



## NETWORK ANALYZER – User’s Manual



- multirange (8 for voltage, 8 for current)
- simultaneous acquisition of: **RMS** voltages, **RMS** currents, frequency,  $\cos\phi$ , powers, energies, THD..
- accuracy 0,5 %
- 2 pulse outputs for energy and alarms
- memorization of max. average powers every 15 minutes
- temperature / phase sequence/ hour counter
- insulated interface for **Contatto** bus by **DUEMMEGI**
- scratch-resistant membrane touch switches
- secret access code
- plumbable splashproof lens cover
- modular execution (6 DIN modules)

The Network analyzer **ModANA** designed and developed wholly by **Duemmegi** is built to comply with all the modern requirements of measure and control of electrical parameters in a single-phase and three-phase networks. The adoption of the latest generation’s microprocessors, of a new measuring circuit with auto-range, the careful choice of every component ( **UL** recognized printed circuits ) and the calibration with **EAL.SIT** certificated devices, warrant the highest precision and reliability in every condition of use.

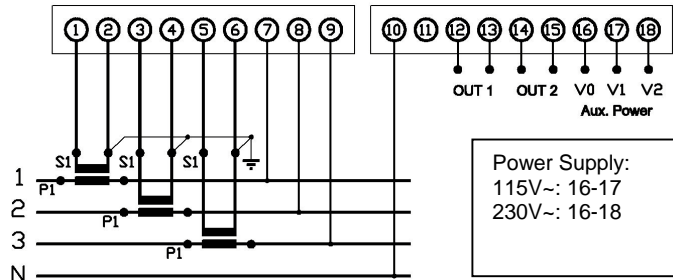
The use of the analyzer **ModANA** allows to obtain several advantages:

- § simplification of wire assembly (a single meter for all the variables to be measured)
- § in field configuration of CT and VT ratios for direct values reading (automatic selection engineering units)
- § a single device for all type of connection: single-phase, three-phase with **2 CT** (ARON), three-phase with **3 CT**
- § automatic programmable page change
- § averaging with selectable response time
- § measure of active and reactive energy with 2 programmable pulse outputs for remote acquisition
- § 2 user configurable alarms. Nearly all measured/calculated values can be selected as alarm source (see table)
- § insulated interface for **Contatto** bus by **DUEMMEGI** (MCP XT controller is required)

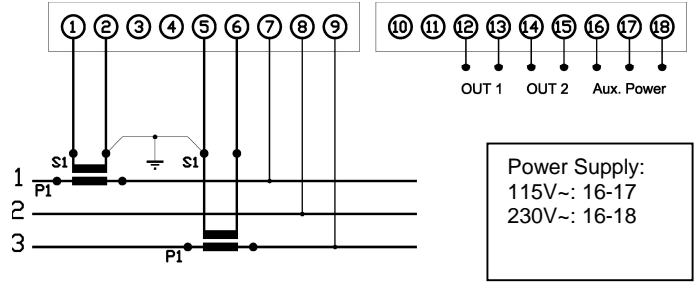
Variables		Measured units	Measured values	Calculated values	Alarms
Phase Voltages	V1N V2N V3N	[V]	<b>P</b>		<b>P</b>
Linked Voltages	V12 V23 V31	[V]	<b>P</b>		<b>P</b>
Linked average Voltage	Vtm	[V]		<b>P</b>	<b>P</b>
Currents	I1 I2 I3	[A]	<b>P</b>		<b>P</b>
Average Current	I <sub>tm</sub>	[A]		<b>P</b>	<b>P</b>
Active Powers	P1 P2 P3	[W]	<b>P</b>		<b>P</b>
Total Active Power	P <sub>tot</sub>	[W]		<b>P</b>	<b>P</b>
Reactive Powers	Q1 Q2 Q3	[VAR]	<b>P</b>		<b>P</b>
Total Reactive Power	Q <sub>tot</sub>	[VAR]		<b>P</b>	<b>P</b>
Apparent Powers	S1 S2 S3	[VA]		<b>P</b>	<b>P</b>
Total Apparent Power	S <sub>tot</sub>	[VA]		<b>P</b>	<b>P</b>
Phase Cosφ	PF1 PF2 PF3	[φ]		<b>P</b>	<b>P</b>
Total Cosφ	PF	[φ]		<b>P</b>	<b>P</b>
Frequency	Frequency	[Hz]	<b>P</b>		<b>P</b>
Positive and negative Active Energy	Wh(+) Wh(-)	[Wh]		<b>P</b>	
Positive and negative React. Energy	VARh(+) VARh(-)	[VARh]		<b>P</b>	
Average positive active power	P <sub>m</sub> (+) P <sub>m</sub> (-) Q <sub>m</sub> (+) Q <sub>m</sub> (-)	[W] [VAR]		<b>P</b>	<b>P</b>
Peak positive active power	P <sub>m</sub> (+) P <sub>m</sub> (-) Q <sub>m</sub> (+) Q <sub>m</sub> (-)	[W] [VAR]		<b>P</b>	
Peak values	Peak 1...2 ...3...4	[...] pk		<b>P</b>	
Hour-meter	Hour Meter	[hh.mm.ss]	<b>P</b>		
Temperature (internal probe)	Temperature	[°C ]	<b>P</b>		<b>P</b>
Phase sequence	V. Phase Sequence		<b>P</b>		<b>P</b>
Total harmonic distortion	Thd V1-V2-V3 Thd I1-I2-I3	[%]	<b>P</b>		<b>P</b>

