User manual

Smart valve controller



Shenzhen power-tomorrow actuator valve co.,ltd

www.qotosmart.com

Introduction

Dear users, hello! Thank you for choosing QOTO smart water valve series products. Please read this manual carefully before using, it will help the product offer the perfect service for a long time.

QOTO smart irrigation controller series can control valve opening ratio, calculate and count the water flow to realize precise and smart irrigation. Communication technology includes Lora, NB-iot, 4G, etc., adapting to different irrigation scenarios at home and abroad, such as: urban greening irrigation projects, agricultural plantation to achieve wireless irrigation. Compared with traditional irrigation, it allows users to formulate corresponding solutions to get installation more labor-free. The APP is compatible with Android and ios systems, making it more convenient and worry-free.

Features of product

1.It is superior to traditional solenoid valve: Its full bore has 2-3 times larger flow rate than solenoid valve does, so for the same area, QOTO irrigation system requires less valves and save more cost.
2.For installation: it requires no electric power cable as solar panel and batteries work as power supply so as to decrease installation and maintenance cost. It is simple and easy installation.
3.For remote control:users can remote control via App and web at anywhere and anytime such as water consumption and water flow.
4.For functions: a dozen of functions at one hand, and only simple operation is asked for precise irrigation task. It is a smart irrigation which every one can use.
5.For safety, to make it safer irrigation, it has real-time feedback, water shortage warning, low power alarm, fault warning etc.

Main parameters

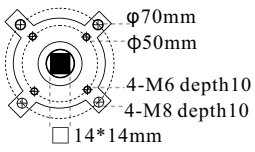
Type	Parameters		
Model	QT-01F	QT-02F	QT-05/10/15F
Battery	18650 lithium battery (wide temperature) two pcs	18650 lithium battery (wide temperature) four pcs	With protection shell and lithium battery bag
Solar panel	Monocrystalline silicon 5V 0.6W	Polysilicon 6V 5.5W	Polysilicon 30V 8.5W (Max 40W)
Bottom port	External solar panel can power the lithium battery 9V-30V External power adapter can power the device: DC9V-30V 10W	The solar panel port can support power adapter of DC5V1A(6.5V/2A max)	/
Flowmeter (External flowmeter need extra purchase)	Built-in flowmeter	External flowmeter	External flowmeter
	Max flow rate：10m/s	Max flow rate：10m/s	Max flow rate：10m/s
	Min flow rate：0.3m/s	Min flow rate：0.3m/s	Min flow rate：0.3m/s
	Working pressure：5kg/cm²	Working pressure：5kg/cm²	Working pressure：5kg/cm²
Max torque	≤10KGfCM	≤60 N.m	≤150 N.m
Max power	Communication：3.8W	Communication：3.8W	Communication：3.8W
	Motor stall：4.6W	Motor stall：25W	Motor stall：96W
Dormant power	Dormant current：<10uA	Dormant current：<10uA	Dormant current：<10uA
Standby current	NB<30mA,4G<8mA Lora<20mA	NB<30mA,4G<8mA Lora<20mA	NB<30mA,4G<8mA Lora<20mA

Main functions and features

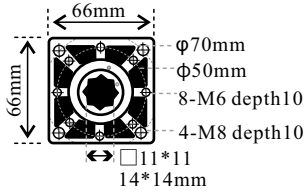
1. APP or computer remote control, control cabinet is not needed, easier to install and use
2. Rechargeable battery + solar panel as green and environmentally-friendly power supply
3. Air call function, the device responds in time, while it is more energy-saving and power-saving, and has a longer standby time.
4. The operation control function is relatively more comprehensive to meet different irrigation needs: Single control ;Duration control ;Capacity control;Cycle control;Timing control.
5. With polling irrigation function, multiple valves queue up for irrigation in sequence.
6. Group control function, multiple valves carry out single/duration/capacity/cycle group control task at the same time.
7. Functions such as fault warning, water shortage warning (with flow meter), low power warning, etc., make it safer to use
8. When watering is turned on, the status of the valve is fed back to the mobile phone or computer in real time
9. Intelligent linkage function, which can be linked with other intelligent devices to realize automatic irrigation
10. Control the valve opening ratio
11. Delayed watering function in rainy and snowy days
12. User management function, setting up sub-accounts and assigning management equipment,
13. External antenna: In the poor signal environment, the antenna can be extended to ensure the normal communication.
14. Signal indicator
15. Zero pressure to switch valve
16. IP66 protection grade, which can be installed outdoors.
17. Lora, 4G, NB-iot communication protocols are optional,
18. The controller adopts standard mounting screw holes, which is suitable for most valves on the market, and is convenient for valve replacement and maintenance.
19. Full bore, not easy to block the valve, long service life.

Installation section

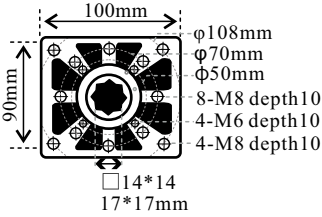
QT-02F-G/L/N



QT-05-G/L/N



QT-10/15-G/L/N



QT-02F-N/L/G Wiring and Valve Calibration Manual

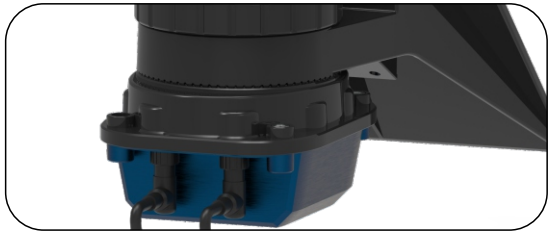
Port diagram



Power supply port



Flowmeter port

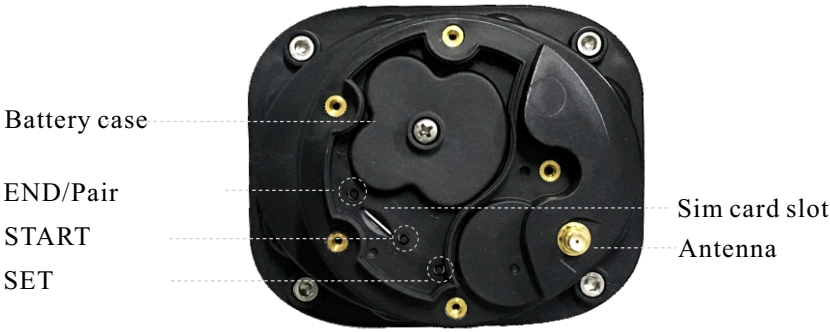


Note: 1. The power supply port can connect solar panel and power adapter, when it connects power adapter, the power adapter should be DC5V 1A, the voltage can not be over 6.5V, the current can not be over 2A.
2.To connect or remove flowmeter, it does not support direct plugging. Please cut off the power before connecting or removing, so that the valve can recognize the flowmeter

Button descriptions and calibration settings

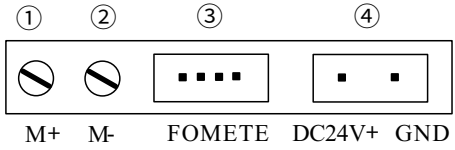
Button descriptions
SET: long press for 5 sec, the valve is ready for calibration settings
START: short press for 2 sec, open the valve
END: short press for 2 sec, close the valve

Operation instruction for valve position calibration
1. Long press SET for 5 sec, ready for calibration settings, the valve position value returns to intermediate value
2. START light turns on, according to valve open ratio, select a way such as long pressing START or END, to fully open valve, press SET 2sec, switch to ALL CLOSE settings.
3. END light turns on, long press START or END to fully close the valve, but pay attention to the valve moving direction, it must be the reverse direction of opening the valve,Press the setting button (SET) for 2 sec, save and exit the valve setting state, and the valve setting is completed.
Note: in the process of calibration, the direction to open and close the valve must be opposite, START and END button can switch to operate. After the calibration, take a test to make sure that the valve is opened and closed in the right position before installed on the pipe.



