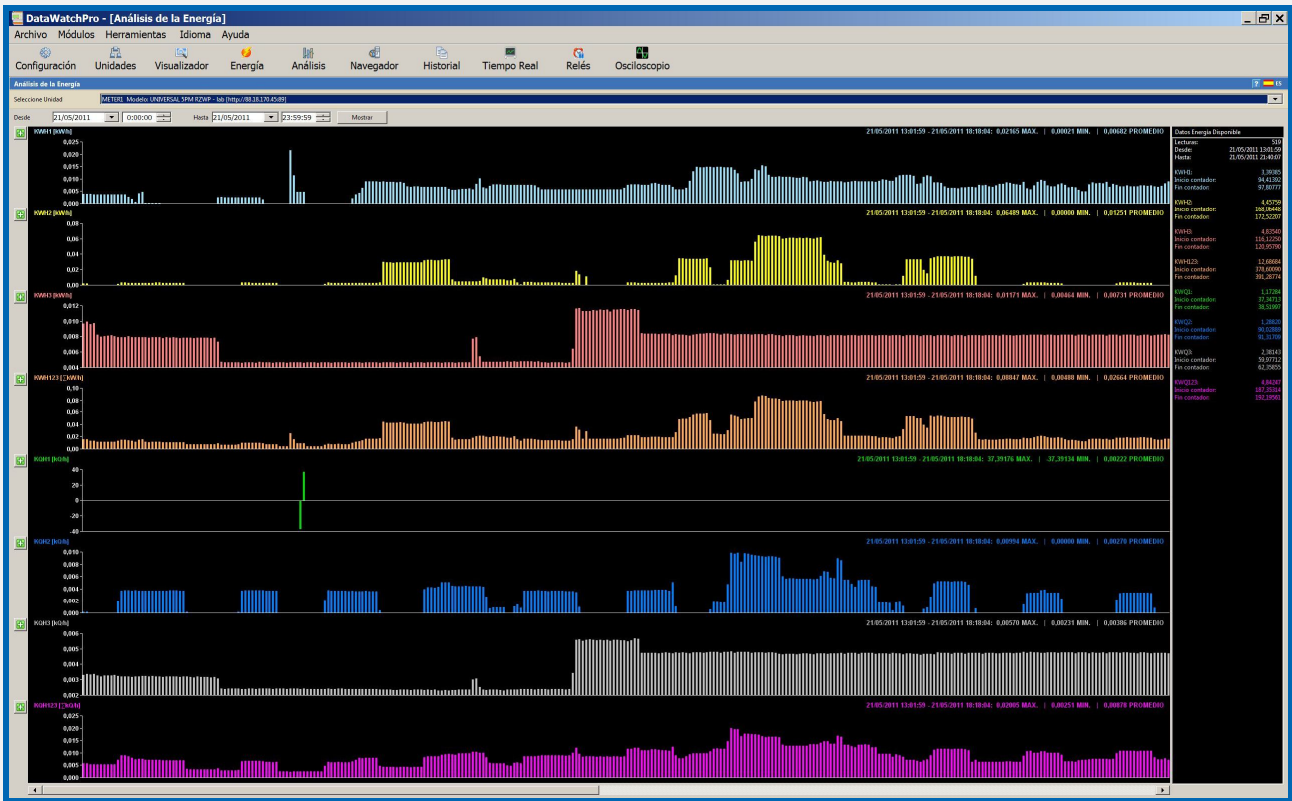


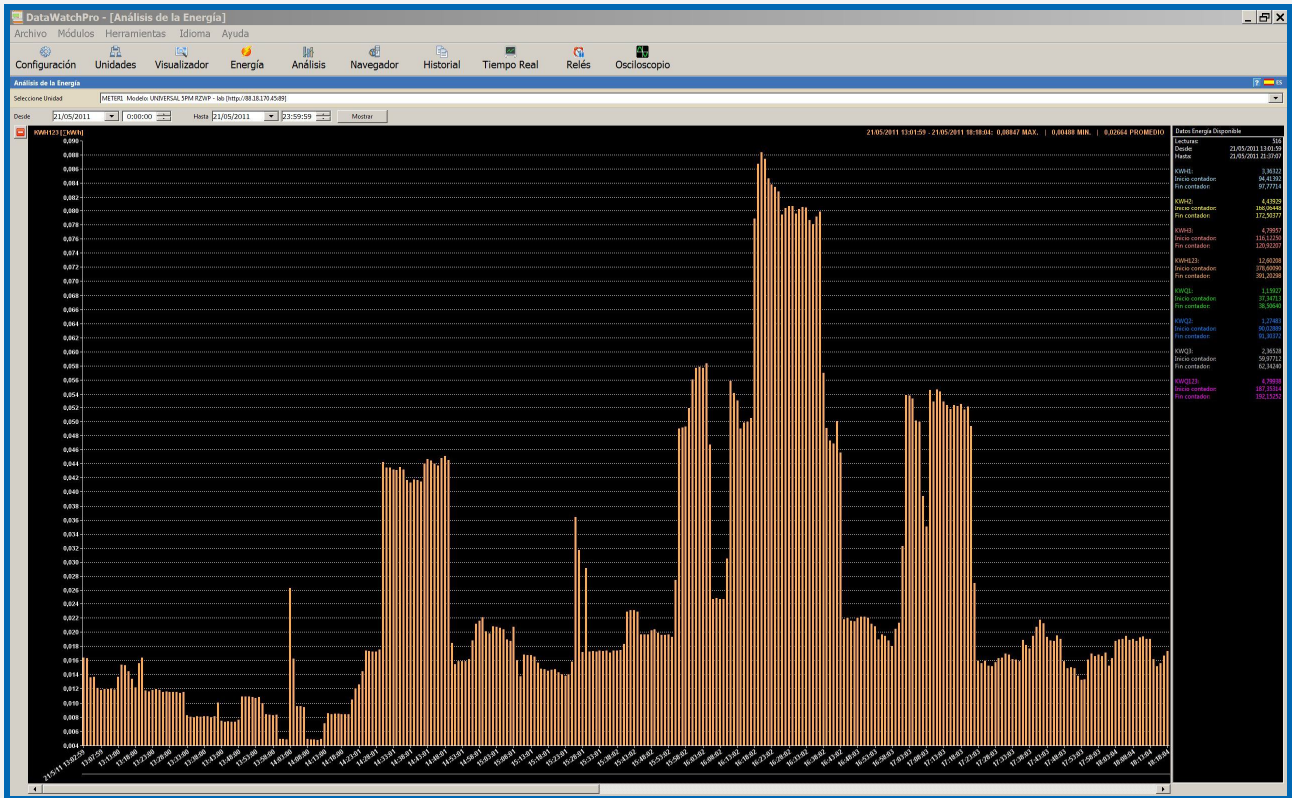
4.11 Module – graphic plotter (long period graphic analysis)





