

1. Scenario Preset

- (1) There are 10 Areas power by 1-phase power system, each area is far from each other so impossible for centralized installation of energy meters.
- (2) For each area, we need to monitor 1 circuit 1-phase of it for monitoring the overall area's load power consumption.
- (3) Rated voltage of this main incoming circuit 1-phase is 230Vac L-N, and rated/max current was no more than 100A AC.
- (4) For the places that we gonna install the energy meter, they are covered by stable WiFi signal.
- (5) Eventually, for each area we only need 1 pcs ADW310-D16-WF/C WiFi 1-phase Energy Meter.

2. Devices Deployment Plan

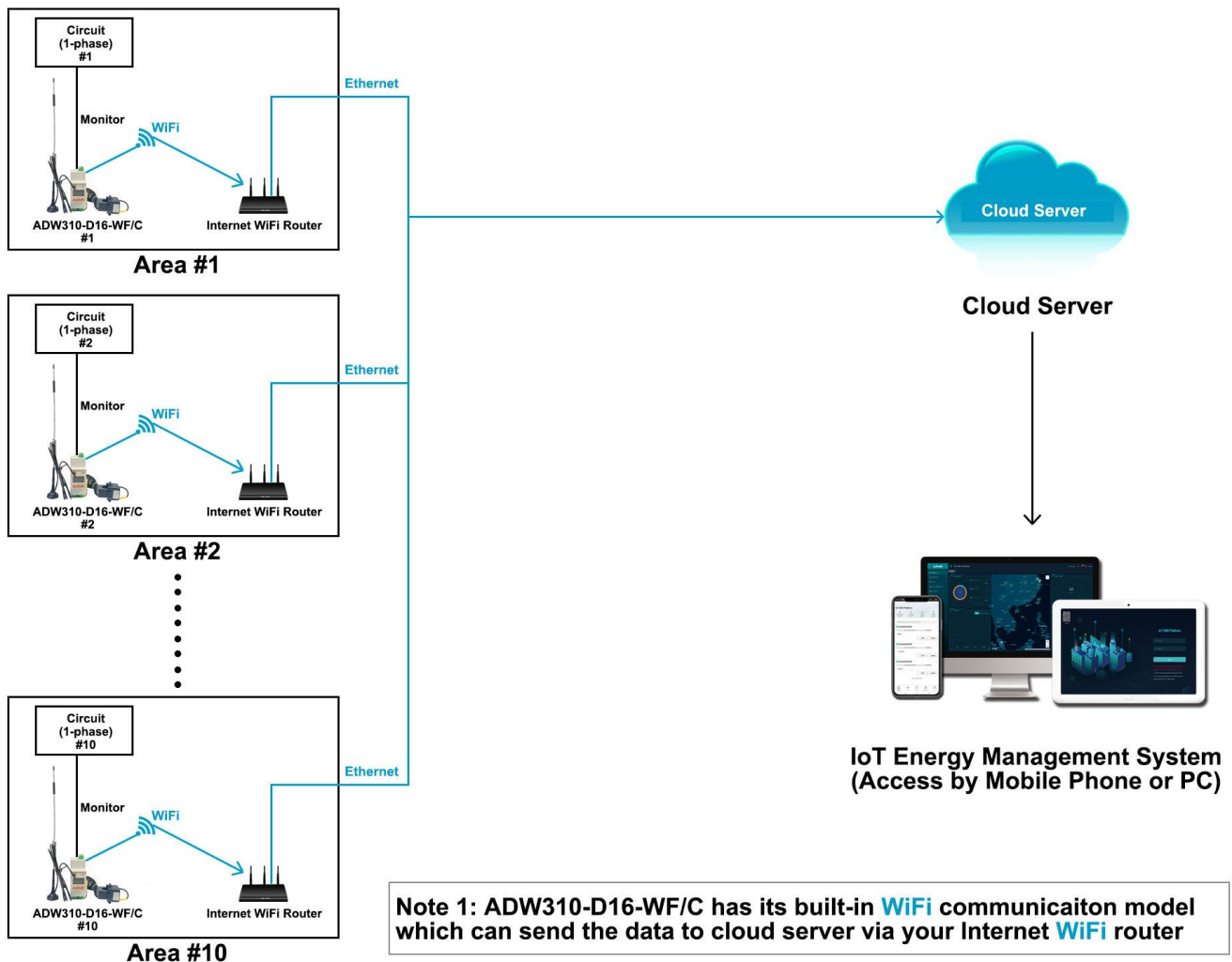
Area #1- Power Circuit (1-phase) #1:

- 1* ADW310-D16-WF/C WiFi 1-phase Energy Meter [For monitoring Power Circuit #1 & WiFi Upstream]

