

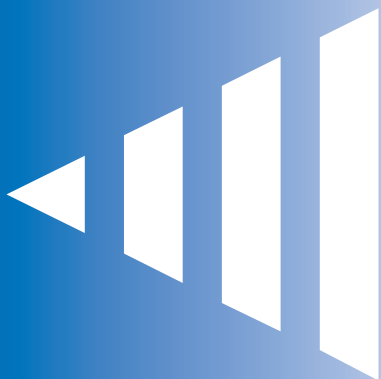
# elcotronicsrl

Volt  
Amp  
CosØ • P.F.  
KW  
Hz  
% Harmonics • T.H.D.  
KVA  
KVA  
KVArh  
KWh  
KVA $\pm$   
Peak KVA  
Peak KW  
Temperature  
hh - mm - ss  
dd - mm - yy



## EM3-TB Three-Phase Electric Energy Analyser Portable Version

Measurements in true **RMS** value  
Displays all the parameters of a three-phase electric system  
Unbalanced loads in BT - MT - AT  
Daily, Monthly or Yearly Load Trending  
Avoids penalties for Over Demand  
Stores the Electrical System Parameters and allows processing Series of Measurements on your PC



## TECHNICAL FEATURES

### Inputs:

Volt: L1-N, L2-N, L3-N

Max 400V RMS-50Hz, 60Hz, 400Hz

Ampere: 0-5A RMS-50Hz, 60Hz, 400Hz

### Overload:

Volt: 1000V RMS max for 1 sec.

Ampere: 20A RMS max for 1 sec.

### Power Supply:

230VAC + 10% 50/60Hz

### Automatic scale change-over:

3 voltage scales, 4 current scales

Measures in true RMS value

### Measuring Method:

Digital sampling

### Sampling frequency:

4800Hz

### Automatic compensation:

every second

### Precision:

Voltage, Current, Active, Reactive and Apparent

Power: 1% on a full scale

Cos $\Phi$  + 0.02 unit

Frequency: 0.5% of the reading

## DATA MEMORY

RAM Memory module: 32Kb

Instrument set-up values on an EEPROM

## OPERATING CONDITIONS

### Temperature:

from -10°C to +50°C

### Relative humidity:

20% to 80%

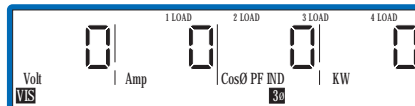
### Reference standards:

IEC 348, VDE 411

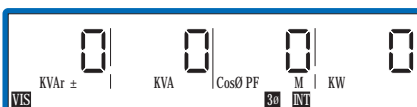
EM3 TB is the portable version of the EM3 Electric Energy Analyzer. A bag of reduced dimensions conveniently contains one analyzer, three amperometric clamp meters and a thermal printer ST32/144, if required. Specifically designed as a mobile unit, the EM3 TB analyzer is suitable to carry out series of measurements on unbalanced three-phase electric systems without the need of a fixed installation. Once the instrument has been connected to the 230 Vac mains and the clamp meters and volt terminals have been properly arranged, the analyzer will be able to read all the system parameters for the time period desired. The portable analyzer is produced in different versions according to the customer's requirements. All the optional functions of the EM3 can be incorporated, including the possibility of connecting the instrument to your PC for subsequent processing of collected data.



Displays Cos $\Phi$  P.F.  
instant L1 - L2 - L3



Volt three-phase  
Amp three-phase  
Cos $\Phi$  three-phase, instant  
kW three-phase, instant



Displays the average value of kVA, kW and Cos $\Phi$  reached during the integration period. The average value is automatically computed at the end of the preset integration period.  
Displays the exceeding or lacking capacitor KVAr in order to reach the preset Cos $\Phi$  value.

