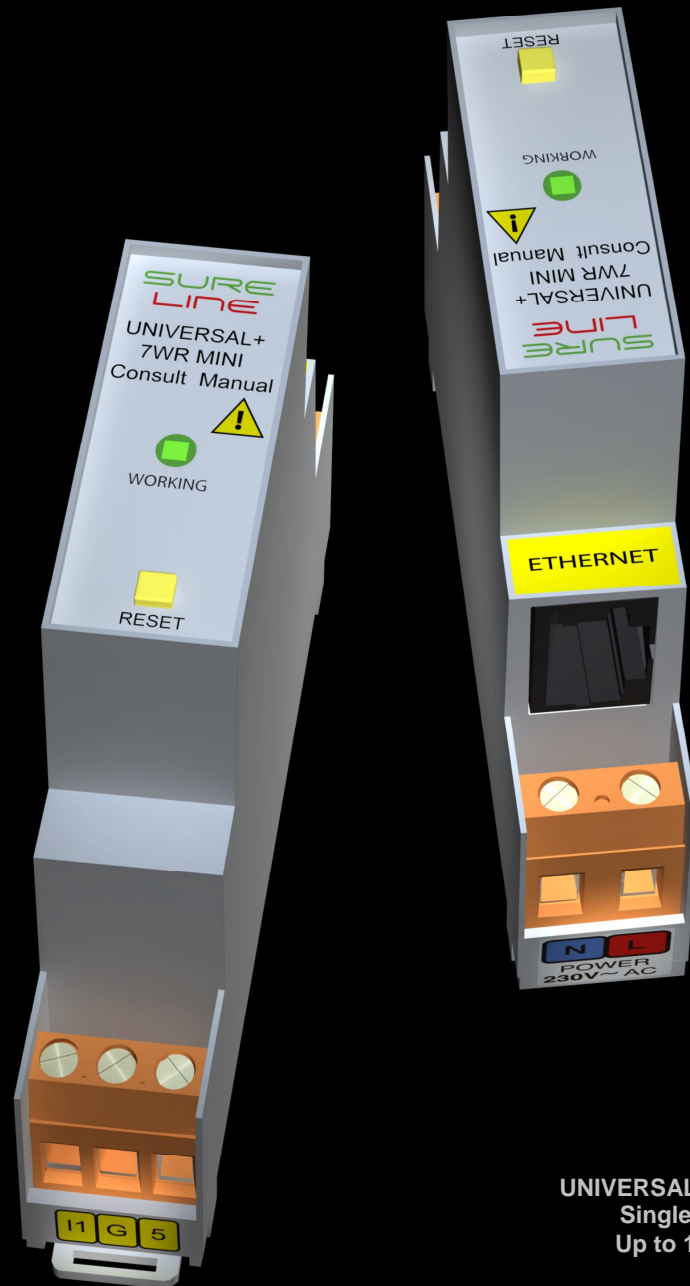


Universal tele-programmable, tele-controllable mains analysis unit with WebServer and Modbus TCP/IP
Graphic and numerical display in real time. RMS, Peak, AC and DC measurements
Oscilloscope event-logger in waveform with pre-trigger (built-in 600-event memory)
64 harmonics with calculation of power, power factor, distortion range in % and value V – A, + THD
THD measurement and alarm as from 2-63, programmable by harmonic and harmonics bracket (v. HP)
64-harmonic spectrum with distortion range in % and V-A value, plus THD
Proactive measurements of 1600 electrical parameters + temperature and humidity
Relays with alarms, timers, time programmer, input control and manual control
Graphical history (months, days, hours and minutes) of energy, costs and emissions with built-in 3-year memory
Tele-management, sizing, surveillance, energy maintenance and I/O control. Precisions: (V, I): $\pm 0.2\%$, $\pm 0.4\%$ and $\pm 0.5\%$



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

Annexe to UNIVERSAL+ 7WR MINI M4 manual
Software: version V3.12

Annexe to UNIVERSAL+ 7WR MINI M4 user/installation manual

It is essential that the user/installer fully understand the present annexe to the generic UNIVERSAL+ 7WR M4, Rogowski M4 and MINI M4 manual prior to using the unit. Should any doubt arise, please refer to the Authorised Distributor or the Manufacturer (Please, refer to the generic UNIVERSAL+ 7WR M4, Rogowski M4 and MINI M4).

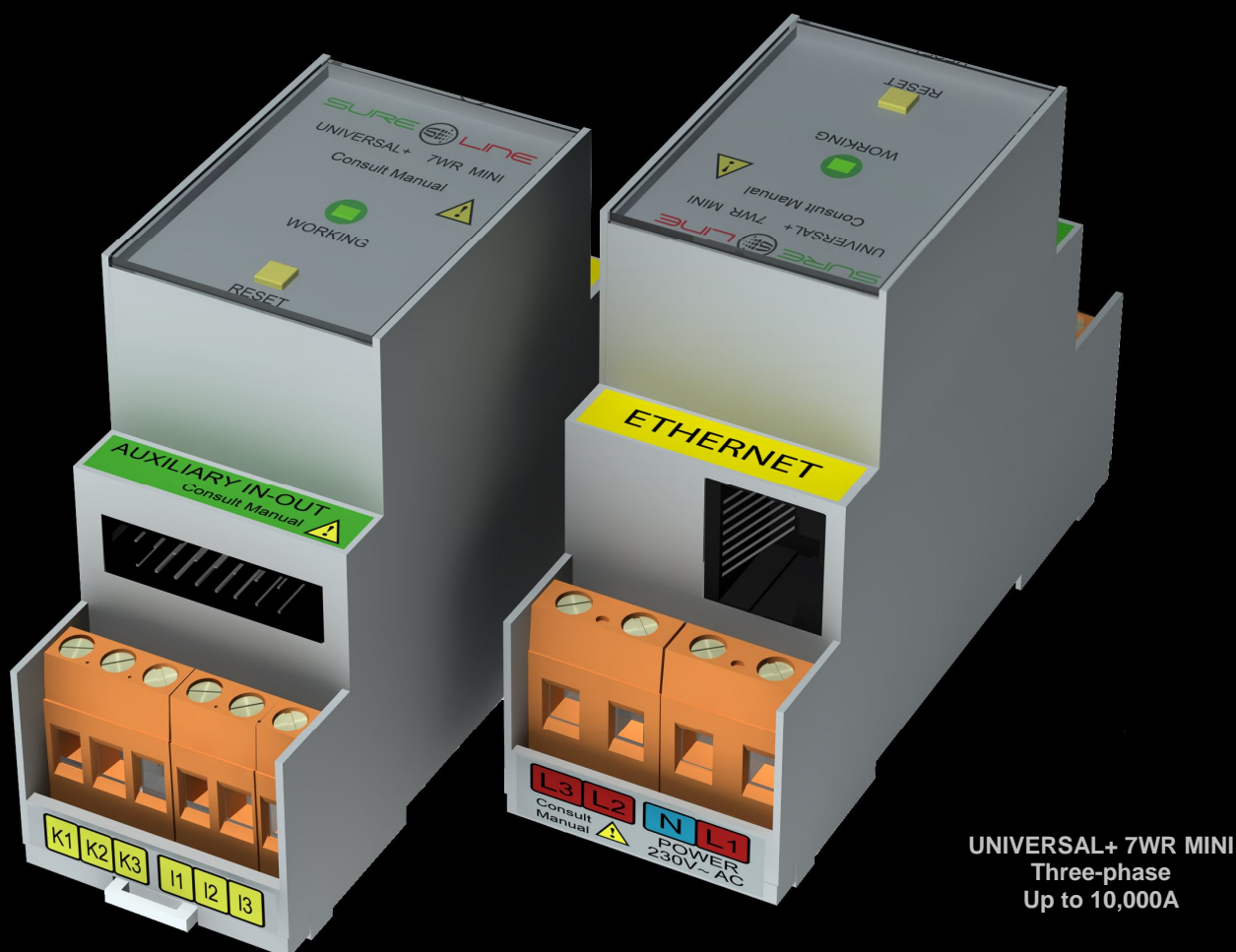
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Consult appended manuals for specific models:

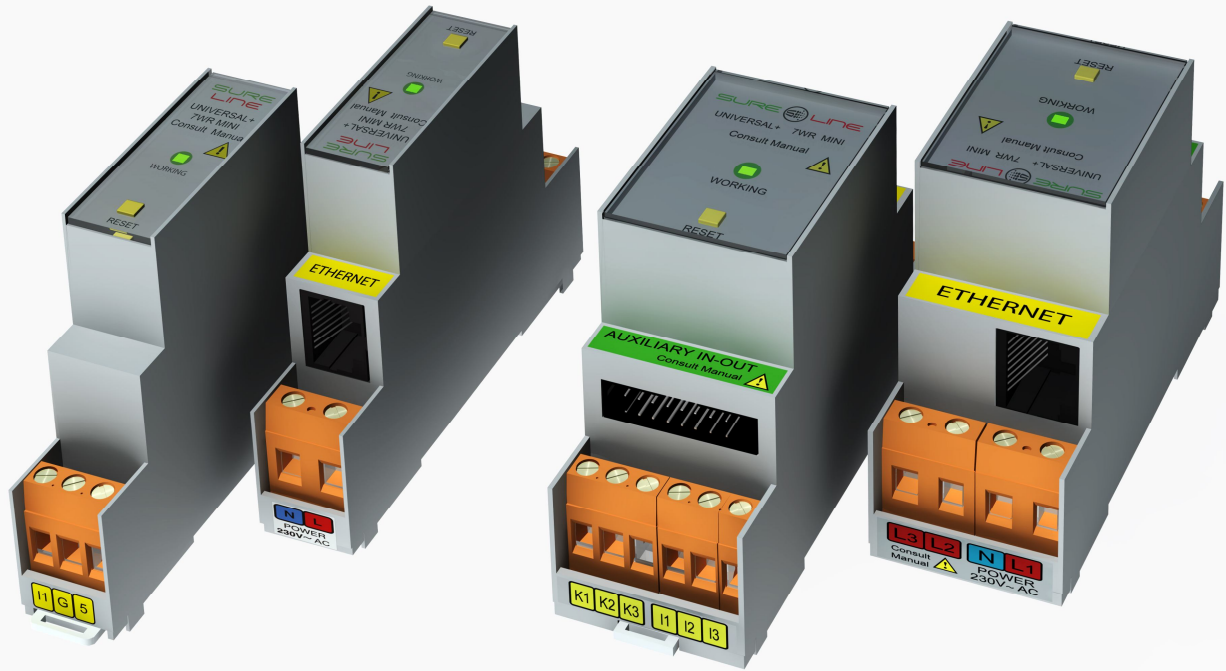
[Generic UNIVERSAL+ 7WR M4, Rogowski M4 and MINI M4 manual](#)