**WIRING DIAGRAMS**

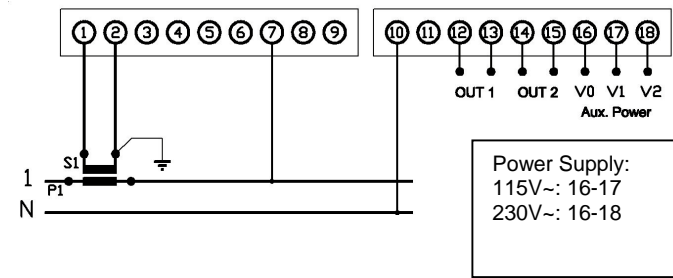
**Three-phase 4 wires circuit (3 CT)**



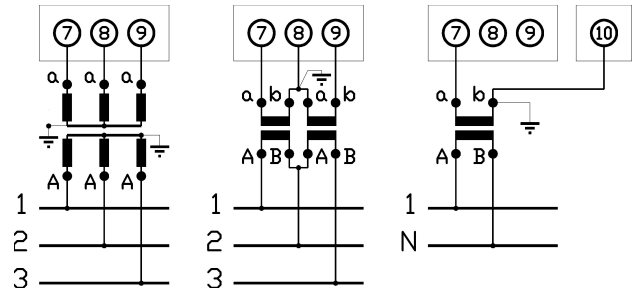
**Three-phase 3 wires circuit (2 CT, ARON insertion)**



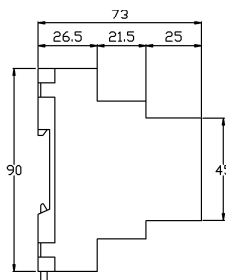
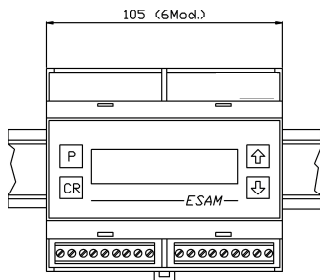
**Single-phase circuit**



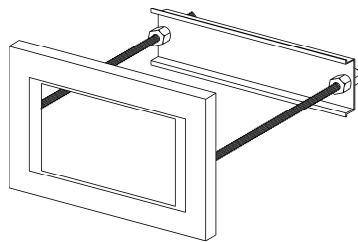
**VT Insertions**



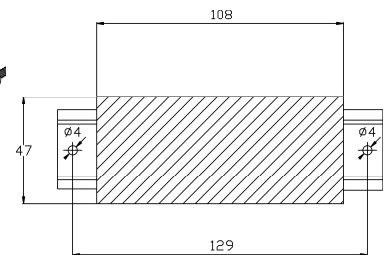
**OVERALL DIMENSIONS**



**ADAPTER FOR FRONT PANEL MOUNTING**



**PANEL CUTOUT**



## TECHNICAL CHARACTERISTICS

### **Technical data**

- high contrast LCD display with backlight: 2 lines x 16 characters (height about 6 mm.)
- input voltage: 15 ... 300V (single-phase), 30 ... 500V (three-phase)
- input current: 0,05 ... 6A
- max. programmable value for primary current: 99999A
- max. programmable value for primary voltage: 999999V
- voltage and current crest factor: 2
- averaging time interval 1-5
- voltage and current accuracy:  $\pm 0,5\%$ ,  $\pm 1$  digit; power accuracy:  $\pm 1\%$ ,  $\pm 1$  digit
- 2 configurable outputs:
  - pulses for energy (output pulse duration: 1 ... 255msec)
  - alarms (selectable on most measured and calculated values with hysteresis, programmable time-delay and self-resetting; using ex.: load self-resetting control, ...)
- output solid relays 1 & 2 contacts rating: 200V, 50mA (Pin. [12] **C1** [13] **NO1** [14] **C2** [15] **NO2**) (on request)
- output NPN transistors 1 & 2 rating: 50V, 100mA (Pin. [12] **Coll.1** [13] **Emitter1** [14] **Coll.2** [15] **Emitter2**) (standard)
- auxiliary power supply: 115-230V  $\pm 10\%$  50/60Hz (terminals 16-17-18); power consumption < 5VA
- other optional auxiliary power available under request
- insulated interface for **Contatto** bus by **DUEMMEGI**
- adapter for front panel mounting (on request).

### **Reference standards**

Electrical characteristics complying with : CEI 85-15, EN60688, IEC688

Safety characteristics complying with: CEI 66-5, EN61010-1, IEC 348, VDE 0411.

