Version: REV01

Wireless Intelligent Controller

GG-002WIFI/3G

User Manual

www.anctech.com

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1. Introduction

Wireless Intelligent Control system GG-002WIFI/3G. The main controller with built in wireless mesh network wirelessly control surrounding field wireless controllers up to 2000 meters as control radius, and send all field information to web server through WIFI or 3G if it is an agriculture field. Customers can control and supervise from anywhere, anytime from the world.

The main controller controls up to:

60 field irrigation zones, each zone can register/control up to 4 moisture sensors and 4 valves.

5 wireless pumps,

5 wireless flow meter controllers with pressure meter and pump/master valve control.

8 wireless master valves.

All field controllers are solar powered. With wireless communication, no need of power and communication lines, it is very easy and low cost to install and maintain.

2. How It Works

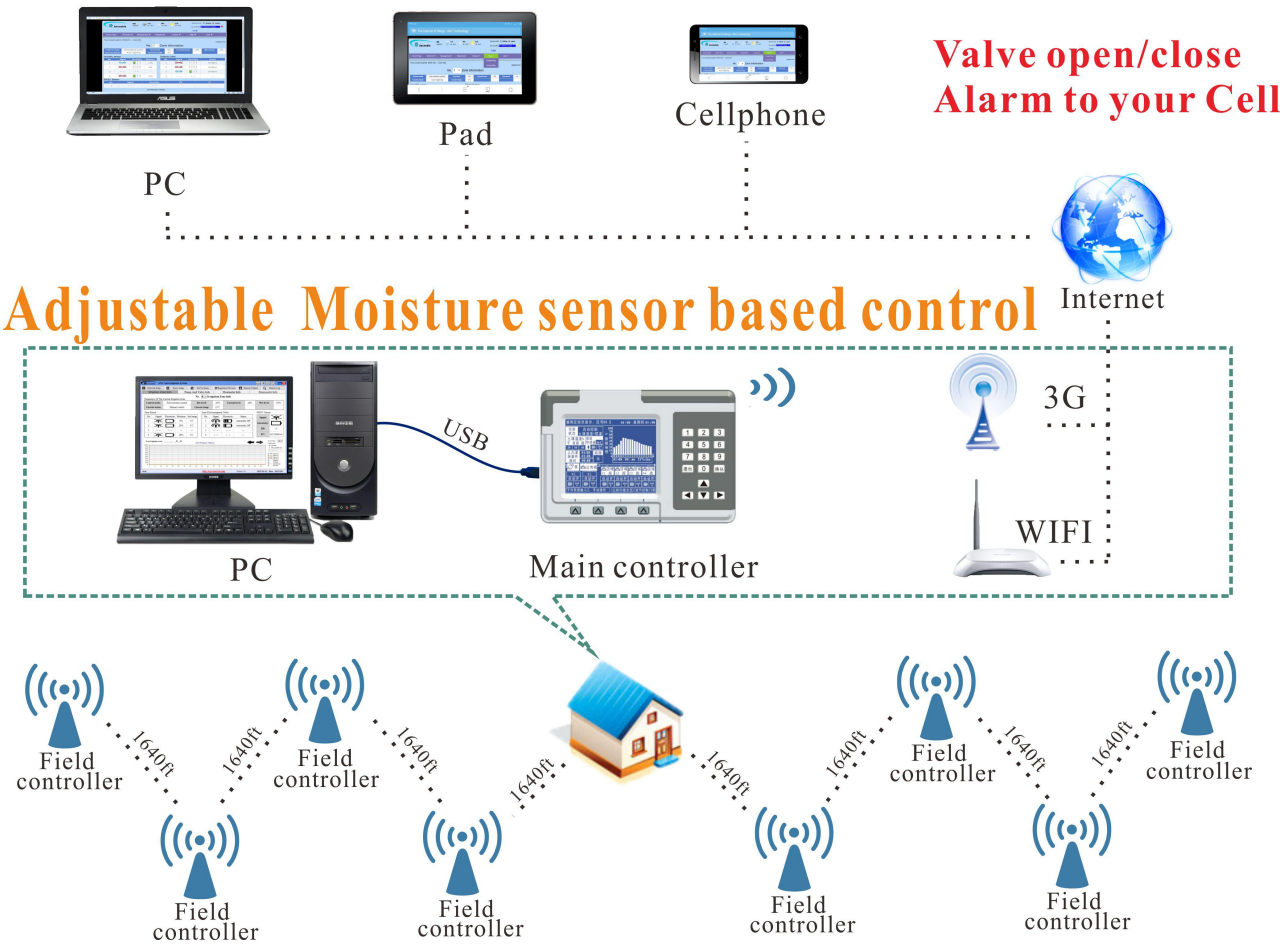
First, all the field controllers need to register with main controller to establish bidirectional wireless mesh network communication. Then the main controller GG-002WIFI/3G periodically send out wireless signals to demand field information from field controllers, like current moisture, temperature, flow rate, water pressure, communication status, and battery status … to realize auto control of field valves, master valves, and pumps.

This system support moisture based auto control and timer control.

1. Moisture sensor based control. The system will open/close valves according to Dry/Wet threshold default.
2. Timer control.

Connect main controller through USB to PC, there is real time field information on the PC screen, push “Scan” key to renew field information. Supervise and control from the PC. With WIFI or 3G, the PC will send field information to ANC server, so customers can supervise and control the system at any time and anywhere.

3. System Diagrams



4.Specifications

4.1 Main Controller

Power supply: 12VDC, 1A

Back up battery: Ni-MH 2300Ah AA 1.2V*4

Idle current: ≤100mA

Receiving frequency: 902MHz-928MHz

Remitting frequency: 902MHz-928MHz

Wireless range: Open space, 2m-500m, can reach 2000m through relay function

Operating temperature : -30-60°C Relative humidity: ＜90%

Dimension: 246mm*156mm*47mm

Wireless field controllers: Please refer to field controller user manual

Remark:

Suggested maximum Flow meter extention cable is 5 meters.

Suggested maximum pressure switch extention cable is 50 meters.

Suggested maximum pressure meter extention cable is 50 meters.

Suggested maximum pressure pump extention cable of GG-005Ms&P is 50 meters.

Suggested maximum moisture sensor extention cable is 50 meters except moisture sensor for GG-005 series.

