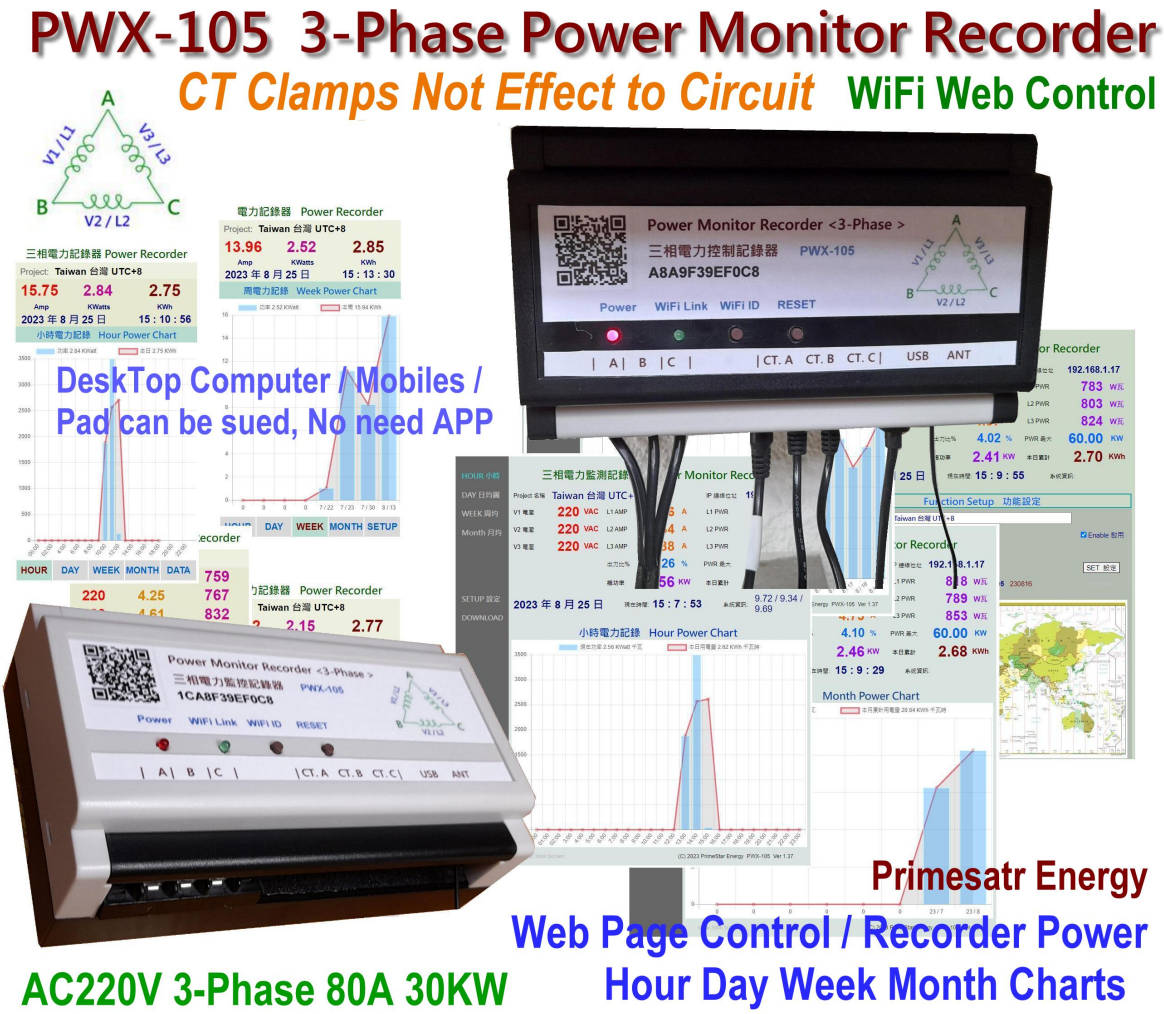
Power Monitor Recorder User Manual

Model: PWX-105 / PWX-105 iPex

AC220V / 3-Phase / 3-Channel CT



Version Updated : 2024 / 2 / 5 Ver: 1.42

Version Updated List:

Updated: 2024 / 2 / 5 **Version:** 1.42 2024 iPex

> Dual operation mode: WiFi Web Page Control + BT Bluetooth Android APP user control interface.

> Extended +20dB WiFi Dual Antenna for 10 -20M WiFi connection.

> RTC Real Time Clock inside, three precise clock inside for more accuracy, device can work stand alone without internet.

When Internet Linked, use web clock auto correction,

When BT Bluetooth work mode, use internal CPU clock, accurate by user APP,

When No Internet / No BT, use low power RTC clock.

> Add 10-Minute data record function.

2024 PWX-105 iPex Dual Mode WiFi Web + Bluetooth APP operation

Dual operation mode select:

WiFi / Web Page Application Mode.

> Normal power-On → Into **WiFi Web application mode.**

Red Power LED -> When power on operation.
Blue WiFi Link LED -> Blink when WiFi communication.

Reset key -> Press for power on reset.
WiiFi ID key -> Press 10-seconds for WiFi ID clear & reset.

BT Bluetooth Android APP mode.

> Keep press WiFi ID key + Click Reset Button → **BT Bluetooth APP mode.**
-> WiFi ID LED will flash for 5-times into Bluetooth mode.

Any time press Reset button -> will return to WiFi Web page mode.

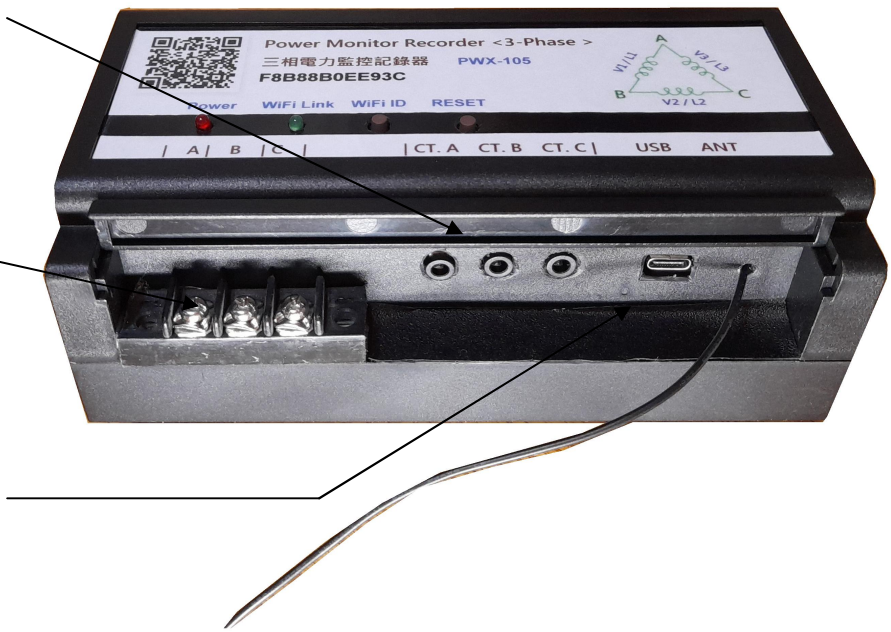
> Recorded Data Files will not effected when reset or change mode,
only today hourly data will effected !

1. Introduction

3-Phase C.T.
Clamp for
L1 / L2 / L3
sockets

A | B | C
Voltage
Detective

USB Power
DC 5V
(100 -280V)



Power LED : Red Power Indicator

WiFi Link : Blue / Green WiFi Indicator

RESET : System Reset Button

WiFi ID : WiFi ID Clear / Reset Button

> **Turn Off the Main Power Line Breaker :** Please make sure the main power line already discounted for electrical operation safety issues.

> **Wire to A | B | C voltage detection :** Connect 3-phase line to A | B | C for AC Voltage detection. (AC Voltage detection or Entry simulation two working mode.)

> **Clip CT Clamps to power line :** Connect CT clamps to each 3-phase AC power line, and put into panel CT | A | B | C | sockets for L1 / L2 / L3 current detection.

> **Put on USB power :** When AC power back, Red LED will On for system ready work, and green WiFi LED flash for data communication working.

> **Use Pad / Cell phone to setup PWX-105 for home WiFi SSID / Passwords :**

First time use need to input the home WiFi SSID / Password for PWX-105 then could acceptable for the WiFi data communications.

> **Any time may scan QR Code on top of PWX-105 quickly link web pages :** When Home WiFi SSID setup completed, any time user may scan the on-top QR Code or make a web shirt-cut path to visit the PWX-105 web pages.

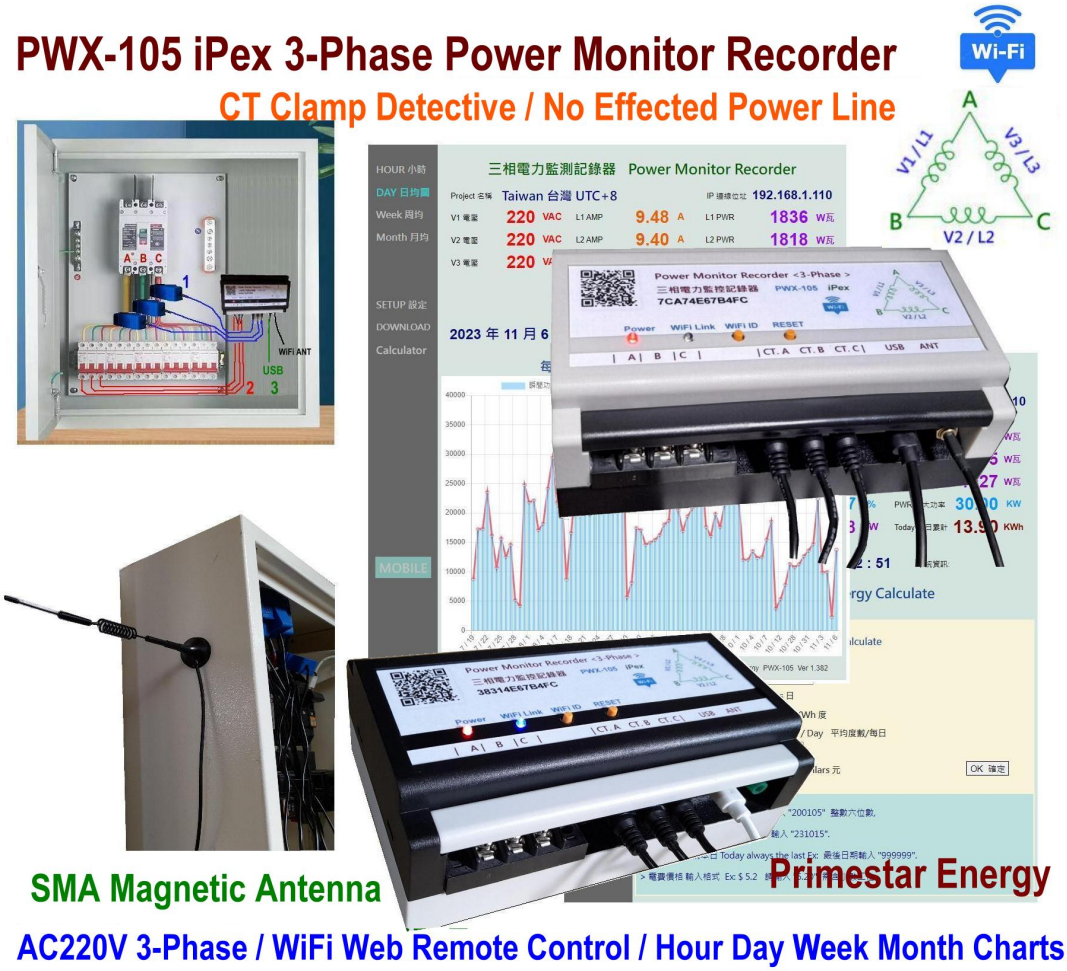
The WiFi IP address example like_ 192.168.1.25 was provided from home WiFi router when completed WiFi SSID setup, to accept the PWX-105 WiFi communications.

> **Voltage Detection & Entry simulation mode :** Product has two work mode_

Voltage Detection_ Connect wire to A | B | C voltage detection connector, System Will read voltage from connector, And Setup page not enabled device voltage simulation, then it will displayed V1 / V2 / V3 for line detective voltage.
(Work for AC220V power system)

Enter Simulation Voltage_ Not connect the A | B | C connector, User enter The line voltage on Setup page: Device Voltage like “220” for AC220V, and enable it. The V1 / V2 / V3 will use user input voltage data.
(Work for AC 220V / 330V / 380V)

(Notice : When work for AC 330V or up voltage, Don’t connect AC line to voltage connector, system working voltage is up to AC280V ! CT clamps not effected !)