4.12 Module – energy analysis





4.13 General configuration

Configuración del sistema y datos predeterminados

General | Alarmas | **Email** | Guardar Datos | Análisis de Datos | Parámetros

Para poder enviar emails de manera automática necesita disponer de una cuenta SMTP.

Direcciones email para notificaciones

Dirección Email 1:

Dirección Email 2 (Opcional):

Dirección Email 3 (Opcional):

Datos cuenta SMTP

Dirección SMTP:

De Email:

Puerto (Port):

Requiere autenticación:

Usuario:

Contraseña: [Enviar Email de prueba](#)

Cancelar | Guardar

4.14 Readings configuration

Configuración Lecturas Unidades

Esta pantalla le permite configurar la lectura de datos. Puede establecer el intervalo entre lecturas y la duración de cada sesión de lectura.

Configuración

Periodo entre lecturas: 7 Segundos

Plazo máximo para tomar cada lectura: 5 Segundos

Duración de la sesión lecturas: --SIN LÍMITE--

Total lecturas sesión (estimado): SIN LÍMITE Por unidad

Activar lector multihilo 'multi-thread': Usuario Experto (el modo de lectura prec

Modo de leer los datos

En la lectura secuencial se leen las unidades una después de la otra. En la modalidad multihilo se pueden leer múltiples unidades a la misma vez.

Límites secuencial

Número de unidades permitidas: 1

Número actual de unidades: 2

Tipo de lecturas actual: Multihilo

Predeterminado Cancelar Guardar

4.15 Alarms configuration (independent notifications via e-mail of 249 programmable alarms)

Detalles Unidad - METER1 [1]

Detalles Alarmas Funciones Notas

Alarmas para METER1 249 Alarmas

Nombre Alarma	Activar	Tipo	Valor	Dimensión	Ignorar
⚠ V1 Tensión RMS L1 [MAX]	<input type="checkbox"/>	MAX	0,00	V	0
⚠ V1 Tensión RMS L1 [MIN]	<input type="checkbox"/>	MIN	0,00	V	0
⚠ V2 Tensión RMS L2 [MAX]	<input type="checkbox"/>	MAX	0,00	V	0
⚠ V2 Tensión RMS L2 [MIN]	<input type="checkbox"/>	MIN	0,00	V	0
⚠ V3 Tensión RMS L3 [MAX]	<input type="checkbox"/>	MAX	0,00	V	0
⚠ V3 Tensión RMS L3 [MIN]	<input type="checkbox"/>	MIN	0,00	V	0
⚠ ID Intensidad Diferencial RMS [MAX]	<input type="checkbox"/>	MAX	0,00	mA	0
⚠ ID Intensidad Diferencial RMS [MIN]	<input type="checkbox"/>	MIN	0,00	mA	0
⚠ V12 Tensión entre fases L12 [MAX]	<input type="checkbox"/>	MAX	0,00	V	0
⚠ V12 Tensión entre fases L12 [MIN]	<input type="checkbox"/>	MIN	0,00	V	0
⚠ V23 Tensión entre fases L23 [MAX]	<input type="checkbox"/>	MAX	0,00	V	0
⚠ V23 Tensión entre fases L23 [MIN]	<input type="checkbox"/>	MIN	0,00	V	0
⚠ V31 Tensión entre fases L31 [MAX]	<input type="checkbox"/>	MAX	0,00	V	0
⚠ V31 Tensión entre fases L31 [MIN]	<input type="checkbox"/>	MIN	0,00	V	0
⚠ I1 Intensidad RMS L1 [MAX]	<input type="checkbox"/>	MAX	0,00	A	0
⚠ I1 Intensidad RMS L1 [MIN]	<input type="checkbox"/>	MIN	0,00	A	0
⚠ I2 Intensidad RMS L2 [MAX]	<input type="checkbox"/>	MAX	0,00	A	0
⚠ I2 Intensidad RMS L2 [MIN]	<input type="checkbox"/>	MIN	0,00	A	0
⚠ I3 Intensidad RMS L3 [MAX]	<input type="checkbox"/>	MAX	0,00	A	0
⚠ I3 Intensidad RMS L3 [MIN]	<input type="checkbox"/>	MIN	0,00	A	0
⚠ HZ1 Frecuencia L1 [MAX]	<input type="checkbox"/>	MAX	0,00	Hz	0
⚠ HZ1 Frecuencia L1 [MIN]	<input type="checkbox"/>	MIN	0,00	Hz	0
⚠ HZ2 Frecuencia L2 [MAX]	<input type="checkbox"/>	MAX	0,00	Hz	0
⚠ HZ2 Frecuencia L2 [MIN]	<input type="checkbox"/>	MIN	0,00	Hz	0
⚠ HZ3 Frecuencia L3 [MAX]	<input type="checkbox"/>	MAX	0,00	Hz	0
⚠ HZ3 Frecuencia L3 [MIN]	<input type="checkbox"/>	MIN	0,00	Hz	0
⚠ W1 Vatios L1 [MAX]	<input type="checkbox"/>	MAX	0,00	W	0
⚠ W1 Vatios L1 [MIN]	<input type="checkbox"/>	MIN	0,00	W	0
⚠ W2 Vatios L2 [MAX]	<input type="checkbox"/>	MAX	0,00	W	0
⚠ W2 Vatios L2 [MIN]	<input type="checkbox"/>	MIN	0,00	W	0
⚠ W3 Vatios L3 [MAX]	<input type="checkbox"/>	MAX	0,00	W	0
⚠ W3 Vatios L3 [MIN]	<input type="checkbox"/>	MIN	0,00	W	0
⚠ W123 Vatios L123 [MAX]	<input type="checkbox"/>	MAX	0,00	W	0
⚠ W123 Vatios L123 [MIN]	<input type="checkbox"/>	MIN	0,00	W	0
⚠ WP1 Vatios Positivos L1 [MAX]	<input type="checkbox"/>	MAX	0,00	W+	0

