

1. Scenario Preset

- (1) There are 10 Areas with 3-phase Power System needed to be monitored
- (2) Each MDB has 20 circuits 3-phase needed to be monitored, circuits' rated voltage is 3x400Vac
- L-L and 3x230Vac L-N, circuit's rated current is 100A AC.

(3) For the place that we gonna install energy meter and WiFi gateway, it was covered by stable WiFi signal.

(4) All 3-phase energy meter will be of partial centralized installation in each MDB, which make it possbile for 1 AWT100-WiFiHW WiFi IoT gateway to support 20 (max 25, recommend 20) ADL400/ C 3-phase Energy Meters using RS485 wired communication in a close range within 300m.

2. Devices Deployment Plan

Area #1 - Power Circuit [3-phase] #1-1 ~ #1-20:

- 1* AWT100-WiFiHW IoT WiFi Gateway [Support energy meter in Area #1 for WiFi Data Upstream]

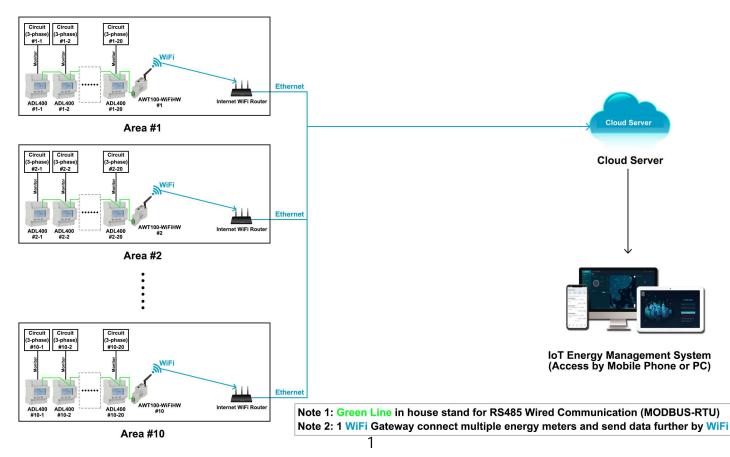
- 1* AWT100-POW Power Supply Module [For 85~265Vac/Vdc power supply of AWT100-WiFiHW]

- 20* ADL400/C 3-phase DIN-rail Energy Meter [For monitoring Power Circuit #1-1 ~ #1-20]

- 60* AKH-0.66/K K- 24 150/5 Split-core Current Transformer [Paired with ADL400/C for current input]

Area #10 - Power Circuit [3-phase] #10-1 ~ #10-20:

- 1* AWT100-WiFiHW IoT WiFi Gateway [Support energy meter in Area #10 for WiFi Data Upstream]
- 1* AWT100-POW Power Supply Module [For 85~265Vac/Vdc power supply of AWT100-WiFIHW]
- 20* ADL400/C 3-phase DIN-rail Energy Meter [For monitoring Power Circuit #10-1 ~ #10-20]
- 60* AKH-0.66/K K- 24 150/5 Split-core Current Transformer [Paired with ADL400/C for current input]

