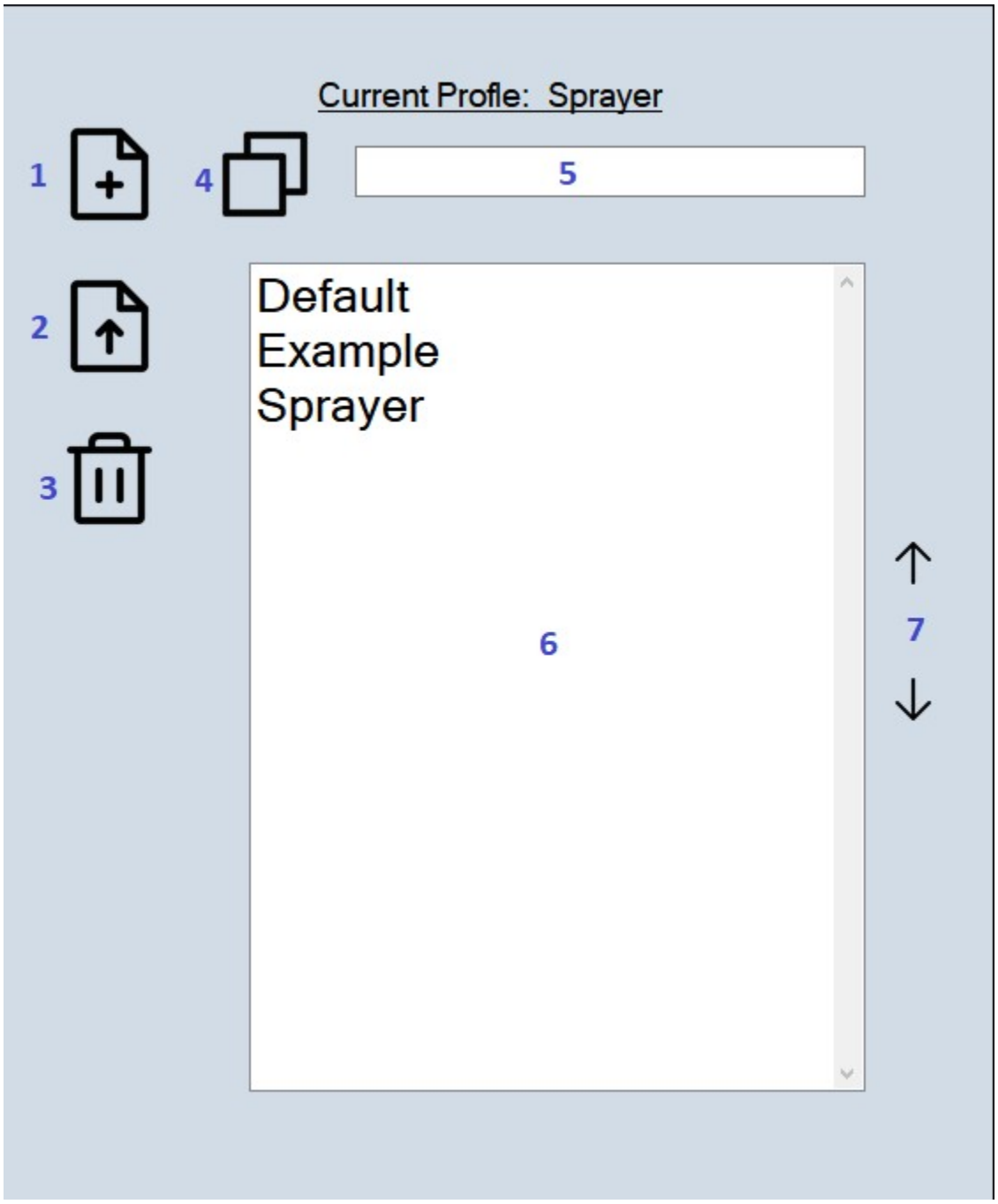
