REV: 1.02

4 Moisture Sensor Field Controller

Model: 4MS-Solar

Manual

ANC Technology
www.anctech.com

Contents

1. How to operate

1.1 Description

The 4MS-Solar is a wireless/relay field controller for GG-002 WIFI or 3G systems. Control up to 4 moisture sensors, and solar powered. Easy to use, and good for agriculture and landscape to optimize irrigation and save water.

1.2 Specifications

Solar panel: 17.4V DC /220mA/3.8W

Rechargeable battery: 10*1.2V/ 2.3AH AA, 12V/2300MAH

Idle current: 1mA

Frequency: 902-928 MHZ

Wireless distance at open space: 1640ft

Working temperature, [-20~60℃]; Humidity, [<90%]

Duration of fully charged battery: 7 days without sun.

Required charging time: 10 hours in standard illumination

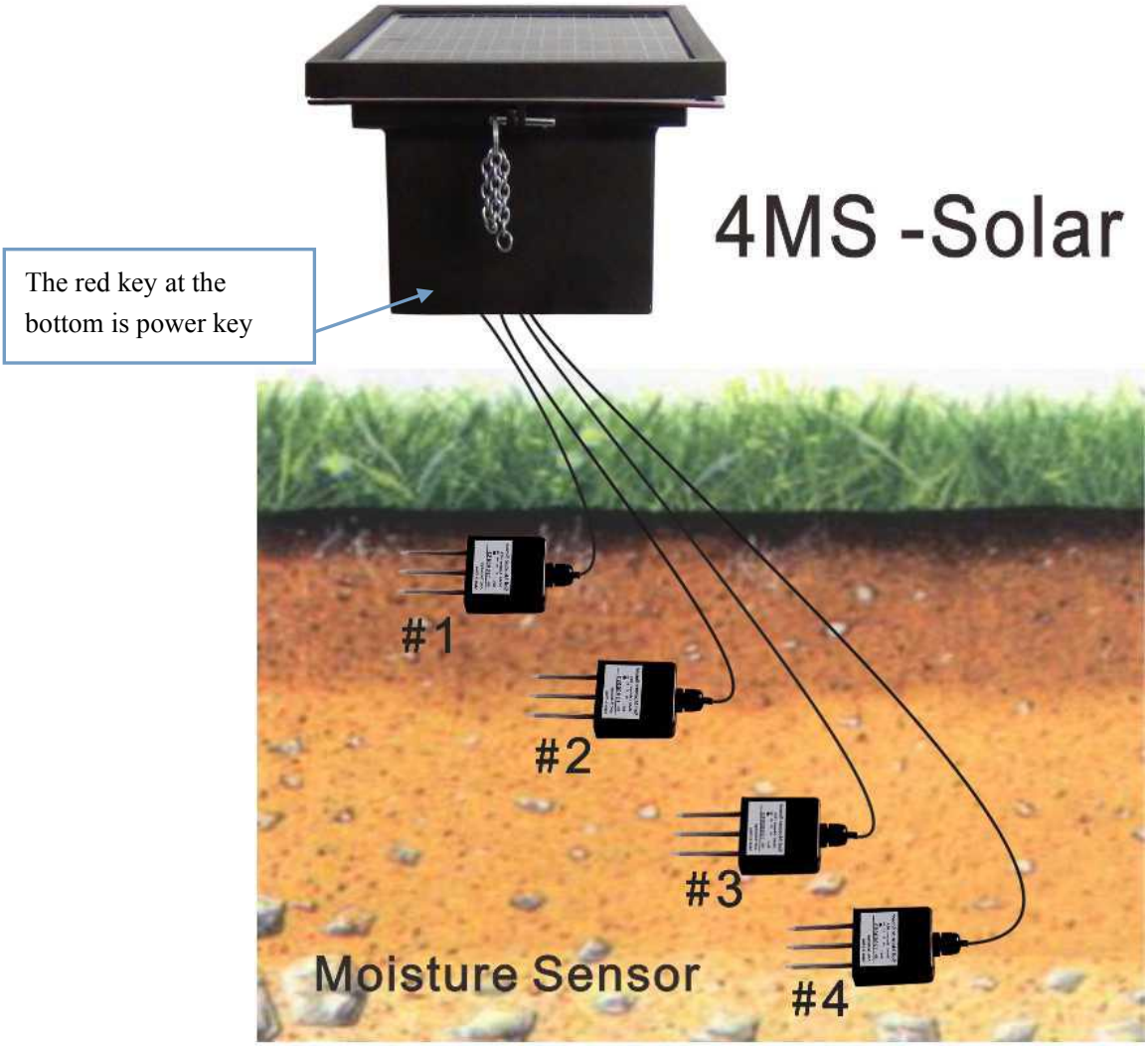
Moisture sensor:

1. Output: Digital data

2. Moisture Range: 0-99%

3. Precision: +/-5%

4. Extension cable is up to 50 meters.



1.2.1 How to install battery

Remark:

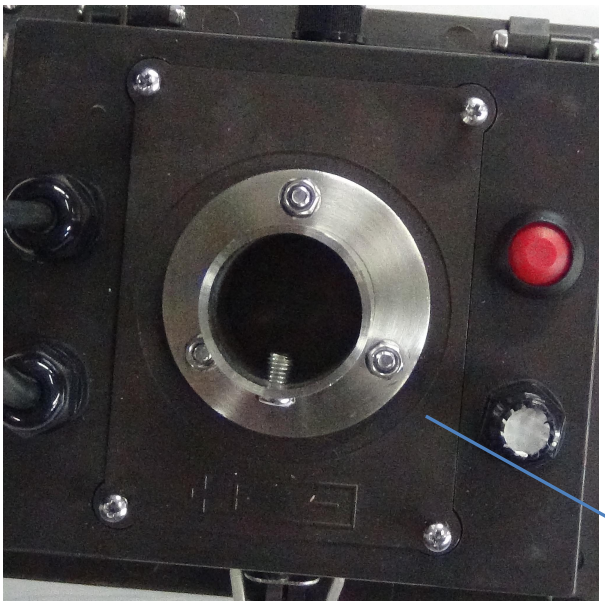
1). Battery: Rechargeable Ni-MH AA battery 1.2v*10

2). Pay attention to (+/-) sign.

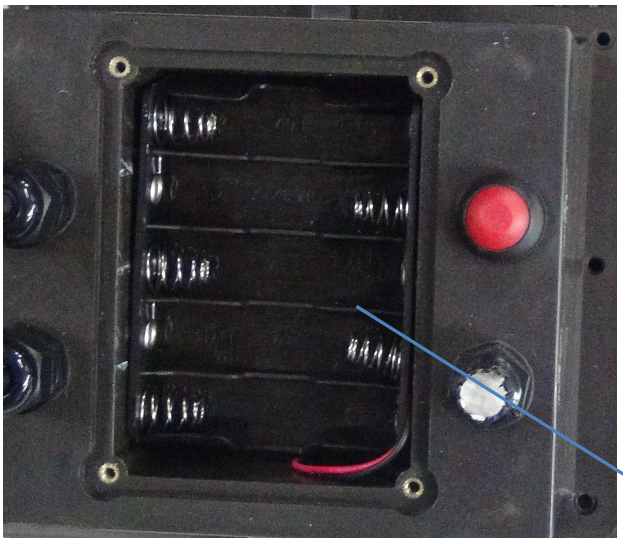
3). Suggest using rechargeable battery which is more than 2300mAh.

Installation steps:

1). Unscrew and open the battery box cover.

