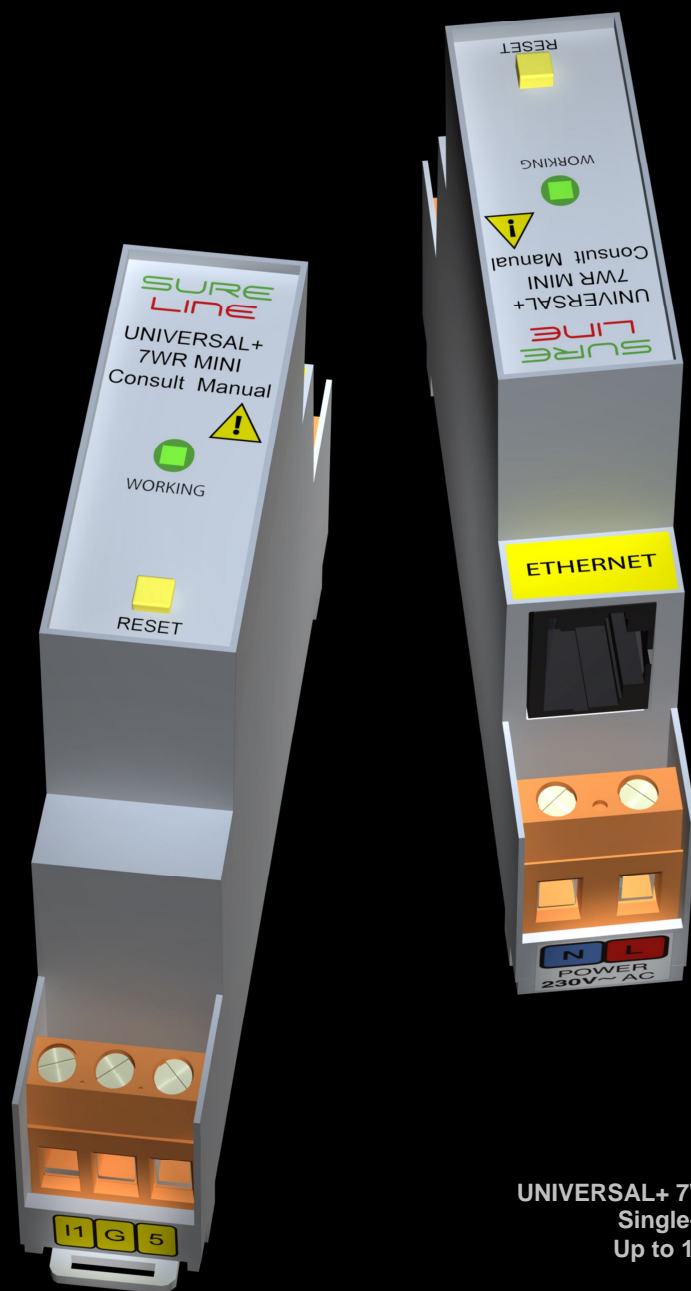


Universal tele-programmable, tele-controllable mains analysis unit with WebServer and Modbus TCP/IP /IP
Graphic and numerical display in real time.

6-channel oscilloscope with autoscale, auto-refresh and instantaneous value measurement cursor
Graphical history (months, days, hours and minutes) of energy, costs and emissions with built-in 3-year memory
Sizing, surveillance and energy maintenance. Precisions (V, I): $\pm 0,2\%$, $\pm 0,4\%$ and $\pm 0,5\%$



UNIVERSAL+ 7WR MINI BASIC
Single-phase
Up to 10,000A

UNIVERSAL+ 7WR MINI BASIC manual
With software version V3.12

User's/installer's manual - UNIVERSAL+ 7WR MINI BASIC

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

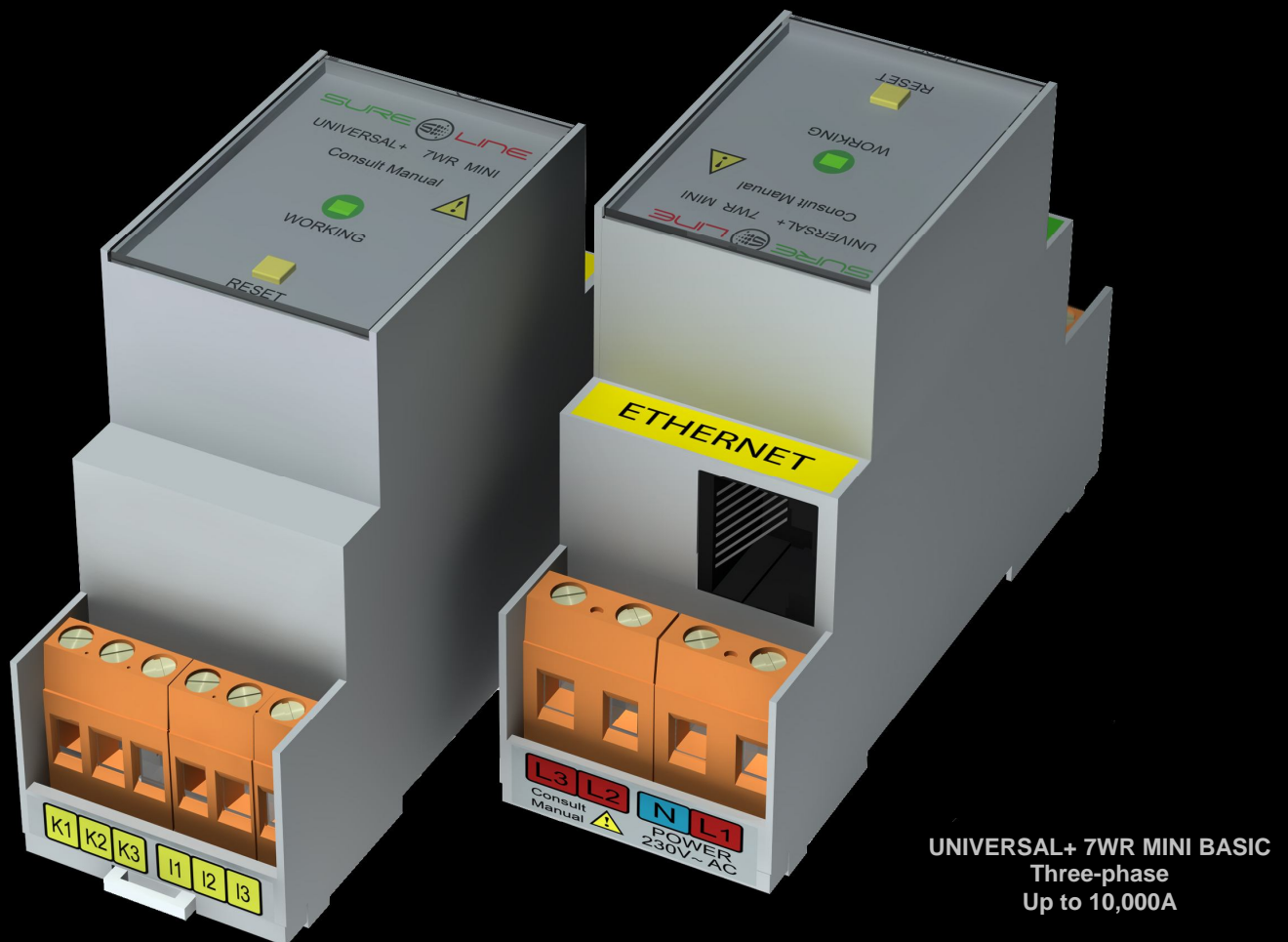
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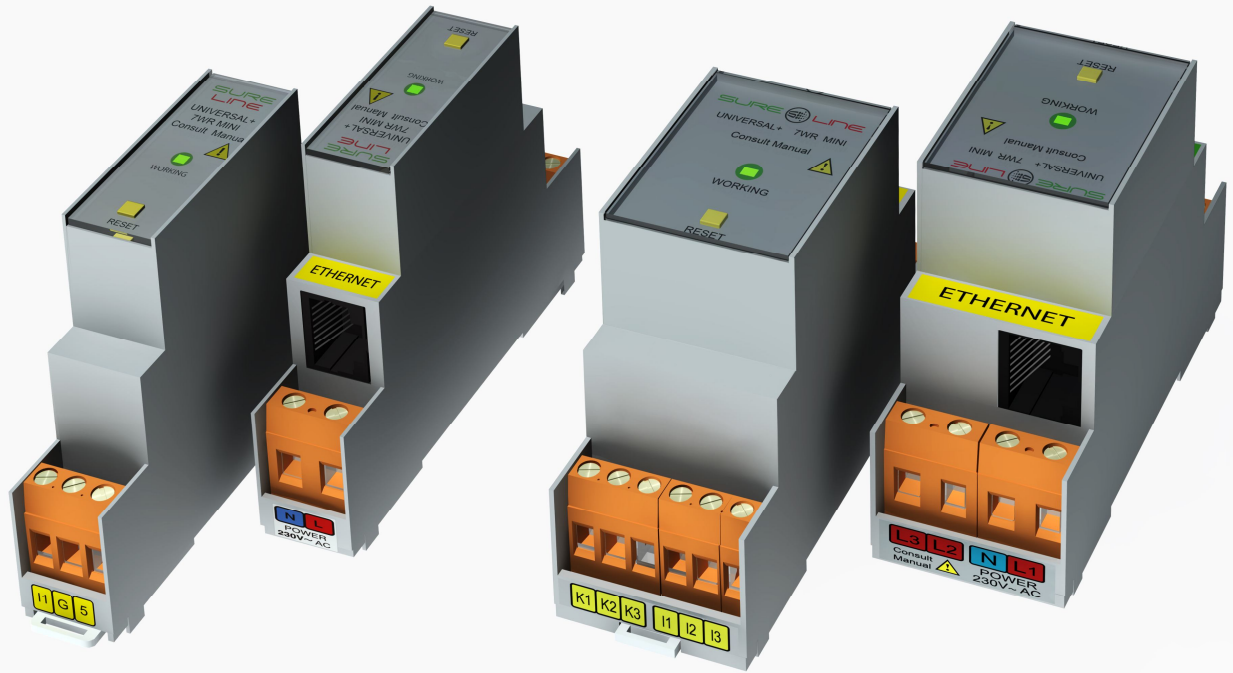
Published in Spain by Safeline, S.L. 10th Edition (July 2020)



Consult appended manuals for specific details

[Instruction manual – DatawatchPro software](#)

[Manual Safeline Web Service](#)



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



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Important: Depending on the versions of the software and of the UNIVERSAL+ 7WR MINI BASIC model and (consult these on the identifying label on the side of the unit and on its display and/or WebServer), different protections/alarms, measurements, connections and characteristics are included. These are to be found in the corresponding manuals and synoptic tables.

Chapter 1 – Introduction

1.1 Nomenclature

UNIVERSAL+ 7WR MINI BASIC

Version: Line intensity transformer. Only transformers TRIT7, TRIT14, TRIT18 and TRIT26 Individually calibrated for their corresponding unit for greater precision.

TRIT7 (5A for standard transformer from 50A/5A up to 10,000A/5A)
TRIT14, TRIT18 and TRIT26 (70A, 140A and 280A)

7WR MINI [BASIC] [] [500E] [E] [] [] [] [] [] [] []
1 2 3 4 5 6 7 8 9 10

1- Configuration

[**BASIC**] = Without automatic data dispatch to a remote server via Internet
[**BASIC SR**] = Automatic data dispatch to a remote server via Internet: Specially designed to work with "Safeline Web Service" administration software.

2 - Phases

[**T**] = Three-phase 4-pole
[**M**] = Single-phase 2-pole

3 – Version: Voltage measuring scale (line neutral) AC

[**250E**] = full measuring scale line neutral 250V Pk
[**500E**] = full measuring scale line neutral 500V Pk

4 – Version: Line intensity measurement toroidal transformer

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

5 – Power-measurement frequency

[**50Hz**] = 50Hz (standard)
[**60Hz**] = 60Hz

6 – Power supply

[**115V**] = 115V AC (Line Neutral)
[**230V**] = 230V AC (Line Neutral) (standard)

7 – Version: intensity measurement

[**5**] = 5A (5A for standard transformer from 50A/5A up to 10,000A/5A)
[**70**] = 70A
[**140**] = 140A
[**280A**] = 280A

8 – Version: Energy log with memory

[] No suffix = no energy log and no built-in memory
[**G**] = with energy log (L1 single-phase or Σ L1, 2 and 3 three-phase) and built-in 3-year memory
[**G3**] = with energy log (L1, L2, L3 and Σ L1, 2 and 3) and built-in 1.5-year memory (only 3-phase model)

9 – Version: oscilloscope

[] No suffix = no oscilloscope
[**OS**] = with oscilloscope (V L1, L2, L3 and A L1, L2, L3 three-phase, or V L1 and A L2 single-phase)

10 – Line intensity measurement toroidal transformer AC (single-phase:1 pc; three-phase: 3 pcs)

[**TRIT7**] = TRIT7 (internal \varnothing 7mm) (5A for standard transformer from 50A/5A up to 10,000A/5A)
[**TRIT14**] = TRIT14 (internal \varnothing 14mm) (70A)
[**TRIT18**] = TRIT18 (internal \varnothing 18mm) (70A and 140A)
[**TRIT26**] = TRIT26 (internal \varnothing 26mm) (70A, 140A and 280A)

Example: UNIVERSAL+ 7WR MINI BASIC T 500E E 50Hz 230V 70A G3 OS TRIT14

Attention: Please, refer to the identifying label on the side of the unit

1.2 Introduction

The **SURELINE UNIVERSAL+ 7WR MINI BASIC** incorporates advanced cutting-edge 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: Configuration of TCP/IP parameters to factory-set values, read-only mode in Internet/Intranet, customisable user code, easy installation, programmability, etc.

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.

The UNIVERSAL+ 7WR MINI BASIC is a sized down version of the UNIVERSAL+ 7WR MINI M4 which brings together the basic functions necessary for an optimum metering, logging, surveillance and maintenance of electrical installations

Central measurement and data unit (mains analysis)

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

6-channel oscilloscope with (optional) auto-refresh and autoscale. Includes instantaneous value measurement cursor in all channels.

Maximum and minimum measurement logs

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) .

Graphic energy, costs and emissions log with built-in 1.5-year memory (optional)

Active and reactive energy consumption log in L1, L2, L3 and Σ L1, 2 y 3.

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) .

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 command). Chronological recorder of 200 data in data base for each unit ..

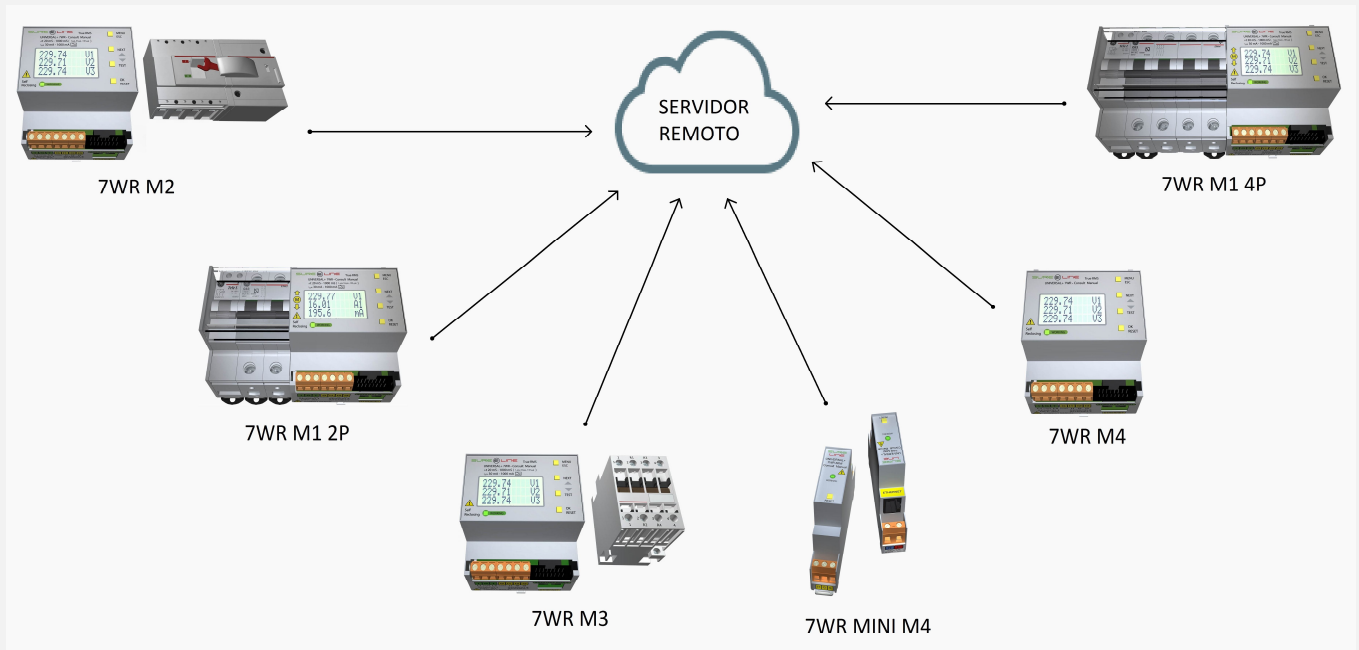
Automatic data dispatch to a remote server via Internet / Intranet

Simple, rapid WEB access via Internet/Intranet 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

Automatic data dispatch to a remote server via Internet / Intranet:

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, LOG and I/O status in .json format.



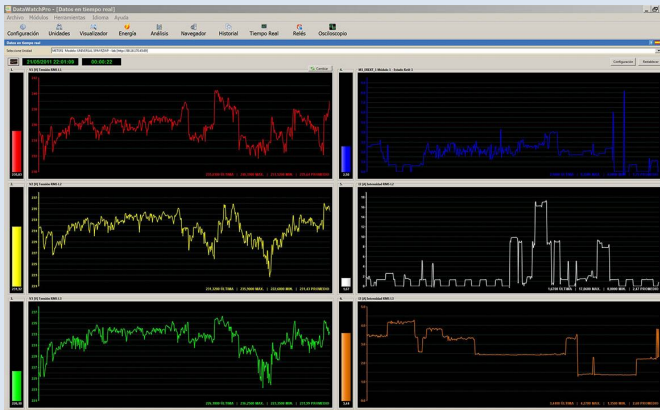
Chapter 2 – Synoptic table of characteristics, single-phase 2-pole and three-phase 4-pole

UNIVERSAL+ 7WR MINI BASIC (3-year guarantee)		
Single-phase only L1 / Three-phase L1, L2, L3	7WR MINI BASIC	
	Single-phase	Three-phase
Measurements		
True RMS and Pk voltage L1, L2, L3	•	•
True RMS voltage between phases L1-2, L2-3, L3-1		•
True RMS intensity with autoscale L1, L2, L3	•	•
Neutral intensity		•
Line frequency L1, L2, L3	•	•
Apparent power L1, L2, L3, Σ L123	•	•
Active power L1, L2, L3, Σ L123	•	•
Reactive inductive power L1, L2, L3, Σ L123	•	•
Reactive capacitive power L1, L2, L3, Σ L123	•	•
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, Σ L123 from 0000000,00001 to 9999999,99999 kWh	•	•
Active exported energy counters L1, L2, L3, Σ L123 from 0000000,00001 to 9999999,99999 kWh	•	•
Reactive energy counters L1, L2, L3, Σ L123 from 0000000,00001 to 9999999,99999 kWh	•	•
Maximum and minimum measurement logs		
Maximum: voltage L1, L2 and L3	•	•
Maximum: intensity L1, L2 and L3	•	•
Maximum: neutral intensity	•	•
Maximum: frequency V1, V2 and V3	•	•
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	•	•
Minimum: voltage L1, L2 and L3	•	•
Minimum: frequency V1, V2 and V3	•	•
WebServer in real time, display refreshed every 1.5 seconds for variable parameters		
Start-up WEB page, PIN	•	•
WEB page: Box "Measures and events"	•	•
WEB page: Box "Real time" 300-event graphic logger, 9 channels with autoscale	•	•
WEB page: Box "Energy log" with 3-year built-in memory (optional)	•	•
WEB page: Box "Unit configuration"	•	•
WEB page: Box "Access configuration" and WEB page: Box "Close session"	•	•
300-event graphic logger, 9 channels (28 measurements) with autoscale and variable refreshment (1-600 secs.) with temporary max. min. avg. measurements		
Current value for 28 measurements	•	•
Temporary maximum value (300 events, 1-60 secs.) for 28 measurements	•	•
Temporary minimum value (300 events, 1-60 secs.) for 28 measurements	•	•
Temporary average value (300 events, 1-60 secs.) for 28 measurements	•	•
Difference in value between maximum and minimum (Max value – Min value) of 28 measurements	•	•
Graphic energy log, costs and emissions with (optional) built-in memory. Graphic active 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		
Opción "G3": Energy log (L1, L2, L3 and ΣL1,2 and 3) with built-in 1.5-year memory		
5-minute interval active and reactive energy consumption log	•	•
Hourly active and reactive energy consumption log	•	•
Daily interval active and reactive energy consumption log	•	•
Monthly interval active and reactive energy consumption log	•	•
Modbus TCP/IP communication protocol and TCP/IP. HTTP protocol. WebServer		
Measurements (Reading 35 measurements T)	•	•
Energy counters (Reading 12 counters, 3-phase)	•	•
Maximum and minimum measurements (Reading 25 measurements, 3-phase)	•	•
Outstanding characteristics		
True RMS values	•	•
WebServer: display, programming and remote control via Internet/Intranet	•	•
4-digit protection PIN	•	•
Configuration of TCP/IP parameters to factory values	•	•
DataWatchPro: Professional software for PC with database, graphic analysis, etc.	•	•
Precisions available in $\pm 0.2\%$, $\pm 0.4\%$ and $\pm 0.5\%$ in intensity and voltage		
Basic precision: $\pm 0.2\%$	•	•
Basic precision: $\pm 0.4\%$	•	•
Basic precision: $\pm 0.5\%$	•	•
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) and includes a complete list of measurements, LOG and I/O status in .json format.	•	•
6-channel oscilloscope with (optional) auto-refresh and autoscale. Includes instantaneous value measurement cursor in all channels.		
V L1, L2, L3 and A L1, L2, L3 three-phase, or V L1 and A L2 single-phase	•	•

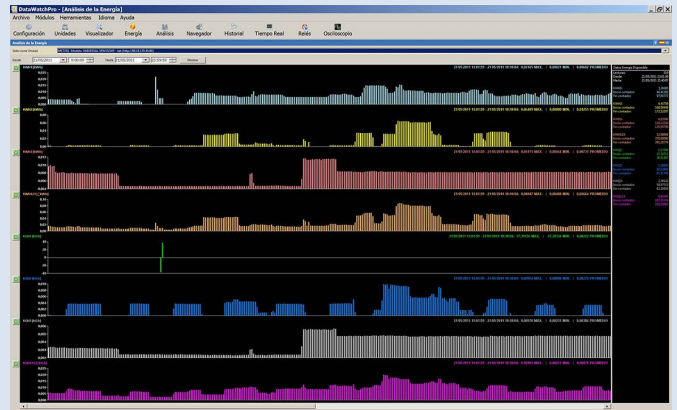
DataWatchPro included for all the UNIVERSAL+ 7WR MINI BASIC range
Professional software with database and graphic data analysis

- Multi-thread communication with a multitude of remote units via Internet/Intranet (reading and command)
- 68-parameter chronological logger in database for each unit
- Independent notifications via e-mail of 100 programmable alarms for each unit
- Module: numerical data analysis
- Module: graphic data analysis.
- Module: history analysis

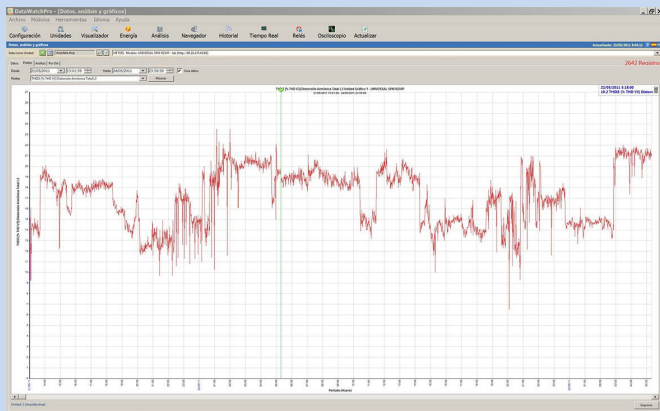
• Module: real time



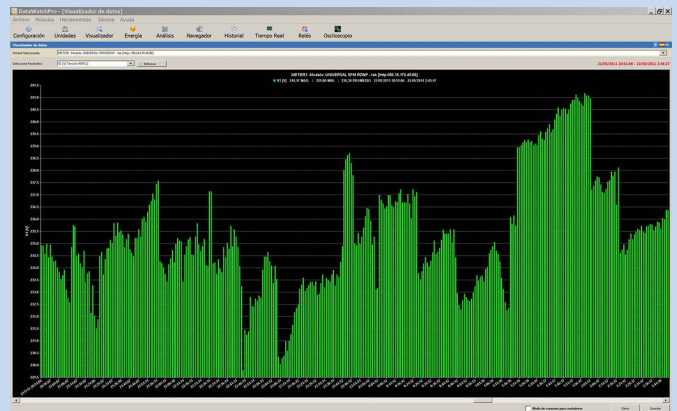
• Module: graphic energy analysis



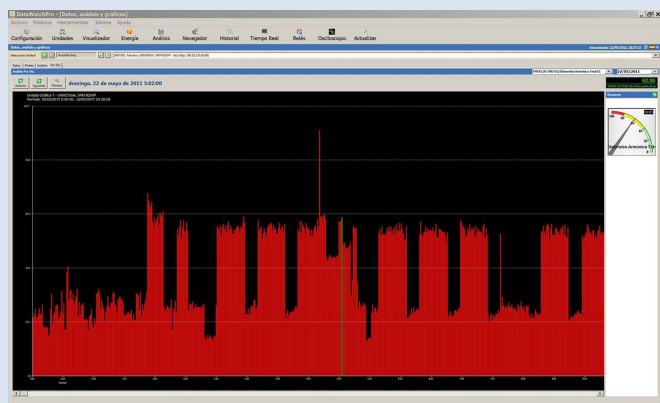
• Module: graphic plotter (graphic long period analysis)



• Module: graphic display (rapid analysis)



• Module: daily analysis



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.