Suggested maximum liquid level switch extention cable is 50 meters.

Suggested maximum magnetic valve extention cable is 20 meters.

Suggested maximum GG-005 moisture sensor extention cable is 20 meters.

5. Terms Explanation

Dry set level: Soil dry point, when soil moisture sample level is at or below this level, the system will start irrigation. This level is user determined, expressed as a percent range is 0 to 99%.

Wet set level: Soil wet point, when soil moisture sample level is at or above this level, the system will stop irrigation. This level is user determined, expressed as a percent range is 0 to 99%.

Rain sensitivity: Moisture % for checking rain during timer function.

At beginning or during irrigation time, the system will check rain sensor. If the moisture % is bigger than the setup threshold, system will not start, or terminate the irrigation to prevent irrigation in the rain.

Irrigation zone: Divided by natural shape with same kind of crops require same irrigation method. Could up to 4, 3" valves, open at same time, or open one by one. Or small as using only one 1" valve.

6. Features

1. The main controller can control up to 60 irrigation zones, 5 wireless flow meter controllers with control to pump/master valve and pressure meter, 8 master valves.

2. The main controller real time show all the field Information as following:

- Current soil moisture and temperature of the zone.
- Set Dry/Wet moisture control levels or rain sensor sensitivity
- Current control mode of each zone.
- Wireless signal and battery status of each field device by zone.
- Zone's manual or auto status.
- Valves open/close/failure status.

• Data of last irrigation event.

• Water flow rate and total from each flow meter.

• Moisture history chart with indicator of most recent irrigation events

3. Each system has unique ID, independent, and with no interference.

4. Simple but powerful operation, through either main controller, PC or web server from any where：

a) With bidirectional wireless communications, could adjusting Dry/Wet control levels either on the PC, main controller or field controllers.

b) Remote manual open/close zone valves or master valves from the PC, main controller, also manually open/close valves from the field controllers for convenience.

c) Can set and adjusting Dry/Wet control threshold through field controller, which will send the setup threshold back to main controller.

5. If rain is forecasted, user can browse to “Rain Delay” function, choose no irrigation for xx hours before rain in “Timer” mode, or irrigate only to keep the moisture above the dry level at “Moisture” mode, or to wait for the rain forecast period to pass, to minimize water usage.
6. Optional: Install wireless flow meter controller with pressure meter on pumps or master valves to add flow rate and pressure alarm function to reduce water loss by broken pipe.
7. Strongly suggest install pressure switch to every valve. The controller will check water pressure 3 times then alarm if there is abnormal pressure.
8. All 60 zones can independently choose one of these three irrigation modes:

a，Moisture sensor based control.

b，Moisture sensor based control + irrigation time period.

c，Timer control.

d. Timer + Rain sensor.

9. When under “Moisture sensor based control + Irrigation time limit” mode, each zone can independently choose from 5 programmable timer tables.
10. When in “Timer” mode, each zone can have independent irrigation schedules, from Monday to Sunday with independent schedules, each day up to 2 irrigation events. Can copy schedules to different zones for convenience.
11. When zones are in “Timer + Rain sensor ” mode, the moisture sensor may be used as a rain sensor. User can set the moisture sensitivity very easily. No more irrigation in the rain.
12. Each zone, for any irrigation mode, can be set for maximum length of irrigation time to prevent flooding due to broken pipe or accident.
13. If there is not enough water pressure for irrigation of all zones needing irrigation, the user may set the minimum/maximum number of zones to irrigate simultaneously under each pump or city water. Zones requiring irrigation first are the first to irrigate.
14. All field devices are solar powered, communicating with the main controller by special bidirectional wireless mesh network communication paths. No power/communication line is required, so is very easy to install/maintain and great for environment.
15. All field devices can be used to relay wireless signals of other devices to dramatically increase wireless communication distance while maintaining low transmitter/receiver power consumption. The wireless control range can be up to 6.500ft/2,000 meters.

16. Frost alarm: the user can set temperature protection threshold high or low (as 0°C). When temperature reaches these points, the main controller will either alarm or automatically start to irrigate to prevent heat/frost damage according to user set default. Option also to water for a short time to clear ice from pipes.
17. If rain is forecast, user can browse to “Rain Delay” function, irrigate only to keep the moisture above the dry level at “Moisture” mode, to minimize water usage.
18. Irrigation events, moisture history and failures can be viewed in the event history.
19. Each irrigation zone can control up to 4 moisture sensors and up to 4 wireless valve controllers. User can add or delete field devices at will.
20. Total flow alarm function: Mainly used in monitoring fertilization, users can set two alarm fertilizer according to their own fertilizer, respectively. The first is warning; the second reaches the end of the fertilizer amount. Each time the alarm, the main controller shows alarm icon and bee alarm, 3G main controller also send alarm message to the user’s phone at the same time. Reminding users to prevent excessive fertilization, affects the growth of plants timely.
21. Friendly interface, operating instructions are richly displayed, to realize operation with no instruction manual available.

7. Notes for Installation

1. Please don’t put the main controller in a metal box, or have solid objects in the communications path. Try to place the main controller, or wireless portion of field controller 1m or 3ft above ground to assure good wireless communication range. Wireless portion of field controllers may be mounted above crops or plants to improve signal communications.

2. Main controller is for indoor application, be cautious of water spilling.

3. All wireless devices in the field must register first before establish wireless/relay communication. The registration must be unique in the system, any overlap or register with more than one place will cause errors. Can register first before install to the field, or install in the field first, then register with main controller. Keep the devices 2m from the main controller to prevent RF signal overload when do learning.

4. All wireless moisture sensor controller must setup Dry/Wet threshold before put into usage. Or setup the Dry/Wet control threshold through main controller.

5. If using one controller with control up to 4 valves, the moisture sensor should be installed within irrigation range of #1 valve. Otherwise the function of irrigating by opening valves one by one will not success.

6. All solar controllers must be installed at locations with maximum sun exposure.

7. Suggested control routes show as following:

A: City water →Zones

B: City water→ Master valve→Zones.

C: Water source→ Pump→ irrigate

D: Water source→ Pump→ zones

E: Water source→Pump→ Master valve→ Zones.

