# HAC-ML Wireless Remote Meter Reading System V1.0





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### **1.System Overview**

The HAC-ML (LoRa) wireless remote meter reading system (hereinafter referred to as HAC-ML system) integrates acquisition, measurement, two-way communication, meter reading and valve control. The system includes: wireless meter reading module HAC-ML, concentrator HAC-GW-L, handheld unit (handheld unit meter reading terminal) HAC-RHU, iHAC-ML meter reading charging system (WEB server).



Main features of HAC-ML system:

#### 1) Ultra long-distance communication

- LoRa modulation mode, long communication range.
- Concentrator and meter communication distance: 3-5km in urban environment; 10-15km in rural environment.
- Handheld unit and meter communication distance: 3km.

#### 2) Ultra low power consumption and long service life

- > The average power consumption of meter module is  $\leq 20$ uA.
- Three working modes of system: LOP1, LOP2, LOP3, response time: 12s, 24h-12s, 24h; according to ER18505 battery only use 50% capacity, the lifespan of meter module is 8 years, 10 years, 12 years. In actual use, user can switch any working mode by the concentrator.

#### 3) Anti-interference, high reliability

- Frequency hopping technology avoids co-channel interference and improves transmission reliability.
- Utilizing the patented technology of TDMA time division multiple access communication, the communication time unit is automatically synchronized to avoid data collision.
- Adopt the transmission rate and transmission distance adaptive algorithm to prevent

interference and increase system capacity.

#### 4) Large management capacity

- The concentrator can support up to 5,000 meters. The concentrator stores 5000 pieces of data; stores each meter with a 10-year annual freeze and a monthly freeze data for the last 12 months.
- The transmission rate and transmission distance adaptive algorithm are adopted to effectively increase the system capacity.
- The system is easy to expand: it is compatible with water, gas and heat meters, and it is convenient to increase or decrease; neighboring cells can share concentrators.

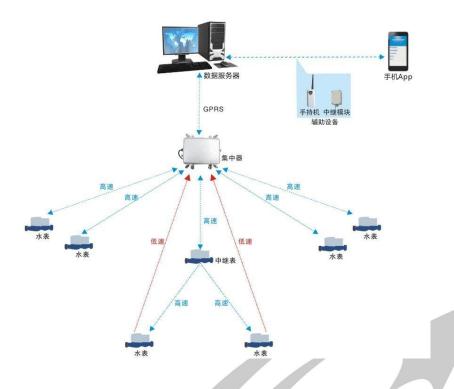
#### 5) Easy installation and high success rate of meter reading

- Dual meter reading mode: 24h active reporting of metering data; real-time meter reading control valve (switching valve).
- Concentrator multi-core RF design, receiving multi-frequency, multi-rate data at the same time.
- > Meter reading by handheld unit and meter reading by single point

### 2. System Topology

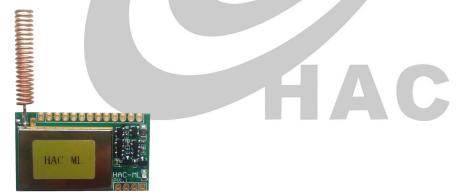
The HAC-ML module and the HAC-GW concentrator adopt the networking mode of uplink star network and downlink simple mesh network, simplify the uplink data transmission channel, improve the system channel utilization rate, optimize the downlink communication network, and reduce system data transmission delay, improve network reliability. At the same time, the synchronous network is adopted to avoid collision probability during data transmission, improve transmission efficiency, realize precise downlink control, and further reduce system power consumption.

The HAC-ML networking system is convenient, concise, and flexible. The network has no boundaries and is convenient for maintenance, adjustment and expansion.



# **3.HAC-ML Module**

The HAC-ML module is a new generation wireless communication product based on LoRa communication technology and combined with practical application requirements, including data acquisition and wireless transmission functions, with long transmission distance, ultra low power consumption, anti-interference, reliable performance ,easy to install, small size and so on.



# **3.1. HAC-ML Module Feature**

1) Active bubbling transmit data every 24 hours.

2) Provide multi-channel, multi-rate automatic switching, effectively improve system capacity.

3) TDMA time division multiple access communication mode, automatic synchronization

communication time unit, can completely avoid data collision.

4) Adopt frequency hopping technology to avoid co-channel interference.

5) Three working modes:

LOP1 (remote wake-up in real-time, 12 seconds copy control, battery life is more than 8 years)

LOP2 (the response time of valve-off is up to 24h, the response time of valve-on is 12s, and the battery life is more than 10 years)

LOP3 (the response time of valve on/off is up to 24h, the battery life is greater than 12 years) 1)It has functions such as acquisition, measurement, valve control, wireless communication, soft clock, ultra-low power consumption, power management, and anti-magnetic attack.

- Support single and dual dry pulse metering, or user can purchase direct-reading metering method, fixed metering method before leaving the factory.
- > Power management function, detect the transmit status or control valve voltage and report.
- The magnetic attack detection function generates an alarm flag when detecting a malicious magnetic attack.
- Supports power-off storage function. After the module is powered off, it is not necessary to re-initialize the measurement value.
- Support frozen data reading, the monthly and annual forzen data can be read via concentrator.
- > With valve dredging function, which is configured by the supported software.
- Support wireless near or remote parameter settings.
- 2) Utilizing the magnetic trigger meter data reporting or meter automatically bubble data.

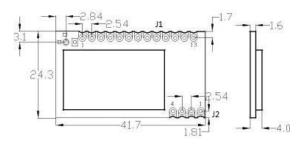
3)With standard spring antenna, flexible circuit board antenna or other metal antenna can also be customized according to user products.

4)Optional welding farad capacitor (or user own can solder it).

5)Optional 3.6Ah capacity lithium ER18505 battery, the waterproof connector can be customized.

6)If the user adopts 4 dry batteries, 6V power supply is required, and the corresponding power management circuit can be customized.

# 3.2. HAC-ML Module Structure and Interface Definition



The two directions of antenna can be selected (the unit of dimension:mm).

Interface definition and description J1 (J2 is reserved)

Pin No.	Name	Pin description	
1	EPW	External power supply output	
2	GND	Ground	
3	MR1	S1 access terminal of reed switch	
4	MR2	S2 access terminal of reed switch	
5	GND	Ground	
6	OPEN	Valve open position detection	
7	CLOSE	Valve close position detection	
8	C-	Farad capacitor is negative	
9	GND	Ground	
10	VCC	+2.8~6.0VDC	
11	V-	Valve control is negative	
12	V+	Valve control is positive	
13	C+	Farad capacitor is positive	

Note: The farad capacitor withstand voltage must be greater than the supply voltage.

- VCC: Standard 3.6V ER18505 battery positive or 4.5V dry battery, 6V power supply needs to be customized.
- EPW: The standard is to provide a 3.0V regulated power supply to the outside, the maximum current is 100mA, this function needs to be customized and opened.
- S1 and S2 access terminals of reed switch: When the dual reed switch is metering, only one metering pulse is generated after the interleaved low pulse respectively. If it is low for more

than 2 seconds at the same time, it will not be metering and suggests a magnetic attack alarm state. For a single reed switch, S1 is pulse metering and S2 can be used as a magnetic attack detection input terminal.

- The detection end of valve control. V+/V- is used to control the valve switch, and OPEN/CLOSE detects if the valve is in place. For gauges that are not connected to position detection, the valve control controls the valve in a controlled timeout (water valve is 20 seconds, gas valve is 3 seconds). The valve controls the limited flow function and limits the valve drive current to no more than 160mA.
- HAC-ML module can be widely applied to wireless remote meter reading system, the module can be integrated into the meter, or it can be installed in the appropriate position.

Working frequency	865-867Mhz
Effective transmit power	17dBm
Frequency stability	±5PPM
Sensitivity	<-136dBm
Operating temperature	-20~70°C
Working banwidth	125kHz/250kHz
Working voltage	+2.8~6V
Receive current	≤20mA
Transmit current	≤130mA
Transmit time	The maximum transmit time is ≤1.5s
Transmit distance	3-5km in urban area; 10-15km in rural area.
Valve electrical parameters	Voltage is $2.8 \sim 6V$ , current is $\leq 160$ mA
Sleep current	≤8uA
Average working current	≤20uA
Dimension	42.1mm*24.8mm*3.2mm

# **3.3. HAC-ML Module Technical Parameters**

#### **3.4. HAC-ML Module Instructions**

#### 1) Initialization setting

- When the module is used for the first time, the data is randomly reported once a day, waiting for the concentrator to allocate time slices, and after doing this, the data is reported every day according to the allocated time.
- The HAC-ML module provides multiple channels and rates, and the module autonomously switches the working channel and rate by analyzing the current communication quality and signal strength.
- After changing the battery, there is no need to reset the metering value. The module supports the function of saving data when power is off.

