USER'S MANUAL FOR X METER DEVICES

Models:

- Base din
- 96x96
- Gold din
  (ref. wiring diagrams base model XMeter din)
- Modbus
  (ref. wiring diagrams base model XMeter din)

Rev. 1 (Date: 13 /07 /2021)

Requests for any specific information on the product and/or on relating options not contained in the synthetic manual, may be sent to our web site: www.energyteam.it, section "CONTACTS", sending an email to @mail the TECHNICAL AREA" indicating the specific request.

Energy Team reserves the right to make the modifications it deems necessary without having to give any prior notice.

CONTENTS

LIST OF MEASUREMENTS

Direct measurements for each phase

- Phase-neutral voltage L1-N
- Phase-neutral voltage L2-N
- Phase-neutral voltage L3-N
- Phase-phase voltage L1-L2
- Phase-phase voltage L2-L3
- Phase-phase voltage L3-I1
- Line current L1
- Line current L2
- Line current L3

Derived measures for each phase

- Bi-directional active power L1 (positive = imported (Q1 and Q4) negative = exported (Q2 and Q3))
- Bi-directional active power L2 (positive = imported, negative = exported)
- Bi-directional active power L3 (positive = imported, negative = exported)
- Bi-directional reactive power L1 (positive = imported (Q1 and Q4)
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- Bi-directional reactive power L3 (positive = imported)
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- Distortion Power L3 (index of harmonic current presence)
- Apparent Power L1
- Apparent Power L2
- Apparent Power L3
- Power Factor L1
- Power Factor L2
- Power Factor L3

Main measures three-phase system

- Three-phase equivalent voltage phase-neutral
- Three-phase equivalent voltage phase-phase
- Three-phase equivalent current

- Three-phase active power (positive = imported (Q1 and Q4), negative = exported) Bi-directional
- Three-phase reactive power (positive = imported (Q1 and Q2) Bi-directional

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- Three-phase equivalent distortion power
- Three-phase equivalent apparent power
- Three-phase equivalent power factor
- Calculated neutral current
- Neutral-star point voltage ideal N-O
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Integrated values three-phase energy system

- Imported active energy (Q1 and Q4)
- Exported active energy (Q2 and Q3)
- Imported reactive energy (Q1)
- Imported reactive energy (Q2)
- Imported reactive energy (Q3)
- Imported reactive energy (Q4)
- Imported active power (Q1 and Q4)
- Imported active power (Q2 and Q3)
- Imported active power (Q1)
- Imported active power (Q2)
- Imported active power (Q3)
- Imported active power (Q4)

CONFORMITY

Applied standards

- EN 55011 (Class A)

- EN 50470-1
- EN 50470-3 (Class B)
- EN 61000-4-2
- EN 61000-4-3
- EN 61000-4-4
- EN 60204-1
- EN 61000-4-5
- EN 61000-4-6
- EN 61000-4-11

MULTIFUNCTION X METER
MEASUREMENT INSTRUMENT

OPTIONS

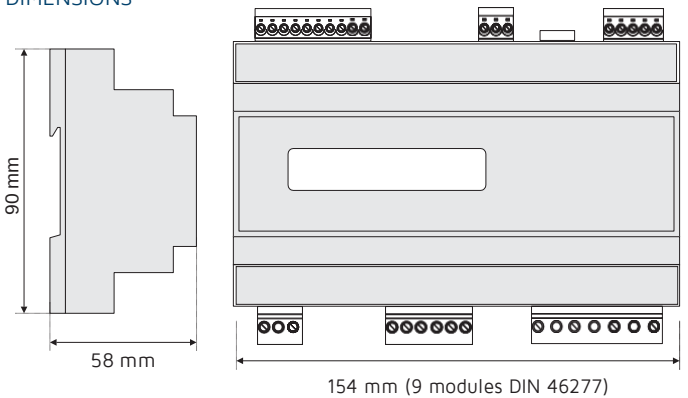
X M1	Memory and Communication extension
X M2	Mod. A Bridge 232/485 Mod. B Bridge USB/485
X M3	Mod.8 Digital inputs
X M4	Mod. Gsm/Gprs Modem
X M5	Mod. Ethernet
X M6	Mod. Harmonic recordings
X M8	Mod.1 Galvanic-isolated analog channel
X M9	Mod. PT100-500 Interface
X M10	Mod. Room temperature interface
X M11	Mod. Temperature and humidity interface
Es 3	Supervision Software