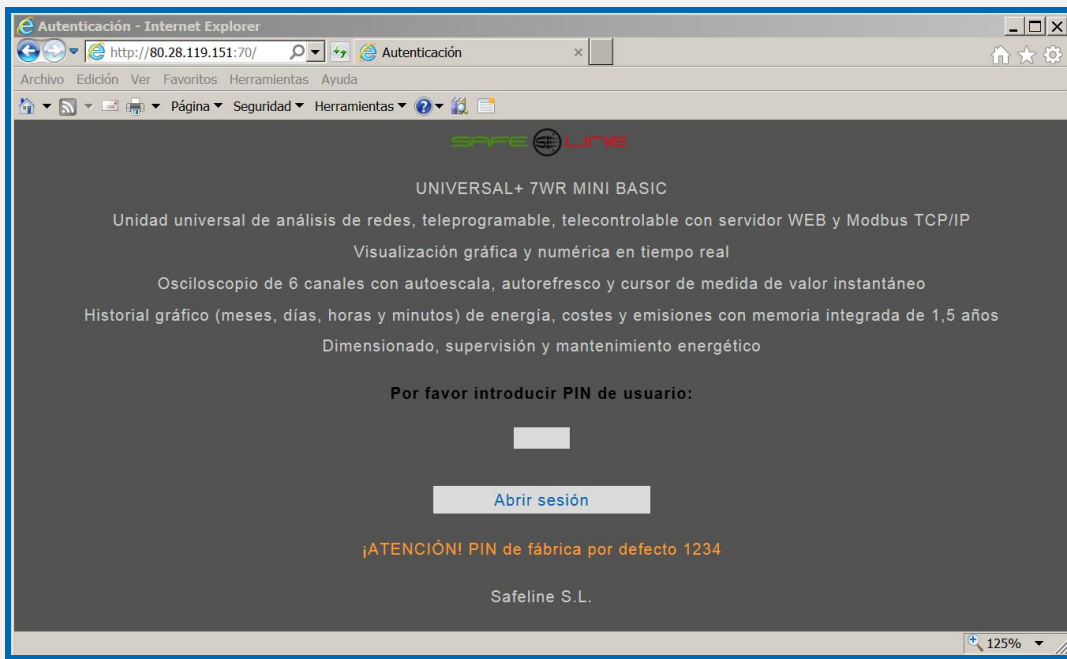
In order for the data dispatch and command reception of the WebServer to function correctly, a good quality Internet connection or an Internet line connection (optic fibre or similar) is imperative.

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.



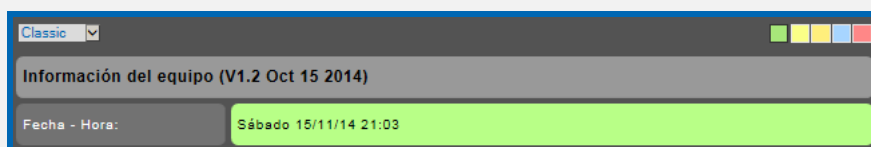
Surfing:

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 8 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).



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	Intensidad RMS y Neutro	Tensión entre fases	Frecuencia
V L1 = 242.78 V L2 = 238.17 V L3 = 234.24	A L1 = 2.54 A L2 = 1.20 A L3 = 4.77 A LN = 7.57	V L12 = 410.57 V L23 = 415.87 V L31 = 412.23	Hz L1 = 49.9 Hz L2 = 50.0 Hz L3 = 50.0
Potencia Aparente	Potencia Activa	Potencia Activa (Máximetro)	Factor de Potencia
VA L1 = 617.9 VA L2 = 286.6 VA L3 = 1119.3 ΣL123 = 2023.8	W L1 = 550.0 W L2 = 272.1 W L3 = 1037.3 ΣL123 = 1859.4	W L1 = 759.1 W L2 = 497.6 W L3 = 1064.2	PF L1 = 0.889 PF L2 = 0.949 PF L3 = 0.926
Potencia Reactiva Inductiva	Potencia Reactiva Capacitiva		
VArL L1 = 0.0 VArL L2 = 0.0 VArL L3 = 420.4 ΣL123 = 420.4	VArC L1 = 281.4 VArC L2 = 89.9 VArC L3 = 0.0 ΣL123 = 371.3		

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 = 265.82648 kWh L2 = 195.52267 kWh L3 = 226.06379 ΣL123 = 687.41294	kWh L1 = 0.00000 kWh L2 = 0.00000 kWh L3 = 0.00000 ΣL123 = 0.00000	kQh L1 = 138.60205 kQh L2 = 67.44948 kQh L3 = 130.62952 ΣL123 = 336.68105
PIN <input type="text"/> <input type="button" value="RESET"/>		

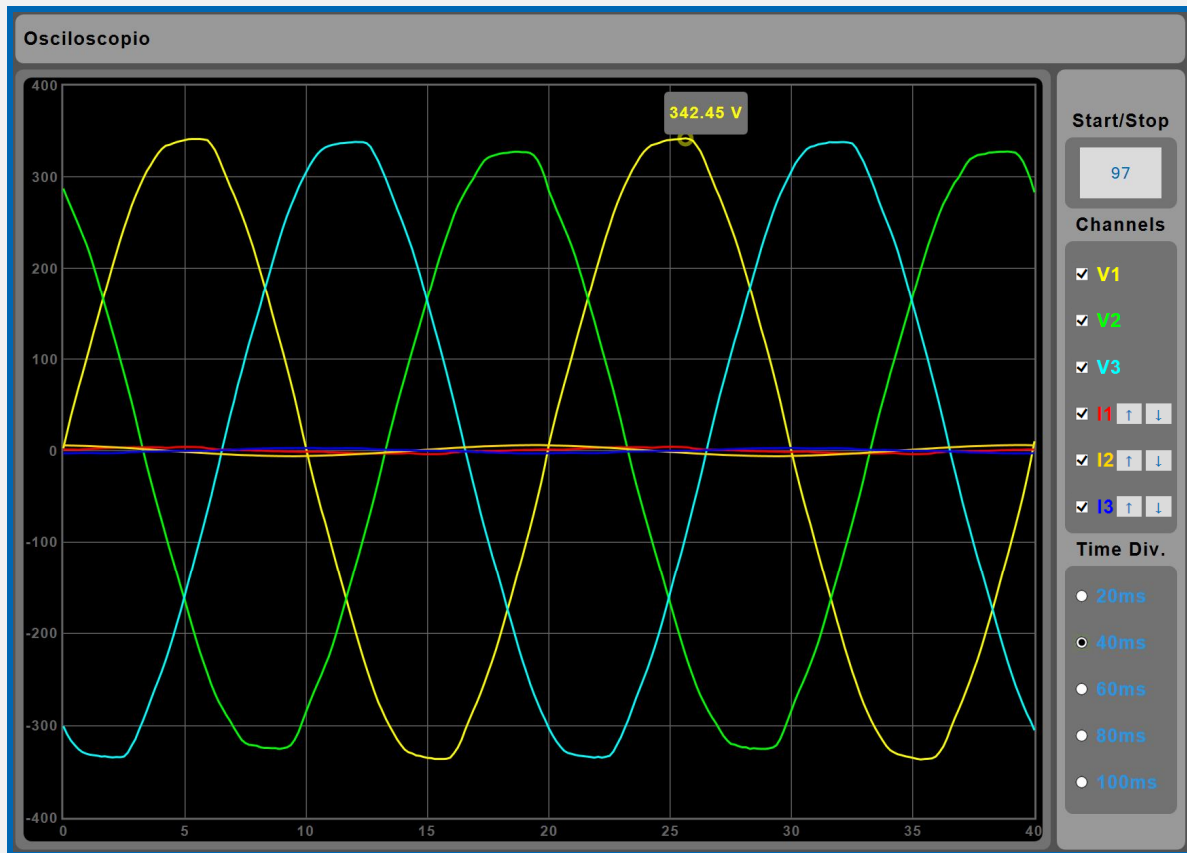
3.2.3 WEB page: Box “Measures and events”, section “Maximum and minimum values”

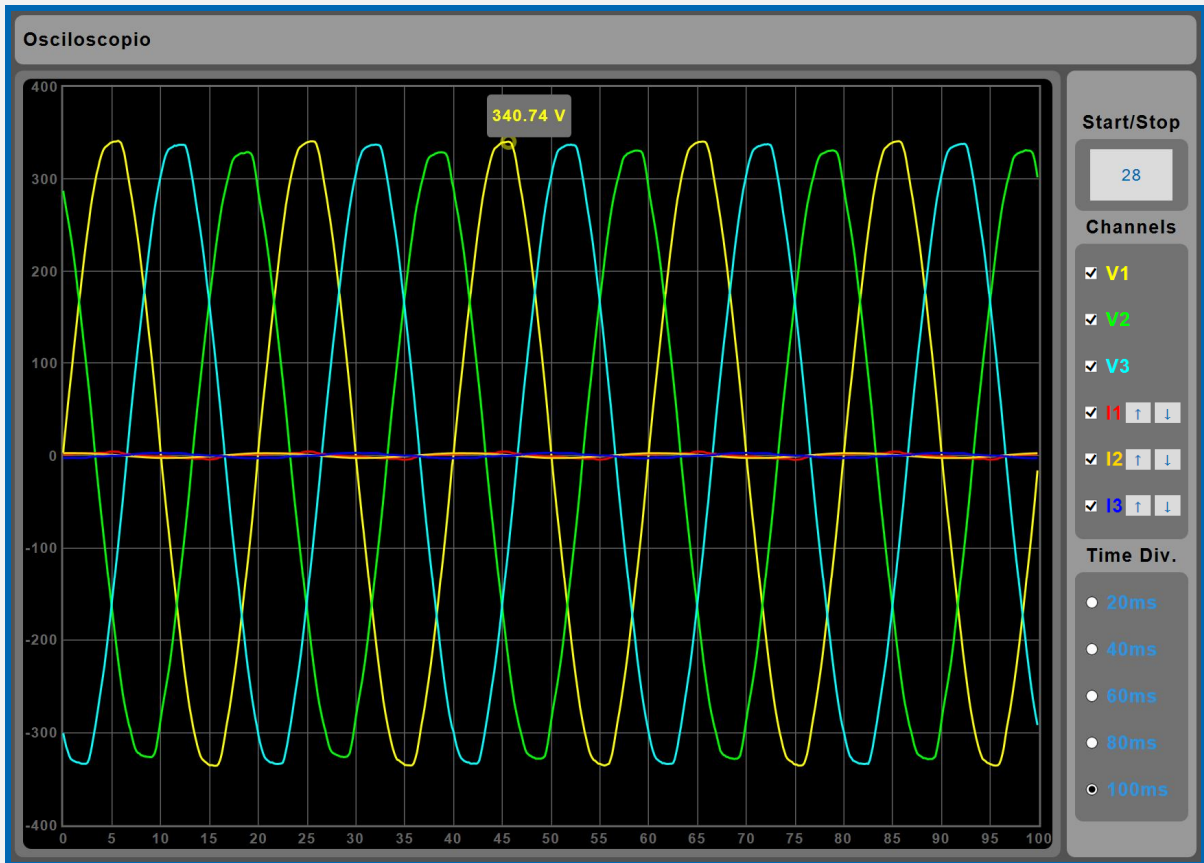
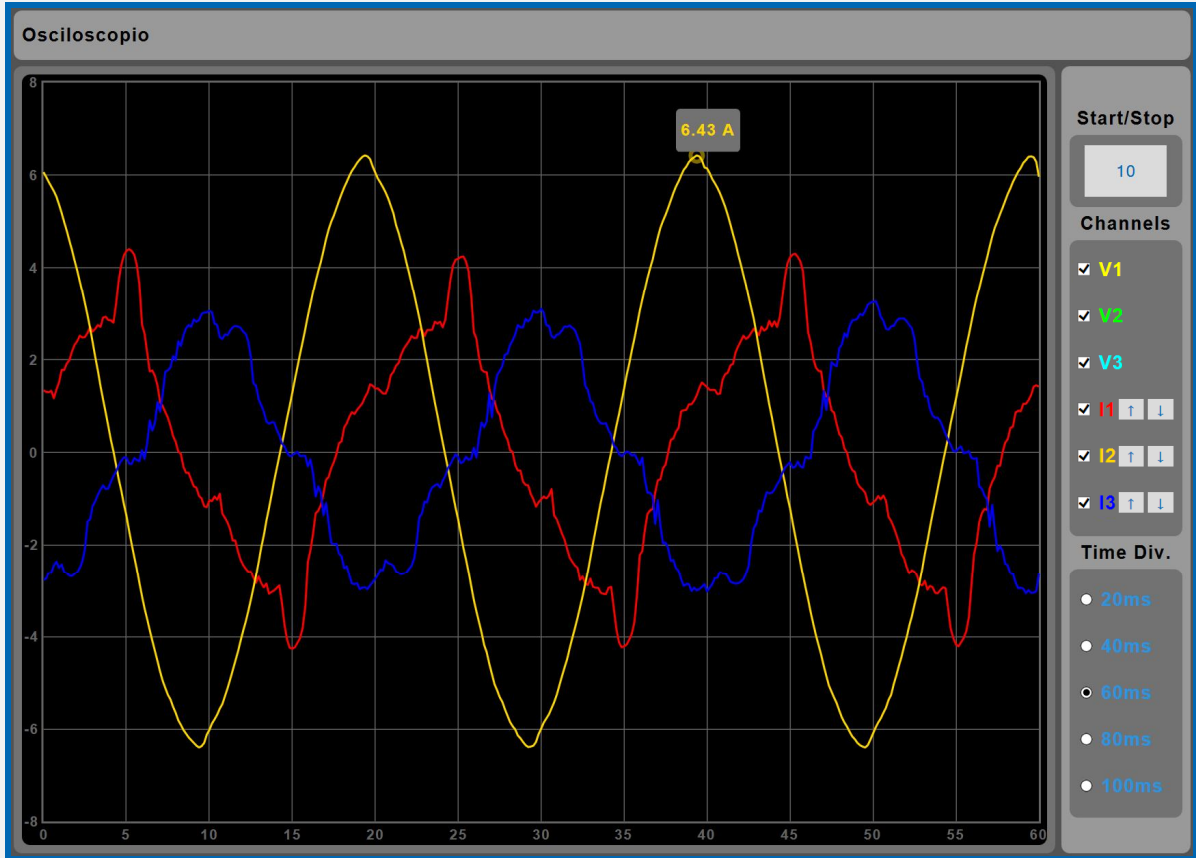
The following frame displays the maximum and minimum measurements in real time and is continuously refreshed (every 1,5 secs).

Valores máximos medidos			
Tensión RMS	Intensidad RMS y Neutro	Frecuencia	Potencia Aparente
V L1 = 251.77 V L2 = 248.47 V L3 = 249.23	A L1 = 20.94 A L2 = 21.73 A L3 = 20.43 A LN = 33.28	Hz L1 = 50.1 Hz L2 = 50.1 Hz L3 = 50.1	VA L1 = 4954.5 VA L2 = 5088.5 VA L3 = 4774.9
Potencia Activa (Máximetro)	Potencia Reactiva Inductiva	Potencia Reactiva Capacitiva	
W L1 = 2436.5 W L2 = 3338.4 W L3 = 2224.8	VArL L1 = 1242.2 VArL L2 = 1937.0 VArL L3 = 755.4	VArC L1 = 754.2 VArC L2 = 231.7 VArC L3 = 1377.7	
PIN <input type="text"/> <input type="button" value="RESET"/>			
Valores mínimos medidos			
Tensión RMS	Frecuencia		
V L1 = 231.33 V L2 = 223.88 V L3 = 226.11	Hz L1 = 49.8 Hz L2 = 49.8 Hz L3 = 49.8		
PIN <input type="text"/> <input type="button" value="RESET"/>			

3.3 WEB page: Box: "Oscilloscope"

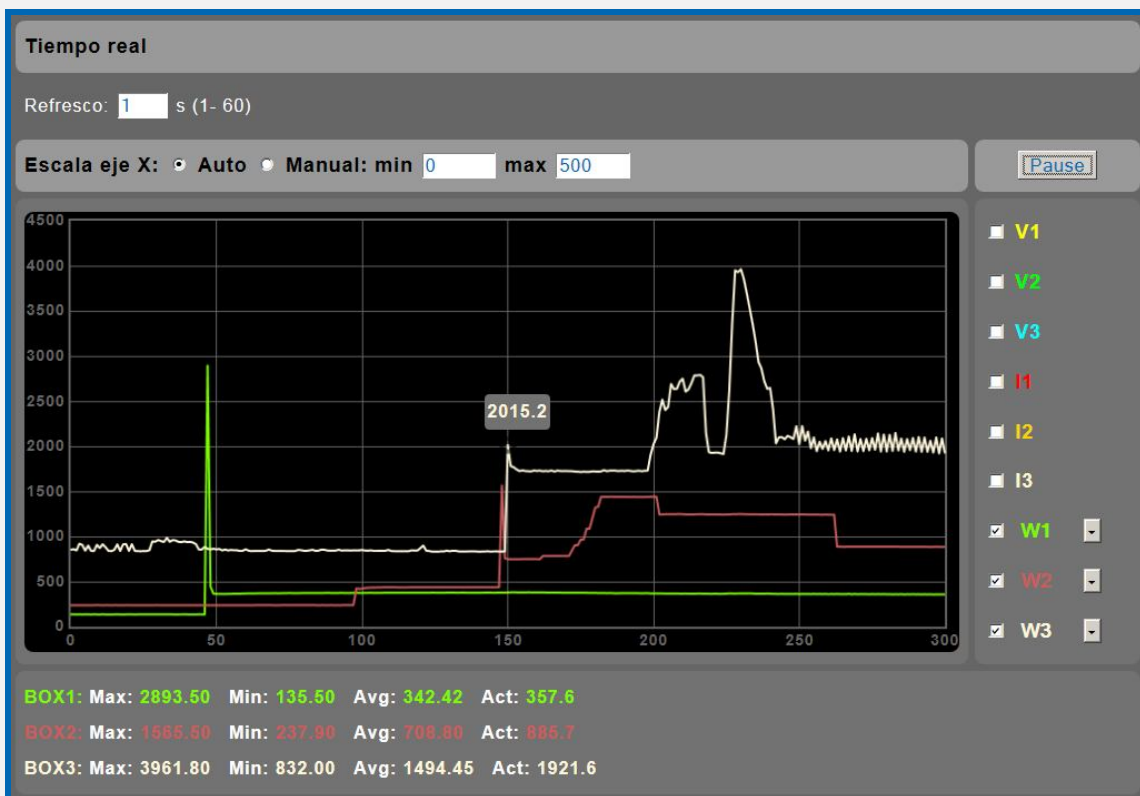
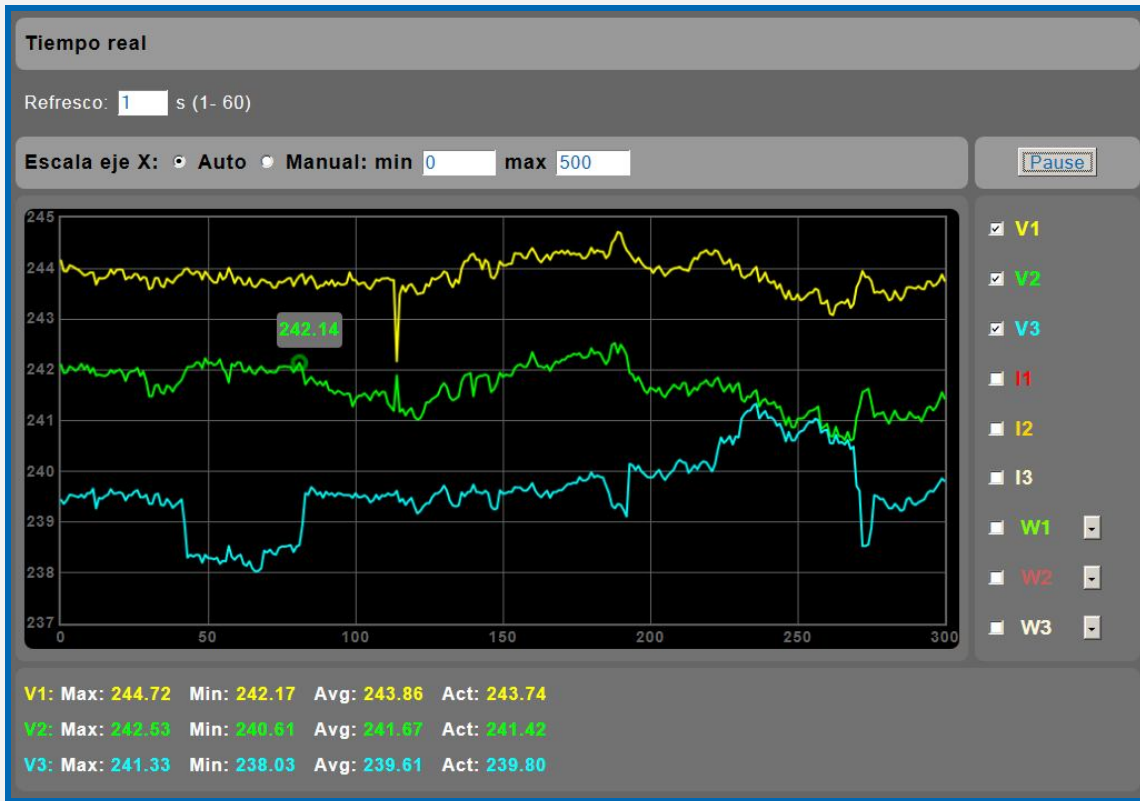
6-channel oscilloscope with (option OS) auto-refresh and autoscale. Includes instantaneous value measurement cursor in all channels. Continuous refreshment display of the 6 channels. (Intranet every 0,3 sec. approx.; Internet every 1,5 sec. approx.) using Internet Explorer 11. In order to view this page correctly, the PC, MAC, smartphone, tablet, PDA, browser must have Internet access. On an Intranet network, there must be a server with the library files uploaded. These files are easily installed in any computer (consult UNIVERSAL+ Apache manual).

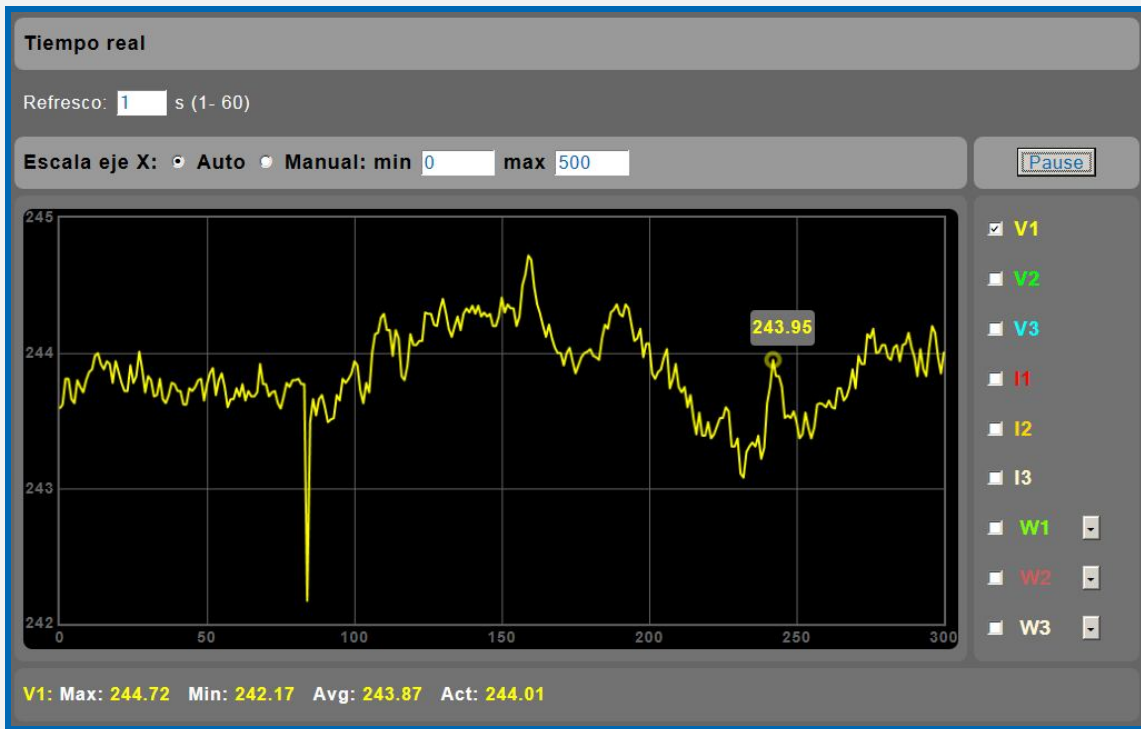




3.4 WEB page: Box “Real time”

300-event graphic logger, 9 channels (28 measurements) with autoscale and variable refreshment (1-600 secs.). With temporary maximum, minimum and average measurements. Includes 9-channel 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).





3.5 WEB page: Box “Energy log” G3 version

Opción “G3”: Energy log (L1, L2, L3 and ΣL1,2 and 3) with built-in 1.5-year memory

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 .