#### 2) Workflow

- When the module is powered on, the LED flashes once every 60 milliseconds, and it enters the normal working mode after detecting the normal voltage or up to 30 seconds.
- The HAC-ML periodically transmits once every 24 hours, waiting to receive feedback from the concentrator to determine whether there is a control command.
- After the HAC-ML is installed in the field, user can use the button or magnetic switch trigger mode to transmit data once, which can be used as an installation test.

# 4.HAC-GW-L Concentrator

Based on LoRa wireless communication technology,HAC-GW-L (concentrator) adopts multicore RF simultaneous operation design to realize long-distance, high efficient and reliable data transmission. The HAC-ML system adopts a star network structure and node management is very simple. Networking communication uses node time slice design to avoid data collision probability and improve the overall stability of the system.



### 4.1. HAC-GW-L Main Features

1) With multi-core RF design, it can receive multiple frequency points and multiple rates of data at the same time.

2) Effective communication distance with the acquisition module: 3-5km in urban environment;

10-15km in rural environment

3) The uplink planetary network structure, the downlink one level meter routing, the data communication path is simple, and the network operation is convenient.

4) The meter module ID registration management automatically filters the meter data.

5) The HAC-GW-L concentrator can support up to 5,000 meters and store 5000 uplink data. It can query the storage data of a specific time period through the server. At the same time, it can save the annual freeze data of each meter for nearly 10 years and the monthly freeze data of nearly 12 months.

6) Save the data that needs to be downlinked, and save 1000 data at the same time. The server can query, delete, and increase the downlink data of the specified node or all nodes at any time.

7) It is possible to broadcast all the meters, or select some parts for broadcasting.

8) GPRS or LTE communication functions, it can be operated remotely: broadcast information management, uplink and downlink data management, system remote upgrade and other functions.

9) The customer can set the network connection parameters (IP, domain name, port) through the serial port.

10) We HAC provides a corresponding dynamic data link library to support server development.

11) Support upgraded remotely. After the gateway connects to the server, the server can remotely upgrade the gateway program.

12) IP67 waterproof metal case for outdoor use.

13) Power indicator, wireless communication indicator, GSM/LTE online indicator.

14) Industrial power supply with 110V-220V AC/DC, dimension: 160mm  $\times$  110mm  $\times$  60mm.

# 4.2. HAC-GW-L Basic Function

The concentrator mainly includes three functions: meter ID management, meter uplink data management, and server downlink command management.

1) Meter ID management: download, delete, add and read. The management of meter ID stores parameters such as the ID value of management node and the corresponding time slice interval of the current concentrator. The time slice parameter is sent to meter each time the data is reported to the ACK returned by the concentrator.

2) Meter uplink data management: storage and read. Each time the matched bubble data is

automatically backed up to FRAM (Ferroelectric Memory), all data within a certain period of time can be read remotely by the server.

3) Broadcast information management: download of broadcast content, download, delete, and read of broadcast ID. The broadcast information includes the broadcast data content part and the broadcast meter ID part. The two parts of the content need to be sent to the concentrator separately. Only the nodes that are within the broadcast ID will be broadcasted. After a successful broadcast, the node will automatically expire and will not be repeated. Broadcast data is not been sent repeatably.

4) Server downlink data management: read, delete, and increase the downlink data of specified or all meter IDs. The concentrator can store up to 1000 downlink data, and can read, add, delete, etc. the data stored by the specified or all nodes.



### 4.3. HAC-GW-L Connection Port Definition

# 4.4. HAC-GW-L LoRa Module Technical Parameters

Working voltage	+4.75~5.25V						
Working frequency	865-867Mhz						
Frequency stability	±2.5PPM						
Working bandwidth	125KHz						
Transmit power	17dBm/27dBm						
Transmit current	<350mA						
Receive sensitivity	-136dBm						
Receive current	<60mA						
Working temperature	-40°C~80°C						

# 4.5. HAC-GW-L GPRS Module Technical Parameters

Working frequency	EGSM900/DCS1800MHz
Maximum transmit power	EGSM900 Class 4 (2 W)

	GSM1800 Class 1 (1 W)
Receive sensitivity	<-106dBm
Voltage	4.0V
Working temperature	-40°C ~80°C

# 5. iHAC-ML Meter Reading Charging System(WEB server)

# 5.1. iHAC-ML Account Management

### 5.1.1. Login Account

Account and password maintenance, create a new account, user can assign cells to existing or new accounts. Accounts established by different administrators are independent of each other.

nagement>>login account lo. PID	Account Name						1
	Account Name	-					
00107		Password	Account Type	Tel	Notes	Creator	Create Date
1 23495	admin	12345678	管理员(manager)	11111		admin	2018-01-23 14:56:10
2 23495	test	11111111	管理员(manager)	12345678		admin	2018-11-20 11:46:59
3 23495	cs23163	11111111	管理员(manager)	123		admin	2019-01-15 09:11:42
4 23852	SHDH	11111111	manager	13410868276		admin	2019-03-22 09:26:42
5 1234	test1	11111111	管理员(manager)	13410868276		admin	2019-03-22 09:32:59
6 21997	zhgc	11111111	管理员(manager)	13410868276		admin	2019-04-24 10:30:42
7 1234	test2	11111111	管理员(manager)	123456789	11	admin	2019-05-15 17:38:53
8 21997	test3	12345678	管理员(manager)	123456	123465	admin	2019-05-15 17:41:13
9 21997	test4	12345678	管理员(manager)	155		admin	2019-05-15 18:04:00
10 21997	testchen	11111111	管理员(manager)	11	11	admin	2019-06-14 17:52:27
11 23749	testchen1	11111111	管理员(manager)	13410868276		admin	2019-06-14 18:29:50
12 23749	testchen2	11111111	管理员(manager)	11	11	admin	2019-06-14 18:32:44
	3         23495           4         23852           5         1234           8         21997           7         1234           8         21997           9         21997           10         21997           11         23749	2         2465         c2343           4         2355         SHCM4           5         1224         text1           6         12097         dhpc           7         1224         text2           8         20077         text3           9         20077         text4           9         20077         text4           10         21097         text4	2         24495         a22403         1111111           4         24852         SHDH         1111111           5         1234         Isaft         1111111           6         1234         Isaft         1111111           7         1234         Isaft         1111111           8         20907         Isaft         12245878           9         20907         Isaft         12245878           9         20907         Isaft         12245878           9         20907         Isaft         12245878           10         20497         Isaft         1111111           11         22449         Isaftement         1111111	2         2495         cc2140.3         111111         管理员manageri           4         2455         SFUH         111111         manageri           5         1224         Math         111111         管理员manageri           6         1224         Math         111111         管理员manageri           7         1224         Mat2         111111         管理员manageri           8         21097         Mat2         111111         管理员manageri           9         20077         Mat3         C234078         管理员manageri           9         20077         Mat4         C234078         管理员manageri           9         20077         Mat4         111111         管理员manageri           10         224097         Mat4         111111         管理员manageri	2         24495         oc21403         1111111         管표型message)         123           4         2450         SHD+4         1111111         Image: 141408277           6         124         Math         1111111         TatEmmager)         144088278           6         1254         Math         1111111         TatEmmager)         124088278           7         124         Image: 1111111         TatEmmager)         124088276           8         2097         Image: 1234978         TatEmmager)         1244978           9         2097         Image: 1234978         TatEmmager)         124497           9         2097         Image: 1234978         TatEmmager)         15           10         20497         Image: 111111         TatEmmager)         15           11         2749         Math         111111         TatEmmager)         15	2         24967         a2163         111111         TB Signarayan         224           2         2450         B404         111111         mayor         124060274           6         1244         Math         111111         TB Signarayan         124060276           7         1244         Math         111111         TB Signarayan         124060276           7         1244         Math         111111         TB Signarayan         1240579           7         1244         Math         111111         TB Signarayan         1240579           8         2097         Math         1224578         TB Signarayan         1240579         145           9         2097         Math         1224578         TB Signarayan         154         145           9         2097         Math         111111         TB Signarayan         154         145           10         2149         Math         111111         TB Signarayan         154         154	2         24945         02140         111111         TREMEntanger         23         adm         adm           4         2452         SE404         111111         magn         140408278         adm         adm           5         224         Math         111111         TREMEntanger         140408278         adm         adm           6         2047         Mag2         111111         TREMentager         140408278         adm         adm           7         124         Math         111111         TREMentager         12449710         1         adm         adm           8         2097         Math         1224971         TREMentanger         12449710         14060000         adm         adm           9         2097         Math         T224971         TREMentager         15         adm         adm           9         2097         Math         111111         TREMentager         14060276         adm         adm           10         2074         Math         111111         TREMentager         14060276         adm         adm

1) User can directly enter the number of pages and jump. In this column, the display is the total number of lists.

2) The account number is unique and cannot be repeated.

3) When creating a new account, be sure to determine the user type of the account so that it can use the supported software as expected. The account and password cannot have Chinese.