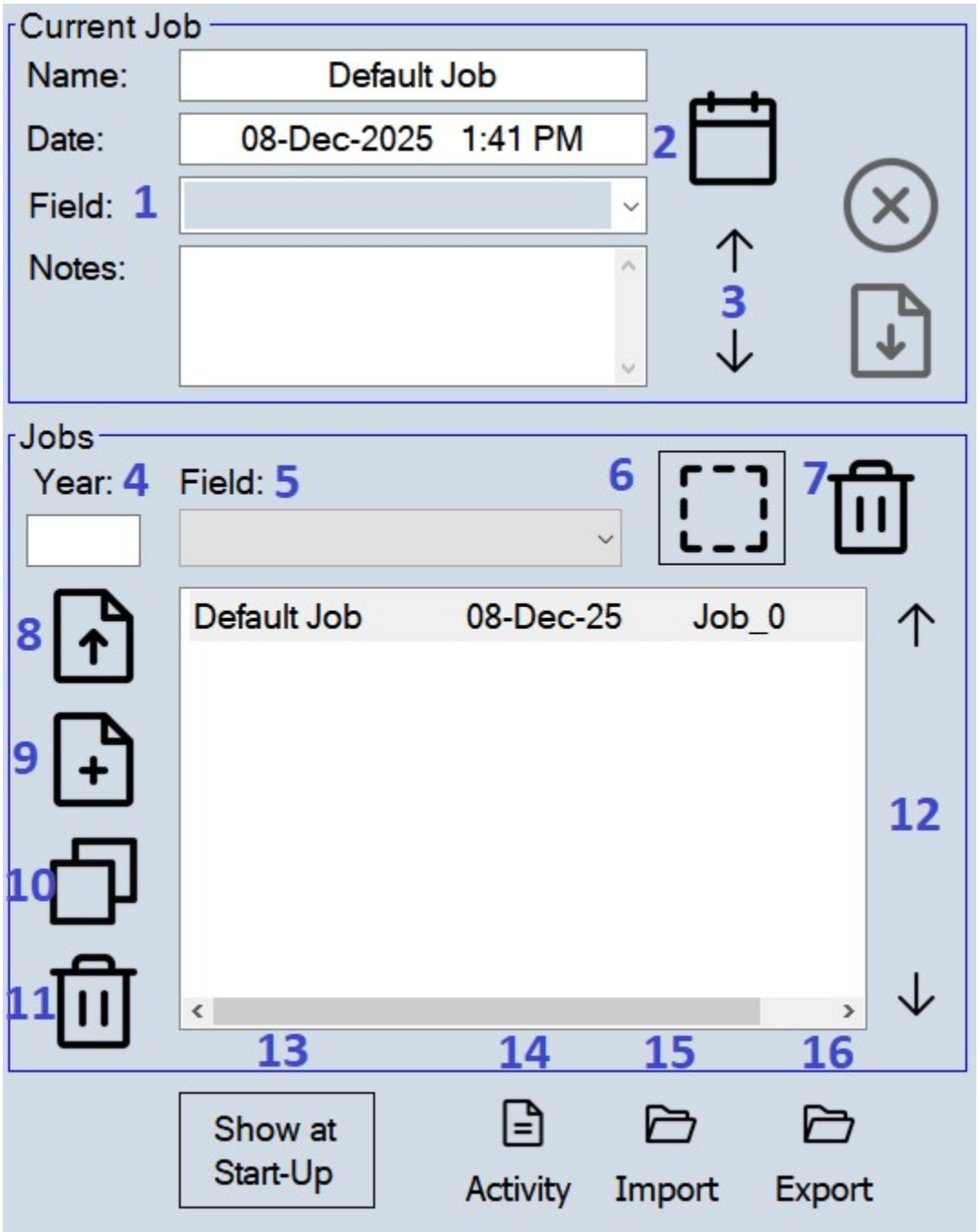
File - Profiles



