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Automation Technology

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General Description

We are constantly under development, finding new & more efficient ways of doing things, adding more functions to improve efficiency. However, to improve (as in any situation in life) we need to find our faults, only then will we be able to improve.

Most issues are due to Hardware, or a misunderstanding of how certain functions work. We rely on our users to familiarise themselves with the software & to do as much trouble shooting themselves before contacting a Farmsync Technician as learning on the job is the best method.

Make use of the User Manual & this Trouble Shooting Manual to find the fault / understand the use of the function better. If, in the unfortunate case you cannot find the solution to the issue, log a ticket on our Ticket System with your query & a Farmsync Technician will be in contact as soon as possible.

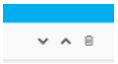
Frequently Asked Questions

Below are a few "Frequently Asked Questions" & their solutions.

We know, you have never found the question you are asking in one of these FAQ on any website you have ever visited, we hope it is different here. We are constantly revising this list & adding more as required. Your feedback would also be appreciated.

Goodluck, we hope you find what you are looking for!

Question:	Possible Causes:	How to fix:
Field Station is Offline (Red)	○ Main Controller lost power ▪ Eskom / Solar ▪ Battery ○ Internet connection lost in main pumphouse ○ Outdated Firmware on station ○ A recent Firmware update might not be compatible with main controller firmware	○ Confirm that there is power ○ At DC/FMS test the battery, check battery age ○ Check on your cell phone if both Farmsync hotspots are available ○ Farmsync ○ Farmsync xxxx ○ Do a power cycle – switch everything off in the pumphouse, including the internet routers, then switch everything back on ○ Reboot the field station – take a video of the stations lights as they come back on & send to you installer in case the station does not come back online
Base Station offline, & cannot get back online	○ Main Controller lost power ▪ Eskom / Solar ▪ Battery ○ Internet connection lost in main pumphouse ○ Battery / UPS system is not sufficient to handle load for long periods of time	○ Check on your cell phone if both Farmsync hotspots are available ○ Farmsync ○ Farmsync xxxx ○ If available, try watching a YouTube video while connected to a Farmsync hotspot to confirm connection ○ If not, & there is another router in the office nearby, reboot that router ○ Do a power cycle – switch everything off in the pumphouse, including the internet routers, then switch everything back on
My Program does not want to sync/save		○ Refresh the Station ○ Contact a Farmsync Technician
My Valve Program does not want to stop	○ More than one Valve Program with the same Mainline running at the same time ○ Base lost power during irrigation	○ Do a power cycle – switch everything off in the pumphouse, including the internet routers, then switch everything back on ○ Stop all programs ○ Switch the pumps off at the

		Starterboxes - manually
Some logs are missing from reports	○ Check the "Uptime" of the Station. If the Base has rebooted close to the Program being done, it may lose some records. ○ Logging for that sensor is not enabled	○ Contact a Farmsync Technician
How do I Ungroup a step		○ Above each Step & on the right are two arrows ○  ○ By clicking any of these two, ALL steps created will be undone
Program schedules are overlapping due to Eskom loadshedding ("Eskom Pause" function)	○ When multiple programs are created to run according to a schedule & loadshedding occurs during one of the cycles	○ Under "Scheduling" in the Valve Program, select the relevant Mainline & assign a **PRIORITY** to the program ○ When this is done, Farmsync will use this as a method of determining if a upcoming program that was meant to start after the program that was now paused should run before that program is resumed, or straight after/as soon as there is an opening where no program is running
Valve status shows "Not Detected"	○ Valve signal not yet received ○ Valve not connected (wires) ○ Valve not yet synced properly	○ Sync the station that the valve is connected to ○ Sync the Mainline connected to the valve ○ Make sure the the valve wiring is connected and secure ○ Save the valve set-up

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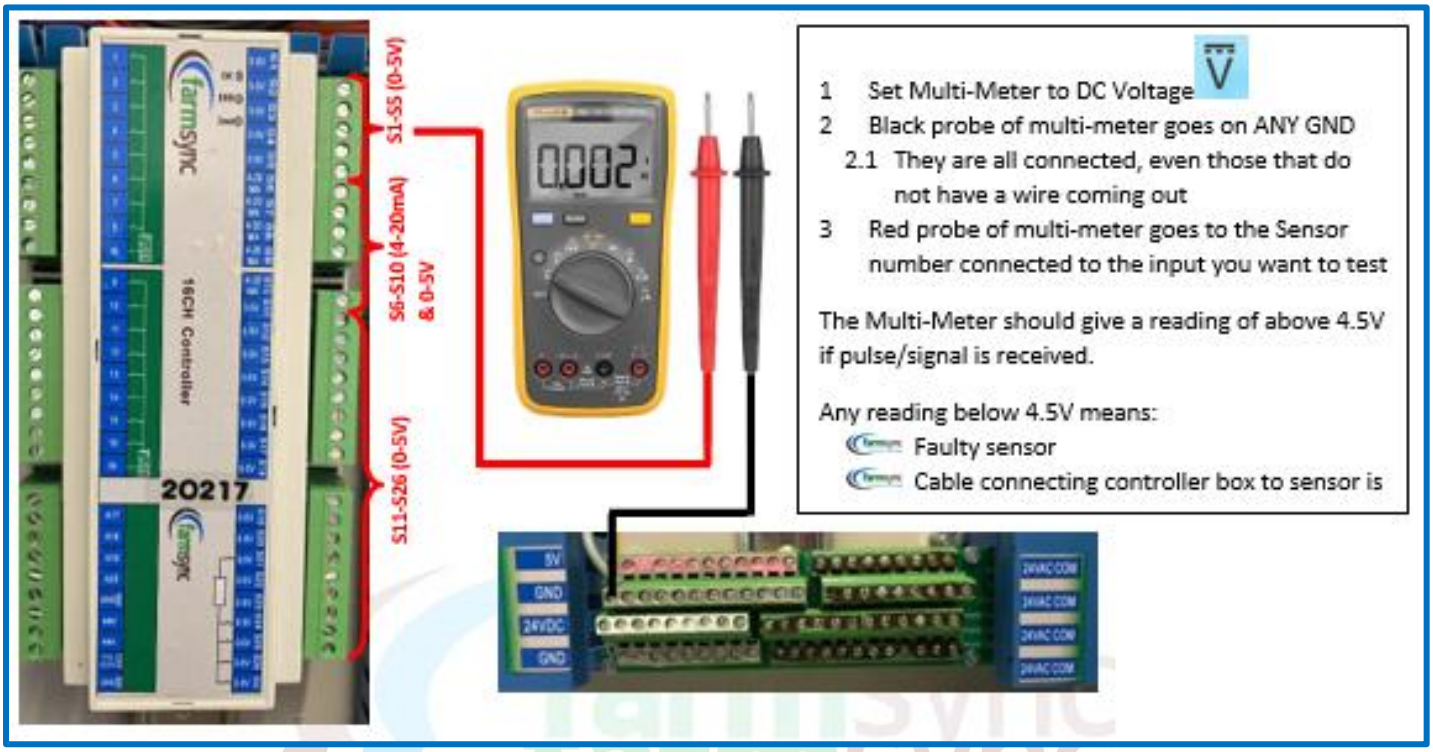
Testing Equipment