QT-05/10/15F-N/L/G wiring diagram and calibration

Wiring diagram

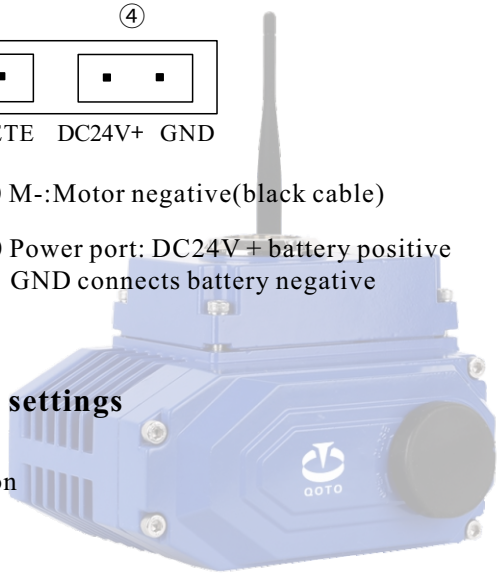


① M+:Motor positive(red cable)

② M-:Motor negative(black cable)

③ FOMETE:Flow meter access

④ Power port: DC24V + battery positive
GND connects battery negative



Button descriptions and calibration settings

Button descriptions

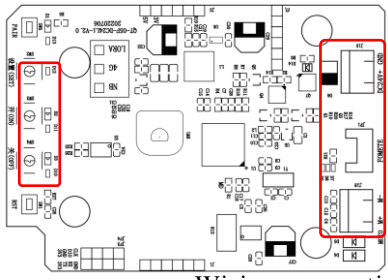
SET: long press for 5 sec, ready for calibration
ON/OFF: button for calibration
PAIR: open and close valve
RST: reset button

Operation instruction for valve position calibration

1. Long press SET for 5 sec, ready for calibration settings, the valve position value returns to intermediate value
2. START light turns on, according to valve open ratio, select a way such as long pressing START or END, to fully open valve, short press SET, switch to ALL CLOSE settings.
3. END light turns on, long press START or END to fully close the valve, but pay attention to the valve moving direction, it must be the reverse direction of opening the valve

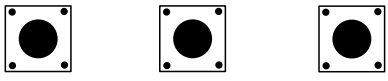
Note: in the process of calibration, the direction to open and close the valve must be opposite, START and END button can switch to operate. After the calibration, take a test to make sure that the valve is opened and closed in the right position before installed on the pipe.

Calibration buttons



Wiring connection

ON /OFF Calibration button



Registration and add devices

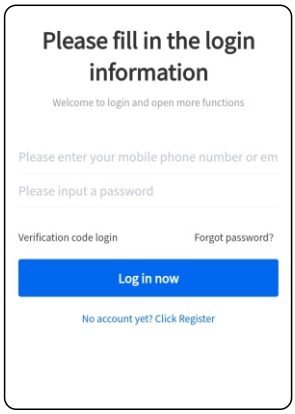
(1)Registration and App download

Mobile phone:

For mobile phone with IOS, search “IOTMGR” in Apple app store, sign up via mobile phone or email.

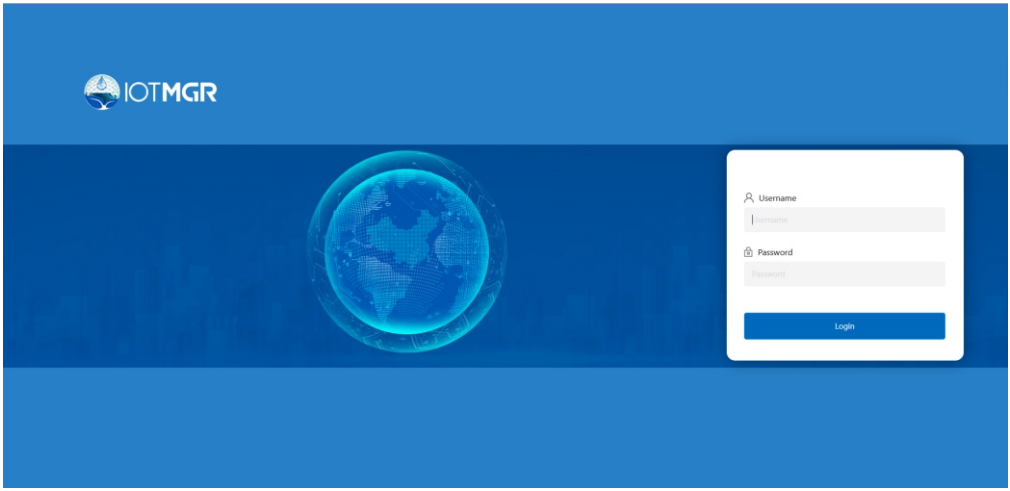
IOS App
Download QR code

Android
For mobile phone with Android, please scan QR code to download



Web:

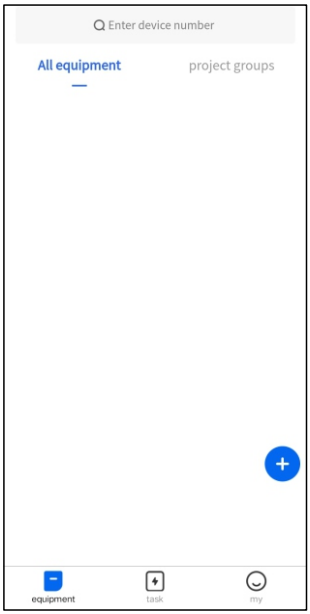
Login web: www.smart1688.net
Sign up via mobile phone or email



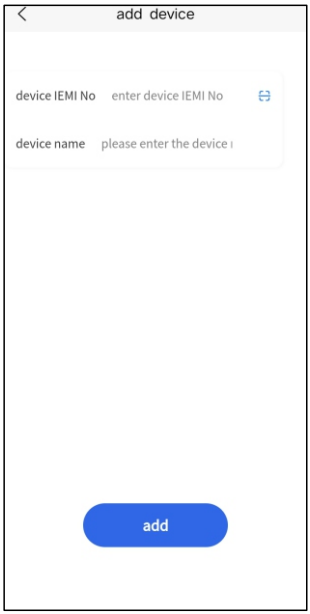
(2)Add and bind the GSM devices

Mobile phone:

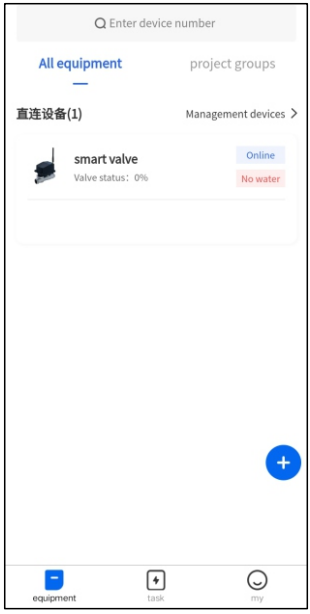
"All devices"interface, click on "+" to add devices



scan QR code or input IEMI number→input device name →add the device

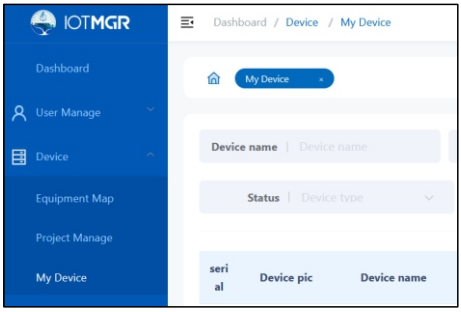


The bound device is on the list

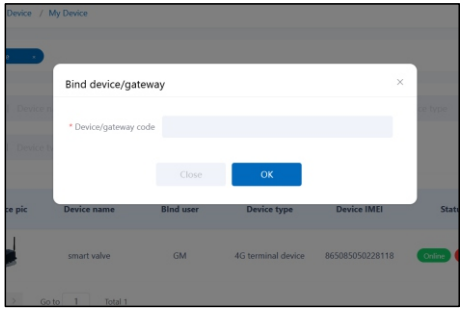


Web:(www.smart1688.net)