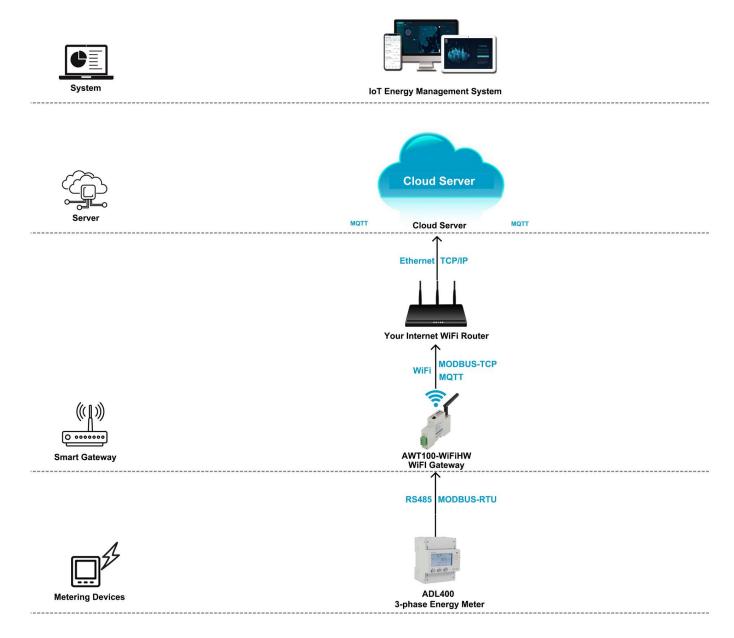




3. Communication Structure&Logic

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

(2) AWT100-WiFiHW gateway support upstream of WiFi communication with MQTT and MODBUS-protocol and downstream of RS485 communication based on MODBUS-RTU protocol. ADL400/C support upstream communication of RS485 communication based on MODBUS-RTU protocol.
(3) Based on the communication described in item (2), Acrel AWT100-WiFiHW gateway could receive the data from ADL400/C energy meter using RS485 communication while sending the data further to cloud server using WiFi upstream communication. Thus accomplish a complete communication from bottom metering devices to top system software.



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WiFi Upstream

RS485 Downstream

4. Hardware Devices Overview [Energy Meter & Paired IoT Gateway]

Model 1: AWT100-WiFiHW IoT WiFi Smart Gateway

- Upstream Comms.: WiFi [MQTT, MODBUS Protocol]-Downstream Comms.: RS485 [MODBUS-RTU Protocol]-Support: Up to 25 Downstream Devices via RS485.

- Auxiliary Power Supply: 85~265Vac [via AWT100-POW]
- Certificate&Standard: CE; CE-RED; IEC

Model 2: AWT100-POW Power Supply Module

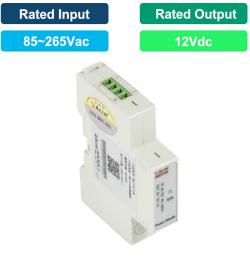
- Input: 85~265Vac

- Output: 12Vdc
- Application: Paired with AWT100-4GHW for 85~265Vac
- Power Supply Input [via PIN L & PIN N]
- Certificate&Standard: CE



IoT Gateway

MQTT&MODBUS





- Rated Current: 3x1(6)A AC (via paired CT)

- Wired Comms: RS485 Interface, MODBUS-RTU Protocol

- Rated Voltage: 3x380~456Vac L-L & 3x220~264Vac L-N

Model 2: ADL400 3-phase AC DIN-rail Energy Meter

- Monitoring: Up 1 circuits 3-phase [AC Metering]

- Certificate&Standard: CE; CE-MID; EAC



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3. Hardware Devices Overview [Energy Meter & Paired CTs]

Model 2: AKH-0.66/K K- 24 150/5 Split-core Current Transformer

- Current Ratio: 150A/5A
- Primary Current: 150A
- Secondary Current: 5A
- Accuracy: Class 0.5 or 1.0
- Certificate&Standard: CE
- More Introduction: https://www.acrel-electric.fr/product/split_core

