POWER ANALYZER

PCE-PA 7200

INSTRUCTION MANUAL

1. INTRODUCTION

NOTE

This Power Meter has been designed and tested according to CE Safety Requirements for Electronic Measuring Apparatus, IEC/EN 61010-1 and other safety standards. Follow all warnings to ensure safe operation.

WARNING
READ "SAFETY NOTES" (NEXT PAGE) BEFORE USING THE METER.

CAT IV – Measurements performed at the source of the low voltage installation.

CAT III – Measurements performed in the building installation.

CAT II – Measurements performed on circuits directly connected to the low voltage installation.

2. SAFETY NOTES

1. Read the following safety information carefully before attempting to operate or service the meter.
2. Use the meter only as specified in this manual. Otherwise the protection provided by the meter may be impaired.
3. Keep drying when using this product.
4. To reduce the risk of electric shock, do not remove cover.
5. Do not use this product while is getting wet.
6. Never give shocks, such as vibration or drop, which may damage the meter.
7. The maximum measurement current is 1000A.
8. Rated environmental conditions :
   (1) Indoor 600Vac.
   (2) Installation Category III.
   (3) Pollution Degree 2.
   (4) Altitude up to 2000 meter.
   (5) Relative humidity 80% max.
   (6) Ambient temperature 0~40℃.

9. Observe the International Electrical Symbols listed below :

□ Detector is protected throughout by double insulation or reinforced insulation.

⚠ Warning ! Risk of electric shock .

⚠ Caution ! Refer to this manual before using the product.

∼ AC; Alternating Current

3. FEATURES

1. Determine the running cost of your appliances.
2. Measure voltage, current, frequency, watt, power factor, and greenhouse gas emissions.
3. Log and Recall function.
4. Enable users to read the data in memory directly on the meter without connecting to a PC.
5. Optical USB to RS-232 data transmission.
6. 2 Optical LEDs are built-in for data transfer.
7. Transferring and showing real-time data to a PC.
8. Make informed decisions when purchasing appliances and equipment.
9. Reduce your electricity bill.
10. Calculate electrical expenses by real, hour.
11. Data communication function.
12. Freely set upper and lower limit for V, A, W and alarm when measured value is out of limit.
13. Backlight function.

4. SPECIFICATIONS

Item	Range	Resolution	Accuracy
AC voltage	600 V	0.1V	±1%±5dgt
AC current	1000 A	0.1A	±1.5%±5dgt (>10A)
Power	0-9999 kW		±2.5%±5dgt
Apparent power	0-9999 kVA		±2.5%±5dgt
Power factor	0.001-1	0.001	
Frequency	45-65 Hz	0.1	±0.5%±5dgt
Cost	9999 $		
Energy	9999 kWh		
Gas	9999 kg		
Cost setting	0-9999 kWh		
Gas setting	0-9999 kg / kWh		

● Dimensions :
  Power Meter: 177(L) × 200(W) × 105(D)mm
  AC Current Clamp: 212(L) × 100(W) × 47(D)mm
● Weight : Approx. 1400g
● Safety standards: IEC / EN 61010-1 CAT III 600V
                    EN 61326-1
● Power source: 1.5V(AA) × 6

5. INSTRUMENT LAYOUT

(1) AC Current Clamp: Output voltage 0.5mV/1A.

(2) ACV Terminal: Input AC voltage.

(3) ACA Terminal: Input AC current.

(4) LCD Display Screen: LED display.

(5) Select Button:
Display kW/kVA/ACV/ACA maximum and minimum
Display kWh/CO2/cost real and hour duration data

(6) Reset Button: Reset all test data.

(7) Backlight Button: ON or OFF backlight function.

(8) Mode Button:
Select kW, PF, kVA, HZ, ACV, ACA, kWh, CO2, cost
and time mode.

(9) Set Button:
ACV/ACA/kW upper/lower alarm and CO2/cost rate
set and test time function setting.

(10) Run/Stop Button:
Start or pause process during the measurement period.