- Bi-directional meter (Imported/delivered energy)
- 50 true measurements made
- Measurements in true value (true RMS)
- Measures on 4 quadrants
- Graphic display with settable character size
- Full and clear indications of measurements
- 6-key keyboard with buzzer
- Configurable impulsive outputs of all measured values
- Configurable alarm outputs of all measured values
- Graphic display of voltage, current, powers and COSFI of last 3 days
- 12 Power Meters on 4 quadrants that can be set to zero through password
- Indication in € of absorbed and delivered energy
- Clock and Calendar
- Container DIN 46277 (9 Modules)
- Removable terminals to make assembly easier
- Temperature probe inside the instrument
- Software TA and TV inversion function
- Expansion and modularity (memory, digital inputs, GSM/GPRS modem, Ethernet, e-mail, quality of supply).

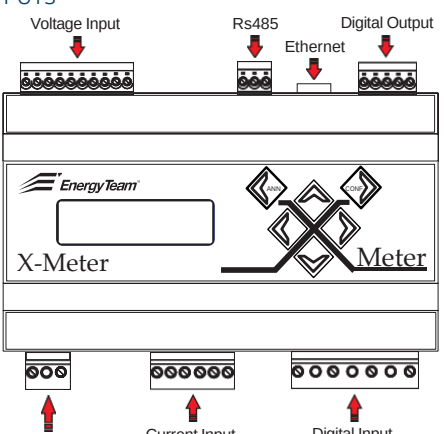
The advantages are clear:

This device costs like any other average multi-function device but it has higher initial features (graphic display, impulsive outputs for act./react. Energy, short storage of consumptions in memory) plus the possibility of expanding it to a real Power Quality instrument without having to replace it. Create your X-Meter whenever and however you want. Check the list of possible options.

DIMENSIONS



INPUTS/OUTPUTS



TECHNICAL FEATURES

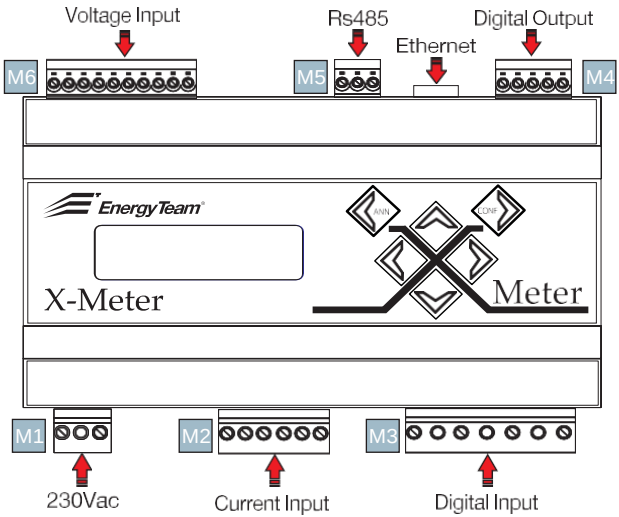
Measurements on grid	Unit of Measure
Voltage	Vac
Active Power	W
Reactive Power	VAr
Apparent Power	VA
Distortion Power	VA
Three-phase equivalent current	A
Line Current	A
CosFI	
Power Factor	
Delivered Active Energy	Wh
Absorbed Active Energy	Wh
Inductive Reactive Energy	VArh
Capacitive Reactive Energy	VArh
Frequency	Hz
Precision	+/-0.25% of the full scale of Meas.Val. +/-0.50% of full scale of Deriv. Meas.Val.