Why?:

We want to confirm that the communication path between the Controller & the equipment (pump / valve / sensor) is unbroken. Below are a few methods to test this.

Testing 5V Inputs on 16Ch Controller



1 Set Multi-Meter to DC Voltage V

2 Black probe of multi-meter goes on ANY GND

2.1 They are all connected, even those that do not have a wire coming out

3 Red probe of multi-meter goes to the Sensor number connected to the input you want to test

The Multi-Meter should give a reading of above 4.5V if pulse/signal is received.

Any reading below 4.5V means:

- Faulty sensor
- Cable connecting controller box to sensor is

Testing 24VAC Outputs on 16Ch Controller

1 Set Multi-Meter to AC Voltage ~V

2 Black probe of multi-meter goes on ANY 24VAC COM

2.1 They are all connected, even those that do not have a wire coming out

3 Red probe of multi-meter goes to the Sensor number connected to the output you want to test

The Multi-Meter should give a reading of above 20V if pulse/signal is received.

Any reading below 20V means:

- Faulty sensor
- Cable connecting controller box to sensor is faulty / joint is faulty – check wiring

Field Stations (DC & Field Monitoring)

It is of the utmost importance that Clients familiarise themselves with the hardware & ensure that they can do basic fault-finding on their own.

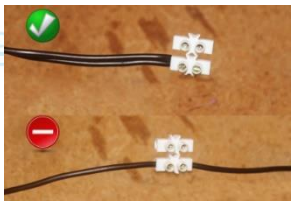
Should the problem then persist, the Client can contact a Farmsync technician, & they can provide further assistance. Please provide them with your own fault-finding results.

Whatever the problem may appear to be, it is Best Practice to remove the DC Station from its field position & to fault-find in the office / Farmsync Controller location. When this is done, follow these steps to eliminate possible problems:

- Check Antenna connection
  - Is the Jacket damaged?
  - Is the connection loose?
  - Is the antenna bent?
  - Is the cover on the antenna still present?
- Always have extra DC Solenoids available on the farm
- Connect these *known working DC Solenoids* to the DC Station & test each Solenoid by opening & closing the "valves" on Farmsync (Station IO Mapping – see "Irrigation Valves" above for detail) at least 3-5 times to cancel out a faulty battery
  - Should the solenoids work, the following may be the problem:
    - Faulty Solenoids in field – using a 9V battery, you can test each solenoid & replace as needed

1. Put each wire of the Solenoid on the positive & negative of the battery. If nothing happens, switch the wires around, the wire that was on the negative must now be on positive, & the wire that was on positive must now be on negative.
2. If the Solenoid is in working condition, you should have heard / felt it click in your hand.
3. If nothing happened, the Solenoid is faulty.

    - Faulty Solenoid connection – do a visual inspection of the wire connections / joints
      - It is advised that wherever necessary, HV Grease be used at connections (like chocolate blocks) & sprayed with Tectyl to protect against corrosion



        - DO NOT spray the PC board, this is only for wire connections using chocolate blocks **outside** of the DC Station
      - To protect wiring against animals, sleave wiring in poly pipe / conduit or similar – take care to NOT cover the connection / joint as this may lead to water collecting in the pipe & causing corrosion
    - Signal – the crops may have outgrown the installation height of the DC Station, install at a higher elevation & ensure **Direct** line of sight
- Replace the battery of the DC Station
- If after new battery problem persists, the fault may lie in the PC Board of the DC Station
  - A Farmsync Technician can be contacted to assist further
  - The DC Station may have to be sent in, or a replacement PC Board can be sent to the Client for replacement

Fertigation System

No Flow

Out% column is the % at which Farmsync opens the fert valve.

Should the % reach 100% and the **L/m³** & **Current Total** column values do not change, there is a flow problem.

Check for blockages in filters, empty fertiliser tanks & any manual valves between the fert meter & fert tank that may be closed.

Solenoids must also be checked – this you can test at IO Mapping by switching the solenoid.

