**Acrel 4G Based
IoT Energy Monitoring Solution
(1-phase Separate)**

Author: Aaron Shi
E-mail: aaron@acrel.cn
Website: www.acrel-electric.
ke

1. Scenario Preset

(1) There are 10 Houses in a certain area power by 1-phase power system, each house is far from each other so impossible for centralized installation of energy meters.

(2) For each house, we need to monitor the main incoming circuit 1-phase of it for monitoring the overall house's power consumption.

(3) Rated voltage of this main incoming circuit 1-phase is 230Vac L-N, and rated/max current was no more tha 100A AC. (The rated current of circuit normally same to the CB's rated current of this monitored main circuit 1-phase).

(4) For the places that we gonna install the energy meter, they are covered by stable 4G signal.

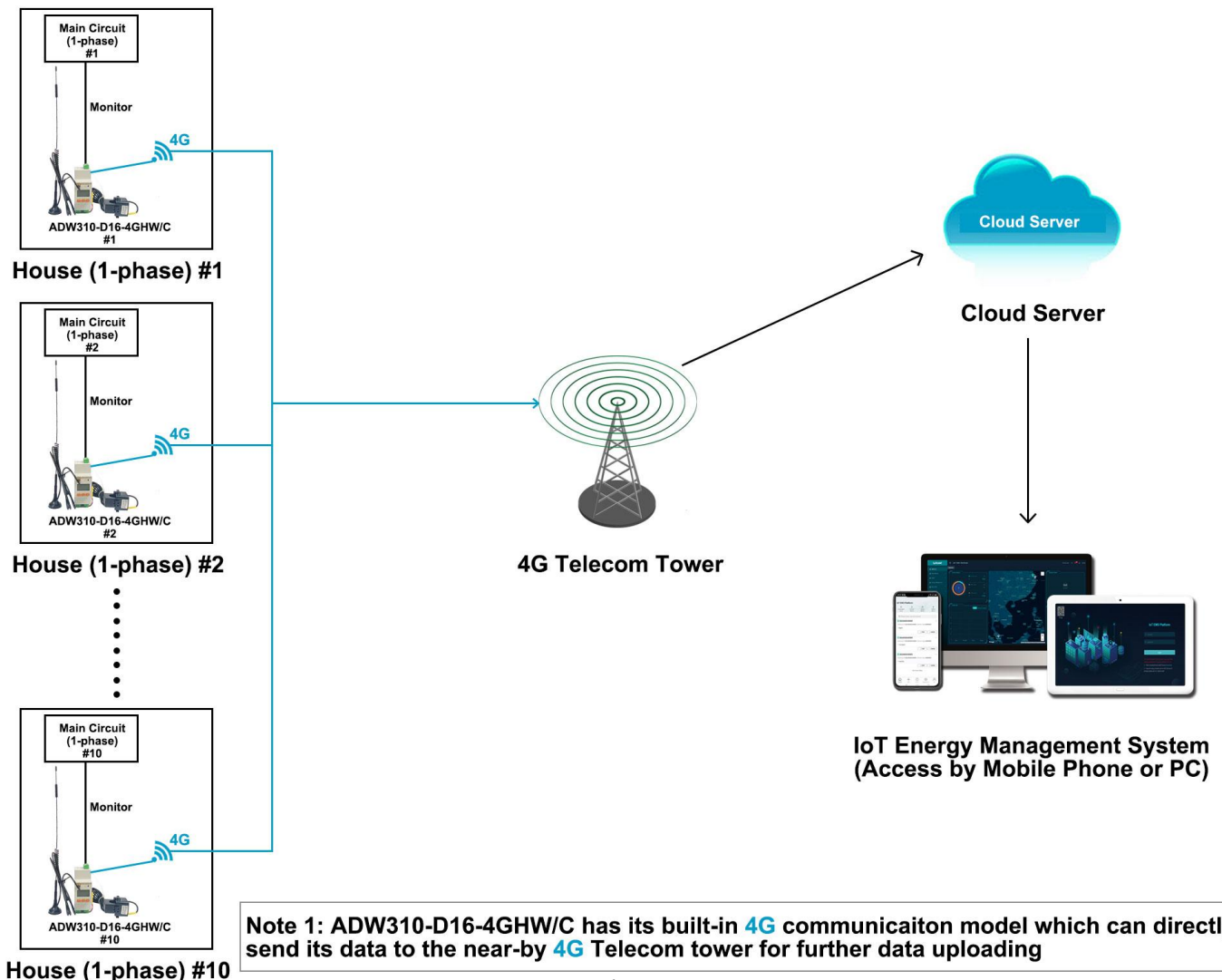(5) Eventually, for each house we only need 1 pcs ADW310-D16-4GHW/C 1-phase 4G Energy Meter