[Manual Safeline Web Service](#)

[Instruction manual - DatawatchPro software](#)

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

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



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 M4 model (consult these on the identifying label on the side of the unit and on its WebServer), different 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 M4:

Version: Line intensity transformer. Only TRIT7, TRIT14, TRIT18 and TRIT26 transformers Individually calibrated with their 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 [M4] [] [500E] [E] [] [] [] [] [] [] []
1 2 3 4 5 6 7 8 9 10 11

1- Command configuration

[M4] = Command 4

[M4 SR] = M4 + 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 TRIT7, TRIT14, TRIT18 and TRIT26 (5A, 70A, 140A and 280A) transformers

5 – Power supply-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 event-logger in waveform with pre-trigger (built-in 600-event memory)

[] No suffix = without oscilloscope event-logger in waveform with pre-trigger (built-in 600-event memory)

[W] = with oscilloscope event-logger in waveform with pre-trigger (built-in 600-event memory)

10 – Version: Connection of external I/O modules

[] No suffix = without connection to I/O modules

[S] = with connection to I/O modules, 10 logical outputs (relays), 10 logical inputs and temperature/humidity probe

11 – 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 M4 T 500E E 50Hz 230V 70A G3 W S TRIT14

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

Chapter 2 – User's guide

2.1 Reset key

General reset (with the unit in operation)

Pressing and holding the key for more than 10 seconds, the unit undergoes a GENERAL RESET.

Very important

The general reset restores the TCP/IP parameters to factory values and enables the TCP/IP programming from Internet/Intranet. It also deletes recorded data, alarms detected and recorded and status of the unit, with the exception of:

- Total accrued cut-off counter
- Alarm configurations
- User PIN

2.2 User PIN

The user PIN represents a high degree of security for the owner when surfing the 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.

ATENCIÓN: 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.

NOTE: For security reasons, should the TCP/IP programming be disabled via Internet/Intranet, it can only be re-enabled via the unit itself using the Reset key.

2.3 Intensity measurement transformer ratio

This submenu permits the user to program the intensity measurement transformer turns ratio of lines L1, L2 and L3. Programmable from 50A/5A, up to 10,000A / 5A (in 5A steps).

NOTA IMPORTANTE: IMPORTANT: Consult the intensity transformer compatibility with the different configurations in the UNIVERSAL+ 7WR MINI M4 range.

Three-phase:

7WR MINI M4 E	70A	Programming:	70 A / 5 A	Only TRIT14, TRIT18, TRIT26 toroids
7WR MINI M4 E	140A	Programming:	140 A / 5 A	Only TRIT18, TRIT26 toroids
7WR MINI M4 E	280A	Programming:	280 A / 5 A	Only TRIT26 toroids
7WR MINI M4 E	up to 10,000A	Programming:	xxxx A / 5 A	TRIT7 + Standard transformer, 50A/5A up to 10,000A/5A

Single-phase:

7WR MINI M4 E	70A	Programming:	70 A / 5 A	Only TRIT14, TRIT18, TRIT26 toroids
7WR MINI M4 E	140A	Programming:	140 A / 5 A	Only TRIT18, TRIT26 toroids
7WR MINI M4 E	up to 10,000A	Programming:	xxxx A / 5 A	TRIT7 + Standard transformer, 50A/5A up to 10,000A/5A

2.4 Impedance measurement.

Impedance measurement (Z), measurements displayed via WebServer.

When consumption is zero ($I = 0$), the impedance is infinite ($Z = \infty$).

Since the character screen does not have the infinity symbol (∞), this is shown as "0.00". Therefore, in the above case, $Z = 0.00$.

La impedance is calculated using the formula V_{rms} / I_{rms} . Therefore, the value of Z is in ohms (resistance)

2.5 Alarm delays

NOTE: The RMS alarm delays can vary between an additional 0 and 15ms depending on the moment of the RMS calculation

The peak alarm delays can vary between an additional 0 and 312uS depending on conversion and calculation.

The alarm delays programmed in seconds can vary +/-1 second.

2.7 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

2.8 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

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

2.9 Oscilloscope event-logger in waveform with pre-trigger

NOTE: When an event occurs, the waveforms are recorded in a non-volatile memory..

Recording time for an event (three-phase 6-channel) ranges from 620ms and 720ms (access time non-volatile memory).

While the recording in memory takes place, the oscilloscope event-logger does not log events.

Streamed events of a different type of trigger will all be recorded only if there is an interval of ≥ 720 ms between each and the next.

Repetitive events (of the same type of trigger) will be recorded every 10 secs (time alarm indicated)

Memory: The unit has sufficient memory to store 600 three-phase, 6-channel events. Once the 600-event memory is used up, no more data can be stored. Should one so wish, the events can be stored and displayed in a PC using the DataWatchPro software.

Should one wish to store another 600-event cycle, the memory must be deleted after having entered the user PIN.

Iniciar memoria del registrador de eventos

Aviso: Se perderán todos los datos guardados en memoria.

PIN

Attention: Update the time and date in the unit's clock in order to obtain correct data in the event-logger manually or automatically with the DatawatchPro software.

2.10 Clarification LOG

In the event of simultaneous alarms, only the first detected is logged.

In the event of various alarms going off in less than 1 second, only the first detected is logged.

Chapter 3 – Technical characteristics (please, refer to synoptical tables of characteristics 3.2)

3.1- Technical characteristics - UNIVERSAL+ 7WR MINI M4 (version with 0.5% precision)

Technical characteristics - UNIVERSAL+ 7WR MINI M4 (version with 0.5% precision)		
(supply: L-N 230V AC ± 15 % 50Hz sinusoidal alternating) Single-phase 2-pole (M) only L1 / Three-phase 4-pole (T) L1, L2, L3		
Measurement: True RMS voltage L1, L2, L3 (line neutral)	from 50,00V to 350,00V (version: 500E = full scale 500V Pk)	
Measurement: Peak voltage L1, L2, L3 (line neutral)	from 70,00V to 500,00Vpk (version: 500E = full scale 500V Pk)	
Measurement: True RMS voltage between phases L1 L2, L2 L3, L3 L1	from 100,00V to 500,00V (version: 500E = full scale 500V Pk)	
Measurement: AC voltage L1, L2, L3 (line neutral)	from 50,00V to 350,00V (version: 500E = full scale 500V Pk)	
Measurement: DC voltage L1, L2, L3 (line neutral)	from 0,00V to 450,00V (version: 500E = full scale 500V Pk)	
Measurement: True RMS intensity and AC intensity in autoscale Example for a programming of 70A RMS	Programmable from 50A/5A, up to 10,000 A / 5 A (in 5A steps). from 0,14A to 12,60A and 11,20A to 70,00A	
Measurement: Peak intensity and DC intensity in autoscale Example for a programming of 70A RMS	RMS intensity by 1,4142 from 0,20A to 23,47Apk and 15,84A to 98,99Apk	
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, ΣL123	Resolution 0,1W	
Measurement: Apparent power (VA) L1, L2, L3, ΣL123	Resolution 0,1VA	
Measurement: Reactive inductive power L1, L2, L3, ΣL123	Resolution 0,1VarL (from an FP of 0,995)	
Measurement: Reactive capacitive power L1, L2, L3, ΣL123	Resolution 0,1VarC (from an FP of 0,995)	
Measurement: Requested power L1, L2, L3, ΣL123	Resolution 0,1 +W	
Measurement: Returned power L1, L2, L3, ΣL123	Resolution 0,1 -W	
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.	
DC power (Wdc) de L1, L2, L3 and AC power (Wac) de L1, L2, L3	Resolution: 0,1VA (Depending on external intensity transformer)	
Counter: Active imported energy L1, L2, L3, ΣL123	from 0000000,00001 kWh to 9999999,99999 kWh	
Counter: Active exported energy L1, L2, L3, ΣL123	from 0000000,00001 kWh to 9999999,99999 kWh	
Counter: Reactive energy L1, L2, L3, ΣL123	from 0000000,00001 kWh to 9999999,99999 kWh (from an FP of 0,995)	
Measurement: Voltage unbalance L1, L2, L3 (line neutral)	%	
Measurement: Intensity unbalance L1, L2, L3	%	
Measurement: Voltage crest factor L1, L2, L3 (line neutral)		
Measurement: Intensity crest factor L1, L2, L3		
Measurement: Line impedance L1, L2, L3 (line neutral)	Z	
Measurement: Line frequency L1, L2, L3 (line neutral)	45,0Hz a 55,0Hz	
Measurement: Temperature	from -40,0 °C to +100,0 °C	
Measurement: Humidity	from 0,0% to 100,0% RH	
Measurement: Harmonic distortion Total (THD 63 harmonics) In Voltage L1, L2 and L3 in 50Hz (line neutral) In Intensity L1, L2 and L3 in 50Hz	from 0,1 to 999,9% % Measurement precision 1% from 0,1 to 999,9% % Measurement precision 1% 1 year ± (% measurement precision + 2 digits + 0.05% of F.E.) 22°C ± 5 °C, 30 a 75% HR	
% Measurement precision in: RMS voltage L1, L2, L3 (line neutral)	0.5 %	
% Measurement precision in: DC (Vdc) voltage L1, L2, L3 (line neutral)	0.5 %	
% Measurement precision in: AC (Vac) voltage L1, L2, L3 (line neutral)	0.5 %	
% Measurement precision in: RMS intensity L1, L2, L3	0.5 %	
% Measurement precision in: Intensity DC (Idc) L1, L2, L3	0.5 %	
% Measurement precision in: Intensity AC (Iac) 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	
% Measurement precision in: DC (Wdc) power	% Precision: V+I (RMS)+0.2	
% Measurement precision in: AC (Wac) power	% Precision: V+I (RMS)+0.2	
Specifications of typical precision and conditions for the module at:	1 year ± (% measurement precision + 2 tens digits + 0.3% del F.E.) at 22°C ± 5 °C, humidity:30 to 75% HR, range: 25-90%, 50Hz sinusoidal.	
Alarms programmable in value and delay:		
ΔV Pk (voltage difference) L1, L2, L3 (line neutral)	from 20V to 200V	Delay: 156,25 μs
ΔV RMS (voltage difference) L1, L2, L3(line neutral)	from 1V to 300V	Delay: 20ms
RMS overvoltage L1, L2, L3 (line neutral)	from 50V to 320V	Delay: 20ms to 10000ms (version F.E. 500V Pk.)
Pk overvoltage L1, L2, L3 (line neutral)	de 70Vpk to 450Vpk	Delay: 0,156ms to 9,06ms (version F.E. 500V Pk.)
RMS low voltage L1, L2, L3 (line neutral)	from 50V to 20V	Delay: 20ms to 10000ms (version F.E. 500V Pk.)
RMS intensity L1, L2, L3	from 1A a xxxxA	Delay: 20ms to 10000ms
Pk intensity L1, L2, L3	from 2APk a xxxxA	Delay: 0,156ms to 9,06ms
Neutral intensity	from 1A a xxxxA	Delay: 2S to 180S
Power 1 W L1, L2, L3	from 1 to 9999999 W	Delay: 1S to 999S
Power 2 W (Maximeter-integration programmable from 10 secs to 15 mins.)	from 1 to 9999999 W	L1, L2, L3
Power factor L1, L2, L3	from 0,99 to 0,01	Delay: 1S to 180S
Voltage THD L1, L2, L3	from 1% to 90%	Delay: 2S to 180S
Intensity THD L1, L2, L3	from 1% to 90%	Delay: 2S to 180S
Over-frequency L1, L2, L3 (line neutral)	from 51Hz a 55Hz	Delay: 1S to 180S
Low frequency L1, L2, L3 (line neutral)	from 45Hz a 49Hz	Delay: 1S to 180S
Phase sequence	-	Delay: 1S to 180S
Phase failure		
Voltage unbalance L1, L2, L3 (line neutral)	from 5% to 100%	Delay: 1S to 180S
Intensity unbalance L1, L2, L3	from 5% to 100%	Delay: 1S to 180S
Over-temperature	from -40,0 °C to +100,0 °C	Delay: 1S to 180S
Low temperature	from -40,0 °C to +100,0 °C	Delay: 1S to 180S
Over- humidity	from 10% to 90%	Delay: 1S to 180S
Low humidity	from 10% to 90%	Delay: 1S to 180S