Power supply	Unit of Measure	
Power supply	Vac Vdc	100-250 100-350
Frequency	Hz	50 - 60
Consumption	VA	5

General	Unit of Measure	
Voltage inputs N.3	VAC	100 o 400
Current inputs N.3	A	/ 5
Impulsive outputs N.2 (Act./React)		
Optomos outputs (N.1 Min N.1Max)	100 mA	24 Vdc
Level of protection	IP	20
Weight	g	400
Dimensions L H W 9 modules DIN	mm	154 x 90 x58
Operating temperature	-10 C° +55 C°	
Relative humidity	95% without condensate	

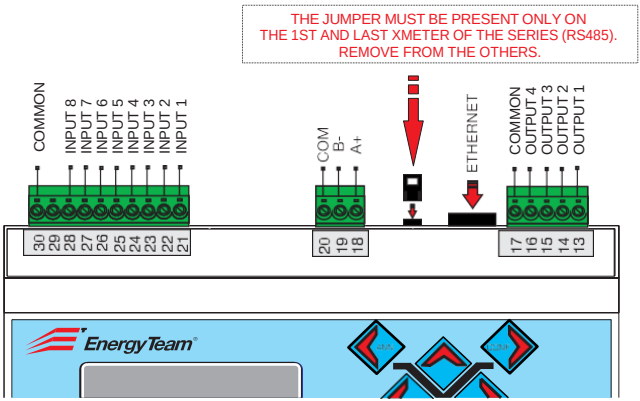
WIRING

INPUT-OUTPUT CLAMPS RELATIVE TO CABLE SECTIONS

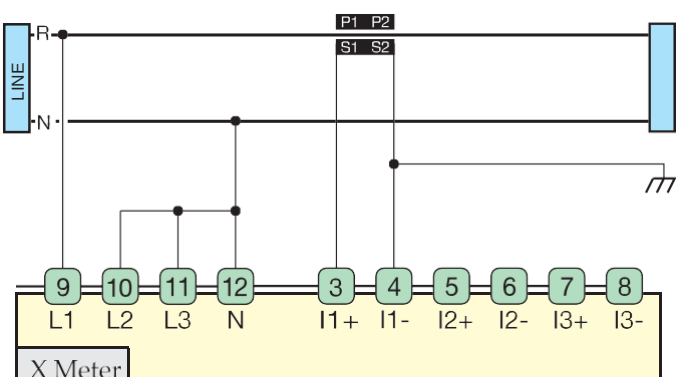


M1	Power supply *Cable section maximum* : ø 2 mm²(16AWG)
M2	Current Input Cable section maximum : ø 2.5mm²(14AWG)
M3	Voltage inputs Cable section maximum : ø 2.5mm²(14AWG)
M4	Digital outputs Cable section maximum : ø 0.75mm²(18AWG)
M5	Rs485 Cable section maximum : ø 0.75mm²(18AWG) Belden 9841
M6	Digital inputs Cable section maximum : ø 0.75mm²(18AWG)