(11) Log Button:
The data is stored 2000 records.

(12) Recall Button:
Stored records data can be re-called from the memory.

(13) Hold Button: Data hold.

(14) Terminal for PC Interface: connect data transmission
cable.

(15) Power Button: Power on/off.

(16) Test leads.

6. MEASURING METHODS

The meter is a multiple measurement function of AC power meter.

Those functions are voltage, current, watt, va, frequency, power factor, power consumption and actual cost of power consumed measurement.
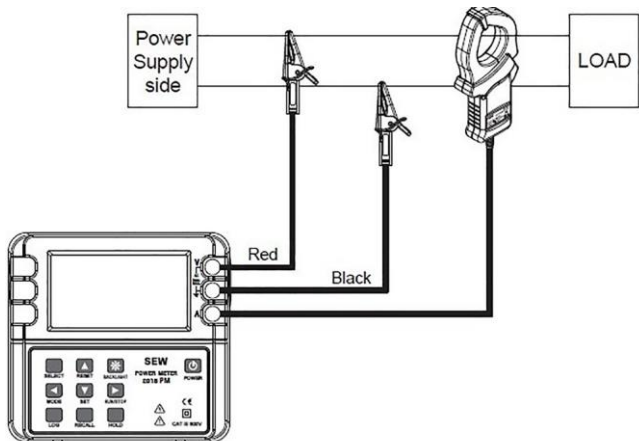
Connections:

1. AC Voltage Measurement:
   Insert the Red test lead to the Red testing terminal and insert the Black test lead to the Black testing terminal.

2. AC Current Measurement:
   Insert the Clamp sensor test lead to the BNC terminal

Power Measurement on Single-Phase Two-Wire Circuit

6-1. Main buttons functions of power meter

MODE Button :
You can select different modes by pressing MODE button.
These modes are watts, power factor, apparent power, frequency, AC voltage, AC current, kWh, GAS, cost and time mode.

SELECT Button :
When the main modes are watts, apparent power, AC voltage, AC current modes, press the SELECT button can see the detail of maximum and minimum on the display.
Other main mode like kWh, GAS, COST mode when pressing the SELECT button, you can see the detail of REAL, HOUR, duration on the display.
Under the time mode, press the SELECT button can select different display of time mode, (min/sec) mode, (hours)mode, (days/hours)mode.

SET Button :
1. Alarm function:
   Under the watt, AC voltage and AC current modes press the SET button can set UPPER and LOWER limit alarm functions.
2. Time setting function:
   Under the time setting mode, press the SET button can set run-time or end-time test duration.

RESET Button :
Press and hold the RESET button can reset all test data.

RUN/STOP Button :
Press the RUN/STOP button can start or pause process during the measurement period.

BACKLIGHT Button :
Press the BACKLIGHT button, the LCD will have backlight function.

LOG Button :
Press LOG button, the display will show "LOG" on the power meter, and the data is stored 2000 records. The data is stored every second until the memory full. Press the RUN/STOP button to execution.

RE-CALL Button :
Press the "RECALL" button into the RE-CALL mode. the data in the memory can be re-called on the LCD.

Hold Button:
Data hold.

Power Button:
Power on/off.

6-2. Screen mode
6-2-1. WATTS Screen Mode:
● Press the SELECT button can show the detail of
   MAX/MIN on the display.

⇒ : Press the SELECT button
     can see MAX/MIN watts.

● SET Alarm
   Press the SET button can set watt alarm to the
   upper/lower limit mode.
   Press the SELECT button can change the upper or
   lower limit.
   Press the MODE (◄) button can change flashing
   number position.
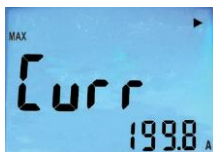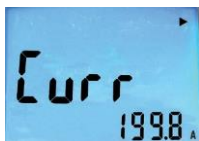   Press the RESET(▲) button to increase the flashing
   digit (0→9).
   Press the SET(▼) button to decrease the flashing
   digit (9→0).
   Press the RUN/STOP(►) button to confirm the
   setting number.