_current_transformer_akh_0_66_k_24



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		(Choose Host Serv	Remark ice or Buy-out Service after 3
		been sent to cloud s	Il the meters across the country whose data has server through 4G,WiFi or Ethernet .	\$0 (recommended in pilot pro	oitect)	3-m	ial of Cloud IoT System) onth Free Trail ed to rent a cloud server))
	. 🚍	3.Provide IoT APP 4.Generate energy of	ading and data collection. for mobile phone side and IoT WEB for PC side. data report of daily, monthly and annually yeay and period-on-period energy analysis.	\$xxxx/Year (For 200 Po (Price for Host Service of recommended in pilot pro	ints) Only,	\$xx to buy Hosting S connected	Service for 1 monitoring point to the system 1 year eed to rent a cloud server)
Acrel Cloud IoT Energy Manager	ment System	5.Provide various a of the system and p	larm function to ensure a stable operation rotect your property. e trial of system with full technical support	\$xxxxPermanent (Limitless (Price for Buy-out Serv Only,recommended in late p	Points) ice	1-time charging of permanent use (Lin	\$xxxx for Buy-out Service of hitless monitoring points and need to be rent by users)
			Cloud Server				
Name			Description	Server Renting Price (For Reference Only			Remark
Cloud Server Cloud Server		Cloud. 2.Users of Cloud Ic cloud server when th System. And if they our Cloud IoT Syste rent on Amazon so	Id be rent on the cloud server provider like Amazon of Energy Management System only need to rent hey choose buy-out service of our Cloud loT are using hosting service or 3-month free trial of arm, we will use our own cloud server which has been that users don't need to rent a cloud server. Cloud Server is only a reference price that we have rud.	According to Specs of Rent Server	ed Cloud	1000~2000 monito (Serv	erver specs could support bings points connected to the system rer: 8 core 16G em: windows server 2016)
			WiFi Smart Gateway				
Overview Picture	USAGE&MO	DULE NAME	DESCRIPTION & SPECIFICATION	QUANTITY	FOB U	INIT PRICE (USD)	AMOUNT (USD)
		rt Gateway - WiFiHW	Upstream: WiFi (2.4&5GHz, support MQTT&MODBUS-TCP Protocol) Downstream: RS485 (MODBUS-RTU) Support: up to 20–25 Energy Meters within 400m using RS485 Wired Communication Power Supply: 85~265Vac/Vdc	10 pcs		1	I
I when		pply Module 0 -POW	Input: 85~265Vac/Vdc Output: 24Vdc Application: paired with AWT100 Series gateway for 85~265Vac/Vdc power supply input	10 pcs		1	I
			3-phase Energy Meter				
Overview Picture	USAGE&MO	DULE NAME	DESCRIPTION & SPECIFICATION	QUANTITY	FOB U	INIT PRICE (USD)	AMOUNT (USD)
		iil Energy Meter - 400	Communication: RS485 (MODBUS-RTU) Harmonic: Total and 2nd-31st harmonic Multi-rates(Optional): 4 Tariff Rates and etc. Rated Voltage: 3x380-456Vac L-L & 3x220-264Vac L-N (45-65Hz) Rated Current: or 3x1(6)A AC (via CTs)	200 pcs		1	I
			Paired CTs				
		ent Trasnformer δ/Κ Κ-φ24	Current Ratio: 150/5A AC Aperture: φ24mm (diameter) Accuracy: Class 1.0 Application: Paired with ADL400/C for current input, suitable for primary current below 150A AC.	600 pcs		1	I



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: acrelTest 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



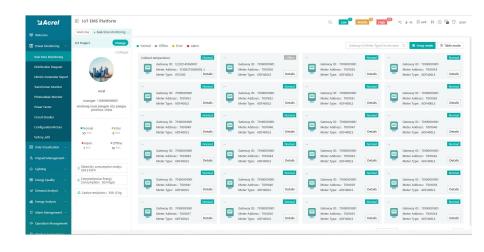
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	L	ogin	
	No account yet?	Click on the register	



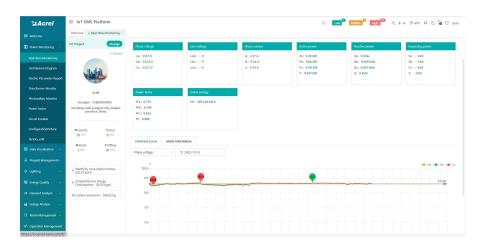
Main Function of WEB side System:

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

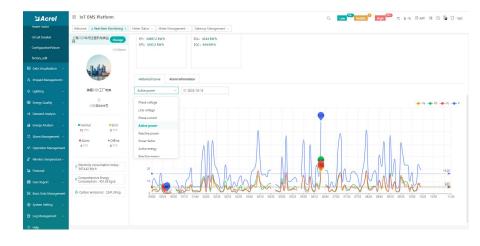
(1) Devices List: Showing the overall devices connected to Acrel System and were bond to certain project. SN code, Online-Offline status, devices model and other necessary information will be shown here.



(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.