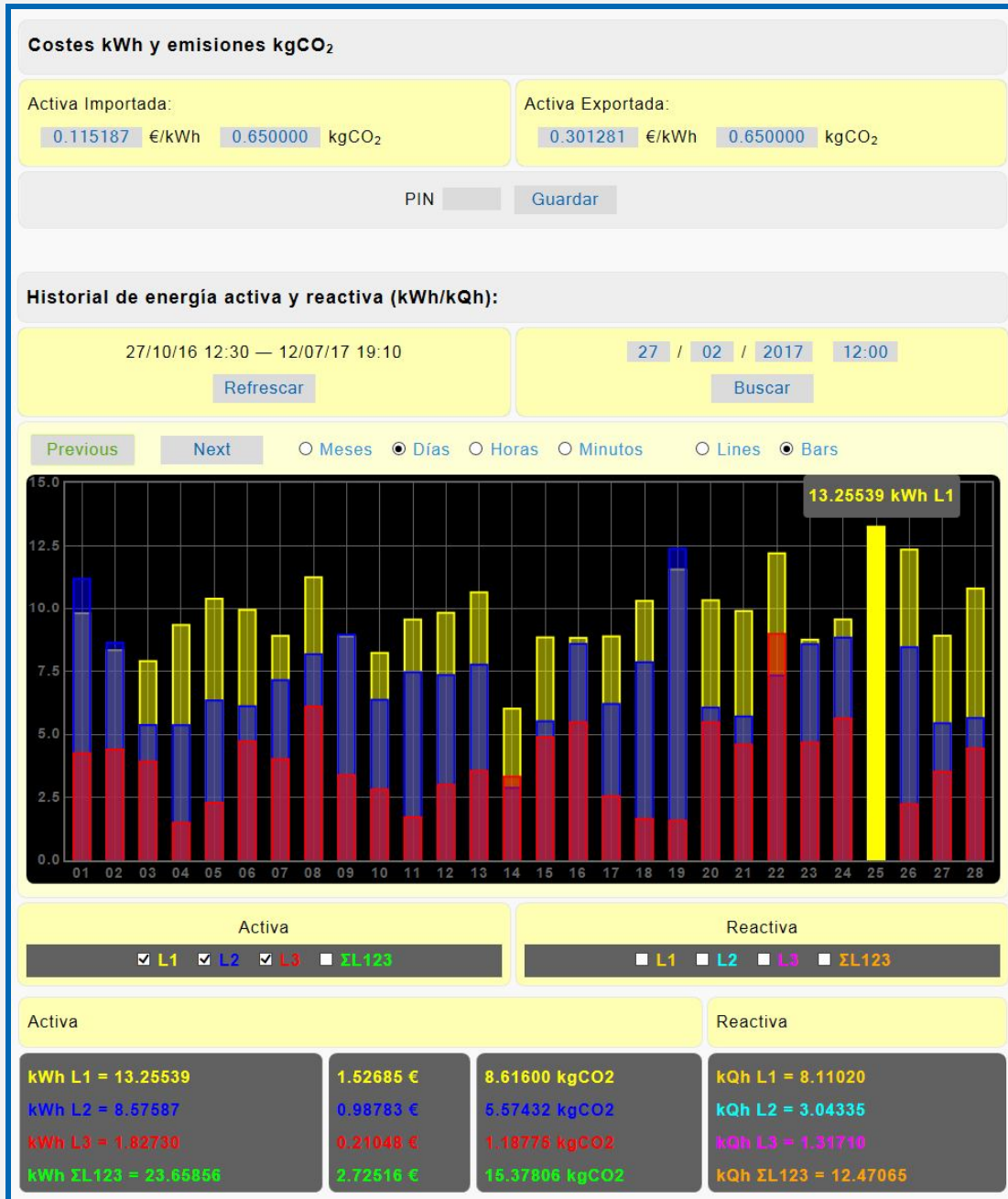
Option “G3” includes measurement cursor in all **four** (active and reactive) channels

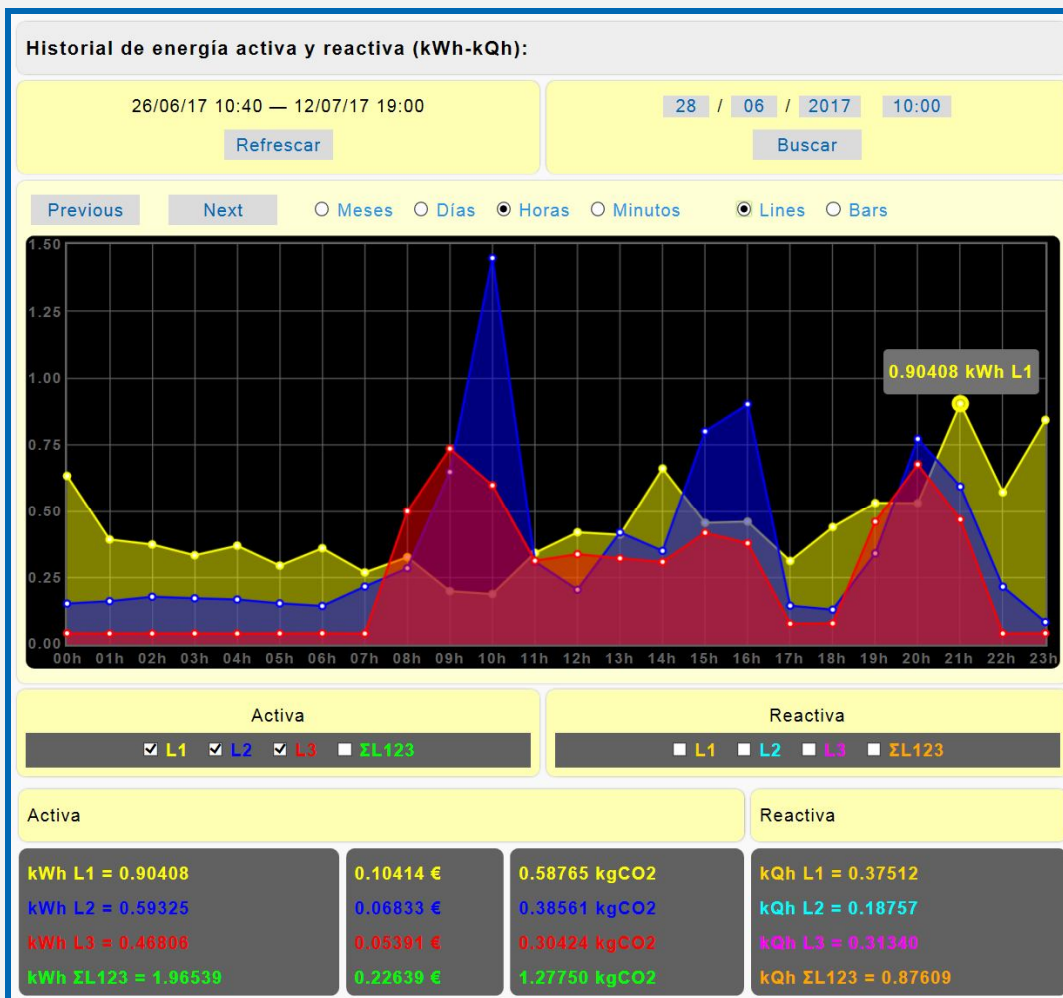
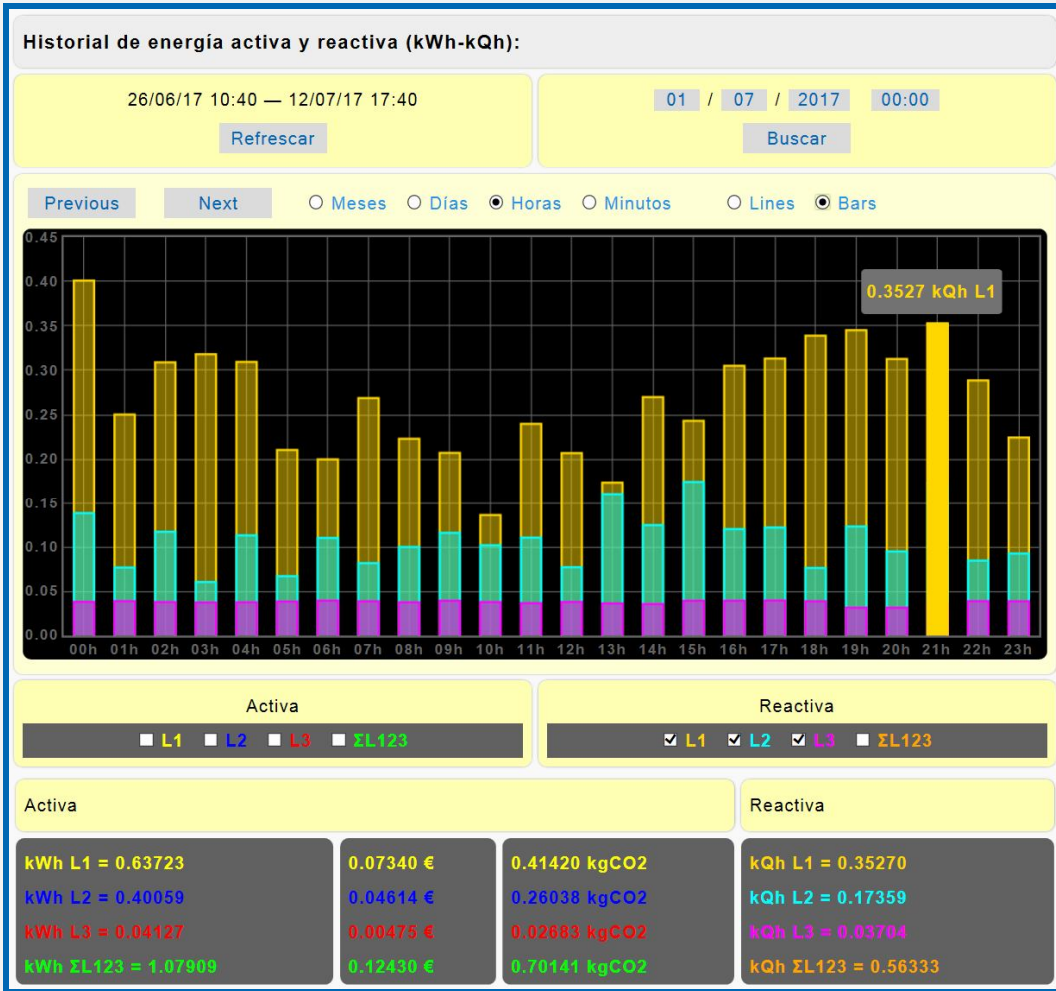
The emissions ratio is the amount of carbon emitted into the atmosphere to produce 1kWh.

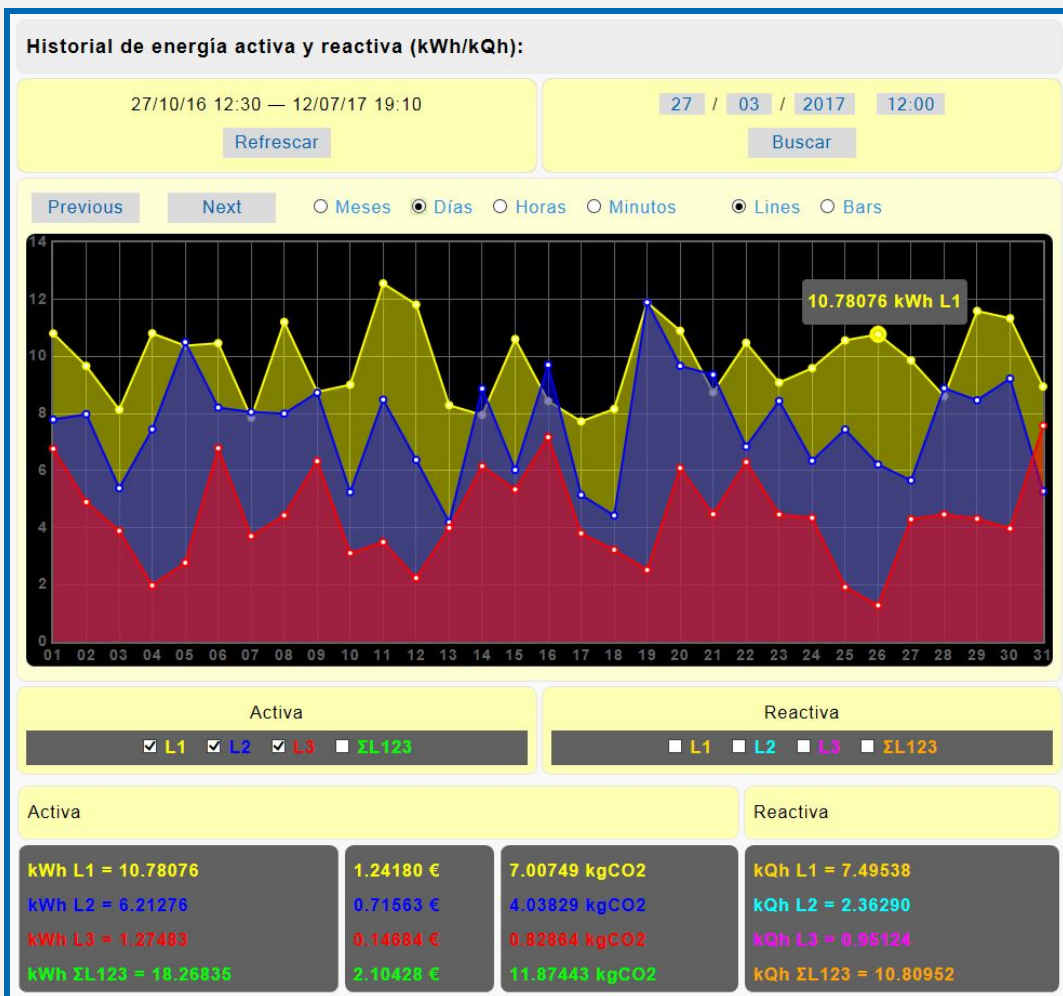
The European ratio is approximately 0.65 kg CO₂ per kWh.

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).







3.6 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

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

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

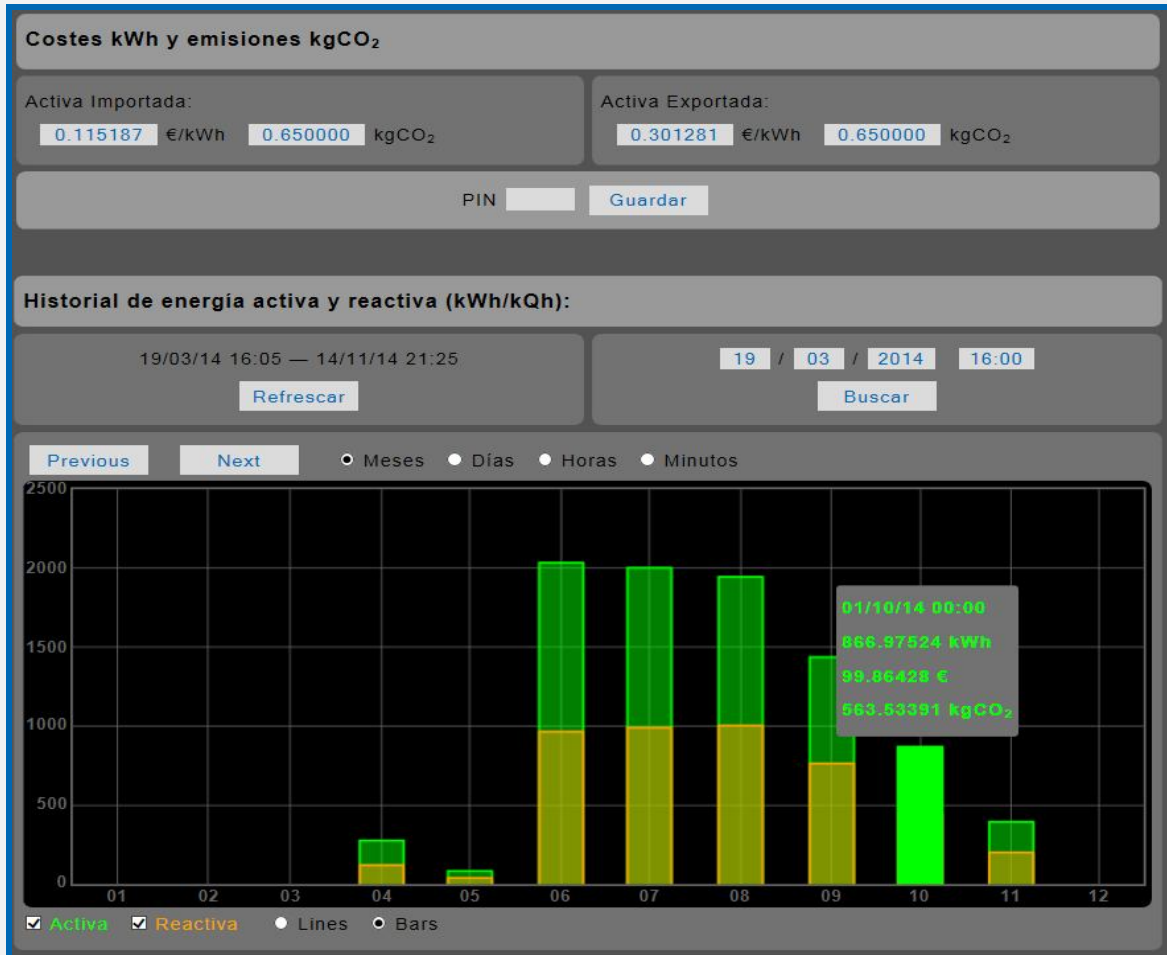
Option “G” includes measurement cursor in both (active and reactive) channels.

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

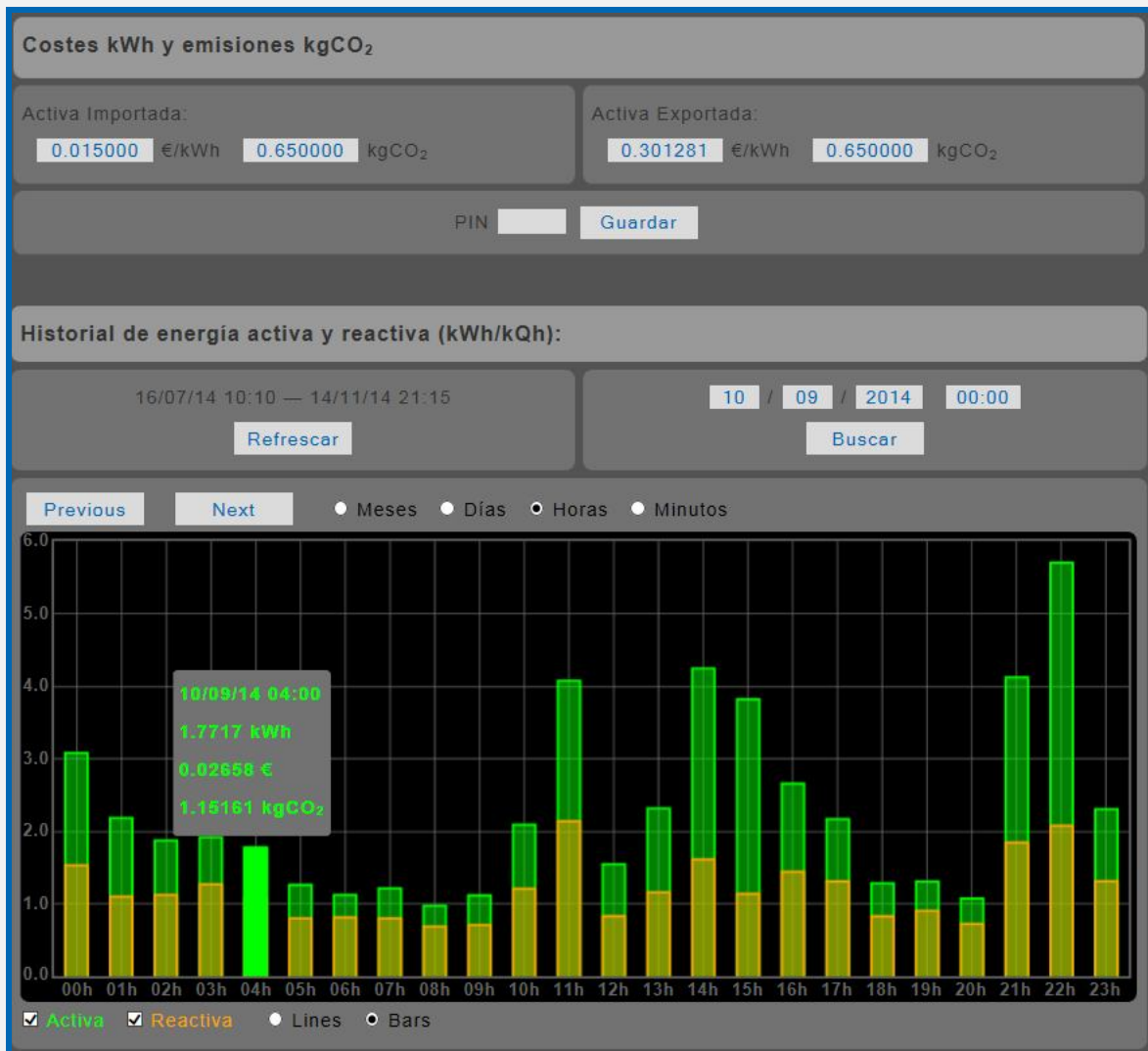
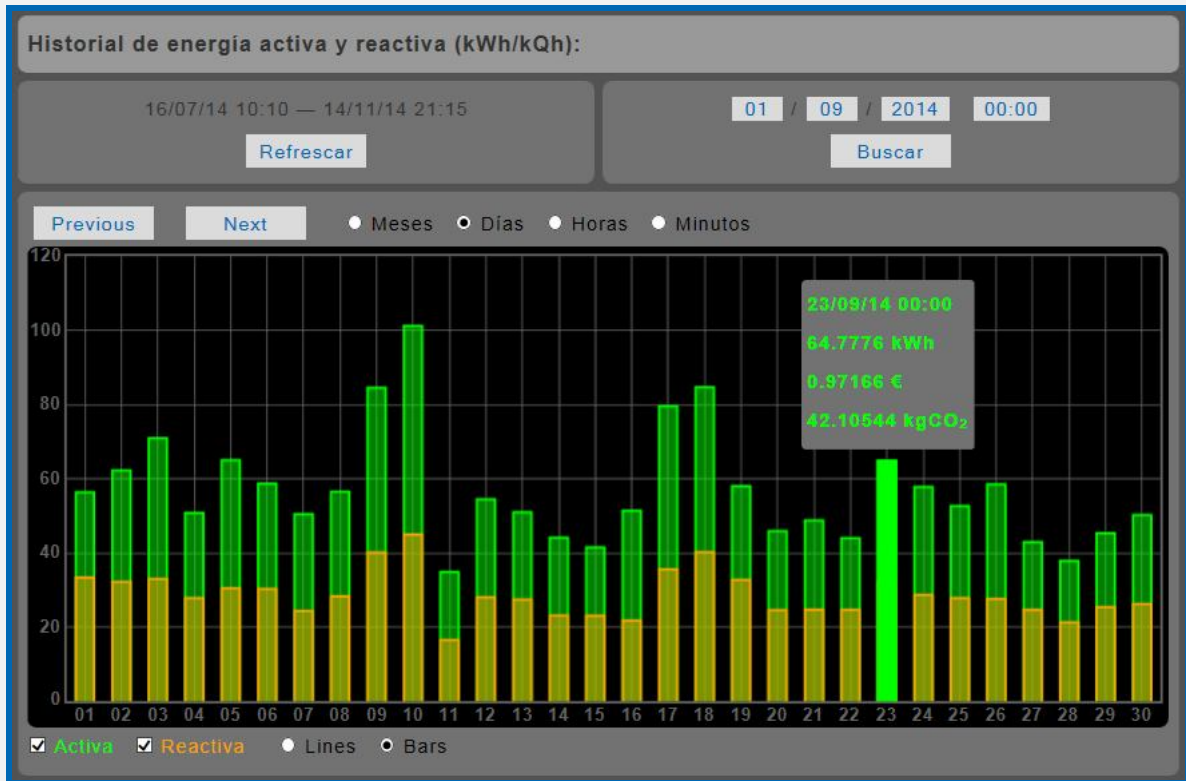
The European ratio is approximately 0.65 kg CO₂ per kWh.

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).












3.7 WEB page: "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

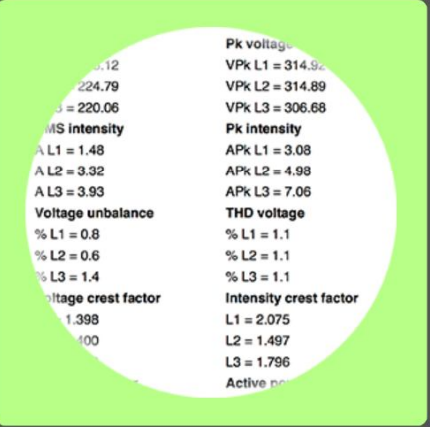


Frecuencia

Hz L1 = 50.0	A L1 = 0.93
Hz L2 = 50.0	A L2 = 9.3
Hz L3 = 50.0	A L3 = 1.93

Intensidad Pk

APk L1 = 0.93

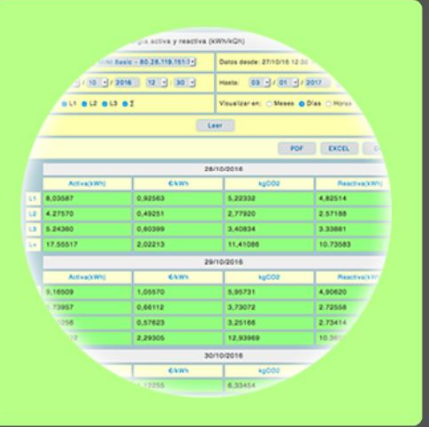


Vpk voltage
VPk L1 = 314.92
VPk L2 = 314.89
VPk L3 = 306.68

Pk intensity
APk L1 = 3.08
APk L2 = 4.98
APk L3 = 7.06

THD voltage
% L1 = 1.1
% L2 = 1.1
% L3 = 1.1

Intensity crest factor
L1 = 2.075
L2 = 1.497
L3 = 1.796



Historial de energía

Activa (kWh)	Reactiva (kVh)	Coste (€)	Emisiones (kgCO2)
L1 8.22887	0.30563	5.22332	4.82514
L2 4.27570	0.43211	2.77920	2.57188
L3 5.24360	0.80389	3.40834	3.33861
T 17.55517	2.02213	11.41086	10.73583

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.


3.8 WEB paje 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

Policomparador energético remoto

Generador de informes

Generador de informes energéticos

Multigenerador de informes energéticos

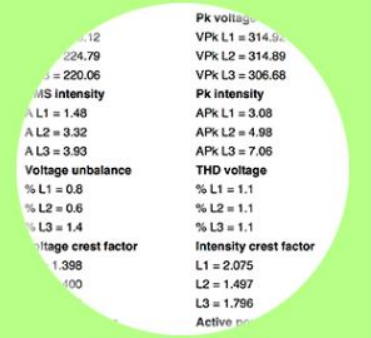
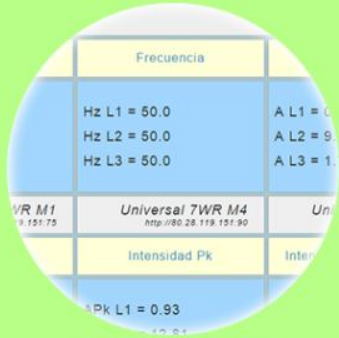
Este nuevo complemento permite personalizar y organizar las medidas que necesite de multitud de equipos, para así poderlas comparar entre ellas en tiempo real.

¿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!

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.

¡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.



3.9 WEB page: Box “Unit configuration”

The following frame permits the user to edit the name of the unit, establish the language, intensity transformer ratio and maximeter average, configure the clock and initialise the energy log memory.