6-2-2. POWER FACTOR Screen Mode :

6-2-3. Apparent Power Screen Mode :
- Press the SELECT button can show the detail of MAX/MIN on the display.

⇒ : Press the SELECT button can see MAX/MIN apparent power.

6-2-4. Frequency Screen Mode :

6-2-5. AC Voltage Screen Mode :

● Press the SELECT button can show the detail of MAX/MIN on the display.

⇒ : Press the SELECT button can see MAX/MIN AC Voltage.

● SET Alarm

Press the SET button can set AC voltage alarm to the upper/lower limit mode.

Press the SELECT button can change the upper or lower limit.

Press the MODE(◄) button can change flashing number position.

Press the RESET(▲) button to increase the flashing digit (0→9).

Press the SET(▼) button to decrease the flashing digit (9→0).

Press the RUN/STOP(►) button to confirm the setting number.

6-2-6. AC Current Screen Mode :

● Press the SELECT button can show the detail of MAX/MIN on the display.

⇒ : Press the SELECT button can see MAX/MIN AC Current.

● SET Alarm
Press the SET button can set AC current alarm to the upper/lower limit mode.
Press the SELECT button can change the upper or lower limit.
Press the MODE(◄) button can change flashing number position.
Press the RESET(▲) button to increase the flashing digit (0→9).
Press the SET(▼) button to decrease the flashing digit (9→0).

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Press the RUN/STOP(►) button to confirm the
setting number.

6-2-7. kWh Screen Mode :

● SELECT REAL/HOUR function

: Press the SELECT button
can see REAL/HOUR kWh.

6-2-8. GAS Screen Mode :

● SELECT REAL/HOUR function

: Press the SELECT button
can see REAL/HOUR
GAS kg.

● SET GAS RATE
  Press the SET button can set GAS rating.
  Press the MODE(◄) button can flashing number
  position.
  Press the RESET(▲) button to increase the flashing
  digit (0→9).
  Press the SET(▼) button to decrease the flashing
  digit (9→0).
  Press the RUN/STOP(►) button to confirm the
  setting number.

6-2-9. COST Screen Mode :
  ● SELECT REAL/HOUR function

: Press the SELECT button
  can see REAL/HOUR cost.

● SELECT COST RATE
  Press the SET button can set COST rating.
  Press the MODE(◄) button can flashing number
  position.

Press the RESET(▲) button to increase the flashing digit (0→9).
Press the SET(▼) button to decrease the flashing digit (9→0).
Press the RUN/STOP(►) button to confirm the setting number.

6-2-10. TIME Screen Mode :
- SELECT TIME MODE

⟹ : Press the SELECT button can see minutes and seconds/ HOURS/DAYS HOURS time mode.

- SET TIME MODE
Press the SET button can set TIME duration.
Press the MODE(◄) button can flashing number position.

Press the RESET(▲) button to increase the flashing digits.
Press the SET(▼) button to decrease the flashing digits.
Press the RUN/STOP(►) button to confirm the setting number.

6-2-11. LOG Screen Mode:

● SELECT LOG MODE

Connect teh data transfer cable to the power meter and PC all the records can be saved in the memory and recalled to a PC and downloading saved data a PC. Press LOG button ,the display will show "LOG" on the power meter, and the data is stored 2000 records. The data is stored every second until the memory full.

Press the RUN/STOP(►) button to execution.
Reset memory data can Press the "RESET" button clear all memory data.
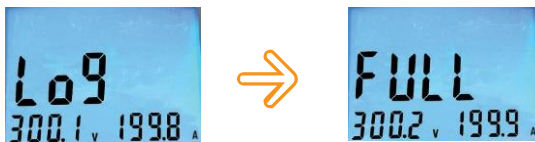
● RE-CALL Mode:

Press the "RECALL" button into the RE-CALL mode the data in the memory can be re-called on the LCD.