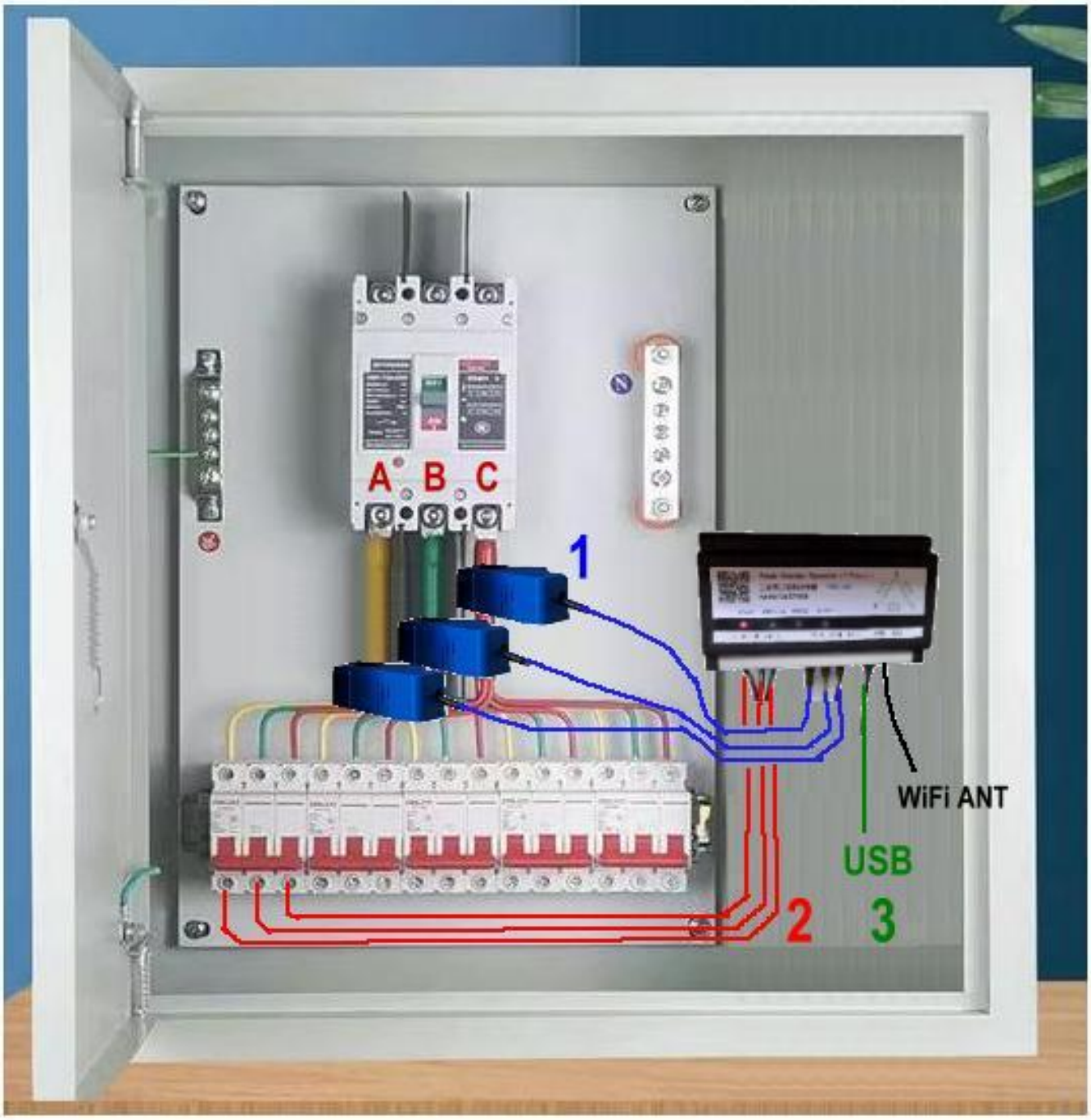


PWX-105 iPex WiFi Upgrade Version_

> **Dual Antenna :** The PWX-105 iPex supports dual antenna, can be WiFi link by build-in antenna and also supports external Gain Antennas by SMA port connect.

> **Ext. Gain Antenna :** Through the external high gain antenna, PWX-105 iPex will extend the WiFi link range for signal amplification.

2. Installation



> **Turn Off the Main Power Line Breaker :** Please make sure the main power line already discounted for electrical operation safety issues.

> **Install PWX-105 position :** Install PWX-105 to specified position on power box or stable position which have WiFi signal for remote controls.

1. **Plug CT clamps on 3-phase :** Put the CT clamp on each 3-phase lines and plug to CT A | B | C sockets, as bule line <1> indicated, then start detective power activity. The 3 items of CT clamps will monitor L1 / L2 / L3 3-phase line power consumption records.

2. **Voltage Detection :** Wiring of 3-phase AC line to A | B | C voltage detector connector as <2> Red lines, to read the line voltage data.
   Suitable for AC220V system only, not acceptable for AC330V or up voltage.

   (Notice: PWX-105 voltage maximum range is AC280V, When user application to AC330Vor up voltage system, The USB power source should drop down voltage below AC280V, and the voltage detector only work for AC220V !)

3. **Put on USB power :** Put USB adaptor for the power of PWX-105.
   (The USB Adaptor only work for AC100V – AC250V, if user work in AC330Vor up voltage, it need drop down voltage for USB.)

> **WiFi SMA External Antenna :** The PWX-105 has dual antenna design, built-in WiFi antenna will work all time, but when user application on weak signal area, It's recommend the PWX-105 iPex model with external extended WiFi antenna To improve WiFi signal for better data communication.

> **Installation complete, Turn-on NFB AC power :** When the AC power back, the power red LED will go-on, and the WiFi comm. Green LED flash, for WiFi data linking, The PWX-105 ready for work now !

Next step for WiFi SSID / password setting.

3. First time WiFi Setting

> **Clear the old WiFi setup :** User may clear the previous WiFi setting data by press the WiFi ID button for 10 seconds until the WiFi LED On then return to original status.

> **Log-in the PWX-105 WiFi hot spot :** Turn on the WiFi hot spot search function, search the PWX-105 hot spot entrance like this …

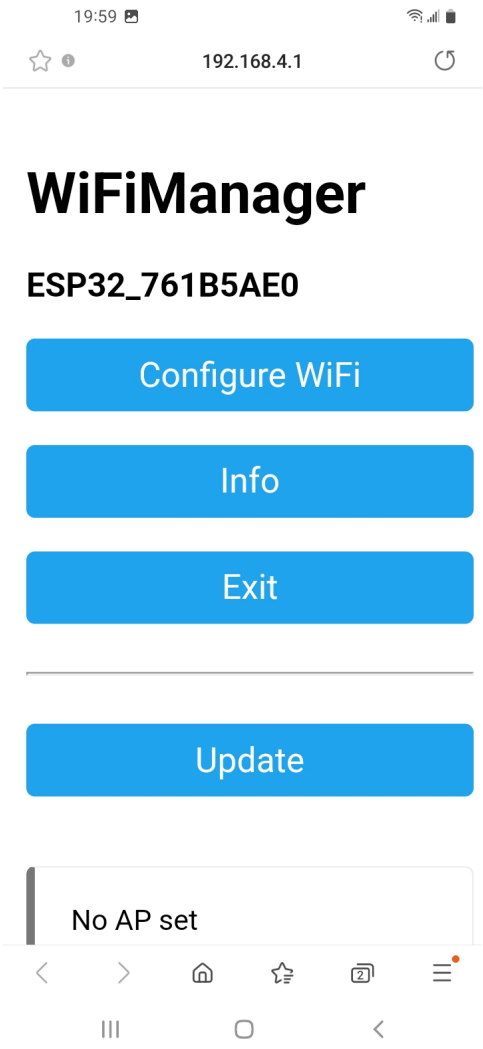
> "ESP32__XXXXX" The head ESP32 WiFi hot spot is the device chip ID and add with your machine code, please select it for enter WiFi configuration.

> System will show there is no internet service but it is ok, we just only use it to enter your home WiFi SSID & Password only needed.

> Scan the top QR-Code machine ID for WiFi configuration_

> Scan the top QR Code of machine ID, use browser to open web page for WiiFi Manager and select WiFi configuration.

> Or user may use browser and type_ 192.168.4.1 for into WiFi Manager page by manual operate.

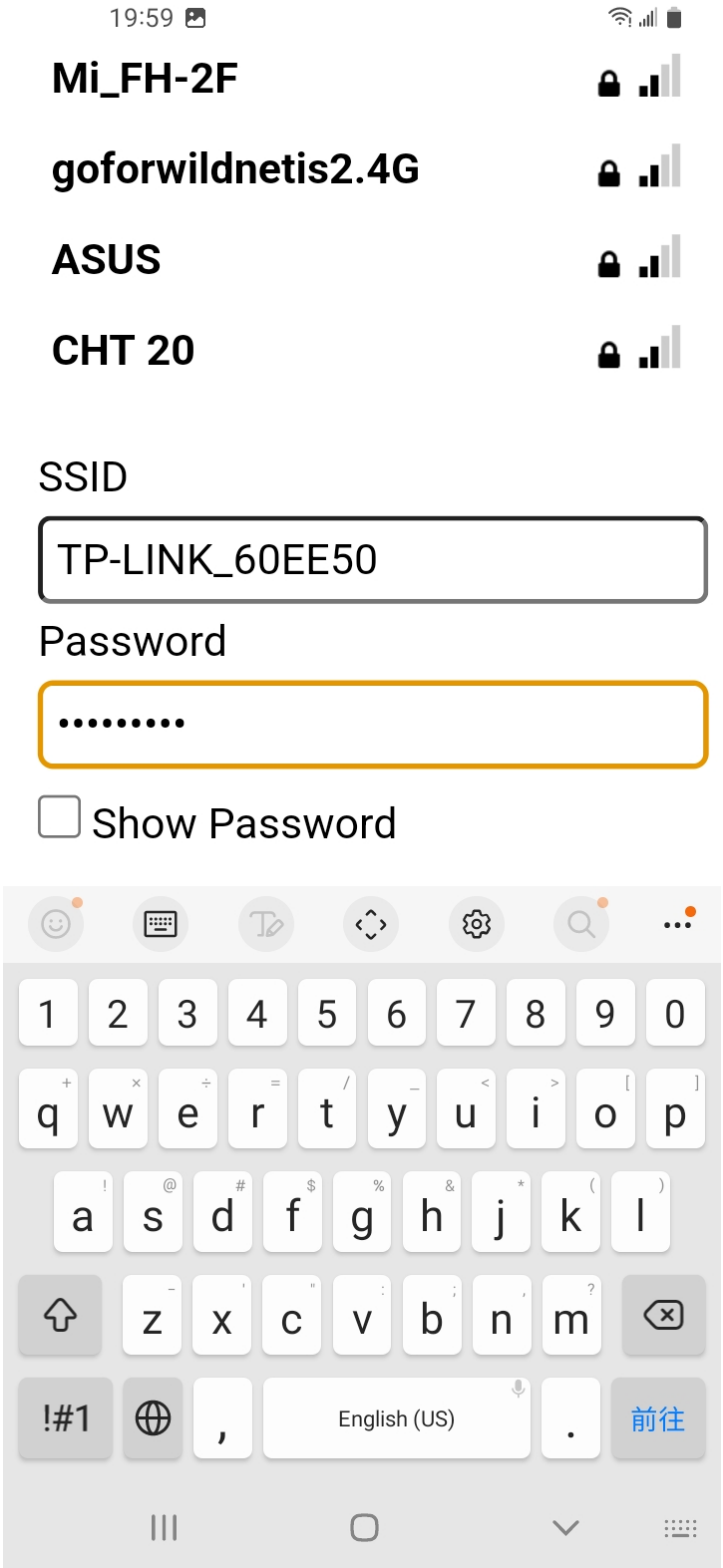


> NOTICES:

Now procedures only available when user connected the ESP32 hot-spot complete.

If it ‘s not showed, please back previously step to choice the ESP32_xxx of WiFi service again to complete web setting.

> Enter the ESP32 WiFi Manager and select <Configure WiFi > for PWX-105 to home WiFi router connect setting.