Password	Account Type	Tel		Password	Account Type	Tel	
2345678	管理员(manager)	11111	13	2345678	管理员(manager)	11111	
1111111	管理员(manager)	12345678		111111	管理员(manager)	12345678	
			11	111111	管理员(manager)	123	
1111111	管理员(manager)	123	11	111111	manager	13410868276	
1111111	manager	13410868276	11	111111	管理员(manager)	13410868276	
1111111	管理员(manager)	13410868276		111111	管理用(mananer)	13410868276	
1111111	管理员(manager)	13410868276	1	Assign community permi	Telescold II		
1111111	管理员(manager)	123456789	10		Name: admin		
2345678	管理员(manager)	123456	1.	☑ 1:测试1			
2345678	管理员(manager)	155	1.	2.hy			
1111111	Modify the account info	×	1	☑ 3.演示			
1111111	PID 23495			☑ 4.观试			
1111111							
	Account Type 管理员	(manager) •		≤ 5.测试2			
	Account Name admin			✓ 6:奥试专用			
	Password 123456	578		☑ 7:创意园			
	Tel 11111						
	Notes			🗹 8.dahua			
				ef 9:1			
				I1:获海国利			

# 5.1.2 Account Type

The account type is divided into four basic types: administrator, reporter, meter reading staff,

and charger. User can also customize other account types and assign permissions to their types. Only when permissions are assigned, user can see the related menu on the left. And including the button function of some pages, the administrator can assign permissions to his subordinate account types.

tenu Admin menu	Account Ty	pe	Query Add Edit Delete Assig	n Privileges						
Account management		gement>>Account I			_					
ogin Name		No.	Account Type	0	Description					
count Type		1	管理员(manager)	管理员(manager)				admin		
rt Management		2	管理员(manager)	管理员(manager)				test		
Management		3	报装员(reporter)	小区、业主报装(community and user re	port)			test		
nagement		4	抄表员(reader)	抄表(read meter)				test		
settings		5	收费员(cashier)	收费系统(charge system)				test		
manage		6	管理员(manager)	管理员(manager)				cs23163		
manage		7	报装员(reporter)	小区、业主报装(community and user re	port)			cs23163		
		8	抄表员(reader)	th=(read mater)				cc72162		
		9	收费员(cashier)	Assign permissions						
		10	manager	Account Type: 管理员(manager)					Â.	
		11	reporter	发送短信(Send SMS)	<ul> <li>✓ 登想账号(Login Account)</li> <li>✓ 小区接続(Community Report)</li> <li>」地图标注(Mark Map)</li> </ul>					
		12	reader	✓ 账号类型(Account Type)						
		13	cashier							
		14	管理员(manager)	✓ 业主报装(User Report)						
		15	报装员(reporter)	☑ 业主开户(Open Account)	☑ 业主充	值(Recharge)				
		16	抄表员(reader)	✓ 业主损责(Change Meter) ✓ 业主过户(Change Name)						
		17	收器员(cashier)							
		18	管理员(manager)	☑ 修改价格类型(Modify Price Type)	✓ 删除整	个小区的业主(	(Delete All Users)			
		19	报装员(reporter)	☑ 集中器 数据管理(Gateway Data Management)	● 集中器	」广播管理(Ga	teway_Broadcast		-	
		20	抄表员(reader)		Mananama	ann				
		21	收器员(cashier)	提	交(Submit)	全选(All)	重置(Reset)	取消(Cance	I)	
		22	管理员(manager)						11.	

# 5.2. iHAC-ML Registration and Installation Management

#### 5.2.1 Community registration and installation management

In the list of community registration and installation management, user can see the number of meters, which is calculated by the supported software combined owner's register and install. (In the add operation, one concentrator can manage multiple communities, but the concentrator number between different administrators cannot be the same, otherwise the concentrator number already exists. The super administrator belongs to the global and cannot add communities.)

Menu Admin menu	comm	unity name	<	concentrator	Address	SMS function Dont open 🔻	Meter Type Select -	Query	Add Edit	Delete			
Account management	Report	ting manager	ient >> Commi	anity Reporting									
Report Management		No.	commNo	community name		Address	conce	ntrator	Meter Type	Meter Sum	SMS function	Notes	
Community		1	17	testchen	25.65		23749:0,		water,gas,heat	2	Not Open		
1 User	8	2	16	test_chen	西丽大学城		98765:0,		water,gas,heat	ē	Not Open	11	
Device Management		3	15	SenBai	XII		9998:136,		water		Not Open	1	
Query Management		4	14	test	111		9998:11,		water		Not Open	11	
Advanced Settings		5	12	應检部222	西西		20864:123,		ammeter	1	Not Open		
Payment manage		6	11	珠海國測	抹海		20859:1,		water,gas,heat	e	Not Open		
		7	9	1	1		1:1.		water		Not Open	1	
		8	8	dahua	Dahua Community		433.43333,208	41:51,	water,heat,amr	n	Not Open		
		9	7	创意园	创意园		521:10,		water		Not Open		
		10	6	测试专用	公司		20547:123211	3,	ammeter		Not Open	測试	
	8	11	5	测试2	深圳2		66666.123,		water		Not Open		
		12	4	演试	测试地址		20193.123456	678 12345,	water		Not Open		
		13	3	演示	深圳南山		1234:1235645		water		Not Open		
		14	2	hy	huayi		20555:123123		ammeter		Not Open	測试	
		15	1	测试1	南山区		8888:1888888	3888,	water,gas,heat	ε	Not Open		

### 5.2.2 Proprietor's registration and installation management

1) Add: add proprietor's information individually

2) Modification: modify the proprietor's information. For the proprietor who has opened the account, only the address, phone number and remarks can be modified.

3) Open an account: for the proprietor has been registered and installed to choose the price type to open an account, before opening the account, the price type must be set in the current payment

management, and the account can be opened in batches.

4) Delete an account : users who have not owed money can cancel their accounts.

5) Delete: a single unopened owner can be deleted.

6) Change the meter: after adding the complete frozen data, the meter can be changed.

7) Transfer an account : An account can be transferred after settling the cost.

8) Modify the price type: modify the price type of the user after opening the account.

9) Delete the entire community proprietor: If there is a proprietor who owes money, it will not be able to delete it.

10) Import: add proprietor information in batches, support registration and installation in batches, format can refer to the downloaded template.

11) Export: export all proprietor information of the current community.

=				Welc	ome to use N	1L A								
C	ommunity	/ 1:演	式1 、	Me	eter No	name		Tel	User No					
cor	centrato	r 8888	1888888888	Account	t status select	Address	M	odel 选择文件 #	未选择任何文件	mport				
Q	uery Ad	ld E	dit Delete User	Delete	Open Account	Change Price Type	Change Meter	Transfer Delete	All Users Export					
Re	portina m	anage	ment >>User rep	orting										
-	No.		name		User No	concentrator	Meter No	Meter Type	Already open acc	Account balance	Initial month	Initial reading	Tel	
	1	6	E产测试-3	001		8888	123456789	ammeter	No	0.0	2019-02	2.5	3	深圳性
	2	4	E严测试-1	sc001		8888	184602990	water	No	0.0	2018-11	0	1	深圳生
	3	4	E产测试-2	003		8888	184602991	water	No	0.0	2018-11	0	2	深圳性
	4	)	yf2测试	1000		8888	10	water	1	-10.0	2018-11	2.35	123567	深圳al
	5		F津华仪25-C	1890		8888	2018111621	water	No	0.0	2018-11	0	21	深圳
	6	7	F津华仪26-C	1891		8888	2018111622	water	No	0.0	2018-11	0	22	深圳
	7	1	F津华仪27-C	1892		8888	2018111623	water	No	0.0	2018-11	0	23	深圳
	8	1	€津华仪28-C	1893		8888	2018111624	water	No	0.0	2018-11	0	24	深圳
	9	Ŧ	F津华仪29-C	1894		8888	2018111625	water	No	0.0	2018-11	0	25	深圳
	10		€運华仪30-C	1895		8888	2018111626	water	No	0.0	2018-11	0	26	深圳
	11	-	F津华仪31-C	1896		8888	2018111627	water	No	0.0	2018-11	0	27	深圳
	12	1	F津华仪32-C	1897		8888	2018111628	water	No	0.0	2018-11	0	28	深圳
	13		F連华仪33-C	1898		8888	2018111629	water	No	0.0	2018-11	0	29	深圳
	14		€聿华仪34-C	1899		8888	2018111630	water	No	0.0	2018-11	0	30	深圳
	15		F津华仪35-C	1900		8888	2018111631	water	No	0.0	2018-11	0	31	深圳
	16		F津华仪36-C	1901		8888	2018111632	water	No	0.0	2018-11	0	32	深圳
	17	1	F津华仪37-C	1902		8888	2018111633	water	No	0.0	2018-11	0	33	深圳
	18	1	E津华仪38-C	1903		8888	2018111634	water	No	0.0	2018-11	0	34	深圳
	19		F津华仪39-C	1904		8888	2018111635	water	No	0.0	2018-11	0	35	深圳
	20		E津华仪40-C	1905		8888	2018111636	water	No	0.0	2018-11	0	36	深圳
	21		F津华仪41-C	1906		8888	2018111637	gas	No	0.0	2018-11	0	37	深圳A
	22		F津华仪42-C	1907		8888	2018111638	heat	No	0.0	2018-11	0	38	深圳b.
	23		€津华仪43-C	1908		8888	2018111639	ammeter	No	0.0	2018-11	0	39	深圳C
	24	1	F津华仪44-C	1909		8888	2018111640	water	No	0.0	2018-11	0	40	深圳d-

### 5.3. iHAC-ML Device Management

#### 5.3.1 Concentrator management

#### **5.3.1.1 Information Management**

Register, delete, bulk register and read of meter ID.