2. Devices Deployment Plan

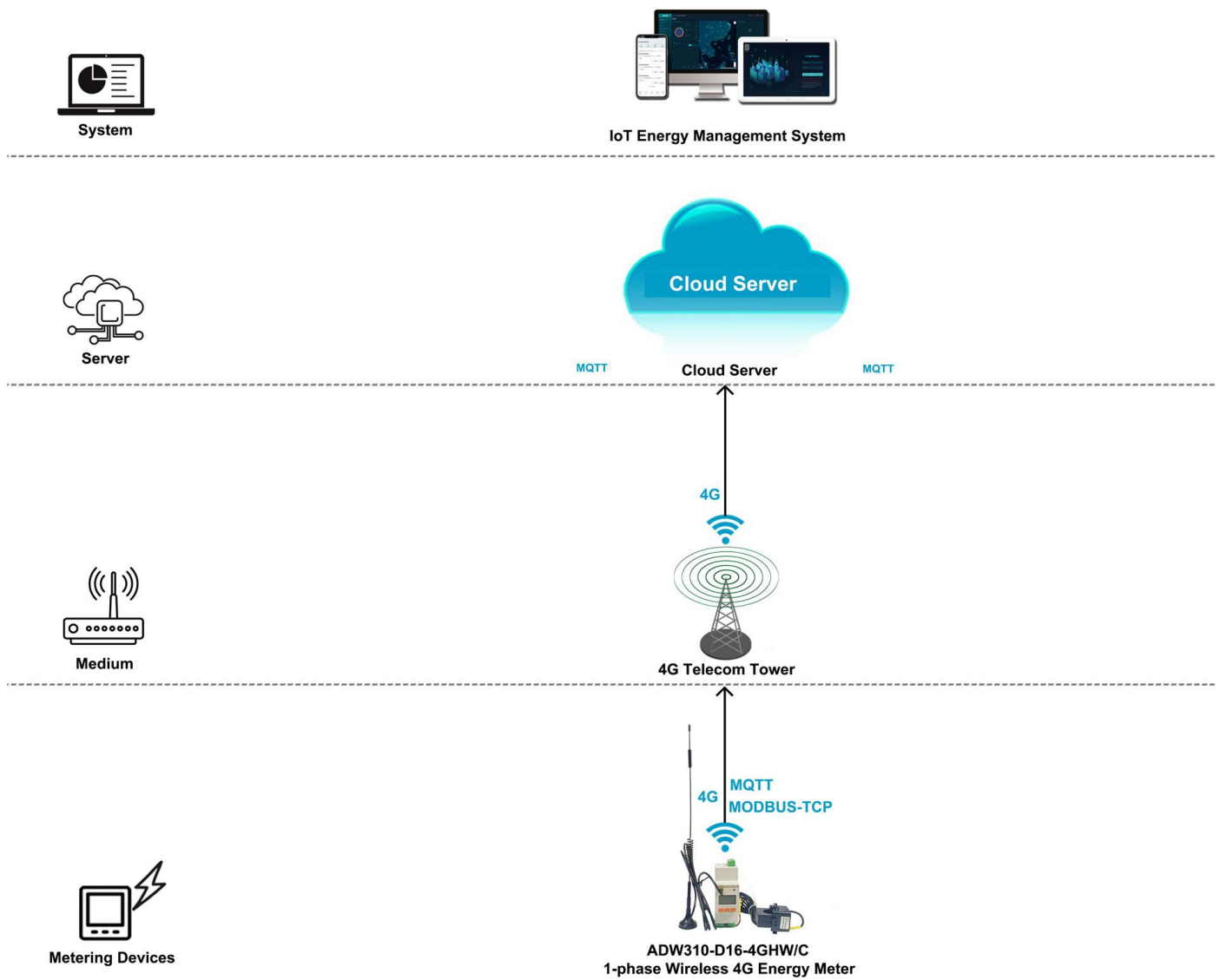**House (1-phase) #1:**
- 1* ADW310-D16-4GHW/C Wireless 4G Energy Meter.
.
House (1-phase) #10:
- 1* ADW310-D16-4GHW/C Wireless 4G Energy Meter