99 Counter type alarms Pulse valores máximo y mínimo para modificar

Borrar Cerrar Guardar

Chapter 5 – General description

5.1 Programmable enablement/disablement of output relays in the event of one or various alarms

Alarm	Enablement/disablement of output relays (10 relays) and relays A, B, C and B of a remote unit via Internet/Intranet
Overvoltage	Yes, programmable
Low voltage	Yes, programmable
Intensity	Yes, programmable
Differential intensity	Yes, programmable
Neutral intensity	Yes, programmable
Power factor	Yes, programmable
Voltage THD	Yes, programmable
Intensity THD	Yes, programmable
Voltage unbalance	Yes, programmable
Intensity unbalance	Yes, programmable
Over-temperature	Yes, programmable
Low temperature	Yes, programmable
Over-humidity	Yes, programmable
Low humidity	Yes, programmable
Over-frequency	Yes, programmable
Low frequency	Yes, programmable
Phase sequence	Yes, programmable
Remote input 1	Yes, programmable
Remote input 2	Yes, programmable
Time programmer	Yes, programmable
Timer 1 module 1 (digital input IN1 module 1)	Yes, programmable
Timer 2 module 1 (digital input IN2 module 1)	Yes, programmable
Timer 3 module 1 (digital input IN3 module 1)	Yes, programmable
Timer 4 module 1 (digital input IN4 module 1)	Yes, programmable
Timer 1 module 2 (digital input IN1 module 2)	Yes, programmable
Timer 2 module 2 (digital input IN2 module 2)	Yes, programmable
Timer 3 module 2 (digital input IN3 module 2)	Yes, programmable
Timer 4 module 2 (digital input IN4 module 2)	Yes, programmable
Power 1 W	Yes, programmable
Power 2 W (Maximeter programmable from 10 secs to 15 mins.)	Yes, programmable

5.2 Display

One can display data and/or program the unit either using the front panel or via Internet

Front panel:

NEXT" or "TEST" (up or down) display all the measurement screens.

Menu takes the user into the user's menu where all the programmable parameters can be changed.

Via Internet/Intranet:

Display and programming via the WebServer.

5.3 Relays A and B (of the external I/O modules)

The unit has two rapid (10 milliseconds) enablement relays, A and B, to which alarms can be associated. In other words, one or various alarms and other functions can be associated to each relay. When an alarm is enabled, the relays to which this alarm is associated are also enabled. The priority of the relays is always upon enablement. This means that the relay remains enabled until such time as all the alarms which enable and are associated to it disappear.

Once enabled, a relay remains enabled for a minimum time equal to that established for displaying the alarm on-screen (10 secs) even if the alarm were to have remained active less time.

(Please, refer to "Relay A or B enabled by" in the user's guide in the annexed command manuals.)

5.4 Remote input 1 and Remote input 2 (of the external I/O modules)

The unit incorporates a control of two logical rapid-detection inputs (5 milliseconds) with independent, programmable signal/action counters. (signal: normal or rocking, action: unlocking and reset of reclosures)

These inputs can be associated to each relay (10 relays).

They can also be used for gas, water and other counters.

5.5 I/O external modules (outputs, inputs and timers)

The unit can control a maximum of two external input/output modules. Each module is made up of 4 inputs (relays IN1, IN2, IN3, IN4) and 4 outputs (relays R1, R2, R3, R4), making a total of : 8 logical outputs (relays) and 8 logical inputs (optocoupled or potential-free or direct to 230V AC).

Relays R1, R2, R3 and R4 of module 1 and module 2:

The same as for relays A and B, alarms and other functions can also be associated to the output relays of the external modules. That is to say, one or various alarms can be associated to each relay. When an alarm is enabled, the relays to which this alarm is associated are also enabled. The priority of the relays is always upon enablement. This means that the relay remains enabled until such time as all the alarms which enable and are associated to it disappear.

Once enabled, a relay remains enabled for a minimum time equal to that established for displaying the alarm on-screen (10 secs) even if the alarm were to have remained active less time.

The enablement of the relays and the detection of the IN inputs pertaining to the external modules can be delayed by a maximum of 1 second due the communication process with said module.

(Please, refer to "External I/O module" in the user's guide in the annexed command manuals.)

Inputs IN1, IN2, IN3 and IN4 of module 1 and module 2:

The inputs are readings of the status of the input relays and can be enabled or disabled. Each input has an associated timer: input I1 timer 1; input I2 timer 2; input I3 timer 3 and input I4 timer 4.

Timers 1, 2, 3 and 4:

The functioning of the timers can be either upon enablement or disablement of its input. When an input is enabled or disabled, it generates its timer's countdown and when the timer comes to the end of its time, it enables one or more relays which, in turn, have the option to enable in the event of timer. Should no relay have this association, then nothing will happen.