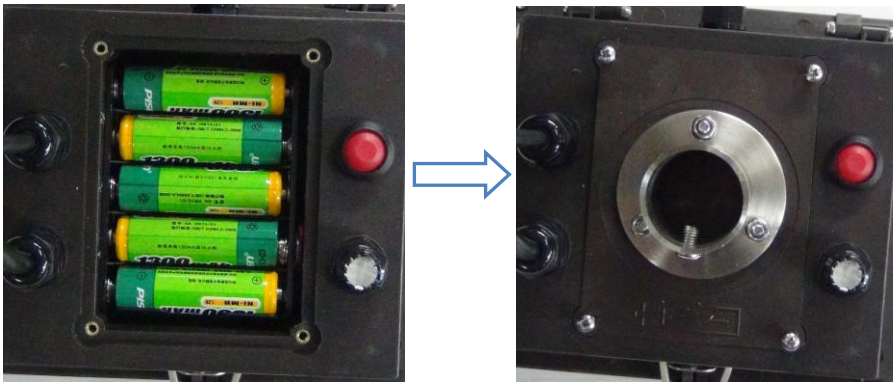


2). Take out the battery box



3). Put in Ni-MH AA rechargeable battery 1.2v*10, pay attention to +/- sign.

4). Put the battery box back, put cover back, screw tight.



1.3 Power on.

Push the red power switch, followed by two beeps, show ANC logo, then into operation.

After power on, the controller will start to do the following check:

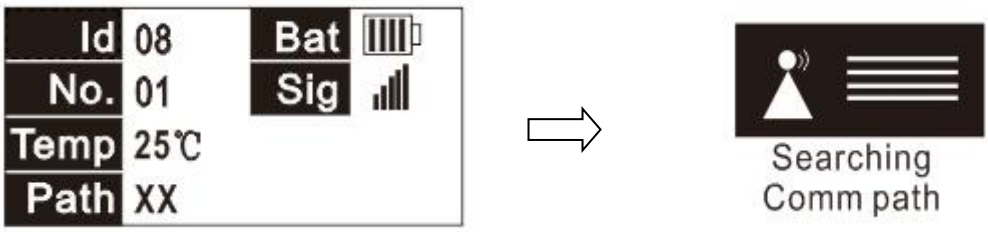
1. Check battery voltage. If the voltage is lower than working voltage, the controller will turn selves off and wait until the battery is been recharged above working voltage by the solar panel.
2. Check the connection of moisture sensors. If there are no connection of moisture sensors, the controller will read the moisture % always at 99%.
3. If not setup Dry/Wet control yet, or the setup is not right, there will be a reminder of failure. The system will not working until this setup is been fixed. Push 【Menu】 key into adjusting Dry/Wet control, adjusting them until right.

Note: Wet control % must bigger than Dry control %.

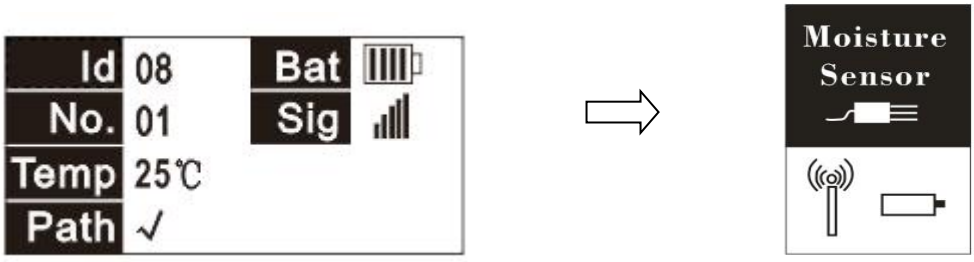
1.4 How to establish wireless communication mesh network

After power is on, if a moisture sensor is registered, the controller will automatically try to establish a wireless communication route to reach the main controller. During searching time, input keys are locked, LCD shows “Searching Com path”. After the route is established, there will be two beeps, the controller is ready for operation.

If failure to establish the route occurs, the controller will unlock the keys and return to panel control. Push “+” and “-” keys at the same time, to check the route, you will see XX, which means no route been established. Push and hold [Enter/Save] [Exit/Delete] keys at same time to re-search the route.



After successfully establishing a route, the field controller will send the route information to the main controller. This can be shown on the main controller screen.