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.

The security PIN accepts and saves the changes effected during the programming process.

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.

Nombre de este equipo

Idioma

Español Inglés

Relación transformador de Intensidad

/5A (50 - 10000)

Potencia Activa (Máximetro)

Promedio
 s (10 - 900)

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

Si No

Aceptar y guardar cambios

PIN

Configuración reloj

Fecha: / / *
 Día:
 Hora:

Cambio de hora automático: Si No

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

PIN

Inicializar memoria de consumos energéticos

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

PIN

3.10 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.

Modbus

Activado Desactivado (Aumenta de 4 a 6 los sockets TCP/IP)

PIN

TCP/IP Configuración

Dirección IP
 Máscara de subred
 Puerta de enlace
 Puerto
 MAC

PIN

TCP/IP Configuración (Servidor remoto)

Activado Desactivado

Nombre

URL

Usuario

Contraseña

PIN

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

Si No

PIN

Cambiar PIN

PIN

Nuevo PIN

Repetir nuevo PIN

Ubicación de la carpeta de gráficos

PIN

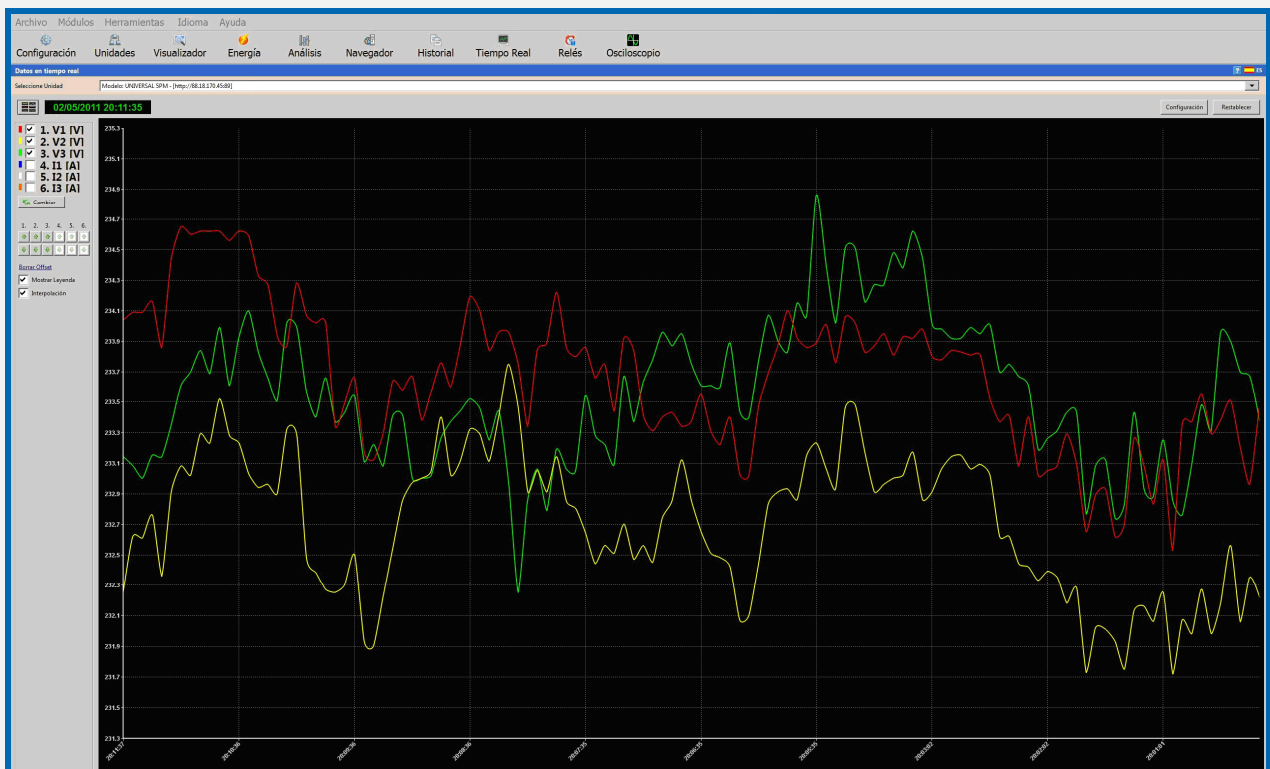
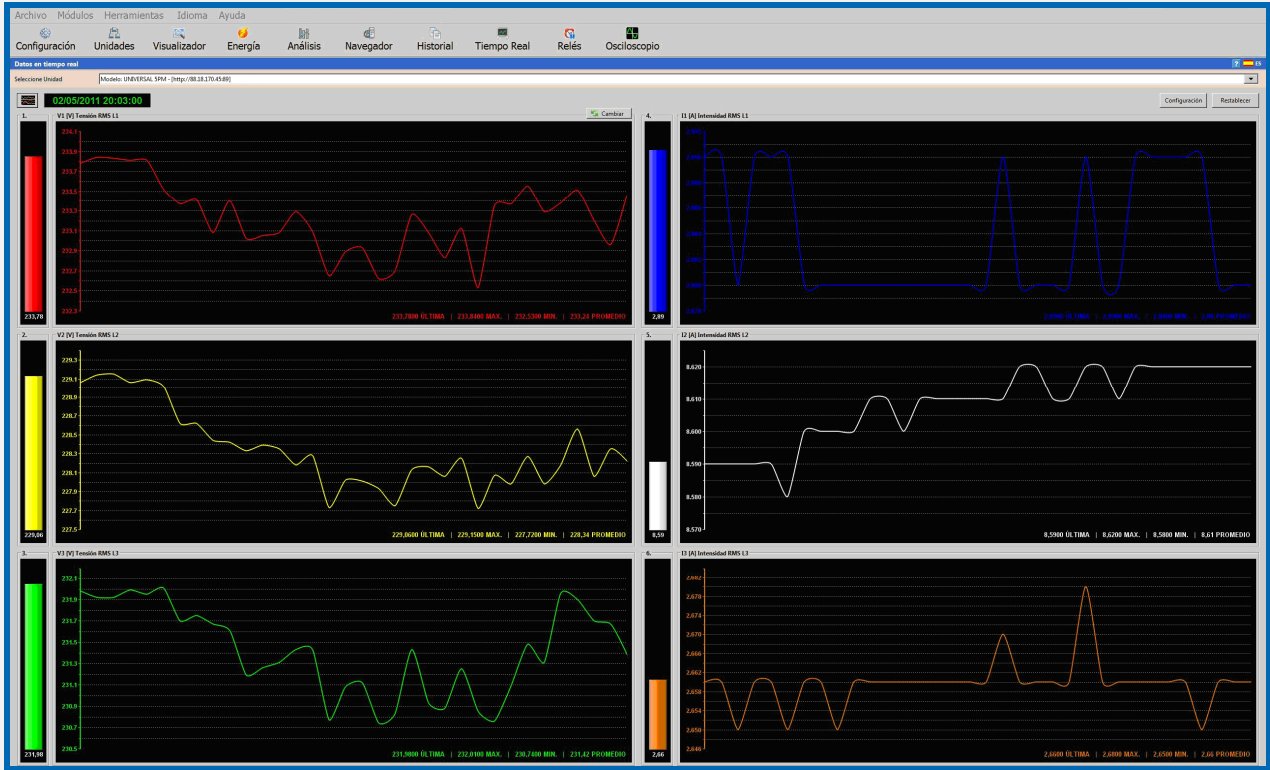
3.9 WEB page: Box “Close session”

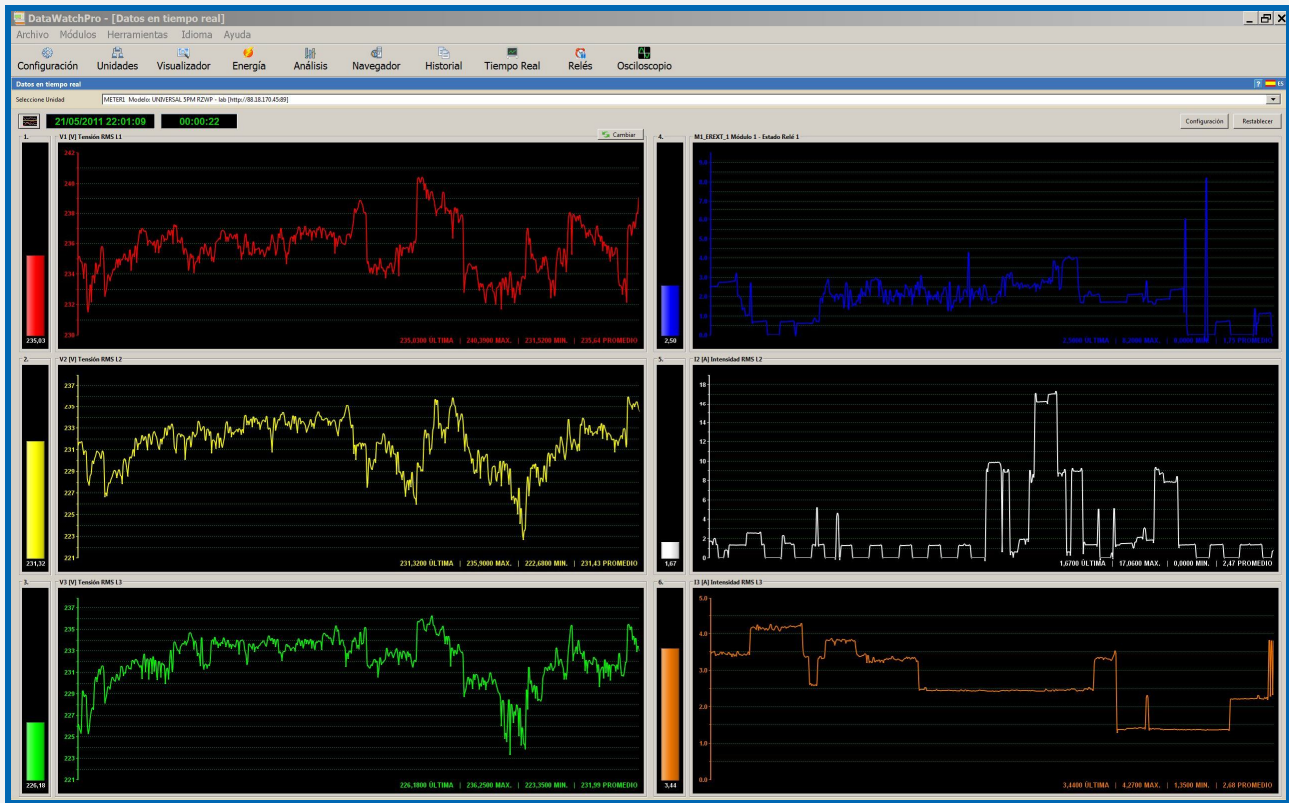
Closes the session. The session having been closed, the next time the user attempts to access the content, the access PIN will be requested. For security reasons, an automatic session closure is generated every 30 minutes should the session have been quitted without “close session” having been pressed.

Chapter 4 – DataWatchPro professional software

Attention: Date and time must be updated in the unit before using the DatawatchPro software.

4.1 Module – Real time

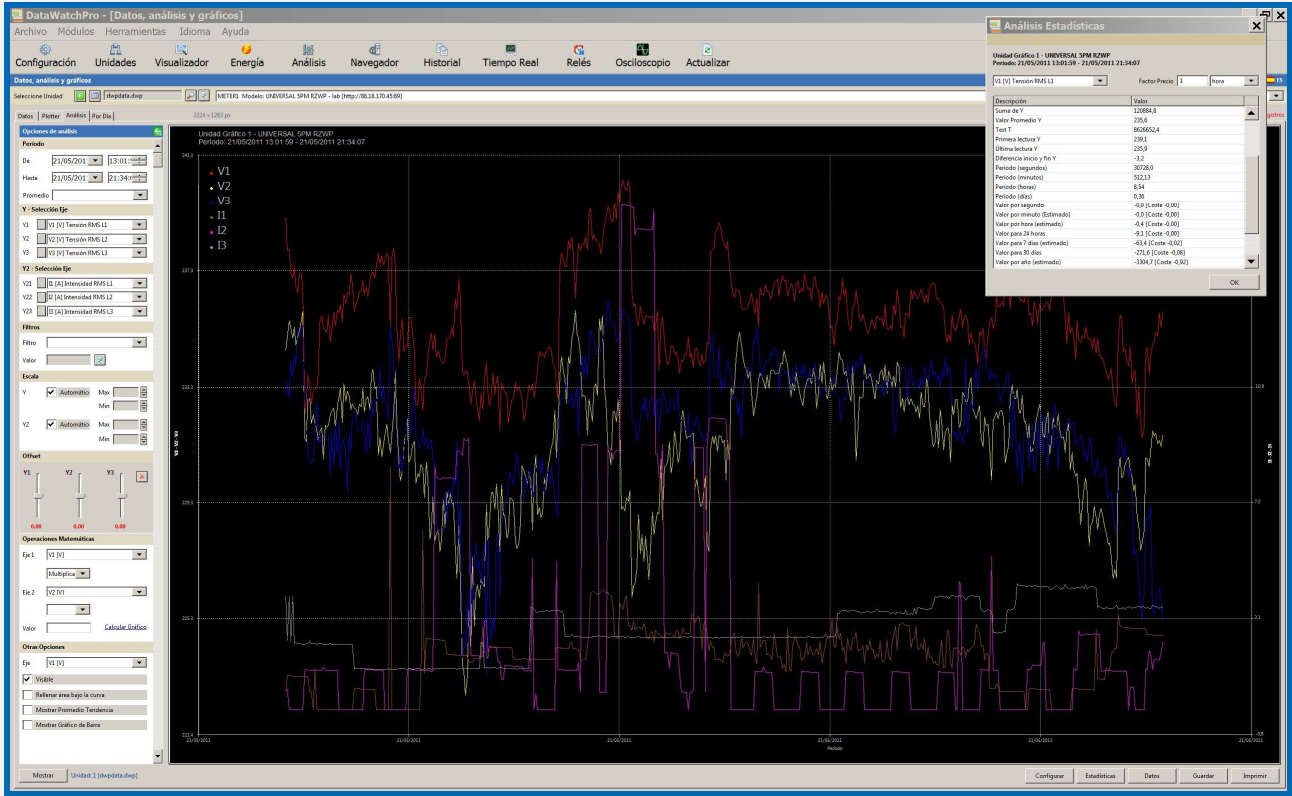




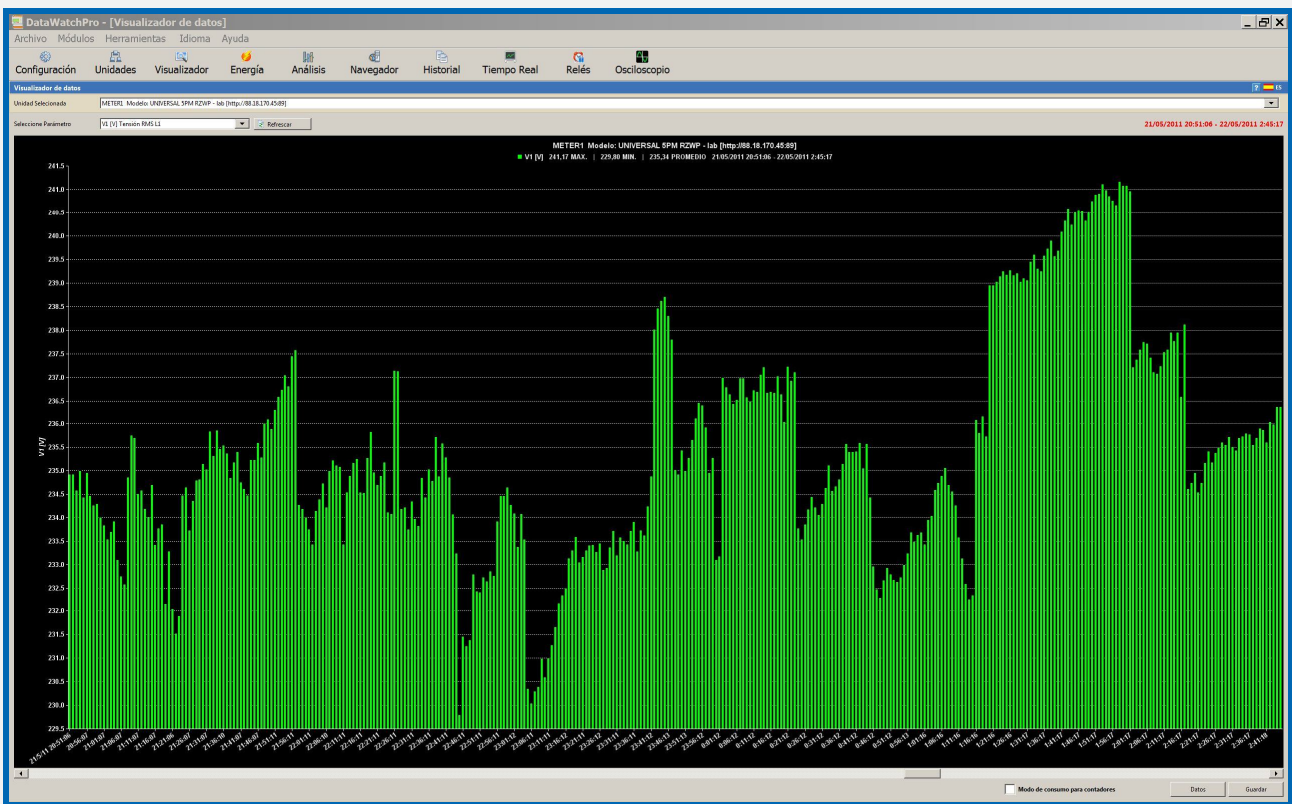
4.2 Module – numerical data analysis

The screenshot shows a numerical data analysis table with the following columns: ReadID, UnitID, ReadTime, MODE, UVER, NOM, V1, and V2. The table contains multiple rows of data, including a summary row at the bottom with values like 230.08, 234.56, 237.96, 235.55, 237.18, 235.31, 237.18, 234.97, 234.44, 235.15, 236.73, 234.73, 235.02, 235.02, 235.2, 232.04, 233.18, 232.89, 233.67, 232.02, 233.18, 232.31, 233.23, 232.04, 233.26, 231.8, 233.78, 231.37, 233.72, 231.87, 235.31, 235.08, 235.26, 231.95, 235.15, 231.89, 235.75, 231.95, 234.83, 232.68, 234.83, 232.68, 235.52, 232.44, 235.86, 232.53, 235.37, 231.89, 235.9, 232.5, 236.3, 233.33, 236.57, 232.69, 236.71, 232.89, 236.47, 232.84, 236.38, 232.67, 235.85, 232.5, 233.17, 233.66, 233.22, 233.9, 233.02, 233.23, 233.41, 233.31, 233.86, 232.94, 233.86, 232.5, 233.54, 233.78, 233.98, 233.76, 233.62, 233.87, 233.87, 233.87, 233.75, 231.48, 233.01, 232.45.

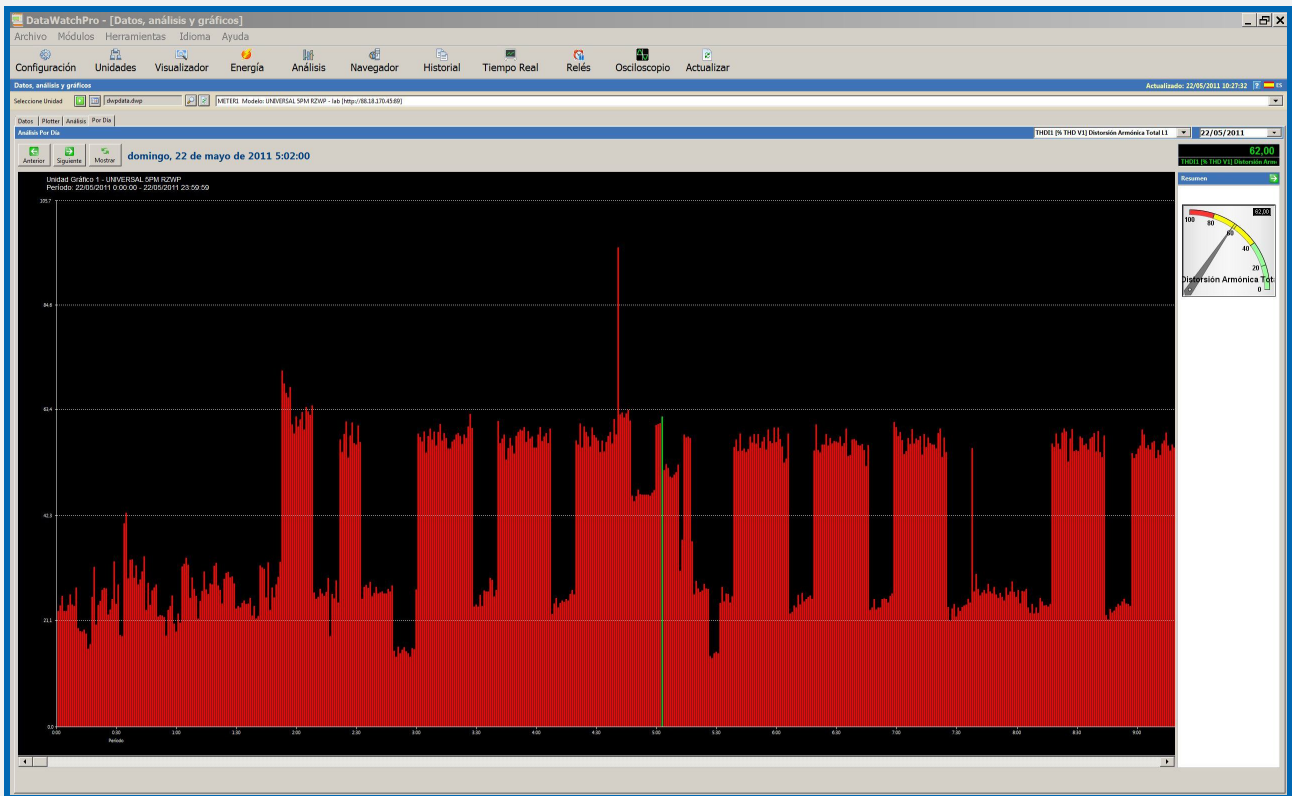
4.3 Module – graphic data analysis



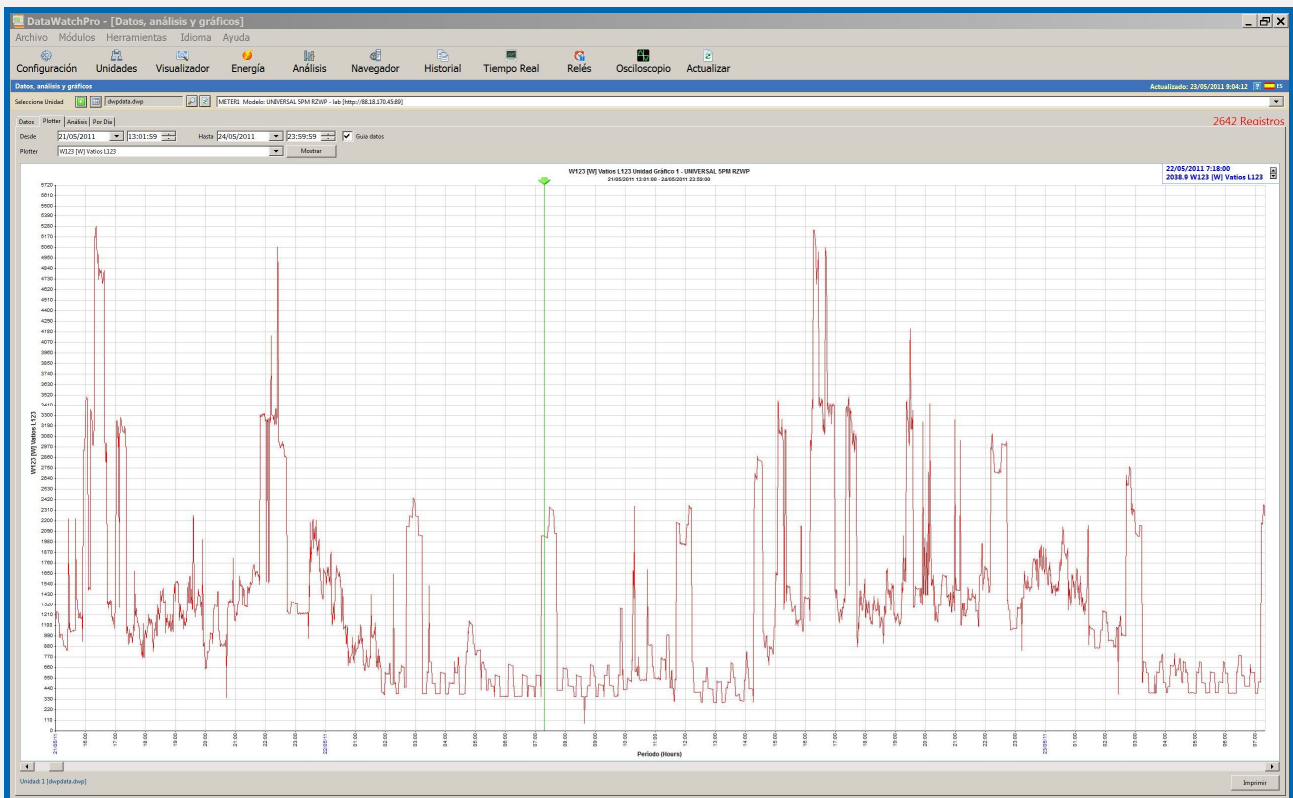
4.9 Module – Graphic display (rapid analysis)