Suggestion for install flow meter controller:

After pump, before or after master valves. For pressure meter, After pump, before or after master valve.

8. If one field controller including moisture sensor and latching valves, please register them with main controller one by one.

9. These valves open and close rapidly. Use pressure relief valves as necessary to prevent

pipe breakage and water hammer.

10. Protect pipes and valves from freezing weather if necessary

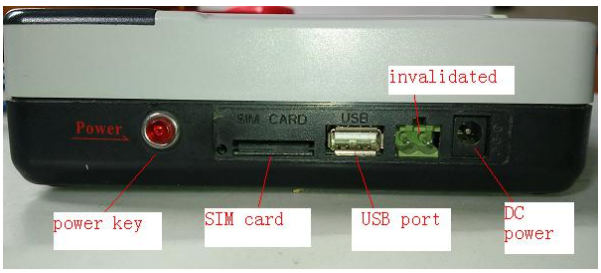
11. Use filters to prevent debris from clogging or making the valves stick.

8. Basic installation and how to use

8.1 Installation:

Please go to www.anctech.com for installation video

8.2 Main Controller



Main controller rear panel illustration

Main controller LCD illustration

Main controller antennas illustration

8.3 How to setup main controller

Except registration/delete field controllers must done on the main controller, all other setup can been done either on main controller or on PC. And setup from anywhere through ANC server. For setup through PC, or ANC Server, please read “Help” on the PC application software.

(**Note:** zone naming, WIFI/3G setup, data storage backup and recover must been done through PC)

8.3.0 Ready to connect PC

1. Prepare one PC with window operating system. With good USB port.

2. Take out the CD in the package, put into CD driver, find GG-002WIFI/3G file, open and copy to your PC hardware storage, open GG-002 APP on your PC, choose GG-002WIFI/3G.EXE, create fast-link key to the desk top for convenience.

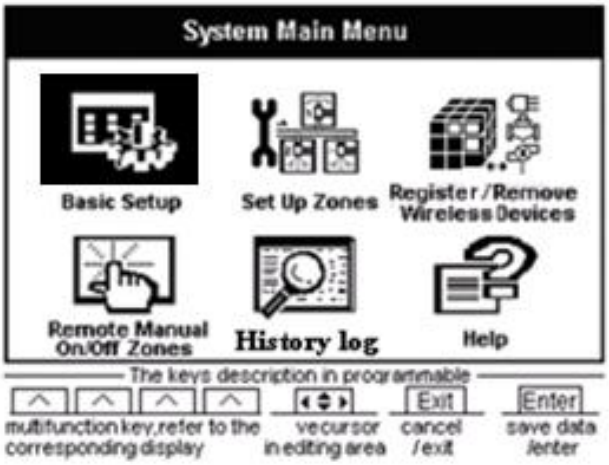
3. Find “Drive” file on the CD, double click on the “USB-drive.EXE”, following instruction to install USB driver. Double click “Framework 4.0.EXE”, install and run. If PC already have Framework 4.0 or above, (will show on PC), don’t need to install.

4. About how to setup WIFI/3G network and how to get mobile APP, please refer to “PC Software manual” on page 10.

8.3.1 How into setup menu, and do setup

At main controller window, push【0/Set】key，into“System Main Menu”（As illustrated）. Push “▲、▼、◀、▶”key to browse，choose sub-menu, push【Enter】key into the menu， push【Exit】key to return。 “System Main Menu” total has 6 sub-menus, as

illustrated。



8.3.2 Basic setup

In “System Main Menu”, push “▲、▼、◀、▶”keys browse to “Basic“ sub-menu, push【Enter】key into the menu.

Right top of “1/7” means one of total 7 choices.

Using Function keys【Browse menu up】and 【Browse menu down】, up and down menu, push “▲、▼、◀、▶” keys move edit cursor to the point, key in digital number, or using function keys “Data+1” or “Dat-1” up/down the number.

Using temperature set up as example:

Temperature unit setup------【1】

1, C degree 2, F degree

Current setup is 1, means C degree. If want to change to F degree, push “▲、▼、◀、▶” keys move edit cursor to the point, key in 2, push 【Enter】to save and out. Or can wait until done all the edit, then push 【Enter】to save and out. Push 【Exit】 key to exit and back to previous setup.

If forget to push Enter key to save, when you push menu up/down keys, will ask if you want to save previous setup. Push 【Enter】to save, push【Exit】key to exit.

(Note: Every time push 【Enter】key will save all changed setup on this window.)

1, Set up control mode and unit

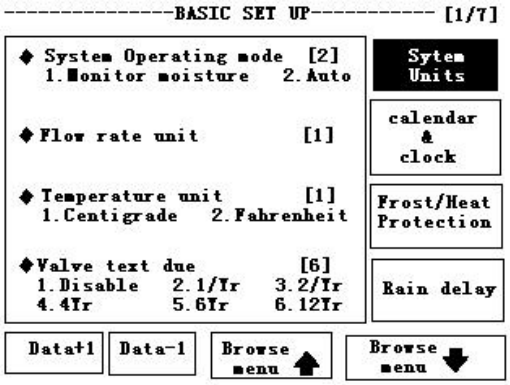
2, Setup calendar and time

3, Setup high/low temperature protection (See 8.3.2.3)

4, Setup rain delay (See 8.3.2.4)

5, Limit of zones irrigate simultaneously (8.3.2.5)

6, Setup fertilizing control (See 8.3.2.6)



7, Setup irrigation time period (See 8.3.2.7)

8.3.2.1 Setup control mode/unit

A. There are two operating mode:

Monitoring soil moisture only. Main controller scan field information every 30 minutes, show and save data on the main controller, no auto control of any field equipment.

Auto Control. Collect and show all field information and auto control all possible field equipment.

For System Operating Mode, Using “Data +1” key and “Data -1” function keys to choose 1 or 2. Choose 1 means you choose “Monitoring soil moisture only”, choose 2 means “Auto Control”.

B. Choose unit for flow meter:

Once one unit been chosen, all the data will show the same unit.

C. Choose temperature unit

Same as B.

D. Setup manual check supervise plan

For auto irrigation system, reliability of open/close valve is very important. Also need to check irrigation spray head time to time. This setup of supervise plan is for supervise if workers did go to field, manually opened the valve and checked spray heads. For example, if setup plan to check once a year, then if there is no manually open valve record within time window, alarm will on to remind customer.