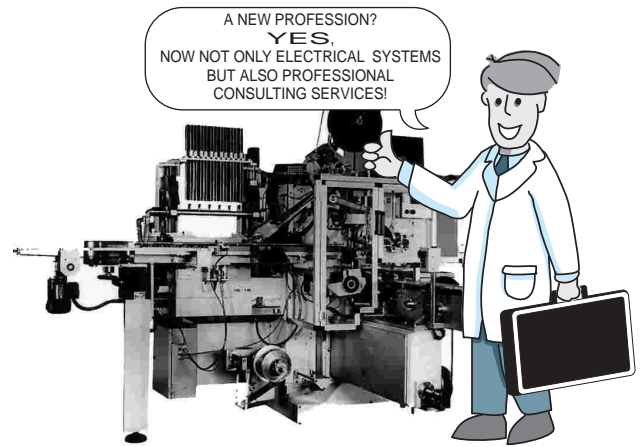
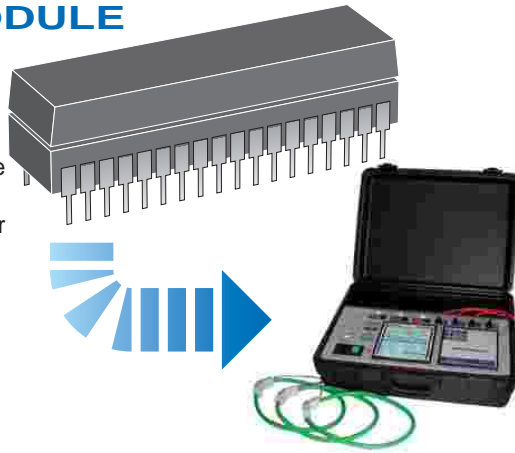
## EASY TO CONNECT

The display clearly shows the values read on the system!

# Three Phase Electric Energy Analyser

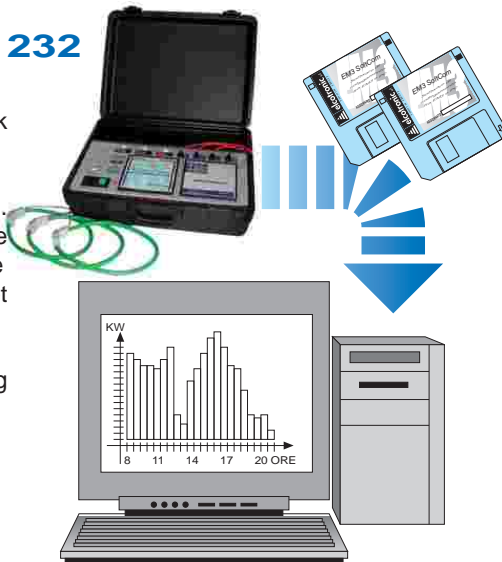
## MEMORY MODULE 32kb

The memory module inside the EM3 makes it possible to leave the energy analyzer plugged into the system to be monitored for a whole week time.



## OUTPUT RS 232

Once the analyzer is back to your office, you can connect it to your PC to process the data collected. Download the memory file into your PC and with the use of an electronic sheet you have an overall view of the job done and see any faults occurred during the day.



The printer allows collected data to be printed at set intervals. The printout reads as follows: month/day/year - hour/minute/second followed by the measure of the three- and single-phase basic parameters.

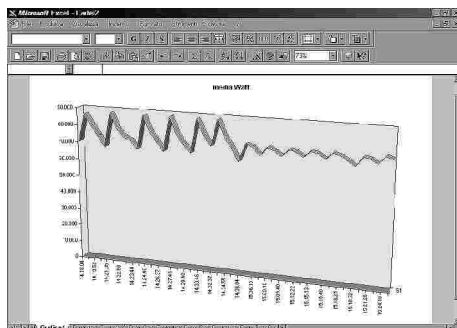
The symbol '#' before a parameter means that an alarm is set to display when the parameter setpoint is exceeded. The symbol '\*' before '#' means that the value is currently under alarm.

Alarms are always positioned on the single phases; when a parameter goes under alarm a printout is produced and when the alarm stops, a printout is made to testify variation.