"Device management"→My device, "bind device/gateway"

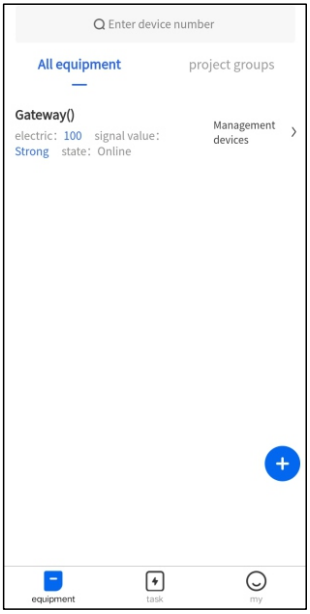


Input IEMI number→OK

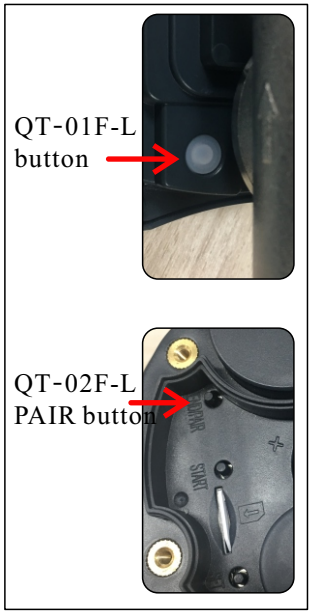


(3) Add and bind LoRa devices:

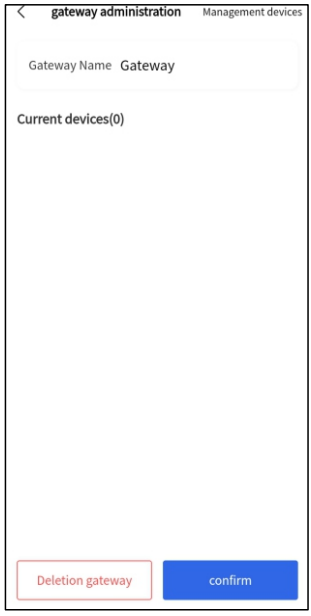
1.Follow the steps of adding a device,first add the gateway



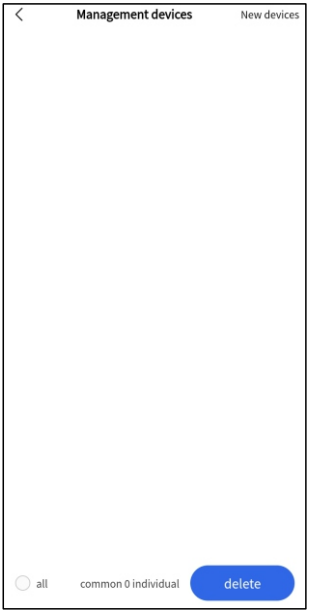
2.Long press the PAIR button on the valve controller for 5 sec to enter the pairing network state



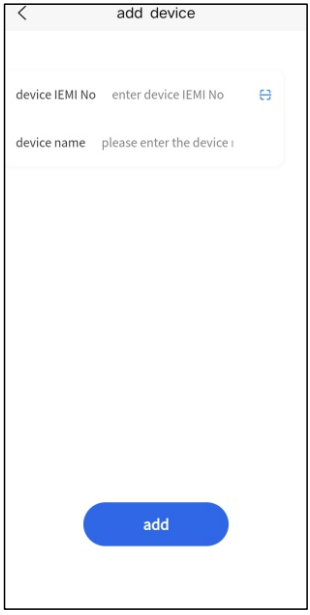
3.Click on Gateway, enter gateway management→ “manage device” on the right upper corner



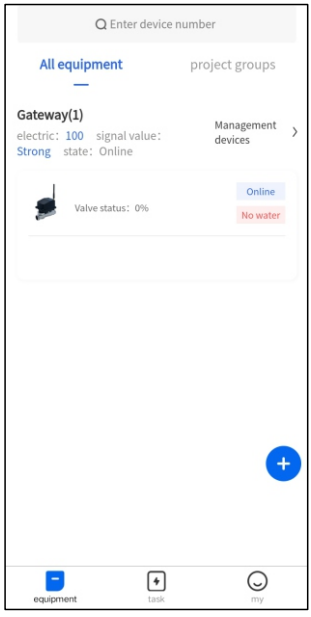
4.Click on add new device on the right upper corner



5.Input IEMI number and scan QR code→ name the device→add



6.The bound device is on the list

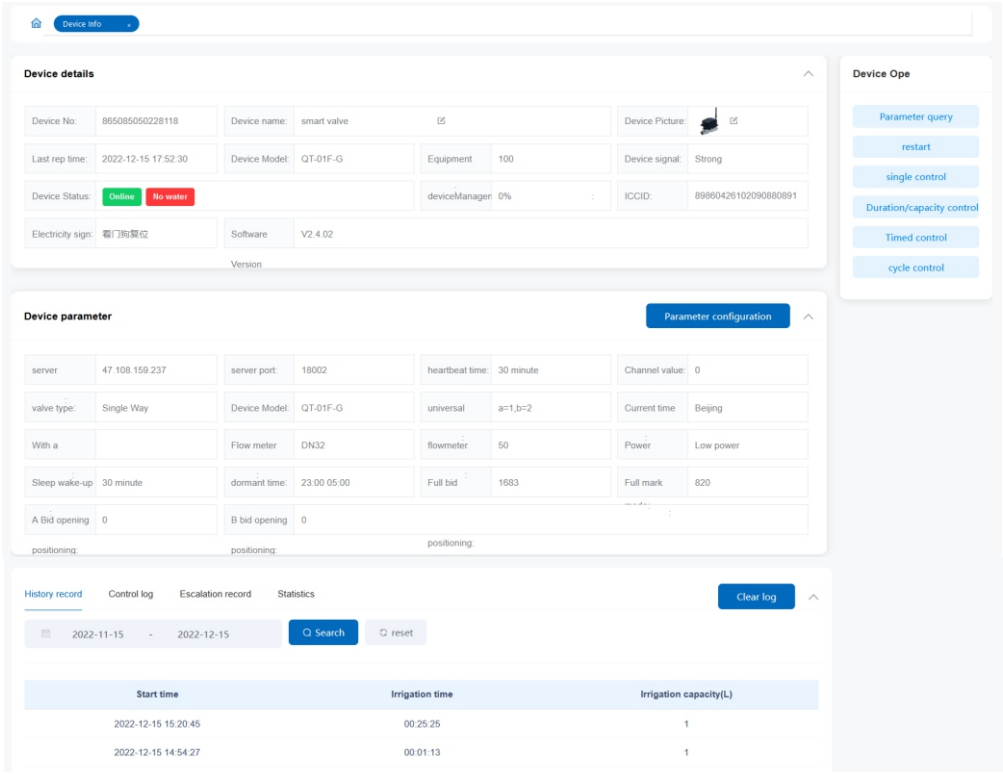


(4)Device parameter

After adding the devices, click on “details” to view the device parameter
Device parameter includes: parameter query,parameter configuration and review, device operation interface, history, control log, escalation log, statistic, etc.