Note: After manually open the valve in the field, must wait for the open information send to main controller before turn off. Otherwise will have no record in main controller.

8.3.2.2 Set up calendar / clock

Reference 8.3.2

The format as: Year-Month-Date, Hour-Minute-Second, 24 hours a day. For years, 15 means year 2015.

If choose to be simultaneous with PC, then PC will periodically update time with main controller, to keep simultaneous.

8.3.2.3 Setup high/low temperature protection

Reference 8.3.2.

A. Low temperature protection. Setup low temperature alarm point. Negative temperature by function key to key in.

B. High temperature protection. Setup high temperature alarm point.

C. High/low temperature protection methods has 3 choices. One method is automatically irrigate according to setup. Please to be cautious about this choice.

8.3.2.4 Rain Delay

Reference 8.3.2.

Rain delay. When there is rain forecast, customer can initiate rain delay function. The rain delay take current time as start time, __M-__D __H:__M means month, day, hour and minute. Setup lasting time such as 72 hours if the rain will come at third day. During that 72 hours, this system will automatically keep the soil moisture at low end of Dry control level+2%, so not hurt the crops, and wait for the rain.

After this 72 hours, the system will automatically back to auto status.

No this function for Timer operation mode.

8.3.2.5 Limit zones irrigated simultaneously

Reference 8.3.2

This limit is to make sure there is enough water pressure for all the irrigating zones, or min/max requirement for each pump. User sets up the min/max number, the pump will not open until minimum number of valves require irrigation reached, all other zones require irrigation exceeding maximum limit will wait. First zone requesting irrigation will be scheduled to irrigate first, when the limit allows.

8.3.2.6 Setup fertilization mode

Please wait.

8.3.2.7 Set up permitted irrigation time

Reference 8.3.2 (Note: If set start time same as finish time, which means no limit, irrigate at any time)

This setup is for lawns, gardens, crop with special requirements and regulatory requirements. The main controller will not issue an open valve command until moisture level and forbidden irrigation period conditions are both met.

This system can setup to 5 independent permitted irrigation time tables. Labeled from 1 to 5. Each zone only can use one time table, same table can been used for different zones. This function only work with “Moisture + Permitted irrigation time period” mode.

8.3.3 Setup irrigation zones

In “System main menu ”, through **“▲、▼、◀、▶”** browse to choose [Set up zones]，push [Enter] into this setup. There will jump out a window：“Select zone to set up. Enter zone number [ ] range: 01-60. Key in the irrigation zone number want to set, push [Enter] key into this zone setup. Finished set, push [Enter] key to save, push [exit] key to exit and back to previous menu。

There are 8 set up for each zone，as shown below：

8.3.3.1 Enable or disable this zone/Control mode/Choice of moisture sensor

Reference 8.3.2.

Using function keys below screen browse to “Enable or disable this zone" menu, push [Enter] key into this menu. Right side screen will show content of this setup.

Users choose either 0-disabled, or 1 to enable the zone. Push [Enter] key to save, push

[Exit] to exit and back to the previous menu.

A. Able or disable the zone. This zone will not into this control system until been able. Register field controllers to this zone would not able this zone. Must choose able this zone. Disable this zone will mean no any control and display of this zone.

Note: Registration has nothing to do with if this zone is been able or not.

B. Control mode of this zone.

1-Soil moisture control……Which means user set up Dry/Wet control moisture %, the controller will open the valves to irrigate as long as the soil moisture is less than the dry control level. The controller will close the valves when the soil moisture % reached setup wet control level.

2. Moisture + Permitted irrigation time period. This means customer set up Dry/Wet control levels, plus permitted irrigation time table. The system will not open/close the valves until meet both conditions.

3. Timer. Here means timer control.

4. Timer + Rain detection. Which means timer, plus using moisture sensor as rain sensor, after reach some level of moisture, stop irrigation in the rain.

C. Moisture sensor. Each zone can support up to 4 moisture sensors. For detect moisture at different depth, or take average. Control irrigation according to one of the moisture sensor, or take the average reading as control point. If take one moisture sensor reading as control sensor, this sensor must been registered as #1 sensor. Rain sensor same.

(Note: Not registered moisture sensor will cause control failure. Average moisture reading from all the registered sensors in this zone).

D. Choose method of valve control. Each zone can control up to 4 valves. Can choose

either open all once, or one by one if there is not enough water pressure. When choose irrigate one by one, the controller will record time duration of first valve from dry to wet control level, then open other valves one by one by using same irrigation length. It is good for same kind of crop.

(Notes: 1. For one by one irrigation, The moisture sensor must be in the irrigation range of #1 valve. Other valves will be irrigated one by one according to same irrigation length of #1 valve. 2. For timer mode, #1 valve follow the setup timer. Other valves follow same length one by one.

3. If irrigated one by one valve, recording #1 valve irrigation length as whole zone irrigation length.)

8.3.3.2 Set up Dry/Wet control levels/Rain Sensibility

Details reference 8.3.2

A. Setup Dry/Wet control levels. User can using field controller to setup these control threshold. When crop just need to irrigate, push the “Dry Set” key will save the current moisture % as dry control threshold. When land is just wet enough, push the “Wet set” key to save this moisture % as wet control threshold. These setup will wirelessly send to main controller for control. Open related valve when current moisture less than dry control level, or close the valve when current moisture is bigger than the wet control level.

Notes:

1. Please note that the wet control level should be greater than dry control level. If there is an error, the controller will have a long beep to remind user to redo the set up.

2. When adjusting dry/wet control levels from the main controller, first make sure the related field controller is in normal operation. Otherwise the revised data can't been send to the field controller

3. Because of bidirectional wireless communication, after revised wet/dry control levels either from the main controller or field controller, both controllers will show the same revised control level information on their LCD

4. If the moisture sensor is damaged, the current reading will straight up to 99%, the valve will be closed and wait for inspection.

B. Setup Rain sensibility

Set up one moisture % as rain check point, this apply to Timer + Rain Sensor mode. Should put the rain sensor out of irrigation range. At beginning, or during irrigation, the system will stop irrigation if current moisture % is bigger than the sensibility %.