1) Export the proprietor meter ID, and export the meter ID registered and installed by the proprietor for batch registration to the concentrator.

2) Download the meter ID, user can first save the template file to the local by clicking the template, fill in the meter ID that needs to be downloaded in batches (up to 5000), click to select the file, select according to the storage location, click the download meter ID button after the selection is completed. The download meter ID is a batch add. Note that the new download meter ID will overwrite all meter IDs that existed before in the concentrator.

3) Register \ delete the meter ID, the meter ID set can fill in one or more meter IDs, when multiple meter IDs, separated by English commas.

4) Read all the meter IDs, read all registered meter numbers from the concentrator, and export, view, update, etc.

#### 5.3.1.2 Data Management

1) The command to be sent: there is no need to enter the meter number, click to read, all the

pending instructions can be read in the concentrator (here is the delay control valve command issued to the concentrator).

2) **Frozen data:** user can read the data of a single meter when meter number is input, if not input, the frozen data of all the meters will be read in the concentrator (the frozen data will be automatically classified, it's divided into monthly and annual freeze, when all frozen data is read, it will take a long time).

3) Flow data: read the uplink data for a certain period of time, starting from the selected time and ending at the current time of the system.



#### 5.3.1.3 Broadcast Management

The page download meter ID operation are somewhat similar with the information management page batch registered ID function operation. The meter ID of broadcast operation will be required to be registered to the concentrator first, and the specific broadcast operation can be performed according to the gray text reminder.

e 👘 👘 💷 1113	
Menu Admin menu Concentrator_Broad	Jcast Management
III Account management Community 1:测试:	▼ concentrator 8888:1888888888 ▼
Report Management     Device Management     Part of Broadcast Co	mmand Order: Send command first, then download and broadcast meter ID
	and Order: Send command first, then set the effective days
Data     Broadcast order	open Valve   Execute
Broadcast. Effective days	Set 1-255
Information     Download Meter ID	: 选择文件 未选择任何文件 Download Meter ID Model
Meter	
III Query Management	
Advanced Settings     Broadcast order	Read Delete
ID of broadcast list	Read
in or broadcast fist	
-	

#### 5.3.2 Meter management

#### 5.3.2.1 Real-time control valve

1) Real-time control valve, the relay number is queried by the routing table information. If the control valve meter has relay routing information, the relay information is obtained by database analysis, without knowing the relay or without the relay meter, there is no need to input any information, the system automatically fills 0.

2) If the meter and concentrator time are not synchronized, select the preamble to 12s before sending the real-time command.

3) Real-time control valve, after receiving the real-time command, the concentrator will send the command to the meter.

4) Real-time meter reading, which can read the meter information in real time.

Mark to     Water prime     Water pr			ntrol													
	anagement	Meter No				Wakeup Time 2	Seconds *									
FeedBack Meter No reading Voltage Valve(gate) Status Receive date Rssi Measure Valve(gate) Power DER Meter Water entry Water Batter Tault mark Status DER Type temperature temperature alarm	ent ent	Relay id		Open valve(Sluice	in rea Close va	alve(Closing) in re	Read Meter in real-time									
FeedBack Meter No reading Voltage Valve(gete) Receive date Rasi Measure Valve(gate) Power DER Meter Valer-entry Water Batter Status Rasi fault mark Status																
FeedBack Meter No reading Voltage Valve(gate) Receive date Rasi Measure Valve(gate) Power DER Meter Valter entry Water Batter fault mark Status DER Type temperature temperature alarm	-		_													
		FeedBack	Meter No	reading	Voltage	Valve(gate)	Receive date	Rssi	Measure	Valve(gate)	Power	DER	Meter	Water entry	Water	Battery
						otatua			Tecon	THUTK	Juitua		19.00	temperature	temperature	enerritt
	4															
	l	1														

#### 5.3.2.2 Delay Control Valve

Main functions: open valve, close valve, read monthly/annual frozen data, read firmware version information, dredge valve, etc.

The operation process is as follows:

1) After filling in the meter information to be controlled, click the corresponding action button.

2) When the "concentrator storage data operation succeeds", it indicates that the control meter instruction has been sent to the concentrator.

3) After receiving the delay control valve command, the concentrator saves the instruction to the concentrator, and waits for the concentrator to receive the data reported by the corresponding meter before delivering the instruction to the meter.



# 5.4. iHAC-ML Query Management

#### 5.4.1 Latest data query

1) Querying the information reported in the meter and finally reporting the information, so that user can know the report information in a timely manner.

2) Support excel export function (click the export column information setting, user can export the column with personalized settings)

Menu Admin menu	Communit	1.3BRst1	* Liber N	10	name		Address						
Account management	Meter No		т	el 📃	Query	Get Export Colu	imns Sel	Nothing	· · E	xport screen			
ort Management	Query mana	gement >> Late	st data query										
a Management Management	No.	Code	name	Meter No	reading	Valve(gate) St	Voltage	Rs	si Fe	edBack	Water entry te	Battery alarm	Add
est Data	1	9871	天津华仪	2	0	close	3.54	-46	Data reques	t packet		OK	(第2月)
	2	9870	天津华仪	1	0	open	3.66	-45	Data reques	t packet		OK	深見切り
al	3	9881	yyf	12	0	open	3.6	-56	Data reques	t packet		Ok	(第2年11月
Data	4	9876	天津後仪	7	121,009	open	3.41	-3				×	語知り
Data	5	9874	天津建议	5	0	close	3.48	-3	Please hold down t	the moure for mu	tiple choicer :		第三大川
query	6	9877	天津島位	8	0	open	3,6	-7	No.		*		100000
e query	7	9873	天津华仪	4	0	open	3.6	-1	Code				深圳
	8	9875	天津华仪	6	0	open	3.66	-9	Meter	No			深知川
eter records	2	9872	天津华仪	3	0	open	3.66	- 1	Readin	g			「深い切」
ne records	10	1000	vvf2.mest	10	5.3	open	3.66	-7	Valve()	ate) Status			深圳abc123
ner records	11	003	生产调用式-2	184602991	0	open	3.35	-5	Real				深圳生产面积
records	12	1888	天津华(Q23-C	2018111619	2.1	open	3.54	-9	FeedB	ack			12年3月
tings	13	1887	天津华仪22-C	2018111618	2.1	open	3.54	-9	Valve(	gate) mark			深圳
nage	14	1886	天津华仪21-C	2018111617	2.1	open	3.54	-9	Measu	re mode			深辺川
	15	1885	天津华仪20-C	2018111616	2.1	open	3.54	- 1	Power	Status			深彩切り
	16	1884	天津华仪19-C	2018111615	2.1	open	3.54	-9	der				2762.11II
	17	1883	天津島仪18-C	2018111614	2.1	open	3.54	-9	Concer	Type			7至均1
	18	1882	天津华仪17-C	2018111613	2.1	open	3.54	-9	Addres				深入川
	19	1881	天津华仪16-C	2018111612	2.1	open	3.54	-1	Tel Receiv	- data	-		(第3月)
	20	1880	天津华仪15-C	2018111611	2.1	open	3.54	- 1		Up Down			深圳
	21	1879	天津华仪14-C	2018111610	2.1	open	3.54	- 1		Op Down			対応力川
	22	1878	天津44仪13-C	2018111609	2.1	open	3.54	-9					(第2)
	23	1877	天津給仪12-C	2018111608	2.1	open	3.54	-1	提究(Submit)	重盟(Reset)	取消(Cancel)		「第二人」
	24	1876	天津埠(以11-C	2018111607	2.1	open	3.54	-97	Data reques	I packet		VA	深知川
	25	1875	天津华仪10-C	2018111606	2.1	open	3.54	-101	Data reques	t packet		Ok	(第2月)
	20		THE NAME OF A DATA OF A DATA		0.4		200						

### 5.4.2 Abnormal Data Query

The query information is abnormal situation when meter information is reported.

Abnormal situation: the voltage is lower than 3.1 safety voltage, the valve mark is faulty, the metering mark is faulty, there is magnetic attack, power off, metering open circuit fault, current measurement data error, etc.