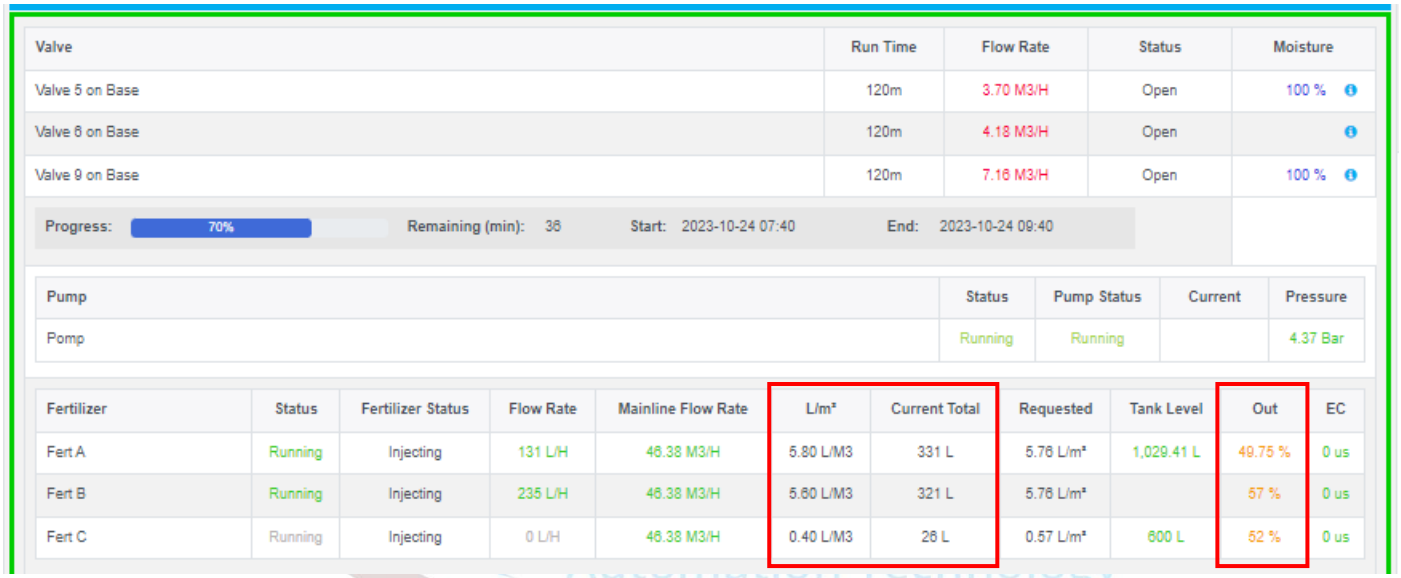
Low Flow

L/m3 column shows the practical dosage rate of the system.

Should this value be lower than the **Requested** dosage rate, first check that the filters at the fert tanks are clean.

If a low dosage rate, combined with the **Out %** climbing very slowly but stays high, open the choke valve / needle valve slightly & monitor the **L/m3** column.

Should this still not make a sufficient difference in the dosage rate, contact your installer for assistance.



Valve	Run Time	Flow Rate	Status	Moisture
Valve 5 on Base	120m	3.70 M3/H	Open	100 %
Valve 6 on Base	120m	4.18 M3/H	Open	
Valve 9 on Base	120m	7.16 M3/H	Open	100 %

Progress: 70% Remaining (min): 36 Start: 2023-10-24 07:40 End: 2023-10-24 09:40

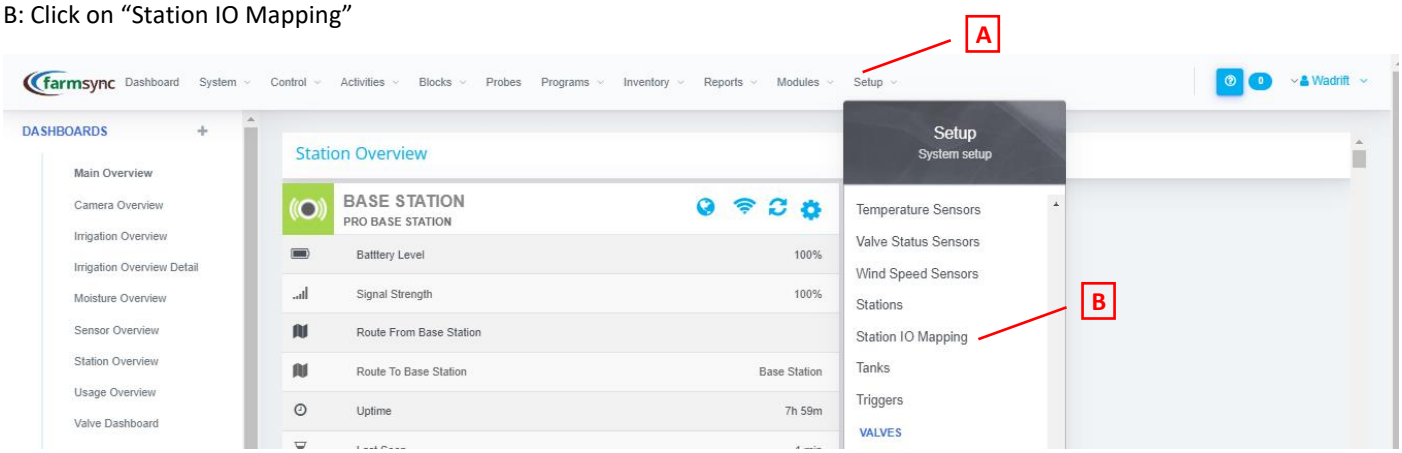
Pump	Status	Pump Status	Current	Pressure
Pomp	Running	Running		4.37 Bar

Fertilizer	Status	Fertilizer Status	Flow Rate	Mainline Flow Rate	L/m³	Current Total	Requested	Tank Level	Out	EC
Fert A	Running	Injecting	131 L/H	46.38 M3/H	5.80 L/M3	331 L	5.76 L/m³	1,029.41 L	49.75 %	0 us
Fert B	Running	Injecting	235 L/H	46.38 M3/H	5.60 L/M3	321 L	5.76 L/m³		57 %	0 us
Fert C	Running	Injecting	0 L/H	46.38 M3/H	0.40 L/M3	26 L	0.57 L/m³	600 L	52 %	0 us

Pumps

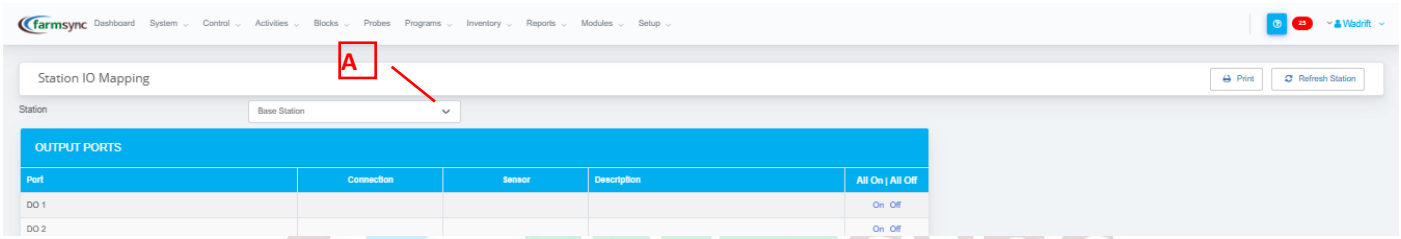
Please note that to test the pumps without having the VSD Drive Alarms triggering due to closed valves, open at least two valves to ensure a flow of water is present when the pumps are switched on.