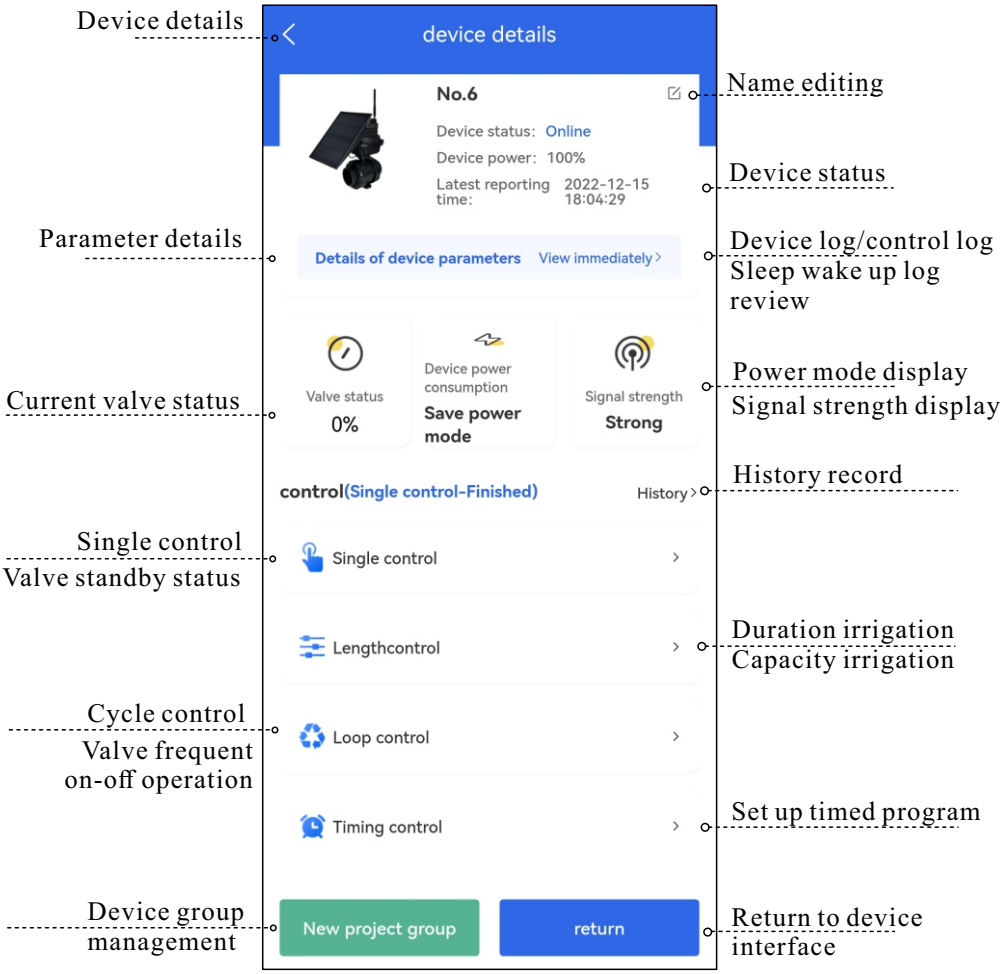
Parameter details on Web terminal :

①Device details: to edit device name, photo, basic information display: device NO., model,version. Electricity, signal strength, device status, last rep time etc can be view in the column too.
②.Parameter configuration: select time zone, valve calibration value, flowmeter parameter, power mode, Sleep wake-up time, dormant time etc, note: parameter settings should be edited under the coach of our professional technicians, random settings might lead to abnormal functions.
③. Device operation: to operate valve, single control, duration/capacity control, cycle control, timed control, restart
④.Device record review: history record, control log, escalation log, statistic of monthly duration and water volume.



Operation interface

Mobile App interface

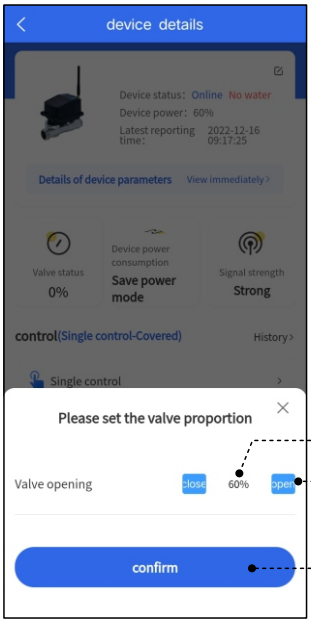


Operation instruction

(1)Single control:

Set up valve standby position for single control, for example, 80% valve opening ratio, when the order is delivered, the valve keeps 80% opening ratio until the next order to cover it.

Mobile App terminal:



Operation steps:

①.Select the device you want to operate, enter the operation interface

②.Select “single control”, pop up settings window

③.Select percentage, “on” is equal to 100%

④.Send the order

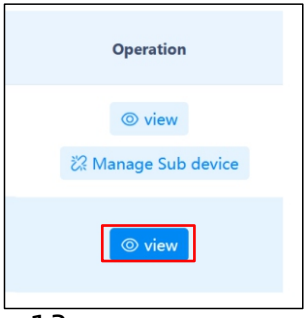
Valve opening percentage

Open the valve to 100%

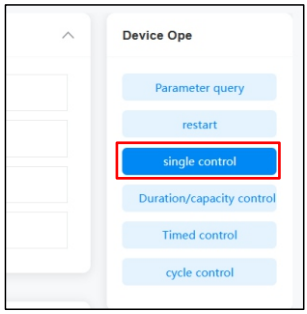
Confirm and send the order

Web terminal:

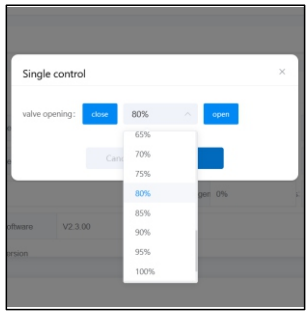
1.“Device” → “My device”, “view” on the right column



2.Enter the device interface, select “single control” on the right operation column



3.Select valve open ratio, confirm and send the order, “open” is equal to 100%



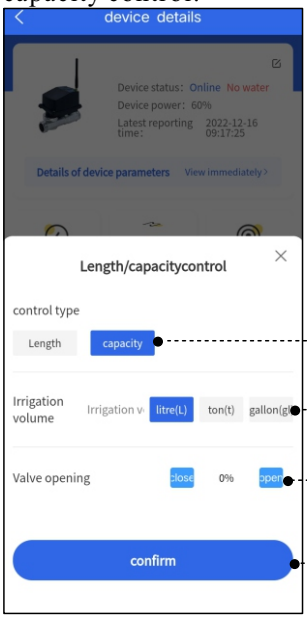
(2)Duration/capacity control

Duration control: to control valve opening duration; Capacity control: to regulate the water consumption; Both irrigation modes support valve opening percentage

Note: capacity control requires flowmeter and multiple measuring units are optional.Please pay attention to the measuring unit before setting the capacity, the difference among the units is quite large.

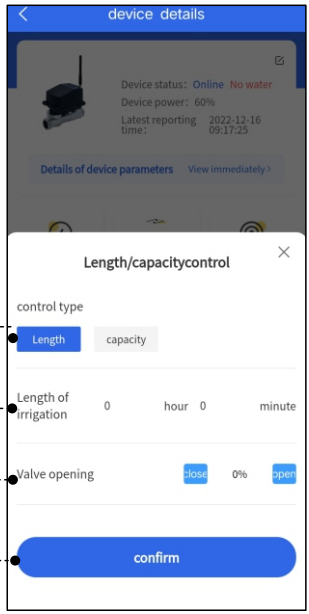
Mobile App terminal

capacity control:



Note: capacity control requires flowmeter to activate the function

duration control:



Capacity control

Duration control

Capacity settings

Duration settings

Valve open ratio

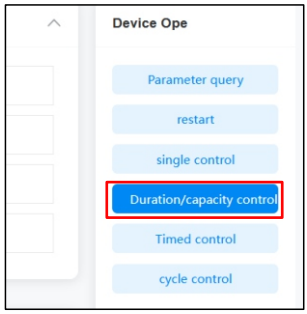
Confirm and send the order

Web terminal:

1.“Device” → “My device”, “view” on the right column



2.Enter the device interface, select “Duration/Capacity control” on the right operation column



3.Select duration or capacity, set the irrigation duration or capacity--valve open ratio---confirm and send the order



(3)Cycle control:

When frequent irrigation is needed for each day, please set the irrigation cycles and rest interval, the smart valve will be opened and closed according to the setting cycles

Mobile App terminal:

Operation steps:

①.Select the device and enter the operation interface

②.Select “cycle control” and pop up the setting window

③.Set the irrigation cycles, which are the cycles to open and close the valve

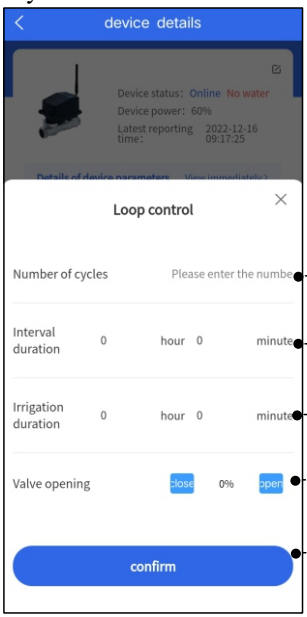
④.Set the rest interval, which is the interval between the last turning off and next turning on.