Electromagnetic compatibility complying with: EN 50081-2, EN 50082-2, EN 55011, EN 61326

### **Environmental conditions**

Operating temperature: -10°C ... +55°C

Storage temperature: -30°C ... +70°C

Reference temperature: +20°C

Temperature coefficient:  $\pm 0,01\%/^{\circ}\text{C}$

Environment rh 85% not condensing at 35°C for max. 60 day/year; the yearly average humidity must not exceed 65% (DIN40040).

### **Galvanic insulation**

Insulation between:

- |  |                  |
|--|------------------|
| • Voltmetric and amperometric inputs         | 2KV/60 sec. 50Hz |
| • Voltmetric input and serial output         | 2KV/60 sec. 50Hz |
| • Voltmetric input and pulse/alarm outputs   | 2KV/60 sec. 50Hz |
| • Amperometric input and serial output       | 2KV/60 sec. 50Hz |
| • Amperometric input and pulse/alarm outputs | 2KV/60 sec. 50Hz |
| • Input and auxiliary supply                 | 2KV/60 sec. 50Hz |
| • serial output and auxiliary supply         | 2KV/60 sec. 50Hz |
| • pulse/alarm outputs and auxiliary supply   | 2KV/60 sec. 50Hz |

**LIST OF THE MEASUREMENTS**

LABEL	DESCRIPTION	PEAK	PULSE	ALARM	CODE
V1N	Voltage Phase 1	P		P	1
V2N	Voltage Phase 2	P		P	2
V3N	Voltage Phase 3	P		P	3
I1	Current Phase 1	P		P	4
I2	Current Phase 2	P		P	5
I3	Current Phase 3	P		P	6
P1	Active Power Phase 1	P		P	7
P2	Active Power Phase 2	P		P	8
P3	Active Power Phase 3	P		P	9
Frequency	Frequency (measured on Phase 1)	P		P	10
V12	Linked Voltage Phase 1-2	P		P	11
V23	Linked Voltage Phase 2-3	P		P	12
V31	Linked Voltage Phase 3-1	P		P	13
Vtm	Average Voltage (V12+V23+V31)/3	P		P	14
I <sub>tm</sub>	Average Current (I1+I2+I3)/3	P		P	15
P <sub>tot</sub>	Total active power (P1+P2+P3)	P		P	16
S1	Apparent Power Phase 1	P		P	17
S2	Apparent Power Phase 2	P		P	18
S3	Apparent Power Phase 3	P		P	19
S <sub>tot</sub>	Total apparent power ( $\sqrt{P^2+Q^2}$ )	P		P	20
PF1	Phase 1 power factor	P		P	21
PF2	Phase 2 power factor	P		P	22
PF3	Phase 3 power factor	P		P	23
PF	The three-phase power factor	P		P	24
Q1	Reactive power phase 1	P		P	25
Q2	Reactive Power Phase 2	P		P	26
Q3	Reactive power phase 3	P		P	27
Q <sub>tot</sub>	Total reactive power (Q1+Q2+Q3)	P		P	28
Wh(+)	Total positive active energy		P		29
Wh(-)	Total negative active energy		P		30
VARh(+)	Total positive reactive energy		P		31
VARh(-)	Total negative reactive energy		P		32
W(+)	Average positive active power in 15 minutes			P	33
W(-)	Average negative active power in 15 minutes			P	34
VAR(+)	Average positive reactive power in 15 minutes			P	35
VAR(-)	Average negative reactive power in 15 minutes			P	36
Peak 1	Peak value 1				37
Peak 2	Peak value 2				38
Hour Meter	Hour meter				39
Temperature	Temperature	P		P	40
V. Phase Sequence	Phase sequence				41
Alarms	Output state 1				42
Alarms	Output state 2				43
Peak 3	Peak value 3				44
Peak 4	Peak value 4				45
W(+)	Max positive active power in 15 minutes				46
W(-)	Max negative active power in 15 minutes				47
VAR(+)	Max positive reactive power in 15 minutes				48
VAR(-)	Max negative reactive power in 15 minutes				49
Thd V1	Total harmonic distortion V1 (%)	P		P	50
Thd V2	Total harmonic distortion V2 (%)	P		P	51
Thd V3	Total harmonic distortion V3 (%)	P		P	52
Thd I1	Total harmonic distortion I1 (%)	P		P	53
Thd I2	Total harmonic distortion I2 (%)	P		P	54
Thd I3	Total harmonic distortion I3 (%)	P		P	55