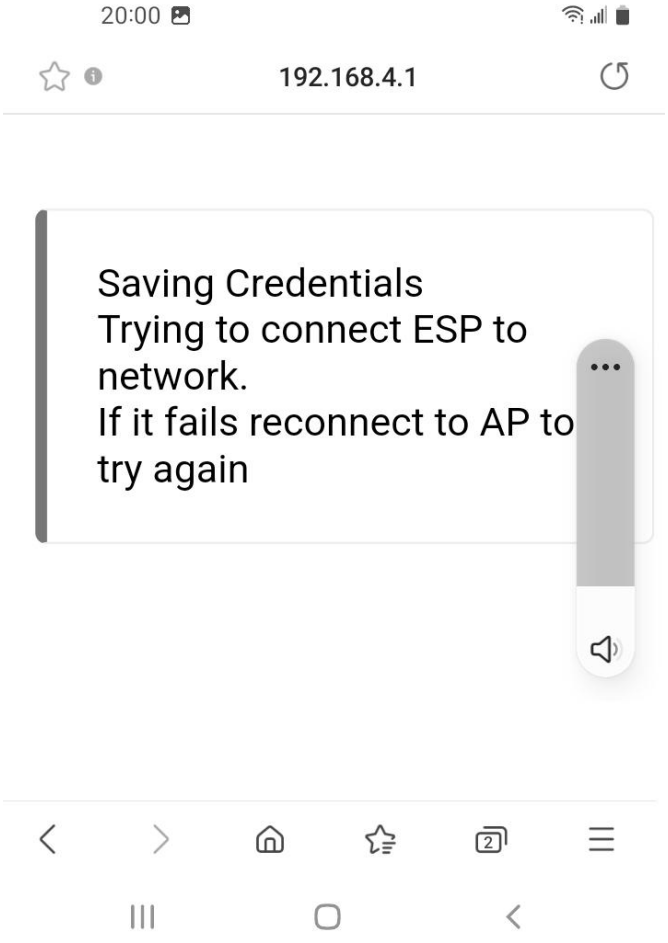
> Select your home WiFi SSID for PWX-105 to connect and enter the password then SAVED.

> **NOTICES:**

Now we selected WiFi hot spot that must be the same as later which user want to enter the PWX-105 web control functions.

If not the same WiFi SSID router that may cause fire wall blocked and unable to connect.

> The WiFi setup complete OK !



> Shown as this means WiFi Configure completed, when next time scan QR code it will goto the web page directly.

> When the WiFi configuration not success, or user and PWX-105 not in the same WiFi hot spot, it may cause miss-connection and unable to reach the web pages service.

> When too many WiFi hot-spot at home, be sure that user operation computer with PWX-105 in the same WiFi SSID router to make sure the web connection available all time.

> Please repeat the upper procedure for complete the WiFi SSID & Password setting.

> Again scan top QR Code for enter PWX-105's web function pages.

> When WiFi setting complete, after scan QR code it will show the connected IP address which get from home WiFi router, and into web page automatically when user opened browser.

> OK ! Next for web function pages !

> WiFi Setup completed !

Congratulations, when you success enter the web control page of PWX-105, that means system had already work normally now.

> Any time user just scan the QR code then into the web page directly like this.

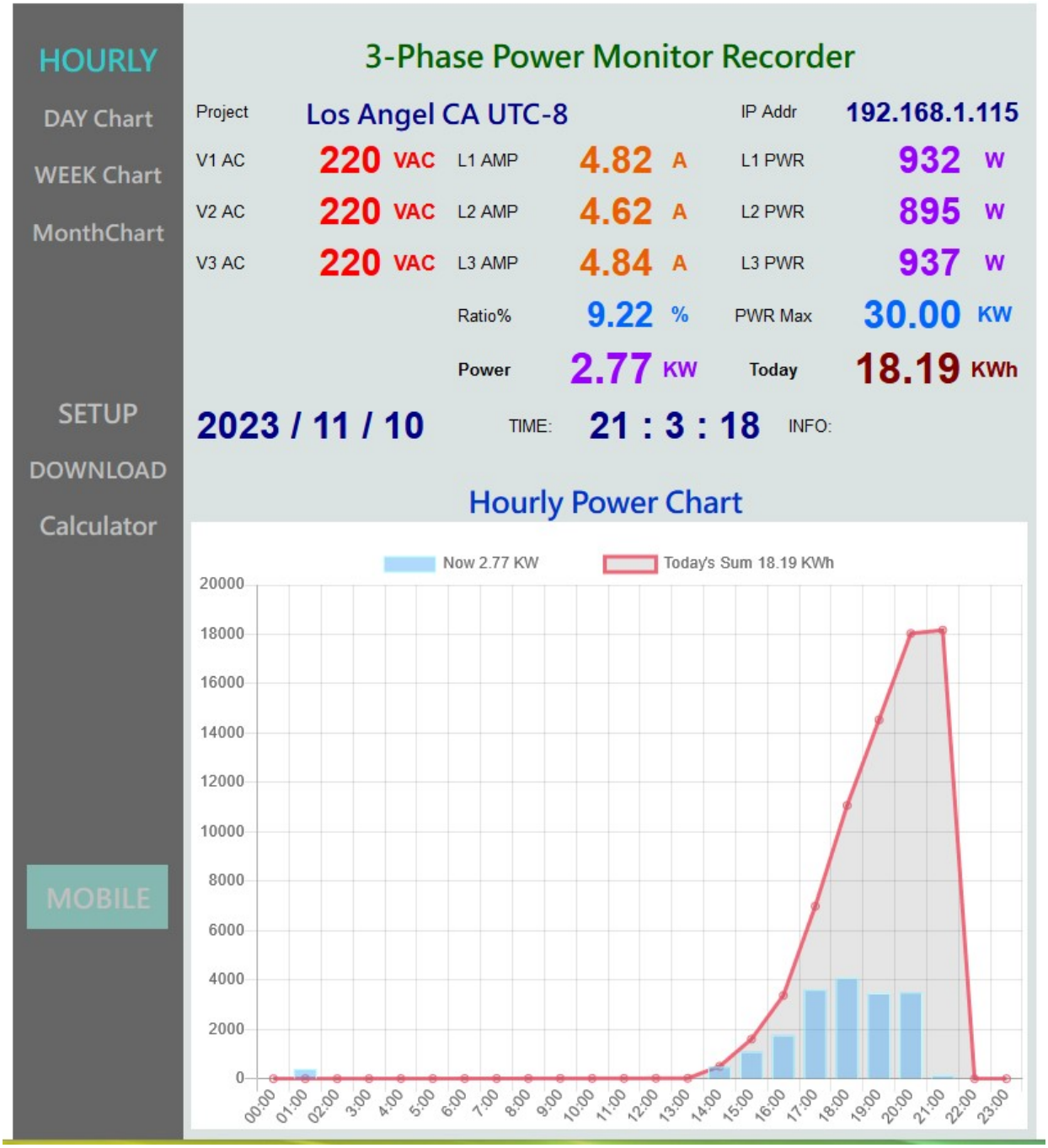
Or user may save the web IP address which shows on the page_ 192.168.x.x as short-cut, then next time can into web page quickly.

> The IP address like_ 192.168.1.30 is the web address which get from users home WiFi router, so you may save the address as short-cut for directly open this address into the PWX-105.

> WiFi Configuration completed OK !

4. Web Page Functions

< HOME, HOUR, DAY, WEEK, MONTH chart pages >



> HOME : Hourly Power Chart Displays today's hourly power consumption lists chart, Blue is Power Watt, Red is Power Sum in Watts / Hourh.

Left function : HOUR Chart Today / Hourly Power Chart

DAY Chart Daily Power Chart

WEEK Chart Weekly Power Chart

Month Chart Monthly Power Chart

SETUP User information setup

DOWNLOAD Charts files Upload / Download center

MOBILE Cell phone mobile pages

Real-time data: Project name: User application name.

IP Address **192.168.1.14** is the web connecting address.

Voltage V1 / V2 / V3 User's 3-phase AC power line voltage, default is 220V.

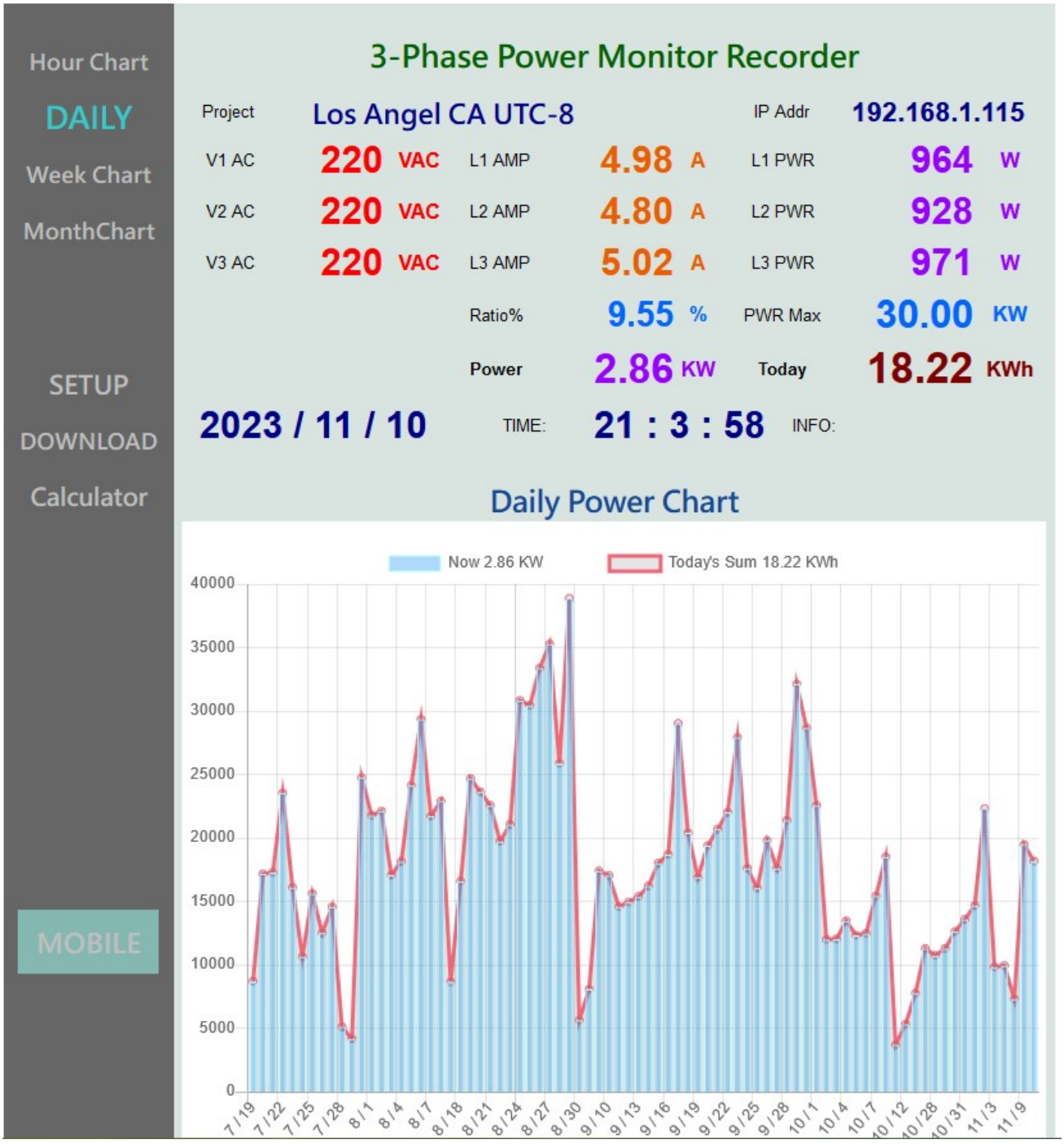
AMP L1 / L2 / L3 Current power of AC L1 / L2 / L3 line ampere values.

PWR Max. Maximum power device value, default is 30KWh.

Power Current measured power consumption of TTL AC Watts.

Ratio % Now power / Device maximum ration%.

Today Today's power consumption summary in KWh.