Note 1: ADW310-D16-4GHW/C has its built-in 4G communicaiton model which can directly send its data to the near-by 4G Telecom tower for further data uploading

Acrel 4G Based
IoT Energy Monitoring Solution
(1-phase Separate)

Author: Aaron Shi
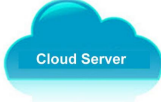E-mail: aaron@acrel.cn
Website: www.acrel-electric.
ke

3. Communication Structure&Logic

(1) 4G Communication could be served as one of the final data upstream methods by sending the data to cloud server deployed in Internet so that Acrel IoT System could be interact with these data collected by bottom metering devices like Energy Meter

(2) ADW310-D16-4GHW/C Wireless 4G 1-phase Energy Meter has a built-in 4G communication module which allow it to directly send data to local 4G telecom tower through 4G signal based on MQTT and MODBUS-TCP protocol without using a extra 4G IoT Gateway.

(3) Each ADW310-D16-4GHW/C has a 4G card tray for installing the 4G sim card which could be bought from your local 4G service provider.

(4) ADW310-D16-4GHW/C also have a RS485 communication normally used for devices adjustment with Acrel ADW310 adjustment softare.

System

IoT Energy Management System

Server

Cloud Server

MQTT   Cloud Server   MQTT

4G

Medium

4G Telecom Tower

MQTT
4G   MODBUS-TCP

Metering Devices

ADW310-D16-4GHW/C
1-phase Wireless 4G Energy Meter

**Acrel 4G Based
IoT Energy Monitoring Solution
(1-phase Separate)**

Author: Aaron Shi
E-mail: aaron@acrel.cn
Website: www.acrel-electric.
ke

4. Overall Model Selection&Quoation

(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 projtect)	3-month Free Trail (Users don't need to rent a cloud server))
		$140/Year (For 10 Points) (Price for Host Service Only, recommended in pilot projtect)	$14 to buy Hosting Service for 1 monitoring points connected to the system 1 year (Users don't need to rent a cloud server)
		$8000/Permanent (Limitless Points) (Price for Buy-out Service Only,recommended in late projtect)	1-time charging of $8000 for Buy-out Service of permanent use (Support OEM 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 monitoings points connected to the system (Server：8 core 16G Operation System：windows server 2016)

4G Wireless Energy Meter

Overview Picture	USAGE&MODULE NAME	DESCRIPTION & SPECIFICATION	QUANTITY	FOB UNIT PRICE (USD)	AMOUNT (USD)
	1-phase 4G Wireless Energy Meter **ADW310-D16-4GHW/C**	**Communication:** 4G (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 Trasnformer	**Current Ratio:** 100A/25mA AC **Aperture:** φ16mm **Appliaction:** Paired with ADW310-D16-WF/C for current input	10 pcs		

Acrel 4G Based
IoT Energy Monitoring Solution
(1-phase Separate)