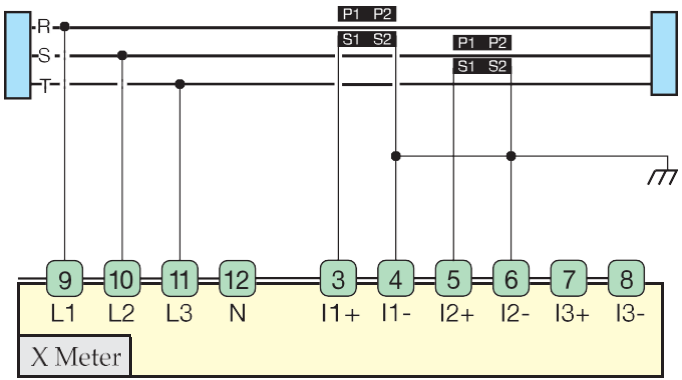
I/O SERIAL CONNECTIONS



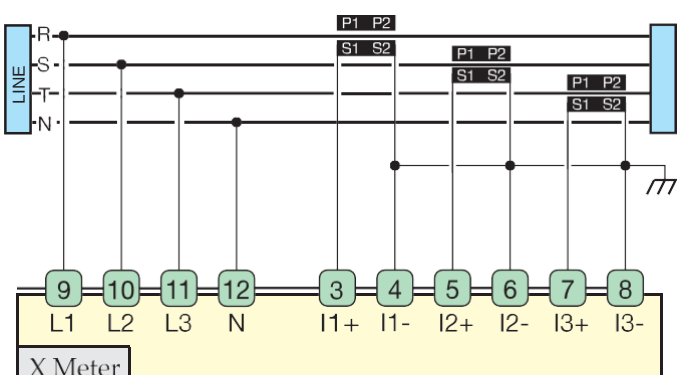
DIRECT CONNECTION LOW VOLTAGE SINGLE-PHASE LINE



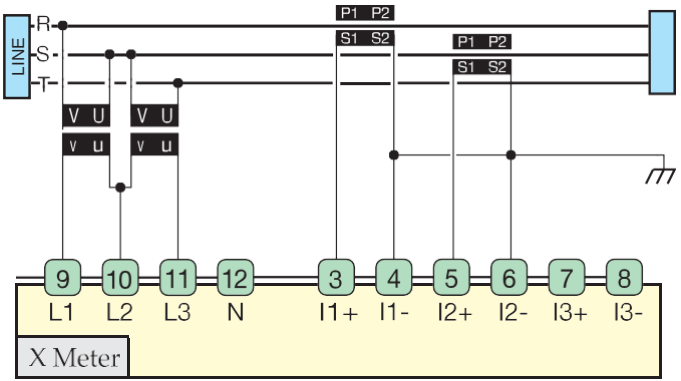
DIRECT CONNECTION LOW VOLTAGE 3-PHASE LINE



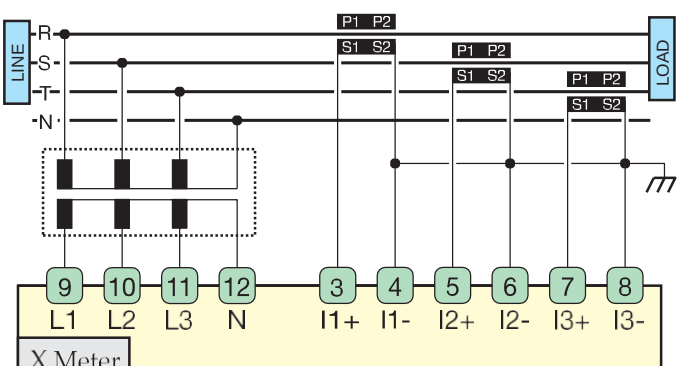
DIRECT CONNECTION LOW VOLTAGE 3-PHASE LINE +NEUTRAL



DIRECT CONNECTION MEDIUM VOLTAGE 3-PHASE LINE



DIRECT CONNECTION MEDIUM VOLTAGE 3-PHASE LINE +NEUTRAL



XMETER 96 MULTIFUNCTION MEASUREMENT INSTRUMENT

OPTIONS

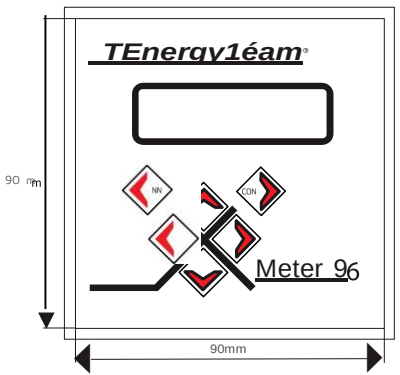
X M1	Memory and Commu-nication extension
X M2	Mod. A Bridge 232/485 Mod. B Bridge USB/485
X M3	Mod. 4 Digital inputs
X M4	Mod. Gsm/Gprs Modem
X M5	Mod. Ethernet
X M6	Mod. Harmonic recordings
X M8	Mod.1 Galvanic-isolated analog channel
X M9	PT100-500 Mod. interface
X M10	Mod. Room temperature interface
X M11	Mod. Temperature and humidity interface
Es 3	Supervision Software