1. New	2. Load
3. Delete	4. Copy
5. File name for New/Copy	6. Files to select
7. Page Up/Down	

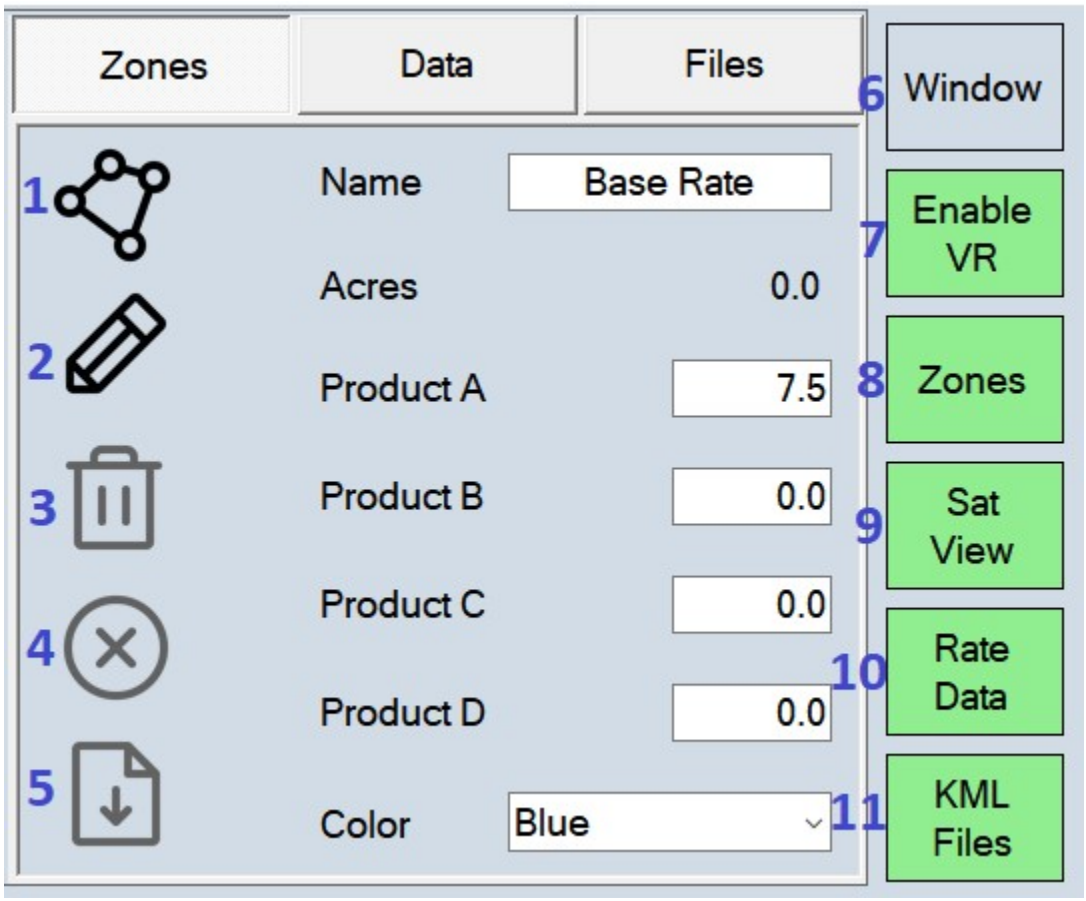
File - Jobs


Current Job
Name:
Default Job
Date:
08-Dec-2025 1:41 PM
2
Field: 1
Notes:
3
Jobs
Year: 4
Field: 5
6
7
8
Default Job 08-Dec-25 Job_0
9
12
10
11
13
14
15
16
Show at Start-Up
Activity
Import
Export

1. Field name. Select from list or type new name.
2. Insert current data and time.
3. Page up/down through notes.
4. Sort jobs by Year
5. Sort jobs by Field
6. Sort Filter.
7. Delete selected Field
8. Open the selected job.
9. Create a new job.
10. Copy selected job information and its rate map to a new file.
11. Delete selected Job.
12. Page up/down through Job list.
13. Display the jobs menu when the app launches.
14. Job report.
15. Import jobs.
16. Export jobs.