AC/DC measurements	
DC (Vdc) voltage L1, L2, L3 (line neutral)	Range: from 0,00V a 450,00V (500E version = full scale 500V Pk.)
AC (Vac) voltage L1, L2, L3 (line neutral)	Range: from 50,00V to 450,00V (500E version = full scale 500V Pk.)
DC (Idc) intensity L1, L2, L3	Depending on external intensity transformer
AC (Iac) intensity L1, L2, L3	Depending on external intensity transformer
DC (Wdc) power L1, L2, L3	Resolution 0,1VA (Depending on external intensity transformer)
AC (Wac) power L1, L2, L3	Resolution 0,1VA (Depending on external intensity transformer)
Harmonics measurements with power, distortion factor, power factor and THD	
% voltage HDF (harmonic distortion) L1, L2, L3 from harmonic k0 to 63 (64 harmonics)	64 harmonics Range: from 0,1 to 999,9%
% intensity HDF (harmonic distortion) L1, L2, L3, from harmonic k0 to 63 (64 harmonics)	64 harmonics Range: from 0,1 to 999,9%
Power W L1, L2, L3, Σ L1,2,3, from harmonic k0 to 63 (64 harmonics)	64 harmonics resolution 0,1VA
Power factor L1, L2, L3, from harmonic k0 to 63 (64 harmonics)	64 harmonics from 0,000 to 1,000
Voltage L1, L2, L3, from harmonic k0 to 63 (64 harmonics)	64 harmonics
Intensity L1, L2, L3, from harmonic k0 to 63 (64 harmonics)	64 harmonics
300-register graphic logger, 12 channels (46 measurements) with autoscale and variable refreshment (1-60 secs) with temporary max., min. and avg. measurements	
Current value of 46 measurements and Difference in value between maximum and minimum (Max value – Min value) of 46 measurements	
Temporary maximum value (300 registers, 1-600 Secs.) of 46 measurements	
Temporary minimum value (300 registers, 1-600 Secs.) of 46 measurements	
Temporary average value (300 registers, 1-600 Secs.) of 46 measurements	
Graphic energy log, costs and emissions with (optional) built-in memory. Graphic active and reactive energy . 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 (only 3-phase model)	
Graphic bar and line display in WebServer for months, days, hours and 5-minute frames.	
Oscilloscope event-logger in waveform with pre-trigger and autoscale, 6 channels V1, V2, V3, I1, I2, I3, with captures for each event (optional) Three modes of log length in 6 channels 160ms, 320ms and 640ms (pre-trigger: 40ms, 80ms and 160ms) 600-event storage in built-in memory. Display via WebServer and DataWatchPro. Trigger for alarms which can be enabled and are programmable in value and delay. Chronological record for each type of alarm. Display via WebServer with horizontal zoom functions. Multi-channel measurement, value and time cursor, 3 mathematical V¹ channels, etc. Display via DataWatchPro with offset functions, amplitude, time base, horizontal shift zoom, value and time cursor,	
Alarm: Δ V Pk (voltage difference) L1, L2, L3	
Alarm: Δ V RMS (voltage difference) L1, L2, L3	
Alarm: RMS overvoltage L1, L2, L3	
Alarm: Pk overvoltage L1, L2, L3	
Alarm: RMS intensity L1, L2, L3	
Alarm: Pk intensity L1, L2, L3	
Alarm: Voltage THD L1, L2, L3	
Alarm: Intensity THD L1, L2, L3	
Alarm: Over-frequency L1, L2, L3	
Alarm: Low frequency L1, L2, L3	
Remote input 1 and Remote input 2 (digital inputs). External trigger	
Sampling 6 channels, log length 160ms pre-trigger 40ms	6,4KHz per channel. Native resolution (1024 points in 160ms)
Sampling 6 channels, log length 320ms pre-trigger 80ms	6,4KHz per channel. Resolution /2 (1024 points in 320ms)
Sampling 6 channels, log length 640ms pre-trigger 160ms	6,4KHz per channel. Resolution /4 (1024 points in 640ms)
Other	
Delay remote Inputs 1 and 2	5ms
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 M4 single-phase module	18mm (1 module) height: 67mm 35mm DIN rail
Dimensions UNIVERSAL+ 7WR MINI M4 three-phase module	36mm (2 modules) height: 67mm 35mm DIN rail
Weight UNIVERSAL+ 7WR MINI M4 single-phase module	75 gr.
Weight UNIVERSAL+ 7WR MINI M4 three-phase module	135 gr.
Weight toroids	TRIT7 (12 gr.), TRIT14 (70 gr.), TRIT18 (185 gr.), TRIT26 (300 gr.)
Guarantee	3 years
Configurable language	Spanish or 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 (500E version = full scale 500V Pk.)
Full scale (F.E.): between phases L1 L2, L2 L3, L3 L1	900V (500E version = full scale 500V Pk.)
Full scale (F.E.): Intensity L1, L2, L3:	from 50A to 10,000A (as per programming of intensity ratio) by 1,4142
Full scale (F.E.): Intensity L1, L2, L3:	20A and 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)
Full scale (F.E.): DC and AC power L1, L2, L3:	Intensity full scale, by voltage full scale (Max. 9999999,9 W)
Full scale (F.E.): harmonic distortion	999,9 %
Chronological log of last alarm	with value and year, month, day, hour and minute.
Remote input 1 and 2, programmable:	Programmable input signal, normal or rocking.
Individual alarm counters	cf. synoptical tables of characteristics
Registers of maximum and minimum measurements	cf. synoptical tables of characteristics
Alarm central, tele-control and automation	10 logical outputs (relays) and 10 logical inputs.
Time programmer with high-precision clock	6 programs per day, programming in hours and minutes, enablement of 10 logical outputs (relays)
WebServer (Version: HTML 4.01 Transitional, IPV4, connection RJ45 8 pin 10 BASE-T)	
7-channel oscilloscope with autoscale and 3 mathematical V¹ channels. Includes instantaneous value measurement cursor in all channels (display in WebServer)	
7-channel oscilloscope with autoscale and offset control functions, amplitude, time base, delay/advance in degrees, multi-channel measurement cursor, Measurement of RMS, Pk, THD, etc. Sampling 7 channels 6,4KHz per channel (display in DataWatchPro)	
Analysis of harmonics spectrum with autoscale (V1, V2, V3, I1, I2 and I3 with 64 harmonics). Measurements of 64 harmonics with power, distortion factor(range in % and value V – A) and power factor. Display with continuous refreshment (every 1,5 secs). Includes measurement cursor (display via WebServer).	
Analysis of 7-channel harmonics spectrum with autoscale (up to harmonic 63, range in % and RMS value).	
Multi-channel measurement cursor and simultaneous analysis of 1, 2, 3, 4, 5, 6 and 7 channels (display via DataWatchPro).	
DWP (DataWatchPro): Professional software for PC with database and graphic analysis.	
Modbus TCP/IP, Port 502, and TCP/IP. HTTP communication protocol . WebServer.	