#	Date	Time	V3Ph	A3Ph	Cos3Ph	W3Ph	V L1	V L2	V L3	A L1	A L2	A L3	Cos L1	C
5	21/05/97	14.18.04	380	59.4	1	36200	220	219	220	59.2	59.2	59.6	1	
6	21/05/97	14.18.58	381	142	1	94000	220	219	220	142	143	143	1	
7	21/05/97	14.19.52	380	112	1	74000	220	219	220	112	113	113	1	
8	21/05/97	14.20.34	381	89.4	1	59100	220	220	220	89	89.5	89.8	1	
9	21/05/97	14.21.05	381	89.5	1	59200	220	220	220	89.3	89.7	89.7	1	
10	21/05/97	14.21.46	379	142	1	93100	219	219	219	142	145	145	1	
11	21/05/97	14.22.38	379	112	1	73600	219	219	219	112	113	113	1	
12	21/05/97	14.23.26	379	89	1	65900	219	219	219	88.6	89.4	89.3	1	
13	21/05/97	14.23.40	379	89.7	1	66000	219	219	219	89.2	89.2	89	1	
14	21/05/97	14.24.04	379	89.1	1	36500	219	219	219	89.8	89.4	89.3	1	
15	21/05/97	14.24.46	379	142	1	93300	219	219	219	142	143	143	1	
16	21/05/97	14.25.59	380	112	1	73900	219	219	220	112	113	113	1	
17	21/05/97	14.26.37	381	89.4	1	65900	220	220	220	89.8	89.8	89.9	1	
18	21/05/97	14.27.04	381	89.5	1	36200	220	219	220	89.3	89.5	89.6	1	
19	21/05/97	14.27.43	381	142	1	94000	220	220	220	142	145	145	1	
20	21/05/97	14.28.58	381	113	1	74200	220	219	220	112	113	113	1	
21	21/05/97	14.29.40	379	89.1	1	58400	219	219	219	89.7	89.6	89.4	1	
22	21/05/97	14.30.04	381	89.4	1	36100	220	219	220	89.2	89.6	89.6	1	
23	21/05/97	14.30.46	379	142	1	93100	219	219	219	142	143	143	1	
24	21/05/97	14.31.55	380	112	1	73700	219	219	220	112	113	112	1	

This is an example of how downloaded and formatted data are displayed using a software like Microsoft Excel.

The same software can be used to create graphs which better show the pattern of the monitored parameters for a deeper analysis. Written reports on the results achieved can be prepared as well.



01/24/97		10:05:00	
ELCOTRONIC srl			
3 Phase	Volt	Amp	CosøPF
	395.00	359.0	1.00
3 Phase	W		W av
	246.00K		270.00K
3 Phase	KVh		KVArh
	644.00		502.00
Phase	L1	L2	L3
#Volt	229.00	226.00	230.00
Amp	358.00	360.00	358.00
#CosøPF	1.00	1.00	1.00
#Watt	82.00K	81.50K	82.40K
%Harm	7.00	2.00	0.00
VA	82.10K	81.30K	82.40K

Series of parameters being observed

01/24/97		10:20:00	
ELCOTRONIC srl			
3 Phase	Volt	Amp	CosøPF
	393.00	477.0	1.00
3 Phase	W		W av
	225.00K		270.00K
3 Phase	KVh		KVArh
	646.00		503.00
Phase	L1	L2	L3
#Volt	230.00	223.00	230.00
Amp	710.00	358.00	356.00
#CosøPF	1.00	1.00	1.00
#Watt	163.00K	79.80K	82.20K
%Harm	1.00	4.00	6.00
VA	163.20K	79.30K	82.20K