⑤.Set the duration

⑥.Select percentage, “open” is equal to 100%

⑦.Confirm and send the order

Cycle control:



Number of cycles

Interval duration

Irrigation duration

Valve opening ratio

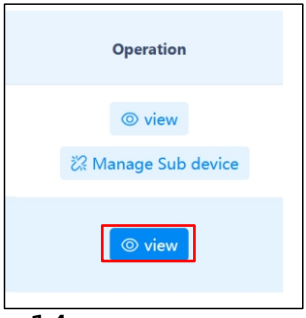
Confirm and send the order

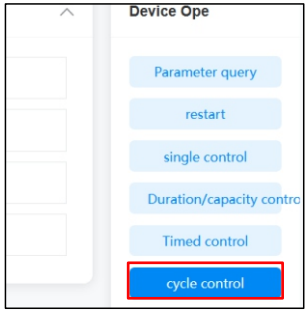
Web terminal:

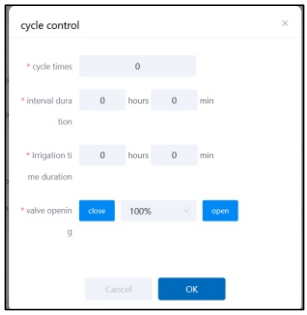
1.“Device” → “My device”, “view” on the right column

2.enter the device interface, select “cycle control” on the right operation column

3.set the cycles--rest interval--duration--valve open ratio--confirm and send the order



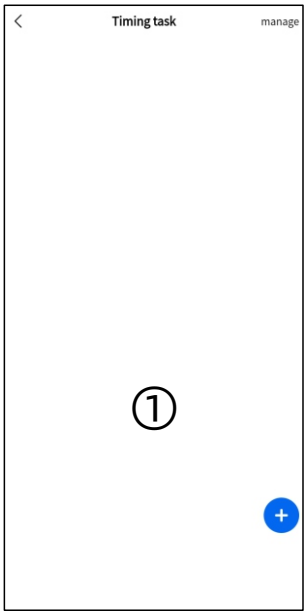




(4)Timed control:

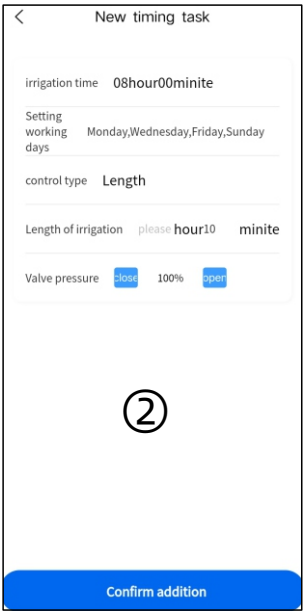
Timed control is to set up timing irrigation program. 20 timed programs are available, in each timing program, duration and capacity setting is available(capacity timed program requires flowmeter)

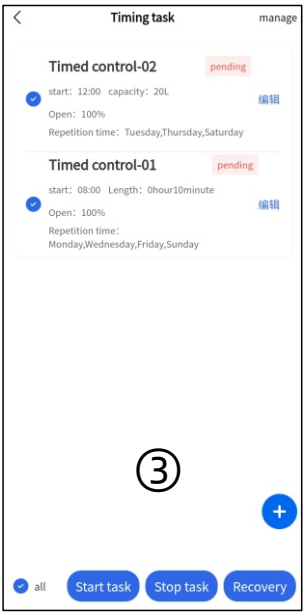
Mobile App terminal:



①.Select the device, and enter the device interface, click on the “+”, and add a new timed program

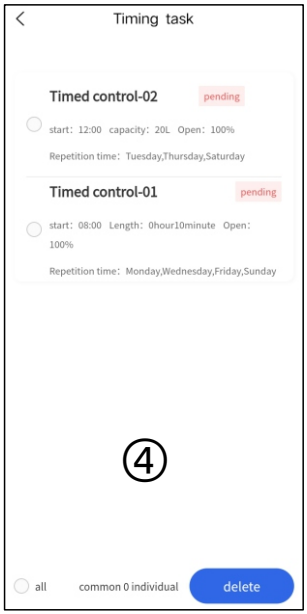
②.Starting time→ working day→duration or capacity→duration→valve open ratio
For example: Photo 2, the timed program is to start irrigating on 8:00 at every Tuesday, Thursday and Saturday, duration is 5 min, valve open ratio is 100%





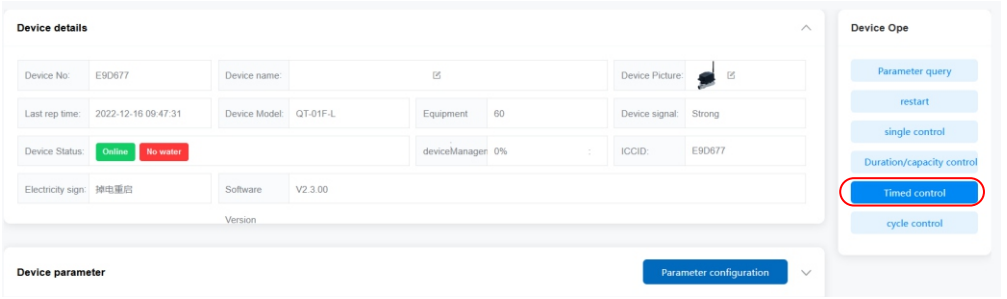
③In the timed program list, select the target timed program, start the task. For ending, please choose and turn off the task.

④“Edit” can set the task again, click on management, for those useless task, user can delete at will

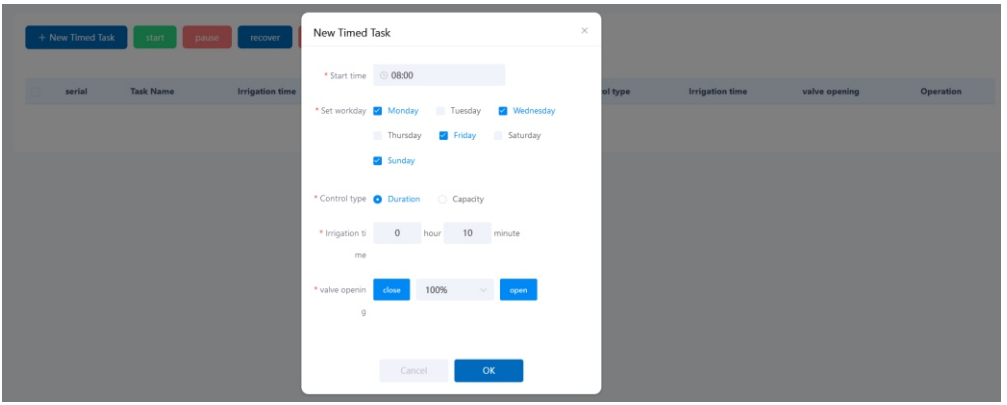


Web terminal:Timed control

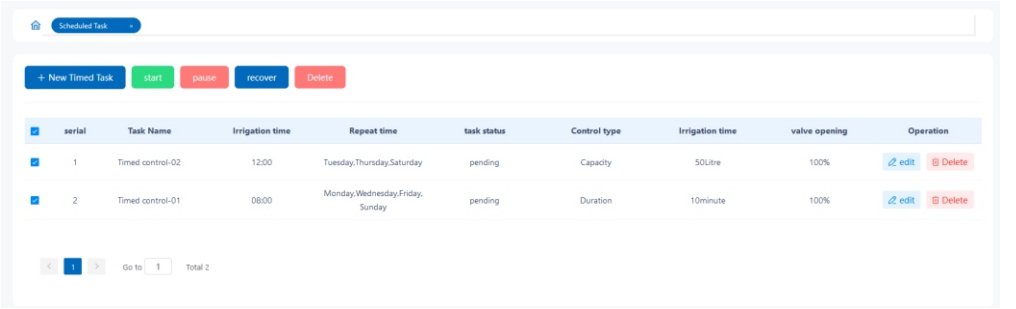
①.“Device” → “My device”, “view” on the right column
Select “Timed control”, enter the settings interface