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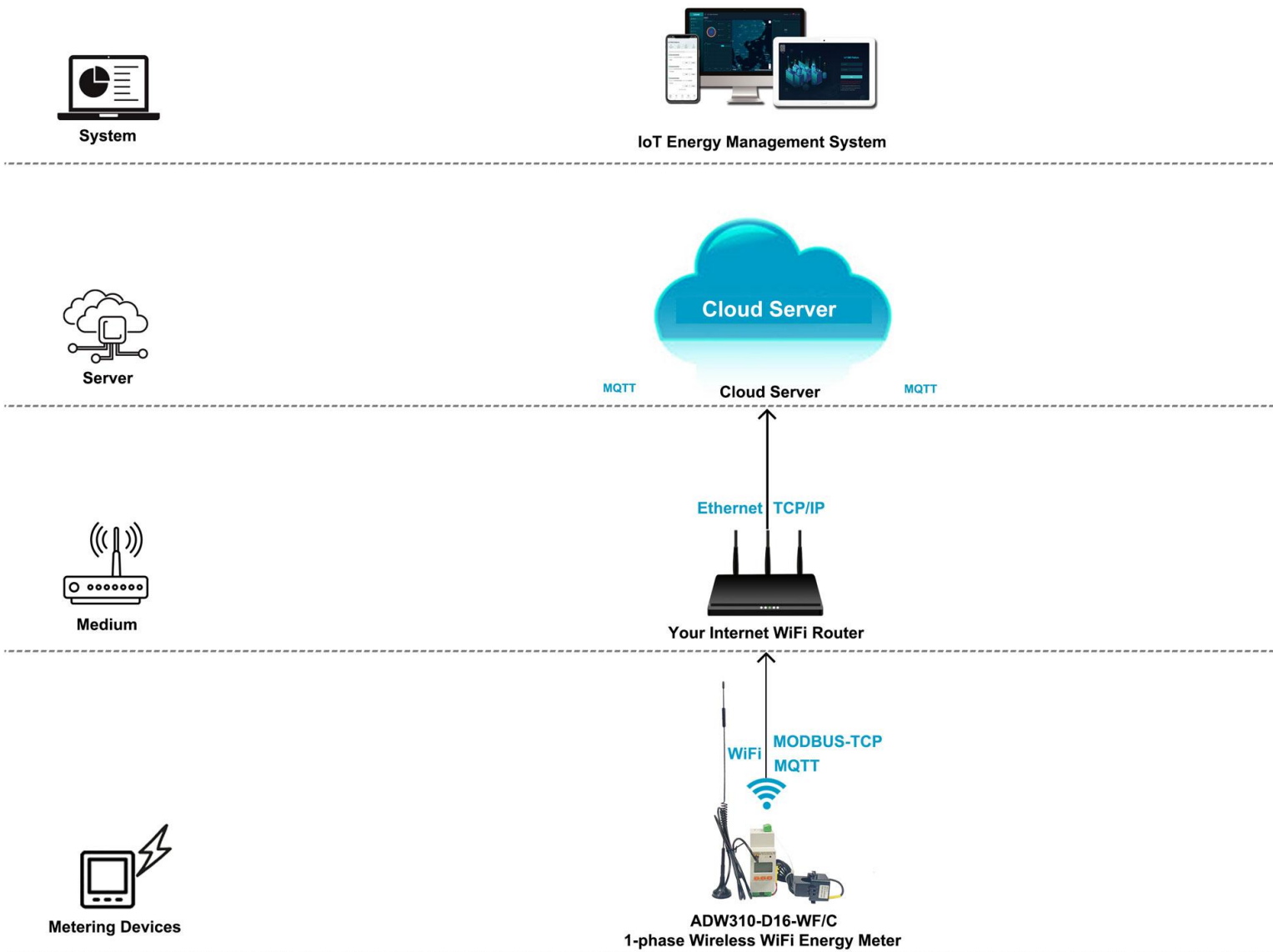
Area #10 - Power Circuit (1-phase) #10:

- 1* ADW310-D16-WF/C Wireless WiFi Energy Meter [For monitoring Power Circuit #10 & WiFi Upstream]



3. Communication Structure&Logic

- (1) WiFi Communication could be served as one of the final data upstream methods by sending the data to cloud server deployed in Internet via your WiFi Internet Router so that Acrel IoT System could be interact with these data collected by bottom metering devices like Energy Meter
- (2) ADW310-D16-WF/C Wireless WiFi 1-phase Energy Meter has a built-in WiFi communication module which allow it to directly send data to your Internet WiFi Router using MQTT and MODBUS-TCP protocol without using a extra WiFi IoT Gateway. Then your WiFi router will send the data further to internet for a final data upstreaming.
- (3) In the factory manufacturing stage, we can set the WiFi configuration (WiFi account and password) in ADW310-D16-WF/C so that users normally don't need to set WiFi configuration again.
- (4) ADW310-D16-WF/C also have a RS485 communication normally used for devices adjustment with Acrel ADW310 adjustment software. For example, setting like WiFi configuration could be done.



4. Hardware Devices Overview


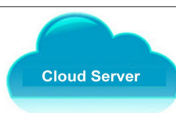

Model 1: ADW310-Dxx-WF/C WiFi 1-phase IoT Energy Meter

- Monitoring: Up to 1 circuits 3-phase [AC Metering]
- Wireless Comms.: WiFi [MQTT, MODBUS Protocol]
- Wired Comms.: RS485 [MODBUS-RTU Protocol]
- Rated Current: 3x1(6)A AC [via -/5A CTs.]
- Rated Voltage: Up to 220~264Vac L-N
- Certificate&Standard: CE



4. Overall Model Selection&Quotation

(1) This Quotation doesn't include freight charge. To gain a complete quotation, please refer the actual quantity that you want to request for the actual order, once we receiving it. We will issue a Official Proforma Invoice with Acrel Stamps on it for later procedure.

System Software					
Name	Description	System Price	Remark (Choose Host Service or Buy-out Service after 3-month Free Trial of Cloud IoT System)		
 Acrel Cloud IoT Energy Management System	1.System support all the meters across the country whose data has been sent to cloud server through 4G,WiFi or Ethernet . 2.Remote meter reading and data collection. 3.Provide IoT APP for mobile phone side and IoT WEB for PC side. 4.Generate energy data report of daily, monthly and annually period with year-on-yeay and period-on-period energy analysis. 5.Provide various alarm function to ensure a stable operation of the system and protect your property. 6.Offer 3-month free trial of system with full technical support as for a test phase or pilot project.	\$0 (recommended in pilot project)	3-month Free Trail (Users don't need to rent a cloud server)		
		\$xxx/Year (For 10 Points) (Price for Host Service Only, recommended in pilot project)	\$xx to buy Hosting Service for 1 monitoring points connected to the system 1 year (Users don't need to rent a cloud server)		
		\$xxxxPermanent (Limitless Points) (Price for Buy-out Service Only, recommended in late project)	1-time charging of \$xxxx for Buy-out Service of permanent use (Limitless monitoring points and a cloud server need to be rent by users)		
Cloud Server					
Name	Description	Server Renting Price (For Reference Only)	Remark		
 Cloud Server	1.Cloud Server could be rent on the cloud server provider like Amazon Cloud. 2.Users of Cloud IoT Energy Management System only need to rent cloud server when they choose buy-out service of our Cloud IoT System . And if they are using hosting service or 3-month free trial of our Cloud IoT System, we will use our own cloud server which has been rent on Amazon so that users don't need to rent a cloud server. 3.The quotation of Cloud Server is only a reference price that we have rent on Amazon Cloud.	According to Specs of Rented Cloud Server	Below cloud server specs could support 1000-2000 monitorings points connected to the system (Server: 8 core 16G Operation System: windows server 2016)		
WiFi Wireless Energy Meter					
Overview Picture	USAGE&MODULE NAME	DESCRIPTION & SPECIFICATION	QUANTITY	FOB UNIT PRICE (USD)	AMOUNT (USD)
	1-phase WiFi Wireless Energy Meter ADW310-D16-WF/C	Communication: WiFi (MODBUS-TCP, MQTT) & RS485 (MODBUS-RTU) Rated Voltage: 220~264Vac L-N Rated Current: 20(100)A AC (via paired external CTs)	10 pcs	\$ (Including both Energy meter and External CTs)	
	Paired 1* External Split-core Current Trasformer	Current Ratio: 100A/25mA AC Aperture: φ16mm Appliaction: Paired with ADW310-D16-WF/C for current input	10 pcs		