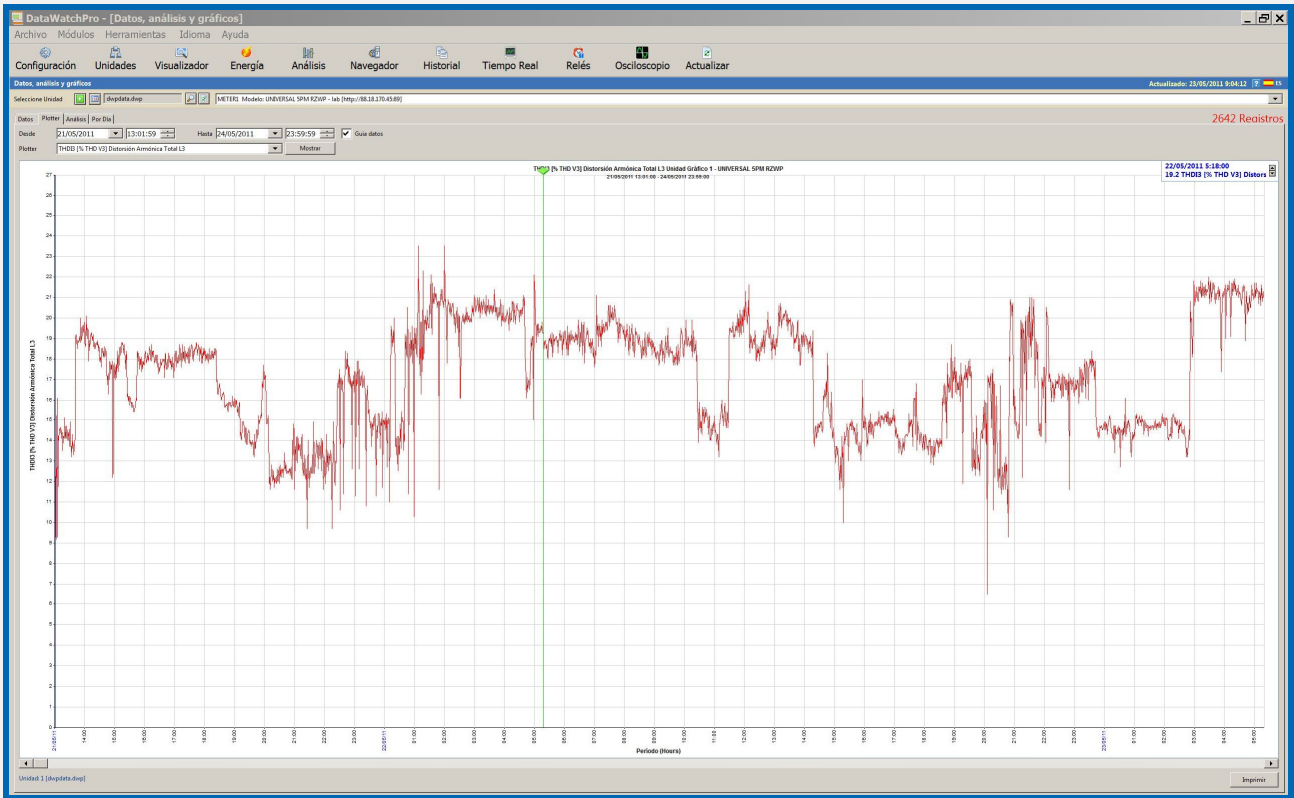


4.5 Module – daily analysis

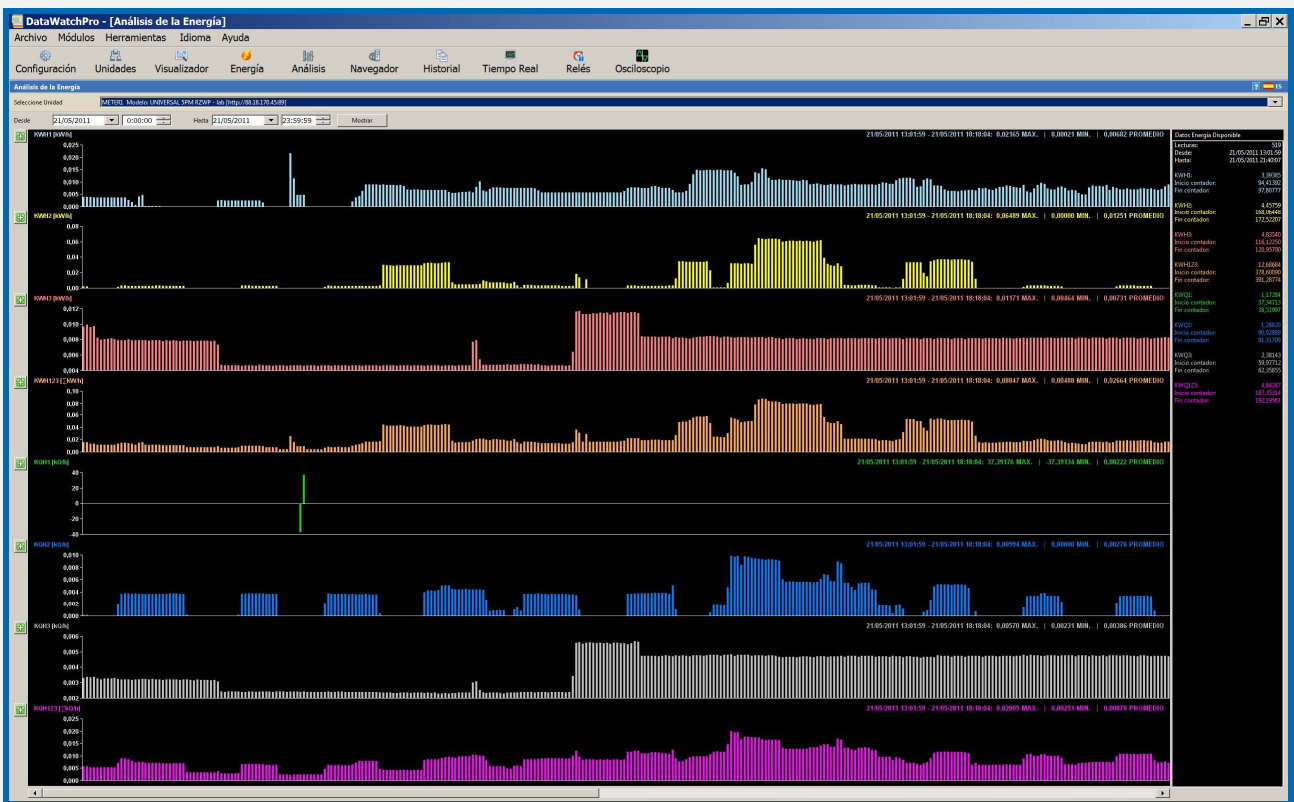


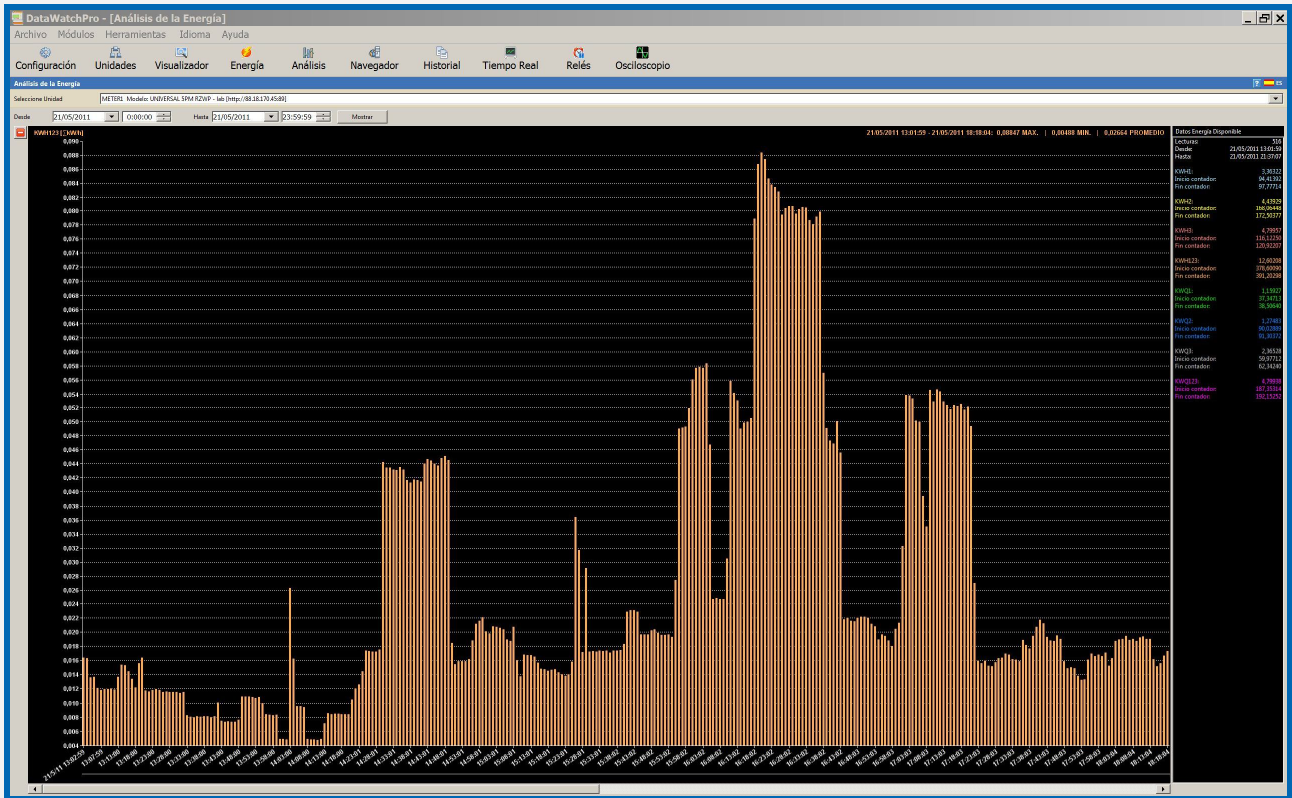
4.6 Module – graphic plotter (long period graphic analysis)





4.7 Module – energy analysis





4.8 General configuration

The screenshot shows the 'DataWatchPro - [Configuración del sistema y datos predeterminados]' window. The 'Email' tab is selected, and the 'Configuración del sistema y datos predeterminados' section is active. The interface includes a warning about SMTP requirements and input fields for email addresses and SMTP account details.

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):

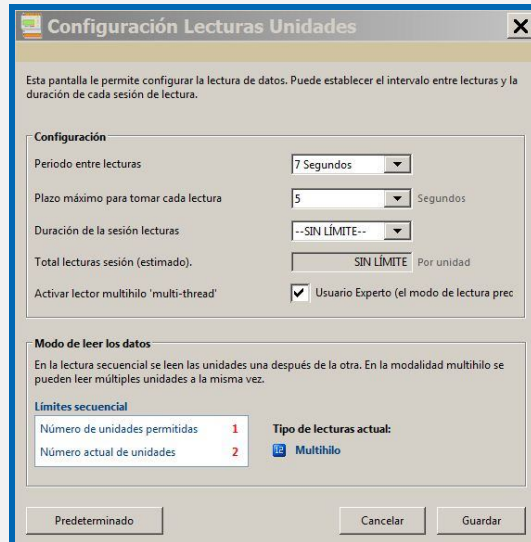
Requiere autenticación:

Usuario:

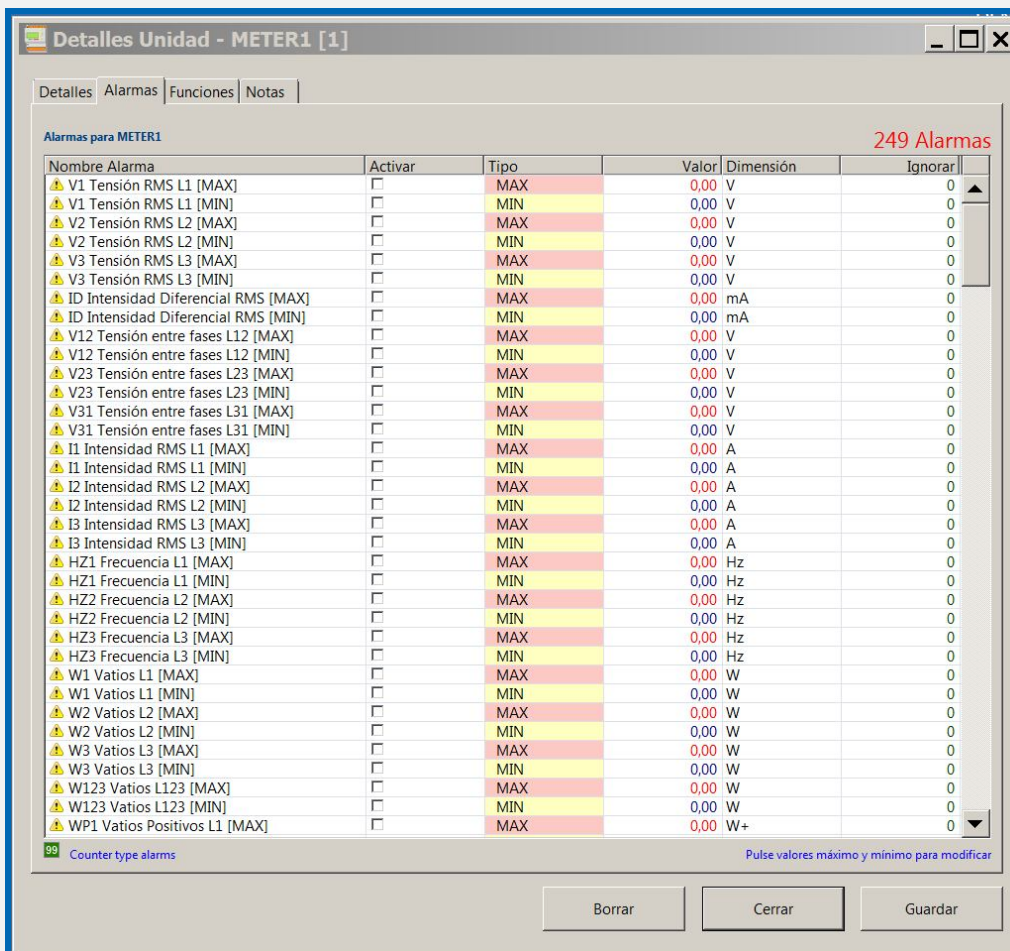
Contraseña: [Enviar Email de prueba](#)

Buttons: Cancelar, Guardar

4.9 Readings configuration



4.10 Alarms configuration (independent notifications via e-mail of 100 programmable alarms)



Chapter 5 – General description

5.1 Display

Display and/or programming via the WebServer via Internet/Intranet.

5.2 DWP (DataWatchPro). Software for PC

Professional software for PC with data base and graphic analysis.

The **DWP (DataWatchPro)** is a cutting-edge software with a permanent register on a data base.

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

It is made up of multiple graphic and process display modules, independent automatic notifications via e-mail of all metering alarms, etc.

Please, refer to Chapter 4

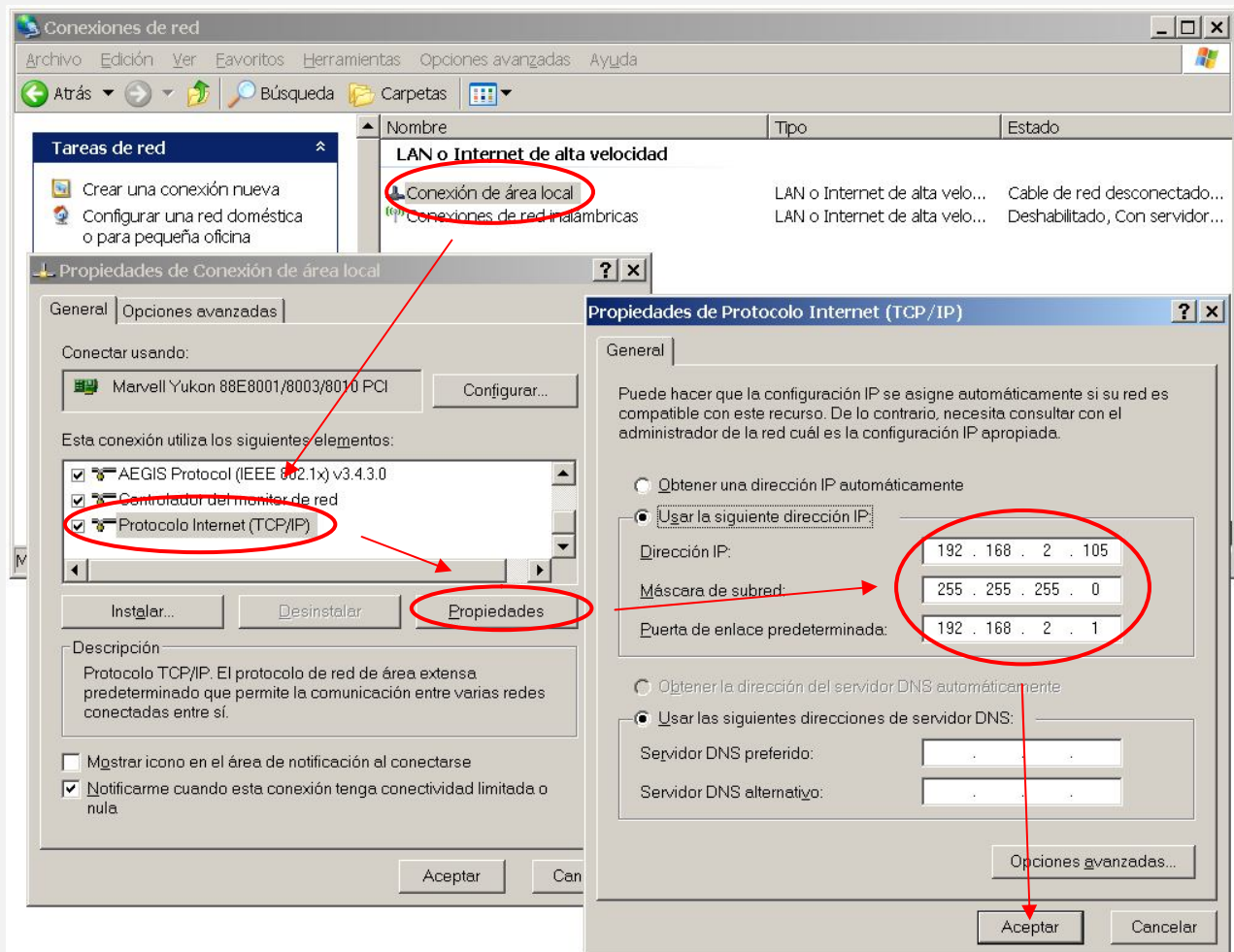
CHAPTER 6 – Installation guide (Internet / Intranet configuration)

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

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

Conexión

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

Actividad

Enviados: 390 Paquetes Recibidos: 0

Propiedades de Conexión de área local

Funciones de red

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

Descripción: Protocolo TCP/IP. El protocolo de red de área extensa predeterminado que permite la comunicación entre varias redes conectadas entre sí.

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

General

Puede hacer que la configuración IP se asigne automáticamente si la red es compatible con esta funcionalidad. De lo contrario, deberá consultar con el administrador de red cuál es la configuración IP apropiada.

Obtener una dirección IP automáticamente

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

Obtener la dirección del servidor DNS automáticamente

Usar las siguientes direcciones de servidor DNS:

Servidor DNS preferido: . . .

Servidor DNS alternativo: . . .

Validar configuración al salir

Opciones avanzadas...

Aceptar Cancelar

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` or `y.y.y.150` (i.e. the assigned IP) in the address bar. 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
<code>http://80.65.135.62</code>	<code>80.65.135.62 → 192.168.2.10</code>	<code>192.168.2.10</code>

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
<code>http://80.65.135.62:120</code>	<code>80.65.135.62:120 → 192.168.2.10:120</code>	<code>192.168.2.10:120</code>

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 o V Ln	Line voltage n=1, 2, 3
VPkn	Peak line voltage n=1, 2, 3
A o 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 o UnbVn	Line voltage unbalance n=1, 2, 3
DesIn o 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
$\sum L_{123}$	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 o I Dif.	Differential intensity
“IΔn”	Rated differential intensity
“In” o I. neutro	Neutral intensity
Temp.	Temperature
Tempo. 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
Block	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
Autoescala	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
Valor RMS	RMS of wave cycle of 20mS(50Hz) or 16.66mS(60Hz)
Valor Pk	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
Display LCD	Liquid crystal display screen
ms	Milliseconds (1ms = 1segundo/1000)
Watchdog	Process monitoring system

7.2 Formulae

Voltaje RMS:	$V_{rms} = \sqrt{\frac{1}{n} \sum_{n=1}^{n=128} V_n^2}$
Intensidad RMS:	$I_{rms} = \sqrt{\frac{1}{n} \sum_{n=1}^{n=128} I_n^2}$
Potencia Aparente:	$VA = V * I$
Potencia Activa:	$W = \frac{1}{n} \sum_{n=1}^{n=128} (V_n * I_n)$
Potencia Reactiva:	$VA_r = \sqrt{VA^2 - W^2}$
Factor de potencia:	$PF = \frac{P}{S}$
Factor de cresta:	$CF = \frac{V_{pk}}{V_{rms}}$
Impedancia:	$Z = \frac{V_{rms}}{I_{rms}}$
THDV:	$THDV = \frac{1}{V_{h1}} \sqrt{\sum_{n=2}^{n=128} V_{hn}^2} * 100$
THDi:	$THDi = \frac{1}{I_{h1}} \sqrt{\sum_{n=2}^{n=128} I_{hn}^2} * 100$
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:	$I_{LN} = \sqrt{\frac{1}{n} \sum_{n=1}^{n=128} (I_{1n} + I_{2n} + I_{3n})^2}$
Voltaje Vpk:	$V_{pk} = \frac{ V_{pk+} + V_{pk-} }{2}$
Intensidad Ipk:	$I_{pk} = \frac{ I_{pk+} + I_{pk-} }{2}$

Chapter 8 – User's guide

8.1 Reset key

RESET key:

General reset (with the unit functioning)

Held down for more than 10 seconds, the unit undergoes a GENERAL RESET

Most important:

The general reset restores the TCP/IP parameters to ex-factory values and enables TCP/IP programming via Internet/Intranet. It deletes all recorded data except for:

- User PIN

Default configuration ex-factory:

IP:Port	192.168.2.10
Gateway	192.168.2.1
Mask	255.255.255.0
Port	80

8.2 User PIN

The user PIN represents a high degree of security for the owner surfing Internet/Intranet since this is the sole means whereby the programmed parameters can be validated. Any changes in programmed values only come into effect once said PIN has been entered.

Made up of 4 digits, each one from 0 to 9

- Default PIN enabled at factory: **1,2,3,4**
- The user PIN can be changed if one is in possession of the current one

NOTE: The 0,0,0,0 PIN is a special PIN which totally cancels request for same. The unit will not request it in any change in programming. The user can change any value either via the front panel or Internet (on condition that the latter is not in read-only mode). This PIN can be useful as a temporary measure during a training process or an overhaul or revision of the unit. However, its use is not recommended on a permanent basis in an installation due to problems which could be caused by unauthorised personnel.

WARNING: For security reasons, no master code exists. In case of loss, the user must contact the manufacturer to have the unit re-programmed and thoroughly verified. It is recommended that this PIN be noted down and kept in a safe place.

NOTA: For security reasons, if the TCP/IP programming is disabled from Internet/Intranet, it can only be re-enabled from the unit itself by means of the reset key.

8.3 I measurement transformer ratio

Permits the user to program the ratio of the convolutions of the intensity measurement transformers for lines L1, L2 and L3.. Programmable from 50A / 5A up to 10.000A / 5A (in 5A steps).

IMPORTANT: Ensure that the intensity transformers are compatible with the different configurations for the UNIVERSAL+ 7WR MINI BASIC range.

Three-phase:

7WR MINI BASIC E 70A	Programming:	70 A / 5 A	Only toroidals TRIT14, TRIT18, TRIT26
7WR MINI BASIC E 140A	Programming:	140 A / 5 A	Only toroidals TRIT18, TRIT26
7WR MINI BASIC E 280A	Programming:	280 A / 5 A	Only toroidals TRIT26
7WR MINI BASIC E up to 10,000A	Programming:	xxxx A / 5 A	TRIT7 + standard transformer, 50A/5A up to 10,000A/5A

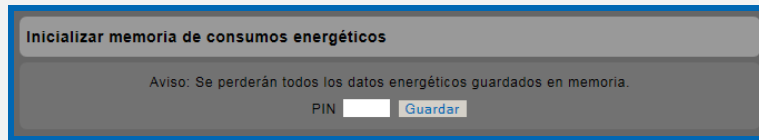
Single-phase:

7WR MINI BASIC E 70A	Programming:	70 A / 5 A	Only toroidals TRIT14, TRIT18, TRIT26
7WR MINI BASIC E 140A	Programming:	140 A / 5 A	Only toroidals TRIT18, TRIT26
7WR MINI BASIC E up to 10,000A	Programming:	xxxx A / 5 A	TRIT7 + standard transformer 50A/5A up to 10,000A/5A

8.4 Energy log with built-in 3-year memory (G version)

Memory: The unit has sufficient memory to store three years' monthly, daily, hourly and 5-minute frame consumptions. Once the 3-year memory is used up, no more data can be stored.

In order to store another 3-year cycle, the memory must be deleted after having entered the user pin.



Iniciar memoria de consumos energéticos

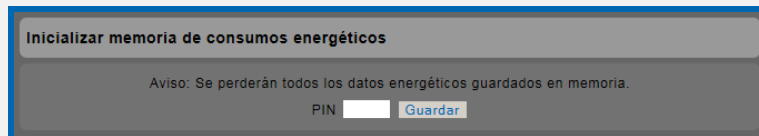
Aviso: Se perderán todos los datos energéticos guardados en memoria.

PIN Guardar

8.5 Energy log with built-in 1.5-year memory (G3 version)

Memory: The unit has sufficient memory to store three years' monthly, daily, hourly and 5-minute frame consumptions. Once the 1.5-year memory is used up, no more data can be stored.

In order to store another 1.5-year cycle, the memory must be deleted after having entered the user pin.



Iniciar memoria de consumos energéticos

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

PIN Guardar

Attention: Update the time and date in the unit's clock in order to obtain correct data in the energy log manually or automatically.