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

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

Acrel	IoT EMS Platform											Q L	•• ⁶³ M	ddle 0	High	·< 4-	6 SR APP	: O	a 17 ac
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al-Sime Monitoring	Enter search content here	- N						Qb(kVar)											EPI(kW-
	* G/F	4	11.04	9	8.82	28.86	-9.54	~6.12	-7.2	22.86	14.58	10.92	11.46	36.96					139425
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sformer Monitor	ROOM002	24	9.84	8.46	8.46	26.76	-8.34	-5.82	-6.84	21	12.9	10.26	10.85	34.02					139429.
	> 1/F	98	10.14	8.76	8.76	27.66	-7.74	-6.06	-7.02	20.82	13.2	10.68	11,28	35.16					139432
ovaltaic Monitor	> 2/F	76	9.54	8.64	8.34	26.52	-8.28	-6.06	-6.6	20.94	12.6	10.56	10.85	34.02					139434
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	70100001001_T001003	46	9.78	8.58	8.4	26.76	-8.46	-6.05	-6.9	21.42	12.96	10.5	10.92	34.38					139448
ting ~	70100001001_T001004	56	13.56	11.4	11.82	36.78	3.36	-4.8	-6.35	14.52	15.48	12.36	13.44	41.28			-		139450
	70100001001_T001005	24	9.66	8.4	8.52	26.58	-8.52	-5.94	-7.02	21.48	12.9	10.32	11.04	34.26					139453
	70100001001_T001005	64	9.42	8.28	8.34	26.04	-8.28	-5.88	-6.95	21.12	12.54	10.14	10.85	33.54					139455
	70100001001_T001007 70100001001 T001008	86	9.36	8.16	8.28	25.8	-8.28	-5.82	-6.95	21.06	12.48	10.02	10.8	33.3					139457
ay Anahysis 🖂	70100001001 T001009	14	10.02	8.22	8.22	26.46	-8.28	-5.88	-6.84	21	12.96	10.08	10.68	33.72					139460
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ation Management	70100001001_T001012																		

(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.

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3 00:55	228.3	228.8	230.4				67.98	54.24	58, 56	13, 56	11.4	11.82	36, 78	3.36	-4.8	-6.36	14.52	15.48	12.36	13, 44	41.28			
4 01:00	228.5	228.8	230				56.52	45, 12	48,24	9.66	8.4	8,52	26.58	-8.52	-5.94	-7.02	21.48	12.9	10.32	11.04	34, 26			
5 01:05	227. 1	228	229.2				55.32	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			
5 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			
7 01:15	230. 3	231.1	232.5				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			
3 01:20	230. 5	231.2	232.8				55.56	44.28	46.08	9.66	8.28	8.16	26.1	-8.34	-5.94	-6.96	21.24	12.78	10.2	10.68	33.66			
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5 01:55	230.1	230.2	232				52.86	49.8	49.26	10.38	10.08	9.12	29.58	6.3	-5.34	6.9	18.54	12.12	11.46	11.4	34.98			
6 02:00	229.2	228.8	230.5				53.58	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			
7 02:05	231	230.7	232.8				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			
8 02:10	230. 1	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			i.
	SheetJS +																							



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

E IoT EMS Platform

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

		Change Energ	y Consumption Co	mprehensive Ener	gy Consumption	Carbon Dioxide	Emissions						
	Enter search content here	Energ	y Consumption: Ele	stric	S Date: D	ey 🗸 👔	2022-10-09	Qs	earch < Chart	# Export			
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				0.00	31.20	0.00	19.20	0.00	36.00	0.00	15.20	0.00	22.40
	0 (0.00	46.40	0.00	30.40	0.00	44.80	0.00	28.00	0.00	39.20
wegy Overview			1	0.00	8.00	0.00	9.60	0.00	9.60	0.00	9.60	0.00	9.60
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IoM Analysis	🖬 (🗙			0.00	32.80	0.00	\$2.80	0.00	33.60	0.00	32.00	0.00	12.80
nergy Trend	🖬 🔪 🗙		N.	0.00	29.60	0.00	29.60	0.00	29.60	0.00	29.00	0.00	29.60
	0		1	0.00	17.60	0.00	21.60	0.00	20.80	0.00	21.60	0.00	20.80
Collecting Report	2 JO			0.00	30.40	0.00	30.40	0.00	30.40	0.00	30.40	0.00	30,40
fuitiple Rate Report				0.00	24.90	0.00	21.60	0.00	20.80	0.00	21.60	0.00	20.80
nergy Rank				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	0.00
				0.00	42.40	0.00	26.40	0.00	47.20	0.00	47.20	0.00	46.40
							1.1.10		21.02		** #*		11.10