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

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

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

UNIVERSAL+ 7WR (3-year guarantee) Version	UNIVERSAL+ 7WR				
	M4		Rogowski M4	MINI M4	
	M	T	T	T	M
Single-phase (M) only L1 / Three-phase (T) L1, L2, L3					
WebServer in real time, display refreshed every 1.5 seconds for variable parameters					
Start-up WEB page, PIN	•	•	•	•	•
WEB page: Box "Measures and events", section "Measurements"	•	•	•	•	•
WEB page: Box "Measures and events", section "Energy counters"	•	•	•	•	•
WEB page: Box "Measures and events", section "Maximum and minimum values"	•	•	•	•	•
WEB page: Box "Measures and events", section "Alarm counters"	•	•	•	•	•
WEB page: Box "Measures and events", section "Event-logger counters in waveform"	•	•	•	•	•
WEB page: Box "Measures and events", section "Historical logger - LOG"	•	•	•	•	•
WEB page: Box "Event-logger" 600-event storage in built-in memory (optional)	•	•	•	•	•
WEB page: Box "Energy log" with 3-year built-in memory (optional)	•	•	•	•	•
WEB page: Box "Real time" 300-event graphic logger, 12 channels with autoscale	•	•	•	•	•
WEB page: Box "Oscilloscope" 7-channel oscilloscope with autoscale	•	•	•	•	•
WEB page: Box "Harmonics" Harmonics spectrum with autoscale (64 harmonics)	•	•	•	•	•
WEB page: Box "Input/output status"	•	•	•	•	•
WEB page: Box "Manual relay control"	•	•	•	•	•
WEB page: Box "Relay alarms"	•	•	•	•	•
WEB page: Box "Relay timers"	•	•	•	•	•
WEB page: Box "Time programmer"	•	•	•	•	•
WEB page: Box "Unit configuration"	•	•	•	•	•
WEB page: Box "Access configuration" and WEB page: Box "Close session"	•	•	•	•	•
WEB page: Box "Thd/Hd/VAr log" Graphic log of meanTHD-HD-VAr at 5-minute intervals with built-in 14-month memory Analysis for harmonics compensation and reactive power		•	•		
300-event graphic logger, 12 channels (46 measurements) with autoscale and variable refreshment (1-600 secs.) with temporary max. min. avg. measurements					
Current value for 46 measurements	•	•	•	•	•
Temporary maximum value (300 events, 1-60 secs.) for 46 measurements	•	•	•	•	•
Temporary minimum value (300 events, 1-60 secs.) for 46 measurements	•	•	•	•	•
Temporary average value (300 events, 1-60 secs.) for 46 measurements	•	•	•	•	•
Difference in value between maximum and minimum (Max value – Min value) of 46 measurements	•	•	•	•	•
Automatic data dispatch to a remote server via Internet (optional)					
By enabling "Remote server TCP/IP configuration", the unit automatically dispatches the data file (Slist.json) to a remote server. This file is dispatched every 5 minutes (in sync with the internal clock)	•	•	•	•	•
Measurements					
True RMS and Pk voltage L1, L2, L3	•	•	•	•	•
True RMS voltage between phases L1-2, L2-3, L3-1		•	•		•
True RMS and Pk intensity L1, L2, L3	•	•	•	•	•
Neutral intensity		•	•		•
True RMS and Pk differential intensity	•	•			
Voltage THD (total harmonic distortion) L1, L2, L3 and Intensity THD (total harmonic distortion) L1, L2, L3	•	•	•	•	•
Voltage THD L1, L2, L3 of intensity L1, L2, L3 as from harmonic 2 – 63, programmable by harmonic and harmonic range (HP versions)	•	•	•		
Voltage unbalance L1, L2, L3 and Intensity unbalance L1, L2, L3		•	•		•
Voltage crest factor L1, L2, L3 and Intensity crest factor L1, L2, L3	•	•	•	•	•
Temperature, relative humidity	•	•	•	•	•
Relative temperature and humidity of 6 remote UNIVERSAL+ 7WR TH sensors via Internet/Intranet (Only in HP versions)	•	•	•		
Line frequency L1, L2, L3	•	•	•	•	•
Line impedance L1, L2, L3	•	•	•	•	•
Apparent power L1, L2, L3, $\Sigma L123$	•	•	•	•	•
Active power L1, L2, L3, $\Sigma L123$	•	•	•	•	•
Requested power L1, L2, L3, L123 and Returned power L1, L2, L3, $\Sigma L123$	•	•	•	•	•
Reactive inductive power L1, L2, L3, $\Sigma L123$ and Reactive capacitive power L1, L2, L3, $\Sigma L123$	•	•	•	•	•
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, $\Sigma L123$ from 0000000,00001 to 9999999,99999 kWh	•	•	•	•	•
Active exported energy counters L1, L2, L3, $\Sigma L123$ from 0000000,00001 to 9999999,99999 kWh	•	•	•	•	•
Reactive energy counters L1, L2, L3, $\Sigma L123$ from 0000000,00001 to 9999999,99999 kWh	•	•	•	•	•
DC voltage (Vdc) L1, L2, L3	•	•	•	•	•
AC voltage (Vac) L1, L2, L3	•	•	•	•	•
DC intensity (Idc) L1, L2, L3	•	•	•	•	•
AC intensity (Iac) L1, L2, L3	•	•	•	•	•
DC power(Wdc) L1, L2, L3	•	•	•	•	•
AC power (Wac) L1, L2, L3	•	•	•	•	•
Differential intensity DC (IDdc) (HP versions)	•	•			
Differential intensity AC (IDac) (HP versions)	•	•			
Voltage %HD (harmonic distortion) L1, L2, L3 of harmonic k 0 to 63 (64 harmonics)	•	•	•	•	•
Intensity %HD (harmonic distortion) L1, L2, L3, of harmonic k 0 to 63 (64 harmonics)	•	•	•	•	•
Power W L1, L2, L3, $\Sigma L123$, of harmonic k 0 to 63 (64 harmonics) Only NON HP versions	•	•	•	•	•
Power factor L1, L2, L3, of harmonic k 0 to 63 (64 harmonics) Only NON HP versions	•	•	•	•	•
Voltage L1, L2, L3, of harmonic k 0 to 63 (64 harmonics)	•	•	•	•	•
Intensity L1, L2, L3, of harmonic k 0 to 63 (64 harmonics)	•	•	•	•	•

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

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

3.3 Description of connection terminals - UNIVERSAL+ 7WR MINI M4

Description of connection terminals - UNIVERSAL+ 7WR MINI M4 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 L-N AC + INPUT SENSOR INPUT1 OF MEASUREMENT L1
△ N POWER 230V	NEUTRAL POWER + COMMON INPUT SENSOR INPUT1, 2 Y 3 OF MEASUREMENT N
△ L2	ENTRADA SENSOR INPUT 2 OF MEASUREMENT L2 (LÍNEA 2) L2-N 230V AC
△ L3	ENTRADA SENSOR INPUT 3 OF MEASUREMENT L3 (LÍNEA 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)
△ AUXILIARY IN-OUT	CONNECTION TO INPUT/OUTPUT RELAY MODULES TEMPERATURE/HUMIDITY PROBE, REMOTE IN1, IN2 USE ONLY SUPPLIED CABLE AND CONNECTORS (Consult the UNIVERSAL+ 7WR IN OUT and accessories, I/O relay modules, temperature and humidity probe manuals)
△ ETHERNET	CONEXIÓN ETHERNET RJ45

Description of connection terminals - UNIVERSAL+ 7WR MINI M4 E, single-phase 2-pole

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

△ L POWER 230V	POWER PHASE L (LINE) 230V L-N AC + INPUT SENSOR INPUT1 OF MEASUREMENT L
△ N POWER 230V	NEUTRAL POWER + ENTRADA SENSOR INPUT1 OF MEASUREMENT N
△ I1	INPUT INTENSITY SENSOR L1 (MAXIMUM INTENSITY 0,1A RMS)
△ G	COMMON INTENSITY SENSOR (MAXIMUM INTENSITY 0,1A RMS)
△ 5	DO NOT CONNECT
△ AUXILIARY IN-OUT	CONNECTION TO INPUT/OUTPUT RELAY MODULES TEMPERATURE/HUMIDITY PROBE, REMOTE IN1, IN2 USE ONLY SUPPLIED CABLE AND CONNECTORS (Consult the UNIVERSAL+ 7WR IN OUT and accessories, I/O relay modules, temperature and humidity probe manuals)
△ ETHERNET	RJ45 ETHERNET CONNECTION

3.4 Description of command panel

- 1 – Green indicator LED WORKING blinking slowly (1 Hz), indicates measurement in process.
- 2 – Green indicator LED WORKING blinking rapidly (1/2 Hz), indicates alarm detected.
- 3 – Square yellow key : RESET key – (General reset if held pressed for more than 10 secs.)

3.5 Alarm values ex-factory by default - UNIVERSAL+ 7WR MINI M4
Version: voltage measurement scale, 500E.

For configurations:

115V 50Hz AC between phase and neutral, 200V AC 50Hz between phases.
230V 50Hz AC between phase and neutral, 400V AC 50Hz between phases.