## LIST OF THE DISPLAYED PAGES

PAGE	DESCRIPTION	PAGE No.
Vtm Itm Ptot PF	Average line voltage, average current, total active power, total power-factor	Page: 1
V1 I1 P1 PF1	Voltage, Current, active power, power-factor phase 1	Page: 2
V2 I2 P2 PF2	Voltage, Current, active power, power-factor phase 2	Page: 3
V3 I3 P3 PF3	Voltage, Current, active power, power-factor phase 3	Page: 4
Stot PF Qtot	Apparent power, reactive power, total power factor	Page: 5
S1 P1 Q1	Apparent power, reactive power, active power of the phase 1	Page: 6
S2 P2 Q2	Apparent power, reactive power, active power of the phase 2	Page: 7
S3 P3 Q3	Apparent power, reactive power, active power of the phase 3	Page: 8
V12 V23 V31	Linked Voltage: Phase 1-2, Phase 2-3, Phase 3-1	Page: 9
V1N V2N V3N	Phase 1 voltage, Phase 2 voltage, Phase 3 voltage	Page: 10
I1 I2 I3	Phase 1 Current, Phase 2 current, Phase 3 current	Page: 11
P1 P2 P3	Active powers	Page: 12
PF1 PF2 PF3	Phase power-factors	Page: 13
V1N Frequency	Voltage phase 1, frequency measured on phase 1	Page: 14
Wh(+) VARh(+)	Total positive active energy, positive reactive energy	Page: 15
Wh(-) VARh(-)	Total negative active energy, negative reactive energy	Page: 16
Wh(+) Wh(-)	Total positive and negative active energy	Page: 17
VARh(+) VARh(-)	Total positive and negative reactive energy	Page: 18
Wh(+)	Total positive active energy	Page: 19
Wh(-)	Total negative active energy	Page: 20
VARh(+)	Total positive reactive energy	Page: 21
VARh(-)	Total negative reactive energy	Page: 22
Peak 1 Peak 2	Peak 1, Peak 2	Page: 23
Peak 3 Peak 4	Peak 3, Peak 4	Page: 24
Pm(+) last/max	average positive active power in 15 minutes	Page: 25
Pm(-) last/max	average negative active power in 15 minutes	Page: 26
Qm(+) last/max	average positive reactive power in 15 minutes	Page: 27
Qm(-) last/max	average negative reactive power in 15 minutes	Page: 28
Thd V1-V2-V3	Total harmonic distortion V1, V2,V3	Page: 29
Thd I1-I2-I3	Total harmonic distortion I1,I2,I3	Page: 30
Temperature	Temperature	Page: 31
Alarms ( note 1)	Output state	Page: 32
HOUR METER	Hour meter	Page: 33
V.Phase sequence	Phases sequence	Page: 34

### Note 1

This page shows the current status of alarms AL1 and AL2. For each alarm it shows the monitored variable, the alarm type and output status. Alarm type can be min "**|B**", max "**à**" or window "**|Bà**".

Same monitored values can be selected as 3-phase: this applies to sets of phase values (e.g. P1-P2.P3,...).

A 3-phase alarm is triggered when ANY value in the set is outside limits.

It is possible to see when the alarm is changing state:

-the word **OFF** will blink for all delay time. The alarm is on but the output state is off.

-the word **ON** will blink for all auto-reset time. The alarm is off but the output state is on.

### Example of page displayed:

AL1	V1	B	OFF
AL2	Ix	à	ON

Alarm 1 on V1 min. OFF,  
Alarm 2 on Ix (3phase) max. ON

AL1	V2	Bà	ON
AL2	Px	Bà	OFF

Alarm 1 on V2 window. ON  
Alarm 2 on Px (3phase) window OFF

## FUNCTION OF THE BUTTONS IN PROGRAM MENU

←	GO TO NEXT PARAMETER TO BE SET
→	GO TO PREVIOUS PARAMETER TO BE SET
CR	EXIT PROGRAMMING
P	MODIFY PARAMETER

## FUNCTION OF THE BUTTON DURING NORMAL OPERATION

←	GO TO NEXT PAGE
→	GO TO PREVIOUS PAGE
CR	DISPLAY THE PAGE NUMBER AND DESCRIPTION
P	KEEP IT PRESSED FOR 2 SECS TO ENTER PROGRAM MENU

**NOTE 1:** The programming automatically stops if no button is pressed within 1 minutes..

## GENERIC SETTING OF A NUMBER

Press "**P**" to change the value of a parameter. If "**select**" appears in the lower part of the display, select from a list of choices using keys "←" or "→", then press "**P**" to confirm.

If the parameter has a numeric value, the first digit will start blinking.

The number indicated by the cursor can be changed pressing "←" or "→", to obtain the desired value (Ex. 1 2 3 4 5 6 7 8 9 0 1...).

Set the first digit, move the cursor one step left pressing "**CR**" and repeat the sequence to obtaining the desired value.

Press "**P**" to confirm the number.

If the entered value is lower or higher than the allowed limits, indicated on the lower area of the display, the message ("**ERROR!!**") will be displayed for one second, then the device will display again the previously set value.

## POWER ON THE DEVICE

At power on, a message like the following will be displayed for 2 seconds:

E2002 3.4 WAIT 9600,N,8,1
------------------------------

The number "**3.4**" indicates software version , 9600 is baud rate, "**N**" (parity), "**8**" (bit in one word) and "**1**" stop bit.