5. Acrel IoT Energy Monitoring System (Partail Introduction)

Acrel IoT Energy Monitoring System could be access in 2 different ways:

(1) Access through WEB on your computer.

Access port: <https://iot.acrel-eem.com/>

(2) Access through APP on your mobile phone

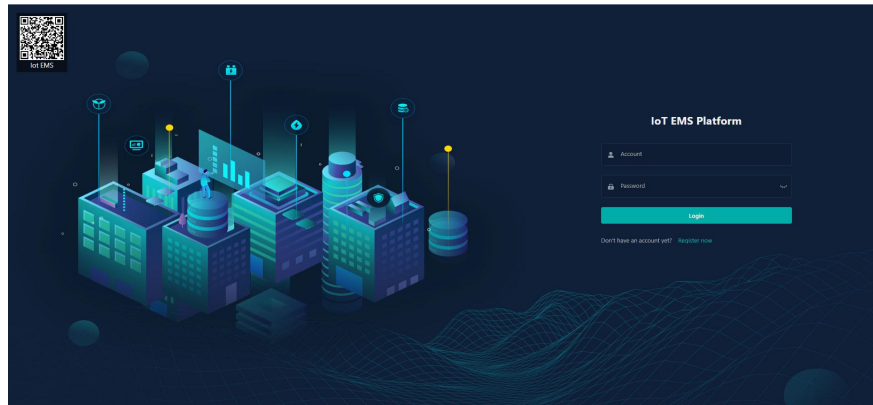
Download Link: <https://play.google.com/store/apps/details?id=com.acrel.iotems>

(1) WEB Accesss (Computer):

Access Port: <https://iot.acrel-eem.com/>

Test Account Name: acrel

Test Account Password: 123456

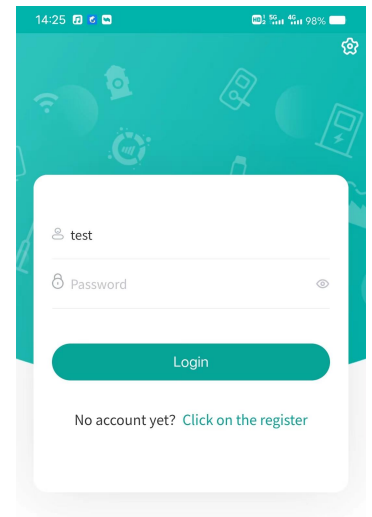
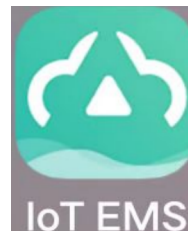


(2) APP Accesss (Mobile):

Download Link: <https://play.google.com/store/apps/details?id=com.acrel.iotems>

Test Account Name: acrel

Test Account Password: 123456

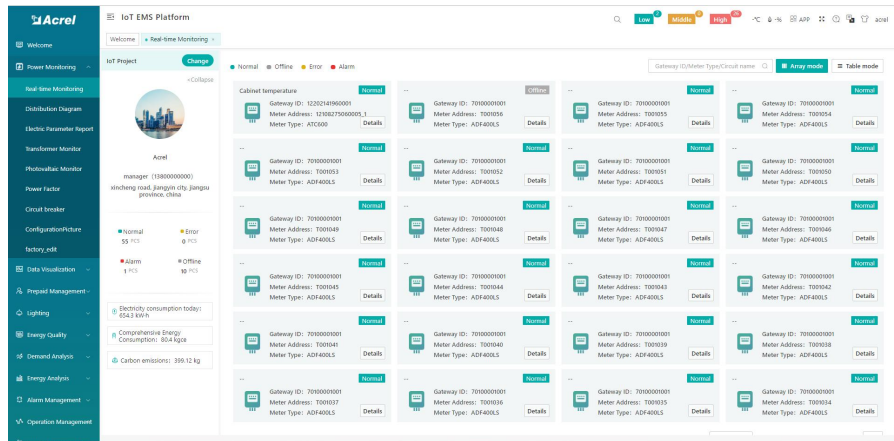


5. Acrel IoT Energy Monitoring System (Partail Introduction)

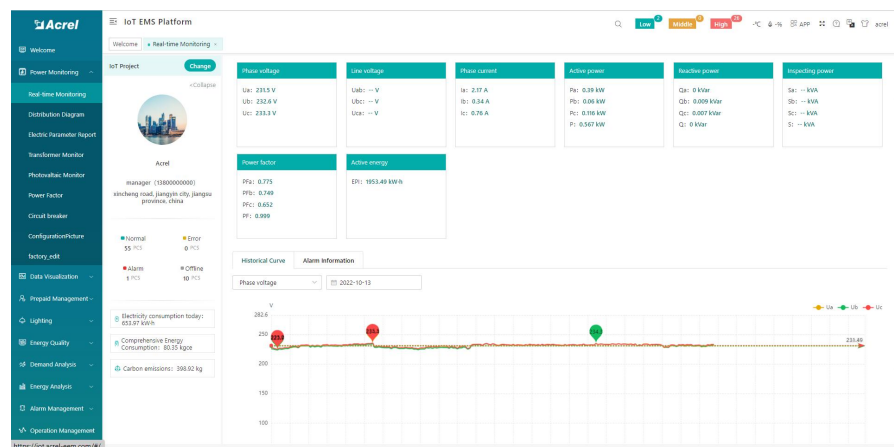
Main Function of WEB side System:

- (1) Devices List (2) History Curve (3) Electricity Parameters Report (4) Energy Consumption Report (Daily, Monthly, Yearly) (5) User Report

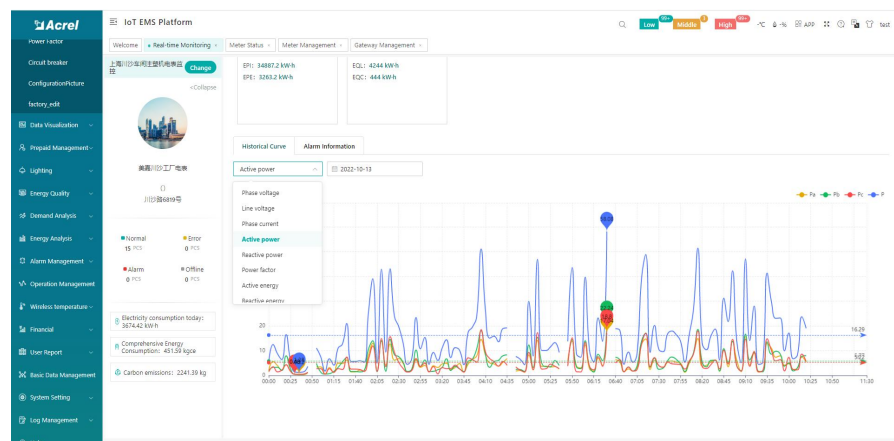
(1) Devices List: Showing the overall devices connected to Acrel System and were bond to certain project. SN code, Online-Offline status, devices model and other necessary information will be shown here.



(2) History Curve: Showing the daily history data curve of all the data that could be collected and upload by energy meter or other basic metering devices.



(2) History Curve: By selecting the items of "data" and "electricity parameter", platform can show the history curve of different data and date.

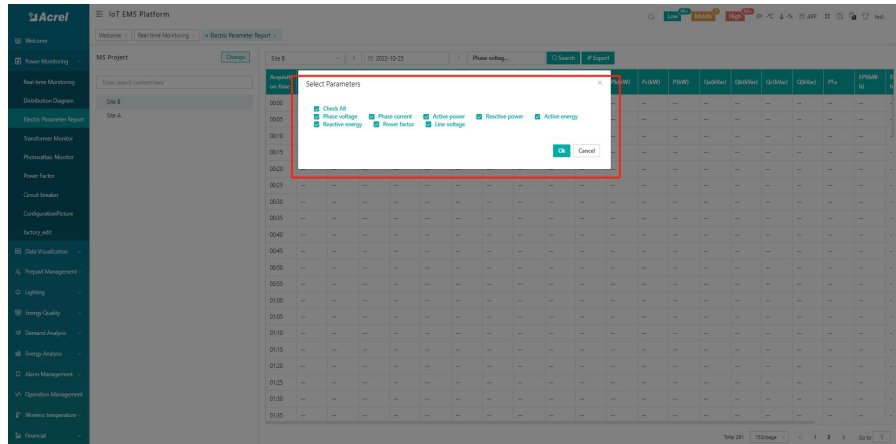


6. Acrel IoT Energy Monitoring System (Partail Introduction)

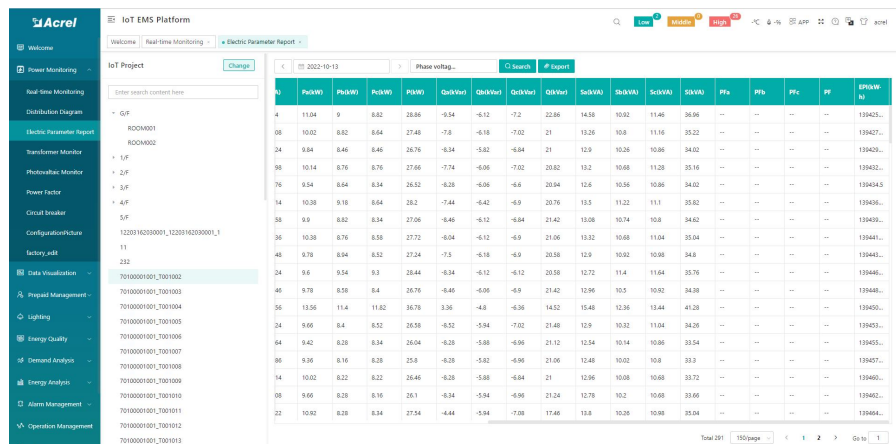
Main Function of WEB side System:

- (1) Devices List (2) History Curve (3) Electricity Parameters Report (4) Energy Consumption Report (Daily, Monthly, Yearly) (5) User Report

(3) Electricity Parameters Report:
Select the "electricity parameters"
that you want to show in this report

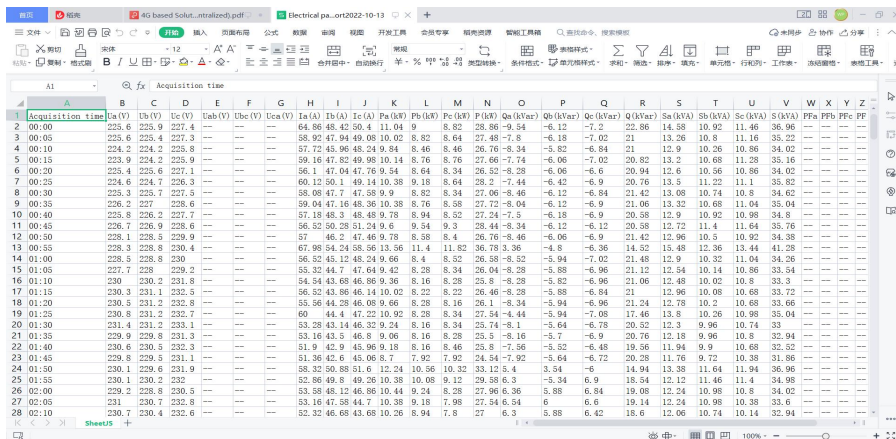


(3) Electricity Parameters Report: All
the electricity parameters that could
be collected by certain energy meter
will showed as a report here.