Author: Aaron Shi
E-mail: aaron@acrel.cn
Website: www.acrel-electric.ke

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
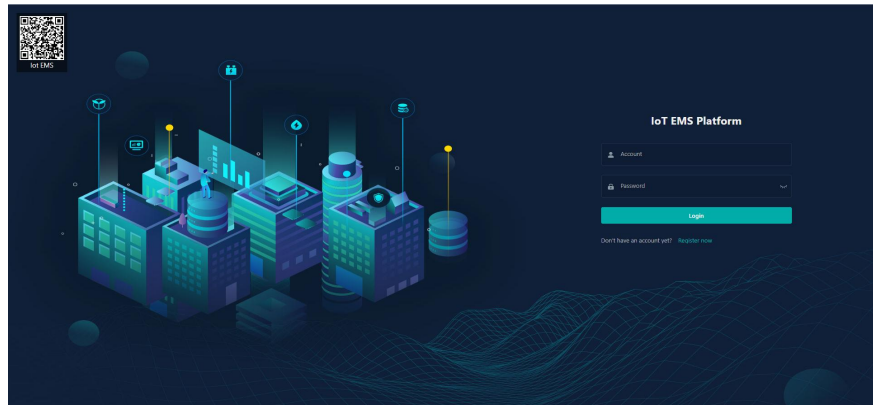
(2) APP Accesss (Mobile):

Download Link: https://play.google.com/store/apps/details?id=com.acrel.iotems
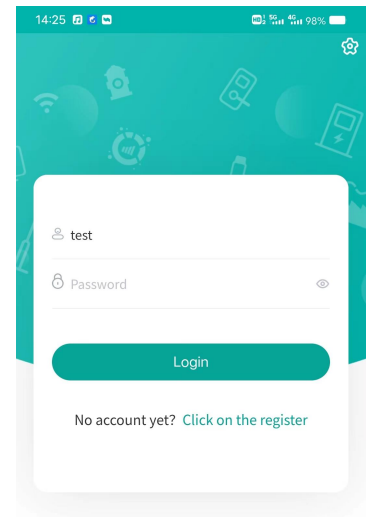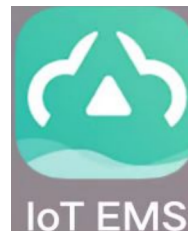
Test Account Name: acrel

Test Account Password: 123456

5. Acrel IoT Energy Monitoring System (Partail Introduction)
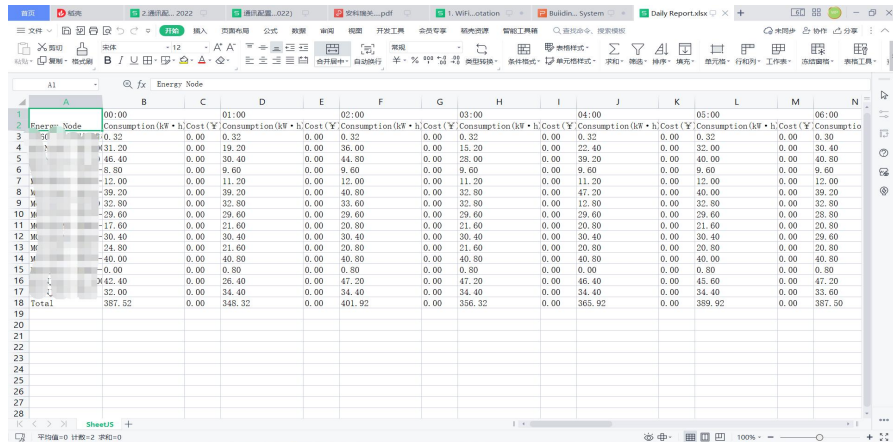
Main Function of WEB side System:

(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.
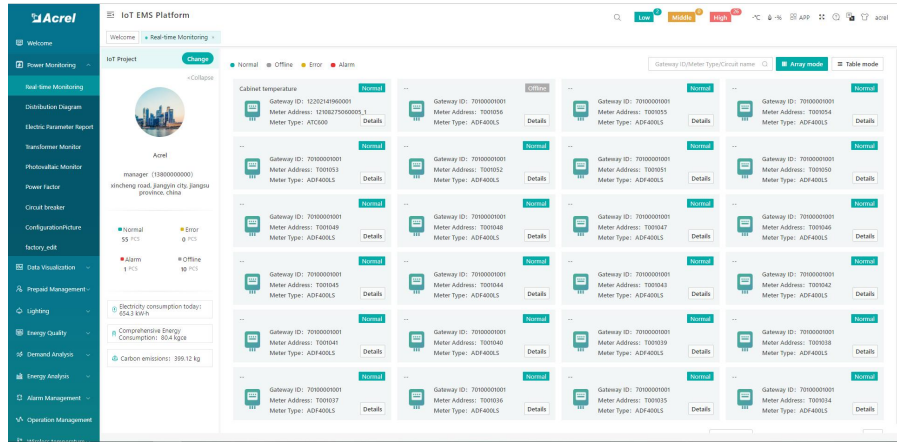
(2) History Curve: Showing the daily history data curve of all the data that could be collected and upload by energy meter or other basic metering devices.
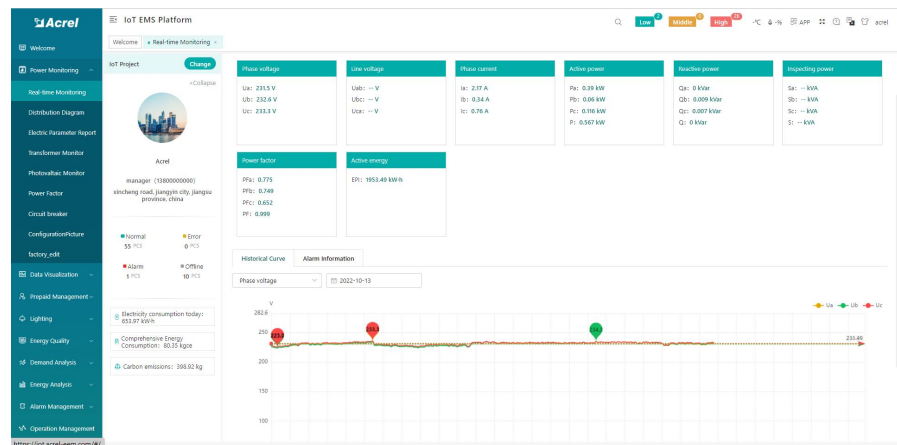
(2) History Curve: By selecting the items of "data" and "electricity parameter", platform can show the history curve of different data and date.

	Acrel 4G Based	Author: Aaron Shi
Acrel®	IoT Energy Monitoring Solution	E-mail: aaron@acrel.cn
	(1-phase Separate)	Website: www.acrel-electric.ke
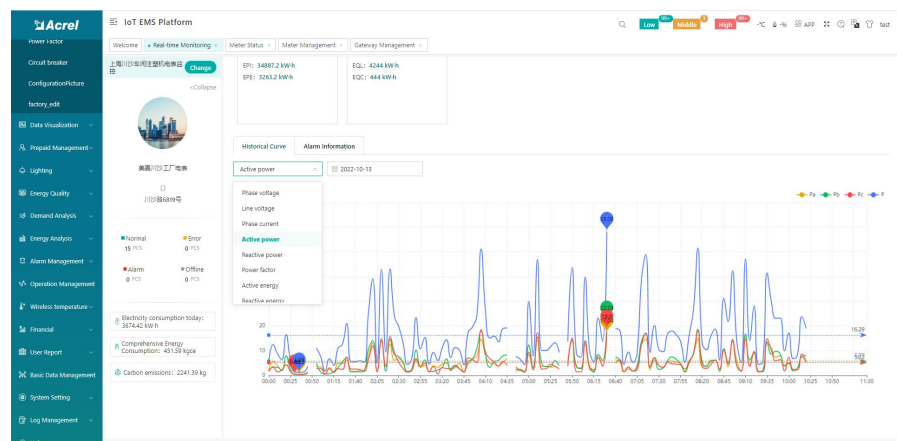
6. Acrel IoT Energy Monitoring System (Partail Introduction)