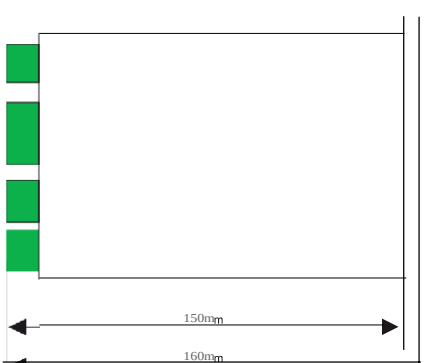
- Bi-directional meter (Imported/transferred energy)
- 50 true measurements made
- Measurements in true value (true RMS)
- Measures on 4 quadrants
- Graphic display with settable character size
- Full and clear indications of measurements
- 6-key keyboard with buzzer
- Configurable impulsive outputs of all measured values
- Configurable alarm outputs of all measured values
- Graphic display of voltage, current, powers and COSFI of last 3 days
- 12 Power Meters on 4 quadrants that can be set to zerothrough password
- Indication in €of absorbed and delivered energy
- Clock and Calendar
- Removable terminals to make assembly easier
- Temperature probe inside the instrument
- Software TA and TV inversion function
- Expansion and modularity (memory, digital inputs, GSM/GPRS modem, Ethernet, e-mail, quality of supply)
- Built-in container 96x96

The advantages are clear:

This device costs like any other average multi-function device butit has higher initial features (graphic display, impulsive outputs for act./react. Energy, short storage of consumptions in memory) plus
the possibility of expanding it to a real Power Quality instrument withouthaving to replace it. Create your X-Meter whenever and however you want. Check the list of possible options

DIMENSIONS





TECHNICAL FEATURES

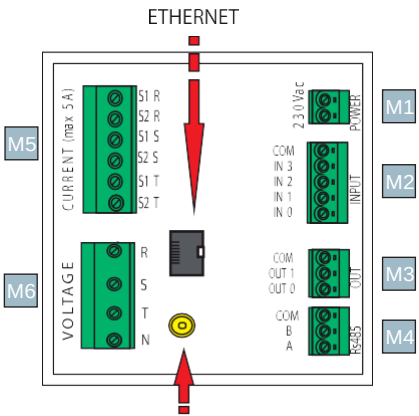
Measurements on grid 50/60HZ	Unit of Measure
Voltage	Vac
Active Power	W
Reactive Power	VAr
Apparent Power	VA
Distortion Power	VA
Three-phase equivalent current	A
Line Current	A
CosFI	
Power Factor	
Delivered Active Energy	Wh
Absorbed Active Energy	Wh
Inductive Reactive Energy	VArh
Capacitive Reactive Energy	VArh
Frequency	Hz
Precision Val.	+/-0.25% of the full scale of Meas. +/-0.50% of full scale of Deriv. Meas. Val.

Power supply	Unit of Measure	
Power supply	Vac Vdc	100-250 100-350
Frequency	Hz	50 - 60
Consumption	VA	5

General	Unit of Measure	
N.3 Voltage inputs	VAC	100 or 400
N.3 Current inputs	A	/ 5
N.2 Impulsive Optomos outputs		
Alarm config. only with option .Xm1	100 mA	24 Vdc
Level of protection	IP	20
Weight	g	500
Dimensions L H W 9 modules DIN	mm	90 x 90 x 150
Operating temperature	-10 C° +55 C°	
Relative humidity	95% without condensate	