(PC software added Dry / Wet threshold setting history record function to facilitate the historical reference to browse. Users are strongly recommended to use PC software to set up a Dry/Wet threshold only to make sure data change time (PC recorded) is accurate. **Note:** If user set Dry/Wet threshold on field controllers or main controller, it needs time to send information to computer, and there is a time difference between main controller or field controller with computer)

8.3.3.3 Set up maximum irrigation time

Reference 8.3.2

A. Maximum irrigation time, means under moisture related mode, when the irrigation time reached maximum time set up here, the valves will be closed no matter what

is the control moisture % to prevent pipe leaking or other kind of damage. (Out of factory default is 0 minutes)

Note: If set as 0, which means no maximum irrigation length limit).

B. Choose Yes/No for that if this zone would be limited by the number of zones to be irrigated at same time. If choose no, then this zone can use as light timer controller. (Out of factory default is (Yes). If you want to use this zone as lights controller, needs to change into "No".)

8.3.3.4 Assigns Pump/Master valves for this zone

Reference 8.3.2

Assign pump and master valve which must been open for this zone to get water. When this zone asks for irrigation, the controller will open valves of this zone first, and then open the assigned master valve, and then the assigned pump.

8.3.3.5 Assigns Pump/Master valves for fertilizing

Setup same as 8.3.3.4. Please wait for more

8.3.3.6 Choose permitted irrigation time tables

Here only can choose one time table from available 5 tables for the zone, not setup the time table. (Out of factory default is #1 table)

(Note: These time tables are only for moisture based control, not for timer control)

8.3.3.7 Fertilizing setup

Please wait.

8.3.3.8 Timer control table setup

Reference 8.3.2

Each zone can setup one independent timer table. If user switch control mode, this timer table will still exist when switch back.

There are two irrigation sections for each day of a week. If both section start time equal to finish time, which means no irrigation for that day.

Use can copy existing timer table to other zones for convenience if they all need same kind of timer irrigation. Push “Enter” key to confirm.

8.3.4 Register / Remove wireless devices

In “system main menu”, through **“▲、▼、◀、▶”** keys browse to “Register / Remove wireless devices”， push [Enter] into this setup。

All field controllers must register first before put into use. The registration with main controller must be unique at designed position. All registration only can been done between main controller and field controllers, and done at same time.

8.3.4.1 Register / remove moisture sensor

Take example of 1MS1V-Solar field controller

Power on 1MS1V-Solar, browse into moisture sensor register/Remove menu, wait…

1. On main controller browse into equipment register/remove menu, register/remove moisture sensor. On the menu window key in zone #, one of 4 moisture sensor positions. If you want register the moisture sensor at zone 1, and as #1 moisture sensor, key in so. If the position already has been registered before, will show you

so. Then should remove the previous one, and try again. Double registration will cause confusion and dis-function.

2. Push function key under “Start register” or “Enter”, main controller start to search for wireless field controller. Now also push register key on the field controller. After they established wireless communication, will show success information on both, with registered information. For field controller, will show main controller ID, zone #, position #.

How to remove: Almost same as register. Push “Start remove” instead of “Start register”. All the registration information will be removed from main and field controllers both.

8.3.5 Remote manual on/off zone

In “system main menu”，through **“▲、▼、◀、▶”** keys browse into “Remote manual on/off zones”， push [Enter] key into this remote control menu.

This function is allow user through main controller Through main controller open/close valves remotely will make valves keep at open/close status until user changed control status to “Auto”. All the remote manual control including all the valves of this zone.

Remote manual on/off zones has 5 choices：

Turn on selected zones

Turn off selected zones

Turn on all enabled zones

Turn off all enabled zones

Return to Auto

Note: Key in the zone number which needs remote control.

8.3.5.1 Remote turn on selected zones

Through "∧" key browse into "Turn on selected zones" menu, right side of the screen will show content of this menu. Type in zone numbers you want to do remote turn on control, then push the [Enter] key to execute the demand. The controller will start to execute the remote control demand and show process on the screen:

"Remote controlling the selected zone's valves---- Please wait", push [Exit] to stop setup and back to previous menu.

8.3.5.2 Remote turn on all the zones

Through "∧" key browse into "Turn on all zones" menu, right side of the screen will show all enabled zones. Then push the [Enter] key to execute the demand. The controller will start to execute the remote control demand and show process on the screen. Back to menu after finished.

8.3.5.3 End remote manual control and return to auto

Choose "Finish remote control, back to auto", Edit area will list all the zone numbers which are been remote controlled. Push 【Enter】key will let all the listed zones back to auto control.

If still want to keep some zones at remote control status，move "▲、▼、◀、▶"keys to reach zone numbers you want to keep, push function key under【Delete】, this zone number will been deleted from the screen. Push【Enter】key to execute will keep this zone at remote status and others back to auto.

8.3.6 Checking history log

In "System main menu", through "▲、▼、◀、▶" keys browse into "History log",

push [Enter] into this menu. “History log” has 4 choices：

1. Flow-meter information
2. Soil moisture history
3. Irrigation history
4. Failure records

8.3.6.1 Flow-meter information

In the “History log” menu, through function “ ∧ ” keys browse into “Flow-meter information”, then right side of the window will be flow meter information. Key in the flow meter number you want to check, the history will show up. Push “▲、▼”keys to turn over page.

8.3.6.2 Soil moisture history

In “Soil moisture history” log, right side of the screen will show content of this menu. In this window, type in irrigation zone number to get the soil moisture history of this zone. Push “▲、▼”keys to turn over page.

8.3.6.3 Irrigation history

Reference above 8.3.6.2

8.3.6.4 Failure records

Browse into “Failure” log, will show the most recent failure event first. Push“▲、▼”keys to turn over page and check more history.

8.3.7 Help

In “System main menu”，browse through “▲、▼、◀、▶” keys into [Help]. Push [Enter]

into this menu. [Help] total 4 choices:

1. System
2. Checking wireless route
3. Q/A
4. Products information
5. WIFI/3G signal testing

8.3.7.1 Checking route

All field controllers also function as relay. In this window listed all the field controllers. Push "▲、▼、◀、▶"key move to the controller you want to check, key in registered number, then show the special route of this field controller. If only show main controller with this field controller, which means this field controller directly communicate with main controller, no relay. If show #1 moisture sensor controller in zone 1, which means this field controller relay through #1 moisture sensor of zone #1 to main controller.