Chapter 9 –Technical characteristics (please, refer to synoptical tables of characteristics)

9.2- Technical characteristics - UNIVERSAL+ 7WR MINI BASIC (version 0.5% precision)

Technical characteristics - UNIVERSAL+ 7WR MINI BASIC (version precision 0.5%) L-N 230V AC ± 15 % 50Hz alternating sinusoidal	
Measurement: True RMS voltage L1, L2, L3 (line neutral)	from 50,00V to 350,00V (version 500E = full scale 500V Pk.)
Measurement: True RMS voltage between phases L1 L2, L2 L3, L3 L1	from 100,00V to 600,00V (version 500E = full scale 500V Pk.)
Measurement: True RMS intensity in autoscale Example for a programming of 70A RMS	Programmable from 50 A / 5 A, up to 10.000 A / 5 A (in 5A steps from 0,14A to 12,60A and 11,20A to 70,00A)
Measurement: Neutral intensity Example for a programming of 70A RMS	Range similar to RMS intensity from 0,50A to 70,00A
Measurement: Active power (W) L1, L2, L3, Σ L123	Resolution: 0,1W
Measurement: Apparent power (VA) L1, L2, L3, Σ L123	Resolution: 0,1VA
Measurement: Reactive inductive power L1, L2, L3, Σ L123	Resolution: 0,1VarL (from an FP of 0,995)
Measurement: Reactive capacitive power L1, L2, L3, Σ L123	Resolution: 0,1VarC (from an FP of 0,995)
Measurement: Power factor L1, L2, L3	from 0,000 to 1,000
Measurement: Active power W L1, L2, L3.	Maximeter (power integration) programmable from 10 secs to 15 mins
Counter: Active imported energy L1, L2, L3, Σ L123	from 0000000,00001 kWh to 9999999,99999 kWh
Counter: Active exported energy L1, L2, L3, Σ L123	from 0000000,00001 kWh to 9999999,99999 kWh
Counter: Reactive energy L1, L2, L3, Σ L123	from 0000000,00001 kQh to 9999999,99999 kQh (from an FP of 0,995)
Measurement: line frequency L1, L2, L3 (line neutral)	45,0Hz a 55,0Hz
% Measurement precision in: RMS voltage L1, L2, L3 (line neutral)	0.5 %
% Measurement precision in: RMS intensity L1, L2, L3	0.5 %
% Measurement precision in: Active power (W)	% Precision: V+I (RMS)+0.2
% Measurement precision in: Apparent power (VA)	% Precision: V+I (RMS)+0.2
% Measurement precision in: Reactive power	% Precision: V+I (RMS)+1.2
Specifications of typical precision and conditions for the module at:	1 year ± (% measurement precision + 2 digits + 0.3% of F.E.) with 22°C ± 5 °C, humidity 30 to 75% HR, range: 25-90%, 50Hz sinusoidal
WebServer in real time, display of variable parameters continuously refreshed (every 1.5 secs)	
Start-up WEB page, PIN	
WEB page: Box "Measures and events"	
WEB page: Box "Real time" 300-event graphic logger, 9 channels with autoscale	
WEB page: Box "Energy log" with 3-year built-in memory (optional)	
WEB page: Box "Unit configuration"	
WEB page: Box "Access configuration"	
WEB page: Box "Close session"	
300-register graphic logger, 9 channels (28 measurements) with autoscale and variable refreshment (1-600 secs with temporary max., min. and avg. measurements and 9 C. cursor	
Current value of 28 measurements	
Temporary maximum value (300 registers, 1-600 Secs.) of 28 measurements	
Temporary minimum value (300 registers, 1-600 Secs.) of 28 measurements	
Temporary average value (300 registers, 1-600 Secs.) of 28 measurements	
Difference in value between maximum and minimum (Max value – Min value) of 28 measurements	
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 Σ L1,2 and 3 three-phase) with built-in 3-year memory	
Opción "G3": Energy log (L1, L2, L3 and Σ L1,2 and 3) with built-in 1.5-year memory (only 3-phase model)	
5-minute interval active and reactive energy consumption log	
Hourly active and reactive energy consumption log	
Daily interval active and reactive energy consumption log	
Monthly interval active and reactive energy consumption log	
Modbus TCP/IP communication protocol, port 502, and TCP/IP. HTTP protocol. WebServer	
Measurements (Reading 35 measurements, 3-phase)	
Energy counters (Reading 12 counters, 3-phase)	
Maximum and minimum measurements (Reading 25 measurements, 3-phase)	
Reset commands, counter reset to zero. (Writing)	
6-channel oscilloscope with (optional) auto-refresh and autoscale. Includes instantaneous value measurement cursor in all channels.	
V L1, L2, L3 and A L1, L2, L3 three-phase, or V L1 and A L2 single-phase	

Other	
Working temperature: L-N 230V AC \pm 15%	0° to +45° C. Standard version -10° to +55° C. Industrial version :models with "TI" suffix -25° to +70° C. Extended industrial version :models with "TE" suffix
Dimensions - UNIVERSAL+ 7WR MINI BASIC - single-phase	18mm (1 module) height: 67mm 35mm DIN rail
Dimensions - UNIVERSAL+ 7WR MINI BASIC - three-phase	36mm (2 modules) height: 67mm 35mm DIN rail
Weight module UNIVERSAL+ 7WR MINI BASIC - single-phase	75 gr.
Weight module UNIVERSAL+ 7WR MINI BASIC - three-phase	135 gr.
Weight toroids	TRIT7 (12 gr.), TRIT14 (70 gr.), TRIT18 (185 gr.), TRIT26 (300 gr.)
Guarantee	3 years
Configurable languages	Spanish and English
In accordance with standards	UNE-EN 6101-1:2011 (IEC 61010-1:2011) UNE 20-600-77(CEI-278)
Full scale (F.E.): Voltage L1, L2, L3:	500V (version 500E = full scale 500V Pk.)
Full scale (F.E.): between phases L1 L2, L2 L3, L3 L1	900V (version 500E = full scale 500V Pk.)
Full scale (F.E.): Intensity L1, L2, L3:	from 50A to 10.000A (depending on programming of the intensity ratio) by 1,4142
Full scale (F.E.): Intensity L1, L2, L3:	20A y 100A in autoscale, version 70A
Full scale (F.E.): Intensity L1, L2, L3:	40A and 200A in autoscale, version 140A
Full scale (F.E.): Intensity L1, L2, L3:	80A and 400A in autoscale, version 280A
Full scale (F.E.): active power L1, L2, L3:	Intensity full scale, by voltage full scale (Max. 9999999,9 W)
Full scale (F.E.): apparent power L1, L2, L3:	Intensity full scale, by voltage full scale (Max. 9999999,9 W)
Full scale (F.E.): reactive power L1, L2, L3:	Intensity full scale, by voltage full scale (Max. 9999999,9 W)
Maximum and minimum measurement logs	cf synoptic tables of characteristics
WebServer (Version: HTML 4.01 Transitional, IPV4, connection RJ45 8 pin 10 BASE-T)	
DWP (DataWatchPro): Professional software for PC with database and graphic analysis.	

Version: 230V AC 50Hz (L1-N) supply. Version: 500E = full scale measurement line neutral 500V Pk.	
Consumption: (POWER L1-N)	1,3W a 230V AC RMS 50Hz sinusoidal alternating
Input voltage: (POWER L1-N) (normal operation)	230V AC \pm 15 % RMS 50Hz sinusoidal alternating
Input voltage: (POWER L1-N) (minimum and maximum limit)	from 170V up to 280V AC RMS 50Hz sinusoidal alternating
Input voltage: RMS phase neutral (INPUT 1 L1-N)	up to 280V RMS AC 50Hz
Input voltage: Pk phase neutral (INPUT 1 L1-N)	up to 395V Pk
Input voltage: RMS phase neutral (INPUT 2 L2-N)	up to 280V RMS AC 50Hz
Input voltage: Pk phase neutral (INPUT 2 L2-N)	up to 395V Pk
Input voltage: RMS phase neutral (INPUT 3 L3-N)	up to 280V RMS AC 50Hz
Input voltage: Pk phase neutral (INPUT 3 L3-N)	up to 395V Pk
Input voltage: RMS between phases L1 and L2, L1 and L3, L2 and L3	up to 450V RMS AC 50Hz
Input voltage: Pk between phases L1 and L2, L1 and L3, L2 and L3	up to 636V Pk
Version: 115V AC 50Hz (L1-N) supply. Version: 250E = full scale measurement line neutral 250V Pk.	
Consumption: (POWER L1-N)	1,3W a 115V AC RMS 50Hz sinusoidal alternating
Input voltage: (POWER L1-N) (normal operation)	115V AC \pm 15 % RMS 50Hz sinusoidal alternating
Input voltage: (POWER L1-N) (minimum and maximum limit)	from 85V up to 140V AC RMS 50Hz sinusoidal alternating
Input voltage: RMS phase neutral (INPUT 1 L1-N)	up to 140V RMS AC 50Hz
Input voltage: Pk phase neutral (INPUT 1 L1-N)	up to 197V Pk
Input voltage: RMS phase neutral (INPUT 2 L2-N)	up to 140V RMS AC 50Hz
Input voltage: Pk phase neutral (INPUT 2 L2-N)	up to 197V Pk
Input voltage: RMS phase neutral (INPUT 3 L3-N)	up to 140V RMS AC 50Hz
Input voltage: Pk phase neutral (INPUT 3 L3-N)	up to 197V Pk
Input voltage: RMS between phases L1 and L2, L1 and L3, L2 and L3	up to 250V RMS AC 50Hz
Input voltage: Pk between phases L1 and L2, L1 and L3, L2 and L3	up to 352V Pk

9.3 Description of connection terminals- UNIVERSAL+ 7WR MINI BASIC.

Description of connection terminals- UNIVERSAL+ 7WR MINI BASIC E three-phase 4-pole

Version: Line intensity transformer. Only transformers TRIT7, TRIT14, TRIT18 and TRIT26 (5A, 70A, 140A and 280A).

△ L1 POWER 230V	POWER PHASE L1 (LINE1) 230V L1-N AC + INPUT SENSOR INPUT1 MEASUREMENT L1
△ N POWER 230V	ALIMENTACIÓN NEUTRO + COMMON INPUT SENSOR INPUT1, 2 AND 3 MEASUREMENT N
△ L2	INPUT SENSOR INPUT 2 MEASUREMENT L2 (LINE 2) L2-N 230V AC
△ L3	INPUT SENSOR INPUT 3 MEASUREMENT L3 (LINE 3) L3-N 230V AC
△ k1	COMMON INTENSITY SENSOR L1 (MAXIMUM INTENSITY 0,1A RMS)
△ k2	COMMON INTENSITY SENSOR L2 (MAXIMUM INTENSITY 0,1A RMS)
△ k3	COMMON INTENSITY SENSOR L3 (MAXIMUM INTENSITY 0,1A RMS)
△ I1	INPUT INTENSITY SENSOR L1 (MAXIMUM INTENSITY 0,1A RMS)
△ I2	INPUT INTENSITY SENSOR L2 (MAXIMUM INTENSITY 0,1A RMS)
△ I3	INPUT INTENSITY SENSOR L3 (MAXIMUM INTENSITY 0,1A RMS)
△ ETHERNET	ETHERNET RJ45 CONNECTION

Description of connection terminals- UNIVERSAL+ 7WR MINI BASIC E single-phase 2-pole

Version: Line intensity transformer. Only transformers TRIT7, TRIT14, TRIT18 and TRIT26 (5A, 70A and 140A)

△ L POWER 230V	ALIMENTACIÓN FASE (LÍNEA) 230V AC + ENTRADA SENSOR INPUT1 DE MEDICIÓN L1
△ N POWER 230V	ALIMENTACIÓN NEUTRO + ENTRADA SENSOR INPUT1 DE MEDICIÓN N
△ I1	INPUT INTENSITY SENSOR L1 (MAXIMUM INTENSITY 0,1A RMS)
△ G	COMMON INTENSITY SENSOR (MAXIMUM INTENSITY 0,1A RMS)
△ 5	DO NOT CONNECT
△ ETHERNET	ETHERNET RJ45 CONNECTION

9.4 Description of display panel

1 - Green indicator LED (WORKING), slow flashing (1 Hz), indicates measurement in progress

2 – Square yellow push-buttons

RESET – (General Reset when held down more than 10 secs.)

Chapter 10 – User's/installation guide

10.1 Precautions / warnings for the user / installer

- Despite this unit's being of maximum safety, both from a design and features standpoint, the utmost care must always be taken when using it. It must not be used until its characteristics and mode of operation have been fully understood.
- The installation should be equipped with elements of protection against over-intensity (suitable fuses and circuit-breakers). The maximum intensity of the intensity measurement transformers must not be exceeded.
- The wiring of the installation and the installation itself must be foreseen so as to support the maximum intensity of the protection elements.
- Do not apply current nor use the unit until all its connections have been connected up and it has been correctly installed in a standard enclosure. Once current has been supplied to the unit, its connections must not be disconnected/connected.
- Do not connect the unit to any voltages/frequencies other than those indicated. (please, refer to technical characteristics).
- Caution: The unit's connecting terminals and the AUX. IN-OUT connector are not insulated from the mains. The Ethernet connector, however, does have insulation from the mains.
- Do not exceed the maximum intensity in the inputs of the intensity sensors L1, L2 and L3.
- In the version of the line intensity measurement toroidal transformer nomenclature "E", install only transformers TRIT7, TRIT14, TRIT18 and TRIT26 (5A, 70A, 140A and 280A).
- For the protection of electrical installations, use UNIVERSAL+ 7WR M1, M2 and M3 (versions command 1, command 2 and command 3).
- Do not expose to liquids or humidity.
- Do not drop, knock or expose to vibrations.
- Do not expose to sources of heat
- Do not expose to environmental temperatures, depending on version, below 0°, -25° C. or over 40°, 50°, 70° C.
- Do not expose to magnetic sources or emissions (electric motors and transformers, electro-magnets, radio frequency emitters, etc.).
- Under no circumstance whatsoever must the unit be opened and the interior manipulated. The safety seals must remain intact. Should they be broken, the correct functioning of the unit could be jeopardised.
- In the event of any of the above occurring, the authorised technical service must be contacted immediately in order for the unit to be checked.
- The unit must be completely disconnected from the mains before cleaning with a soft, dry cloth or brush.
- For security reasons, change the ex-factory PIN for a personalised one and *note it down in a safe place*.

ATTENTION - IMPORTANT!

This unit, UNIVERSAL+ 7WR MINI BASIC module and eventual accessories) must be installed in a closed, standard enclosure, the only part within access of the user being the module's display and command panel.

Important

- Toroidal transformers individually matched and adjusted to their module

Only line intensity transformers TRIT7, TRIT14, TRIT18 and TRIT26 (5A, 70A, 140A and 280A).

The toroidal transformers are individually matched and adjusted to their corresponding Sureline module. Therefore, these elements can, under no circumstance whatsoever, be interchanged with others bearing the same reference and from other Sureline modules. Were these to be interchanged, the measurement obtained would be erroneous and operation would be abnormal. Only the toroidal transformers supplied for the specific Sureline module can be installed. Each transformer indicates the model and serial number of the Sureline module for which it has been specifically matched and adjusted. For current transformers (L1, L2, L3) the line is specified on their label. The toroidal transformer must of necessity be positioned as shown in the "Wiring diagrams", the direction of the arrow indicating the position with respect to the wiring. The length of the wire connecting the toroidal transformers (TRIT7, TRIT14, TRIT18 and TRIT26) to the SURELINE unit must not exceed 25cms. The length of the wire connecting the toroidal transformers (standard transformer from 50A/5A up to 10.000A/5A) to the SURELINE unit must not exceed 100 cms.

- Positioning of the intensity toroidal transformers (L1, L2 and L3)

The toroidal transformer must of necessity be positioned as shown in the "Wiring diagrams". Should the positioning be incorrect, then W+ would measure W- and vice versa and the rL measurement would become rC and vice versa.

- Wiring. Precautions/warnings for the user/installer

By way of a protective cover and to avoid contact and dust, the male connector, AUXILIARY IN/OUT, is fitted ex-factory covered with another female connector. This female connector is a protective cover and is not to be removed if not in use.

To remove this connector and connect in its turn the wired connector to the I/O modules, cut off the AC supply, remove this connector and replace it with the new wired female connector (only that supplied by the manufacturer). This connector cannot be manipulated with the unit live. Consult the accessories, I/O relay modules, temperature and humidity probe manuals.

All the connection terminals must be handled and connected with the unit totally disconnected from the AC supply and no interconnection can be effected with the unit live.

It is of the utmost importance that **the correct polarity is ensured upon connection of the Sureline terminals**. If this polarity is not respected, the high accuracy is lost originating errors in measurement and abnormal functioning

One risk of the unit not functioning correctly could be originated principally by an incorrect wiring up of the connection terminals. It is, therefore, of the **utmost importance that this wiring be carried out correctly** in accordance with the following protocol:

- ⤴ An homologated "male pin" is to be incorporated in the naked core of the stripped pliable conductor. These terminals are placed in the corresponding grooves as far in as they will go.
- ⤴ Ensure that the conductor lead is correctly fixed with the pertinent tightening torque, i.e. there must be no displacement of the terminal nor any damage to the screws on head, thread, fillet or washer, any of which would be to the subsequent detriment of the assemblies and screw connections.

10.2 Transport and handling

This being a highly sophisticated electronic unit, it must be transported and handled with care as per the precautions stipulated in the foregoing section "Precautions / warnings".

10.3 Installation

The installation must be carried out by responsible, competent and qualified technical personnel once the present manual has been fully understood.

The location of the unit must meet the requirements and respect the precautions stipulated in the chapter "Precautions/warnings".

The unit must be installed in a standard single-phase installation, active phase and neutral having a difference of potential of 115V or 230V AC or a three-phase installation (3 phases + neutral) having a difference of potential from phases to neutral of 115V or 230V AC, depending on the version, and also a protection conductor of operative earth. Moreover, the installation must have, at its main switch panel, appropriate protections against over-intensities and leakage to earth.

10.4 Wiring

The unit is fitted with top quality connection terminals. Each terminal has notches to enable easier fixing of the wires and prevent accidental removal. Likewise, the clamping screws have a self-fixing system which avoids their falling out should they work loose.

Moreover, the serigraphy identifies the corresponding counter-positioned terminals on the fanning strip. The graphic indications are backed up by intuitive identifying colours.

Connect the terminals as indicated for the typical or chosen configuration. Please, refer to "Wiring diagrams"

It is imperative that the wiring of the terminals and the tightening of the screws in the fanning strip be effected correctly.

"Wiring diagrams" should be consulted. Should any doubt arise, the manufacturer or authorised distributor should be consulted.

Chapter 11 – Diagnoses and trouble-shooting

11.1 Diagnosis and solution

1. Communication error real time clock

The unit indicates via its WebServer, "Communication error, I2C clock not found".

There is an anomaly in the real-time clock module and must be checked immediately. Do NOT use. Consult the technical service.

Chapter 12 – Verification and start-up

12.1 Start-up

Connect all up-stream conductors by means of switches, sectionalisers or others.
The reinitiation sequence will automatically be carried out and the unit will be operative.

Chapter 13 – Description basic components

13.1 Intensity toroidal transformers (AC) TRIT7, TRIT14, TRIT18 and TRIT26

The UNIVERSAL+ 7WR MINI BASIC nomenclature “E”, is only compatible with transformers TRIT7, TRIT14, TRIT18 and TRIT26.

Attention: They are individually matched and adjusted to the corresponding Sureline module and must under NO circumstance whatsoever, be interchanged with others. **For current transformers (L1, L2, L3) the line is specified on their label.**

Toroidal core (high magnetic permeability and low loss). Precision +/- 1%.

TRIT7	internal Ø: 7mm	5A for standard transformer from 50A/5A up to 10,000A/5A
TRIT14	internal Ø: 14mm	70A
TRIT18	internal Ø: 18mm	70A and 140A
TRIT26	internal Ø: 26mm	70A, 140A and 280A

Chapter 14 – Technical service

14.1 Technical service

Authorised technical service: solely by the manufacturer

Chapter 15 – Maintenance

15.1 Maintenance

On a minimal yearly basis, the user must check that the measurements of the electrical parameters of the unit coincide with those stipulated in the technical characteristics, To this end, competent technical personnel at the factory will revise the unit and proceed to calibrate it if need be.

Chapter 16 – Guarantee

16.1 Guarantee card

GUARANTEE CARD (photocopy or print and send to Safeline)

Sureline model
 Serial nbr
 Date of purchase

Stamp of establishment where unit purchased (with complete address)

.....

Complete name and address of purchaser

.....

e-mail

Main use to which the Sureline unit is to be put

Notes

.....

I hereby authorise Safeline to keep me periodically informed Yes No

GUARANTEE

SAFELINE, S.L., as a leader in the field of electrical and electronic safety equipment endeavours to maintain an extensive service along with up-dated information to the users of its products. To this end, it is indispensable that the user fills out and returns the present guarantee further to purchase of his SURELINE unit.

Period of guarantee: three years as from date of purchase.

Conditions and application of the SURELINE guarantee: Your SURELINE unit is guaranteed against any defect of manufacture or original components as determined by our Technical Service. Any repair or substitution does not extend the guarantee period.

The guarantee covers::

- Reception of the unit for its repair or servicing.
- Cost of all components, replacements and labour on original components

The guarantee does not cover:

- Transport.
- Breakdown caused by non-original components or devices
- Defects caused by incorrect installation.
- Damage caused by incorrect usage, or errors arising from repairs and internal manipulation by unauthorised persons.
- .- Consumables: fuses, thermal fuses, varistors and labour involved in replacement of same

The guarantee is automatically forfeited in the event of:

- Breakage or deterioration of the seals of any of the original SURELINE elements
- Incorrect usage due to non-observance of the recommendations given in the SURELINE manual.

Repair service: All repair service, both within and outside of the guarantee period, is by SAFELINE, S.L. and its Authorised Technical Assistance Services

Chapter 17 – Wiring diagrams

17.1 Wiring diagrams

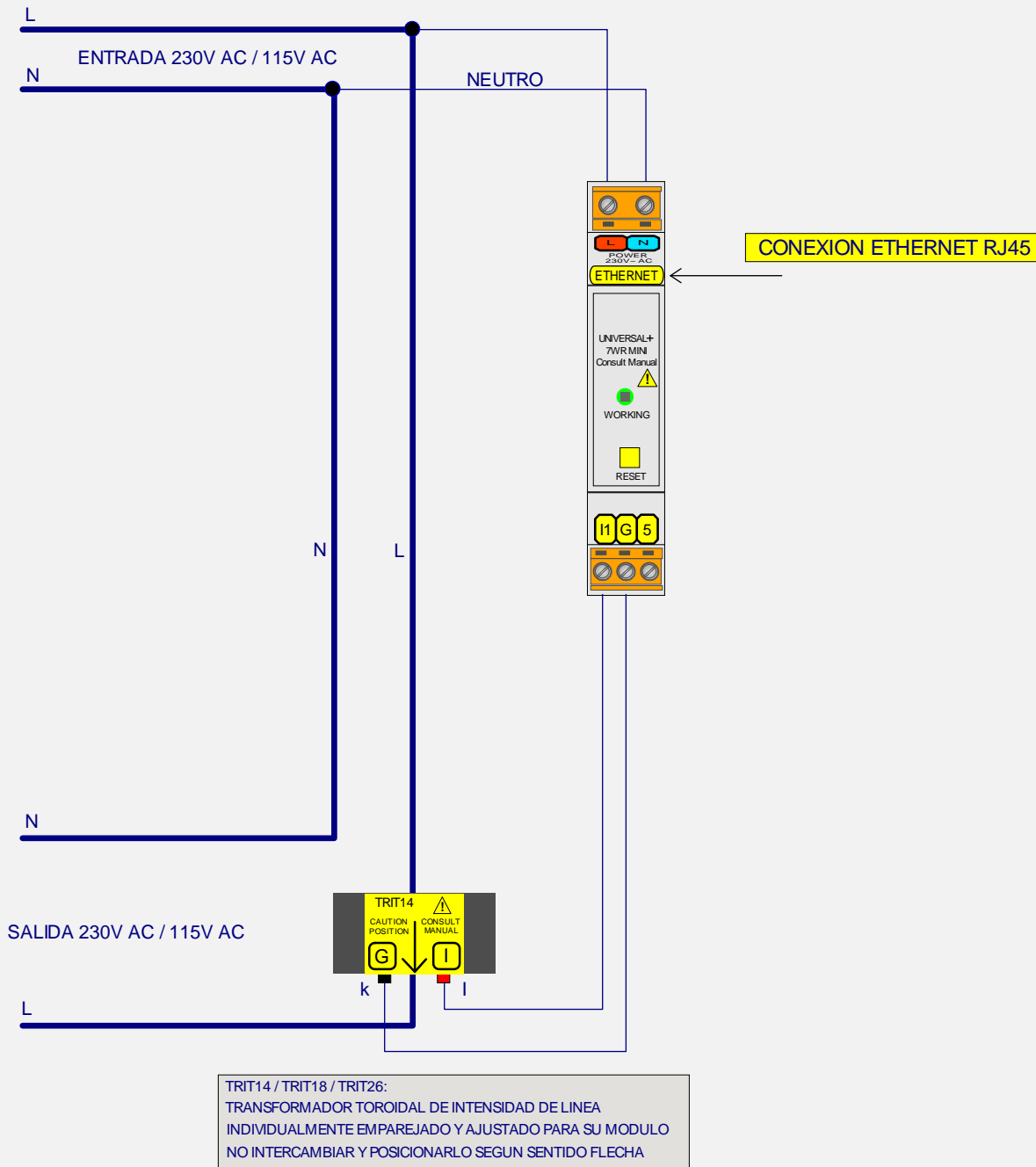
UNIDAD UNIVERSAL+ 7WR MINI BASIC

MODELO UNIVERSAL+ 7WR MINI BASIC - M - 500E - E

CONFIGURACION MONOFASICA 2 POLOS 70A y 140A.