WIRING

INPUT-OUTPUT CLAMPS RELATIVE TO CABLE SECTIONS



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M2	Digital inputs Cable section maximum : ø 0.75mm²(18AWG)
M3	Digital outputs Cable section maximum : ø 0.75mm²(18AWG)
M4	Rs485 Cable section maximum : ø 0.75mm²(18AWG) Belden 9841
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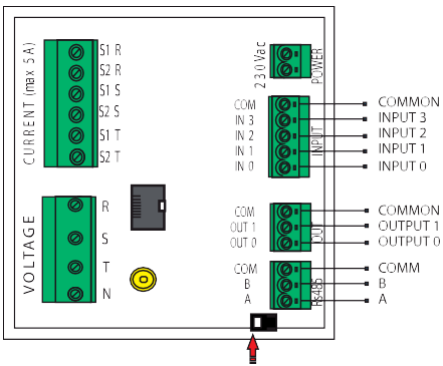
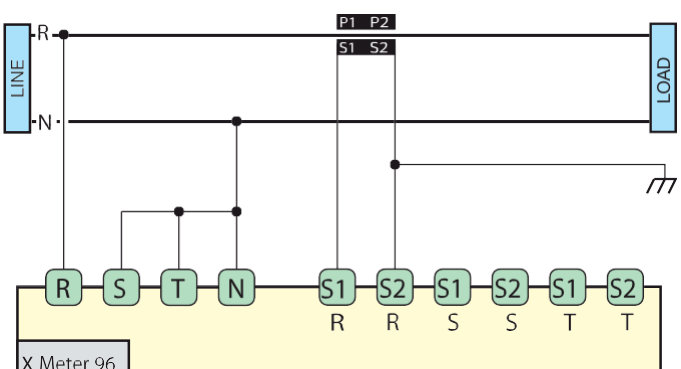
M6	Voltage inputs Cable section maximum : ø 2.5mm²(14AWG)

I/O SERIAL CONNECTIONS

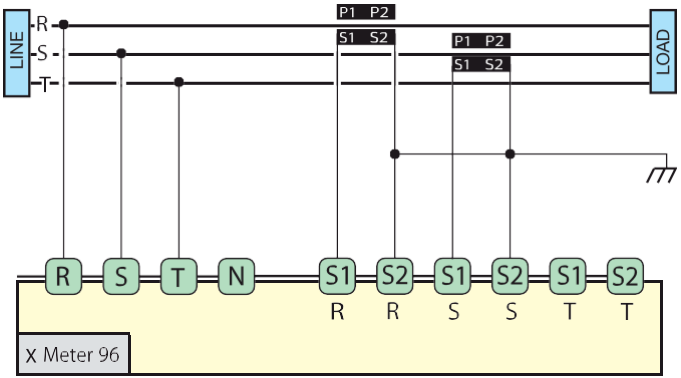


THE JUMPER MUST BE CONNECTED ONLY ON THE 1ST AND LAST XMETER 96 OF THE SERIES (RS485)
To connect bridge on jumper remove the safety from all the terminals and only after the silk-screened back.
The jumper is behind connector re RS485.