> Daily / Weekly power recorded charts,

Hour Chart

DAY Chart

WEEKLY

MonthChart

SETUP

DOWNLOAD

Calculator

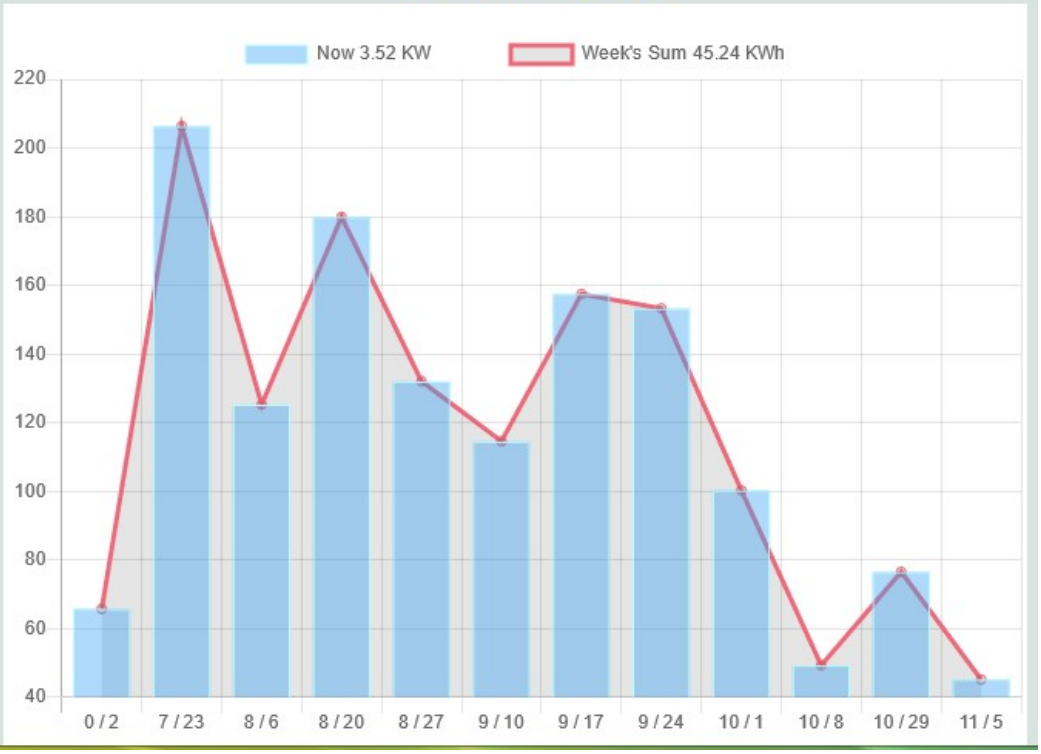
MOBILE

3-Phase Power Monitor Recorder

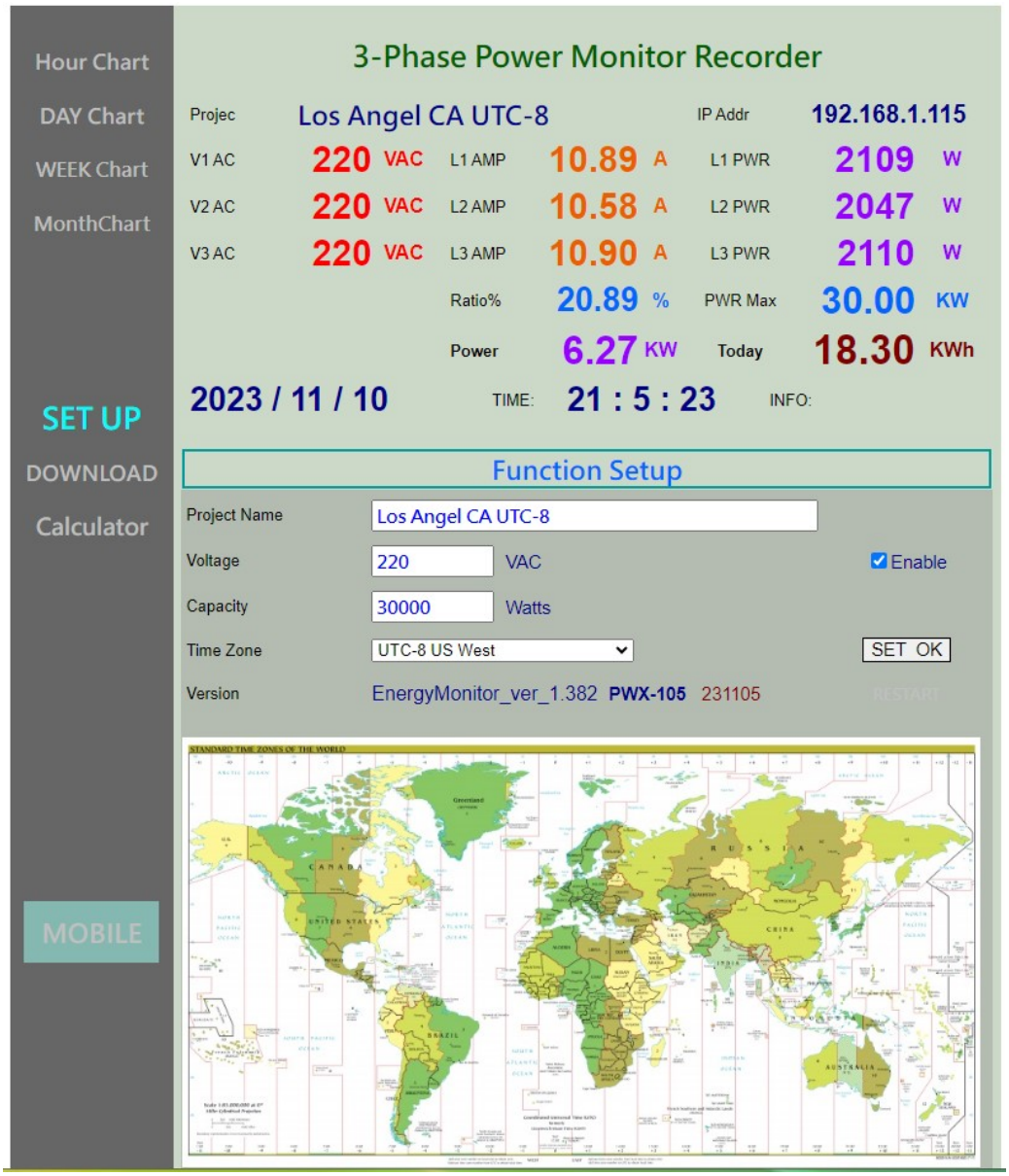
Project	Los Angel CA UTC-8			IP Addr	192.168.1.115
V1 AC	220 VAC	L1 AMP	6.15 A	L1 PWR	1190 W
V2 AC	220 VAC	L2 AMP	5.87 A	L2 PWR	1137 W
V3 AC	220 VAC	L3 AMP	6.17 A	L3 PWR	1193 W
		Riatio%	11.74 %	PWR Max	30.00 KW
		Power	3.52 KW	Today	18.25 KWh

2023 / 11 / 10 TIME: 21 : 4 : 26 INFO:

Week Power Chart



< Setup page >



> **SETUP page :** For Modify / Save user's information.

Project — Enter the user's application name.

(User's Voltage Simulation Mode)

Voltage — Enter the power line AC voltage, Default is "220".

Enable — To enable the user voltage simulation mode.

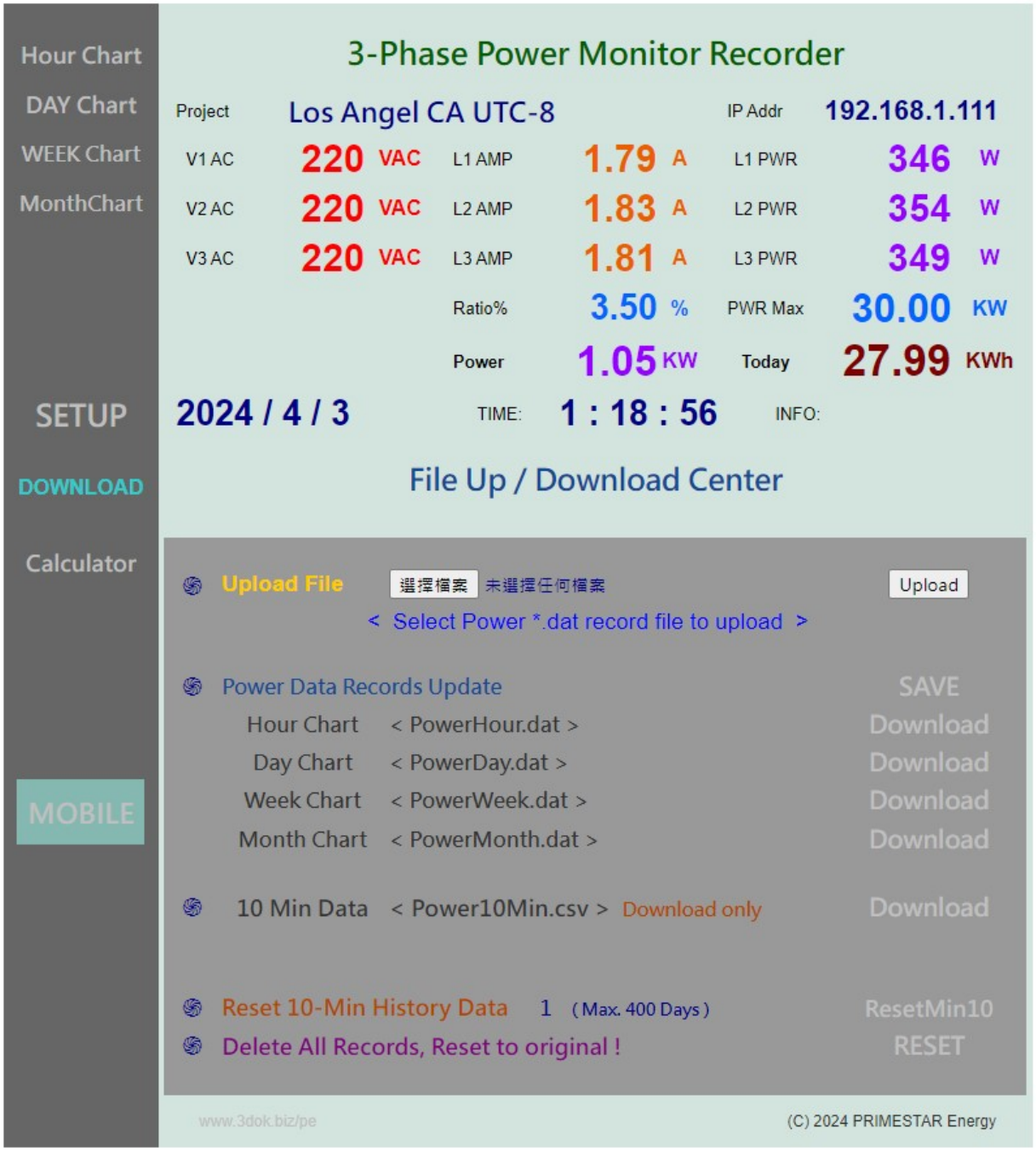
When not connect A, B, C Line Voltage Detection.

Capacity Enter the maximum output capacity. Default is “30000” for 30KW.

Time Zone Setting the user’s home time zone, for auto time correction.

> SET OK Setup completed and Save user’s data !

< Download page >



> **Upload / Download page :** Hour / Day / Week / Month charts file server.

Select for Upload Upload files from user's computer.

Savet Save all real time data into flash memory.

Download Power Data Records Update all files to newest before download.

Hourly data < PowerHour.dat >	Hour / Today's hourly chart		File Download
Dialy data < PowerDay.dat >	Day	Daily	File Download
Weekly data < PowerWeek.dat >	Week	Weekly's	File Download
Monthly data < PowerMonth.dat >	Month	Monthly's	File Download
10-Min data < Power10Min.csv >	10-Minutes	Continued	File Download

(New "Power10Min.csv" file can work on Excel and can modify for computation.)

Reset 10-Min file When first time operation, user need reset the 10-Min data into CSV file format.

Delete All Records, Reset ! Delete all data, reset to original status.