Versión transformador de intensidad de línea. Únicamente transformadores TRIT14, TRIT18 y TRIT26

Versión alimentación 230V / 115V / POE (Power over Ethernet)



CONSULTAR MANUAL DE INSTRUCCIONES

UNIDAD UNIVERSAL+ 7WR MINI BASIC

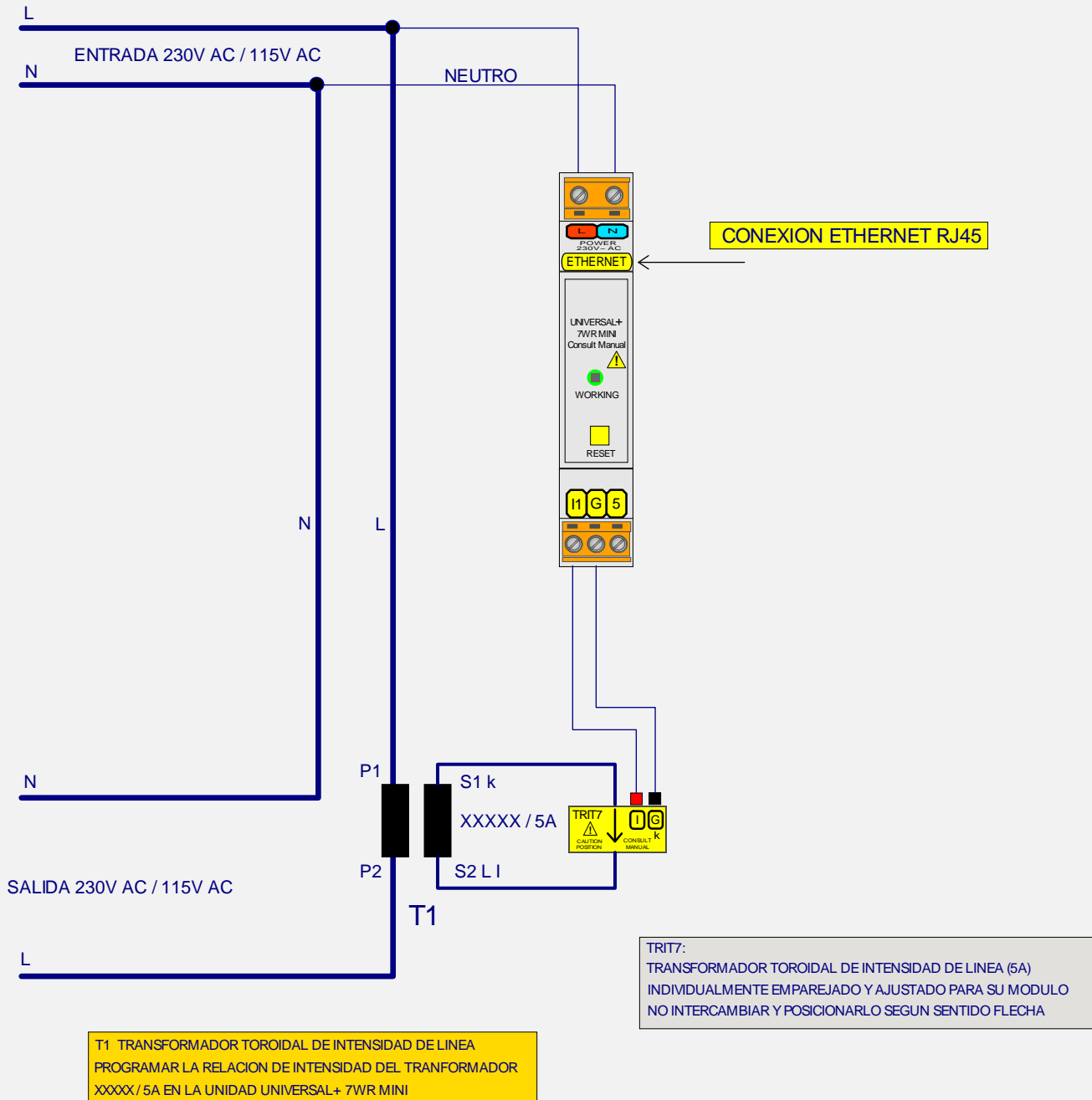
MODELO UNIVERSAL+ 7WR MINI BASIC - M - 500E - E - 50Hz - 230V - 5A

CONFIGURACION MONOFASICA 2 POLOS HASTA 10.000A.

Versión transformador de intensidad de línea. Únicamente transformador TRIT7

TRIT7 (5A para transformador estandar, desde 50A/5A hasta 10.000A/5A en pasos de 5A)

Versión alimentación 230V / 115V / POE (Power over Ethernet)



CONSULTAR MANUAL DE INSTRUCCIONES

UNIDAD UNIVERSAL+ 7WR MINI BASIC

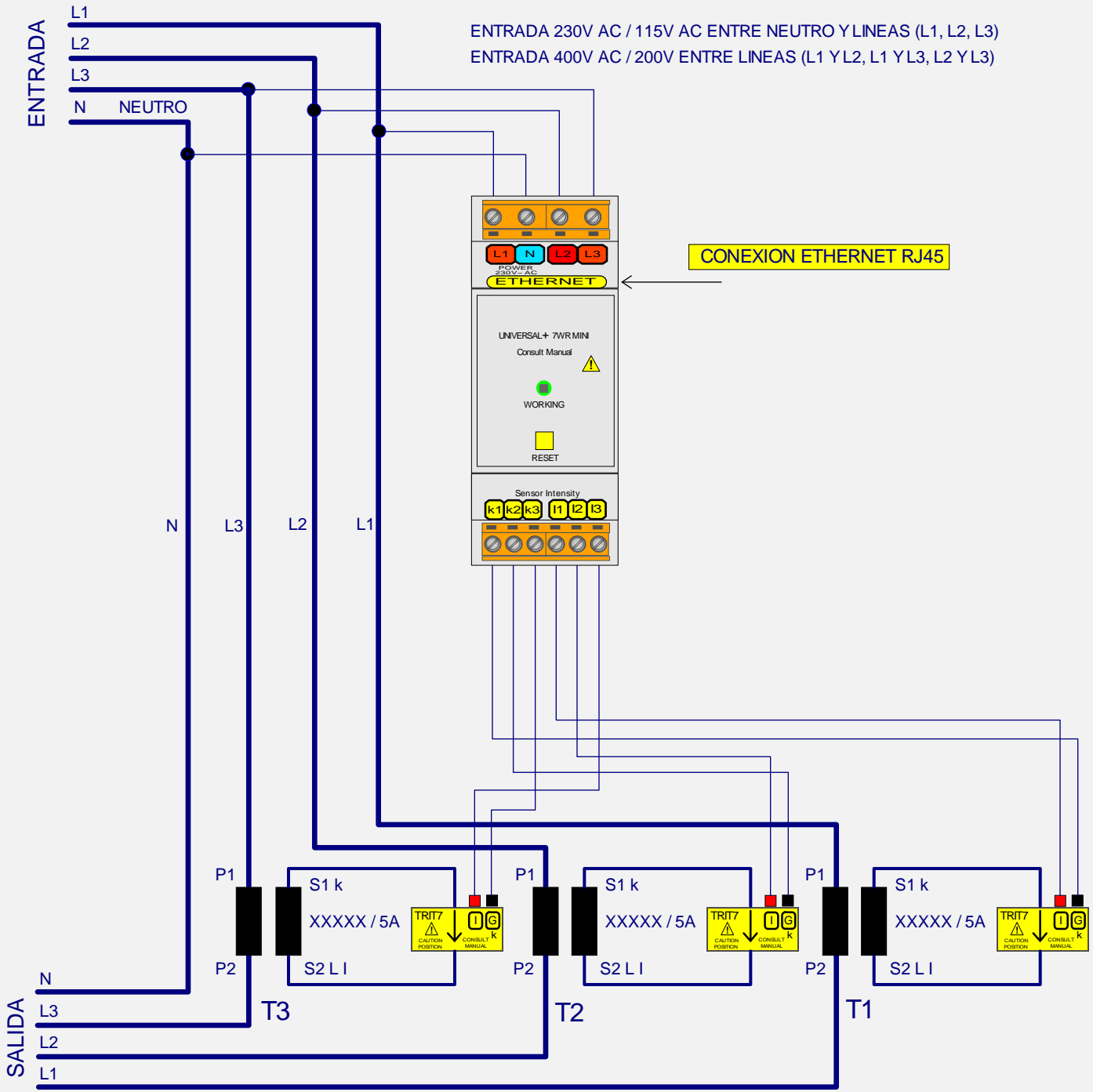
MODELO UNIVERSAL+ 7WR MINI BASIC - T - 500E - E - 50Hz - 230V - 5A

CONFIGURACION TRIFASICA 4 POLOS HASTA 10.000A.

Versión transformador de intensidad de línea. Únicamente transformador TRIT7

TRIT7 (5A para tranformador estandar, desde 50A/5A hasta 10.000A/5A en pasos de 5A)

Versión alimentación 230V / 115V / POE (Power over Ethernet)



CONSULTAR MANUAL DE INSTRUCCIONES

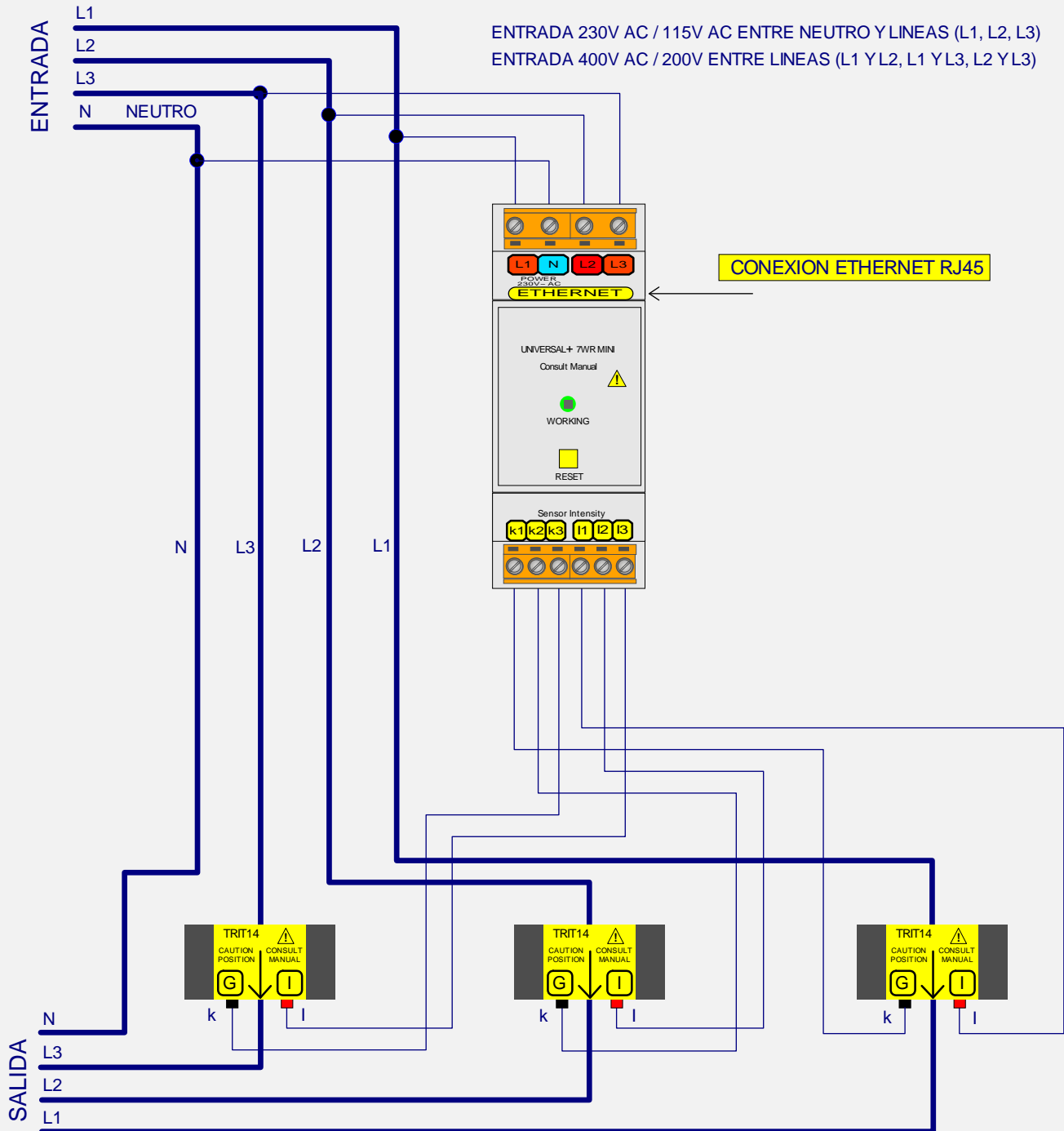
UNIDAD UNIVERSAL+ 7WR MINI BASIC

MODELO UNIVERSAL+ 7WR MINI BASIC - T - 500E - E

CONFIGURACION TRIFASICA 4 POLOS 70A, 140A y 280A.

Versión transformador de intensidad de línea. Únicamente transformadores TRIT14, TRIT18 y TRIT26

Versión alimentación 230V / 115V / POE (Power over Ethernet)



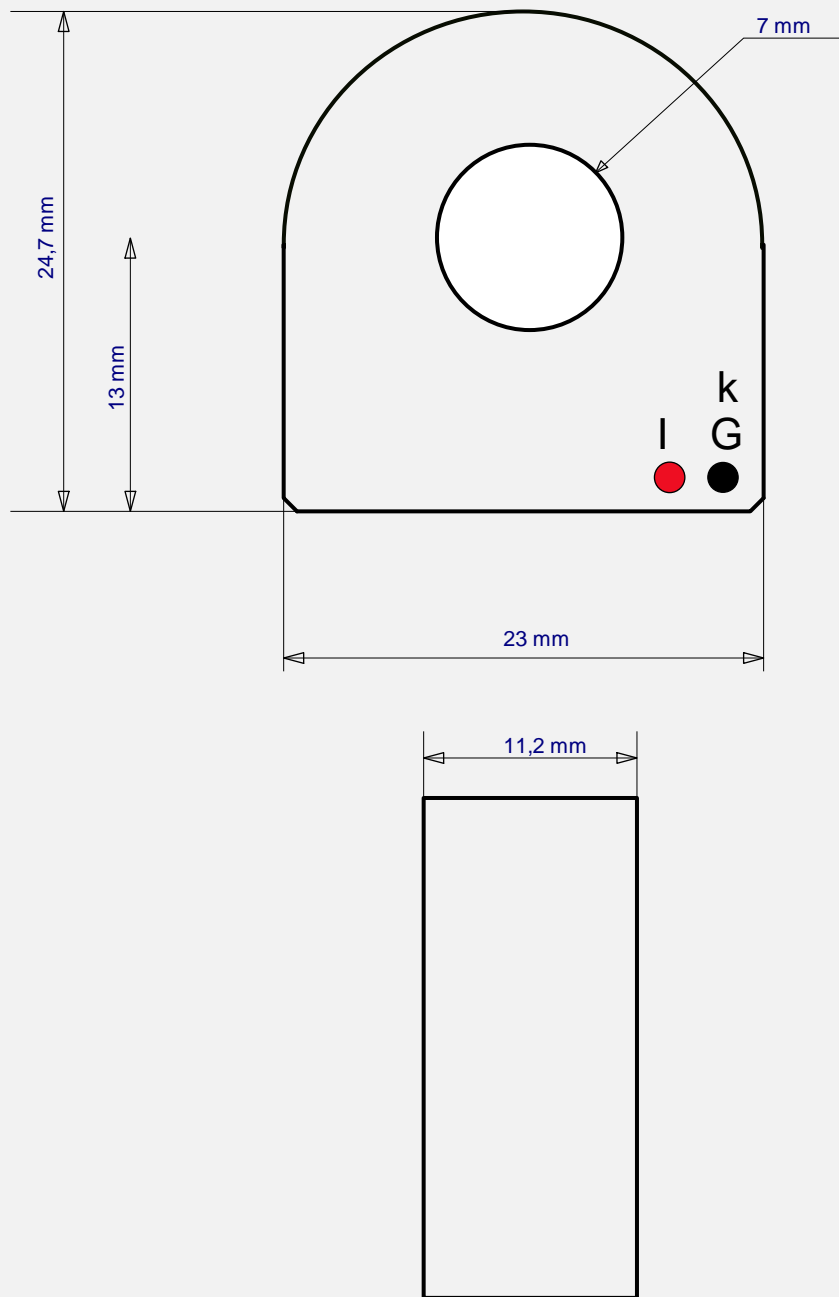
TRIT14 / TRIT18 / TRIT26:
TRANSFORMADOR TOROIDAL DE INTENSIDAD DE LINEA
INDIVIDUALMENTE EMPAREJADO Y AJUSTADO PARA SU MODULO
NO INTERCAMBIAR Y POSICIONARLO SEGUN SENTIDO FLECHA



CONSULTAR MANUAL DE INSTRUCCIONES

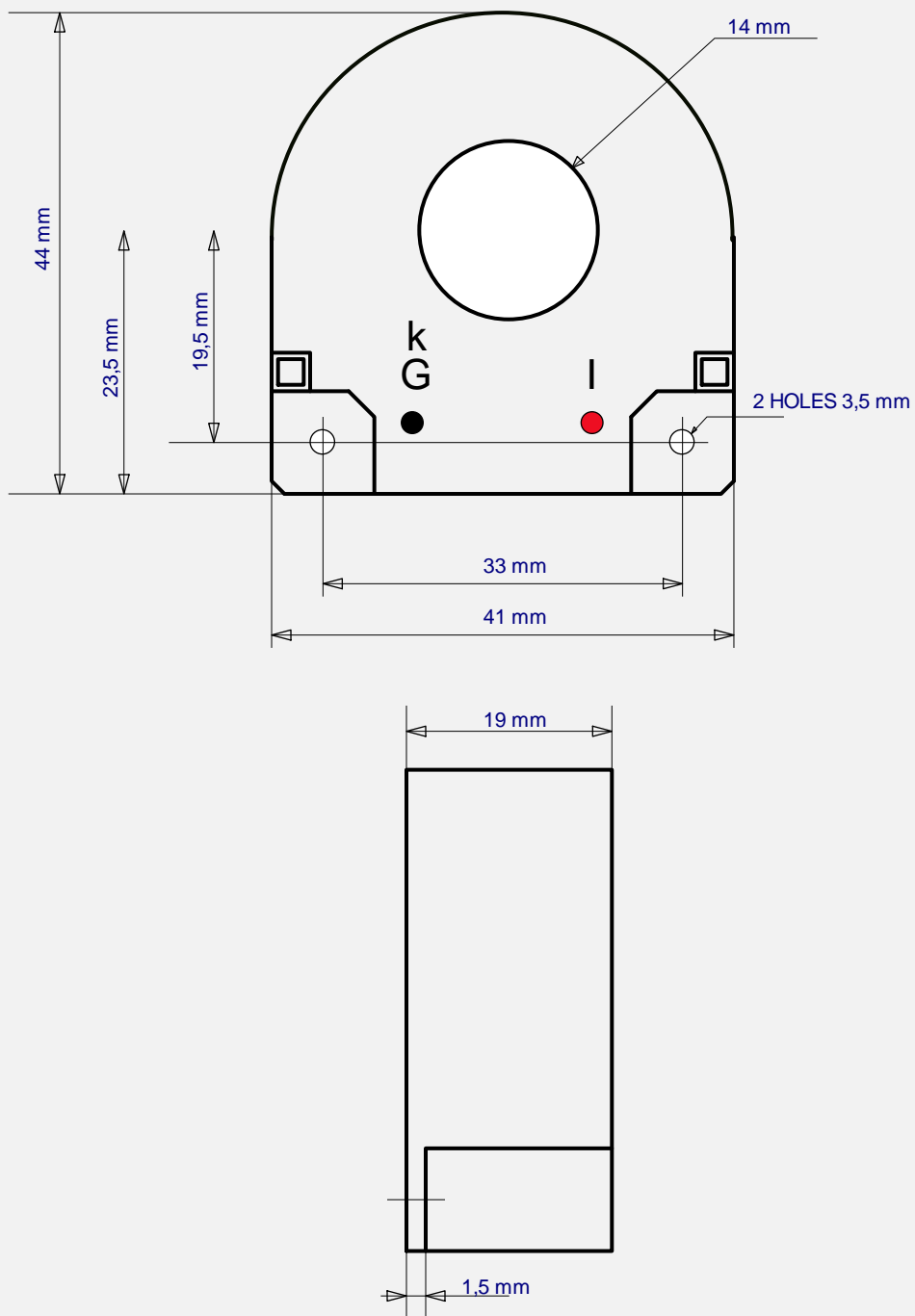
DIMENSIONES TRANSFORMADOR TOROIDAL DE INTENSIDAD DE LINEA

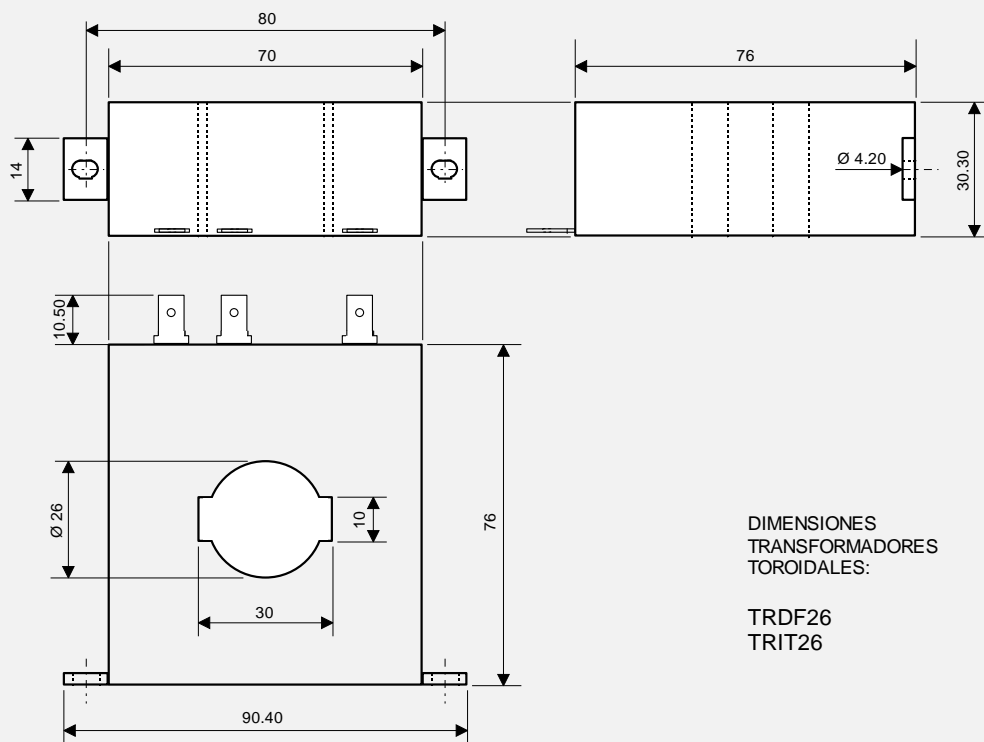
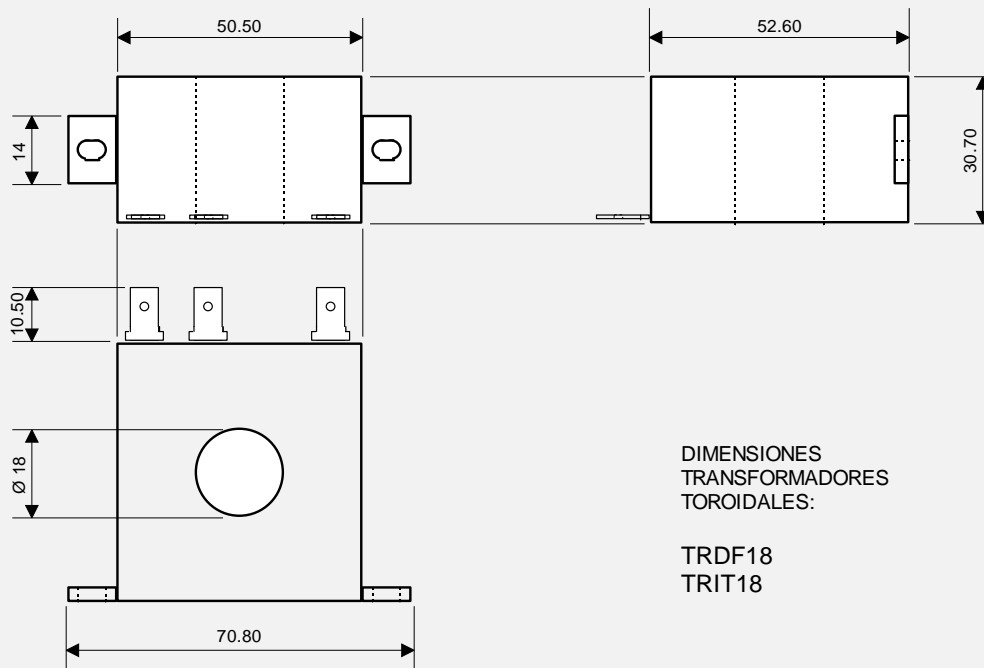
TRIT7



DIMENSIONES TRANSFORMADOR TOROIDAL DE INTENSIDAD DE LINEA

TRIT14





Chapter 18 – Modbus TCP/IP communication protocol , Port 502 (please, refer to synoptical tables of characteristics)

Modbus TCP/IP

Modbus is a communication protocol located at layer 7 of the OSI Model, based on the master/slave or client/server architecture designed in 1979 by Modicon for its range of programmable logic controllers (PLC's). It has become a "de facto" standard within the industrial manufacturing environment and is the most widely used for the connection of industrial electronic devices.

The Modbus TCP/IP protocol transmits via Ethernet port 502.

For further information, consult the specifications and guidelines at "The Modbus Organization" website: <http://www.modbus.org/>.

1. Modbus messaging on TCP/IP implementation guide V1.0b
2. Modbus application protocol specification V1.1b3

Attention!

The commands, tables, data, measurements, etc in light grey herebelow are not enabled in this version.

Modbus supported commands

01 (0x01h)	Read Coils / Reading of digital outputs status
02 (0x02h)	Read Discrete Inputs / Reading of digital inputs status
04 (0x04h)	Read Input Registers / Reading of a register
05 (0x05h)	Write Single Coil / Writing of the status of a digital output
06 (0x06h)	Write Single Register / Writing of a register

Modbus tables

0:0001	Digital outputs (relays)	Commands: 01 and 05	Read / write
1:0001	Digital inputs	Command: 02	Read
3:0001	General measurements and values	Command: 04	Read
4:0001	Command	Command: 06	Write only

Types of data

Bit	Refers to binary
UWord16	Hexadecimal number, 16-bit unsigned integer, uses 1 memory address. Register with 2 bytes of memory in big-endian format. Example: 1234h will be sent as 12, 34. The most significant byte first.
Word16	Hexadecimal number, 16-bit signed integer, uses 1 memory address. Register with 2 bytes of memory in big-endian format. Example: 1234h will be sent as 12, 34. The most significant byte first.
UWord32	Hexadecimal number, 32-bit unsigned integer, uses 2 memory addresses. Register with 4 bytes of memory (2-word) in little-endian format. Example: 12345678h will be sent as 56, 78, 12, 34. The least significant word first.
UWord48	Hexadecimal number, 48-bit unsigned integer, uses 3 memory addresses. Register with 6 bytes of memory (3-word) in little-endian format. Example: 112233445566h will be sent as 55, 66, 33, 44, 11, 22. The least significant word first.
BCD16	Decimal number, 16-bit binary-coded, uses 1 memory address. Register with 2 bytes of memory in big-endian format. Used solely for writing user PIN. Varies from 0000 to 9999 decimal. Example: User PIN = 1234d, 1234h in BCD. Will be sent as 12, 34. The most significant byte first.