If the route information transfer is not successful, the field controller will keep trying every 1 minute.

Note1. These steps are optional, the field controllers will search for a short route to the main controller, and this helps to establish an efficient route:

A. Register all the field controllers first. Then turn off all the field controllers.

B. During search time, the main and remote controllers must be in normal operating state, not in any setup menu, it is ready to receive all wireless signals.

C. Place the field controllers in their field positions. Turn on field controllers nearest to the main controller, for example, within the range of about 500 meters or 1640 feet. These controllers will search for a route to the main controller. After this layer of controllers has found a route to the main controller, then open second layer of field controllers in the mesh work, and repeat until all 4 layers of controllers establish wireless communications with the main controller.

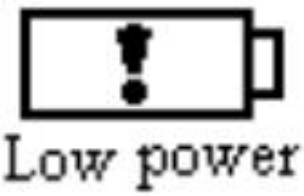
1.5 Power On/Off

Push the red power switch, it will turn power on/off.

1.6 System sleep

During operation, field controllers will check the battery voltage. When the backup battery voltage becomes less than 11 V, the controller will turn off all the valves and pumps, put itself into sleep mode, waiting for the solar panel to recharge the battery. When the battery voltage is charged to 11.5 V, the controller will automatically return to normal operating state. During sleep period, if the solar panel can't charge the battery, and the battery voltage drops to 10 V, to protect the battery from over discharge, the controller will automatically shut down.

After shutdown, the solar panel will still charge the battery as long as there is sun. The controller will automatically wake up after the battery charge returns to normal.

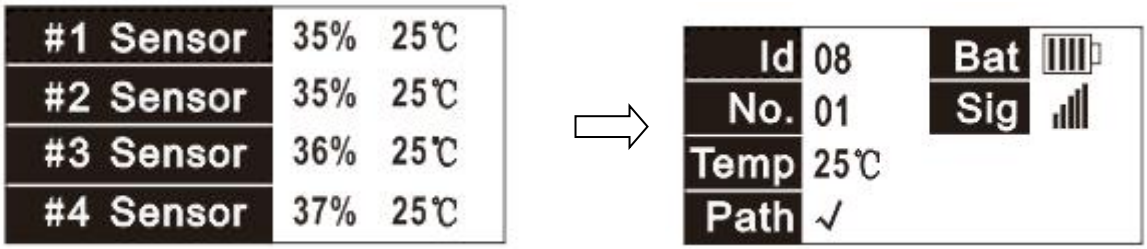


1.7 System information

Push "+" "-" keys to browse information on LCD, there are two pages, first shows moisture sensor, second for other information.

The LCD will turn off after 2 minutes if there is no operation. Push any key to turn

on LCD illumination.



1.8 System setup

Setup notes:

1. When menu display is highlighted, there is sub-menu, press [Browse/Menu] key to enter the sub-menu.

2. When cursor is flashing, enter value or edit. Push **[**+/ **-]** keys to adjust value.

3. Push [Browse/Menu] to enter system setup, push [+/ -] or [Browse/Menu] to browse, there are 6 menu items:

[Set up sensor #1]– [Set up sensor #2]–

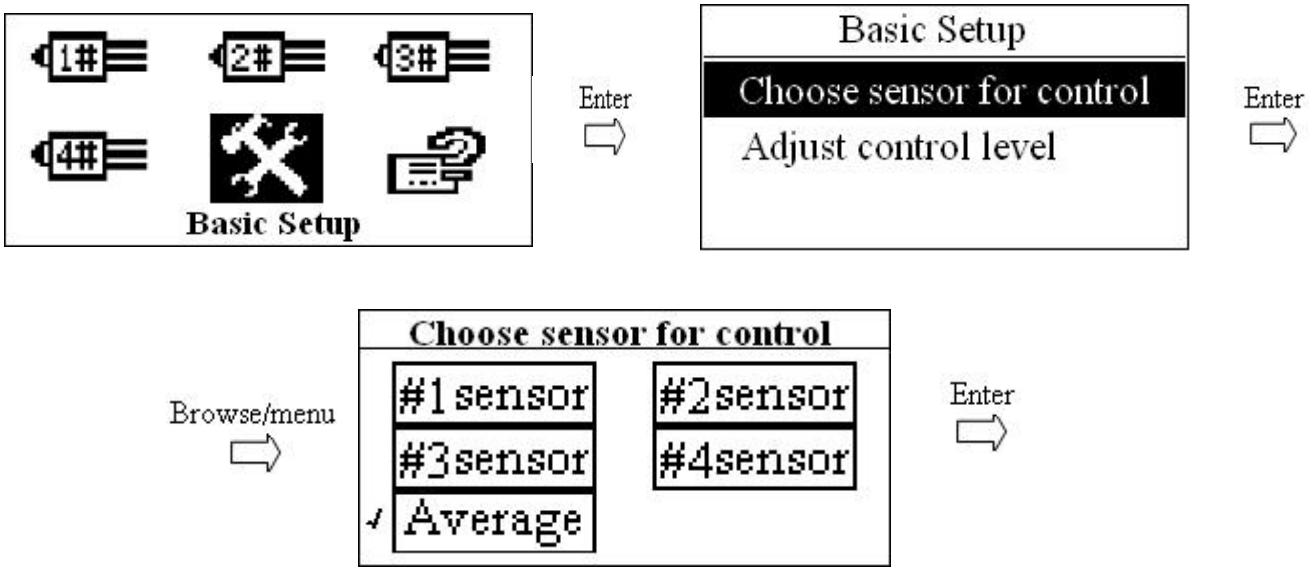
[Set up sensor #3]– [Set up sensor #4]–

[Basic setup]– [User help] –

Push [Enter] to choose menu, push [Exit] to exit, or auto exit will occur after one minute without any operation.