Time	Pu(W)	Pv(W)	Pc(W)	P(W)	Qa(kVar)	Qb(kVar)	Qc(kVar)	Q(kVar)	Sa(kVA)	Sb(kVA)	Sc(kVA)	S(kVA)	Pf(a)	Pf(b)	Pf(c)	Pf	EP(W-h)
11:04	9	8.82	28.86	-9.34	-6.12	-7.2	22.86	14.58	10.92	11.46	36.96	--	--	--	--	--	139425.
10:02	8.82	8.64	27.48	-7.8	-6.18	-7.02	21	13.26	10.8	11.16	35.22	--	--	--	--	--	139427.
9:84	8.46	8.46	26.76	-8.34	-5.82	-6.84	21	12.9	10.26	10.86	34.02	--	--	--	--	--	139429.
10:14	8.76	8.76	27.66	-7.74	-6.06	-7.02	20.82	13.2	10.68	11.28	35.16	--	--	--	--	--	139431.
9:54	8.64	8.64	26.32	-8.28	-6.06	-6.6	20.84	12.6	10.56	10.86	34.02	--	--	--	--	--	139433.
10:38	9.18	9.18	28.2	-7.44	-6.42	-6.9	20.76	13.5	11.22	11.1	35.82	--	--	--	--	--	139435.
9:9	8.82	8.84	27.06	-8.46	-5.82	-6.84	21.42	13.08	11.04	10.8	34.62	--	--	--	--	--	139437.
10:38	8.76	8.58	27.2	-8.04	-6.12	-6.9	21.06	13.08	11.04	10.54	34.02	--	--	--	--	--	139439.
8:78	8.84	8.82	27.24	-7.3	-6.18	-6.9	20.58	12.9	10.52	10.86	34.8	--	--	--	--	--	139441.
9:6	9.34	9.3	28.44	-8.34	-6.12	-6.12	20.58	12.72	11.4	11.64	35.76	--	--	--	--	--	139443.
9:78	8.58	8.4	26.76	-8.46	-6.06	-6.9	21.42	12.96	10.5	10.82	34.88	--	--	--	--	--	139445.
11:56	11.4	11.62	36.78	3.36	-6.48	-6.36	14.52	15.48	12.36	13.44	41.28	--	--	--	--	--	139455.
9:66	8.4	8.52	26.58	-8.52	-5.84	-7.02	21.48	12.9	11.04	10.8	34.26	--	--	--	--	--	139457.
9:42	8.28	8.34	26.04	-8.38	-5.88	-6.96	21.12	12.54	10.48	10.86	33.54	--	--	--	--	--	139459.
9:36	8.16	8.28	25.8	-8.38	-5.82	-6.96	21.06	12.48	10.02	10.8	33.3	--	--	--	--	--	139461.
10:02	8.22	8.22	26.46	-8.38	-5.88	-6.84	21	12.96	10.8	10.68	33.72	--	--	--	--	--	139463.
9:66	8.38	8.16	26.1	-8.34	-5.94	-6.96	21.24	12.78	10.8	10.68	33.66	--	--	--	--	--	139465.
10:62	8.38	8.34	27.34	-8.44	-5.94	-7.08	17.46	13.8	10.26	10.58	35.04	--	--	--	--	--	139467.

(3) Electricity Parameters Report:
Report on platform could be
exported in "Excel" format to your
computer for a brief storage when
accessing the IoT EMS WEB
platform.