This system support up to 3 layers of relay, then reach main controller. After setup all the field controllers, they will automatically looking through relay to reach main controller. If one relay failed, the field controllers will research route after one hour.

After all field controllers been registered, main controller needs to on all the time and stay at the working status (During setup, the main controller no more can communicate with field controllers). Because all the field controllers will keep communicate with main controller, if main controller been turn off, the communication failed, the field controllers will keep search route, which will running down the battery.

Suggest to turn on field controllers which are most close to the main controller, then second run, third run until all established wireless communication.

8.3.7.2 Product information

Product information window show information as following:

1. Hardware code. This is unique ID of the main controller. If wants to connect to web server, must using this ID to register.
2. System ID. Calculated and produced by hardware code. In one system, all controllers can't communicate until all have this same ID. All field controllers get this ID through learning procedure with main controllers. User can see this ID from the field controller registration information.
3. Hardware information

   Show current hardware version and production time
4. Software information

   Show current version and date been updated.

8.3.7.3 WIFI/3G signal test

Only support test 3G signal.

8.4 Main controller display

8.4.1 Multiple window information

During window display, push function key【Other windows】at bottom left, will switch show different information windows. At different window, function of function keys will

be different too.

8.4.2 Window information illustration

1. Battery indicator.

2. WIFI/3G signal information. means there is WIFI or 3G communication failure. Checking connection and setup. Normal sign as 。

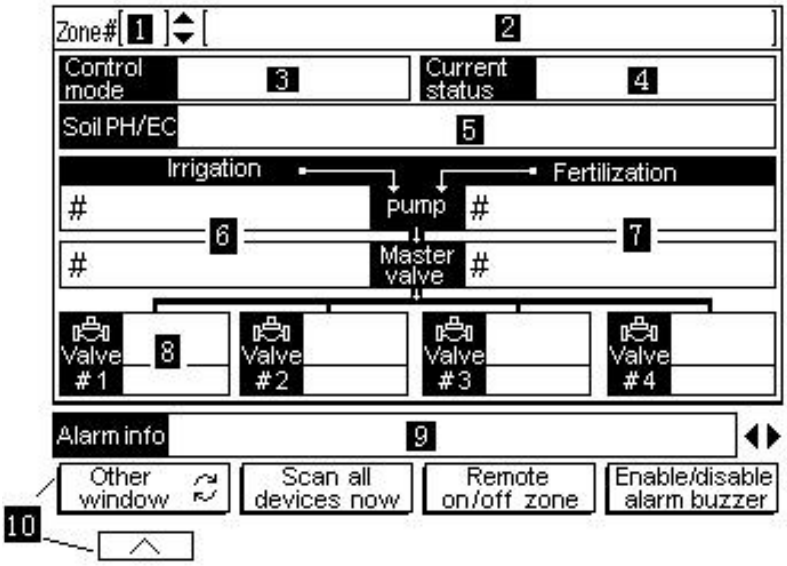
3. Connection icon of main controller and PC. means failure, check USB connection, if installed driver, if running PC program. Normal will show as 。

4. Connection icon of main controller and ANC server. means failure of connection. First check connection, then using PC or cell phone to confirm if can through this route connect to outside web. (Or 3Gcheck) Normal icon show as 。

5. Main controller version, either “GG-002 WIFI”, or “GG-002 3G”.

6. Current set of time and calendar. The format is M-D weekday hour-minute. Renew every 10s.

8.4.3 Information on the main controller



1: Zone #. Only show enabled zones. Push up/down keys to switch, or key in zone number and confirm. If key in zone number which is not been abled, beep and back to previous zone.

2: Programmable description of the zone. For example, like “Up avocado”, for easy to recognize and remember. This must been done in PC program.

3: Show current work mode for this zone.

4: Current work status: 1. Idle, 2. Auto irrigating, 3. Remote open, 4. Remote off, 5. Waiting for irrigation, 6. Extreme temperature protection.

5: Not used expandable function.

6: Master valve and pump connected to this zone, and work status. If no assigned master valve and pump, will show, “Not registered”. Otherwise will show status of communication, battery, and open/close.

7: Will show master valve and pump status which are been used for fertilizing.

8: Show 4 valves status of communication, battery, current open/close, and if registered.

9: When there are alarms, the related zone number will turn to red, and show related

icons, like master valve, pump, flow meter, pressure switch. Only enabled zones will have alarm function. Push " ◀ 、 ▶ "keys browse around to see alarm details. Needs input zone # to check details.

(Icon means:

10. Function key. There are 4 framed function words at bottom of the LCD screen, related to 4 keys below that. The keys related to the function above on LCD.

Explanation of function keys:

【Other Windows】See 8.3.1.1, Switch to other windows.

【Scan now】Scan right now to renew field information and control

【Remote Control】Push into remote control window

【Enable/Delete alarm beep】Push this key will have current status window come out. Push 【Enter】key to reverse current status. Out of factory default is enable alarm.

Alarm icon explanation:

 -------wireless communication failure  -------Valve open/close failure

 ----------Limit temperature alarm  --------Wireless devices lack of battery

 ------- Safety protection lock pump

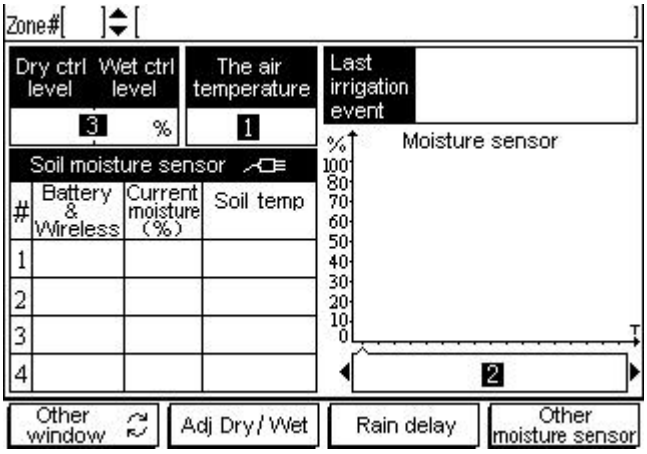
Min—Max▶ ----Above range alarm (flow rate or pressure)

◀Min—Max----Below range alarm (flow rate or pressure)

 --------Total flow first alarm  --------Total flow second alarm

The total flow rate of the first / second alarm function is mainly used for fertilization reminding, to ensure to inform users timely when arrival of the amount of fertilizer.
Please set this function through the PC interface, how to use the PC software, please refer to the specification description of the relevant description in flow meter controller FMP-solar user manual.