1.9 Basic setup

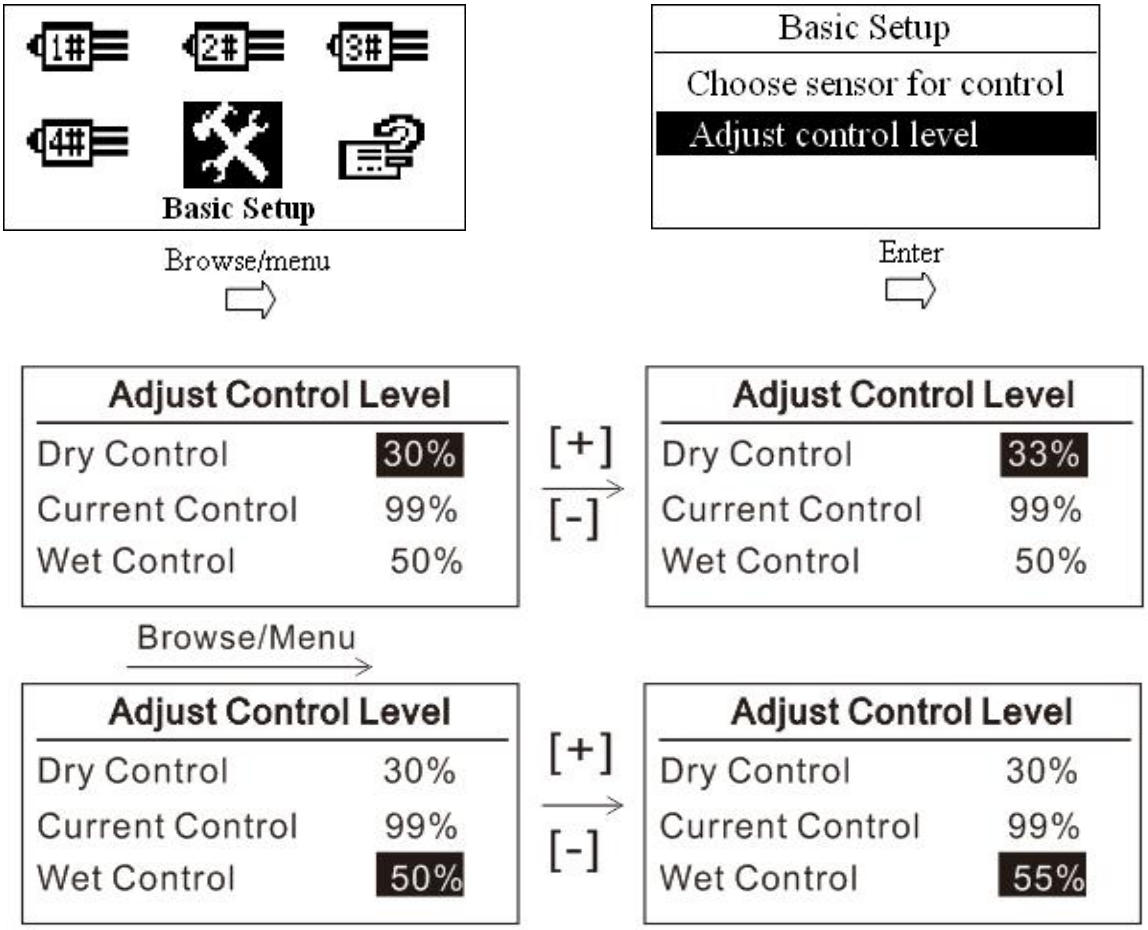
1.9.1 Choose sensor for control



Choose sensor for control, to select one sensor or use the average value of the sensors as the control level. Push [Browse / menu] to choose, and push [Enter/save] to save.

1.9.2 Adjust control level

Under [Basic setup] menu, push [Browse/Menu] to choose [Adjust Control Level] and push [Enter/Save] to confirm. Push [Browse/Menu] to choose to set dry control level or wet control level, then push [+/ -] keys to adjust dry/wet control level, push [Enter/Save] to save.



Note: Wet Control Level must greater than Dry Control Level.

1.10 Register to main controller

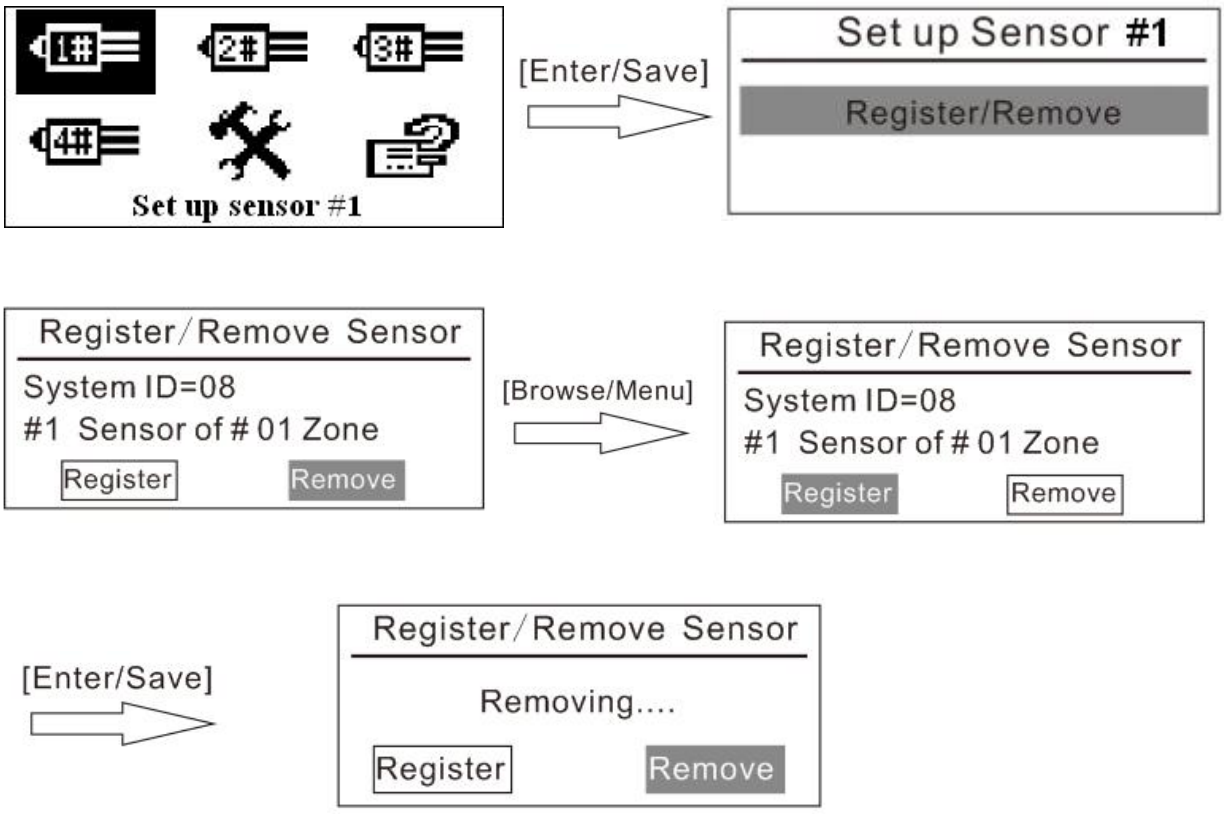
Register field controllers with the main controller to establish a bidirectional