(Please, refer to "I/O external module" in the user's guide in the annexed command manuals.)

NOTE: The logical status of the input/output modules displayed with "-", indicates that the I/O modules either are not enabled in the menu or that they have not been installed.

5.6 Time programmer

The time programmer permits the user to program the enablement/disablement of the relays and/or the MCB/circuit-breaker/ancillary contactor.

Each day of the week has 6 programs, allowing 6 different time frames to be established wherein any relay or the MCB/circuit-breaker/ancillary contactor can be enabled.

Programming is in HH:MM (hours:minutes) enablement and HH:MM disablement, plus an independent box per program in order to indicate which of these 6 possible daily programmes are enabled. All programs whose box is not enabled/selected will be ignored.

Configuration of the 10 exceptions - day, month, hour and minute of the 6 programs with individual enablement/disablement of each program.

The time programmer's activity is associated to the 10 output relays and/or the main disconnection device (circuit-breaker or relay/contactor control) and/or the **4 relays A, B, C and D of a remote unit via Internet/Intranet**. In order to associate relays, one must go to the "Relay alarms" button.

The internal clock (date and time) is programmed manually or automatically (synchronizing date and time with PC, laptop, etc...)

5.7 DWP (DataWatchPro). Software for PC

Professional software for PC with data base and graphic analysis.

The **DWP (DataWatchPro)** is an advanced software with a permanent register on a data base.

It permits the capacity for display, analysis, logging and control of one or several universal modules and their features to be easily increased.

It is made up of multiple graphic and process display modules, an easy process programmer with a wide gamut of possibilities for programming the relays with parameter level alarms in a time frame. **Oscilloscope event-logger in waveform with pre-trigger; 7-channel oscilloscope, 64-harmonic 7-channel spectrum**; graphics of all the parameters; independent automatic notifications via e-mail of all metering alarms, etc.

Please, refer to Chapter 4

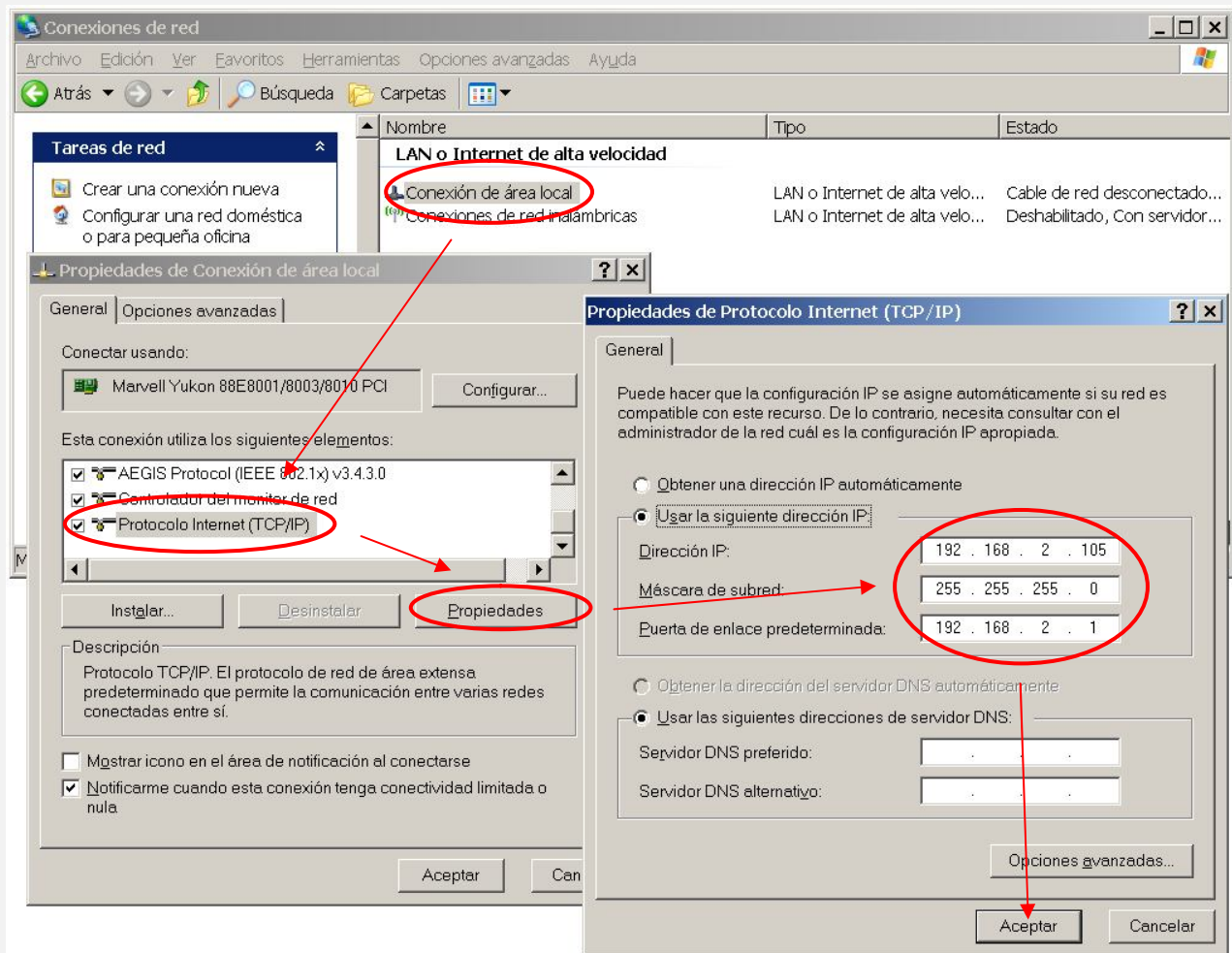
CHAPTER 6 – Installation guide (Internet / Intranet configuration)

6.1 Point to point connection configuration

This section explains how to adjust the PC's TCP/IP parameters manually so that they coincide with those of the universal unit. An RJ45 cable must be connected from the PC to the unit. In very old PC's, an RJ45 crossover cable is used.