A: Click on “Setup”
B: Click on “Station IO Mapping”



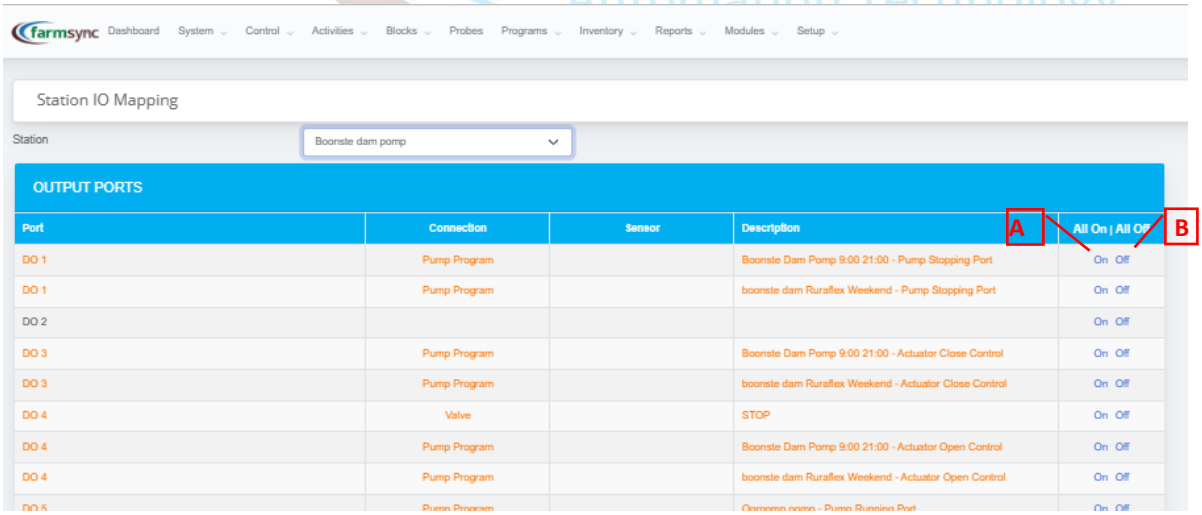
Station IO Mapping

A: Use the dropdown menu to select the correct station



Output Ports

A: Once the correct pump is found on the list of outputs, click “On” to switch the pump on
B: Once confirmed that the correct pump has switched on, click “Off” to switch the pump off



Pressure Sensors

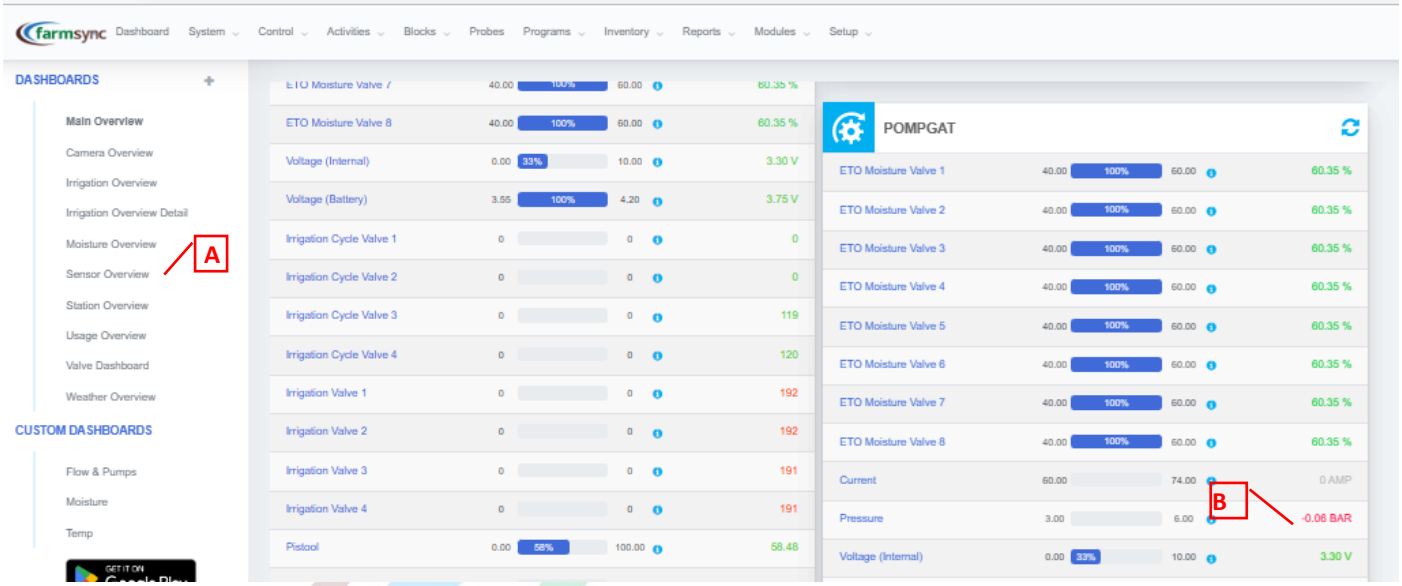
This test can be performed at any time that the system is running. There should be a pressure gauge installed after the pump (or at any location where a Pressure Sensor is installed), use this pressure reading as well as the current pressure reading shown on the starter box of the pump to confirm the reading shown on Farmsync.