wireless communication channel with the main controller. Register all sensors used, Register sensors one by one.

1.10.1 How to register sensor #1 with main controller

When this wireless field controller is in the registration state, the main controller must be at the registration state also.

At system main menu, browse to [Set up Sensor #1], push [Enter/Save]. Choose [Register/Remove] and push [Enter/Save] to show Register/Remove the device. Push [Browse/Menu] again to choose between [Register] and [Remove], and push [Enter/Save] to execute registration or removal of this sensor.



Remarks：

1. During registration, if no registration information from main controller is received after 2 minutes, this field controller will exit from registration.

2. During removal, if no registration information is received from main controller, pushing [Exit/Delete], will prompt - do you want "Local delete?"

Local delete means delete registration information from this field controller first, then later manually delete this information from main controller. Push [Exit] to exit and push [Enter] to remove, as shown:

1.10.2 Register other sensors with main controller

Same as 1.10.1, above, sensors will not function until registered.

This controller may have up to 4 moisture sensors to detect moisture at different depths or take their average moisture level to control irrigation. Register all sensors used.

1.11 One key set dry/wet control level

When soil just needs irrigation, push and hold “set dry control” key for about five seconds, this controller will set current moisture % as dry control level. Then send the new setup to main controller. Use same procedure to set wet control level.

Note: Wet Control Level must higher than Dry Control Level. If need to set dry control level high, use “adjust control level” menu, increase the wet first.

2. How to upgrade wireless field controllers

1. Preparation: First, turn power off for the field controller which needs to be updated. Preparing one field controller with the new software you want. You can do this by buying a new one from ANC Technology, or send one old version field controller to ANC Technology for update at a fee. This new version field

controller would be used to update all other existing wireless field controllers.

2. For the field controller waiting for upgrade, push and hold the menu key and power button simultaneously until interface show as Figure 2.1, then press menu key to select【Download Program】, push【Enter】key to start download program, interface as Figure 2.2

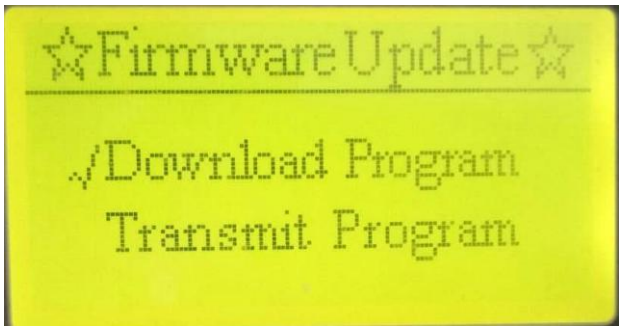


Figure 2.1

Figure 2.2

3. For the new version carrier of the field controller, push and hold the menu key and power button simultaneously until interface show as Figure 2.3, push menu key to select [Transmit Program], and push the 【Enter】key to start transmit the program, interface shows as Figure 2.4