1. Connect the unit to the PC using an RJ45 Ethernet cable
2. Go to "Control panel" >> "Network connections" or "Network central and shared resources"
3. Disable "Wireless network connections" and enable "Local area connection" (should it be necessary)
4. Click on "Local area connection" to open up the properties
5. Double click on "Internet protocol (TCP/IP)"
6. Select "Use the following IP address:"
7. Fill in the boxes as shown below. Accept.

Windows XP:



8. Open the browser and type `http://192.168.2.10` in the address bar
9. Press Enter

Default configuration ex-factory:

IP:Port	192.168.2.10:80
Gateway	192.168.2.1
Mask	255.255.255.0
MAC	xx.xx.xx.xx.xx.xx

Windows 7:

Ventana principal del Panel de control

Ver información básica de la red y configurar conexiones

ENRIC-PC (Este equipo) Red no identificada Internet

Tipo de acceso: Sin acceso a la red

Conexiones: **Conexión de área local**

Estado de Conexión de área local

Conectividad IPv4: Sin acceso a la red

Conectividad IPv6: Sin acceso a la red

Estado del medio: Habilitado

Duración: 01:07:20

Velocidad: 10,0 Mbps

Paquetes: Enviados 390 Recibidos 0

Propiedades de Conexión de área local

Conectar usando: Realtek PCIe GBE Family Controller

Esta conexión usa los siguientes elementos:

- Cliente para redes Microsoft
- Programador de paquetes QoS
- Compartir impresoras y archivos para redes Microsoft
- Protocolo de Internet versión 6 (TCP/IPv6)
- Protocolo de Internet versión 4 (TCP/IPv4)**
- Controlador de E/S del asignador de detección de topología...
- Respondedor de detección de topologías de nivel de vínculo

Propiedades: Protocolo de Internet versión 4 (TCP/IPv4)

Usar la siguiente dirección IP:

Dirección IP: 192 . 168 . 2 . 105

Máscara de subred: 255 . 255 . 255 . 0

Puerta de enlace predeterminada: 192 . 168 . 2 . 1

6.2 Internet/Intranet connection configuration

In order to make for an easy TCP/IP configuration of the unit, the IP address, the port and the gateway can be modified from the unit's front panel.

The configuration of the unit's TCP/IP parameters must be consistent with the network in which it is to be installed. Should the user not know whether the factory values coincide with those of his network, he should proceed as follows:

From any PC in the network:

- a) Go to start-up
- b) Execute
- c) Type "cmd.exe"
- d) Accept (the screen goes black)
- e) Type "ipconfig.exe"
- f) Accept

An informative list is displayed. The PC's IP address and gateway should be noted down.

These values should be copied to the unit, *but increasing the last digit of the IP address by one (or more) units* since there cannot be two IP addresses with the same number in the same network.

For example: If the PC's IP is y.y.y.100, the unit should be assigned y.y.y.101 or y.y.y.150

From the unit's front panel, access the menu and search for:

TCP/IP configuration >> TCP/IP information >>

```
Port:          80
P:            x.x.x.x
Gateway: x.x.x.x
Mask:        255.255.255.0
MAC:         -
```

Place the cursor on the parameter to be modified, press OK. Using the increase and decrease keys, adjust the value and press OK. Repeat until concluded.

Press "Esc" until "Accept and save changes?" appears. Press OK and enter the user PIN (1234 by default).

Connect the unit up to the network. Open the browser and type [http:// y.y.y.101](http://y.y.y.101) or y.y.y.150 (i.e. the assigned IP). Press "Enter" .

6.3 Remote access configuration

Execute the steps described in the previous section "Internet / Intranet connection configuration ".

In order to access the WebServer remotely from any other network, certain changes must be effected in the Router in the network where the WebServer is connected.

Since one is accessing remotely, one cannot use the WebServer IP as if it were in the same physical network. The reason for this is that the WebServer is hidden behind a Router which cannot be seen externally. Therefore, in order to access the WebServer, the Router must be first connected and then it will redirect to the WebServer.

Procedure:

1. Configure the Router's work mode as multi-terminal. If the network is already functioning with different users, it is probably already in multi-terminal mode.
2. Ensure that there is no filter in the Router which closes port XX, the work port configured in the WebServer (default: 80).
3. The NAT or PAT ("Network Address Translation" or "Port Address Translation") of the Router must be configured in such a way that any IP with port XX is redirected to the WebServer's IP, also with port XX. As mentioned above, the work port configured in the WebServer is by default 80.

e.g.: The WebServer has work port 80

HOME	(in) ROUTER (out)	OFFICE
Type in Navigator	Public IP → Private IP	WebServer displays
http://80.65.135.62	80.65.135.62 → 192.168.2.10	192.168.2.10

NOTE: If the port is other than 80, this must be specified in the navigator by adding "number of port" to the IP.

e.g.: The WebServer has work port 120

HOME	(in) ROUTER (out)	OFFICE
Type in Navigator	Public IP → Private IP	WebServer displays
http://80.65.135.62:120	80.65.135.62:120 → 192.168.2.10:120	192.168.2.10:120

6.4 More than one WebServer in the same network

In order to be able to have several WebServers in the same network, it is imperative that:

In INTERNET:

they have different ports and IP's.

The NAT or PAT ("Network Address Translation" or "Port Address Translation") of the Router must be configured in such a way that any public IP input with port XX is redirected to the IP of WebServer, this also with port XX. As mentioned above, the work port configured in the WebServer is, by default, 80.

e.g.: WebServer1 IP = 192.168.2.10:80
 WebServer2 IP = 192.168.2.11:8080

Therefore, the NAT or PAT of the Router must be configured in such a way that all the IP's with port 80 are enrouted to IP 192.168.2.10 and those IP's with port 8080 to IP 192.168.2.11.