Dashboard – Sensor Overview

A: Select the “Sensor Overview” Dashboard on the left of the screen.

Scroll until you find the correct Station that the Sensor is connected to.

B: Find the correct Pressure Sensor & compare the pressure show on Farmsync with the pressure on the relevant pressure gauge.



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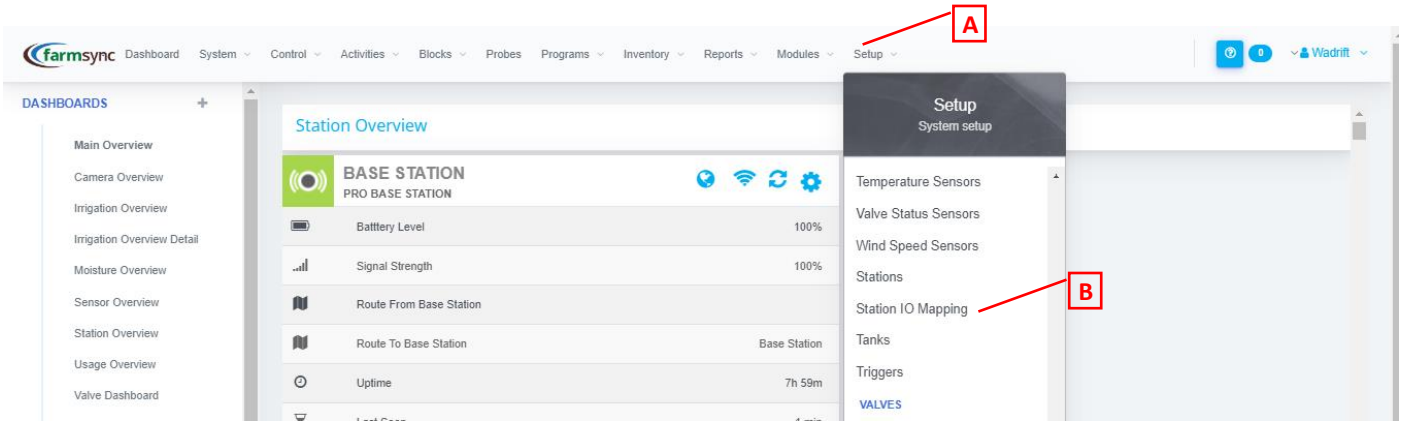
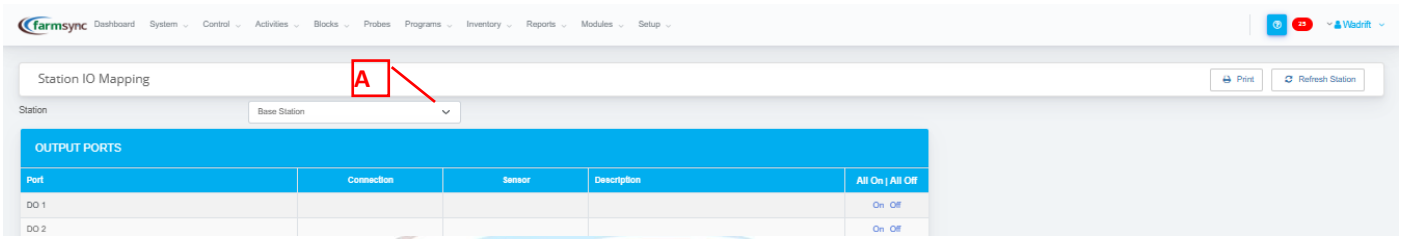
Main Valves

A: Click on “Setup”
B: Click on “Station IO Mapping”



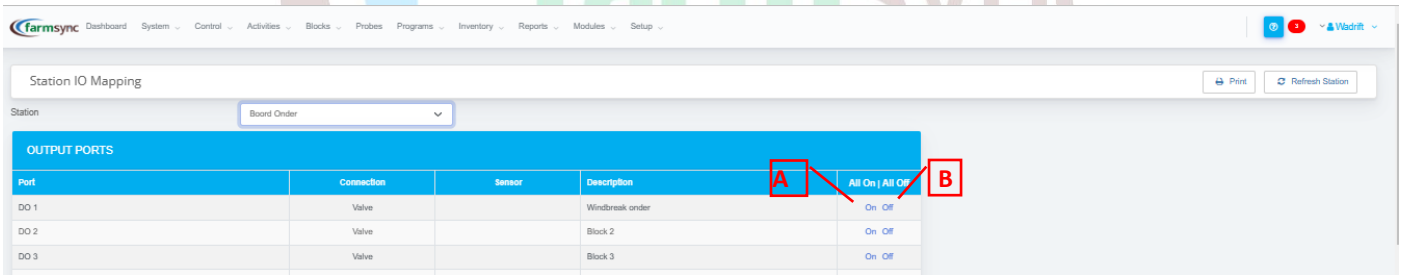
Station IO Mapping

A: Use the dropdown menu to select the correct station



Output Ports

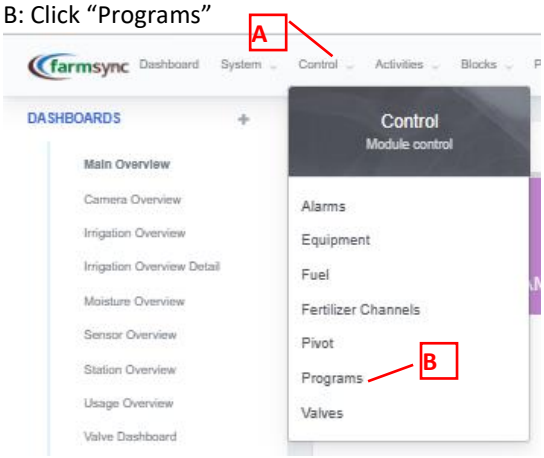
A: Once the correct valve is found on the list of outputs, click “On” to switch the valve port
B: Once confirmed that the correct valve has switched, click “Off”