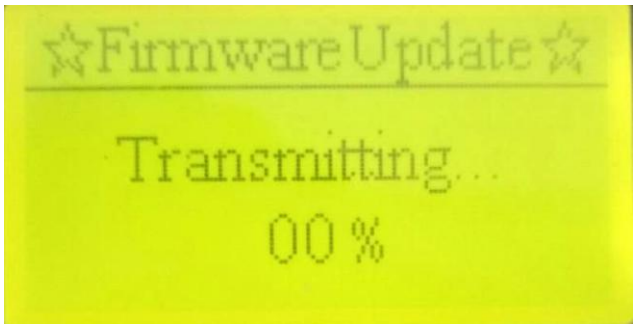


Figure 2.3

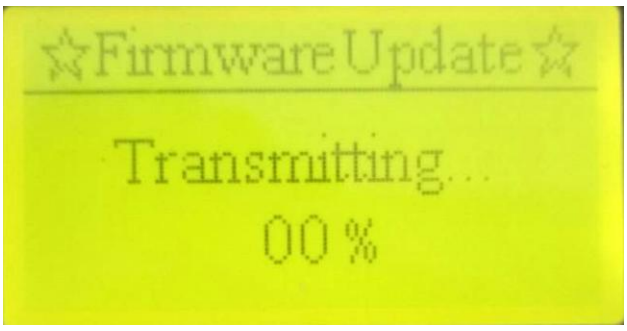


Figure 2.4

4. The upgrading interface will show the upgrading progress. The upgrade procedure takes a few minutes. Make sure the distance of two units are at effective communication distance of 2m≤X≤500m, to grantee good wireless communication.

5. After successful upgrade, LCD will show as Figure 2.5

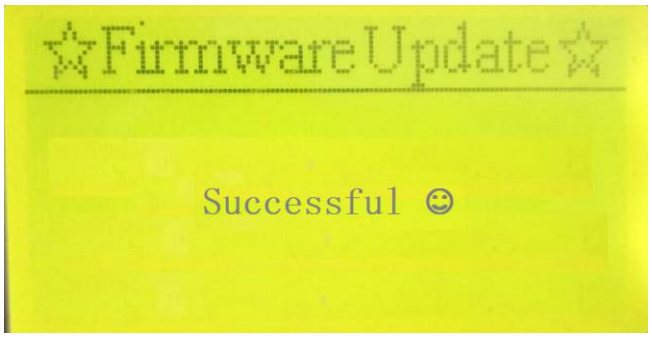


Figure 2.5

3. Frequently ask questions

1. Q：Main controller always shows communication failure

A：First make sure wireless field controller registered to main controller. Learned "ID", and Dry/Wet levels, 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.

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

A: Push [Browse/Menu] key to begin set up sensor, push [Enter/Save] key into set up sensor, then into [Adjust Control Level]. The LCD will show the current moisture level. When the moisture sensor probe is in the air, the number should be 00%, 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.

3. Q: After wireless field controller working some time later, LCD without any display, and keys also no reaction, main controller display this zone is failure.

A: If the wireless field controller cannot receive solar power for long time, and the backup battery voltage is less than 11 V, the controller will turn off all the valves and pumps, then put self into sleep, waiting for the solar panel to recharge the battery. If the wireless field controller still can not receive solar, the controller will auto turn from sleep status to total turn off. After been total turn off, the solar panel will still charge the battery as long as there is sun. But needs user to check and turn on the controller.

4. Packing list

1. Wireless solar controller
2. One moisture sensor
3. User Manual
4. Warranty card

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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