Record =rEC —— rEC   1966 —— Record No:1-2000

Press the "MODE" button to read different parameters, such as watts, power factor, apparent power, frequency, AC voltage, AC current, kWh, GAS, cost.

watts ⇒ power factor ⇒ apparent power ⇒ frequency

voltage ⇒ current ⇒ kWH ⇒ CO2

COST
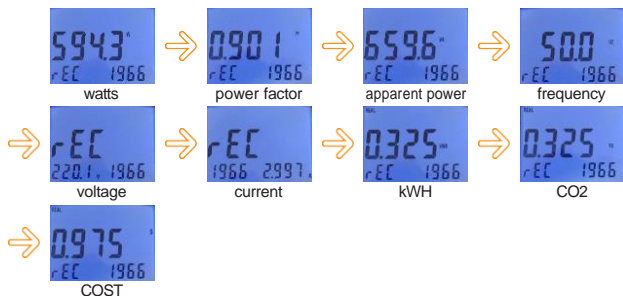
Press the RESET (▲) button or the SET(▼) button to select the record. If press the RESET button or SET button for more than 1S, the number of the record will be added by 10 or deducted by 10.

added by 10   deducted by 10

Pressing the "RESET" button can clear all the data in the memory. Press the "SELECT" button for more than 3 seconds to escape from LOG mode or RE-CALL mode, and will get into the normal mode.

normal mode
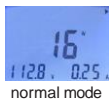
6-2-12. Other:

- LCD Back-light

  Press the "backlight" button to enable the back light function. You can press the "backlight" button again to disable the function.

7. CLEANING & STORAGE

Periodically wipe the case with a damp cloth and detergent. Do not use abrasives or solvents.

8. PC COMMUNICATION METHOD

(a) Power meter is compatible with RS232 communication.
(b) The basic transmission protocol is as follows :
Transmission protocols can be confirmed from a hyper terminal.
- (1) Communication port : connect to a created port in the case of a serial communication port.
- (2) Transmission speed : 9600
- (3) Parity : none
- (4) Stop bit :1
- (5) Flow control : none
- (6) Normal mode :
   When the english capital letter "C" is transmitted from a PC is pressed, data will be consecutively received and "COMM" will be displayed on the product's screen. When the english capital letter "P" is transmitted, the communication will be cancelled.

   N-1108V 00000A 00000W 00000VA PF0000 0599Hz 0000000WH
   N-1108V 00000A 00000W 00000VA PF0000 0599Hz 0000000WH
   N-1108V 00000A 00000W 00000VA PF0000 0599Hz 0000000WH
   ⋮

- (7) Log mode :
   When the english capital letter "L" is transmitted from a PC is pressed, data will be consecutively received and "COMM" will be displayed on the product's screen. When the english capital letter "P" is transmitted, the communication will be cancelled.

   L0000-1126V 00000A 00000W 00000VA PF0000 0600Hz 0000000WH
   L0001-1126V 00000A 00000W 00000VA PF0000 0600Hz 0000000WH
   L0002-1126V 00000A 00000W 00000VA PF0000 0600Hz 0000000WH
   L0003-1126V 00000A 00000W 00000VA PF0000 0600Hz 0000000WH
   ⋮