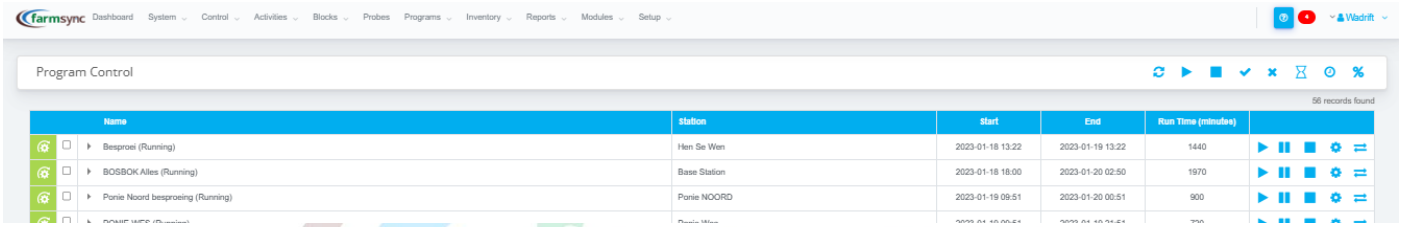
Filters

Filters are one of the key components of irrigation. They are your first line of defence in protection against blockages of your irrigation system. It is for this reason that it is of vital importance to ensure that your filter is flushing correctly.

A: Click “Control”
B: Click “Programs”



Find the Filter Flush Program & press “Play” button.
Make sure to note if all filters have flushed & that the timing is set correctly.



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Water Meters / Fert Meters

This test can be performed at any time that the system is running (As long as flow is present).

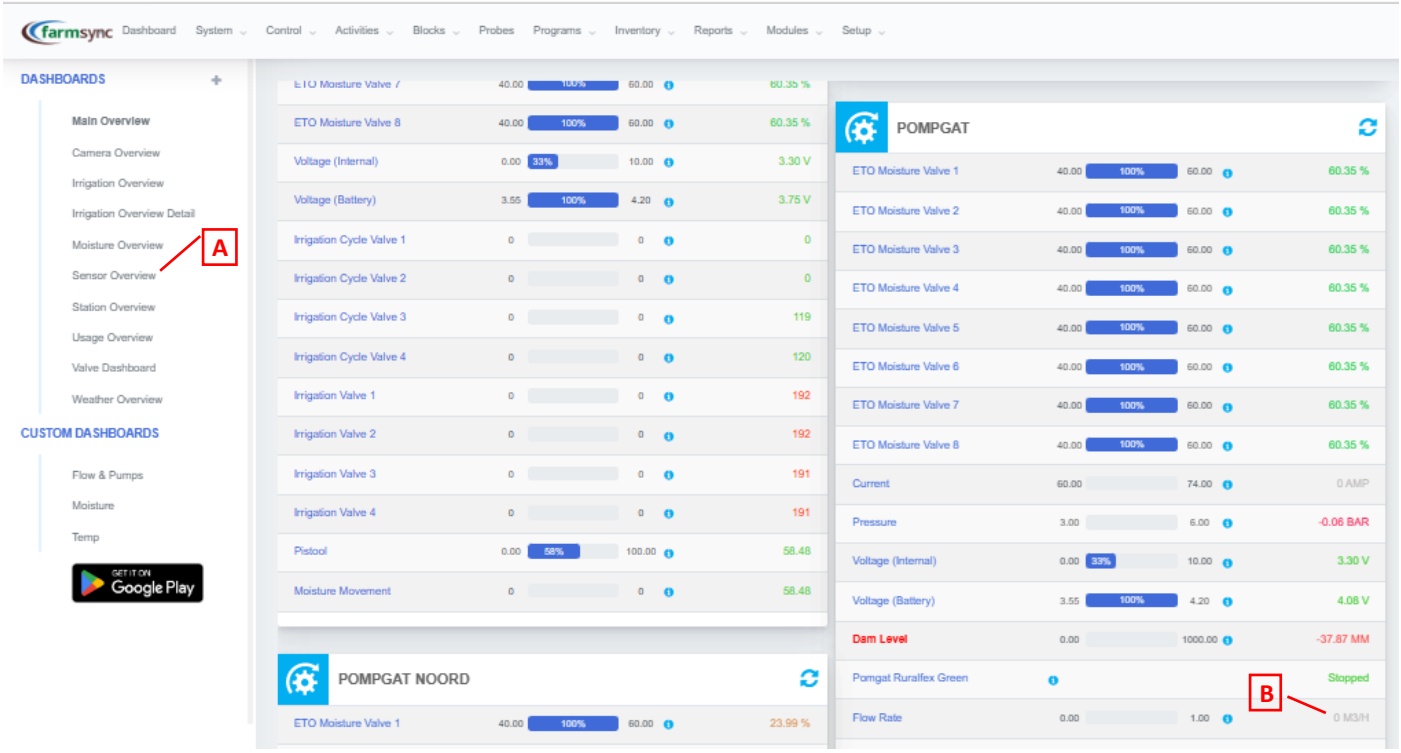
Water Meter

Ensure that there is flow present on the irrigation system. Physically check the meter in the pumphouse.

If more that one watermeter is present on the system, make sure to test each watermeter separately; do this by only opening valves that are connected to this specific water meter.

A: Select the “Sensor Overview” Dashboard on the left of the screen.
Scroll until you find the correct Station that the Sensor is connected to.
B: Find the correct **Flow Rate** Sensor & compare the Flow Rate shown on Farmsync with the calculated Flow Rate of the relevant watermeter.