## PROGRAMMING

Press button "**P**" for 2 seconds (blinking "**Program**") and then press "←".

If a password was set , the following message ("**ENTER PASSWORD..**") will be displayed to enter the programming.

PASS = 00000 ( 0-99999 )
-----------------------------

Input the personal password to get access to configuration data.

**- SETTING PRIMARY CURRENT VALUE OF CT ;**

CTP = 00005  
( 1-99999 )

Ex. CT 1500/5A, the value to be input is 1500.  
Note: with direct input 5A set 5.

It is possible to skip the setting pressing "ē"; to go out of program menu pressing "CR", or change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING SECONDARY CURRENT VALUE OF CT ;**

CTS = 5.00  
( 1.00-6.00A )

Ex. CT 1500/5A, the value to be input is 5.  
Note: with direct input 5A set 5.

It is possible to skip the setting pressing "ē"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING PRIMARY VOLTAGE VALUE OF VT ;**

VTP = 000300  
( 10-999999V )

Ex. VT 800/100V, the value to be input is 800.  
Note: with direct input 220V set 220.  
The TV ratio is between the phase and the neutral (300V are 520V three-phase).

It is possible to skip the setting pressing "ē"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING SECONDARY VOLTAGE VALUE OF VT ;**

VTS = 300.0  
( 57.7-300V )

Ex. VT 800/100V, the value to be input is 100.  
Note: with direct input 220V set 220.  
The VT ratio is between the phase and the neutral (300V are 520V three-phase).

It is possible to skip the setting pressing "ē"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING THE PAGE DISPLAYED AT POWER ON ;**

PAG1 = 02  
( 1-34 )

This parameter must always be different from zero. To choose the desired page, please refer to the table "LIST OF THE DISPLAYED PAGES" at the beginning of this manual.

It is possible to skip the setting pressing "ē"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING SECOND PAGE DISPLAYED ;**

PAG2 = 00  
( 0-34 )

Selection of the second page displayed in sequence, if TPAG is not zero.(See "SETTING OF THE PAGE TIMING").  
To chose the desired page, please refer to the table "LIST OF THE DISPLAYED PAGES" at the beginning of this manual.

To select no page, set this parameter to zero.

It is possible to skip the setting pressing "ē"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING THIRD PAGE DISPLAYED ;**

PAG3 = 00  
( 0-34 )

Selection of the third page displayed in sequence, if TPAG is not zero. (See "SETTING OF THE PAGE TIMING").  
To chose the desired page, please refer to the table "LIST OF THE DISPLAYED PAGES" at the beginning of this manual.

To select no page, set this parameter to zero.

It is possible to skip the setting pressing "Ⓔ"; to go out of program menu pressing "CR", or to change the value with "P" (see "GENERIC SETTING OF A NUMBER").

**- SETTING FOURTH PAGE DISPLAYED ;**

PAG4 = 00  
( 0-34 )

Selection of the fourth page displayed in sequence, if TPAG is not zero. (See "SETTING OF THE PAGE TIMING").  
To chose the desired page, please refer to the table "LIST OF THE DISPLAYED PAGES" at the beginning of this manual.

To select no page, set this parameter to zero.

It is possible to skip the setting pressing "Ⓔ"; to go out of program menu pressing "CR", or to change the value with "P" (see "GENERIC SETTING OF A NUMBER").

**- SETTING THE PAGE TIMING ;**

TPAG = 00  
( 0-99S )

Time interval, in seconds, after which the display is switched to the next selected page.

Set this parameter to zero to display PAG1 forever.

It is possible to skip the setting pressing "Ⓔ"; to go out of program menu pressing "CR", or to change the value with "P" (see "GENERIC SETTING OF A NUMBER").

**- SETTING AVERAGING TIME INTERVAL;**

AVG = 1  
( 1-5sec )

Approximate time interval for acquisition of measurements.  
Averaging is actually taken over a given number of power line cycles.

It is possible to skip the setting pressing "Ⓔ"; to go out of program menu pressing "CR", or to change the value with "P" (see "GENERIC SETTING OF A NUMBER").

**- PASSWORD SETTING ("PASSWORD XXXXX");**

PASS = 00000  
( 0-99999 )

If this parameter is set to a value different from zero, access to program menu will be password protected. The user has to enter the set value as a password to get access to program menu.

Set this parameter to zero to disable password protection.

It is possible to skip the setting pressing "Ⓔ"; to go out of program menu pressing "CR", or to change the value with "P" (see "GENERIC SETTING OF A NUMBER").

**- SETTING MEASURE FOR PEAK VALUE 1 ;**

ChPk1 = V1N

Selection of measurement to be monitored for peak detection.

It is possible to skip the setting pressing "Ⓔ"; to go out of program menu pressing "CR", or to change the value with "P" (see "GENERIC SETTING OF A NUMBER").



**- SETTING MEASURE FOR PEAK VALUE 2;**

ChPk2 = V1N

Selection of measurement to be monitored for peak detection.