	Community	1:週刊试:1	Meter No		name				Tel			User No			
Account management	Voltage -		Address		Attack	select	-	Valve(gate) r	nark	select	•	1	Query	Expor	
	Query manag	gement >> Ab	normal data que												
Device Management	No.	name	-	Tel	Met	er No		Rea	d dat	e		reading	Valve	(gate) Sta	
Query Management 1	1	yyf2演形式	123567	10			2	2018-11-30 03:-	42:29		5.	3	open		3.66
Enquiry latest Data 2	2	yyf	134123456	78 12			2	2018-11-27 15:	47:51		3.	1	close		0.0
Meters Read Change meter records query Change name records query Delete owner records query Advanced Settings															

# 5.4.3 Raw data query

The query is the report information of all meters.

Menu Admin menu			use ML A	MR systerm >>>									
Menu Admin menu	Community		•	Tel	Meter No		name						
Account management	FeedBack	select	• U	ser No	Address	Repo	ort time	· · ·	Query	Export			
I Report Management													
Device Management	No.	Code	name	Meter No	reading	Valve(gate) St	Voltage	Rssi	FeedBack	Water entry temp	Battery alarm	Address	Rat
Query Management	1	12312345	调试试验	201710403734	0.02	sluice	3.54	-41	Normal Data	0	Ok	测试	low speed
Enquiry latest Data	•												
Enquiry Abnormal	Φ								Page 1 of 1	50 🔹			
Enquiry Original Data													
Enquiry Freeze Data													
Meter offline query													
Meters Read													
Change meter records													
thange name records													
query													
Delete owner records query													
Advanced Settings													
Payment manage	-												
- Payment manage													
						1.00							

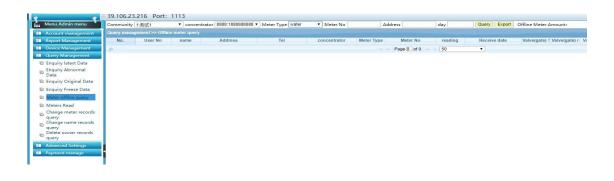
### 5.4.4 Frozen data

The monthly/annual freeze data is queried which is reported by meters.

					Wek							
Menu Admin menu	Community	1:测试1	•	Tel	Meter No		name		Address			
Account management	freeze type	select	•	User No	Report time		>		Query Set Export C	columne Exp	port	
Report Management												
Device Management	No.	Code	name	Meter No	reading	Valve(gate) Sta	Voltage	Rssi	FeedBack	Water entry 1	Battery alarm	Address
Query Management		9870	天津华仪	1	1	close	3.48	-109	Monthly freeze data pa	0	OK	深圳
E Enquiry latest Data												
Enquiry Abnormal Data	Φ								Page 1 of 1 -> -> 5	50	¥.	
E Enquiry Original Data												
Enquiry Freeze Data												
Inquiry Freeze Data     Meter offline query												
Inquiry Freeze Data     Meter offline query     Meters Read     Change meter records												
Enquiry Freeze Data     Meter offline query     Meters Read     Change meter records     query												
Meter offline query Meters Read Change meter records query Change name records query												
Change name records query Delete owner records												
Inquiry freeze Data     Meter offline query     Meters Read     Change meter records     query     Change name records     query     Delete owner records     query												

### 5.4.5 Query the meter that is offline

Query the meter that is not online for a certain period of time.



#### 5.4.6 No registration meter data query

There are two kinds of data saved in the no registration. One is that the concentrator is in the normal working mode, the meter ID has been registered in the concentrator, but the meter information reported by the owner is not used, and the other is that all meters' information are received when the concentrator is in the debugging mode. (the meter is not been registered and installed).

FID		反演类型请选择 •	無中器	表类	型请送择 *							
表号		上期时间 🔤 ~		查询	导出							
<b>通管理 &gt;&gt; 无</b>	登记去鼓摇查问											
序号	表号	抄读日期	读数	阀门状态	RE	场强	反馈类型	PN	集中器	表类型	PID	
	161000002	2016-10-21 08:50:57	0.7	阀门开	3.54	-68	数据清求包	1个计量脉冲计100升	20068	水表	883	高速
	161000001	2016-10-21 08:50:55	0.5	阀门开	3.66	-59	数据请求包	1个计量脉冲计100升	20068	水表	883	高速
	161000002	2016-10-21 08:50:52	0.7	阀门开	3.54	-74	数据请求包	1个计量脉冲计100升	20068	水表	883	低速
i.	161000001	2016-10-21 08:50:45	0.5	阀门开	3.66	-65	数据清求包	1个计量脉冲计100升	20068	水表	883	低速
	161000001	2016-10-20 16:39:01	0.5	阀门开	3.35	-123	正常数据	1个计量脉冲计100升	20068	水表	883	低速
	161000001	2016-10-20 16:38:06	0.5	阀门开	3.41	-124	数据请求包	1个计量脉冲计100升	20068	水表	883	低速
	161000001	2016-10-20 16:38:01	0.5	阀门开	3.48	-129	数据请求包	1个计量脉冲计100升	20068	水表	883	低速
	161000001	2016-10-20 16:37:53	0.5	阀门开	3.41	-130	数据请求包	1个计量脉冲计100升	20068	水表	883	低速
	161000001	2016-10-20 16:37:50	0.5	阀门开	3.48	-129	数据请求包	1个计量脉冲计100升	20068	水表	883	低速
0	161000001	2016-10-20 16:37:41	0.5	阀门开	3.48	-129	数据清求包	1个计量脉冲计100升	20068	水表	883	低速
1	161000001	2016-10-20 16:37:35	0.5	阀门开	3.41	-128	数据请求包	1个计量脉冲计100升	20068	水表	883	低速

### 5.4.7 Daily Data Query

Count online and offline meter numbers and display data of online meters.

											10000								
9 9	Welcon	ne to use	ML AMR sys	term >>> II	P: 39.10	06													
Menu Admin menu	Communit	ty 1:测试1	▼ Me	eter Type select		Meter No	Add	ress	Read time		Group I	ead Export	Online	Num	Offline Num				
Account management	Read Mete																		
III Report Management		No.	User Number	name		Address		Tel	Meter No	re	ading	Read da	ite	Valve(gate) Stat	us Valve(gate) i	mark I	Battery alarm	Voltage	Rssi
Device Management	φ									Page 0 o	10 HALES	0	•						
Query Management																			
Enquiry latest Data																			
Enquiry Abnormal Data																			
Enquiry Original Data																			
Enquiry Freeze Data																			
Meter offline query																			
E Meters Read																			
Change meter records																			
Change name records																			
query																			
m Delete owner records																			
query																			
III Advanced Settings																			
III Payment manage	1																		

### 5.4.8 Meter Change Record Query

Query historical meter change records, which can be exported.

Menu Admin menu	Community 1 1833		no new meter no	UserNo	Query Olear Export	
III Assess management						
III Report Management	No.	Community User I	Number old meter usage	old meter bill	old meter no	new meter no
IIII Device Management	40				Page 0 of	50
IIII Query Management						
W Enquiry latest Data						
Enquiry Abnormal Data						
Enquiry Original Data						
The Enquiry Freeze Data						
ID Meter offline query						
E Meters Read						
Change meter records goery						
Change name records						
E query						
Advanced Settings						
III Payment manage						

### 5.4.9 Transfer Record Query

Query historical transfer records.

· · · · · · · · · · · · · · · · · · ·					Welcon	ne to u:									
Menu Admin menu	Community	/ 1.混成1		Old us	er	Ne	w user		Query	Clear	Export				
Account management	Sumbit man	nagement >>													
Report Management		No.	Com	munity	The nar	ne of old user	-	The phone o	f old user		The name of new user	The phone	of new user	Time of change user	
Device Management	Φ										Page 0	of 0 50	•		
Query Management															
Enquiry latest Data															
Enquiry Abnormal Data															
🗉 Enquiry Original Data															
Enquiry Freeze Data															
E Meter offline query															
E Meters Read															
Change meter records															
query															
query															
Delete owner records															
Advanced Settings															
Payment manage															

### 5.4.10 Account record deletion query

Query historical account deletion record

Account management	Sumbr	i managen											
Report Management		No.	Commun	nity	Code	name	Add	ess	Tel	concentrato	r	Meter Type	Meter N
Device Management	φ									Page 0 of 0	P> PI 50	•	
Query Management													
Enquiry latest Data													
Enquiry Abnormal Data													
Enquiry Original Data													
Enquiry Freeze Data													
Meter offline query													
Meters Read													
Change meter records													
query													
query													
Delete owner records													
query													
Advanced Settings													
Payment manage													

# 5.5. iHAC-ML Advanced Settings

Advanced setting module, where user need to enter a password, the default is "456789"

	Welcome to us	
<u>۲</u>	Welcome to us	_
Menu Admin menu	Password: Submit	
Account management		
Report Management	A	
Device Management	A	
Query Management	A	
Advanced Settings		
Server Management		
RSSI Setting		
🔨 Repeater List settings		
Input Repeater ID		
Enquiry End Node		
Doors Limit		
Model		
Timing		
E Set Threshhold		
Payment manage		

#### 5.5.1 Server Background Management

The page shows the server address which is currently in use and the server background address

can be set.