Version: voltage measurement scale (Line Neutral): 500E = full scale measurement line neutral 500V Pk Single-phase 2-pole (M) only L1 / Three-phase 4-pole (T) L1, L2, L3				
Alarm	Range Value	Value	Range Nbr Delay	Delay
ΔV Pk L1, L2, L3 (voltage difference Pk)	from 20 V to 200 V	40 V	Set	156,25 μ s
ΔV RMS L1, L2, L3 (RMS voltage difference)	from 1 V to 300 V	25 V	Set	20ms
RMS overvoltage L1, L2, L3	50 – 320 V	265 V	(1 - 500) x 20ms = (20 – 10000)ms	49 = 980ms
Pk overvoltage L1, L2, L3	70 – 450 V Pk	400 V Pk	(1 - 58) x 0,15625 ms = (0,156 – 9,06)ms	12 = 1,875ms
RMS low voltage L1, L2, L3	50 – 320 V	185 V	(1 - 500) x 20ms = (20 – 10000)ms	250 = 5000ms
RMS intensity L1, L2, L3	1 – xxxx A	63 A	(1 - 500) x 20ms = (20 – 10000)ms	250 = 5000ms
Pk intensity L1, L2, L3	2 – xxxx A Pk	89 A Pk	(1 - 58) x 0,15625 ms = (0,156 – 9,06)ms	55 = 8,593ms
Neutral intensity	1 – xxxx A	40 A	1 – 180 seconds	10 s
Power1 W L1, L2, L3	1 – 9999999 W	1000 W	1 – 180 seconds	10 s
Power2 W L1, L2, L3	1 – 9999999 W	1000 W	Maximeter programmable from 10 secs to 15 mins.	15 min.
Power factor L1, L2, L3	0,99 – 0,01	0.4	1 – 180 seconds	10 s
Unbalance V L1, L2, L3	5 – 100 %	50 %	1 – 180 seconds	10 s
Unbalance I L1, L2, L3	5 – 100 %	90 %	1 – 180 seconds	10 s
Voltage THD L1, L2, L3	1 – 90 %	10 %	2 – 180 seconds	10 s
Intensity THD L1, L2, L3	1 – 90 %	80 %	2 – 180 seconds	10 s
Over-temperature	-40 to +100 °C	Alarm OFF \geq +50 °C NO alarm ON < +45 °C Value of OFF must be > value of ON	1 – 180 seconds	10 s
Low temperature	-40 to +100 °C	Alarm OFF < -10 °C NO alarm ON \geq -5 °C Value of OFF must be < value of ON	1 – 180 seconds	10 s
Over- humidity	10 – 90 %	Alarm OFF \geq 90 % NO alarm ON < 80 %	1 – 180 seconds	10 s
Low humidity	10 – 90 %	Alarm OFF < 10 % NO alarm ON \geq 20 %	1 – 180 seconds	10 s
Over-frequency L1, L2, L3	51 – 55 Hz	Alarm OFF \geq 55 Hz NO alarm ON < 54 Hz	1 – 180 seconds	10 s
Low frequency L1, L2, L3	45 – 49 Hz	Alarm OFF < 45 Hz NO alarm ON \geq 46 Hz	1 – 180 seconds	10 s
Phase sequence	-	-	1 – 180 seconds	10 s
Remote input 1	Normal or rocking	Normal	-	5ms
Remote input 2	Normal or rocking	Normal	-	5ms
Functions				
Time programmer	ON / OFF	ON		
External module 1	YES/ NO	NO		
External module 2	YES/ NO	NO		
Temp./Humidity probe	YES/ NO	NO		

3.6 Default alarm status (enabled/disabled) ex-factory - UNIVERSAL+ 7WR MINI M4

Alarm	Enabled ex-factory by default	Can be enabled/disabled in configuration menu
RMS overvoltage L1, L2, L3	NO	YES
Pk overvoltage L1, L2, L3	NO	YES
RMS low voltage L1, L2, L3	NO	YES
RMS intensity L1, L2, L3	NO	YES
Pk intensity L1, L2, L3	NO	YES
Neutral intensity	NO	YES
Power 1 W	NO	YES
Power 2 W (Maximeter programmable from 10 secs to 15 mins.)	NO	YES
Power factor L1, L2, L3	NO	YES
Voltage THD L1, L2, L3	NO	YES
Intensity THD L1, L2, L3	NO	YES
Voltage unbalance L1, L2, L3	NO	YES
Intensity unbalance L1, L2, L3	NO	YES
Over-temperature	NO	YES
Low temperature	NO	YES
Over- humidity	NO	YES
Low humidity	NO	YES
Over-frequency L1, L2, L3	NO	YES
Low frequency L1, L2, L3	NO	YES
Phase sequence	NO	YES
Phase failure L1, L2, L3	NO (enabled / disabled upon low voltage)	NO
Remote input 1	NO	YES
Remote input 2	NO	YES
Time programmer	NO	YES

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

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

Chapter 4 – User's/installation guide

4.1 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, MCB's). 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 up to voltages other than 115V AC \pm 20% or 230V AC \pm 20%, depending on version.
- 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 connect the unit to any voltages/frequencies other than those indicated. (please, refer to technical characteristics).
- Only transformers TRIT7, TRIT14, TRIT18 and TRIT26 (5A, 70A, 140A Y 280A) must be installed in nomenclature "E" in the version with the intensity measurement toroidal transformer.
- For protection of electrical installations, the UNIVERSAL+ 7WR (versions commands 1, 2 and 3) should be used.
- 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, magnets, 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*.

WARNING!

This unit (UNIVERSAL+ 7WR MINI M4 module and eventual accessories) must be installed in a closed, standard enclosure, the only part within access of the user being its display and command panel.

The parameters displayed in inverted commas "-.-", indicate that the parameter and, therefore, its corresponding alarm are not implemented in this specific and, consequently, no operation is contemplated

The temperature and humidity in inverted commas "-.-" indicate that the temperature/humidity probe is either not enabled in the menu or that it has not been installed.

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

◆ Important

- Toroidal transformers tare individually matched and adjusted to their corresponding 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 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 core to the SURELINE unit must not exceed 25 cms.

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

The toroidal transformers must of necessity be positioned as shown in the "Wiring diagrams". If positioned incorrectly, W+ will measure W- and vice versa and rL will measure rC and vice versa. 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.

- 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 UNIVERSAL+ 7WR IN OUT and 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 of the protections.

One risk of the unit not functioning correctly could be originated principally by a 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.

4.2 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".

4.3 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 ó 230V AC, or a three-phase installation (3 phases + neutral) having a difference of potential from phases to neutral of 115V ó 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.

4.4 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 5 – Diagnoses and trouble-shooting

5.1 Diagnosis and solution

Via its WebServer, the unit indicates:

1. Test error

When "Test error" is indicated, the technical service must be contacted.

2. Communication error real time clock

The unit indicates "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.

3. Communication error temperature and humidity probe

Verify the wiring of the temperature and humidity probe, cut off the supply to the unit and then switch on again. Go to the submenu "temperature and humidity probe", disable the probe and then enable it again. There is an anomaly in the temperature and humidity probe. Do NOT use it. Consult the technical service.

4. Communication error external module

Verify the wiring of the external modules, cut off the supply to the unit and to the modules and then switch the unit on again. Go to the submenu "External module I/O x" and disable the Communications of the modules and then enable it again. There is an anomaly in one or both the external modules. Do NOT use them. Disable them and consult the technical service.

5. "Incorrect user pin"

The user has entered the PIN incorrectly prior to pressing "Save" or "Send".

6. "Remote unit not found. Check configuration."

Some parameter in "Remote unit TCP/IP configuration" is not correct.

7. "Warning, command sent with pin error. Check configuration."

Some parameter in "Remote unit TCP/IP configuration" is not correct.

8. "Remote server not found. Check configuration."

Some parameter in "Remote unit TCP/IP configuration" is not correct.

9. "SST error"

Failure upon detection of physical memory for data storage.

10. "Warning, incoming command received with PIN error."

A command/order received from another unit or automated system with incorrect user PIN.

Chapter 6 – Verification and start-up

6.1 Start-up

Connect all up-stream conductors by means of switches, sectionalisers or others.

The reinitiation sequence will automatically be carried out. The ancillary MCB will then reset and the unit will be operative.

6.2 Alarm diagnosis

The causes of the alarms are memorised and displayed via the WebServer.

Chapter 7 – Description of basic components

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

The UNIVERSAL+ 7WR MINI M4 nomenclature “E”, is only compatible with TRIT7, TRIT14, TRIT18 and TRIT26 transformers.

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 Para 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 8 – Technical service

8.1 Technical service

Authorised technical service: solely by the manufacturer

Chapter 9 – Maintenance

9.1 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 10 – Guarantee

10.1 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 11 – Wiring diagrams

11.1 Wiring diagrams

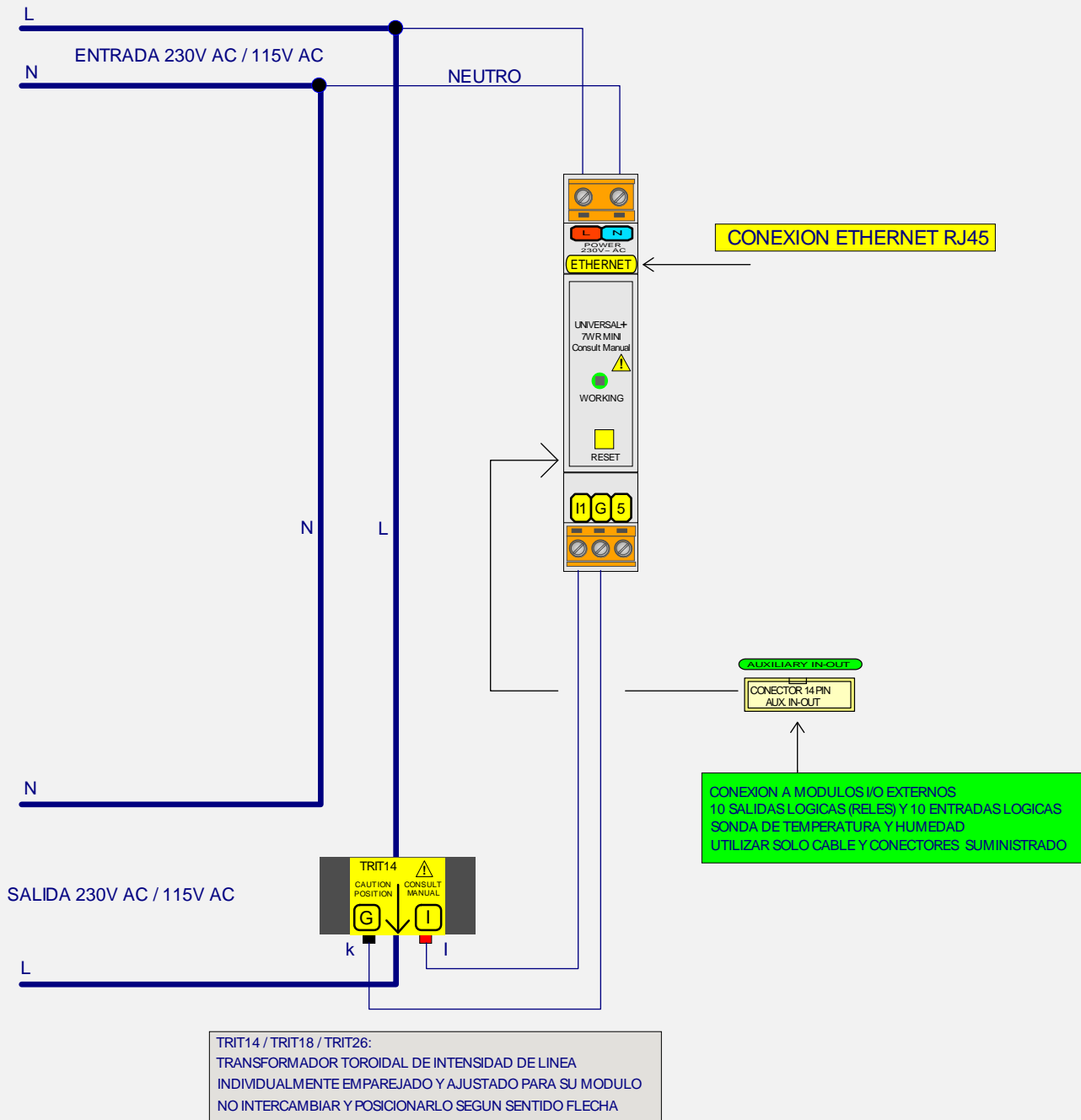
UNIDAD UNIVERSAL+ 7WR MINI MANDO 4

MODELO UNIVERSAL+ 7WR MINI - M4 - 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