In this example Watts are under alarm

# MODELS

# INTERNAL OPTIONS

## EM3-TB31

- MEMORY 32kb
- RS232

## EM3-TB31T

- MEMORY 32kb
- RS232
- TEMPERATURE

## EM3-TB32

- MEMORY 32kb
- RS232
- PRINTER

## EM3-TB32T

- MEMORY 32kb
- RS232
- PRINTER
- TEMPERATURE

## EM3-TB33

- MEMORY 32kb
- RS232
- PRINTER
- ALARMS
- MAX DEMAND

## EM3-TB34

- MEMORY 32kb
- RS232
- PRINTER
- ALARMS
- MAX DEMAND
- TEMPERATURE



### NOTES

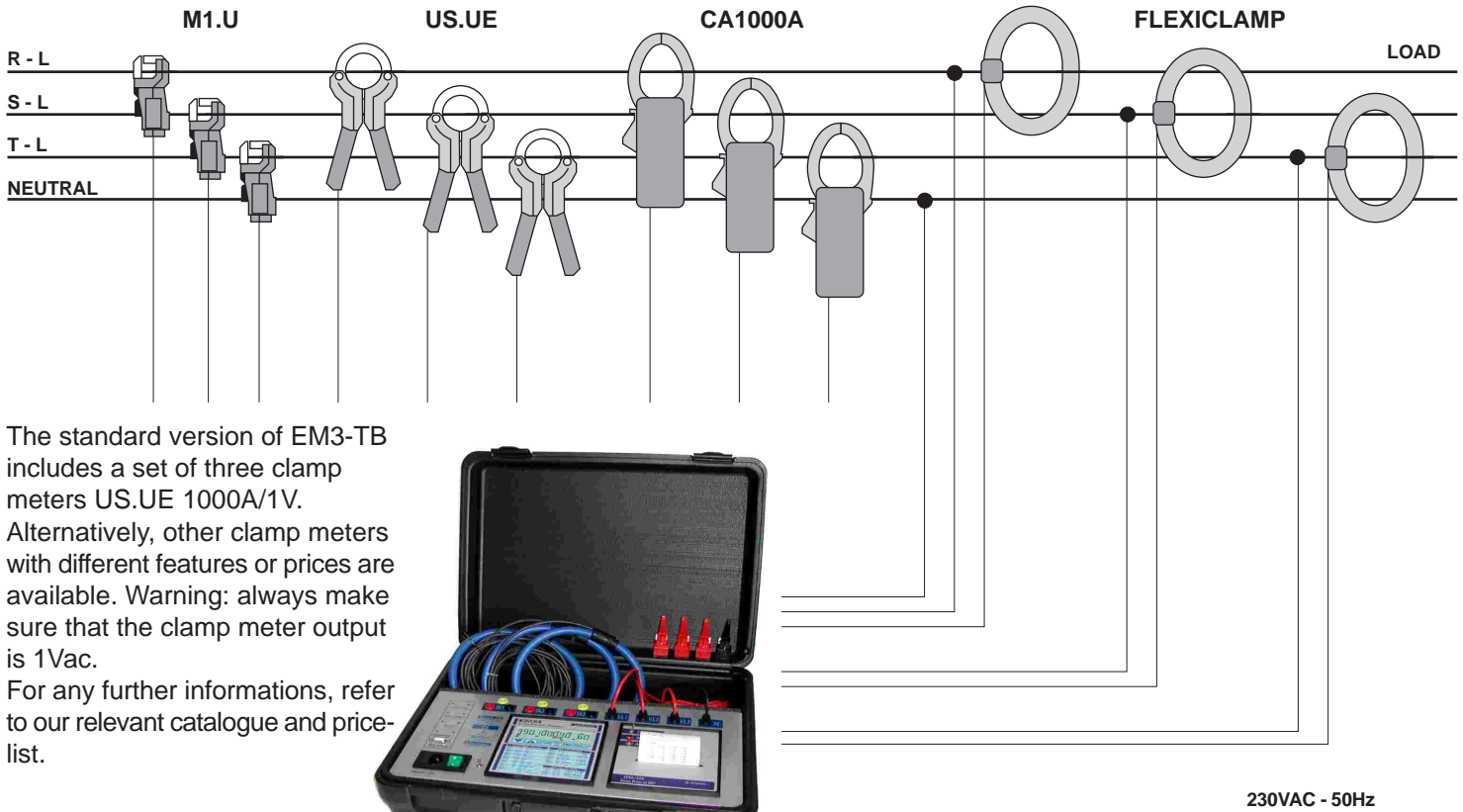
Standard case is not equipped with external modules.

All the instruments of the TB series can be connected to a 230V-50Hz power supply. A battery powered EM3 analyzer can be supplied as an optional extra to perform series of measurements in places where a mains power supply is not available. A 12-Volt lead sealed battery is used with an estimated charge period of approximately 24 hours under optimum working conditions. The printer, if any, works only when the case is connected to a 230V mains. Cod. B12V: includes a 12V battery and a battery charger. Refer to our price-list.

### ACCESSORIES

- MR4** DIN module for alarms and/or load cutoff. Relay output
- MTE1** Temperature module, 1 C1 probe
- MTE2** Temperature module, 2 C1+C2 probes

# CONNECTION



The standard version of EM3-TB includes a set of three clamp meters US.UE 1000A/1V. Alternatively, other clamp meters with different features or prices are available. Warning: always make sure that the clamp meter output is 1Vac. For any further informations, refer to our relevant catalogue and price-list.



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Data are given as an example only. Technical changes can be made without notice.

DISTRIBUTOR