Acquisition time	Ua(V)	Ub(V)	Uc(V)	Ia(A)	Ib(A)	Ic(A)	Pa(W)	Pb(W)	Pc(W)	P(W)	Qa(kVar)	Qb(kVar)	Qc(kVar)	Q(kVar)	Sa(kVA)	Sb(kVA)	S(kVA)	Pf(a)	Pf(b)	Pf(c)	Pf	EP(W-h)	
00:00	226.6	226.9	227.4	--	--	--	64.96	48.42	50.4	11.04	9	8.82	28.86	-9.34	-6.12	-7.2	22.86	14.58	10.92	11.46	36.96	--	139425.
00:05	225.6	225.4	227.3	--	--	--	58.92	47.94	49.08	10.02	8.82	8.64	27.48	-7.8	-6.18	-7.02	21	13.26	10.8	11.16	35.22	--	139427.
00:10	224.2	224.2	225.8	--	--	--	57.72	45.96	48.24	9.84	8.46	8.46	26.76	-8.34	-5.82	-6.84	21	12.9	10.26	10.86	34.02	--	139429.
00:15	223.8	224.2	225.9	--	--	--	59.16	47.82	49.86	10.14	8.76	8.76	27.66	-7.74	-6.06	-7.02	20.82	13.2	10.68	11.28	35.16	--	139431.
00:20	223.4	223.6	227.1	--	--	--	56.1	47.04	47.76	9.54	8.64	8.34	26.32	-8.28	-6.06	-6.6	20.84	12.6	10.56	10.86	34.02	--	139433.
00:25	224.6	224.7	226.3	--	--	--	60.12	50.1	49.14	10.38	9.18	8.64	28.2	-7.44	-6.42	-6.9	20.76	13.5	11.22	11.1	35.82	--	139435.
00:30	225.3	225.7	227.3	--	--	--	58.08	47.7	47.58	9.9	8.82	8.34	27.06	-8.46	-6.12	-6.94	21.42	13.08	11.04	10.8	34.62	--	139437.
00:35	226.2	227	228.6	--	--	--	59.04	47.16	48.36	10.38	8.76	8.58	27.2	-8.04	-6.12	-6.9	21.06	13.32	10.68	11.04	35.04	--	139439.
00:40	225.8	226.2	227.7	--	--	--	57.18	48.3	48.48	9.78	8.94	8.52	27.24	-7.5	-6.18	-6.9	20.58	12.9	10.92	10.98	34.8	--	139441.
00:45	226.7	226.9	228.6	--	--	--	56.52	50.28	51.24	9.6	9.54	9.3	28.44	-8.34	-6.12	-6.12	20.58	12.72	11.4	11.64	35.76	--	139443.
00:50	228.1	228.3	229.9	--	--	--	57	46.2	47.46	9.78	8.88	8.4	26.76	-8.46	-6.06	-6.9	21.42	12.96	10.5	10.82	34.88	--	139445.
00:55	228.3	228.8	230.4	--	--	--	67.98	54.24	58.56	13.56	11.4	11.82	36.78	3.36	-6.48	-6.36	14.52	15.48	12.36	13.44	41.28	--	139455.
01:00	228.5	228.8	230	--	--	--	66.52	43.86	46.14	10.02	8.22	8.22	26.46	-8.28	-5.84	-1.02	21.48	12.9	10.32	11.04	34.26	--	139457.
01:05	227.7	229	229.3	--	--	--	53.52	44.7	47.64	9.42	8.28	8.34	26.04	-8.28	-5.88	-6.96	21.12	12.54	10.14	10.86	33.54	--	139459.
01:10	230	230.2	231.8	--	--	--	54.54	43.68	46.86	9.36	8.16	8.28	25.8	-8.28	-5.82	-6.96	21.06	12.48	10.02	10.8	33.3	--	139461.
01:15	230.3	231.1	232.3	--	--	--	56.52	43.86	46.14	10.02	8.22	8.22	26.46	-8.28	-5.88	-6.84	21	12.96	10.08	10.68	33.72	--	139463.
01:20	229.8	229.8	231.9	--	--	--	53.16	43.5	46.8	9.06	8.16	8.28	25.5	-8.16	-5.7	-6.9	20.76	12.18	9.96	10.8	32.94	--	139465.
01:25	230.8	231.2	232.7	--	--	--	60	44.4	47.22	10.92	8.28	8.34	27.54	-4.44	-5.94	-1.08	17.46	13.8	10.26	10.98	35.04	--	139467.
01:30	231.4	231.2	233.1	--	--	--	53.28	43.14	46.32	9.24	8.16	8.34	25.74	-8.1	-5.64	-6.78	20.52	12.3	9.96	10.74	33.3	--	139469.
01:35	229.8	229.8	231.9	--	--	--	51.36	42.9	45.96	9.18	8.16	8.16	25.5	-8.16	-5.64	-6.78	20.52	12.24	10.98	10.8	34.02	--	139471.
01:40	230.6	230.5	232.3	--	--	--	51.9	42.9	45.96	9.18	8.16	8.46	25.8	-7.56	-5.82	-6.48	19.56	11.94	9.9	10.68	33.82	--	139473.
01:45	229.8	229.9	231.1	--	--	--	51.36	42.6	45.06	9.18	7.92	7.92	24.54	-7.92	-5.64	-6.72	20.28	11.76	9.72	10.38	31.86	--	139475.
01:50	230.1	229.6	231.9	--	--	--	52.16	42.9	45.96	9.18	8.16	8.16	25.5	-8.16	-5.64	-6.78	20.52	12.18	10.98	10.8	34.02	--	139477.
01:55	230.1	230.2	232	--	--	--	52.86	49.8	49.26	10.38	10.08	9.12	29.58	6.3	-3.34	6.9	18.54	12.12	11.46	11.4	34.98	--	139479.
02:00	229.2	228.8	230.9	--	--	--	53.88	48.12	46.86	10.44	9.24	8.28	27.96	6.36	-5.88	6.84	19.08	12.24	10.98	10.8	34.02	--	139481.
02:05	231	230.7	232.2	--	--	--	53.16	47.58	44.7	10.38	9.18	7.98	27.54	6.54	-6	6.6	19.14	12.24	10.98	10.38	33.6	--	139483.
02:10	230.7	230.4	232.6	--	--	--	52.32	46.68	43.68	10.26	8.94	7.8	27	6.3	-5.88	6.42	18.6	12.06	10.74	10.14	32.94	--	139485.

5. Acrel IoT Energy Monitoring System (Partail Introduction)

Main Function of WEB side System:

- (1) Devices List (2) History Curve (3) Electricity Parameters Report (4) Energy Consumption Report (Daily, Monthly, Yearly) (5) User Report

(4) Energy Report (Daily): This Interface show the daily energy consumption report (calculated by forward active energy)