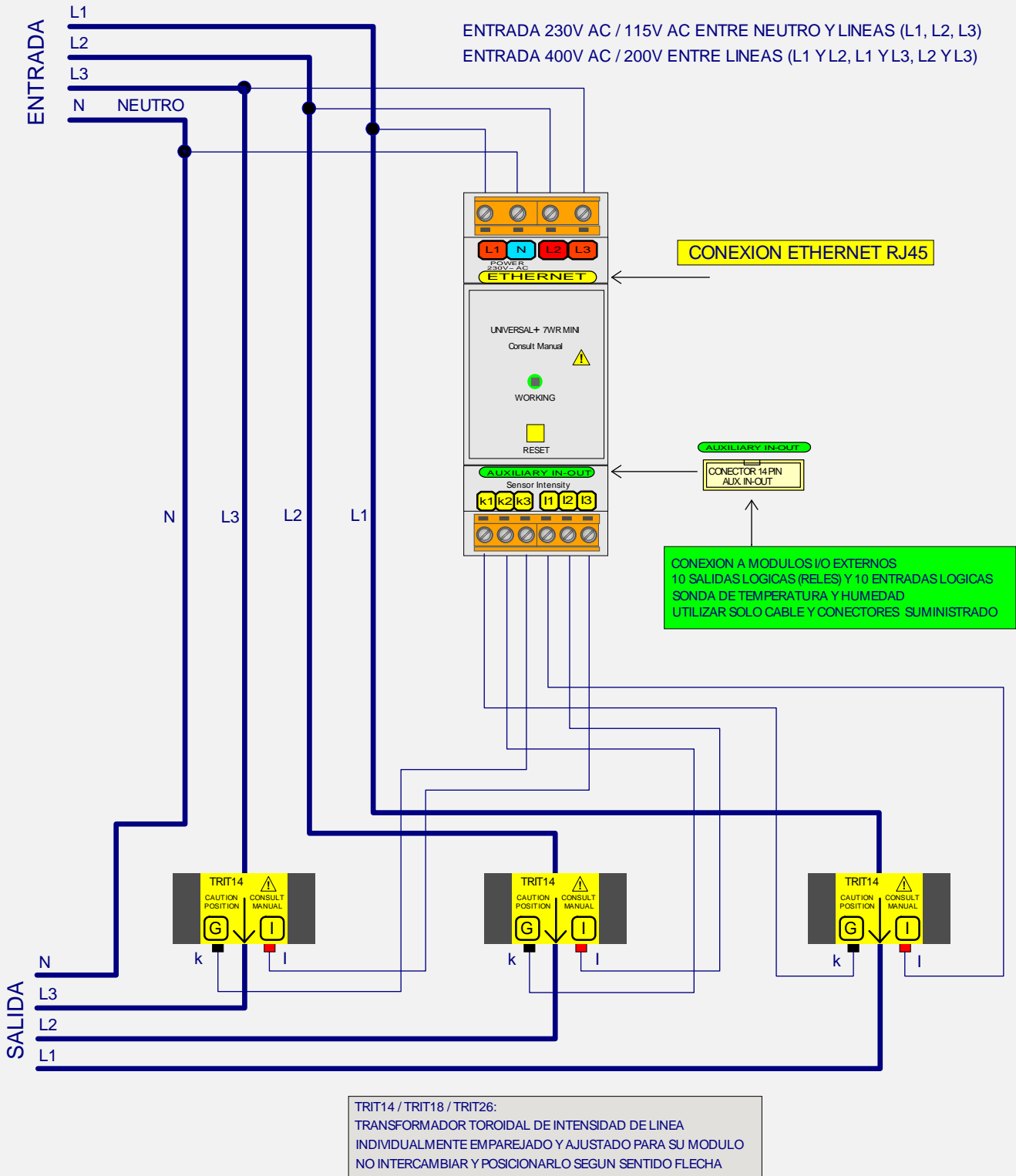
UNIDAD UNIVERSAL+ 7WR MINI MANDO 4

MODELO UNIVERSAL+ 7WR MINI - M4 - 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)



CONSULTAR MANUAL DE INSTRUCCIONES

UNIDAD UNIVERSAL+ 7WR MINI MANDO 4

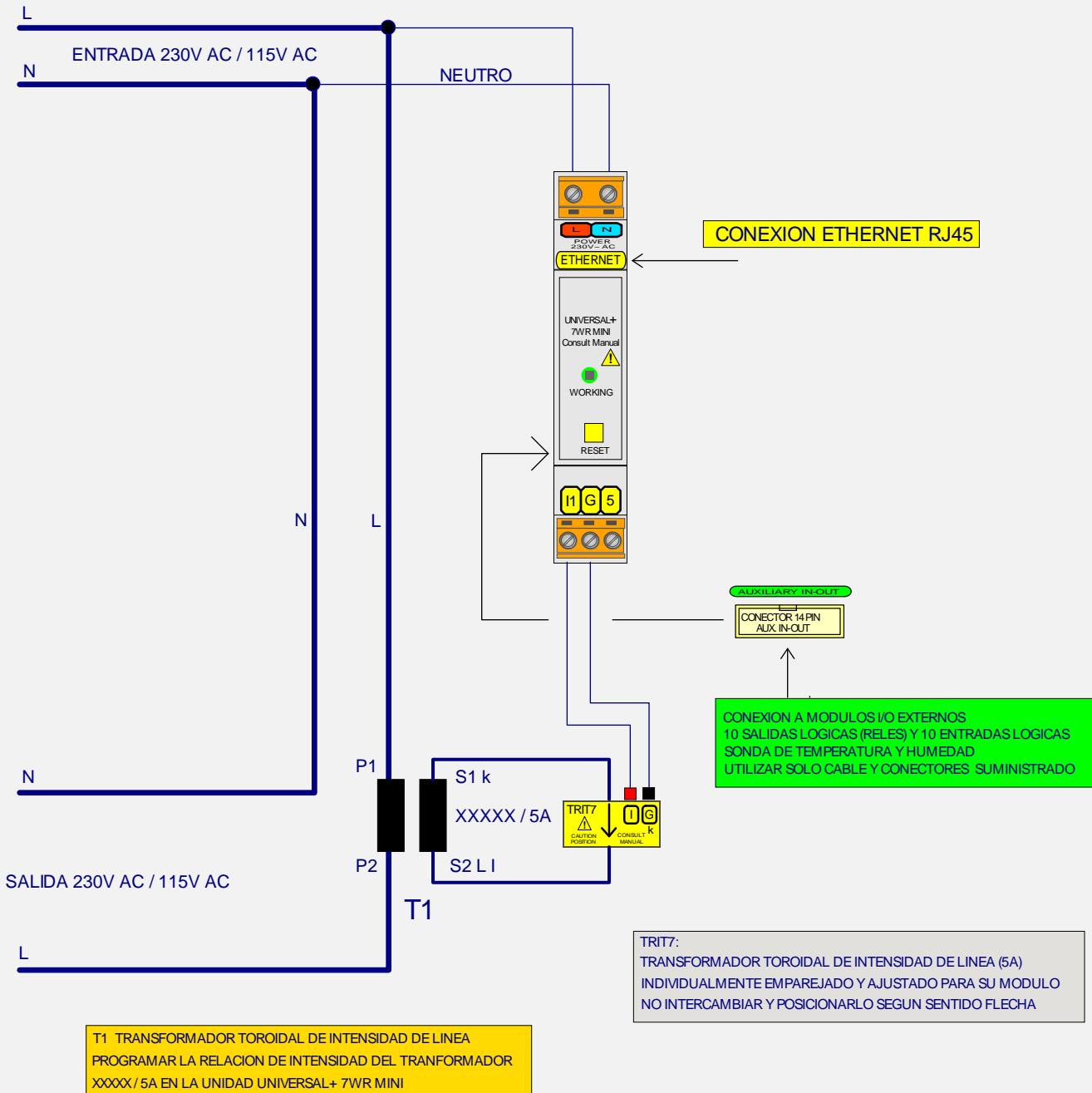
MODELO UNIVERSAL+ 7WR MINI - M4 - M - 500E - E - 50Hz - 230V - 5A

CONFIGURACION MONOFASICA 2 POLOS HASTA 10.000A.