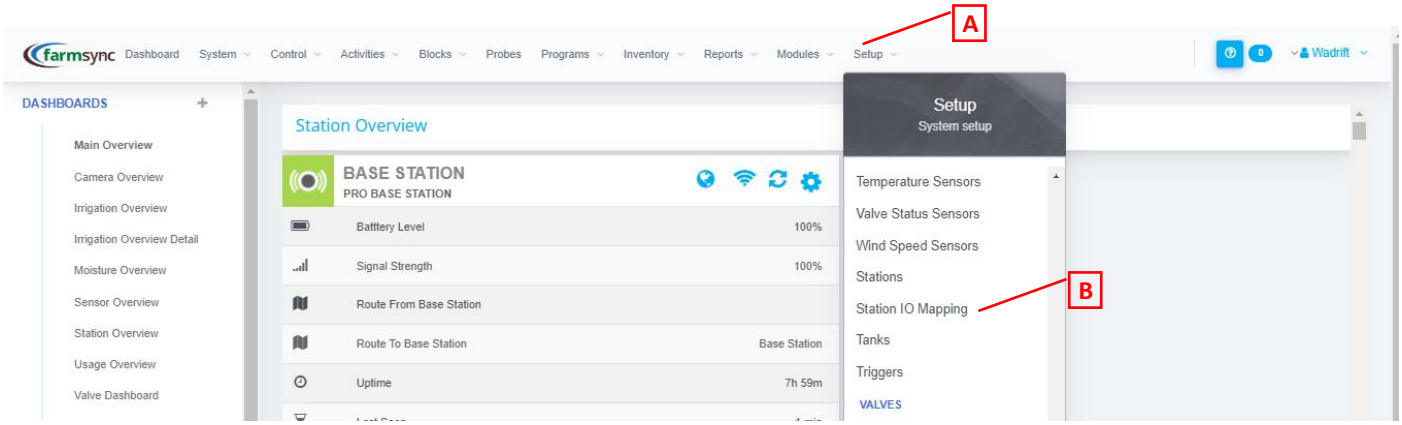
NOTE:
If no flow is present on Farmsync, but the flow meter is running in the pumphouse, refer to Testing 5V Inputs on 16Ch Controller to test the port on the controller.



Irrigation Valves

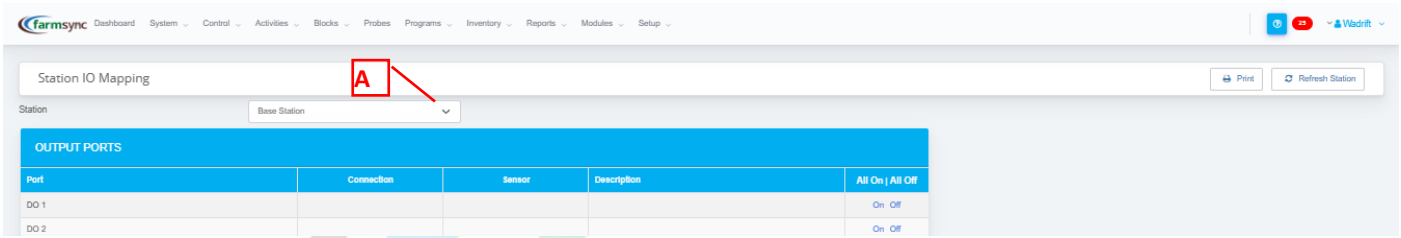
Make sure to have another person present to help confirm that the correct valve switched. Do one valve at a time.

A: Click on “Setup”
B: Click on “Station IO Mapping”



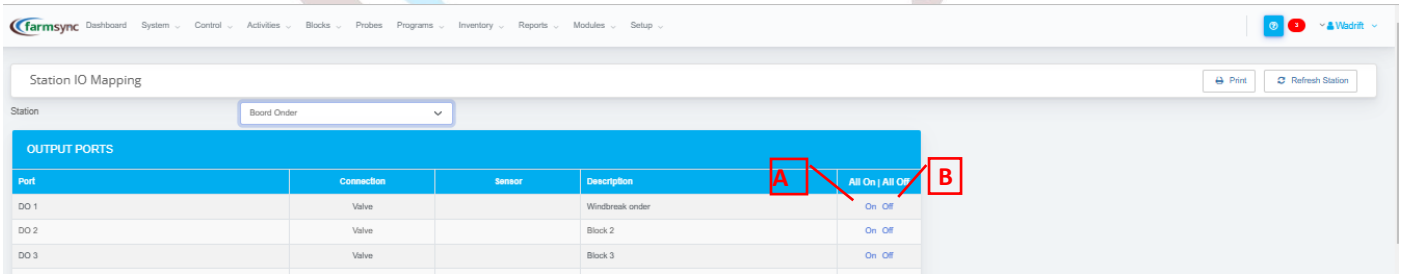
Station IO Mapping

A: Use the dropdown menu to select the correct station



Output Ports

A: Once the correct valve is found on the list of outputs, click “On” to switch the valve port
B: Once confirmed that the correct valve has switched, click “Off”



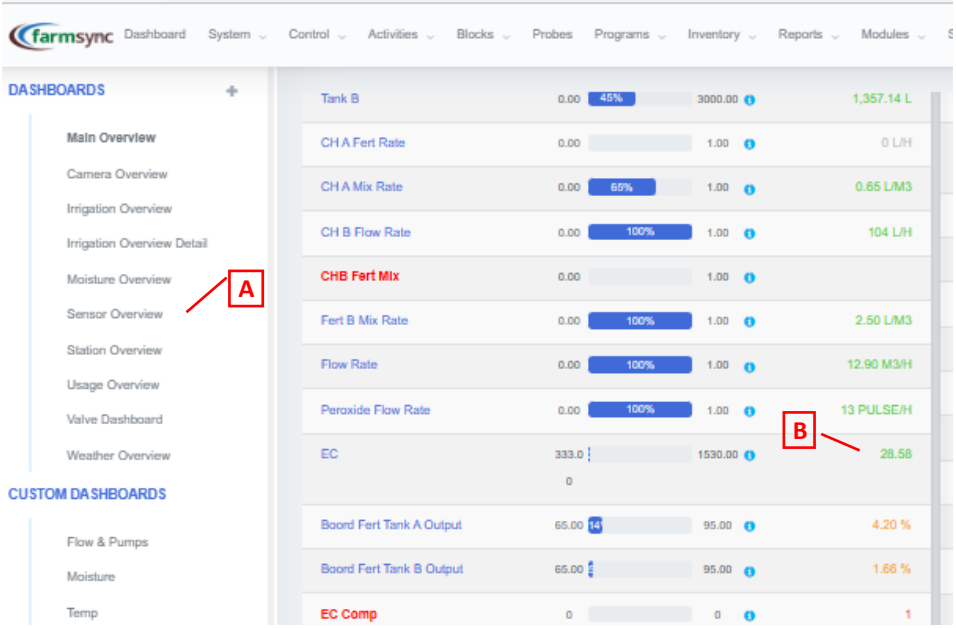
NOTE:
If the valves do not respond, refer to Testing 24VAC Outputs on 16Ch Controller to test the port on the controller.