9. INTERFACE CONNECTION AND OPERATION

(a) This power meter program will set up on your computer automatically.
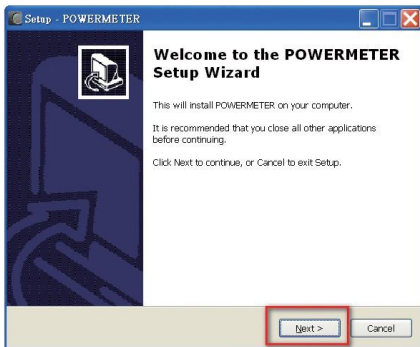
(b) If you want to install a different folder, click Browse, and select another folder.
If it's not necessary, click the "Next" button.
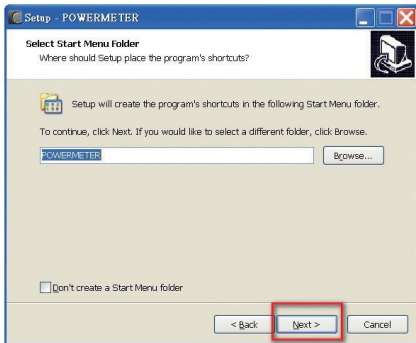
(c) Click the "Next" button.
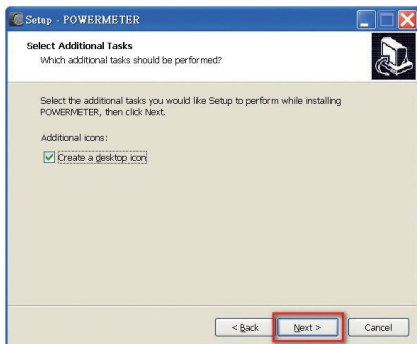
(d) Click the "Next" button.
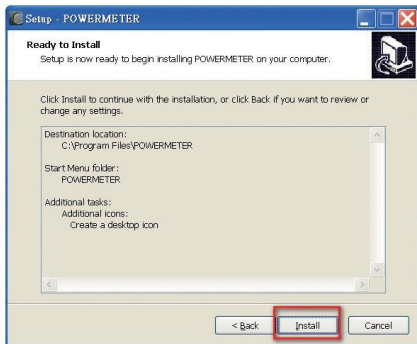
(e) It will show the information of power meter has been successfully installed, then click "Finish" button.

※Install the driver on your personal computer. It's very important to install the driver on your computer. Your computer can not communicate with the Power meter without installing the driver. The driver is also on the USB pen drive. The directory is "E:/USB DRIVER".

10. RS232 PROGRAM

10-1. Initial screen and setting

Click on the POWER METER icon, then a program will be run.

10-2. Data collection and data analysis
10-2-1. Data collection on monitor mode

Click on "set up" and enter the appropriate communication and default settings.

① Click on the "Com Port" and select the RS 232 port number.(select a created port number.)

② Select an appropriate interval for data collection. (Range : 1~60sec.) and Set the time for data collection. The maximum is 24 hour.

③ Set an electric charge per 1 kWh, and a CO_2 emission.

④ File Setting.

⑤ When all setting has done, Press "OK" button.

Select the "Monitor" and "Data Table" and press the "Start" button. If RS 232 link has succeed with POWER METER, then the LCD will show "COMM".

10-2-2. Data Collection on History mode

Select the "History" and "select history test data file on PC disk" and press the "Load Record" button.

10-2-3. Data Collection on Log mode

Click on "tools set up" and enter the appropriate communication and default settings.
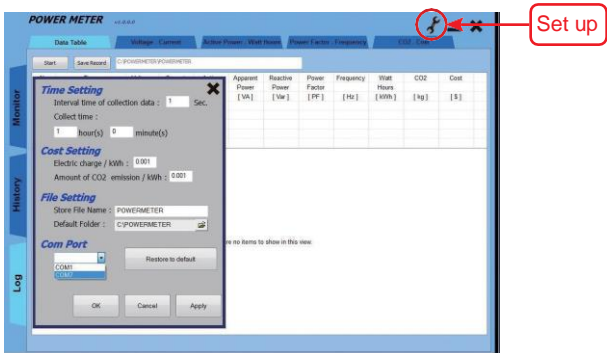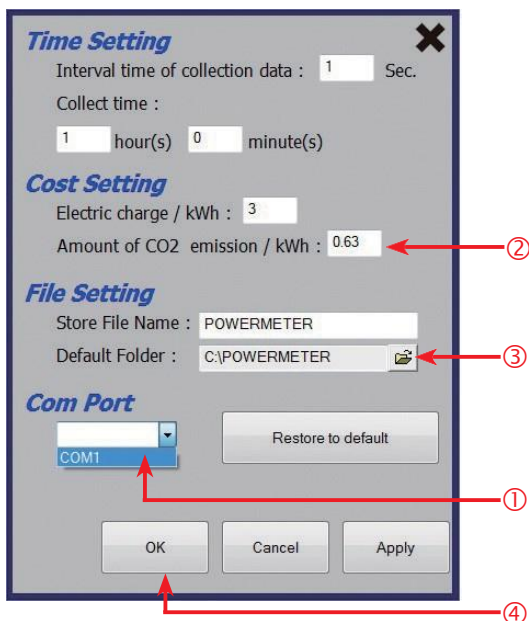
① Click on the "Com Port" and select the RS 232 port number.(select a created port number.)