②.“New timed task” on the left upper corner, starting time→working day→Duration or capacity→ duration→valve open ratio→confirm and created



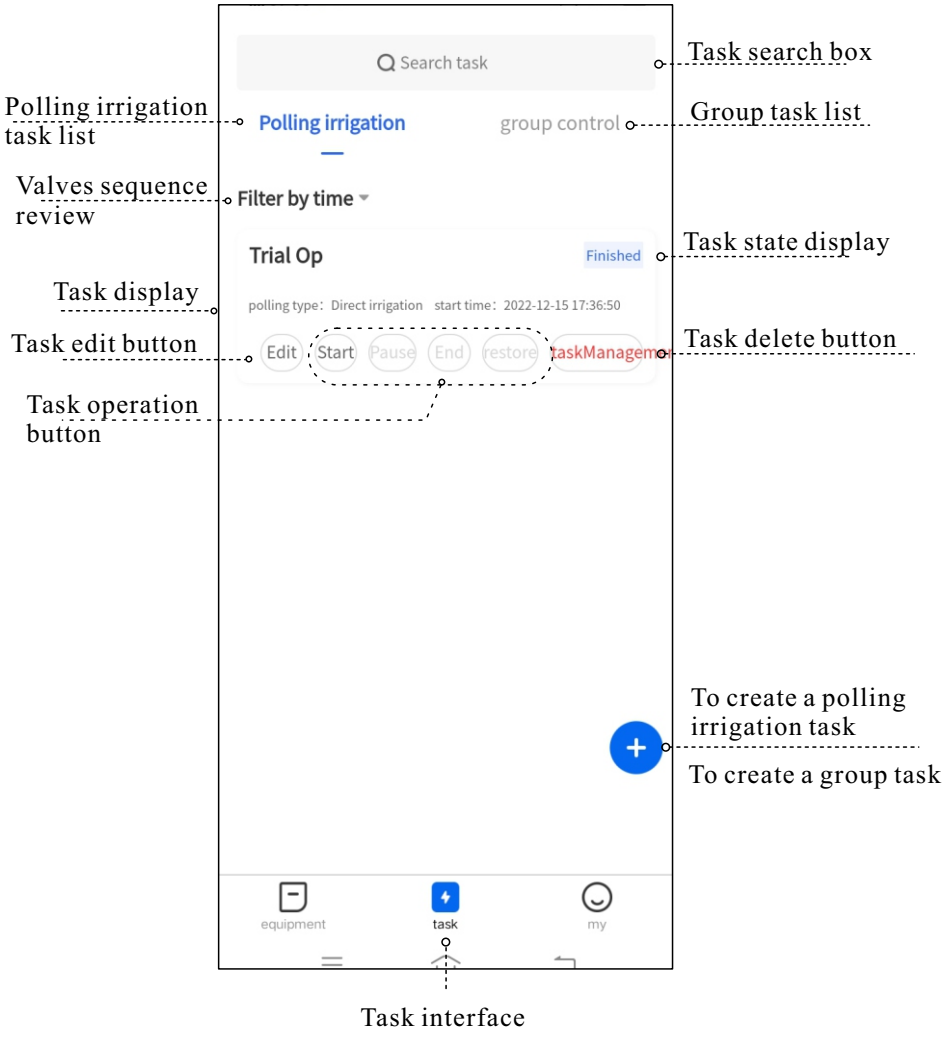
③.Return to the timed task list, select the executed timed task to activate. For ending, please choose and turn off the task. To restore the task, please turn on the task again. “Edit” can set the task again, click on management, for those useless task, user can delete at will



Task operation

Task

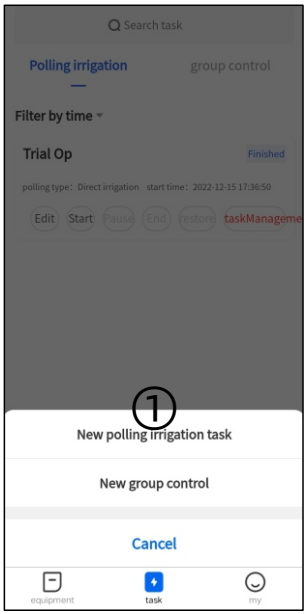
Task types include Polling irrigation and Group task.
The valves automatically queue up to irrigate according to the preset order.
Group task: the valves in the same group execute the same task,single control,duration/capacity control, cycle control, at the same time



(1)Polling irrigation task:

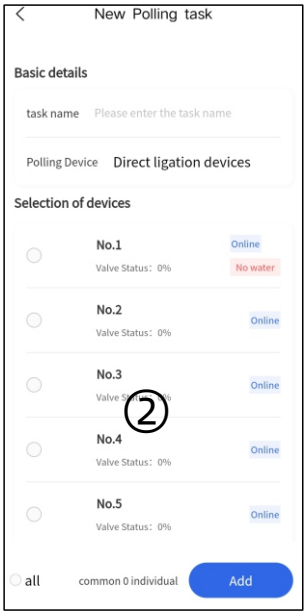
Polling irrigation: valves automatically queue up to irrigate according to preset sequence, when a pump is linked with, pressure can be preset for each pipe.

Mobile App terminal:

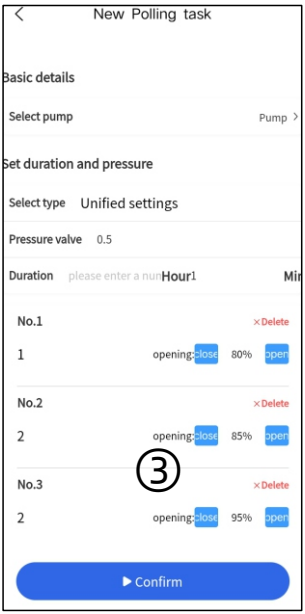


①.Task interface→ "+" on the right down corner, create a new polling irrigation task

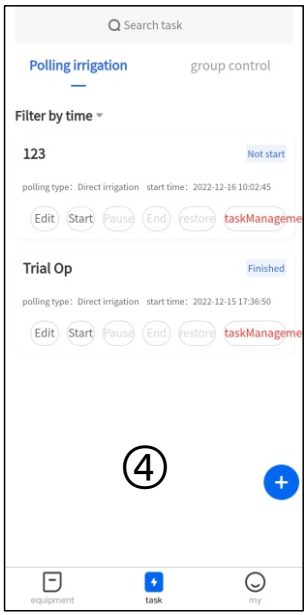
②.Name the task→ select GSM or Gateway devices→ select valves→added to the task



③.Select a pump(if a pump is not available, you can skid this option, the pressure setting is activate when a pump is linked)
→To set pressure and duration
→To set valve open ratio
→To set valve sequence, if all the valves share the same sequence number, it is considered that all valves open at same time
→Confirm and send the order

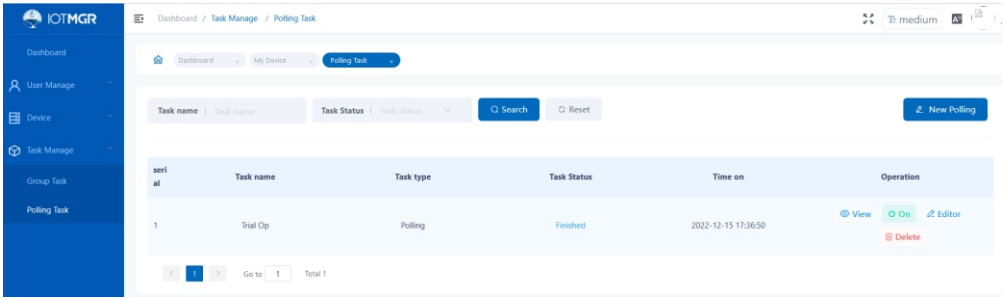


④In the task list, you can start, pause, end the task at will. Re-edition or deletion is available for the task to be executed.