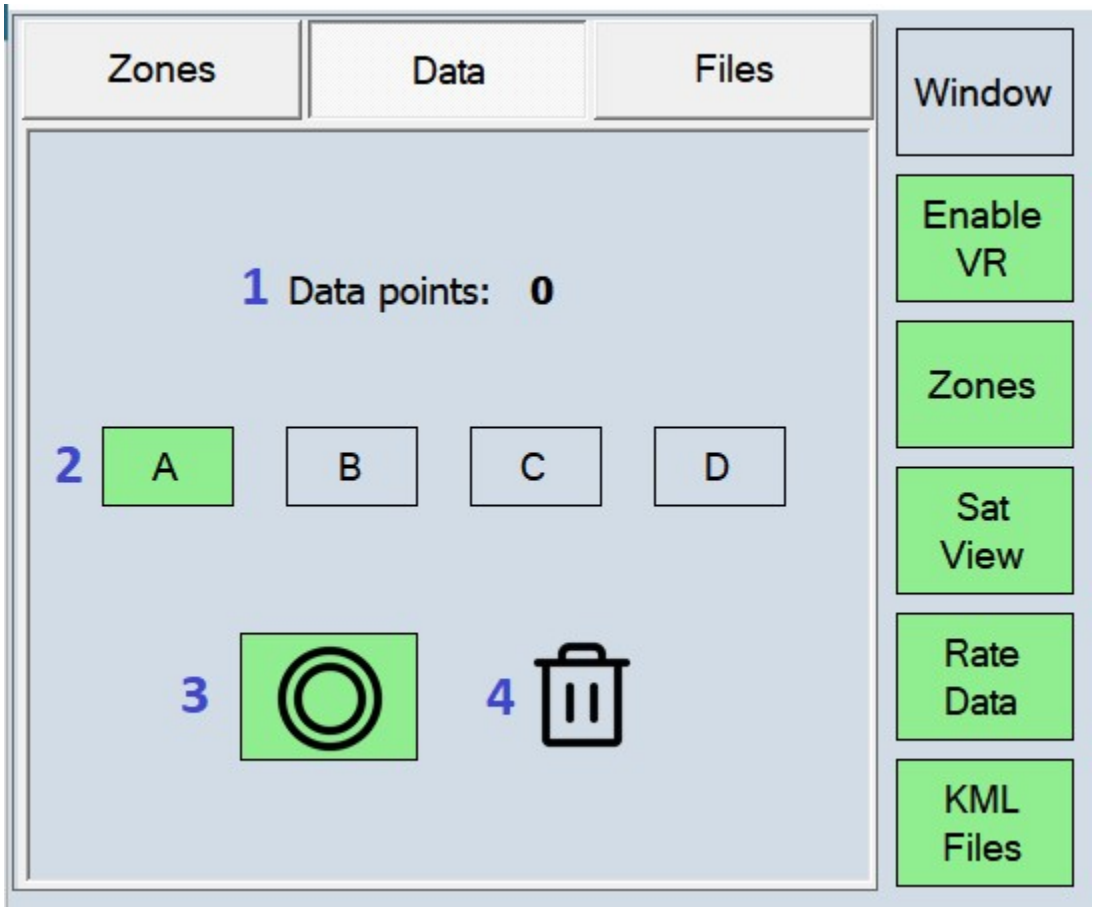
File - Rate Map

Create zones by clicking button 1 then click at least 3 points on the map. With overlapping zones the last zone added has priority. When variable rate is enabled and no zone exists the base rate is used.



1. Create a new rate zone.
2. Edit rate zone properties.
3. If creating a zone, delete corner. If editing a zone, delete zone.
4. Cancel edits.
5. Save edits.
6. Preview window.
7. Enable variable rate control.
8. Toggle rate zones.

9. Toggle satellite view.
10. Toggle applied rate display.
11. Toggle KML display.



1. Data Records.
2. Product applied rate to display.
3. Record applied rates.
4. Delete applied rate data.

File - Options

1. Speed Source – GPS
    - Use speed from AOG.

2. Speed Source – Simulated Speed
    - Simulate a constant speed.

3. Speed Source – Wheel Sensor
    - Enter the module ID and GPIO pin used to sense speed. Enter the calibration number in pulses per mile or pulses per kilometer. Press the up arrow to send configuration data to the module (also sent when saved). Use the calibration screen to calculate the calibration number.