② Set an electric charge per 1 kWh, and a CO2 emission.

③ File Setting.

④ When all setting has done, Press "OK" button.

POWER METER v3.0.0.0

| | | Data Table | Voltage | Current | Active Power | Watt Hours | Power Factor · Frequency | | CO2 · Cost | |

Start   Save Record   C:\POWERMETER\POWERMETER\

No.	Time	Voltage	Current	Active	Apparent Power	Reactive Power	Power Factor	Frequency	Watt Hours	CO2	Cost
		[V]	[A]	[W]	[VA]	[Var]	[PF]	[Hz]	[kWh]	[kg]	[$]
	Min	225.2	0	0	0	0	0	59.7	0	0	0
	Max	231.2	0	0	0	0	0	60.1	0	0	0
	Average	228.1	0	0	0	0	0	59.9			
	Amount								0	0	0
1	1	229.6	0.00	0	0	0	0.000	60.0	0.000	0	0
2	2	229.1	0.00	0	0	0	0.000	60.0	0.000	0	0
3	3	228.1	0.00	0	0	0	0.000	60.0	0.000	0	0
4	4	226.9	0.00	0	0	0	0.000	59.9	0.000	0	0
5	5	226.1	0.00	0	0	0	0.000	60.0	0.000	0	0
6	6	226.1	0.00	0	0	0	0.000	60.0	0.000	0	0
7	7	226.6	0.00	0	0	0	0.000	60.0	0.000	0	0
8	8	227.4	0.00	0	0	0	0.000	60.0	0.000	0	0
9	9	228.1	0.00	0	0	0	0.000	60.0	0.000	0	0
10	10	228.7	0.00	0	0	0	0.000	60.0	0.000	0	0
11	11	228.7	0.00	0	0	0	0.000	60.0	0.000	0	0
12	12	229.2	0.00	0	0	0	0.000	60.0	0.000	0	0
13	13	229.5	0.00	0	0	0	0.000	60.0	0.000	0	0
14	14	229.6	0.00	0	0	0	0.000	60.0	0.000	0	0
15	15	229.5	0.00	0	0	0	0.000	60.0	0.000	0	0
16	16	229.4	0.00	0	0	0	0.000	60.0	0.000	0	0
17	17	229.3	0.00	0	0	0	0.000	60.0	0.000	0	0
18	18	229.0	0.00	0	0	0	0.000	60.0	0.000	0	0
19	19	228.6	0.00	0	0	0	0.000	60.0	0.000	0	0
20	20	228.5	0.00	0	0	0	0.000	60.0	0.000	0	0

Monitor

History

Log
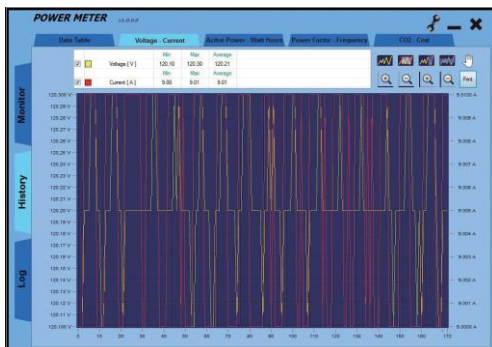
10-3. Data analysis (Monitor/History/Log data analysis)
10-3-1. Test data analysis-voltage and current
When the "Voltage-Current" tab is pressed, the voltage and current analysis and graph will be displayed.