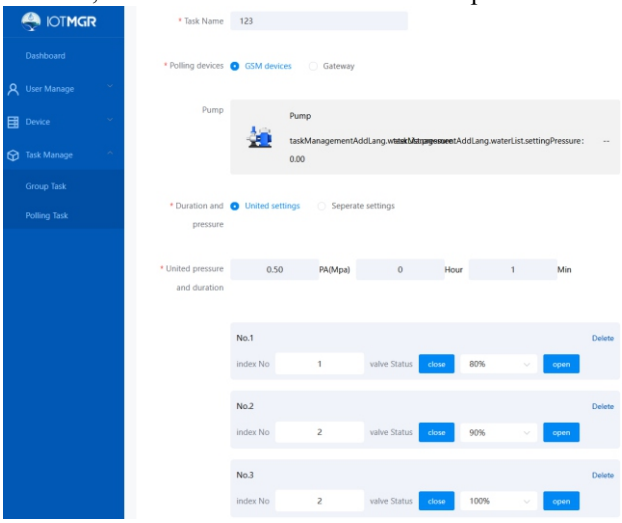


Polling irrigation(Web terminal) :

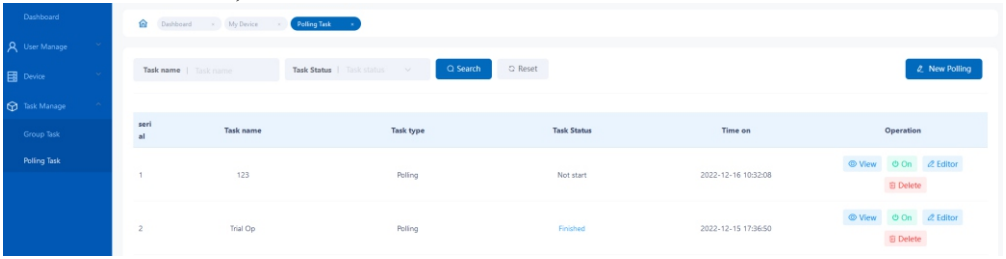
①.“Task manage”→ “Polling task”→ “New polling” on the right upper corner



②.Name the task→ select GSM or Gateway devices→add irrigation valves→ select a pump(if a pump is not available, you can skid this option, the pressure setting is activate when a pump is linked)→ select united or seperate settings, united settings are to set a united pipe pressure and duration for all the valves, seperate settings are to set individual pressure and duration for each valve → set pressure and duration → valve open ratio →set irrigation sequence, if all the valves share the same sequence number, it is considered that all valves open at same time



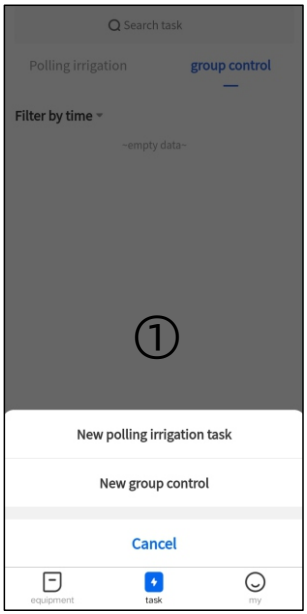
③.In the task list, you can view, start, pause and end the operation, for the task to be executed, you can edit and delete the task. There are two starting types: immediate start or user defined, user defined is to start the task at scheduled time.



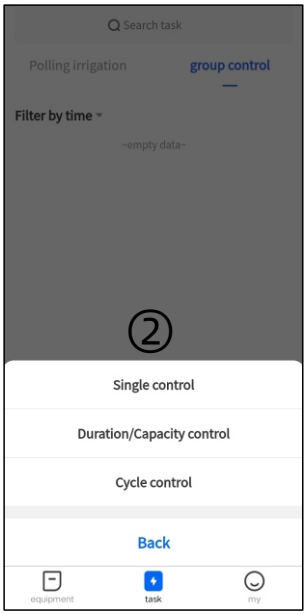
(2)Group task：

Group task: the valves in the group will execute same operation,Group single control,duration/capacity, cycle control.

App terminal：

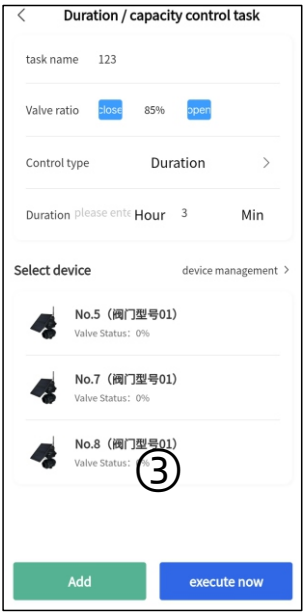


①.Task interface→ “+” on the right down corner to create a new group task

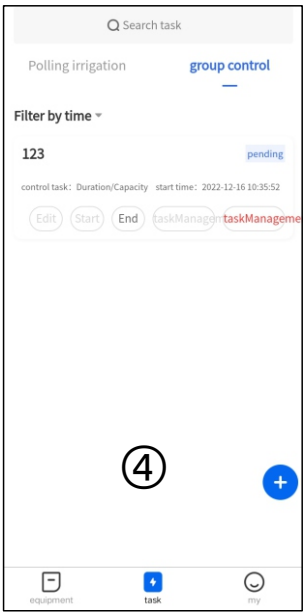


②.Select control mode, single control, duration/capacity or cycle control(capacity control is activated when flowmeter is connected)

③Name the task
→ add valves to the group
→ valve open ratio
→ select control mode
(operation details are the same as previous introdution)

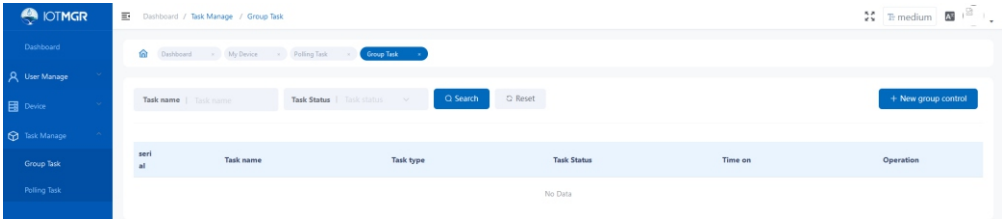


④In the task list, you can start, pause, end the task at will. Re-edition or deletion is available for the task to be executed.