	Account management	Server Mana	-			
	Report Management					
	Device Management	IP:	39.106.23.216		*	
	Query Management	port::	1113		200	
	Advanced Settings	Notes:	Official Server		+	
	Server Management		Clear Set	Check	<	
1221	RSSI Setting					
100	Repeater List settings					
100	Input Repeater ID					
100	Enquiry End Node					
10th	Doors Limit					
1001	Model					
1001	Timing					
400	Set Threshhold					
	Payment manage					

#### 5.5.2 Relay Field Strength Setting

Menu Admin menu	Advanced Manag	ement_RSSI :	Setting				
Account management	Relay rssi:	-108	~ -	104	Set	Clear	
Report Management	Relay Isst.	-200~-100				Check	
Device Management	End node rssi:	-115			Set	Clear	
Query Management	2						
Advanced Settings							
E Server Management							
RSSI Setting	>						
E Repeater List settings							
Input Repeater ID							
Enquiry End Node							
Doors Limit							
© Model							
E Model							
E Timing							

Relay field strength: The field strength value is a meter in this range and can be used as a repeater.

The default range is  $-108 \sim -104$ 

End node field strength: When the field strength is less than or equal to -115, this meter will be set as

the end node.

#### 5.3 Relay List Management

The relay list includes:

A it has a relay list suitable for screening the field strength range;

B it has a meter suitable for the latest data, which is manually transferred to the relay list;

C it can also be manually added to the relay list;

At the same time, there is also a relay blacklist. If it is in the relay blacklist, it indicates that this meter is not used as a relay, although its conditions are met.

	Menu Admin menu	Advan	ced Settings_Rep	eater List Management			
	Account management	Comm	unity 1: 測验式1	<ul> <li>concentrator</li> </ul>	8888:18888	8888888 • Q	uery
	Report Management				The Latest	Lint	
	Device Management	Repeat	er List	Query	Query		
11	Query Management	No.	Relay id	Rssi	No.	Relay id	Rssi
11	Advanced Settings					recently its	
1000	Server Management						
100	RSSI Setting						
1000	Repeater List settings						
	Repeater List settings						
	Input Repeater ID						
1000							
	Input Repeater ID						
	Input Repeater ID Enquiry End Node						
0000	Input Repeater ID Enquiry End Node Doors Limit						
	Input Repeater ID Enquiry End Node Doors Limit Model	Add	l List	Query	Black List		Query

#### 5.5.3 Importing Relay ID

First, user can register to the concentrator with single or multiple relay IDs, and can also download them to the concentrator in batches.

	Menu Admin menu	Advanced Settings_Reg	jister Repe	eater ID		
-	Account management	Community 1:测试1		concentrator	8888:18888888888	
8	Report Management	T				
	Device Management	Download repeater ID:	选择文件	未选择文件	Download repeater ID	Model
	Query Management	register repeater ID :	Repeater I	D. Repeater ID.	register repeater ID	planation: At most 40pcs Repeater can registe
	Advanced Settings	register tepediter in t				
400	Server Management					
100	RSSI Setting					
-	Repeater List settings					
-	Input Repeater ID					
	Enquiry End Node					
100	Doors Limit					
E	Model					
-m	Timing					
1971	Set Threshhold					

# 5.5.4 End Node Query

By comparing the field strength of end node, the data from each bubble is compared to determine

whether it is an end node, and if so, it is saved in the end node table.

Menu Admin menu	Comm	unity 1:	则试1	• (	oncentrator	r 8888:18	8888888888	▼ Er	nd node		Que	y Export				
Account management	Advan			le query												
Report Management		No.	End	l node	RelayID	1	RelayID2	Re	layID3	Rs	si	concentrato	r Is	end node?	Creator	Create D
Device Management	Φ						14.44	Page	of 1 🕞	50		•				No records to view
Query Management																
Advanced Settings	1															
Server Management																
RSSI Setting																
Repeater List settings																
nput Repeater ID																
Enquiry End Node																
Doors Limit																
/lodel																
iming																
et Threshhold																
ayment manage																
				_								_	_			
		1														
												/				
				1												
5 I hres	hol	d n	nan	age	men	t							/			
•••••••••••••••••••••••••••••••••••••••		1			-											
											· .					
		ta	. +1	vale a L	3											
.5 Thres	cent	rato	r thre	esholo	1.		-		/							
	icent	rato	r thre	esholo	1.											
	icent			esholo	1.				_		W	elcome				
Set the con	_		<b>ç</b> 111								w	elcom				
	_		<b>ç</b> 111		1. trator_Li	imit M	anagem	nent			w	elcome				

# 5.5.5 Threshold management

<b>R</b>	Welcome
Menu Admin menu	Concentrator_Limit Management
Account management	Community 1:测试1 ▼ concentrator 8888:18888888888 ▼
Report Management	
Device Management	door limit:128~-80 Set
Query Management	
Advanced Settings	
🗉 Server Management	
RSSI Setting	
Repeater List settings	
🕮 Input Repeater ID	
Enquiry End Node	
🖻 Doors Limit	
🖻 Model	4

#### Welcome to use ML AMR systerm >>> II · · · · · Menu Admin menu Concentrator Mode Management Account managem ▼ concentrator 8888:18888888888 ▼ Community 1:测试1 • Energy: LOP I Set HI. De e Managem Query Management • Mode: Debug Mode Set ET Server Management 旧 RSSI Setting Read Concentrators Current Work Status Status: Repeater List settings Model: Input Repeater ID Enquiry End Node Energy: E Doors Limit Online: E Mo Timing E Set Threshhold Payment ma

#### 5.5.6 Debugging mode: Debugging mode and working mode.

Energy consumption settings, energy consumption levels are LOP I, LOP II, LOP III;

Mode setting, debugging mode and working mode; when the concentrator is in debugging mode, the data of all received meters will be reported to the server. When the concentrator is in working mode, only the data of meter whose report ID has been registered to the concentrator is registered.

The current working state of the concentrator can be read.

#### 5.5.7 School time management

Calibrate the time of the concentrator and server

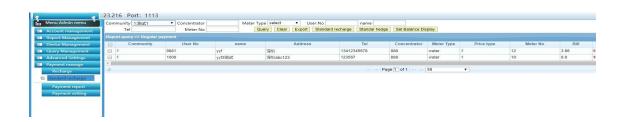


#### 5.6. iHAC-ML Payment Management

#### 5.6.1 Payment

#### **Regular** payment

User can inquire about the proprietor's arrears and the remaining amount, click the regular payment to recharge, click the regular reduction to deduct, both operations have the function of printing the detailed payment of amount, the arrears reminder setting function can be set after the current arrears amount exceeds a certain value, the amount of the arrears is displayed in red; there is an export report function.



# 5.6.2 Payment Report

#### 5.6.2.1 Proprietor's arrears inquiry

Inquire about the information of proprietor who owns money.

Menu Admin menu	ommunity 1:测试1	<ul> <li>Price type</li> </ul>	Meter Type select	<ul> <li>User No</li> </ul>			
Account management	name	Tel	Meter No	Query	Clear Export	Set Balance Display	
Report Management							
Device Management	User No	name	Address		Tel	Concentrator	Me
Query Management							
Advanced Settings	p					IN AN Page 0 of IN INI	50
Payment manage							
Recharge							
Payment report							
Arrearage query							
Recharge statistic							
Recharge statistic query							
<ul> <li>Recharge statistic query</li> <li>Recharge detail query</li> </ul>							
Recharge statistic query							
<ul> <li>Recharge statistic query</li> <li>Recharge detail query</li> <li>Monthly account</li> </ul>							
<ul> <li>Recharge statistic query</li> <li>Recharge detail query</li> <li>Monthly account query</li> </ul>							

#### 5.6.2.2 Charge Statistics Query

According to the selected toll collectors and charging time period, the charging statistics can be queried, and the statistical results can be printed and exported.