Products – Settings

1. Enable product.

2. Rate Sensor Location
    - Module ID, unique ID # of each module, 0-7
    - Sensor ID, unique sensor ID in each module, 0-1

3. Minimum UPM
    - Fixed Value, minimum UPM flow rate acceptable
    - By Speed, adjust the minimum UPM base on speed

4. Off-Rate Alarm
    - the % error in rate where an alarm will sound

5. Default Product
    - product displayed at start up

6. Bump Buttons
    - show the rate up/down buttons on the Large Screen

7. Scale Weight
    - show the scale weight screen

Products – Rate

1. Product Name

2. Control Type
    a. Standard Valve
        - use a valve to vary rate
    b. Combo Close
        - use a valve to vary rate and on/off
    c. Motor
        - vary motor speed to control rate
    d. Combo Timed
        - use adjust/pause time for control

3. Quantity Units
    - units used to measure product

4. Coverage Units
    - Acre, Hectare, Minute, Hour

5. Sensor Counts/Unit
    - sensor counts for each unit applied

6. Density

7. Base Rate
    - application target rate

8. Alt. Rate (%)
    - an alternate rate as a % of the base rate

9. Tank Size

10. Tank Start
    - amount in tank at start of application

Products - Control

1. Gain
    - A factor used to modify the rate adjustment based on the volume of product being applied. A higher volume of product requires a lower gain to reduce the rate of adjustment. The adjustment is exponential – a small change in the gain can produce a very large effect.

2. Integral
    - Use accumulated rate error to move to target rate quicker.

3. Max Power
    - Maximum power delivered to the motor or valve.

4. Min Power
    - The minimum power delivered to the motor or valve.

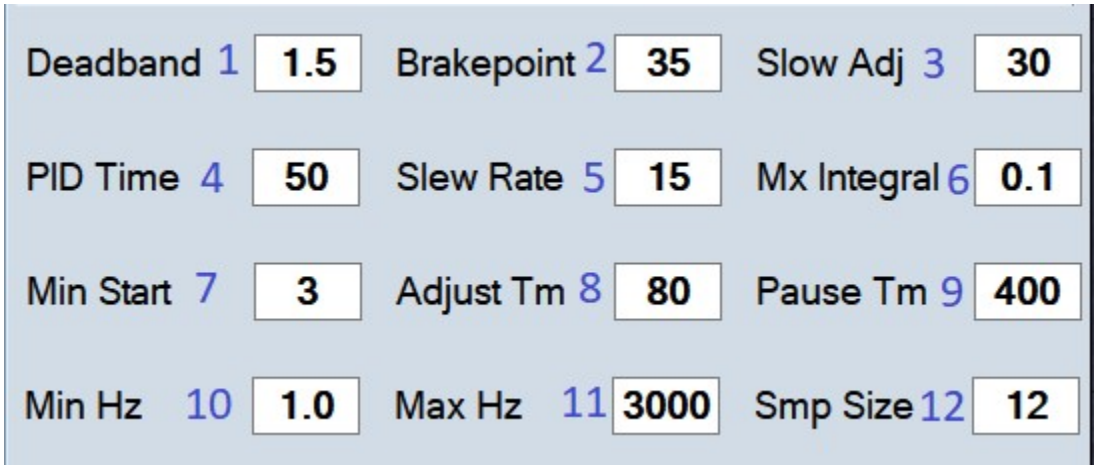
Adjustment Process:

1. Initial Setup:
    - Begin by setting the minimum power required to move the motor or valve. Set the maximum power to 100, reducing it as needed to improve control stability. Set Integral to 0.

2. Gain Adjustment:
   - Next, adjust the gain very slowly until the system overshoots the target. Then reduce the gain to stabilize flow control.