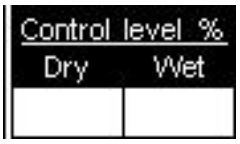
8.4.4 Information window #2 explanation

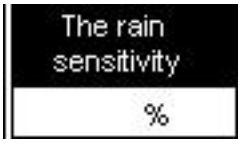


1: Current air temperature, unit can choose C or F. The meter is installed on moisture sensor controller. First choose air temperature from #1 moisture sensor.

2: Display most current 17 moisture recording, push“ ◀ 、▶ ”key to browse more history. Push function key under 【Other sensors】will show information of other 2,3,4 sensors.

3: Show current Dry/Wet control threshold and rain sensitivity. Show Dry/Wet control threshold, show rain sensitivity during mode of timer.





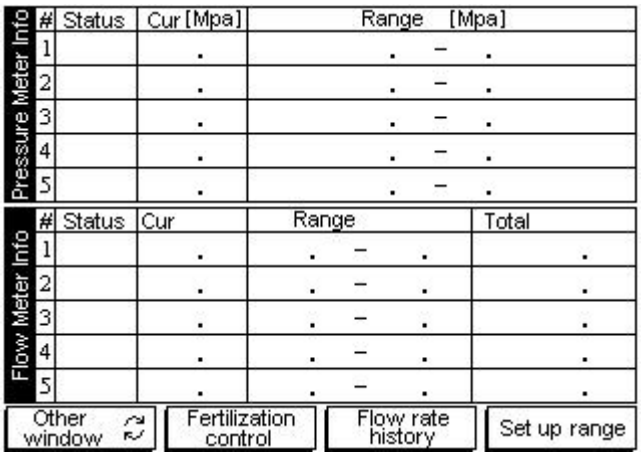
Function keys for this window:

【Adjusting Dry/Wet control levels】Push directly into Dry/Wet control level setup of this zone, easy to do digital adjusting.

【Rain Delay】One key into Rain delay setup.

【Other sensors】

8.4.5 Information window #3 explanation



Show pressure meter information about communication, battery, current pressure and setup pressure range.

Flow meter information including registration, communication, battery, current flow rate, setup flow rate range, and total volume of flow. (Display unit is been chosen from basic setup). When user enabled the total flow alarm function, after the flow meter corresponds to the number of total column data will display icon 【start】; During total flow for the first time alarm will display 1, during total flow the second alarm will display 2; without any icon means the total flow alarm function not enabled .

Function keys explanation:

【Fertilizing】Please wait

【Flow rate history】Push into check flow rate history

【Setup range】Can't setup at main controller. Pressure meter range and flow rate range can been setup from PC， or other end through ANC server.

8.5 How main controller scan to get field information and control field controllers

The main controller scan field information and execute command about every 30 minutes if no irrigation, every 5 minutes during irrigation. During scan time, LCD show up communication icon, all keys would be locked. Push【Exit】to stop scan. The system will start auto scan after one minute.

For Timer function, the system will scan before start time and right after stop time.

8.6 How connect to ANC server through WIFI/3G.

Input right WIFI/3G information to PC application, then the main controller will automatically try to connect to ANC Server. No need any operation.

3G main controller needs to have a 3G SIM card get ready first. Don't pull out 3G SIM with power on. Turn off power on main controller first before take out the SIM card.

8.7 How to initialize the main controller

Power on the main controller, LCD will show ANC icon, bars making progress, push 【0】key then will jump out one interface, 1. Recover out of factory default, 2. Delete history data. Push 【1】to 【2】keys to choose. After this initialization, all history of old data will be clean up. If make no choice, the interface will been close. Or push 【Exit】key to exit.

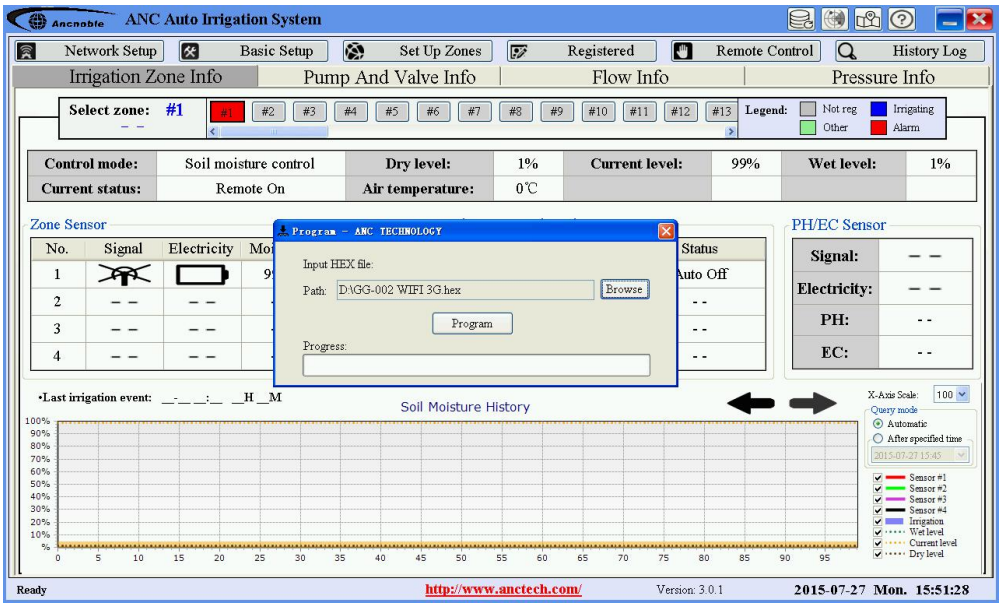
8.8 How to update main controller software

1. Using USB connect main controller and PC, open GG-002 application program.

2. Copy HEX file supplied by ANC to hardware.

3. One hand hold 【0】key, another hand turn power on. Then main controller LCD show that main controller is ready for update, count down 60 seconds. If normal, one interface window come out, points to HEX file needs to updated.