Energy Node	00:00		01:00		02:00		03:00		04:00		
	Cost(¥)	Consumption(kWh)	Cost(¥)	Consumption(kWh)	Cost(¥)	Consumption(kWh)	Cost(¥)	Consumption(kWh)	Cost(¥)	Consumption(kWh)	
...	0.00	0.32	0.00	0.32	0.00	0.32	0.00	0.32	0.00	0.32	
...	0.00	19.20	0.00	19.20	0.00	19.20	0.00	19.20	0.00	19.20	
...	0.00	46.40	0.00	30.40	0.00	44.80	0.00	28.00	0.00	40.00	
...	0.00	8.80	0.00	9.60	0.00	9.60	0.00	9.60	0.00	9.60	
...	0.00	12.00	0.00	11.20	0.00	12.00	0.00	11.20	0.00	12.00	
...	0.00	39.20	0.00	39.20	0.00	40.80	0.00	40.80	0.00	47.20	
...	0.00	32.80	0.00	32.80	0.00	32.80	0.00	32.80	0.00	32.80	
...	0.00	29.60	0.00	21.60	0.00	20.80	0.00	20.80	0.00	20.80	
...	0.00	17.60	0.00	30.40	0.00	21.60	0.00	20.80	0.00	20.80	
...	0.00	30.40	0.00	30.40	0.00	30.40	0.00	30.40	0.00	29.60	
...	0.00	24.80	0.00	21.60	0.00	20.80	0.00	20.80	0.00	20.80	
...	0.00	40.00	0.00	40.80	0.00	40.80	0.00	40.80	0.00	40.80	
...	0.00	0.00	0.00	0.80	0.00	0.80	0.00	0.80	0.00	0.80	
...	0.00	42.40	0.00	26.40	0.00	47.20	0.00	47.20	0.00	46.40	
Total	387.52	0.00	348.32	0.00	401.92	0.00	356.32	0.00	385.92	0.00	387.50

(4) Energy Report (Daily): This daily energy report could be also export to computer in "Excel" format

Energy Node	00:00	01:00	02:00	03:00	04:00	05:00	06:00
...	0.32	0.32	0.32	0.32	0.32	0.32	0.30
...	19.20	19.20	19.20	19.20	19.20	19.20	19.20
...	46.40	30.40	44.80	28.00	39.20	40.00	46.80
...	8.80	9.60	9.60	9.60	9.60	9.60	9.60
...	12.00	11.20	12.00	11.20	11.20	12.00	12.00
...	39.20	39.20	40.80	40.80	40.80	40.80	39.20
...	32.80	32.80	33.60	32.80	32.80	32.80	32.80
...	29.60	29.60	29.60	29.60	29.60	29.60	29.60
...	17.60	21.60	20.80	21.60	20.80	21.60	20.80
...	30.40	30.40	30.40	30.40	30.40	30.40	29.60
...	24.80	21.60	20.80	21.60	20.80	20.80	20.80
...	40.00	40.80	40.80	40.80	40.80	40.80	40.80
...	0.00	0.80	0.80	0.80	0.80	0.80	0.80
...	42.40	26.40	47.20	47.20	46.40	45.60	47.20
Total	387.52	348.32	401.92	356.32	385.92	389.92	387.50

(4) Energy Report (Monthly& Yearly): Same as daily energy report, monthly and yearly energy report could be also checked on platform and exported in "Excel" format.

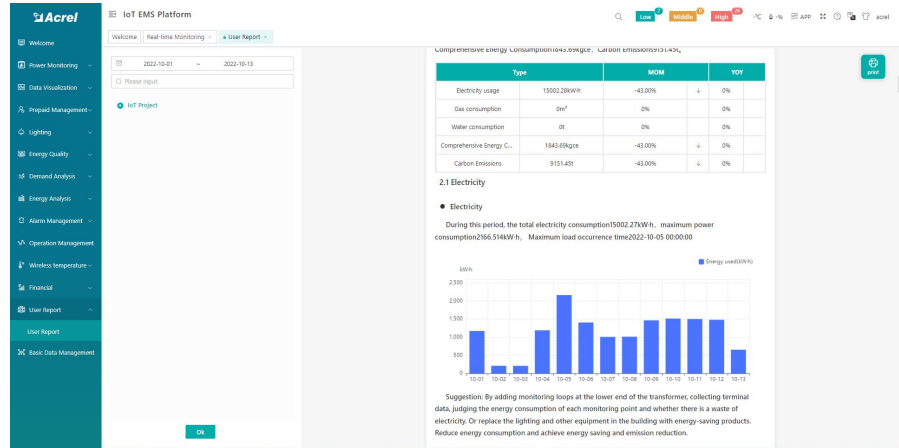
Energy Node	01		02		03		04	
	Cost(¥)	Consumption(kWh)	Cost(¥)	Consumption(kWh)	Cost(¥)	Consumption(kWh)	Cost(¥)	Consumption(kWh)
...	0.00	2.76	0.00	2.82	0.00	2.81	0.00	2.77
...	0.00	2.76	0.00	2.82	0.00	2.81	0.00	2.77
Total	0.00	2.76	0.00	2.82	0.00	2.81	0.00	2.77

5. Acrel IoT Energy Monitoring System (Partail Introduction)

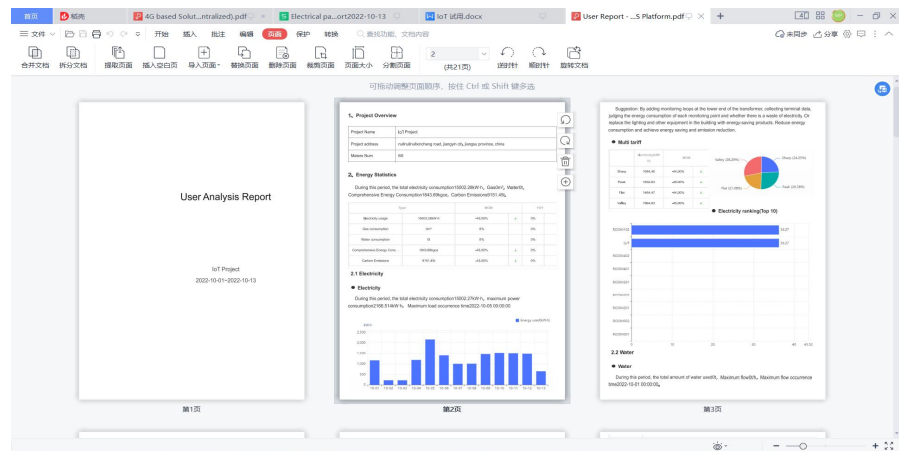
Main Function of WEB side System:

- (1) Devices List (2) History Curve (3) Electricity Parameters Report (4) Energy Consumption Report (Daily, Monthly, Yearly) (5) User Report