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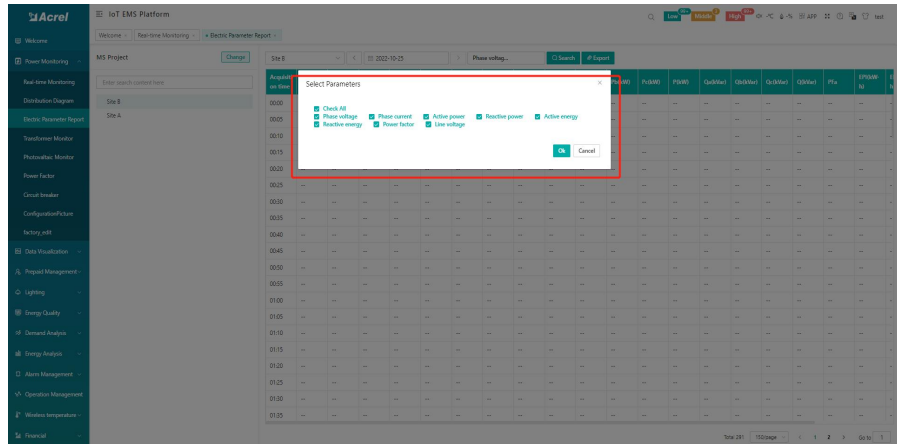
(3) Electricity Parameters Report: All the electricity parameters that could be collected by certain energy meter will showed as a report here.

(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.

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 consumtion report (calculated by forward active energy)

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

(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.

	Acrel 4G Based	Author: Aaron Shi
Acrel®	IoT Energy Monitoring Solution	E-mail: aaron@acrel.cn
	(1-phase Separate)	Website: www.acrel-electric. ke

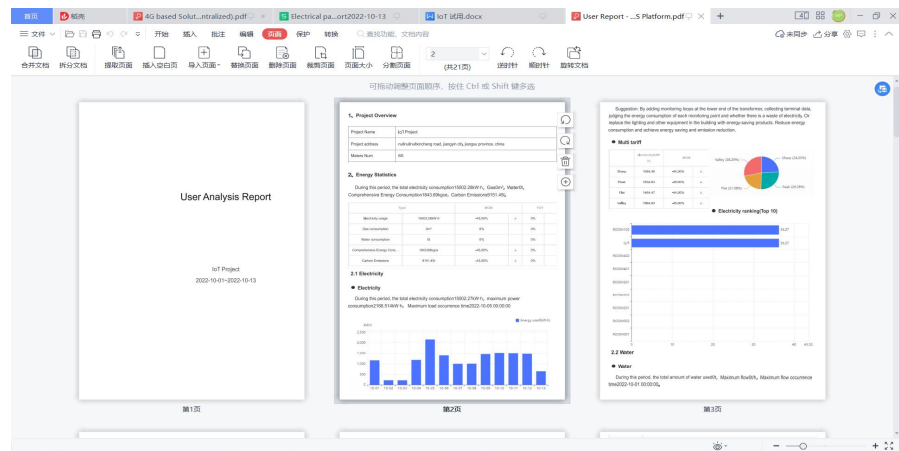## 5. Acrel IoT Energy Monitoring System (Partail Introduction)

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
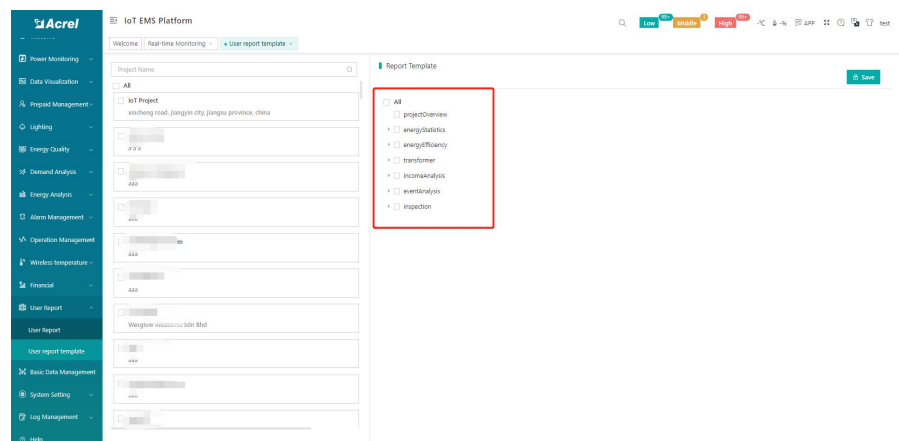
(5) User Report: A comprehensive user report including project overview, energy report, energy analysis and etc could be check on platform
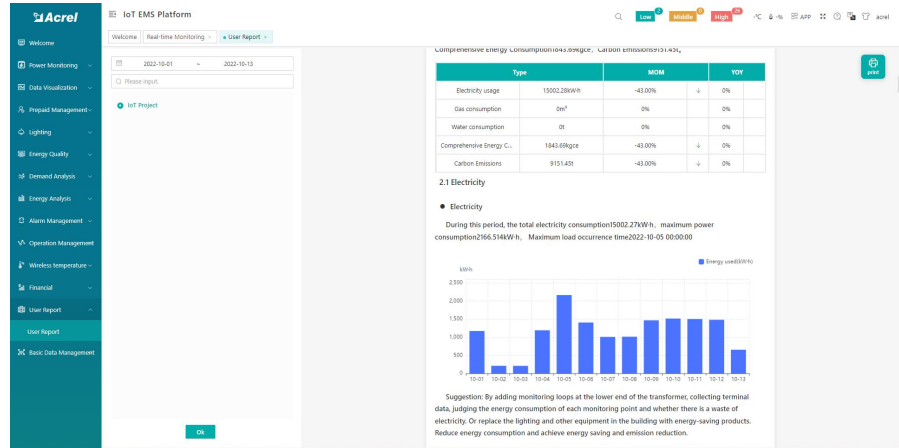
(5) User Report: User report could be exported in "PDF" format into your PC for convenient check and storage.