It is possible to skip the setting pressing "⏪"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING MEASURE FOR PEAK VALUE 3;**

ChPk3 = V1N

Selection of measurement to be monitored for peak detection.

It is possible to skip the setting pressing "⏪"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING MEASURE FOR PEAK VALUE 4 ;**

ChPk4 = V1N

Selection of measurement to be monitored for peak detection.

It is possible to skip the setting pressing "⏪"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING OUTPUT 1 ;**

Out1 = None

Selection of output function for output channel 1.

Available choices are: Alarm-Pulse-None

If the choice is Alarm the following steps of the program menu allow the detailed configuration of the alarm function: **TyAl1, ChAl1, Al1,**

**HyAl1, TdAl1, TrAl1.**

If the choice is Pulse the following steps of the program menu allow the detailed configuration of the Pulse function: **ChPO1, WPO1, TPO1.**

If the choice is none the detailed configuration of output 1 is skipped and the next step of the program menu is the setting of **OUT2.**

It is possible to skip the setting pressing "⏪"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**The following steps TyAl1, ChAl1, Al1, HyAl1, TdAl1, TrAl1** are included in program menu only if **OUT1 = Alarm**

**-SETTING ALARM 1 TYPE;**

TyAl1 = Low

This function defines the type of limit value to be used.

Set **Low** for a minimum limit; set **High** for maximum limit; set **Window** to have a window alarm, set **Low 3ph** minimum limit on 3 phases; set **High 3ph** to set a maximum limit value on 3 phases; set **Win 3ph** for

a window alarm on 3 phases.

NOTE:

3ph alarms apply only to sets of 3 phase values (e.g. P1-P2-P3): a 3-phase alarm is triggered when any value in the set is outside limits.

**Ph.Seq.** is a special case: the alarm is triggered if a phase is not present or the sequence is wrong.

It is possible to skip the setting pressing "⏪"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING MEASURE FOR ALARM 1;**

ChAl1 = V1N

Selection of the measurements to be monitored for alarm 1

It is possible to skip the setting pressing "Ⓔ"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING ALARM 1 THRESHOLD;**

Al1 = 000  
( unit )

Threshold value for Low an High Alarms, centre of the window for window Alarms.

It is possible to skip the setting pressing "Ⓔ"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING ALARM 1 HYSTERESIS;**

HyAl1 = 000  
( unit )

Example Threshold = 300V, Hysteresis = 15V

If Alarms Type is "Low", alarm is triggered when the voltage falls below 300V and is reset when it raises over 315V.

If Alarm Type is "High", alarm is triggered when the voltage goes over 300V and is reset when it gets back below 285V.

If Alarm type is "Window", hysteresis defines the window width: alarm is triggered when voltage is outside the window 285-315 (300 ± 15V).

It is possible to skip the setting pressing "Ⓔ"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING ALARM 1 DELAY ;**

TdAl1 = 00  
( 0-99sec )

If this parameter has a non-zero value, when the monitored variable exceeds the given limits the alarm output is generated after a TdAl1 delay.

This feature can be used to prevent false alarms: an alarm condition lasting less then TdAl1 will not generate an alarm output.

It is possible to skip the setting pressing "Ⓔ"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**-SETTING ALARM 1 SELF-RESETTING TIME;**

TrAl1 = 0000  
( 0-9999S )

The alarm output is kept active for a TrAl1 time interval after recovering from an alarm condition.

It is possible to skip the setting pressing "Ⓔ"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**The following steps ChPO1, WPO1, TPO1 are included in program menu only if OUT1 = Pulse**

**- SETTING MEASURE FOR PULSE OUTPUT 1;**

ChPO1 = Wh(+)

Selection of the measurement to be converted.

(see "LIST OF THE MEASUREMENTS" at the beginning of the manual).

It is possible to skip the setting pressing "Ⓔ"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING PULSE WEIGHT FOR OUTPUT 1;**

WPO1 = 00.001  
( unit )

A pulse is generated whenever the selected measurement increases by this amount.  
To switch off the output channel 1, set 0.

It is possible to skip the setting pressing “**⏪**”; to go out of program menu pressing “**CR**”, or to change the value with “**P**”(see “GENERIC SETTING OF A NUMBER”).

**-SETTING PULSE DURATION FOR OUTPUT 1**

TPO1 = 100  
( 10-255ms )

This value should be less than 50% of the time interval between pulses Overlapping pulse cannot be counted.

It is possible to skip the setting pressing “**⏪**”; to go out of program menu pressing “**CR**”, or to change the value with “**P**”(see “GENERIC SETTING OF A NUMBER”).

**- SETTING OUTPUT 2;**

Out2 = None

Selection of output function for output channel 1.  
Available choices are: Alarm-Pulse-None.  
If the choice is Alarm the following steps of the program menu allow the detailed configuration of the Alarm function: **TyAI2 ChAI2 AI2**

**HyAI2 TdAI2 TrAI2.**

If the choice is Pulse the following steps of the program menu allow the detailed configuration of the Pulse function: **ChPO2, WPO2, TPO2.**

If the choice is None the detailed configuration of output 1 is skipped and the next step of the program menu is the setting of communication protocol.