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

π	加加	5 2.通讯配	2022 🖓	5 通讯配置	.022) 🖵	🛃 安科瑞美pdf	् 🔄 १	. WiFiotation 👳 🔹	P Buildin	System 🖵 🌸 🚦	Daily Repor	txlsx ⊕ × +	6.	88 💿 🗕	Ð
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nere"	Node							f)Consumption(kW ·							
			0.00	0.32	0.00	0.32 36.00	0.00	0.32	0.00	0.32	0.00	0.32	0.00	0.30	
		46.40	0.00	30.40	0.00	44.80	0.00	28.00	0.00	39.20	0.00	40.00	0.00	40.80	
		-8,80	0.00	9,60	0.00	9,60	0.00	9.60	0.00	9,60	0.00	9,60	0.00	9,60	
			0.00	11.20	0.00	12.00	0.00	11.20	0.00	11.20	0.00	12.00	0.00	12.00	
		-39.20	0.00	39.20	0.00	40.80	0.00	32, 80	0.00	47.20	0.00	40.00	0.00	39.20	
		32.80	0.00	32.80	0.00	33.60	0.00	32.80	0.00	12.80	0.00	32.80	0.00	32.80	
		- 29, 60	0.00	29.60	0.00	29.60	0.00	29.60	0.00	29.60	0.00	29.60	0.00	28, 80	
			0.00	21.60	0.00	20.80	0.00	21.60	0.00	20.80	0.00	21.60	0.00	20, 80	
K		-30, 40	0,00	30, 40	0,00	30, 40	0.00	30, 40	0.00	30, 40	0.00	30, 40	0,00	29,60	
K		24, 80	0,00	21.60	0.00	20, 80	0.00	21.60	0.00	20, 80	0.00	20, 80	0,00	20, 80	
		40.00	0.00	40.80	0,00	40, 80	0.00	40, 80	0.00	40, 80	0.00	40.00	0.00	40, 80	
		0.00	0.00	0.80	0,00	0.80	0.00	0.80	0.00	0.00	0.00	0.80	0.00	0.80	
		42.40	0.00	26.40	0.00	47.20	0.00	47.20	0.00	46.40	0.00	45.60	0.00	47.20	
1		32.00	0.00	34, 40	0.00	34.40	0.00	34.40	0.00	34.40	0.00	34, 40	0.00	33,60	
lotal		387.52	0.00	348.32	0.00	401.92	0.00	356. 32	0.00	365.92	0.00	389, 92	0.00	387.50	
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平均值	-0 計版=2	表和=0									ふ 中・ 目	100% ·		-0	+ 3

(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.

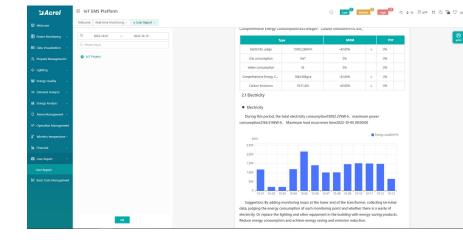
≌Acrel	IoT EMS Platform							Q	Low Nidd	e ⁽⁰ High ⁽²⁶	-c è-s 8	APP 22 ()	📲 🗘 acrai
I Welcome	Welcome Real-time Monitoring × User Report ×	Bectric	Parameter Report ×	Energy Report	×								
Power Monitoring ~	IoT Project Change	Energy	Consumption Co	mprehensive Ener	gy Consumption	Carbon Dicoide En	nissions						
🖾 Data Visualization 🖂	Enter search content here	Energy	Consumption: Ele	stric	U Date:	Month 🗠 🖽	2022-10	Q Sea	och < Chart	# Export			
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	RCOM001		Energy Node	Cost(5)	Consumption W-h)	Month		Cost(\$)	Consumption(k W-b)	Cost(\$)	Consumption(k	Cost(\$)	Consumptio
🐻 Energy Quality 🗸 🗸	ROOM002					Year	W-b)				1000		W-b)
56 Demand Analysis ~	> 🗌 1/F		G/F	0.00	2.76	0.00	2.92	0.00	2.01	0.00	2.17	0.00	1.72
so Demand Analysis ~	• 🗌 2/F		RDOM001										
🛍 Energy Analysis 🔷 🗠	 3/F 4/F 		RDOM002										
YoY Analysis	, A/F		Total	0.00	2.76	0.00	2.92	0.00	2.81	0.00	2.17	0.00	1.72
MoM Analysis	12203162030001_12203162030001_1												
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Energy Trend	232												
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Collecting Report	70100001001_7001003												
Multiple Rate Report	70100001001_7001004												
	70100001001_T001005												
Energy Rank	70100001001_7001006												
Loss Analysis	70100001001_T001007												
Energy Flow	70100001001_T001008												
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VA Operation Management	70100001001_1001012												