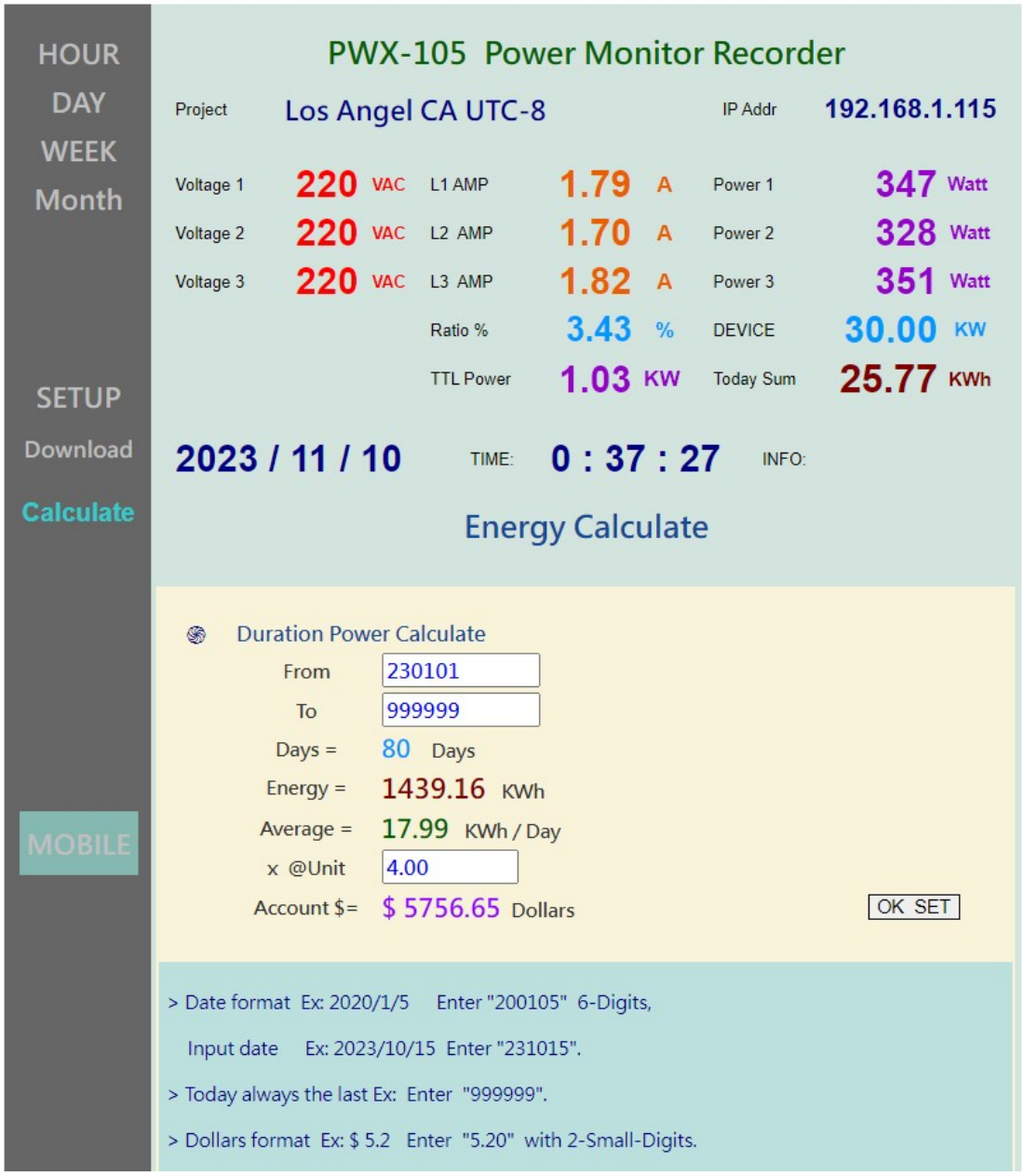
> New "Power10-Min.CSV" file (Download only) : Can be work on Excel in Text file format for example_ (Maximum storage for 400 days)

User may download it any time and reset it to format and record again.

Date format: YYMMDD (Year "2024" for tail "24", Data in Wh Watt / hour.)

Date	00:00	00:10	00:20	00:30	00:40	00:50	01:00
231231	23652.6	277.1	525.2	634.2	722.3	792.1	862.5
240101	24542.5	55.5	142.9	230	323.3	416.5	497.2
240102	17583.6	80.2	157.8	250.8	333.7	414.5	495.4
240103	22086.2	330.2	451.8	543.9	616.8	662.9	707.9
240104	20312	48.4	97.9	154.9	201.6	248.4	295.3
240105	20118.6	81.7	170.4	253.7	309.1	366.4	421.7
240106	26212.2	86.1	178.8	250.5	307.2	363.7	420.2
240107	23792.3	254.6	555	774.2	993.4	1219.2	1444.3
240108	24353.4	214.9	435.2	647.6	861.4	1075.6	1288.2
240109	22255.3	19.5	40	60.5	81	101.5	122.8
240110	23267.6	155.2	246.7	321.4	374.6	427.7	481.2
240111	19633.5	236.2	304	368.6	436.5	522.1	571.5
240112	22389.5	58.1	119.7	178.2	231.8	287	335.4

< Energy Calculate page >



> **Energy Calculate :** Statistics of power and bill calculation for a period.

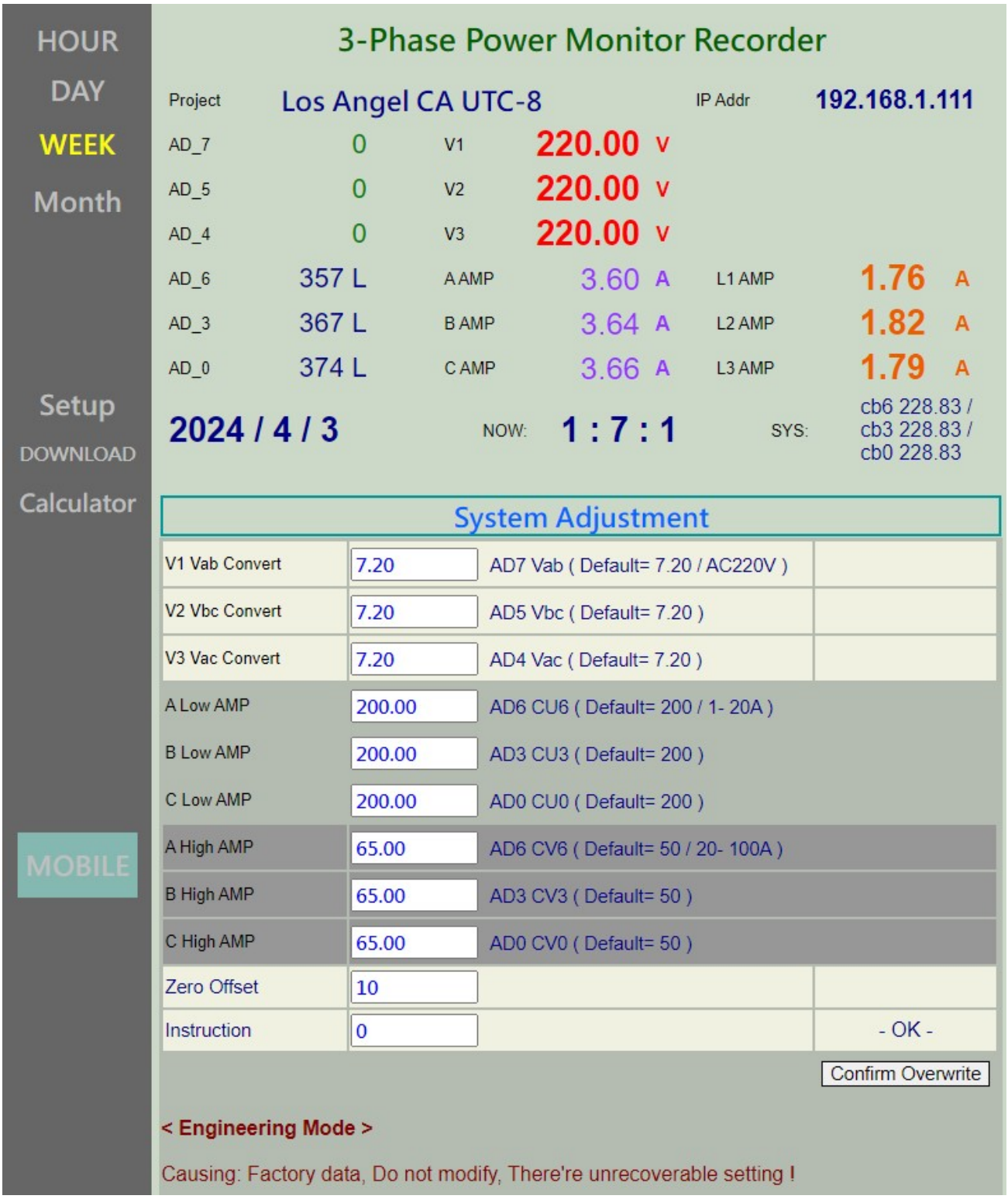
From / To : Set duration date from – to for calculation.

230105 Date Format : Date ex. "2023/5/9" Enter "230509" for 6-Digits.

$ 3.45 Unit price Format : Unit price Ex. "$ 4.1" Enter "4.10" for 2-small digits.

OK SET Start calculate : Input complete, press OK SET , start calculation.

< System Adjustment page > Engineering mode



> **Engineering mode :** Click Setup page -> Left down link "System" Icon into

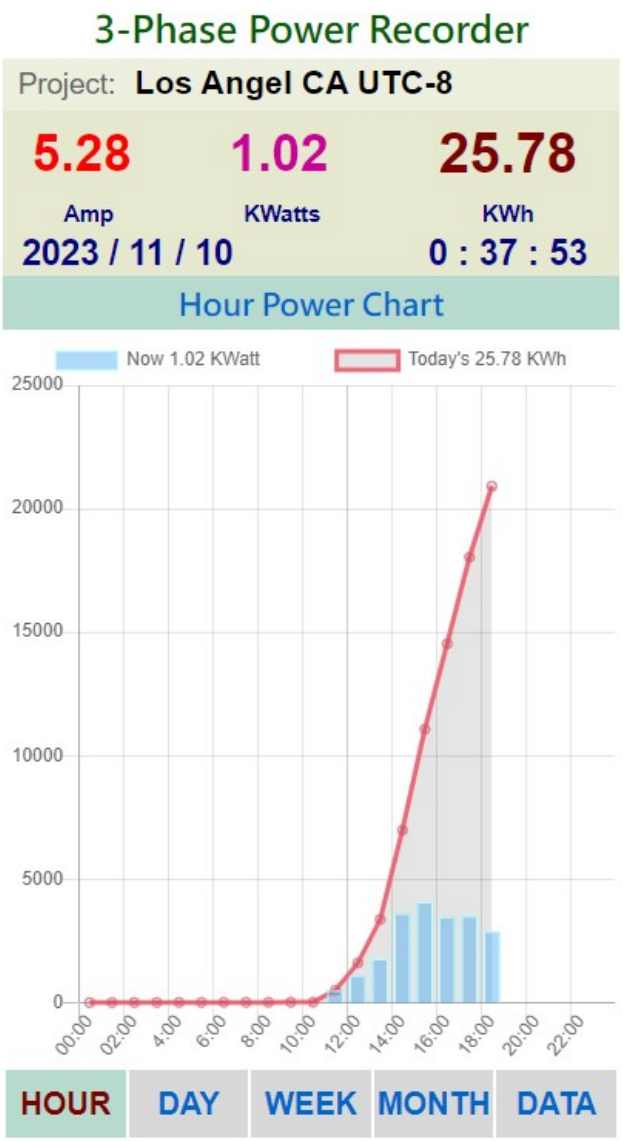
These Engineering Adjustment Page.

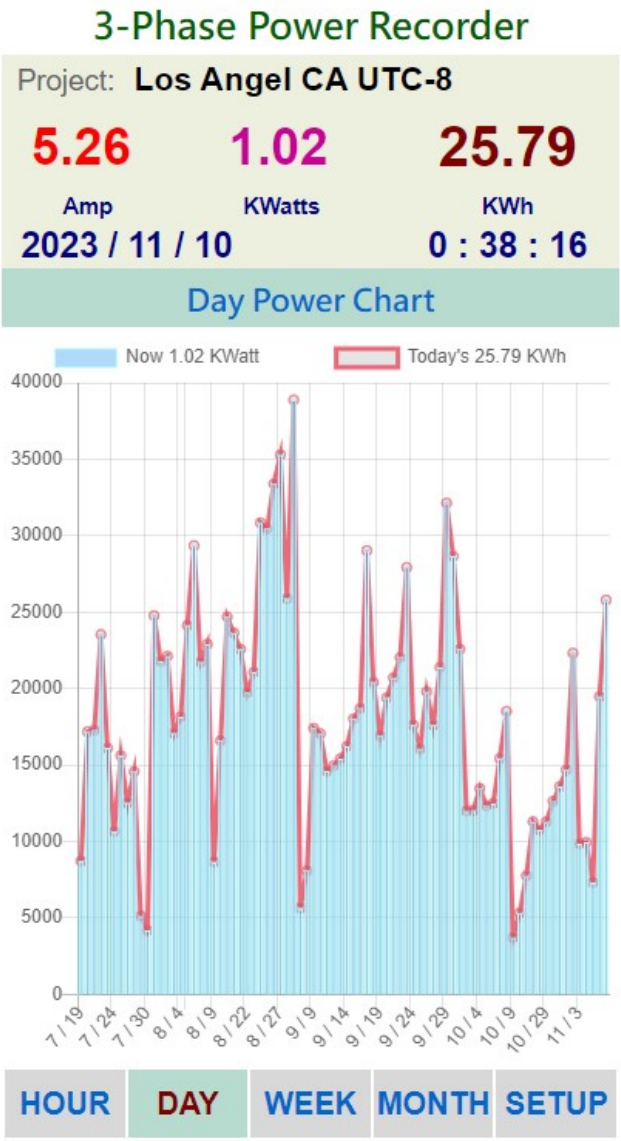
> **V1, V2, V3 AC Voltage Detective Adjustment :** To adjustment V1, V2, V3 volume.