It is possible to skip the setting pressing “**⏪**”; to go out of program menu pressing “**CR**”, or to change the value with “**P**”(see “GENERIC SETTING OF A NUMBER”).

**The following steps TyAI2, ChAI2, AI2, HyAI2, TdAI2, TrAI2 are included in program menu only if OUT2 = Alarm**

**-SETTING ALARM 2 TYPE;**

TyAI2 = Low

This function defines the type of limit value to be used.  
Set **Low** for a minimum limit; set **High** for maximum limit; set **Window** to have a window alarm , set **Low 3ph** minimum limit on 3 phases; set **High 3ph** to set a maximum limit on 3 phases; set **Win 3ph** for a

window alarm on 3 phases.

NOTE:

3ph alarms apply only to sets of 3 phase values (e.g. P1-P2-P3): a 3-phase alarm is triggered when ANY value in the set is outside limits.

**Ph.Seq.** is a special case: the alarm is triggered if a phase is not present or the sequence is wrong.

It is possible to skip the setting pressing “**⏪**”; to go out of program menu pressing “**CR**”, or to change the value with “**P**”(see “GENERIC SETTING OF A NUMBER”).

**- SETTING MEASURE FOR ALARM 2;**

ChAI2 = V1N

Selection of the measurements to be monitored for alarm 2.

It is possible to skip the setting pressing “**⏪**”; to go out of program menu pressing “**CR**”, or to change the value with “**P**”(see “GENERIC SETTING OF A NUMBER”).

**- SETTING ALARM 2 THRESHOLD;**

AI2 = 000  
( unit )

Threshold value for Low an High Alarms, centre of the window for Window Alarms.

It is possible to skip the setting pressing "Ⓔ"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING ALARM 2 HYSTERESIS;**

HyAI2 = 000  
( unit )

Example Threshold = 300V, Hysteresis = 15V

If Alarm Type is "Low", alarm is triggered when the voltage falls below 300V and is reset when it raises over 315V.

If Alarm Type is "High", alarm is triggered when the voltage goes over 300V and is reset when it gets back below 285V.

If Alarm type is "Window", hysteresis defines the window width: alarm is triggered when voltage is outside the window 285-315 (300 ± 15V).

It is possible to skip the setting pressing "Ⓔ"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING ALARM 2 DELAY ;**

TdAI2 = 00  
( 0-99sec )

If this parameter has a non-zero value, when the monitored variable exceeds the given limits the alarm output is generated after a TdAI2 delay.

This feature can be used to prevent false alarms: an alarm condition lasting less then TdAI2 will not generate an alarm output.

It is possible to skip the setting pressing "Ⓔ"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**-SETTING ALARM 2 SELF-RESETTING TIME;**

TrAI2 = 0000  
( 0-9999S )

The alarm output is kept active for a TrAI2 time interval after recovering from an alarm condition.

It is possible to skip the setting pressing "Ⓔ"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

*The following steps ChPO2, WPO2 ,TPO2 are included in program menu only if OUT2 = Pulse*

**- SETTING MEASURE FOR PULSE OUTPUT 2;**

ChPO2 = Wh(+)

Selection of the measurement to be converted.  
(see "LIST OF THE MEASUREMENTS" at the beginning of the manual).

It is possible to skip the setting pressing "Ⓔ"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING PULSE WEIGHT FOR OUTPUT 2;**

WPO2 = 00.001  
( unit )

A pulse is generated whenever the selected measurement increases by this amount.

To switch off the output channel 1, set 0.

It is possible to skip the setting pressing "Ⓔ"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**-SETTING PULSE DURATION FOR OUTPUT 2;**

TPO2 = 100  
( 10-255ms )

This value should be less than 50% of the time interval between pulses Overlapping pulse cannot be counted.

It is possible to skip the setting pressing "⏏"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING COMMUNICATION PROTOCOL :**

PROT = ModBus

Available choices:

- Esam
- ModBus (MODBUS RTU)
- N2JC (N2BUS-Metasys - Johnson Controls)

It is possible to skip the setting pressing "⏏"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING STATION ADDRESS ;**

NUMT = 001  
( 01-255 )

This assigns the network analyser an identification number from 1 to 255.

It is possible to skip the setting pressing "⏏"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING COMMUNICATION RATE;**

BAUD = 9600

The following rates can be selected:  
1200,2400,4800,9600,19200.

It is possible to skip the setting pressing "⏏"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING MIN. DELAY BEFORE REPLY;**

XDEL = 005  
( 0-255mS )

This is the minimum delay between query and reply for serial communication. The default is 5 ms and is normally adequate.