Table 3:0001, accessible with function code 0x04h (Read input registers).

Modbus registers (Dec)	Modbus addresses (Hex)	Nbr. of registers	Type of data	Description	Scaling	Units
Temperature and relative humidity						
1	0000	1	Word16	TEMP, Temperature	1/100	°C
2	0001	1	UWord16	HUME, Relative humidity	1/100	%
Measurements						
3	0002	2	UWord32	VRMS1, RMS voltage L1	1/100	V
5	0004	2	UWord32	VRMS2, RMS voltage L2	1/100	V
7	0006	2	UWord32	VRMS3, RMS voltage L3	1/100	V
9	0008	2	UWord32	VPk1, Pk voltage L1	1/100	V
11	000A	2	UWord32	VPk2, Pk voltage L2	1/100	V
13	000C	2	UWord32	VPk3, Pk voltage L3	1/100	V
15	000E	1	UWord16	ID, RMS differential intensity	1/10	mA
16	000F	1	UWord16	IDPk, Pk differential intensity	1/10	mA
17	0010	2	UWord32	V12, RMS voltage phases L1 and L2	1/100	V
19	0012	2	UWord32	V23, RMS voltage phases L2 and L3	1/100	V
21	0014	2	UWord32	V31, RMS voltage phases L3 and L1	1/100	V
23	0016	2	UWord32	I1, RMS intensity L1	1/100	A
25	0018	2	UWord32	I2, RMS intensity L2	1/100	A
27	001A	2	UWord32	I3, RMS intensity L3	1/100	A
29	001C	2	UWord32	IPk1, Pk intensity L1	1/100	A
31	001E	2	UWord32	IPk2, Pk intensity L2	1/100	A
33	0020	2	UWord32	IPk3, Pk intensity L3	1/100	A
35	0022	1	UWord16	HZ1, Frequency L1	1/10	Hz
36	0023	1	UWord16	HZ2, Frequency L2	1/10	Hz
37	0024	1	UWord16	HZ3, Frequency L3	1/10	Hz
38	0025	2	UWord32	W1, Active power L1	1/10	W
40	0027	2	UWord32	W2, Active power L2	1/10	W
42	0029	2	UWord32	W3, Active power L3	1/10	W
44	002B	2	UWord32	W123, Sum L1+L2+L3	1/10	W
46	002D	2	UWord32	WP1, Requested power L1	1/10	W
48	002F	2	UWord32	WP2, Requested power L2	1/10	W
50	0031	2	UWord32	WP3, Requested power L3	1/10	W
52	0033	2	UWord32	WP123, Sum L1+L2+L3	1/10	W
54	0035	2	UWord32	WN1, Returned power L1	1/10	W
56	0037	2	UWord32	WN2, Returned power L2	1/10	W
58	0039	2	UWord32	WN3, Returned power L3	1/10	W
60	003B	2	UWord32	WN123, Sum L1+L2+L3	1/10	W
62	003D	2	UWord32	VA1, Apparent power L1	1/10	VA
64	003F	2	UWord32	VA2, Apparent power L2	1/10	VA
66	0041	2	UWord32	VA3, Apparent power L3	1/10	VA
68	0043	2	UWord32	VA123, Sum L1+L2+L3	1/10	VA
70	0045	2	UWord32	VARL1, Reactive inductive power L1	1/10	Var
72	0047	2	UWord32	VARL2, Reactive inductive power L2	1/10	Var
74	0049	2	UWord32	VARL3, Reactive inductive power L3	1/10	Var
76	004B	2	UWord32	VARL123, Sum L1+L2+L3	1/10	Var
78	004D	2	UWord32	VARC1, Reactive capacitive power L1	1/10	Var
80	004F	2	UWord32	VARC2, Reactive capacitive power L2	1/10	Var

82	0051	2	UWord32	VARC3, Reactive capacitive power L3	1/10	VAr
84	0053	2	UWord32	VARC123, Sum L1+L2+L3	1/10	VAr
86	0055	1	UWord16	PF1, Power factor L1	1/1000	%
87	0056	1	UWord16	PF2, Power factor L2	1/1000	%
88	0057	1	UWord16	PF3, Power factor L3	1/1000	%
89	0058	1	UWord16	DESV1, Voltage unbalance L1	1/10	%
90	0059	1	UWord16	DESV2, Voltage unbalance L2	1/10	%
91	005A	1	UWord16	DESV3, Voltage unbalance L3	1/10	%
92	005B	1	UWord16	DESI1, Intensity unbalance L1	1/10	%
93	005C	1	UWord16	DESI2, Intensity unbalance L2	1/10	%
94	005D	1	UWord16	DESI3, Intensity unbalance L3	1/10	%
95	005E	2	UWord32	IN, neutral intensity	1/100	A
97	0060	1	UWord16	CFV1, Crest factor V1	1/1000	
98	0061	1	UWord16	CFV2, Crest factor V2	1/1000	
99	0062	1	UWord16	CFV3, Crest factor V3	1/1000	
100	0063	1	UWord16	CFI1, Crest factor I1	1/1000	
101	0064	1	UWord16	CFI2, Crest factor I2	1/1000	
102	0065	1	UWord16	CFI3, Crest factor I3	1/1000	
103	0066	2	UWord32	Z1, Impedance L1	1/100	
105	0068	2	UWord32	Z2, Impedance L2	1/100	
107	006A	2	UWord32	Z3, Impedance L3	1/100	
109	006C	2	UWord32	Maximeter W1	1/10	W
111	006E	2	UWord32	Maximeter W2	1/10	W
113	0070	2	UWord32	Maximeter W3	1/10	W

Measurements with harmonics (cf. Table 4:0001 to select channel and harmonic k)

115	0072	1	UWord16	THDV1, Harmonic distortion V1	1/10	%
116	0073	1	UWord16	THDV2, Harmonic distortion V2	1/10	%
117	0074	1	UWord16	THDV3, Harmonic distortion V3	1/10	%
118	0075	1	UWord16	THDI1, Harmonic distortion I1	1/10	%
119	0076	1	UWord16	THDI2, Harmonic distortion I2	1/10	%
120	0077	1	UWord16	THDI3, Harmonic distortion I3	1/10	%
121	0078	1	UWord16	FP1(k), Power factor harmonic k L1. Cos Φ 1 if k=1.	1/1000	%
122	0079	1	UWord16	FP2(k), Power factor harmonic k L1. Cos Φ 2 if k=1.	1/1000	%
123	007A	1	UWord16	FP3(k), Power factor harmonic k L1. Cos Φ 3 if k=1.	1/1000	%
124	007B	2	UWord32	W1(k), Power harmonic k L1	1/10	W
126	007D	2	UWord32	W2(k), Power harmonic k L2	1/10	W
128	007F	2	UWord32	W3(k), Power harmonic k L3	1/10	W
130	0081	2	UWord32	W123(k), Sum L1+L2+L3	1/10	W
132	0083	2	UWord32	V1(k), Voltage harmonic k L1	1/100	V
134	0085	2	UWord32	V2(k), Voltage harmonic k L2	1/100	V
136	0087	2	UWord32	V3(k), Voltage harmonic k L3	1/100	V
138	0089	2	UWord32	I1(k), Intensity harmonic k L1	1/100	A
140	008B	2	UWord32	I2(k), Intensity harmonic k L2	1/100	A
142	008D	2	UWord32	I3(k), Intensity harmonic k L3	1/100	A
144	008F	2	UWord32	S1(k), Apparent power harmonic k L1	1/10	Var or S
146	0091	2	UWord32	S2(k), Apparent power harmonic k L2	1/10	Var or S
148	0093	2	UWord32	S3(k), Apparent power harmonic k L3	1/10	Var or S
150	0095	64	UWord16 * 64	HDF, Factor de harmonic distortion. k = (0...63). (depending on channel selected)	1/10	%

AC-DC measurements

214	00D5	2	UWord32	V1dc, DC voltage L1	1/100	V
216	00D7	2	UWord32	V2dc, DC voltage L2	1/100	V
218	00D9	2	UWord32	V3dc, DC voltage L3	1/100	V
220	00DB	2	UWord32	I1dc, DC intensity L1	1/100	A
222	00DD	2	UWord32	I2dc, DC intensity L2	1/100	A
224	00DF	2	UWord32	I3dc, DC intensity L3	1/100	A
226	00E1	2	UWord32	V1ac, AC voltage L1	1/100	V
228	00E3	2	UWord32	V2ac, AC voltage L2	1/100	V
230	00E5	2	UWord32	V3ac, AC voltage L3	1/100	V
232	00E7	2	UWord32	I1ac, AC intensity L1	1/100	A
234	00E9	2	UWord32	I2ac, AC intensity L2	1/100	A
236	00EB	2	UWord32	I3ac, AC intensity L3	1/100	A
238	00ED	2	UWord32	P1dc, DC power L1	1/10	W
240	00EF	2	UWord32	P2dc, DC power L2	1/10	W
242	00F1	2	UWord32	P3dc, DC power L3	1/10	W
244	00F3	2	UWord32	P1ac, AC power L1	1/10	W
246	00F5	2	UWord32	P2ac, AC power L2	1/10	W
248	00F7	2	UWord32	P3ac, AC power L3	1/10	W

Maximum temperature and relative humidity

250	00F9	1	Word16	MAX_TEMP, Maximum TEMP	1/100	°C
251	00FA	1	UWord16	MAX_HUME, Maximum HUME	1/100	%

Maximum measurements

252	00FB	2	UWord32	MAX_V1, Maximum V1	1/100	V
254	00FD	2	UWord32	MAX_V2, Maximum V2	1/100	V
256	00FF	2	UWord32	MAX_V3, Maximum V3	1/100	V
258	0101	1	UWord16	MAX_ID, Maximum ID	1/10	mA
259	0102	2	UWord32	MAX_I1, Maximum I1	1/100	A
261	0104	2	UWord32	MAX_I2, Maximum I2	1/100	A
263	0106	2	UWord32	MAX_I3, Maximum I3	1/100	A
265	0108	2	UWord32	MAX_IN, Maximum IN	1/100	A
267	010A	1	UWord16	MAX_HZ1, Maximum HZ1	1/10	Hz
268	010B	1	UWord16	MAX_HZ2, Maximum HZ2	1/10	Hz
269	010C	1	UWord16	MAX_HZ3, Maximum HZ3	1/10	Hz
270	010D	2	UWord32	MAX_MAXW1, Maximum Maximeter W1	1/10	W
272	010F	2	UWord32	MAX_MAXW2, Maximum Maximeter W2	1/10	W
274	0111	2	UWord32	MAX_MAXW3, Maximum Maximeter W3	1/10	W
276	0113	2	UWord32	MAX_VA1, Maximum VA1	1/10	VA
278	0115	2	UWord32	MAX_VA2, Maximum VA2	1/10	VA
280	0117	2	UWord32	MAX_VA3, Maximum VA3	1/10	VA
282	0119	2	UWord32	MAX_VARC1, Maximum VARC1	1/10	VAr
284	011B	2	UWord32	MAX_VARC2, Maximum VARC2	1/10	VAr
286	011D	2	UWord32	MAX_VARC3, Maximum VARC3	1/10	VAr
288	011F	2	UWord32	MAX_VARL1, Maximum VARL1	1/10	VAr
290	0121	2	UWord32	MAX_VARL2, Maximum VARL2	1/10	VAr
292	0123	2	UWord32	MAX_VARL3, Maximum VARL3	1/10	VAr
294	0125	1	UWord16	MAX_DESV1, Maximum DESV1	1/10	%
295	0126	1	UWord16	MAX_DESV2, Maximum DESV2	1/10	%
296	0127	1	UWord16	MAX_DESV3, Maximum DESV3	1/10	%
297	0128	1	UWord16	MAX_DESI1, Maximum DESI1	1/10	%
298	0129	1	UWord16	MAX_DESI2, Maximum DESI2	1/10	%

299	012A	1	UWord16	MAX_DESI3, Maximum DESI3	1/10	%
300	012B	1	UWord16	MAX_THDV1, Maximum THDV1	1/10	%
301	012C	1	UWord16	MAX_THDV2, Maximum THDV2	1/10	%
302	012D	1	UWord16	MAX_THDV3, Maximum THDV3	1/10	%
303	012E	1	UWord16	MAX_THDI1, Maximum THDI1	1/10	%
304	012F	1	UWord16	MAX_THDI2, Maximum THDI2	1/10	%
305	0130	1	UWord16	MAX_THDI3, Maximum THDI3	1/10	%

Minimum temperature and relative humidity

306	0131	1	Word16	MIN_TEMP, Minimum TEMP	1/100	°C
307	0132	1	UWord16	MIN_HUME, Minimum HUME	1/100	%Hr

Minimum measurements

308	0133	2	UWord32	MIN_V1, Minimum V1	1/100	V
310	0135	2	UWord32	MIN_V2, Minimum V2	1/100	V
312	0137	2	UWord32	MIN_V3, Minimum V3	1/100	V
314	0139	1	UWord16	MIN_HZ1, Minimum HZ1	1/10	Hz
315	013A	1	UWord16	MIN_HZ2, Minimum HZ2	1/10	Hz
316	013B	1	UWord16	MIN_HZ3, Minimum HZ3	1/10	Hz

Energy counters

317	013C	3	UWord48	KWH1+, Active imported energy counter L1	1/100000	kWh1+
320	013F	3	UWord48	KWH2+, Active imported energy counter L2	1/100000	kWh2+
323	0142	3	UWord48	KWH3+, Active imported energy counter L3	1/100000	kWh3+
326	0145	3	UWord48	KWH123+, Sum L1+L2+L3	1/100000	kWh+
329	0148	3	UWord48	KWH1-, Active exported energy counter L1	1/100000	kWh1-
332	014B	3	UWord48	KWH2-, Active exported energy counter L2	1/100000	kWh2-
335	014E	3	UWord48	KWH3-, Active exported energy counter L3	1/100000	kWh3-
338	0151	3	UWord48	KWH123-, Sum L1+L2+L3	1/100000	kWh-
341	0154	3	UWord48	KQH1, Reactive energy counter L1	1/100000	kQh1
344	0157	3	UWord48	KQH2, Reactive energy counter L2	1/100000	kQh2
347	015A	3	UWord48	KQH3, Reactive energy counter L3	1/100000	kQh3
350	015D	3	UWord48	KQH123, Sum L1+L2+L3	1/100000	kQh

Cut-off counters by type (*Alarm counters*)

353	0160	1	UWord16	CN_STEMP, Over-temperature cut-off counter		
354	0161	1	UWord16	CN_ITEMP, Low temperature cut-off counter		
355	0162	1	UWord16	CN_SHUME, Over-humidity cut-off counter		
356	0163	1	UWord16	CN_IHUME, Low humidity cut-off counter		
357	0164	1	UWord16	CN_ST1, Cut-off counter over V1		
358	0165	1	UWord16	CN_ST2, Cut-off counter over V2		
359	0166	1	UWord16	CN_ST3, Cut-off counter over V3		
360	0167	1	UWord16	CN_IT1, Cut-off counter low V1		
361	0168	1	UWord16	CN_IT2, Cut-off counter low V2		
362	0169	1	UWord16	CN_IT3, Cut-off counter low V3		
363	016A	1	UWord16	CN_I1, Cut-off counter I1		
364	016B	1	UWord16	CN_I2, Cut-off counter I2		
365	016C	1	UWord16	CN_I3, Cut-off counter I3		
366	016D	1	UWord16	CN_ID, Cut-off counter ID		
367	016E	1	UWord16	CN_DESV1, Cut-off counter DESV1		
368	016F	1	UWord16	CN_DESV2, Cut-off counter DESV2		
369	0170	1	UWord16	CN_DESV3, Cut-off counter DESV3		

370	0171	1	UWord16	CN_DESI1, Cut-off counter DESI1		
371	0172	1	UWord16	CN_DESI2, Cut-off counter DESI2		
372	0173	1	UWord16	CN_DESI3, Cut-off counter DESI3		
373	0174	1	UWord16	CN_INEUTRO, Cut-off counter INEUTRO		
374	0175	1	UWord16	CN_VA1, Cut-off counter POTENCIA VA1		
375	0176	1	UWord16	CN_VA2, Cut-off counter POTENCIA VA2		
376	0177	1	UWord16	CN_VA3, Cut-off counter POTENCIA VA3		
377	0178	1	UWord16	CN_W1, Cut-off counter POTENCIA W1		
378	0179	1	UWord16	CN_W2, Cut-off counter POTENCIA W2		
379	017A	1	UWord16	CN_W3, Cut-off counter POTENCIA W3		
380	017B	1	UWord16	CN_THDV1, Cut-off counter THDV1		
381	017C	1	UWord16	CN_THDV2, Cut-off counter THDV2		
382	017D	1	UWord16	CN_THDV3, Cut-off counter THDV3		
383	017E	1	UWord16	CN_THDI1, Cut-off counter THDI1		
384	017F	1	UWord16	CN_THDI2, Cut-off counter THDI2		
385	0180	1	UWord16	CN_THDI3, Cut-off counter THDI3		
386	0181	1	UWord16	CN_SHZ1, Cut-off counter over HZ1		
387	0182	1	UWord16	CN_SHZ2, Cut-off counter over HZ2		
388	0183	1	UWord16	CN_SHZ3, Cut-off counter over HZ3		
389	0184	1	UWord16	CN_IHZ1, Cut-off counter low HZ1		
390	0185	1	UWord16	CN_IHZ2, Cut-off counter low HZ2		
391	0186	1	UWord16	CN_IHZ3, Cut-off counter low HZ3		
392	0187	1	UWord16	CN_PF1, Cut-off counter PF1		
393	0188	1	UWord16	CN_PF2, Cut-off counter PF2		
394	0189	1	UWord16	CN_PF3, Cut-off counter PF3		
395	018A	1	UWord16	CN_SF, Cut-off counter: phase sequence		
396	018B	1	UWord16	CN_MCB, Cut-off counter: MCB		
397	018C	1	UWord16	CN_PH, Cut-off counter: time programmer		
398	018D	1	UWord16	CN_RIN1, Cut-off counter: Remote input 1		
399	018E	1	UWord16	CN_RIN2, Cut-off counter: Remote input 2		
400	018F	1	UWord16	CN_BLOCK, Block counter		
401	0190	1	UWord16	CN_POFF, Cut-off counter: power failure 230Vac		
402	0191	1	UWord16	CN_TOTAL, Sum of all the counters		
403	0192	1	UWord16	CN_ACCUM, Cut-off counter (undeletable)		
Counters: transients/dips per line						
404	0193	1	UWord16	CN_TH_L1, Counter; transients/dips in L1		
405	0194	1	UWord16	CN_TH_L2, Counter; transients/dips in L2		
406	0195	1	UWord16	CN_TH_L3, Counter; transients/dips in L3		
Status digital outputs, internal relays A and B (Also accessible from table 0:0001, read/write)						
407	0196	1	UWord16	Bit 0, Status of relay A Bit 1, Status of relay B		
Status digital outputs, external modules 1 and 2 (Also accessible from table 0:0001, read/write)						
408	0197	1	UWord16	Bit 0, Status of relay 1 external module 1 Bit 1, Status of relay 2 external module 1 Bit 2, Status of relay 3 external module 1 Bit 3, Status of relay 4 external module 1 Bit 4, Status of relay 1 external module 2 Bit 5, Status of relay 2 external module 2 Bit 6, Status of relay 3 external module 2 Bit 7, Status of relay 4 external module 2		

Status digital inputs, external modules 1 and 2 (Also accessible from table 1:0001, read)					
409	0198	1	UWord16	Bit 0, Status of input 1 external module 1 Bit 1, Status of input 2 external module 1 Bit 2, Status of input 3 external module 1 Bit 3, Status of input 4 external module 1 Bit 4, Status of input 1 external module 2 Bit 5, Status of input 2 external module 2 Bit 6, Status of input 3 external module 2 Bit 7, Status of input 4 external module 2	
Status digital inputs, remote inputs 1 and 2 (Also accessible from table 1:0001, read)					
410	0199	1	UWord16	Bit 0, Status remote input 1 Bit 1, Status remote input 2	

Table 4:0001, accessible with function code 0x06h (Write single register).

Writing in registers from 2 to 4 will only be effective if the user PIN has previously been written in register 1. If this is not done, then the function returns error with exception code 0x01h. In order to delete the user PIN, re-write log 1 as a value of 0x0000h.

Modbus registers (Dec)	Modbus addresses (Hex)	Nbr Registers	Type data	Description
User PIN				
1	0000	1	BCD16	User PIN / Password
Commands				
2	0001	1	UWord16	= 0x0000h, Reset maximum measurements and maximeters W1 W2 W3
3	0002	1	UWord16	= 0x0000h, Reset minimum measurements
4	0003	1	UWord16	= 0x0000h, Reset to zero of energy counters
5	0004	1	UWord16	= 0x0000h, Reset to zero of cut-off counters
6	0005	1	UWord16	= 0x0000h, Unblocking and reset of reclosures
7	0006	1	UWord16	Selector harmonic k. $0x0000h \leq k \leq 0x003Fh$ Measurement V, I, W and FP/Cosfi (k=1) of harmonic k.
8	0007	1	UWord16	Selector channel measurement harmonic distortion factor V1=00h, V2=02h, V3=04h, I1=06h, I2=08h, I3=0Ah. Measurement of all harmonics from 0 to 63

Table 0:0001, accessible with function code 0x01h (**Read Coils**) and 0x05h (**Write Single Coil**).

Writing in registers from 1 to 16 will only be effective if the user PIN has previously been written in register 1 of table 4:0001. If this is not done, then the function returns error with exception code 0x01h. In order to delete the user PIN, re-write log 1 as a value of 0x0000h.

Modbus registers (Dec)	Modbus addresses (Hex)	Nbr registers	Type data	Description
Digital outputs, internal relays A and B				
1	0000	1	Bit	Internal relay A
2	0001	1	Bit	Internal relay B
3	0002	1	Bit	Reserved (Bit at 0)
4	0003	1	Bit	Reserved (Bit at 0)
5	0004	1	Bit	Reserved (Bit at 0)
6	0005	1	Bit	Reserved (Bit at 0)
7	0006	1	Bit	Reserved (Bit at 0)
8	0007	1	Bit	Reserved (Bit at 0)
Digital outputs, external modules 1 and 2				
9	0008	1	Bit	Relay 1 external module 1
10	0009	1	Bit	Relay 2 external module 1
11	000A	1	Bit	Relay 3 external module 1
12	000B	1	Bit	Relay 4 external module 1
13	000C	1	Bit	Relay 1 external module 2
14	000D	1	Bit	Relay 2 external module 2
15	000E	1	Bit	Relay 3 external module 2
16	000F	1	Bit	Relay 4 external module 2

Table 1:0001, accessible with function code 0x02h (**Read Discrete Input**).

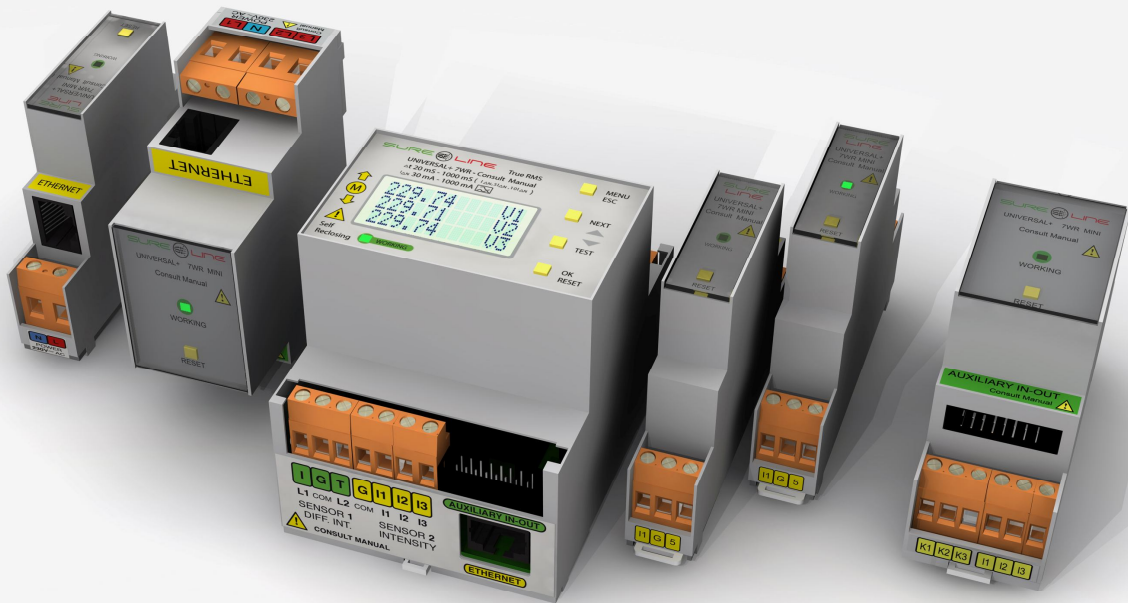
Modbus registers (Dec)	Modbus addresses (Hex)	Nbr registers	Type data	Description
Status digital inputs, remote inputs 1 and 2				
1	0000	1	Bit	Remote input 1
2	0001	1	Bit	Remote input 2
3	0002	1	Bit	Reserved (Bit at 0)
4	0003	1	Bit	Reserved (Bit at 0)
5	0004	1	Bit	Reserved (Bit at 0)
6	0005	1	Bit	Reserved (Bit at 0)
7	0006	1	Bit	Reserved (Bit at 0)
8	0007	1	Bit	Reserved (Bit at 0)
Status digital inputs, external modules 1 and 2				
9	0008	1	Bit	Input 1 external module 1
10	0009	1	Bit	Input 2 external module 1
11	000A	1	Bit	Input 3 external module 1
12	000B	1	Bit	Input 4 external module 1
13	000C	1	Bit	Input 1 external module 2
14	000D	1	Bit	Input 2 external module 2
15	000E	1	Bit	Input 3 external module 2
16	000F	1	Bit	Input 4 external module 2

Chapter 19 – TCP/IP. HTTP communication protocol. WebServer.

There are numerous TCP/IP commands which can be sent to a remote unit from the address bar of any browser or via a software program customised to the owner's requirements. These commands must be sent to the address and IP port of the remote unit and, in order to be effective, must include the user PIN configured for the remote unit to which these commands are destined

1. Receive complete listing of measurements in .txt format.

Please refer to appendix "TCP/IP. HTTP communication protocol. WebServer".



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