Versión transformador de intensidad de línea. Únicamente transformador TRIT7

TRIT7 (5A para 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 MANDO 4

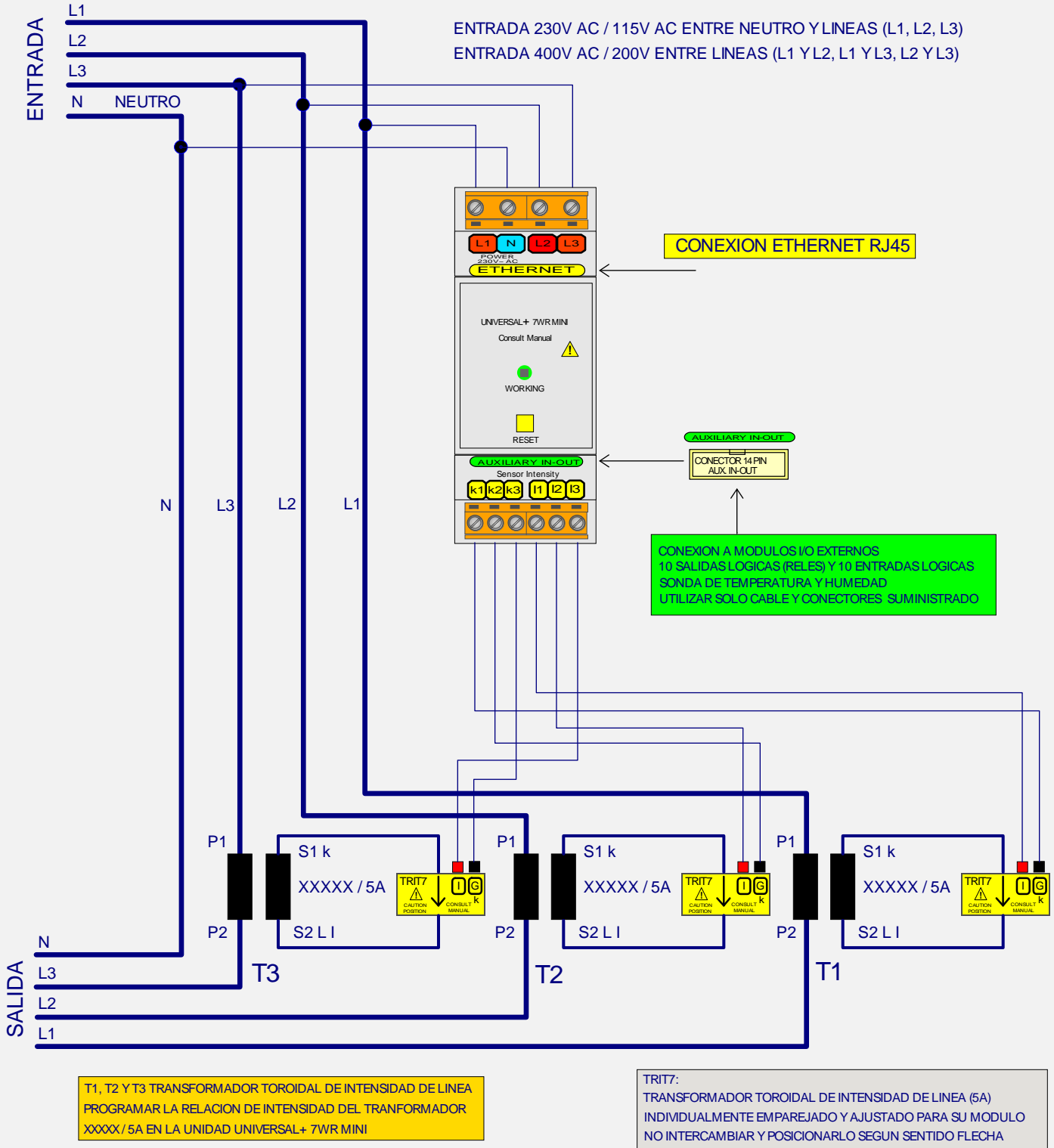
MODELO UNIVERSAL+ 7WR MINI-M4 - T - 500E - E - 50Hz - 230V - 5A

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)

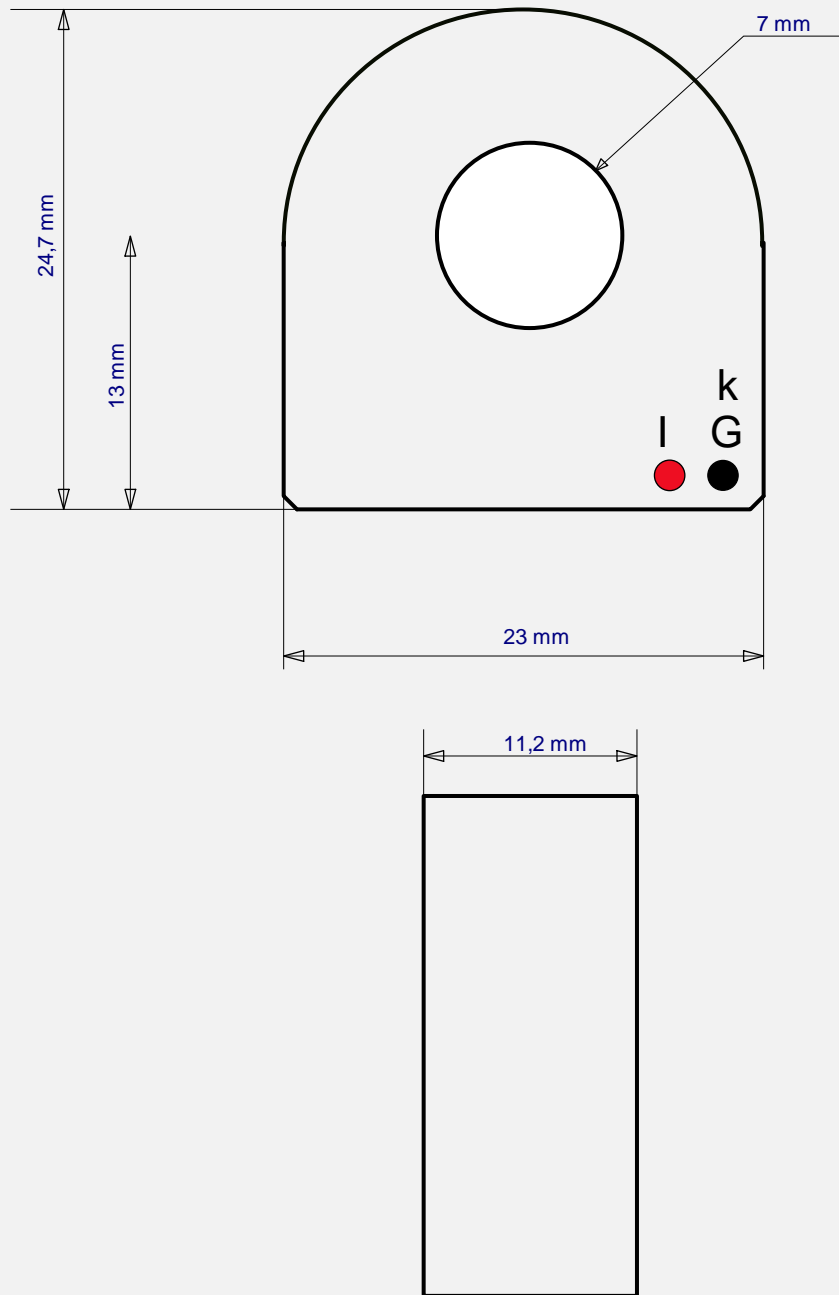
Versión alimentación 230V / 115V / POE (Power over Ethernet)