Account management	Report query-Recharge statistic query Collector Select   Recharge time	~	Query Print Export
Report Management	Recharge statistic qu		Guery Plint Export
Device Management Query Management	Print time2019-07-17 12:11:44		
Advanced Settings	Recharge time to		
Payment manage	Sum bills	0.0	0.0
Recharge Payment report	Turn to Pre-storage	1 (54-35)	350.0
Arrearage query	Deduct from Pre-storage		410.0
Recharge statistic	Card fee		
query Recharge detail query	Cash		-60.0
Monthly account query	Total Charge + Pre-storage + Turn to Pre-storage = Pa	aid Amount + Dedu	ict from Pre-storage
Yearly account query			

#### 5.6.2.3 Charge Details Query

Query the payment details of each proprietor

. '	Menu Admin menu	Collector Select	▼ Community all ▼	User No Recharge		(iiii)
1	Account management	Meter No	name	Query Clear Export Negative an	nount is deducted	
	Report Management	Report query>> List of ch	arges query			
	Device Management	User No	name	Address	Tel	7
	Query Management	9881	yyf	深圳	13412345678	12
	Advanced Settings	9881	yyf	深圳	13412345678	12
	Payment manage	9881	yyf	深圳	13412345678	12
1	Recharge	1000	yyf2测试	深圳abc123	123567	10
	Payment report	9881	yyf	深圳	13412345678	12
400	Arrearage query	1000	yyf2测试	深圳abc123	123567	10
m	Recharge statistic	9881	yyf	深圳	13412345678	12
_	query	9881	yyr	深圳	13412345678	12
<b>D</b>	Recharge detail query	1000	yyf2测试	深圳abc123	123567	10
	Monthly account query	1000	yyrz测试	深圳abc123	123567	10
	Yearly account query	1000	yyf2测试	深圳abc123	123567	10
-	3 1 3	9881	yyf	深圳	13412345678	12
	Payment setting	9881	yyf	深圳	13412345678	12
		9881	yyf	深圳	13412345678	12
		1000	yyf2测试	深圳abc123	123567	10
		9881	yyf	深圳	13412345678	12
		9881	yyf	深圳	13412345678	12
		9881	yyf	深圳	13412345678	12
		9881	yyf	深圳	13412345678	12
		∢ sum	-60,00			
		sum ص	-00.00			e 1 of 1

#### 5.6.2.4 Monthly Cost Query

1) Generate a record based on the frozen data and price type. Each month, a record will be generated and the data of the previous month will be updated. If the TCP/IP server does not automatically report the frozen data, click Add to manually insert the frozen data. User can manually modify the frozen data of the current month before freezing the data report next month; there is the current user status identifier at the end of each column, (such as in use, meter changed, transferred, etc.), after account deletion, meter changed and transferred, the previous meter information will display different colors, there will have the total amount and cost in the last line.

Menu Admin menu	Con	nmunity a	ill 🔹	Price type		Meter Type	select v	User No	M	onth Time			(in)
Account management		name		Tel		Meter No		Query Clear	Export	Add Edit			
Report Management	Rep												
Device Management		No.	commNo	User No	name	Meter Type	type	Last time	Last reading	Present time	Present read	AMT	Sum bills
Query Management		1	1	1000	yyf2测试	water	1:1	2019-07	5.3			0.0	0.0
Advanced Settings		2	1	1000	yyf2测试	water	1:1	2019-05	5.3			0.0	0.0
Payment manage		3	1	1000	yyf2测试	water	1:1	2019-04	5.3	2019-05	5.3	0.0	0.0
Recharge		4	1	1000	yyf2测试	water	1:1	2018-11	2.35			0.0	0.0
Payment report		5	1	9881	yyf	water	1:1	2018-12	3.0			0.0	0.0
Arrearage query		6	1	9881	yyf	water	1:1	2018-11	2.01	2018-12	3.0	0.99	3.96
m Recharge statistic		7	2	1111	MD Task	water	1:1	2019-02	2.0			0.0	0.0
query		8	16	800820	test_chen1	water	12:高级收费标准	2019-06	0.0			0.0	0.0
Recharge detail query		9	16	800821	test_chen2	water	12.高级收费标准	2019-06	0.0			0.0	0.0
Monthly account		10	16	800822	test_chen3	water	12:高级收费标准	2019-06	0.0			0.0	0.0
Yearly account query	- C												
Payment setting		Total Amo	oun 0.99	Total Fee	3.96								

2) Double-click on a single monthly fee to display detailed usage and charges for each ladder