If the port is other than 80, this must be specified in the navigator by adding "number of port" to the IP

In the case of an nnnnn port, this would be <http://192.168.2.10:nnnnn>

In INTRANET: It can be configured with different IP's and with the same or different ports.

6.5 TCP/IP configuration. When the ex-factory IP domain is not within the IP range of user's network

This section explains how to access the unit in order to change the TCP/IP parameters for others belonging to the local network and, thus, access the unit from any point whatsoever of the network.

- Connect the unit up to the network's router or switch
- Obtain the network's parameters
- Create a route for the PC to locate the unit
- Access the unit and exchange the IP for another belonging to the network

To connect the unit up to the network's router or switch

With 230V AC, connect an RJ-45 cable from the unit to the router or switch.
From any PC in the network, proceed as follows.

To obtain the network's parameters

Go to start-up >> Execute >> Type "cmd.exe"
Press Accept. (The screen goes black, the so-called command prompt)

The "ipconfig.exe" command can now be used to see the network's TCP/IP configuration

On the black screen, type "ipconfig.exe"
Press Accept.

An informative list is displayed. The PC's IP address, submask and gateway values should be noted down.

e.g.: IP: y.y.y.100
 Mask: 255.255.255.0
 Port: y.y.y.1

To create a route for the PC to locate the unit

Type the following command (omitting the inverted commas):
Route add "unit's IP " "PC's IP"

Unit's IP = If this has not been changed, ex-factory IP is 192.168.2.10
PC's IP = as previously noted (y.y.y.100)

Go to start-up >> Execute >> Type "**route add 192.168.2.10 y.y.y.100**" >> Press Enter.
(This can also be done from the command prompt)

Open the browser and type:

<http://192.168.2.10> in the address bar. Press enter..

Access the unit and exchange the IP for another belonging to the network

If all has been executed correctly, the user code should now be requested.
Default code ex-factory is **1234**.

The parameters can now be modified so as to pertain to user's network.

The PC's values are now to be copied to the unit but changing the last digit of the IP address since there cannot be two IP addresses with the same number in the same network.

e.g. If the PC's IP is y.y.y.100, the unit should be designated y.y.y.110 or y.y.y.200

Go to "access configuration" and modify the parameters to those previously noted.

In IP address:

Use the PC's IP changing the last digit to avoid duplication in the network. As in the above example, if the PC's IP is y.y.y.100, the user can assign his unit = y.y.y.200. Any value can be assigned as long as it does not exceed 255.

In Subnet mask:

Use that previously obtained with Ipconfig.exe

In Gateway:

Use that previously obtained with Ipconfig.exe

En Port: usually 80

The browser will now have lost communication with the unit. Close the browser completely. .

Open the browser again and type the new IP address in the address bar, as in the following example:

<http://y.y.y.200> Press Enter.

6.6 Aid to a correct configuration

IP Address

This is the name of the system (software), also known as logical address, with which one wishes to communicate. There cannot be two identical IP's with the same port in one same network.

MAC (Media Access Control):

This is the protocol which controls at all times within a local network which device has access to the transmission media. As its address is unique, it identifies each device (hardware) unequivocally. Also known as hardware address.

Mask:

This is another IP address. It is used to distinguish when a given machine pertains to a given subnet thus ascertaining whether or not two machines are in the physical network. If one does not know which is to be configured, one should enter the same mask as one's own PC

Gateway:

This device is connected to several networks. It acts as a bridge between them and carries packets from one to another. It is another IP address pertaining to the network's Router.

Public IP of the router:

This is the public IP of the network where the WebServer is located. This address can be static or dynamic (changing in each connection). Normally, if one wishes to access the WebServer from Internet, this address should be static. By default, if one does not have a Router, this address is the same as that of the WebServer's IP.

Port:

Generally speaking, website servers work with port 80. Nevertheless, should one wish to install 2 WebServers in the same network, it is obligatory to configure different ports. Please, refer to "More than one WebServer in the same network" and "Remote access configuration")

Display, font size and type:

These parameters do not depend on the WebServer. Should one wish to modify the letter size or font, one must consult one's navigator. Optimum display: screen resolution 1280x1024, text size "small" or "medium".

6.7 Help: FAQ (frequently asked questions)

I have modified the IP. How do I restore communication?

If you have only modified the IP, close and then re-open your navigator. Enter the new IP. Special care must be taken when defining a new IP. You must ensure that it is within and near to the IP range used by your network. If you still cannot communicate, you must verify your Router's sub-mask. If the IP is not allowed to pass to the network, try changing your Router's sub-mask to "255.255.255.0".

I have modified the Port. How do I restore communication?

By default, your navigator uses port 80 to communicate with a server. If the port has been modified to other than 80, you must go to the address bar and type in that you wish to establish communication with a server in that port. e.g. for port 120: <http://192.168.2.10:120>

I have configured an IP which does not pertain to my network. How do I restore communication?

Execute the steps described for a first connection or restore factory configuration

What is the purpose of "close session"?

This informs the WebServer that communication has terminated. At the next connection, the PIN will be requested.

What happens if I shut down my computer without closing the session?

If you do not close the session, information security will be reduced since anyone can now access the last page you visited and from there surf at will. All they would have to do is enter the correct IP address of the WebServer from any PC and no PIN will be requested. However, having said that, if they do not know the PIN, they will not be able to modify any parameter.