CONSULTAR MANUAL DE INSTRUCCIONES

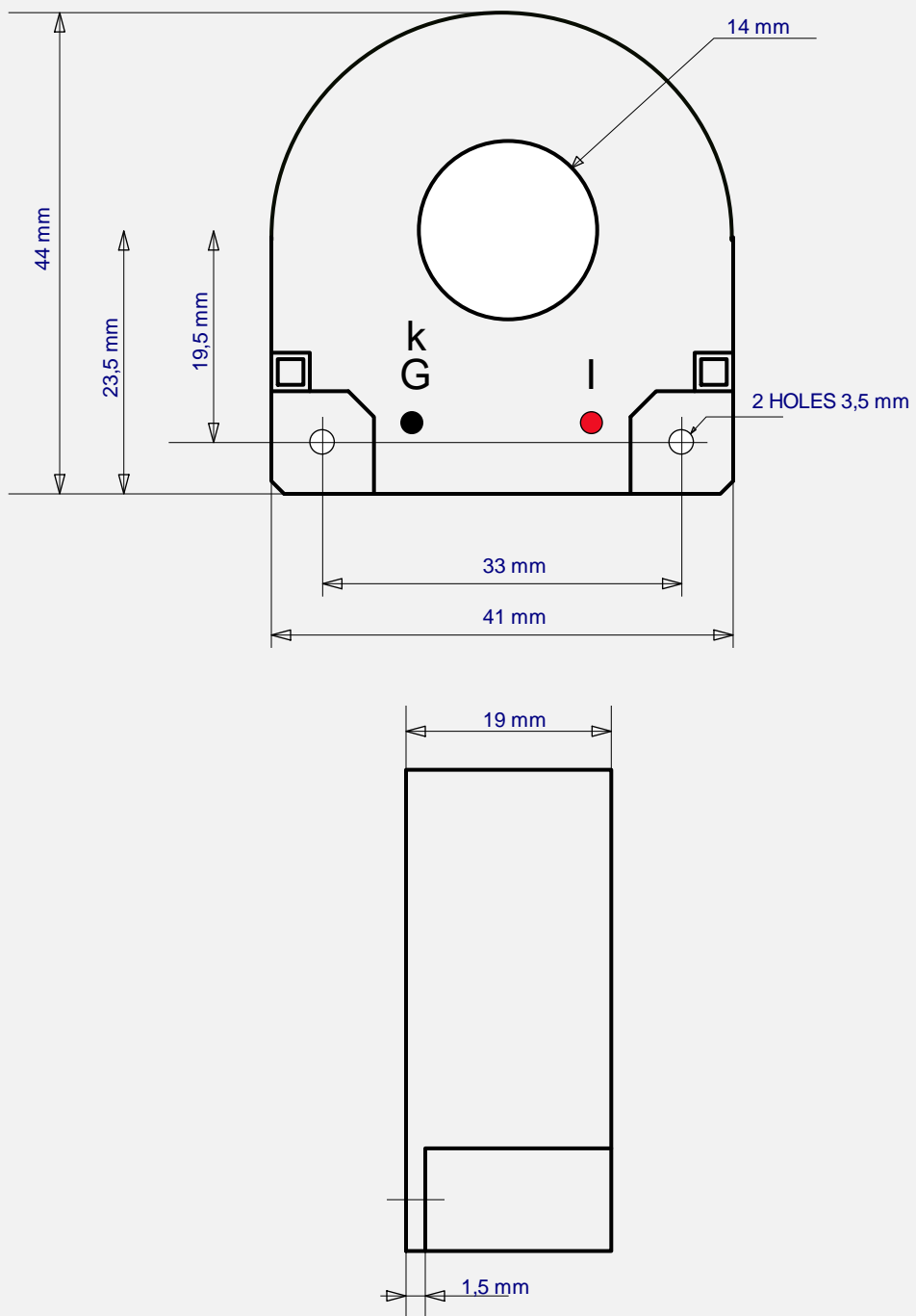
DIMENSIONES TRANSFORMADOR TOROIDAL DE INTENSIDAD DE LINEA

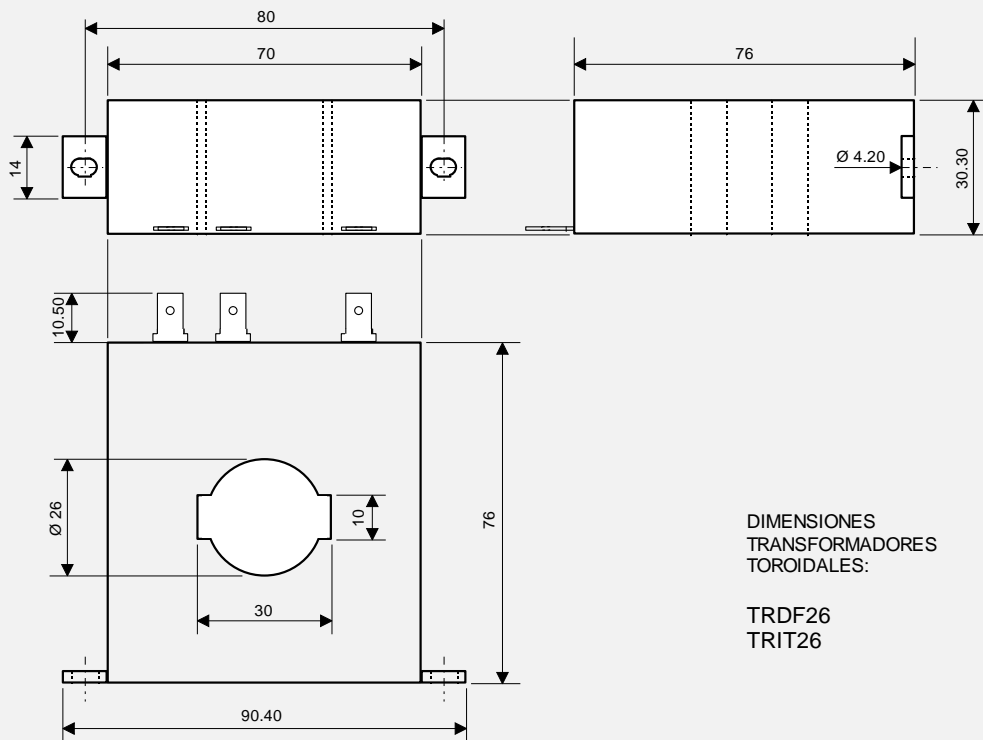
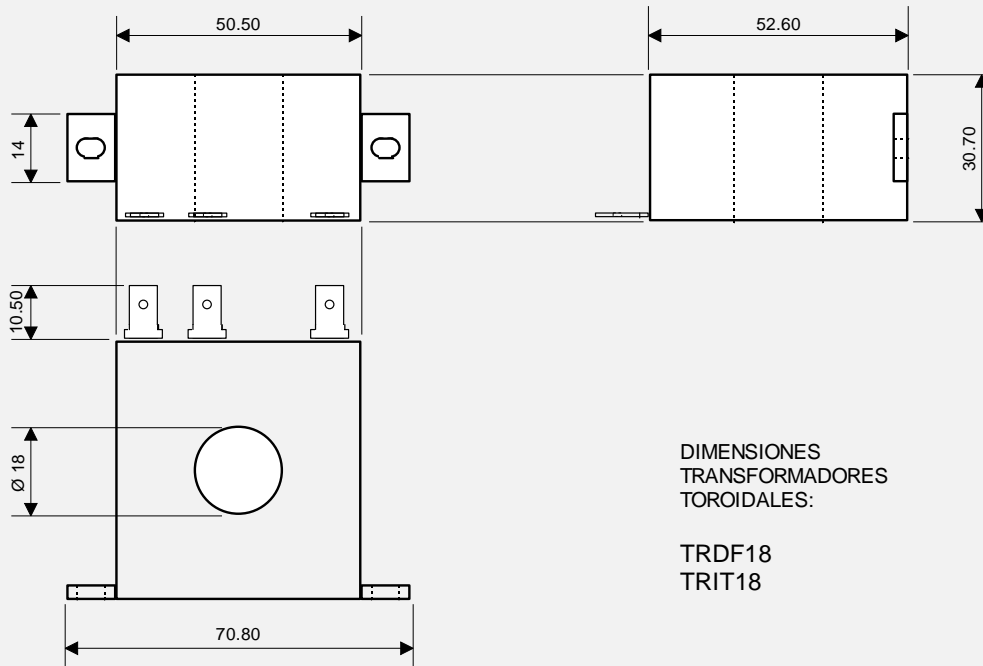
TRIT7



DIMENSIONES TRANSFORMADOR TOROIDAL DE INTENSIDAD DE LINEA

TRIT14





Chapter 12 – 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 (PLCs). 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

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	%Hr
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. $\cos\Phi_1$ if k=1.	1/1000	%
122	0079	1	UWord16	FP2(k), Power factor harmonic k L1. $\cos\Phi_2$ if k=1.	1/1000	%
123	007A	1	UWord16	FP3(k), Power factor harmonic k L1. $\cos\Phi_3$ 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 o S
146	0091	2	UWord32	S2(k), Apparent power harmonic k L2	1/10	Var o S
148	0093	2	UWord32	S3(k), Apparent power harmonic k L3	1/10	Var o 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	%Hr
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 logs 2 to 10 will only be effective if the user PIN has been previously written in log 1 otherwise the function will show 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
9	0008	1	UWord16	Bit 0 = 1, Disable internal relay A Bit 1 = 1, Disable internal relay B Bit 2 Bit 3 Bit 4 Bit 5 Bit 6 Bit 7 Bit 8 = 1, Enable internal relay A Bit 9 = 1, Enable internal relay B Bit A Bit B Bit C Bit D Bit E Bit F

10	0009	1	UWord16	Bit 0 = 1, Disable relay 1 of external module 1 Bit 1 = 1, Disable relay 2 of external module 1 Bit 2 = 1, Disable relay 3 of external module 1 Bit 3 = 1, Disable relay 4 of external module 1 Bit 4 = 1, Disable relay 1 of external module 2 Bit 5 = 1, Disable relay 2 of external module 2 Bit 6 = 1, Disable relay 3 of external module 2 Bit 7 = 1, Disable relay 4 of external module 2 Bit 8 = 1, Enable relay 1 of external module 1 Bit 9 = 1, Enable relay 2 of external module 1 Bit A = 1, Enable relay 3 of external module 1 Bit B = 1, Enable relay 4 of external module 1 Bit C = 1, Enable relay 1 of external module 2 Bit D = 1, Enable relay 2 of external module 2 Bit E = 1, Enable relay 3 of external module 2 Bit F = 1, Enable relay 4 of external module 2
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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)

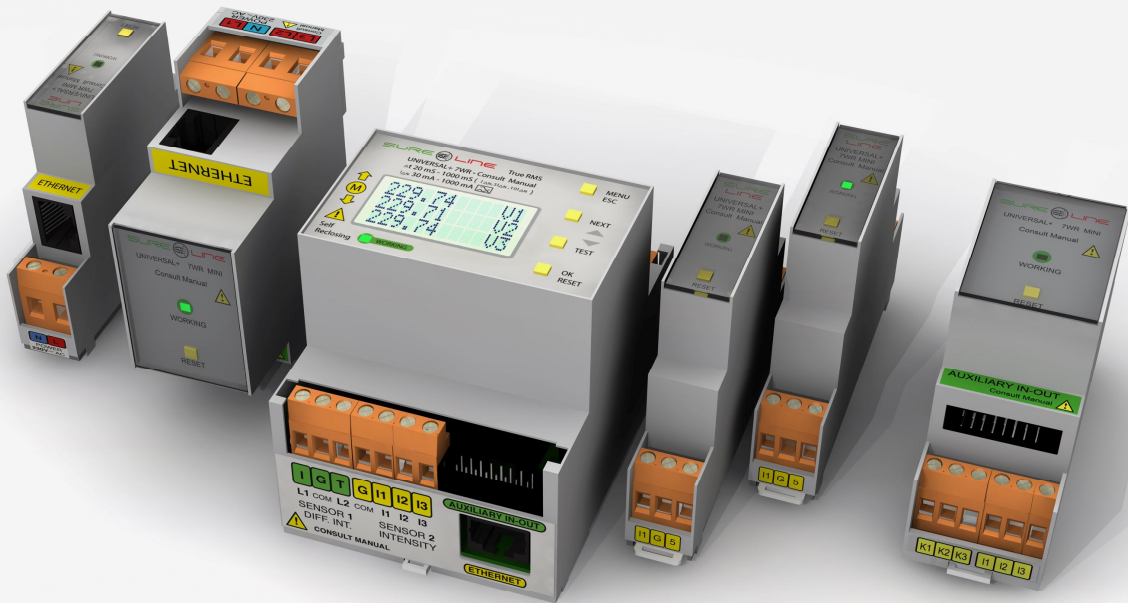
Status digital inputs, external modules 1 and 2				
9	0008	1	Bit	Input 1 external module 1
10	0009	1	Bit	Input 2 external module 1
11	000A	1	Bit	Input 3 external module 1
12	000B	1	Bit	Input 4 external module 1
13	000C	1	Bit	Input 1 external module 2
14	000D	1	Bit	Input 2 external module 2
15	000E	1	Bit	Input 3 external module 2
16	000F	1	Bit	Input 4 external module 2

Chapter 13 – 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 list of measurements , LOG and I/O status in .txt format
2. Enable / disable internal relays A and B
3. Enable / disable relays 1,2,3,4 of external module 1
4. Enable / disable relays 1,2,3,4 of external module 2

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



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