> **Ampere Measurement Adjustment :** To adjustment A, B, C CT Correction.

There's two scale for low / high measurement scale,
Low scale for 1 – 20A, and High scale for 20-100A amperes measurement.

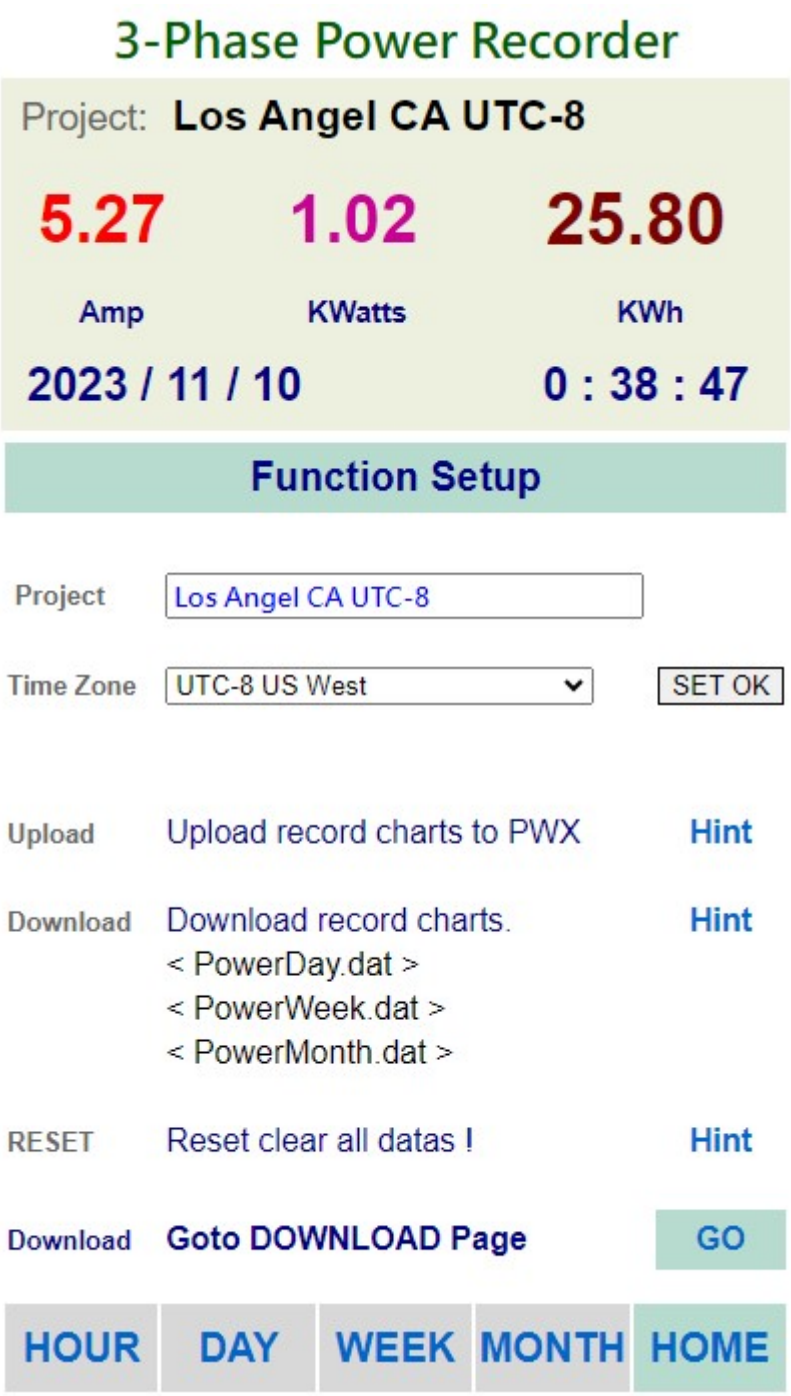
< MOBILE pages > for mobile phone small size pages





> **MOBILE pages :** Hourly / Daily / Week / Month data graphs, real-time information.

> Web Page Lagged : When the WiFi signal weak or blocked, the web page will display delay or slowly, user may try F5 or reload to refresh page again for re-connection.



> **MOBILE Setup Page :** Helps user setting data via mobile phone.

5. BT BlueTooth APP application Mode

> When application place without WiFi signal support, user may use BT Bluetooth communication for Android APP operation mode.

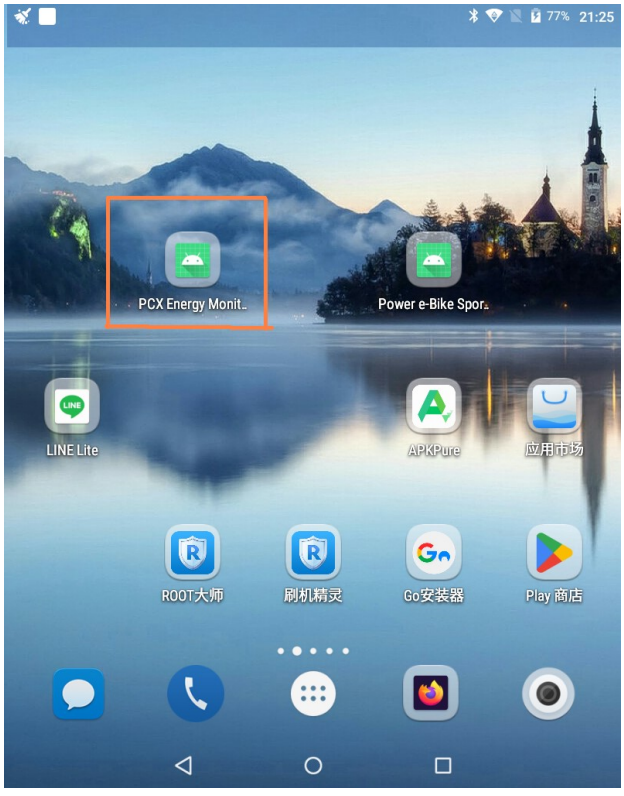
> Install the Android APP “PCX Energy Monitor” download from our website_ https://3dok.biz/download/PWX_COMM6.apk

(The APP is work safety but if user worry it, we suggest install on a secondary Note pad or no-important old cell phone when get warning !)

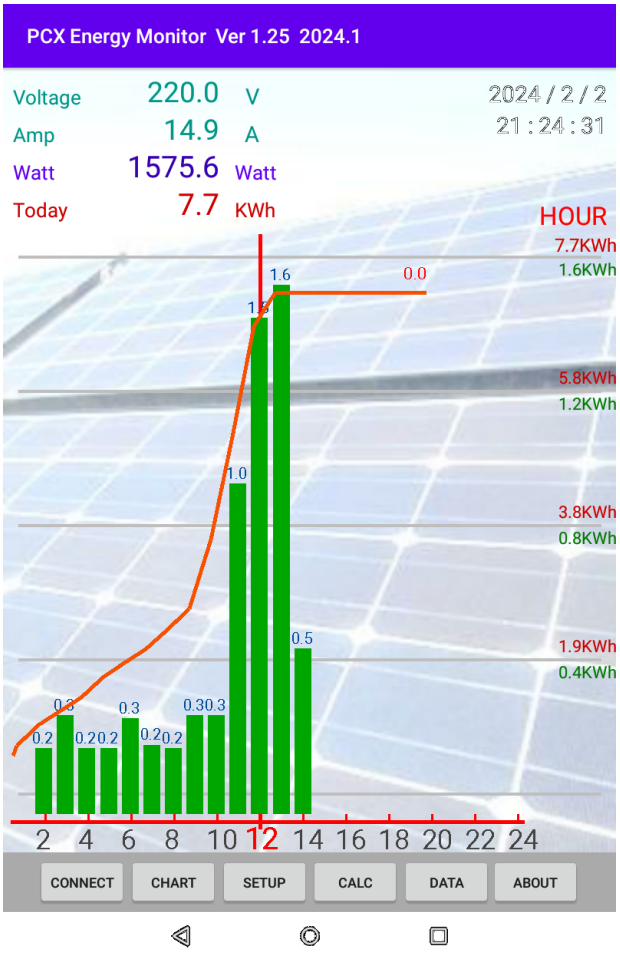
> **BT Bluetooth Mode:** Keep press key “WiFi ID” and click RESET button → Restart into BT Bluetooth APP mode → Until WiFi Signal LED flash for 5-times OK !

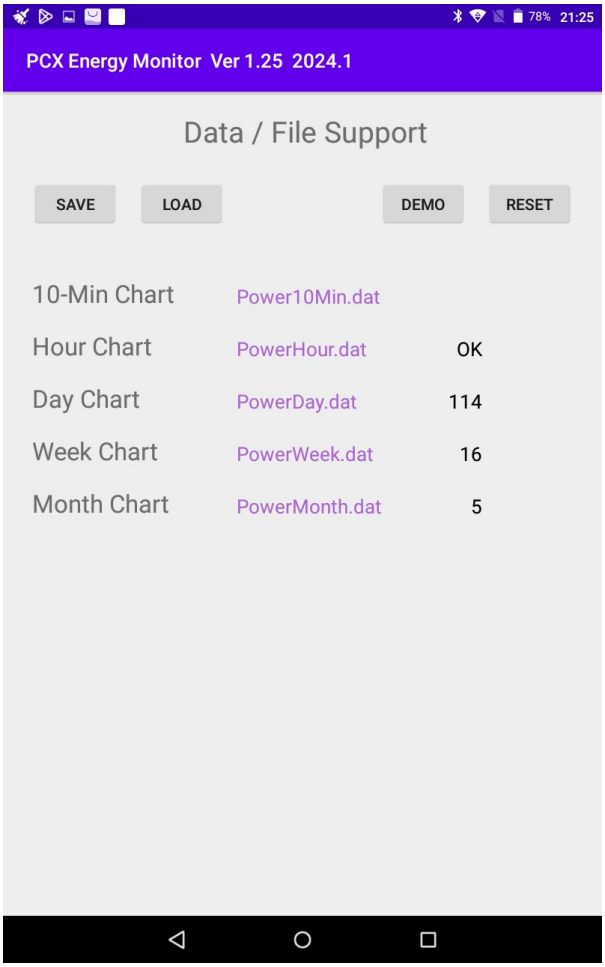
> **WiFi Web Service Mode:** Any time single click the RESET button, it will Restart & return to WiFi Web Page Mode.

> To install the Android APP “PCX Energy Monitor” download from our website_



> APP install OK ! Open the APP “PCX Energy Monitor”.





> Press “**DATA**” for file Save, Load, Demo and Reset_

SAVE : For power monitor data which link form monitor and save into memory.

LOAD : Read file form memory when last time saved.

DEMO : Demo file shows how the monitor work.

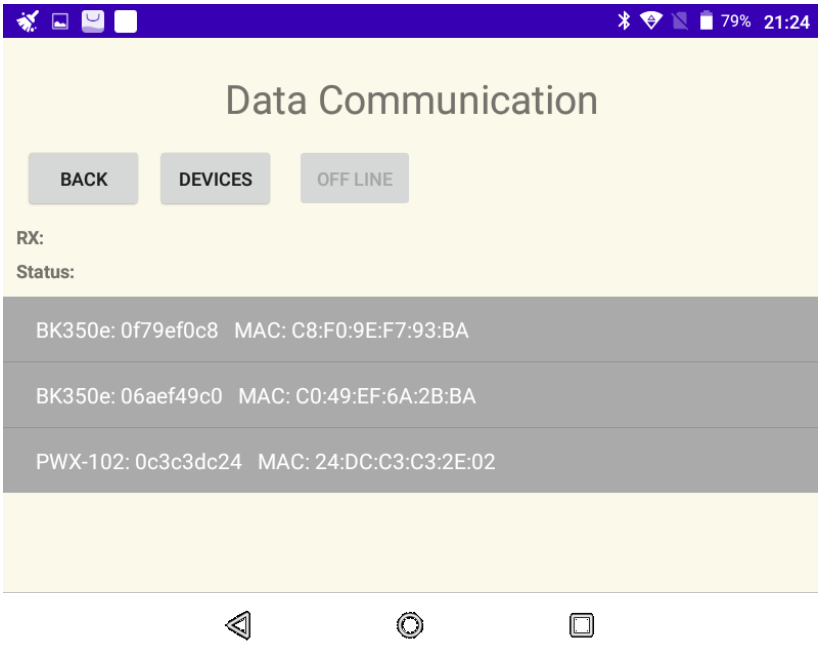
RESET : Reset and clear the data files on cell phone / note pad memory.