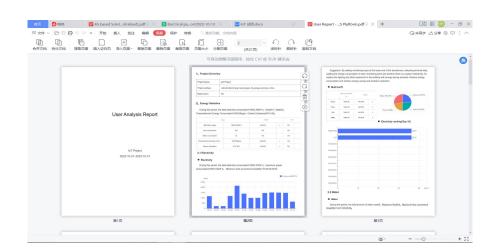
Main Function of WEB side System:

(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.

업Acrel	IoT EMS Platform	Q	Low 🥙 Middle ³ High ²⁰⁰ -C &-% S APP 🙁 🛈 🖥 🕆 test
	Welcome Real-time Monitoring × • User report template ×		
	Project Name Q	Report Template	
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Prepaid Management~	IoT Project	al Al	
	sincheng road. Jiangyin city, Jiangsu province, china	projectOverview	
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User Report	Weigtow museumus Sdn Bhd		
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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.

13:23 😰 🖼 💊	🖽 🖓 🖬 🖏 77% 🔲
C Device List	
Q Gateway ID/Meter Type	
📮 Cabinet temperature 🛛 🕬	
Gateway ID:12202141960001	>
Meter address:12108275060005_1	
Meter Type:ATC600	
Coline	
Gateway ID:70100001001	>
Meter address:T001055	/
Meter Type:ADF400LS	
Online	
Gateway ID:70100001001	
Meter address:T001054	>
Meter Type:ADF400LS	
Coline	
Gateway ID:70100001001	>
Meter address:T001053	,
Meter Type:ADF400LS	
Online	
Gateway ID:70100001001	>
Meter address:T001052	>
Meter Type:ADF400LS	
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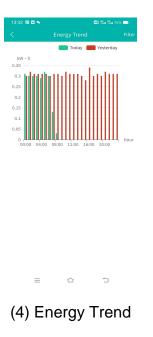
(1) Device List

13:32 😰 🖼 💊		B i %a %a	75% 🔜
<	Electrical p	ara…	Filter
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

13:28 🛙 🖼 💊		🕮 🖓 a 🖓 a 76% 🔲
Device Status:Online		2022-10-13 13:25:00
Ua	Ub	Uc
218.8V	217.5V	218.6V
Uab	Ubc	Uca
V	V	V
la	1b	Ic
0.8A	0.8A	0.8A
Pa	Pb	Pc
0.08kW	0.16kW	0.16kW
P	Qa	Qb
0.48kW	-0.08kVar	0kVar
Qc	Q	PFa
0kVar	-0.16kVar	0.666
EPI	EPE	EQL
15258.4kW • h	5790.4kW • h	16692kW • h
EQC 7143.2kW • h		
Phase voltage		2022-10-13 🔹
v	- O- Ua - O -	Ub -O- Uc

(2) History Curve





(2) History Curve

13:34 🕅 🖼 🛸		🕮 Sa Sa 74% 💶
<	Data report	Filte
energy	comEnergy	CO2
Circuit name	17:00	
	Cost(¥)	Consumpti on(kW · h)
z	- 0.00	0.80
)-	- 0.00	22.40
	0.00	38.40
	0.00	17.60
	0.00	18.40
Total	0.00	97.60
=	\bigcirc	1

(5) Energy Report