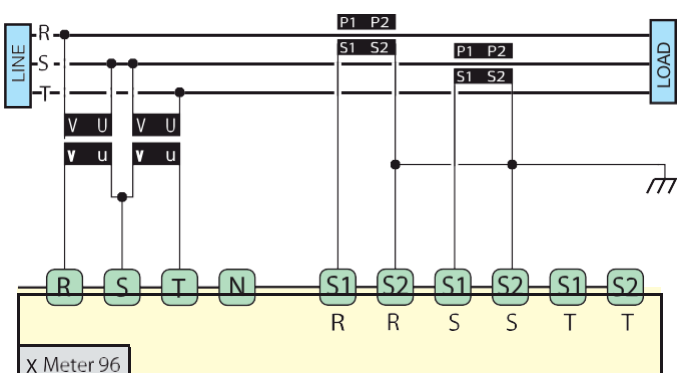
DIRECT CONNECTION LOW VOLTAGE SINGLE-PHASE LINE



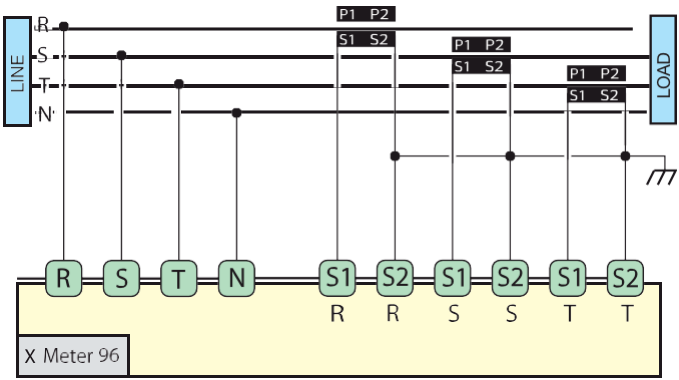
DIRECT CONNECTION LOW VOLTAGE 3-PHASE LINE



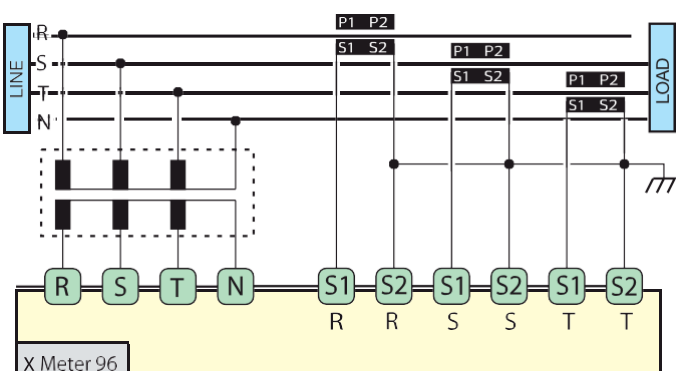
DIRECT CONNECTION MEDIUM VOLTAGE 3-PHASE LINE



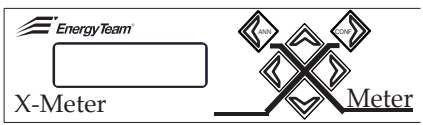
INDIRECT CONNECTION MEDIUM VOLTAGE 3-PHASE LINE



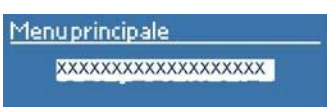
INDIRECT CONNECTION MEDIUM VOLTAGE 3-PHASE LINE + NEUTRAL



CONCISE MANUAL FOR KEYBOARD PROGRAMMING OF XMETER (ALSO FOR MODEL 96X96)



After switching on the device, regardless of what the display shows, it is necessary to bring the device back to the MAIN MENU by using the LEFT button.



From any point of the main menu go to the STANDARD SETUP screen by using the UP and DOWN keys.

Press the RIGHT key to enter in:

Press CONF and enter the default code 1234, using the UP key.
After setting the desired numerical value move to the second digit using the RIGHT button, continue until the entire code has been entered, then press CONF.

REGOLAZIONE DATA.

Enter the date configuration page:

To configure press CONF,

Press RIGHT to go to the portion to modify, which will be the only one highlighted.
Use CONF to enable the possibility to modify the value in the selected period and use the UP and DOWN keys to modify the date with the correct one; modify the 2 figures of the period and confirm by pressing CONF.

Repeat the operation until the date is set. After entering the final date press RIGHT until the following screen appears.

To FINALLY CONFIRM the date press CONF: if the operation was done correctly, the display without the highlighted periods will appear.

TIME SETTING

IMPORTANT : always enter (regardless of the period) only the solar time and never the day-light saving time, the device adjusts the time according to the time of the year indicated.

After setting the date move with the
DOWN key to the following screen :

As for the date, press CONF and the following should appear:

Then press RIGHT and select the time as shown below:

Press CONF and enter the correct time, and press CONF to confirm; move onto the minute digits with RIGHT and repeat the operation up to the seconds.

After confirming the seconds press RIGHT again until the three periods

are displayed as in the screen below:

To CONFIRM the time press CONF: if the operation was done correctly, the display without the highlighted periods will appear:

CURRENT ENTERING MODALITY

Use the DOWN key to move to the following page, the following screen will appear:

According to the type of data that needs to be entered, either 1, 2 or 3 TA, select the modality by using CONF and UP

Confirm the desired modality using CONF.

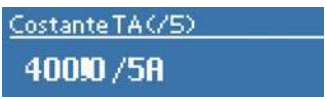
TA CONSTANT
Use the DOWN key to move to the following page, the following screen will appear:

Press CONF to enter the configuration.

Use the keys RIGHT and LEFT to select the value to change, for example if the TA value is 450A move to the first available value to the left and use DOWN to decrease until the desired value is reached, in this case 4.