It is possible to skip the setting pressing "⏏"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**-SETTING FLOATING POINT FORMAT (MODBUS PROTOCOL ONLY);**

SWFP = no swap

A floating point value is 32 bits long and is sent by Modbus as 2 words (16 bits each).

There is no standard agreement about which word has to be sent first, so set this parameter to have them sent in the order that your master

Modbus equipment understands.

It is possible to skip the setting pressing "⏏"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- SETTING INPUT 3 PHASE CONNECTION;**

INCFG = 3 CT

This setting defines what kind of input connection is used.  
Set 2CTaron to use a three phase circuit with 3 wires (ARON).  
Set 3CT to use a 4-wires three-phase circuit

It is possible to skip the setting pressing "⏪"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**-TIME SETTING TO CALCULATE THE AVERAGE POWER:**

TPm = 15  
( 1-99min )

This is the time after which a calculation of the average power is performed. E.g. 15 minutes.

It is possible to skip the setting pressing "⏪"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- ENERGY RESET ;**

ResEn ?

Reset energy values Wh(+), Wh(-), VARh(+), VARh(-).  
Press "P", then "P" again to confirm or "CR" to cancel.

It is possible to skip the setting pressing "⏪"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- PEAK VALUES RESET ;**

ResPk ?

Reset peak values Peak1..4  
Press "P", then "P" again to confirm or "CR" to cancel.

It is possible to skip the setting pressing "⏪"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- RESET AVERAGE POWER;**

ResPm ?

Reset average power values Pm(+), Pm(-), Qm(+), Qm(-).  
Press "P", then "P" again to confirm or "CR"to cancel.

It is possible to skip the setting pressing "⏪"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**RESET OF MAXIMUM AVERAGE POWER;**

SynPm ?

Restart a new averaging period TPm.  
Press "P", then "P" again to confirm or "CR" to cancel.

It is possible to skip the setting pressing "⏪"; to go out of program menu pressing "CR", or to change the value with "P"(see "GENERIC SETTING OF A NUMBER").

**- RESET HOUR-METER ;**

ResH ?

Reset hour counter.  
Press "P", then "P" again to confirm or "CR" to cancel.

It is possible to skip the setting pressing "ê"; to go out of program menu pressing "CR", or to change the value with "P" (see "GENERIC SETTING OF A NUMBER").

**- LOADING OF DEFAULT PARAMETERS ;**

LDEF ?

Load default factory values for all parameters except password.  
Press "P", then "P" again to confirm or "CR" to cancel.

**WARNING** : this command resets all accumulated values, that is energies, peaks, max average, powers and hour counter.

It is possible to skip the setting pressing "ê"; to go out of program menu pressing "CR", or to change the value with "P" (see "GENERIC SETTING OF A NUMBER").

Press "ê" to display:

**END OF PROGRAMMING**

At the end of programming, press "CR".

## DEFAULT VALUES

PARAMETERS	RANGE VALUES	DESCRIPTION	DEFAULT
CTP	1-99999A	CT primary current value	00005
CTS	1-6.00A	CT secondary current value	5.00
VTP	300-999999V	VT primary voltage value	000300
VTS	57.7-300V	VT secondary voltage value	300.0
PAG1	1-34	Page displayed at power on	02
PAG2	0-34	Second page displayed	00
PAG3	0-34	Third page displayed	00
PAG4	0-34	Fourth page displayed	00
TPAG	1-99S	Page time	00
AVG	1-5	Averaging time interval	1
PASS	00000=off	Password	00000
ChPK1		Peak 1	V1N
ChPK2		Peak 2	V1N
ChPK3		Peak 3	V1N
ChPK4		Peak 4	V1N
OUT1		Type output 1	None
OUT2		Type output 2	None
ChAL1		Alarm channel 1	V1N
ChAL2		Alarm channel 2	V1N
TyAL1		Type alarm 1	Low
TyAL2		Type alarm 2	Low
AI1		Alarm 1 threshold	000
AI2		Alarm 2 threshold	000
HyAI1	000	Hysteresis for alarm 1	00
HyAI2	000	Hysteresis for alarm 2	00
TdAI1	0-99S	Delay time for alarm 1	00
TdAI2	0-99S	Delay time for alarm 2	00
TrAI1	0-9999S	Auto-reset time for alarm 1	0000
TrAI2	0-9999S	Auto-reset time for alarm 2	0000
ChPO1		Pulse output channel 1	Wh(+)
ChPO2		Pulse output channel 2	Wh(+)
WPO1	00.000=Of	Weight of pulse 1	00.000
WPO2	00.000=Off	Weight of pulse 2	00.000
TPO1	10-255mS	Timing of pulse 1	0100
TPO2	10-255mS	Timing of pulse 2	0100
PROT		Communication protocol	Modbus
NUMT	1-255	Station address	001
BAUD		Baud rate	9600
XDEL	0-255mS	Min reply delay time	5
INCFG		2 CTArOn , 3 CT	3 CT
PMT	1-99min	Calculation time for average power	15

DUEMMEGI reserves the right to make modifications in every moment to improve the project and to give the best product.