Analysis:

			Min	Max	Average
☑	☐	Voltage [V]	120.10	120.30	120.21
			Min	Max	Average
☑	☐	Current [A]	9.00	9.01	9.01

Graph:

10-3-2. Test data analysis-voltage active power and watt hours mode

When the "Active Power-Watt Hours" tab is pressed, the active power and watt hours analysis and graph will be displayed.

Analysis:

			Min	Max	Average	
☑	🟨	Active Power [W]	974.000	977.000	975.90	
			Real	Hour	Month	Year
☑	🟥	Watt Hours [kWh]	0.099	0.099	71.280	867.240

Graph:
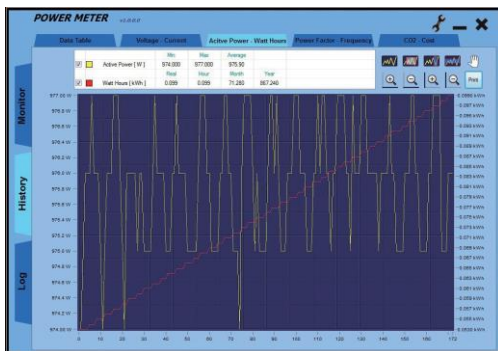
10-3-3. Test data analysis-power factor and frequency mode

When the "Power Factor-Frequency" tab is pressed, the power factor and frequency analysis and graph will be displayed.

Analysis:

			Min	Max	Average
☑	▢	Power Factor [PF]	0.90	0.90	0.90
			Min	Max	Average
☑	▢	Frequency [Hz]	49.80	50.10	49.95

Graph:
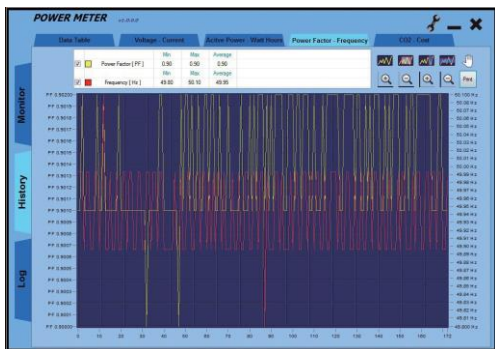
10-3-4. Test data analysis-CO2 and cost

When the "CO2-Cost" tab is pressed, the CO2 and cost analysis and graph will be displayed.

Analysis:

			Real	Hour	Month	Year
☑	🟨	CO_2 [kg]	0.297	0.297	213.840	2601.720
			Real	Hour	Month	Year
☑	🟥	Cost [$]	0.495	0.495	356.400	4336.200

Graph:

-33-
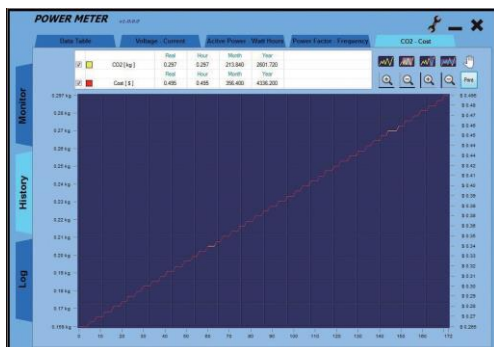
10-4. Print Setting (On History Mode)

Press "Print Setting" button can show table print and graph print setting.

Printing set-up:

14   Contact

If you have any questions, suggestions or technical problems, please do not hesitate to contact us. You will find the relevant contact information at the end of this user manual.

15   Disposal

For the disposal of batteries in the EU, the 2006/66/EC directive of the European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose.

In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company which disposes of the devices in line with law.

For countries outside the EU, batteries and devices should be disposed of in accordance with your local waste regulations.

If you have any questions, please contact PCE Instruments.

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