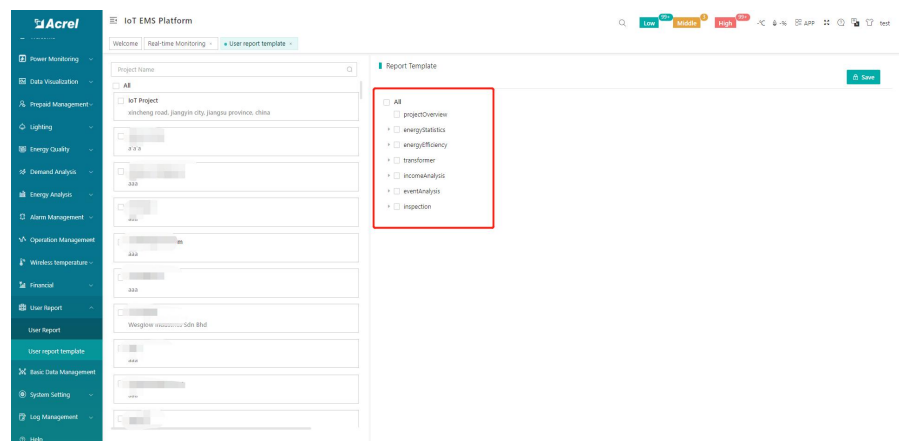
(5) User Report: A comprehensive user report including project overview, energy report, energy analysis and etc could be check on platform



(5) User Report: User report could be exported in "PDF" format into your PC for convenient check and storage.



(5) User Report: User report support template customization in buy-out service of Acrel IoT Energy Monitoring System.

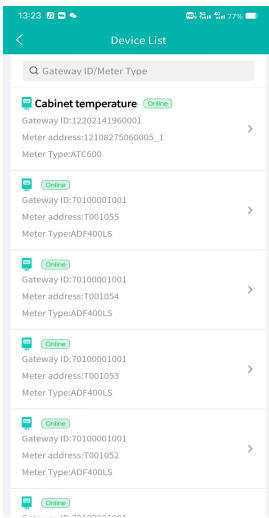


5. Acrel IoT Energy Monitoring System (Partail Introduction)

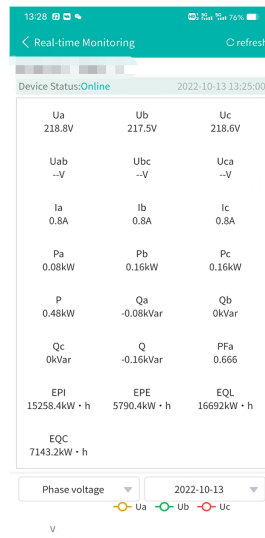
Main Function of APP side System:

(1) Devices List (2) History Curve (3) Electricity Parameters Report (4) Energy Trend (5) Energy Consumption Report (Daily, Monthly, Yearly)

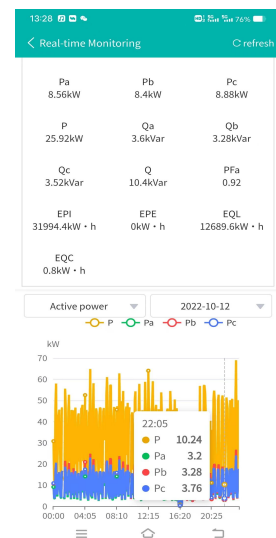
Noted: Since APP side and WEB side of Acrel IoT Energy Monitoring System share the same data, normally recommend our user to add the devices to their account using APP and check the data using WEB platform.



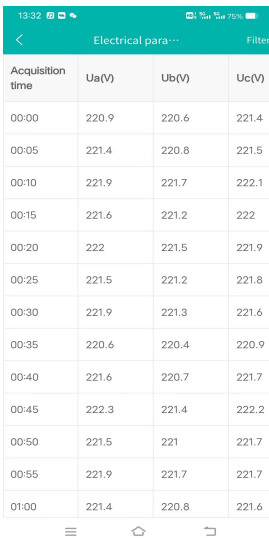
(1) Device List



(2) History Curve

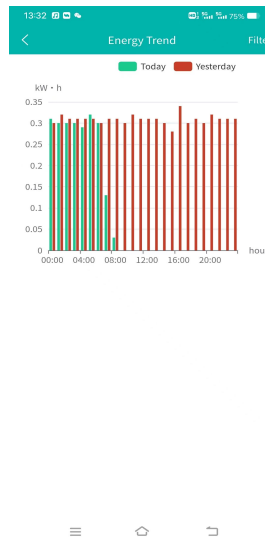


(2) History Curve

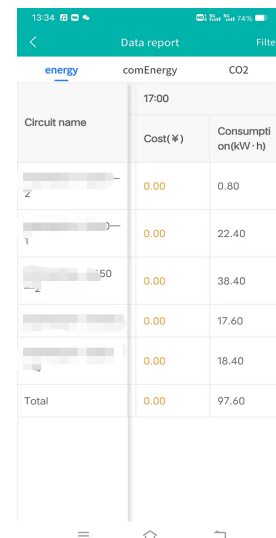


Acquisition time	Ua(V)	Ub(V)	Uc(V)
00:00	220.9	220.6	221.4
00:05	221.4	220.8	221.5
00:10	221.9	221.7	222.1
00:15	221.6	221.2	222
00:20	222	221.5	221.9
00:25	221.5	221.2	221.8
00:30	221.9	221.3	221.6
00:35	220.6	220.4	220.9
00:40	221.6	220.7	221.7
00:45	222.3	221.4	222.2
00:50	221.5	221	221.7
00:55	221.9	221.7	221.7
01:00	221.4	220.8	221.6

(3) Parameter Report



(4) Energy Trend



energy	comEnergy	CO2
Circuit name	Cost(¥)	Consumption(kW·h)
Z	0.00	0.80
T	0.00	22.40
-50	0.00	38.40
	0.00	17.60
	0.00	18.40
Total	0.00	97.60

(5) Energy Report