4. Click 【Start programming】start update, wait until finish. After finished update, will automatically restart and into normal work status. Will keep all previous setup.



9. Frequently ask questions

1. Q: why does the LCD show “Irrigating”, but there is no irrigation occurring, or when the LCD does not show “Irrigating”, the irrigation is on?

A: Possibly one of the following:

A: For user wired valves at the time of installation, check the magnetic valve connection polarity, most probably the wires is reversed.

B: Check the magnetic valve controller, if used, is on and showing the correct state of irrigation. If the state is incorrect, there may be a communications problem, the controllers should show communications error, check for an obstruction between the main controller and the valve controller.

C: Manually turn irrigation on and off at the valve controller, listen for a click from the relay in the controller and from the valve.

If no sound is heard from the valve, check if the cable from the valve controller has been cut or broken. Check the connector in the extension tube, make sure it is clean, dry and the retaining nut is tightened.

1. Verify continuity of the valve solenoid with an ohmmeter, 2 to 6 ohms resistance is typical.

2. If a sound is heard from the valve, and water does not flow, make sure the water inlet has pressure.

3. If a sound is heard form the valve, the valve may be stuck, remove the valve and check for an obstruction, if nothing is found, replace the valve.

4. If no click is heard from the controller, make sure the battery is charged. The main controller shows the battery charge. If the battery charge is OK, replace the controller. If the battery charge is low, and the solar exposure has been normal, replace the battery.

2. Q: Why after learning a new current wet level, does the system not stop irrigating right away?

A: Possibly one of the following:

A: If the moisture sensor is moved after learning the wet level, it may be incorrect. Should redo the learning process.

B: If water is manually added to the soil, then a wet level is learned; the learned level could be very high, since water could be temporarily accumulated on the surface. Use the displayed % reading as a guide to determine what reading is correct. If the learned value is too high, learn the moisture level again later when the soil dries to the desired level.

C: The LED “Irrigating” is off, but still the system is still irrigating. See FAQ 1, about valve problems.

D: On the main controller show this zone is irrigation, but has no problems as described at A and B. then maybe it is sensor problem, please reference questions.

3. Q: How to determine if the moisture sensor is working normally?

A: Push “SET” key to begin set up, push up/down key to browse, when “Learning” is flashing, push “ENT” key to begin setup, when Dry or Wet is flashing, push “Ent” again, then the LCD will show the current moisture level. When the moisture sensor probe is in the air, the number should be 0, then put the sensor probe into water slowly, the moisture value will increase, this means the sensor is working normally. If the moisture number does not change, either the connection to moisture sensor is bad, or the moisture sensor may be bad. Check if the cable from the valve controller has been cut or broken. Check the connector in the extension tube, make sure it is clean, dry and the \retaining nut is tightened.

4. Q：When using multiple valves, why is there so little water flow?

A: Possibly one of the following:

A: Check and see if the Maximum number of simultaneously irrigated zones is too many. User should adjust until there is enough water pressure.

B: Check if the valve is jammed.

C: Check water pressure and pipe. If there is not enough water pressure, reduce the maximum number of simultaneously irrigated zones to increase water pressure.

5. Q：Main controller always shows communication failure

A：First make sure moisture sensor controller learned “ID”, and Dry/Wet levels, magnetic valve solar controller learned “ID”, all at normal operating states, and batteries are charged.

B: Check if the wireless distance is over the normal range, and if there any obstructions in the way. Communications is line of sight. Try adjusting the position until the failure disappears.

6. Q：Pushing a wireless magnetic valve controller key, there is only beep with no other response. Main controller shows failure for this zone.

A：After long time without sun, the battery starts to discharge. The controller first goes to sleep, saving power, in this condition it will beep if a key is pushed, but not operate. If discharge continues, the controller will turn off to save power for automatic recharge. When sun comes out, the solar panel will automatically recharge the battery, but the user must manually turn the power on again at the remote controller.

7. Q：Wireless moisture sensor controller LCD is blank, has no response from any key, main controller shows failure. Wireless magnetic valve solar controller also has no LED indication, no response from key.

A：After long time without sun, the battery starts to discharge. The controller first goes to sleep, saving power, in this condition it will beep if a key is pushed, but not operate. If discharge continues, the controller will turn off to save power for automatic recharge. When sun comes out, the solar panel will automatically recharge the battery, but the user must manually turn the power on again at the remote controller.

8: Q: The main controller screen shows “Can’t open valve” or “Can’t close valve” with a long beep.

A: One hour after the system closes a valve, it will check if the moisture level is increasing. If the moisture does not increase, an error will be reported, possibly a pipe is broken, or magnetic valve has problem. If the senor is buried deep, this could be normal and ignored. Screen will display the error, and system will beep to remind the user to take a look at the field.

One hour after the system closes the valve, if the moisture keeps increasing, or rain occurs after closing the valve, there will be a failure report also, the system will report pipe/valve failure, in the same way as a valve stuck open failure.

When the problems have been solved, the system will automatically return to normal operation.

10.Packing list

1. Main Controller GG-002-WIFI or GG-002-3G (1)
2. Power Supply (input 125Vac/50Hz, output 24Vac/1A), 220Vac input optional (1)
3. USB cable (1)
4. User Manual (1)
5. Warranty card (1)

ANC Technology Limited Warranty card

Dear Customer：

Thank you very much for choosing ANC products.

1. This product has FCC verification and BV certification.

2. Warranty period is one year. Beginning on day of receipt.

3. Please keep your receipt and this warranty card.

4. Please verify contents are correct, see included items listed in the manual.

5. For warranty repair, customer is responsible for shipping to ANC; ANC pays shipping to customer.

6. Beyond the warranty period, or for damage caused by customer or for other than defects in material or workmanship, ANC offers repair service at customer's expense.

7. Service phone: 021 5974-3993, in China; 1 805 530-3958, or toll free 1 877 822 3958 in North America.

Product			**Type**	
User name			**Ship date**	
Address			**Serial #**	
Tel			**Purchasing date**	
Fax			**Zip code**	
Repairing Record	**Check date**	**Problem**	**What been done**	**Repairer**

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