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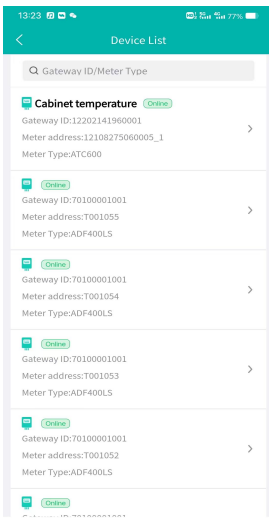
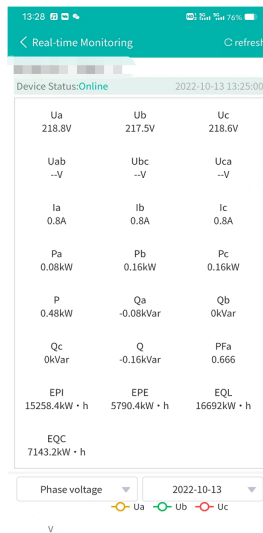## 5. Acrel IoT Energy Monitoring System (Partail Introduction)

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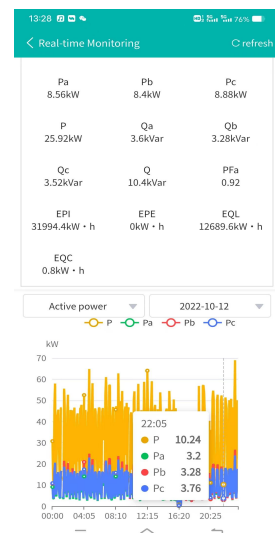
Noted: Since APP side and WEB side of Acrel IoT Energy Monitoring System share the same data, normally recommend our user to add the devices to their account using APP and check the data using WEB platform.
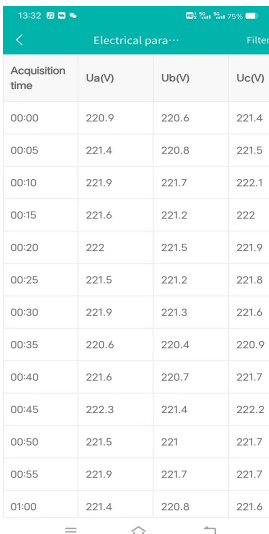

(1) Device List

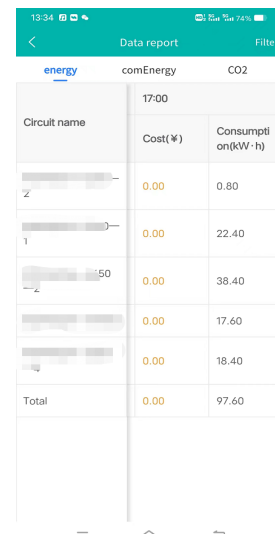(2) History Curve

(2) History Curve

(3) Parameter Report

(4) Energy Trend

(5) Energy Report