I do not know or cannot remember the configured IP

You will have to go to the unit's command console. Within the submenu "TCP/IP configuration", go to option "TCP/IP information". Please, refer to chapter "User's guide (front panel)", section "TCP/IP configuration"

CHAPTER 7 – Glossary and formulae

7.1 Glossary

Vn or V Ln	Line voltage n=1, 2, 3
VPkn	Peak line voltage n=1, 2, 3
A or A Ln	Line intensity or amperes n=1, 2, 3
APkn	Peak line intensity or amperes n=1, 2, 3
CF	Before “Vn” or An” crest factor of same
Vab	Voltage between phases a-b
DesVn or UnbVn	Line voltage unbalance n=1, 2, 3
DesIn or UnbIn	Line intensity unbalance n=1, 2, 3
Zn	Line impedance n=1, 2, 3
mA	RMS milliamperes of differential intensity
mAPk	Peak milliamperes of differential intensity
“An”	Neutral amperes
Hzn	Line frequency Vn n=1, 2, 3
THDVn	Total harmonic distortion of line voltage n=1, 2, 3
THDIn	Total harmonic distortion of line intensity n=1, 2, 3
W	Active power
W+	Requested power
W-	Returned power
PFn	Power factor of line n=1, 2, 3
VAn	Volt-amperes of line n=1, 2, 3
VARLn o rLn	Reactive inductive volt-amperes of line n=1, 2, 3
VARCn o rCn	Reactive capacitive volt-amperes of line n=1, 2, 3
kW	Kilowatt (1KW = 1000W)
kWh	Kilowatts per hour
kQh	Reactive kilowatts per hour
∑L123	Sum of line measurements L1+L2+L3
°C	Degrees centigrade
RH	Relative humidity
S	Over
I	Low
ST Ln	Line overvoltage n=1, 2, 3
IT Ln	Line low voltage n=1, 2, 3
I Ln	Ln intensity n=1, 2, 3
ID or I Dif.	Differential intensity
“IΔn”	Rated differential intensity
Neutral “In” or I.	Neutral intensity
Temp.	Temperature
Timer. n	Timer n=1, 2, 3, 4
SF	Phase sequence
MCB	Ancillary circuit-breaker, Miniature Circuit Breaker (MCB)
PH	Time programmer
ReIN 1,2	Remote input 1 o 2
Lock	Lock
Power	230V AC power supply
L1, L2, L3, Ln o LN	Line 1, Line 2, Line 3, Neutral
L12, L23, L31	Composite measurement between two phases
Autoscale	Automatic selection system for most suitable measurement scale
RA, RB	Relays A and B
R1, R2, R3, R4	Relays external module
IN1, IN2, IN3, IN4	Inputs external module
RMS value	RMS of wave cycle of 20mS(50Hz) or 16.66mS(60Hz)
Pk value	One-off maximum value in the wave crest
Delay	Time delay
1 Delay RMS (50Hz)	20 milliseconds
1 Delay RMS (60Hz)	16.66 milliseconds
1 Delay Pk (50Hz)	156.25 microseconds
1 Delay Pk (60Hz)	130.156 microseconds
LCD display	Liquid crystal display screen
ms	Milliseconds (1ms = 1segundo/1000)
Watchdog	Process monitoring system

7.2 Formulae

Voltaje <u>RMS</u> :	$V_{rms} = \sqrt{\frac{1}{n} \sum_{n=1}^{n=128} V_n^2}$
Intensidad <u>RMS</u> :	$I_{rms} = \sqrt{\frac{1}{n} \sum_{n=1}^{n=128} I_n^2}$
Potencia Aparente:	$VA = V * I$
Potencia Reactiva:	$VAr = \sqrt{S^2 - P^2}$
Potencia Activa:	$W = \frac{1}{n} \sum_{n=1}^{n=128} (V_n * I_n)$
Factor de potencia:	$PF = \frac{P}{S}$
Factor de cresta:	$CF = \frac{V_{pk}}{V_{rms}}$
Impedancia:	$Z = \frac{V_{rms}}{I_{rms}}$
Distorsión armónica total, Voltaje:	$THD_v = \frac{1}{V_{h1}} \sqrt{\sum_{n=2}^{n=128} V_{hn}^2} * 100$ $THD_v = \frac{1}{V_{k1}} \sqrt{\sum_{k_{min}}^{k_{max}} V_{kn}^2} * 100 \quad k_{min} = (2 - 63), \quad k_{max} = (2 - 63)$
Distorsión armónica total, Intensidad:	$THD_i = \frac{1}{I_{h1}} \sqrt{\sum_{n=2}^{n=128} I_{hn}^2} * 100$ $THD_i = \frac{1}{I_{k1}} \sqrt{\sum_{k_{min}}^{k_{max}} I_{kn}^2} * 100 \quad k_{min} = (2 - 63), \quad k_{max} = (2 - 63)$

Desequilibrio:	$DES_{Ln} = \frac{Rms_{Ln} - \frac{Rms_{L1+L2+L3}}{3}}{\frac{Rms_{L1+L2+L3}}{3}} * 100 \quad n = 1, 2, 3.$
Tensiones compuestas:	$V_{ab} = \sqrt{\frac{1}{n} \sum_{n=1}^{n=128} (V_{an} + V_{bn})^2}$
Intensidad neutro:	$I_{LN} = \sqrt{\frac{1}{n} \sum_{n=1}^{n=128} (I_{1n} + I_{2n} + I_{3n})^2}$
Tensión armónico k:	$ V_{hk} = \sqrt{Re(V_{hk})^2 + Im(V_{hk})^2}$
Intensidad armónico k:	$ I_{hk} = \sqrt{Re(I_{hk})^2 + Im(I_{hk})^2}$
Potencia aparente armónico k:	$ VA_{hk} = V_{hk} * I_{hk} $
Potencia activa armónico k:	$ W_{hk} = Re(V_{hk}) * Re(I_{hk}) + Im(V_{hk}) * Im(I_{hk}) $
Factor de potencia armónico k:	$PF_{hk} = \frac{ P_{hk} }{ S_{hk} } \quad Cos\varphi = PF_{h1} = \frac{ P_{h1} }{ S_{h1} }$
Factor de distorsión armónica k:	$ Vhd_{hk} = \frac{ V_{hk} }{ V_{h1} } * 100 \quad Ihd_{fk} = \frac{ I_{hk} }{ I_{h1} } * 100$
Tensión <u>DC</u> :	$ V_{dc} = \left \frac{1}{n} \sum_{n=1}^{n=128} V_n \right $
Intensidad <u>DC</u> :	$ I_{dc} = \left \frac{1}{n} \sum_{n=1}^{n=128} I_n \right $
Tensión AC:	$V_{ac} = \sqrt{V_{rms}^2 - V_{dc}^2}$
Intensidad AC:	$I_{ac} = \sqrt{I_{rms}^2 - I_{dc}^2}$
Potencia <u>DC</u> :	$ W_{dc} = V_{dc} * I_{dc} $
Potencia AC:	$ W_{ac} = W - W_{dc} $

