

Multifunctional power meter KML110



<http://kimelectric.kr>

User Manual 1.1

- The company reserves the right to modify the product specifications described in this manual without notice.

1. Product overview

This series of multifunctional power meters is an ideal device for power monitoring. The meter has the ability to detect the current, voltage, frequency, active power, reactive power, apparent power forward and reverse active energy, and forward and reverse reactive power in the grid. The function of simultaneous measurement of electric energy and power factor. It is suitable for distributed detection of transformer generator sets, capacitor banks and motors, and on-site monitoring and display of power grids and automation control systems.

This series of multifunctional power meters can replace many traditional analog or digital measuring instruments (such as ammeters, voltmeters, power meters, power factor meters, frequency meters, etc.), which can greatly reduce system costs, facilitate field wiring, and improve system reliability. The multi-function power monitor is equipped with a serial port, allowing to connect to an open structure computer network; the application of Modbus communication protocol is convenient for computer programming or reading data.

2. Product function

2.1 Measuring voltage

- Phase voltage: U_a, U_b, U_c
- Line voltage: U_{ab}, U_{bc}, U_{ca}
- Current: I_a, I_b, I_c
- Frequency: (Hz)
- Active power: P_a, P_b, P_c, P_Σ
- Reactive power: Q_a, Q_b, Q_c, Q_Σ
- Apparent power: S_a, S_b, S_c, S_Σ
- Power factor: $Pf_a, Pf_b, Pf_c, Pf_\Sigma$

2.2 Electric energy metering

- Active energy + $E P / - E P r$
- Reactive energy + $E Q / - E Q r$

2.3 Display mode

- Segment LCD display
- Display mode is manual selection

2.4 Communication function

- Protocol: MODBUS-RTU
- Parity bit: odd parity/even parity/no parity
- Communication method: RS485 wired communication
- Baud rate : 1200/2400/4800/9600 bps
- Mailing address : 1-247

3. Product Index

MODEL	KML110 Series	
Connect model	3 phase 3 wire, 3phase 4 wire	
Power supply	AC220V or AC85-270V	
Consumption	Less than 5W	
Phase	3 phase	
Voltage	Rated	57.7/100V; 220/380V; 500V
	Power consumption	< 0.5VA
	TV	1 to 4999 (PT ratio)
	Overload	Last 1.2 times Instantaneous: 2 times per second
Amper	Rated	5A; 1A
	Power consumption	< 0.5VA
	TV	1 to 9999 (CT ratio)
	Overload	Last 1.2 times Instantaneous: 20 times per second
Frequency	45 - 65Hz \pm 0.02Hz	
Power & Power factor	Accuracy grade Accuracy 0.5 level	
Energy kWh	Active Power Level 1 Reactive Power Level 2	
Electric pulse	Passive photocoupler collector output, fixed pulse width 80ms	
Communication	RS485 port with modbus-RTU	
Insulation resistance	>100M Ω	
Display	7 bar LED light	
Operating Temperature	-10 $^{\circ}$ C \div +55 $^{\circ}$ C	
Storage Temperature	-25 $^{\circ}$ C \div +70 $^{\circ}$ C	
Humidity	< 93%, non-condensing	
Altitude	Up to 2000m	

4. Display

4.1 Key Description



Press this key to display 3-phase phase voltage, 3-phase line voltage, 3-phase current, frequency and input/output signal information.
When in the menu install the key is the installation of the value gain



Press this key to display active power 3-phase/total, reactive power, 3-phase/total, apparent power 3-phase/total and power factor.
When in the key setting menu there is a decrease value setting function



Press this key to display active power in / out, reactive power in / out
When in the setup menu there is a function to access the deeper menu or confirm the value



Press this key to access the initial menu
In the setup menu, press this key to return to the previous menu
In the value setting menu, press this key to move between values

4.2 Start Interface

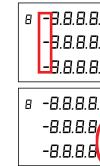


LED display on the left

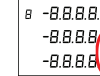
- Phase voltage
- Line voltage
- Current
- Frequency
- Active power
- Reactive Power
- Apparent power
- Power factor
- Electrical Power



The marker position LEDs show the value and decimal point



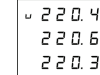
The position highlighted in red shows:
LED display apparent power forward
Excess power factor



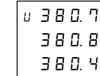
The position highlighted in red shows
"K" Show quantity kV, kA, kW, kVAR, kVA, kWh...
"M" Show quantity MV, MA, MW, MVAR, MVA, MWh...

5. Measurement parameter

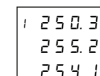
5.1 Parameters current, voltage and frequency



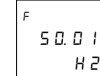
Initial default display shows phase voltage, for example
Phase voltage A: 220.4V
Phase voltage B: 220.6V
Phase voltage C: 220.3V



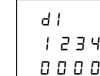
Press "U/I" to see the 3 phases line voltage



Press "U/I" to see 3 phases current

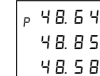


Press "U/I" to see the frequency

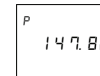


Press "U/I" to see the input signal (if any)

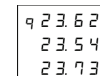
5.2 View power rating and power factors



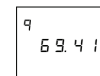
On the display, press "P" to see active power of each phase



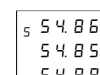
Press "P" to show the total active power