> **Setup BT Bluetooth communication**: When first time use need setting Bluetooth for pair up before connect :

> Goto Cell Phone, Note Pad BlueTooth Setup function, and scan for available device, The Power Monitor is PWX-1xx model name and find it to auto pair-up, If android auto pair-up fail, try manual pair of PN code “1234”.

> If some difficult or pair too long than 1 minute, just turn off BT, and Turn-On again, clear all pairs and try to pair-up again.

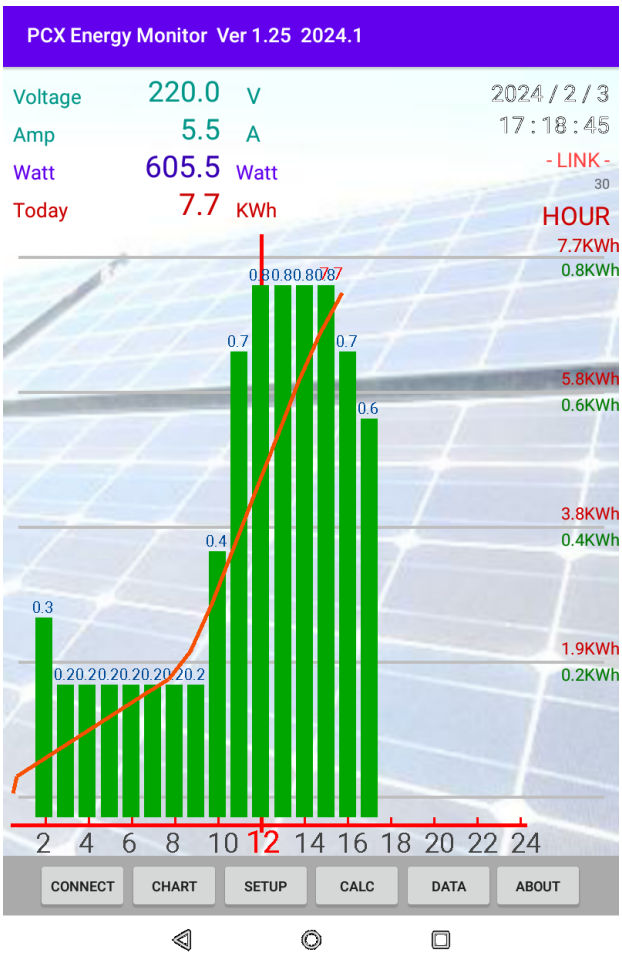
> APP install OK ! Open the APP “PCX Energy Monitor”.

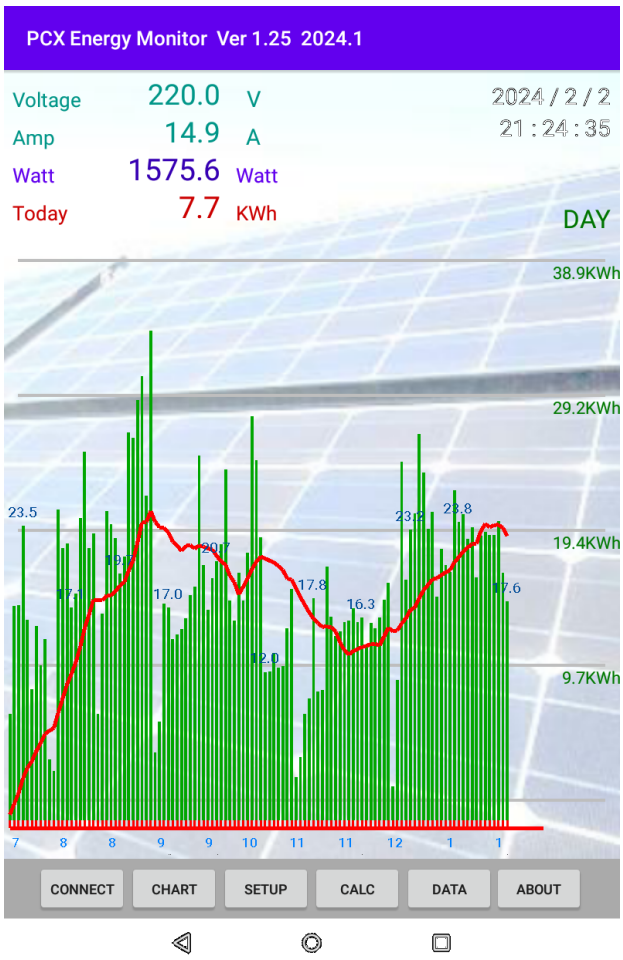


> After Bluetooth pair complete, press “Connect” button goto Data Comm page, press ”Device” to find your BT Bluetooth which already paired to connect to.

> for seconds later, when Status shows “Connect xxxx … OK !” that connect device OK! Let back to main page.

> **Connected On-Line:** When it's connected, the -LINK- On-Line will keep flash and data keep refreshing..

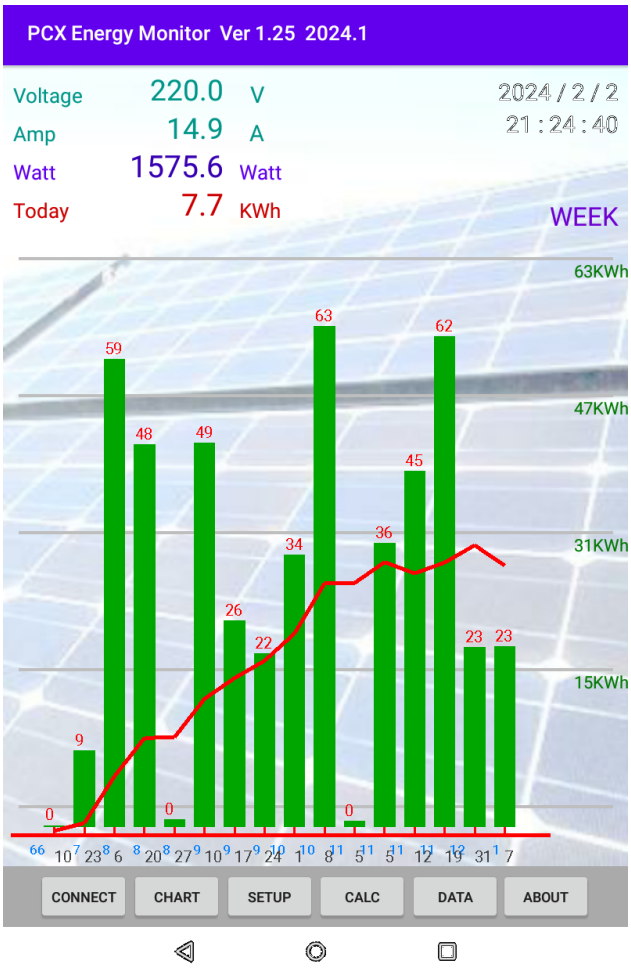


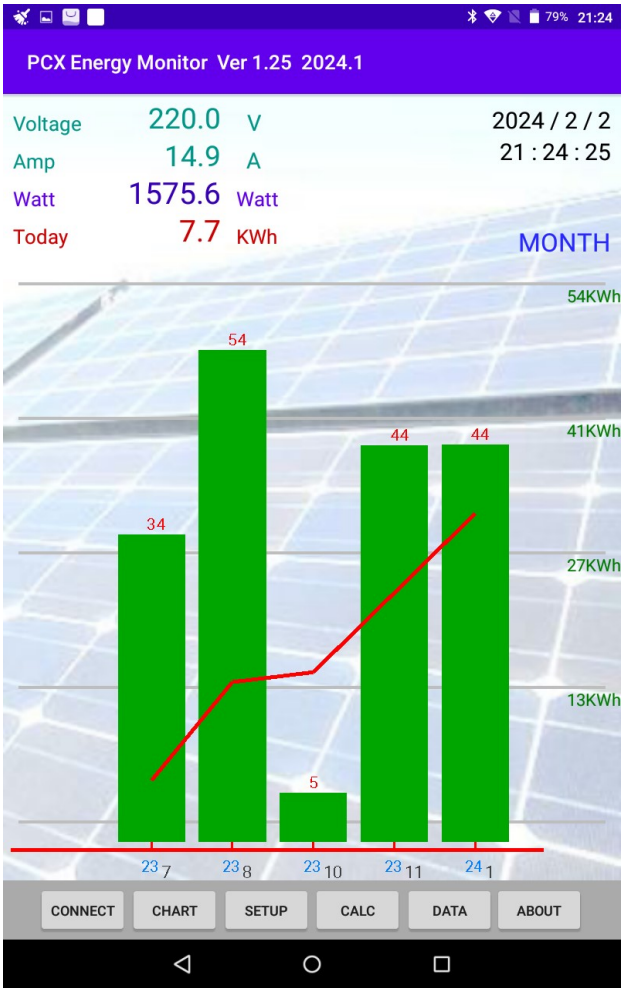


> Press **"CHART"** button to switch data charts of Hours / Days / Weeks / Months select.

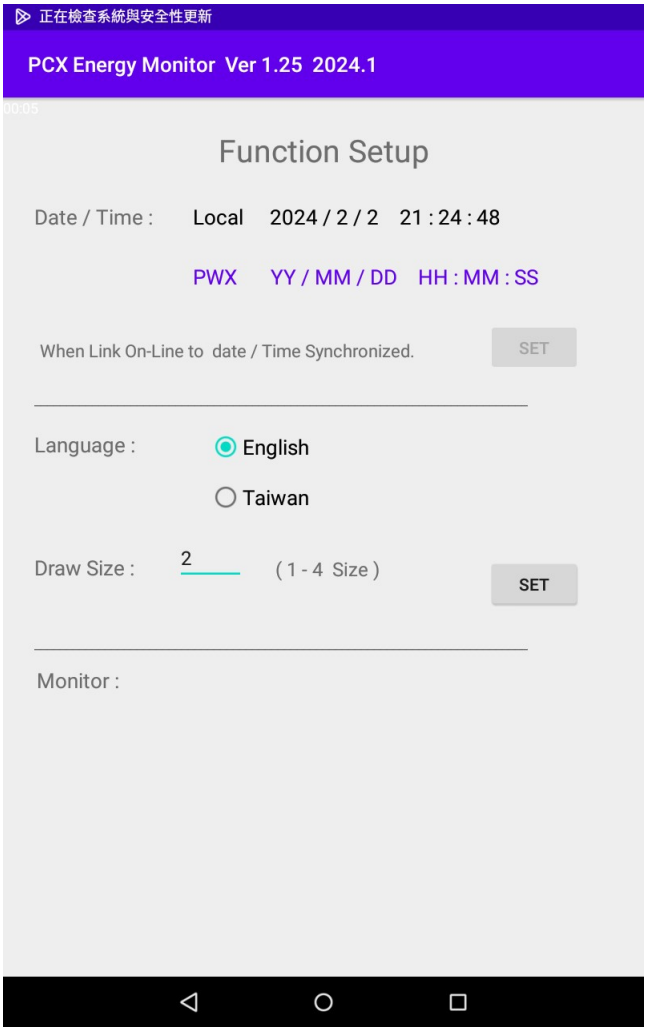
> When data connected On-Line, data charts will auto download from monitor after seconds, but when off-line it will show the saved charts from memory last time saved.

> **Week & Month Data Charts** for reference.