na		13武1 ▼	Price type	1:1	Meter Type	select v	User No 1000	M	onth Time	- [		
	ame yyt2	测试	Tel	123567	Meter No	10	Query Clear	Export	Add Edit			
	No.	commNo	User No	name	Meter Type	type	Last time	Last reading	Present time	Present rea	AMT	Su
	1	1	1000	yyf2测试	water	1:1	2019-07	5.3			0.0	0.0
	2	1	1000	yyf2测试	water	1:1	2019-05	5.3			0.0	0.0
	3	1	1000	yyf2测试	water	1:1	2019-04	5.3	2019-05	5.3	0.0	0.0
	4	1	1000	yyt2	water	1:1	2018-11	2.35			0.0	0.0
4	6										· · · ·	
	Total Amc	etailed month	ily fee							×		
\$		Liner	1000			Licor Nomo, unt	(Dilberth	Motor To	mo water		2	
						and a second second second						
							8-11					
		Present tir	ne:		Pres	ent reading:		A	VIT: 0.0			
		Sum b	IIs: 0.0		c	oncentrator: 888	3	Meter	No: 10			
		Addre	ss: 深圳ab	c123		Tel: 123	567	Create D	ate: 2018-11-21 1	11:11:35		
		The amount a	and cost of e	ach ladder are	shown below:							
		ladder 1	fee 1	ladder	2 fee 2	ladder 3	fee 3					
		0.0	0.0	0.0	0.0	0.0	0.0					
		ladder 4	fee 4	ladder	5 fee 5	ladder 6	fee 6					
		0.0	0.0	0.0	0.0	0.0	0.0					
	×	1 2 3 ✓ 4 Total Amc	1     1     1     2     1     1     2     1     3     1     v     4     1     Total Am     Total Am     User I     Price ty     Present II     Sum b     Adde     The amount 4     Iadder 1     0	1 1 1000     2 1 1000     2 1 1000     3 1 1000     √     4 1 1000     User No: 1000     Frice type: 1:1     Frisent time:     Sum bills: 0.0     Address: 深圳ab     The amount and cost of eff     [idder 1 fee 1     0 00	1       1       1000       yy128jit.         2       1       1000       yy128jit.         3       1       1000       yy128jit.         2       1       1000       yy128jit.         3       1       1000       yy128jit.         4       1       1000       yy128jit.         5       User No: 1000       Price type: 1.1         Price type: 1.1       Prise type: 1.0         Addres:       Sum bills: 0.0         Addres:       Sullabc123         The amount and cost of each ladder are         iadder 1       fee 1         0.0       0.0	1         1         1000         yyf2®ist         water           2         1         1000         yyf2®ist         water           3         1         1000         yyf2®ist         water           User No:         1000         yyf2@ist         water           1         1000         yyf2@ist         water           User No:         1000         pyf2@ist         water           Junch         1000         off         off <td>1         1         1000         yyt2@iit.         water         1:1           2         1         1000         yyt2@iit.         water         1:1           3         1         1000         yyt2@iit.         water         1:1           v         4         1         1000         yyt2@iit.         water         1:1           Total Am         User No:         1000         User No:         100         User Name:         yyt2           Price type:         1:1         Last time:         201         Price type:         1:1         Last time:         201           Price type:         1:1         User No:         10.0         concentrator:         884           Address:         @liabc123         Tel:         1234           The amount and cost of each ladder a</td> <td>1         1         1000         yy12@list.         water         1.1         2019-07           2         1         1000         yy12@list.         water         1.1         2019-04           3         1         1000         yy12@list.         water         1.1         2019-04           2         1         1000         yy12@list.         water         1.1         2019-04           2         4         1         1000         yy12@list.         water         1.1         2019-04           2         4         1         1000         yy12@list.         water         1.1         2019-04           2         4         1         1000         yy12@list.         water         1.1         2018-01           2         1.1         1000         yy12@list.         water         1.1         2018-01           3         1000         yy12@list.         water         1.1         2018-01           3         1.1         2018-01         Last time:         2018-01           1         Price type:         1.1         Last time:         2018-01           3         0.0         concentrator:         888         Addres:         388&lt;</td> <td>1         1         1000         yy12@itt         water         1:1         2019-07         5.3           2         1         1000         yy12@itt         water         1:1         2019-07         5.3           3         1         1000         yy12@itt         water         1:1         2019-07         5.3           2         1         1000         yy12@itt         water         1:1         2019-04         5.3           2         4         1         1000         yy12@itt         water         1:1         2019-04         5.3           2         4         1         1000         yy12@itt         water         1:1         2019-04         5.3           7         Total Am         fill         1000         yy12@itt         water         1:1         2018-01         2.35           Total Am           Present time:         Present time:         Present time:         Present time:         Address: '#@illabc123'         Tel:         12357'         Create Di           Address:         1         iadder 2         fee 2         iadder 3         fee 3         0.0         0.0         0.0         0.0         0.0         0.0</td> <td>1         1         1000         yyf2/8/82         water         1:1         2019-07         5.3           2         1         1000         yyf2/8/82         water         1:1         2019-05         5.3           3         1         1000         yyf2/8/82         water         1:1         2019-05         5.3           2         1         1000         yyf2/8/82         water         1:1         2019-04         5.3           2         4         1         1000         yyf2/8/82         water         1:1         2018-04         5.3           7         TotaAmc         distalled monthly law         water         1:1         2018-11         2.35           7         TotaAmc         Size No: 1000         User Name: yyf2/8/82         Meter Type: water         1.0           9         Frice type: 11:1         Last meating: 2.35         Protestitume: Present reading: 2.35         AMT: 0.0           9         Size No: 1000         concentrator: 898.9         Meter No: 10         Address: 3%1/40c12.3         Tel: 123567         Create Date: 2018-11-21           8         Address: 3%1/40c12.3         Tel: 123567         Create Date: 2018-11-21         The amount and cost of each ladder are shown below:           &lt;</td> <td>1         1         1000         yyt2@itst         water         1.1         2019-07         5.3           2         1         1000         yyt2@itst         water         1.1         2019-05         5.3         2019-05         5.3           3         1         1000         yyt2@itst         water         1.1         2019-05         5.3         2019-05         5.3           2         4         1         1000         yyt2@itst         water         1.1         2019-01         2.35           Total Ame         total Ame           User No: 1000         User Name: yyt2@itst         Meter Type: water           Total Ame           User No: 1000         User Name: yyt2@itst         Meter Type: water           Price type: 1:1         Last time: 2018-11         Last colspan="2"&gt;Cast time: 2.35           Sum bills: 0.0         concentrator: 8088         Meter No: 10           Address: %@italct123         Tei: 123507         Create Date: 2018-11-21 11:11:35           Total Ame         italder 1         italder 3         fee 3</td> <td>1         1         1000         yrt28list         water         1.1         2019-07         5.3         0.0           2         1         1000         yrt28list         water         1.1         2019-05         5.3         0.0         0.0           3         1         1000         yrt28list         water         1.1         2019-05         5.3         0.0         0.0           etal         1         1000         yrt28list         water         1.1         2019-05         5.3         0.0           etal         1         1000         yrt28list         water         1.1         2018-11         2.3         0.0           total Ame         <thttps: 10.0<="" doi.org="" th="">         User No:         1000         total Ame         <thtotal ame<="" th=""> <thtotal ame<="" th=""> <t< td=""></t<></thtotal></thtotal></thttps:></td>	1         1         1000         yyt2@iit.         water         1:1           2         1         1000         yyt2@iit.         water         1:1           3         1         1000         yyt2@iit.         water         1:1           v         4         1         1000         yyt2@iit.         water         1:1           Total Am         User No:         1000         User No:         100         User Name:         yyt2           Price type:         1:1         Last time:         201         Price type:         1:1         Last time:         201           Price type:         1:1         User No:         10.0         concentrator:         884           Address:         @liabc123         Tel:         1234           The amount and cost of each ladder a	1         1         1000         yy12@list.         water         1.1         2019-07           2         1         1000         yy12@list.         water         1.1         2019-04           3         1         1000         yy12@list.         water         1.1         2019-04           2         1         1000         yy12@list.         water         1.1         2019-04           2         4         1         1000         yy12@list.         water         1.1         2019-04           2         4         1         1000         yy12@list.         water         1.1         2019-04           2         4         1         1000         yy12@list.         water         1.1         2018-01           2         1.1         1000         yy12@list.         water         1.1         2018-01           3         1000         yy12@list.         water         1.1         2018-01           3         1.1         2018-01         Last time:         2018-01           1         Price type:         1.1         Last time:         2018-01           3         0.0         concentrator:         888         Addres:         388<	1         1         1000         yy12@itt         water         1:1         2019-07         5.3           2         1         1000         yy12@itt         water         1:1         2019-07         5.3           3         1         1000         yy12@itt         water         1:1         2019-07         5.3           2         1         1000         yy12@itt         water         1:1         2019-04         5.3           2         4         1         1000         yy12@itt         water         1:1         2019-04         5.3           2         4         1         1000         yy12@itt         water         1:1         2019-04         5.3           7         Total Am         fill         1000         yy12@itt         water         1:1         2018-01         2.35           Total Am           Present time:         Present time:         Present time:         Present time:         Address: '#@illabc123'         Tel:         12357'         Create Di           Address:         1         iadder 2         fee 2         iadder 3         fee 3         0.0         0.0         0.0         0.0         0.0         0.0	1         1         1000         yyf2/8/82         water         1:1         2019-07         5.3           2         1         1000         yyf2/8/82         water         1:1         2019-05         5.3           3         1         1000         yyf2/8/82         water         1:1         2019-05         5.3           2         1         1000         yyf2/8/82         water         1:1         2019-04         5.3           2         4         1         1000         yyf2/8/82         water         1:1         2018-04         5.3           7         TotaAmc         distalled monthly law         water         1:1         2018-11         2.35           7         TotaAmc         Size No: 1000         User Name: yyf2/8/82         Meter Type: water         1.0           9         Frice type: 11:1         Last meating: 2.35         Protestitume: Present reading: 2.35         AMT: 0.0           9         Size No: 1000         concentrator: 898.9         Meter No: 10         Address: 3%1/40c12.3         Tel: 123567         Create Date: 2018-11-21           8         Address: 3%1/40c12.3         Tel: 123567         Create Date: 2018-11-21         The amount and cost of each ladder are shown below:           <	1         1         1000         yyt2@itst         water         1.1         2019-07         5.3           2         1         1000         yyt2@itst         water         1.1         2019-05         5.3         2019-05         5.3           3         1         1000         yyt2@itst         water         1.1         2019-05         5.3         2019-05         5.3           2         4         1         1000         yyt2@itst         water         1.1         2019-01         2.35           Total Ame         total Ame           User No: 1000         User Name: yyt2@itst         Meter Type: water           Total Ame           User No: 1000         User Name: yyt2@itst         Meter Type: water           Price type: 1:1         Last time: 2018-11         Last colspan="2">Cast time: 2.35           Sum bills: 0.0         concentrator: 8088         Meter No: 10           Address: %@italct123         Tei: 123507         Create Date: 2018-11-21 11:11:35           Total Ame         italder 1         italder 3         fee 3	1         1         1000         yrt28list         water         1.1         2019-07         5.3         0.0           2         1         1000         yrt28list         water         1.1         2019-05         5.3         0.0         0.0           3         1         1000         yrt28list         water         1.1         2019-05         5.3         0.0         0.0           etal         1         1000         yrt28list         water         1.1         2019-05         5.3         0.0           etal         1         1000         yrt28list         water         1.1         2018-11         2.3         0.0           total Ame         total Ame <thttps: 10.0<="" doi.org="" th="">         User No:         1000         total Ame         <thtotal ame<="" th=""> <thtotal ame<="" th=""> <t< td=""></t<></thtotal></thtotal></thttps:>

#### 5.6.2.5 Annual Cost Query

To query the user's annual fee, double-click on a single annual fee to display the detailed usage and

charge for each segment; there is the current user status indicator at the end of each column. (such as in use, meter changed, meter transferred, etc.)

Account management		•	Price type		Met	ter Type select		User No			
	name		Tel		Me	eter No		Query	Clear	Export	
Report Management Rep											
Device Management	No. commNo	User No	name	Meter Type	Last time	Last reading	Present time	Present read	AMT	Sum bills	
Query Management 1	1	9881	yyf	water	2018-11	2.01	2018-12	3.0	0.99	3.96	12
Advanced Settings 2	1	1000	yyf2澳所式	water	2018-11	2.35			0.0	0.0	10
Payment manage 3	1	1000	yyf2澳际式	water	2019-04	5.3			0.0	0.0	10
Recharge 4	2	1111	MD Task	water	2019-02	2.0			0.0	0.0	1233
Payment report 5	16	800820	test_chen1	water	2019-06	0.0			0.0	0.0	9
Arrearage query	16	800821	test_chen2	water	2019-06	0.0			0.0	0.0	10
Recharge statistic 7	16	800822	test_chen3	water	2019-06	0.0			0.0	0.0	15
query 🔹											
Recharge detail query Tota	Amount 0.99	Total Fee	3.96								
👝 Monthly account 🔹 🗇								Page 1	of 1	50	
Query     Yearly account guery											

### 5.6.3 Payment Settings

#### Price type setting

The price type that is modified each time will take effect in the next month, and the price type generated by the add operation will take effect in the current month.

5 4	price1 st 20 50 Cuery	Query C tart2 pric 8 2.5	30 100	Delete           7           1.5           of 1           >>           50 •	5
5 4	20 50	6	30 100	7	5
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	Query		Page 1 o	nf 1 ->> >: 50 ▼	
	Query		Page 1 o	of 1 50 -	
	Query				
rt1 price1					
rt1 price1					
	e1 start2	price2	start3	price3	
4	50	2.5	100	1.5	
4	50	2.5	100	1.5	
4	50	2.5	100	1.5	150
5	20	6	30	7	50
			o Allionoo	유민육년	<u>_</u>
			LoR	LoRa Alliance	LoRa Alliance 成员单位