Historial THD/HD/Var, promedio 5 <u>minuta</u> l.	
Distorsión armónica total, Voltaje (%):	$THDv_{5min} = \frac{1}{300} \sum_{m=1s}^{m=300s} \left(\frac{1}{V_{k1}} \sqrt{\sum_{n=2}^{n=63} (V_{hn})^2 * 100} \right)_m$
Distorsión armónica total, Intensidad (%):	$THDi_{5min} = \frac{1}{300} \sum_{m=1s}^{m=300s} \left(\frac{1}{I_{k1}} \sqrt{\sum_{n=2}^{n=63} (I_{hn})^2 * 100} \right)_m$
Distorsión armónica, Voltaje (V):	$HDv(V)_{5min} = \frac{1}{300} \sum_{m=1s}^{m=300s} \left(\sqrt{\sum_{n=2}^{n=63} (V_{hn})^2} \right)_m$
Distorsión armónica, intensidad (A):	$HDi(A)_{5min} = \frac{1}{300} \sum_{m=1s}^{m=300s} \left(\sqrt{\sum_{n=2}^{n=63} (I_{hn})^2} \right)_m$
Potencia reactiva (<u>VAR</u>):	$VAR_{5min} = \frac{1}{5min/t} \sum_{n=1t}^{n=5min/t} (\sqrt{S^2 - P^2})_n$ <i>t = 100ms/200ms/300ms/400ms/500ms (promediado por defecto).</i>

M4 and MINI M4:

Voltaje <u>Vpk</u> :	$Vpk = Valor\ Máximo\ (Vn)$ n = 1 a 128
Intensidad <u>Ipk</u> :	$Ipk = Valor\ Máximo\ (In)$ n = 1 a 128

M4 Rogowsky:

Voltaje <u>Vpk</u> :	$Vpk = \frac{ Vpk_+ + Vpk_- }{2}$
Intensidad <u>Ipk</u> :	$Ipk = \frac{ Ipk_+ + Ipk_- }{2}$

CHAPTER 8 – EXTERNAL I/O MODULES

8.1 I/O modules

The I/O modules can be configured for up to 10 logical outputs (relays), 10 logical inputs and connection for temperature/humidity probe.

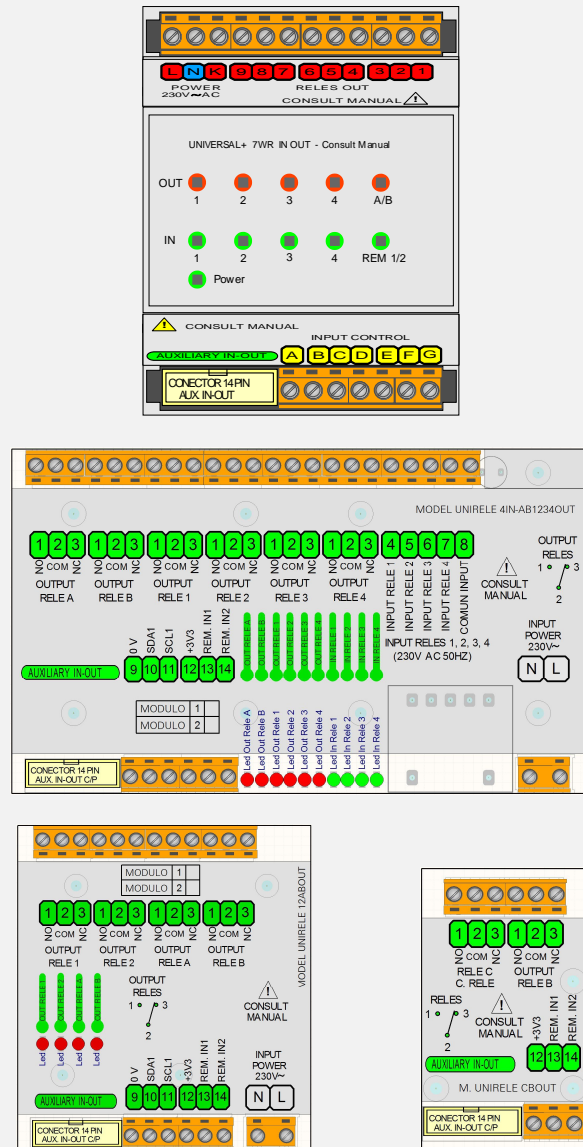
Logical outputs. Options:

- Outputs relays potential-free change-over contacts
- Optocoupled outputs NPN open collector transistor (24V).

Logical inputs. Options:

- Optocoupled inputs (24V).
- Inputs for potential-free contact.
- Direct inputs at 230V AC.

Due to there being diverse modules available in the UNIVERSAL+ 7WR range, the user must refer to the corresponding instruction manuals: **UNIVERSAL+ 7WR IN OUT** and **UNIVERSAL+ 7WR accessories, I/O relay modules, temperature and humidity probe.**





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