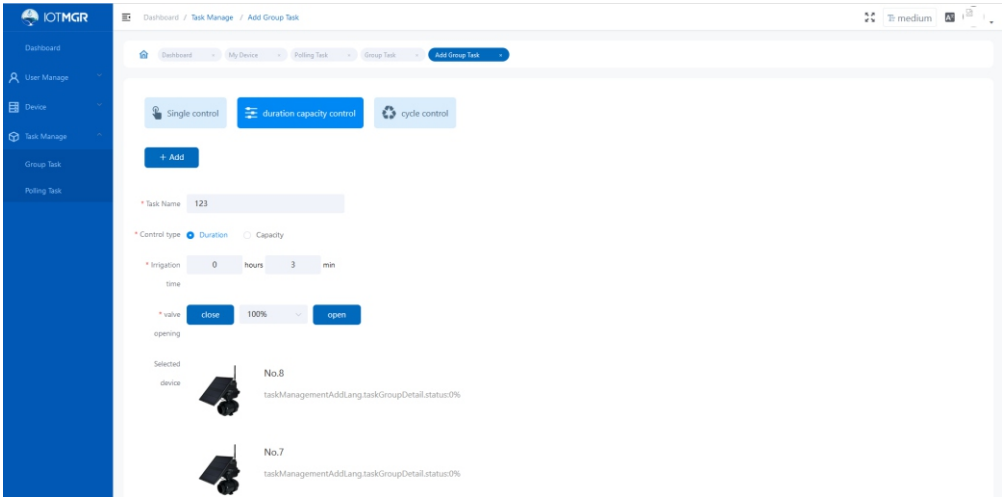


Group task(Web):

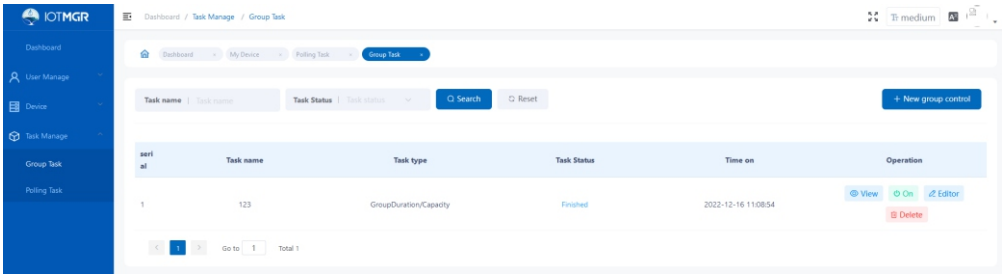
①.“Task manage”→“Group task” → “New group task ”on the right upper corner



②.Select control mode: single control, duration/capacity or cycle control(capacity control is activated when flowmeter is connected)→add devices to the group→name the task→set the operation detials(similar to previous single control,duration/capacity control,cycle control, timed control instruction)→valve open ratio→confirm and activate

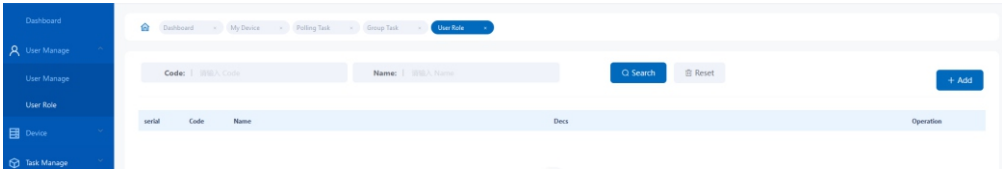


③.In the task list, you can start, end the task at will. Re-edition or deletion is available for the task to be executed.

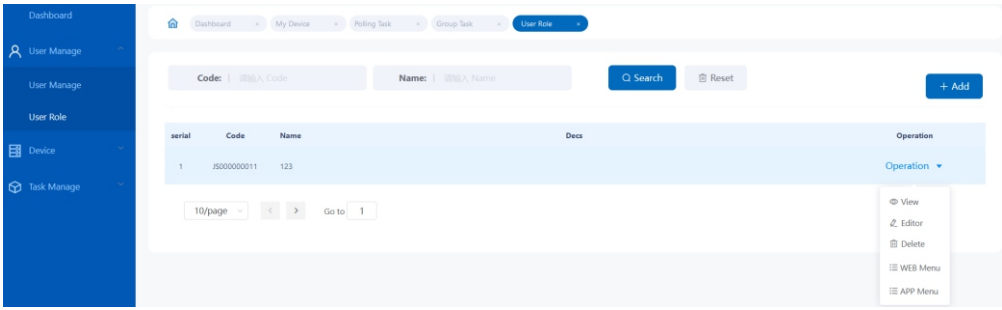


(3)Sub-account creation:

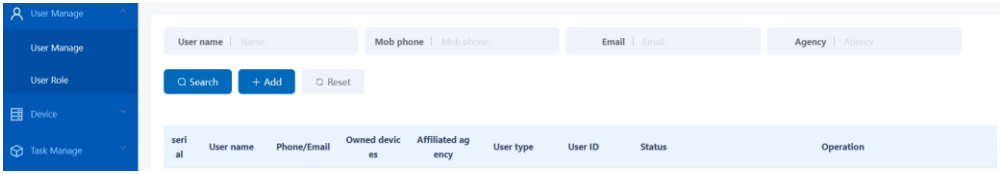
①.User role→ “Add”, name the role, confirm and create a new role



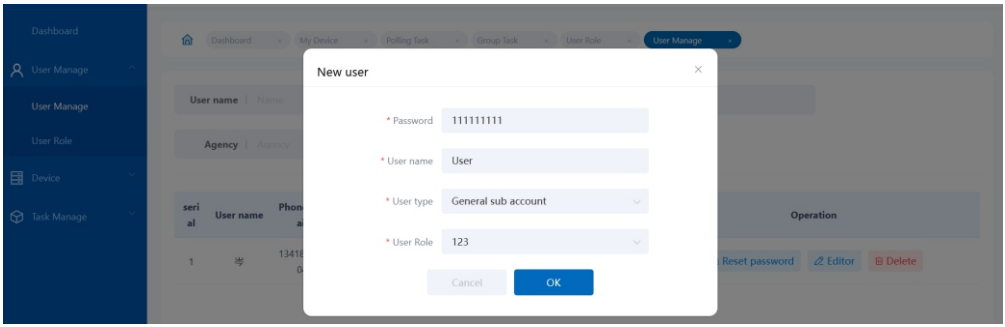
②.Assign authority for the new role→“operation” on the right column, pop up drop-down menus → web menus is for web authority, App menus for App authority, you can assign the authority according to the actual requirement



③.User manage→ “Add” to create a sub account



④.To set sub account password→ name→user type→user role→ confirm



⑤.User account is for sub account login, you can also choose phone number, email as login account.

⑥.Sub project group is the devices assigned for sub account to manage

Notices for working

(1)Notices for installation

1.The Protection class is IP66, it can be installed indoor and outdoor but cannot be soaked into water, please don't install it in a place which is water-logging.
2.Install the device in the area with good signal reception
3.As the device is powered by battery and solar panel, please place it in the sunny area
4.Please follow the national waste battery recycling process for battery recycling to avoid environmental pollution.

(2)Notices for working

1.Don't open the valve when it is frozen
2.Don't hammer, stand on or hold up heavy when the device is working
3. When the valve is switched on and off, do not put body parts or other objects into the valve to avoid bodily injury or damage to the valve;

(3)Daily Maintenance for valve

1.When the device is stocked in the warehouse, it requires regular examination, remove dirt and oil it regularly to prevent rust
2.When it is installed, the following items need a regular examination
1)The abrasion in the sealing surface
2)The abrasion on the trapezoidal thread of stem and stem nut
3)The sealing test should be done after the device is installed well
4)Keep the solar panel clean

(4) Warranty regulations

1. The warranty period of this product is one year.
2. During the warranty period, the breakdown (judged by the company's official staff) will be repaired free of charge under the condition of normal use following the instruction manual.
3. During the warranty period, if one of the following occurs, it must be repaired with a fee:
1) This warranty and valid proof of purchase cannot be provided.
2) Malfunction and damage caused by improper use and improper repair.
3) Failure or damage caused by transportation, moving and falling after receiving the goods.
4)Damage caused by other unavoidable bad factors.
5) Failure or damage caused by the device being soaked in water.
4. Only the above warranties are made, and no other express or implied warranties (including the implied warranties of merchantability, reasonableness and fifitness for a particular application, etc.), whether in the contract, negligence, or other aspects, the company is not responsible for any special, incidental or indirect damages

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