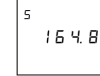
Press "P" to see reactive power of each phase



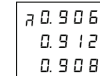
Press "P" to view total reactive power



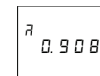
Press "P" to see the apparent power of each phase



Press "P" to see total apparent power



Press "P" to see the power factor of each phase

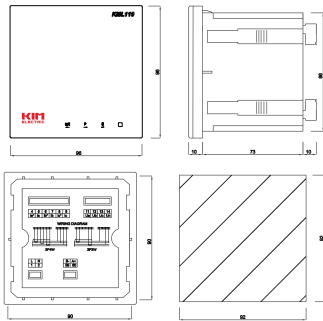


Press "P" to see the total power factor

5.3 Power parameter display ▼

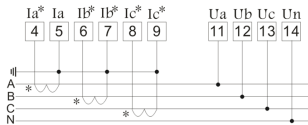
<p>EP 152 244.1</p>	On screen display, press "E" to see Active energy +
<p>EP r 2 03.20</p>	Press "E" to see Active energy -
<p>E9 1 207.2</p>	Press "E" to see reactive power +
<p>E9 r 0.07</p>	Press "E" to see reactive energy -

6. Dimension

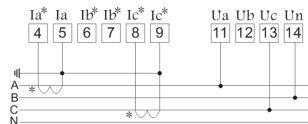


7. Wiring diagram

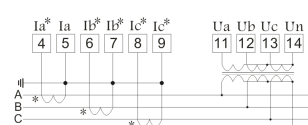
7.1. Wiring diagram 3 phases 4 wires without voltage transformer ▼



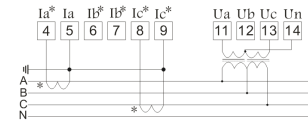
7.2. Wiring diagram 3 phases 3 wires without voltage transformer ▼



7.3. Wiring diagram 3 phases 4 wires with voltage transformer ▼



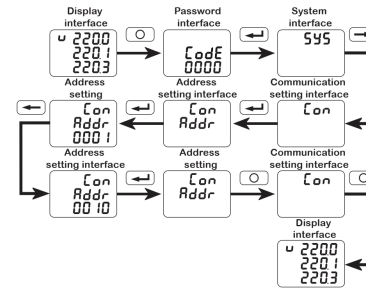
7.4. Wiring diagram 3 phases 3 wires with voltage transformer ▼



7.5. Wiring diagram 1 phases 2 wires ▼



8. Initial parameter setting



In the display interface press the "□" key to enter the user settings menu. The multimeter requires a password, the factory default password is "0 0 0 0"

Code
0000

Using this key "□" to move cursor positions.
Press "▲" and "▼" to increase / reduce value

SYS

After entering the password press "E" to access the settings menu.

8.1 Power parameter setting ▼

SYS

On the menu "SYS" press "E" to enter the system parameter settings

SYS
FU

Press "E" entering the voltage ratio setting as image

SYS
FU
0001

Continue to press "E" Entering to change the voltage variable ratio value, (setting value can be selected from 1 to 4999) then to press "E" to save

SYS
FR

Press "▼" to switch to the current transformer ratio setting

SYS
FR
0100

Press "E" entering to change the current variable ratio value (the setting value can be selected from 1 to 9999) then press the "E" to save

SYS
FR_n

Press "▼" to switch to setting the number of current transformers connected

SYS
FR_n
3ER

Press "E" to change the number of current transformers connected (the setting value can be selected 3CT or 2CT) then press the "E" to save

SYS
LINE

Press "▼" to switch to the wiring diagram setting

SYS
LINE
P3L4

Press "E" to enter to change the wiring diagram (the setting value can be selected P3L4; P3L3; P1L2) then press "E" to save

SYS
ACON

Press "▼" to switch to active power pulse constant setting

SYS
ACON
04.0E

Press "E" to enter the active power pulse constant change (Installer value may be select 100 - 4000 pulses) then press "E" to save

SYS
POLL

Press "▼" to switch to reactive power pulse constant setting

SYS
POLL
0003

Press "E" to enter the reactive power pulse constant change (Installer value may be select 100 - 4000 pulses) then press "E" to save

SYS
CODE

Press "▼" to switch to reset password

SYS
CODE
0000

Press "E" to enter to reset password (setting value can be select 0000 đến 9999) then press "E" to save

SYS
DISP

Press "▼" to switch to the initial default display quantity setting

SYS
DISP
0000

Press "E" to enter to change the display (set value can be selected 0 - view current, voltage (default); 1- view capacity; 2- view power) then press "E" to save

8.2 Set the address and connection speed ▼

CON

At the menu "SYS" press "▼" to move to setting connection parameters as shown below

CON
ADDR

Press "E" entering to set the connection address as image on the left

CON
ADDR
0001

Continue to press "E" to change the connection address (the setting value can be selected from 1 to 247) then press "E" to save

CON
BRUD

Press "▼" to switch to connection speed setting

CON
BRUD
9600

Press "E" to enter to change connection speed (selectable setting value 1200, 2400, 4800, 9600) then press "E" to save

CON
CHEK

Press "▼" to switch to communication check settings

CON
CHEK
n10 2;

Press "E" to change contact information (selectable setting value n10 2; a01; e11; 101) then press "E" to save