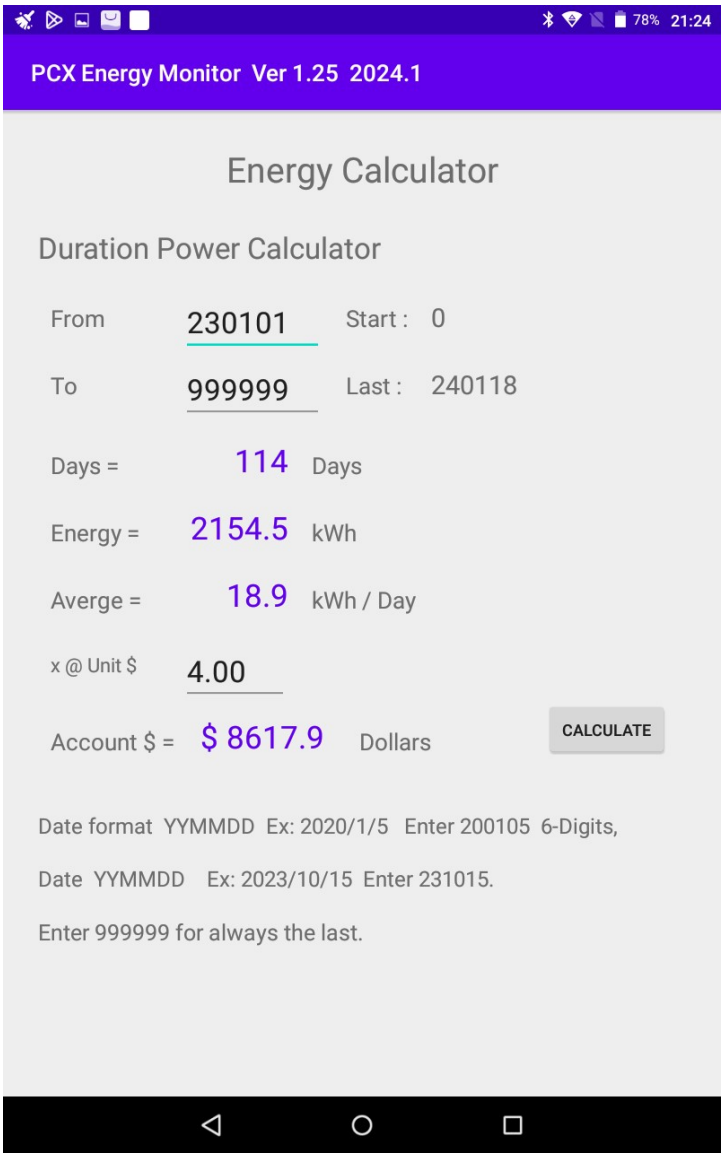
> **SETUP :** For Data / Time & Language setup.



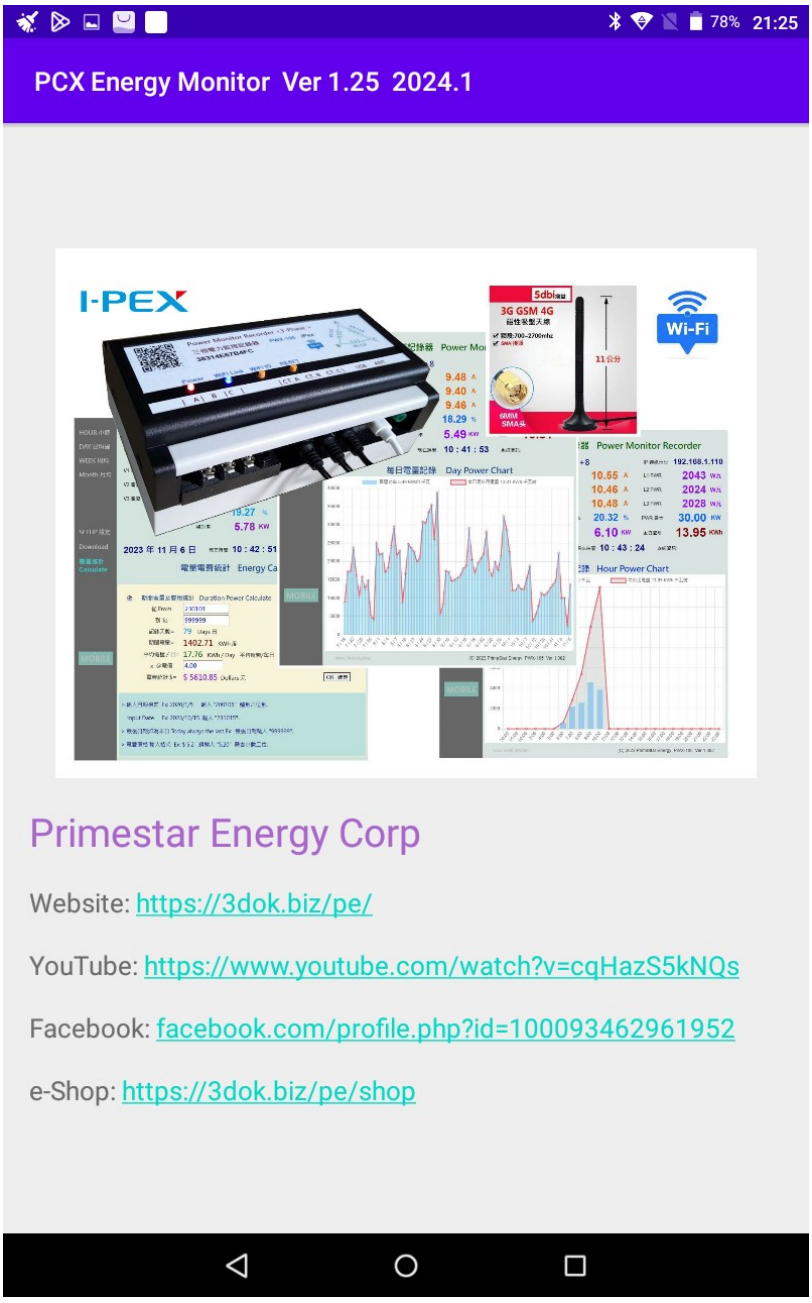
> When connected on-line, it will show the PWX device clock for correction,

Click **“SET”** for time synchronized of PWX monitor and your cell phone.

> **CALC :** Energy calculator for user setting of duration calculate.



> **ABOUT :** Shows the Power Monitor Production Information.



6. Specifications

PWX-105 :	PWX-105 Power Monitor Recorder
iPex Enhanced :	PWX-105 iPex WiFi Dual Antenna + 2-Core Upgraded 200MHz
Measurment :	Clamp C.T. Current Detector x 3
CT Measuring :	AC 100 – 500V / 1 -80 Amp / 100W – 30,000 Watt (30KW)
USB Adaptor :	AC 100 – 250V / USB DC 5V / 5 Watt
Dimension :	160 L x 100 W x 55 H cm / 6.5 in x 4 in x 2.5 in
Weight :	600 - 800 gm / 1.5 Pound

7. Notices for Using

> **In door use only :** Product has not waterproof, it needs to be installed indoors or in a power box. An environment with high moisture and vapor will affect to the device.

> **Requires WiFi signal :** Product requires WiFi communication to provide controls, When the WiFi signal location is insufficient, the web page display will be lagged.

PWX-105 iPex WiFi Upgraded version provides WiFi Dual Antenna and External antenna for improving WiFi signal environment for good connection.

> **AC220 3-phase operation :** PWX-105 is completely suit for AC220V system, no need system adjustment. USB adaptor / AC voltage detection / CT current detection function all ok !

> **AC330 or up 3-phase voltage operation :** if user application for AC330V or up voltage, be note these below_

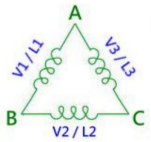
1. Down the voltage below AC280V for 5V USB adaptor work power.
2. Use AC voltage simulation of Setup function enabled !
   Do not connect AC280V and up for voltage detection, it will cause over voltage !
3. CT clamps is not effected, can be work up to AC500V.

> **AC330V / AC380V operation :**

1. Use small transformer drop down voltage below AC220V foe power of USB adaptor.
2. Use Voltage simulation mode and not connect of voltage detector.
3. Setup Page->Set the device voltage as 330V or others->Enable the Voltage Simulation->Set OK.

AC220V 3-Phase Power Monitor Recorder

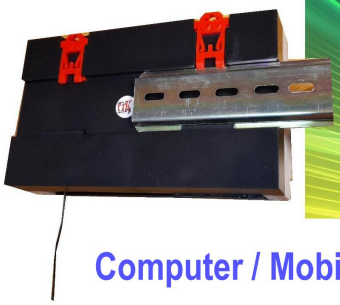
Primestar Energy



AC220V 80A 30KW

CT Clamps No effect to Line

Slide Easy Installation



PWX-105 3-Phase

Computer / Mobiles / Pad can be used, No need Install APP

PWX-105 / 106 / 107 iPex 3-Phase Power Monitor Recorder

吸盘天线适用于700-960MHz，1710-2700MHz频段，
联通、电信，可用于室内手机信号、3G上网信号、4G上
S导航信号、GPRS物联系统信号、通话系统信号收集
泛应用到无线抄表数据回传系统中。
天线外形美观，安装方便，含有3米馈线，强磁吸盘吸附安装，连
A型公头，与SMA型母头设备或连接线可达成连接。

AC220V 30KW 80A / WiFi Web Control

Primestar Energy

PWX Power Monitor Control Recorder

PWX-105 AC220V 50KW

Three-Phase AC Power Monitor Data Recorder

PWX-103 AC100-250V

Home Monitor Control Recorder

PWX-102 AC110V / 220V

Power Monitor Data Recorder

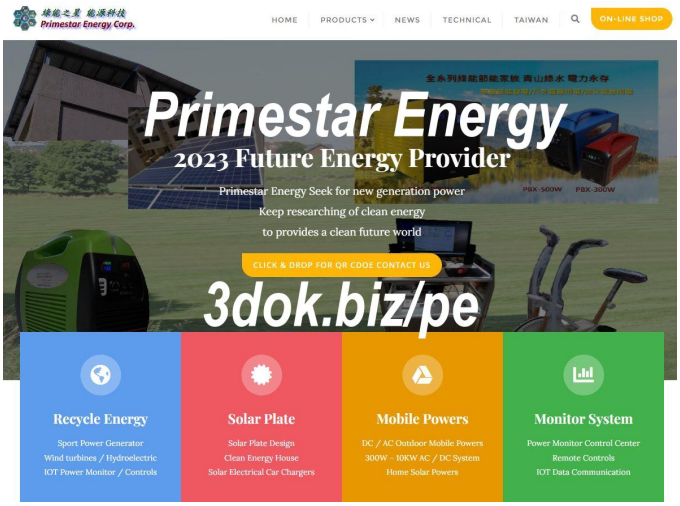
Primestar Energy

Various WiFi Antennas Now Available

4G full-band magnetic antenna

On-Line Shop_ https://3dok.biz/pe/shop/

Primestar Energy_ 3dok.biz/pe



綠能之星 能源科技
Primestar Energy Corp.

FB_ https://www.facebook.com/3dok.biz

< Reference Information >

- AWG / XLPE PVC Wire Check Table –

Size AWG/ kcmil	Size mm^2	Part No. 37-000	Nominal Diameter Inches*	Weight (Lbs./ 1000 Ft.)	DC Resist. @ 25°C (Ohms/ 1000 Ft.)	AC Resist. @ 90°C, 60 Hz (Ohms/ 1000 Ft.)	Inductive Reactance (Ohms/ 1000 Ft.)	Voltage Drop (Volts/Amp/ 1000 Ft.)	Grounding Conductor Size (3x) (AWG)
14	2.1	-508VFD	0.590	158	2.680	3.350	0.046	4.684	18
12	3.3	-516VFD	0.630	199	1.680	2.100	0.043	2.951	18
10	5.2	-308VFD	0.675	258	1.060	1.325	0.040	1.876	14
8	8.3	-309VFD	0.770	368	0.6663	0.8329	0.040	1.194	14
6	13.2	-310VFD	0.885	517	0.4192	0.5240	0.038	0.765	12
4	21	-312VFD	0.975	814	0.2636	0.3295	0.036	0.493	12
2	35	-314VFD	1.090	1178	0.1659	0.2074	0.034	0.322	10
1	43	-315VFD	1.225	1462	0.1315	0.1644	0.034	0.263	10
1/0	50	-316VFD	1.330	1714	0.1042	0.1304	0.033	0.215	10
2/0	66	-317VFD	1.420	1951	0.0827	0.1034	0.032	0.176	10
3/0	86	-318VFD	1.520	2607	0.0655	0.0819	0.031	0.146	8
4/0	95	-319VFD	1.635	3102	0.0520	0.0653	0.030	0.122	8
250	126	-330VFD	1.855	3836	0.0440	0.0553	0.030	0.108	8
350	178	-331VFD	2.060	5141	0.0314	0.0396	0.029	0.085	6
500	250	-333VFD	2.325	6977	0.0220	0.0280	0.028	0.068	6
750	379	-334VFD	2.809	10051	0.0147	0.0191	0.028	0.055	4

> PWX-105 AC220V CT Clamp Inner Size= 16mm, Suit Up to AWG 6 / XLPE 80 Wires.

> PWX-106 AC380V CT Clamp Inner Size= 24mm, Suit Up to AWG 4 / XLPE 200 Wires.