Continue with the RIGHT key and select point as shown in image

Then use UP to move the comma to the desired position:



Then move with LEFT up to the position to change, and use UP to increase up to the desired value, in this case 5.

Press CONF to confirm.

TV CONSTANT

Perform the same operations and modalities as for constant TA

It is possible to enter the value K (KILOVOLT), M (MEGAVOLT), G (GIGAVOLT) if the maximum numerical value available of the primary voltage is higher than 9.999V.

On the page press CONF and use

the RIGHT key to move the cursor beyond the last digit, then press UP to select the desired value, for example K, and save by pressing CONF.

PROGRAMMING OF PULSE OUTPUT/X-METER ALARM

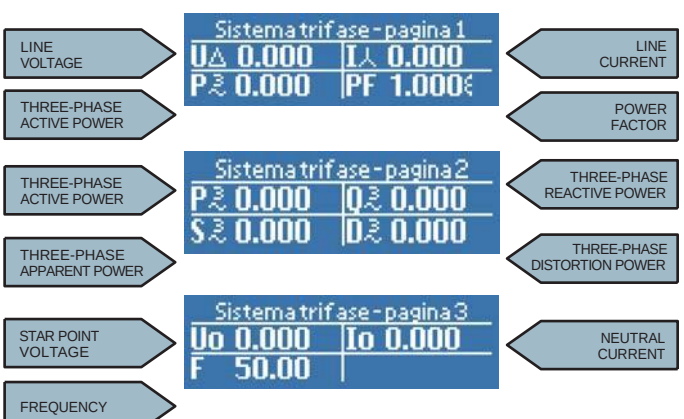
To enter this function it is necessary to enter the PIN (1234 default) and then press CONF: configuration pages for the impulsive outputs 1 are displayed (terminals 15 and 17 com.) and impulsive 2 (terminals 16 and 17 com.) and for the alarms 1 (terminals 13 and 11 com.) and alarms 2 (terminals 14 and 11 com.).

PROGRAMMING OF OUTPUT PULSES X-METER 96

To enter this function it is necessary to enter the PIN (1234 default) and then press CONF: configuration pages for the impulsive outputs 1 are displayed (terminals Out0 and com.) and impulsive 2 (terminals Out1 and com.).

To program this and other parameters not indicated in the manual, download the COMPLETE manual from our site: www.energyteam.it, section "CONTACTS", by sending an email to the "TECHNICAL AREA" containing the "Request Manual X-Meter"

From current screen, press on UP to move to ELECTRIC MEASURES:



From these pages by using the keys RIGHT and UP it is possible to enter the detail of the remaining measures. To enlarge the measurement press theRIGHT key again.

GENERAL SAFETY REGULATIONS

- The X-meter device must be used by specialized and qualified personnel only.
- Disconnect device from mains and all terminals before opening the container. Caution: device powered at 230 vac and 380 vac
- Do not use in presence of water.
- Strictly comply with the indications and diagrams in this manual when connecting the device

WARRANTY

Energy Team guarantees that the products supplied are free from defects and ready for use. If any mal-functioning should arise due to construction and production defects E.T. shall deal with the problem according to the terms laid down by the General Supply Conditions, with particular reference to articles 5B) (terms and duration), 1C) (limitations) and 5D) (other responsibilities). Any intervention or tampering with the device caused by unauthorized third parties makes the warranty immediately void."

CALIBRATION CERTIFICATE

We certify that this device was adjusted through
Primary Sample of Power Fluke 6100A S.N. 46440

Class of accuracy: B
According to Compliance: EN 50470-1 + EN 50470-3

References: 100Vtrms ,50 Hz -- 0,5Atrms ,50 Hz – 3Atrms,50 Hz .

Verified Precision: +/-0,25 % of full scale.

Values read after the adjustment of device:

RANGE

Rated value	Max	Min.	Verif.
100 Vtrms	100,25	99,75	
0,5 Atrms	0,5012 5	0,4980	
3 Atrms	2,9875	3,0125	

Date_____ Technician _____

S.N._____

Note: : to assure the indicated precision in time we suggest checking the instrument every 24 months.

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