EC & PH Sensors

A: Select the “Sensor Overview” Dashboard on the left of the screen.

Scroll until you find the correct Station that the Sensor is connected to.

B: Find the correct EC / PH Sensor & compare the value shown on Farmsync with the EC / PH Unit on the wall.



Level Sensors

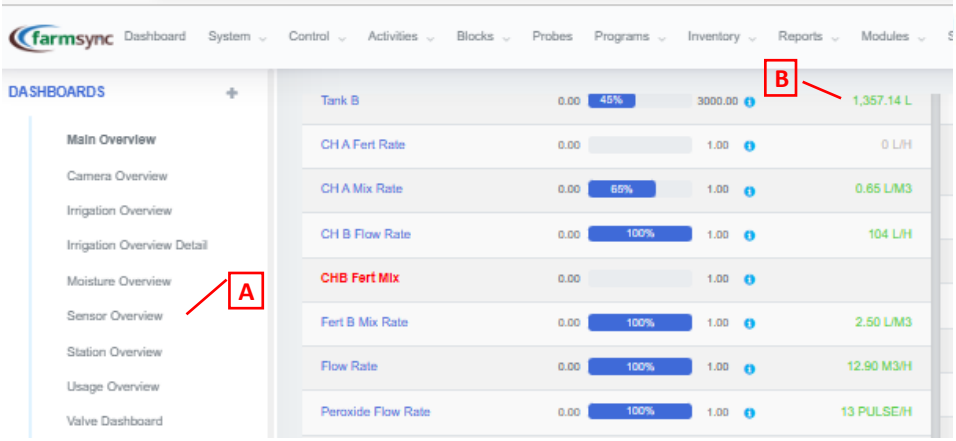
Whether the level sensor is in a tank, dam or river, the test is the same.

A: Select the “Sensor Overview” Dashboard on the left of the screen.

Scroll until you find the correct Station that the Sensor is connected to.

B: Find the correct Level Sensor & compare the value shown on Farmsync with approximate volume of water above the sensor at that time.

Remember to take the level sensor OUT of the water as well, when this is done, the level sensor must always show 0.



NOTE:

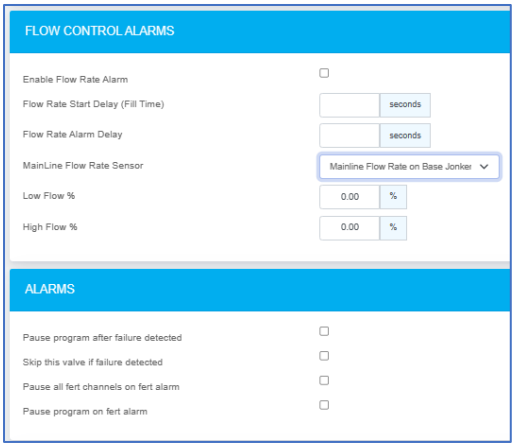
If no level shows on Farmsync, refer to Testing 5V Inputs on 16Ch Controller to test the port on the controller.

Alarms

The following alarm settings are for testing purposes only, it is the Clients responsibility to populate these fields with more specific values that suit their needs after commissioning is complete.

Irrigation Flow Rate Alarms

- Tick the “Enable Flow Rate Alarm” box
- Select the “Mainline Flow Rate Sensor”
- Enter the “Fill Time”
- Enter a low number for “Flow Rate Alarm Delay”
- Select how the program must react upon alarm being triggered by ticking the box for “Pause program after failure detected”



High Flow Rate – allow for 10% more flow

- Tested by opening a valve by hand NOT on the program

Or

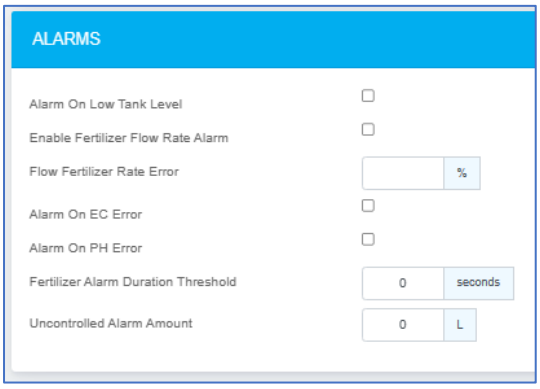
- By opening the Flush valve of a running block in the field to simulate a burst pipe

Leak Detection

- Tested by opening a valve by hand when no program is running (will only work for gravity fed systems)

Fertigation System (Fertilizer Programs)

- Tick the box for “Enable Fertilizer Flow Rate Alarm”



Over-fert – Enter a low value for “Flow Fertilizer rate Error” of 95%

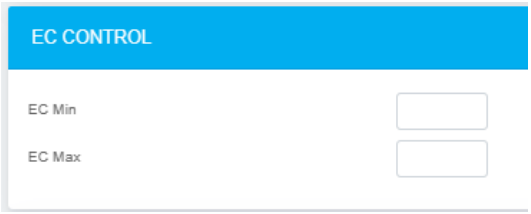
- Tested by manually opening a running fert valve

Fert-Leak – Enter a low value for “Uncontrolled Alarm Amount” of 10L

- Tested by manually opening a fert valve when no fert is running (irrigation system must be running)

EC High

- Tick the box for “Alarm on EC Error” & enter a low value (but still higher than clean water) for “EC Max”



- Tested by manually opening a running fert valve & forcing the EC to go high
- Ensure that the over fert alarm is disabled in order to test this alarm

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