3. Integral:
   - Finally, if necessary adjust integral to get to the target rate quicker.

Optional Settings:



1. Deadband
   - Error % below which no adjustment is made.

2. BrakePoint
   - Error % where adjustment changes to slow rate.

3. Slow Adjustment
   - % of full adjustment

4. PID loop time
    - Time in milliseconds for the adjustment loop.

5. Slew Rate
    - Maximum total PWM change per PID loop.

6. Maximum Integral change
    - Maximum Integral PWM change per PID loop.

7. Minimum start % for a timed combo valve
    - % of target rate used for a faster start from 0.

8. Adjust time for a timed combo valve
    - Time in milliseconds the valve should be adjusted.

9. Pause time for a timed combo valve
    - Time in milliseconds the valve should pause adjustment.

10. Minimum flow sensor pulse Hz

11. Maximum flow sensor pulse Hz

12. Flow sensor pulse sample size
    - Number of flow pulse times used to get the median Hz reading.

Machine - Sections

1. Copy Button
    - Copy width from section 1 to the other sections.

There are 16 sections to a module and up to 8 modules. Module 0 sections are 1-16, Module 1 are 17-32, etc. Sections can be defined individually or within zones. All sections in a zone are the same width. All sections in a zone are controlled with one switch. AOG can still auto control each section individually.

When creating a new file the sections must be defined. The sections will also be defined with AOG sections change.

Machine - Relays

1. Reset relays (circle)

2. Renumber sections (+)

3. Relay Number

4. Relay Types
    a. Section
        - Relay controlled by section switch. This is either from AOG switches, switches on a switchbox or on-screen switches. Master and Auto switches also determine when these relays are on or off.
    b. Slave
        - Relay is on when any section relay is on and off when all section relays are off.
    c. Master
        - Relay is on when any section relay is on and turns off before section relays turn off. Section relay states remain unchanged.
    d. Power
        - Relay is on all the time.

    e. Invert_Section
        - Relay is on when section is off.
    f. Hyd Up
    g. Hyd Down
    h. Tram Right
    i. Tram Left
    j. Geo Stop

k. Switch

- Controlled directly by a switch. Relay is not affected by the Master or Auto switches. When the switch is on the relay is on. When the switch is off the relay is off.

l. Invert_Master

- Relay is on when master is off or when all sections are off.

5. Number

- For a ‘Switch’ type relay, the number of the switch.
- For a ‘Section’ type or ‘Invert_Section’, the number of the section.

There are 16 relays per module and up to 8 modules.

Machine - Switches

4. Master Switch – Control All
    - Control Master relay and section relays.

5. Master Switch – Master Relay only
    - Control Master relay

6. Master Switch – Master Override
    - Master Switch is always on.

7. Work Switch
    - Use a switch connected to the implement to control On/Off.

8. Auto Switch – Rate
    - Auto rate control.

9. Auto Switch – Sections
    - Auto section control.

10. On-Screen Switches – Enabled
    - Show on-screen switches.

11. On-Screen Switches – Dual Auto
    - Show auto rate button and auto section button.

Machine - Pressure

Take two readings to calibrate. Set to a known low pressure and enter the reading and the pressure. Do the same for a known high pressure. Enter the minimum reading for 0 pressure.

Press ‘Show’ to display the pressure screen.

Machine - Primed Start

Start a simulated product application or prime the booms when tractor is stopped. Using the switchbox master switch, hold in the ‘On’ position for the set delay time to enable primed start.

1. On Time
    - Run-time for the application (seconds).

2. Speed
    - Simulated speed.

3. Master switch delay
    - The time to hold the master switch in the ‘On’ position to start the simulation (seconds).

4. Resume
    - After the On Time finishes and if the tractor is moving continue with normal operation.

Machine - Calibrate

Use this screen to set the **Cal Factor** (pulses/unit) for a product. The goal is to achieve a consistent meter roller RPM or liquid flow rate that matches typical field operation. This will give more accurate results.

⚙ Step-by-Step Calibration Process

1. Set Ground Speed

- Enter the ground speed you typically operate at.

2. Set Meter Roller RPM / Valve position

- Switch product **ON** using the power button.
- Enter:
  - Initial base rate
  - Estimated Cal Factor
- Press **Start**:
  - RC adjusts flow to match target rate.
  - If successful, RPM is locked.
  - PWM value used is displayed under the lock (for motor controllers).
- RC will stop calibration if target rate is met.

If RC fails to reach target RPM:

- Press **Stop**.
- Check ground speed
- Adjust estimated Cal Factor, PWM min/max, or metering drive range

3. Set Actual Cal Factor

- Press **Start** to run the meter roller and collect a sample.
- Press **Stop**, enter the measured amount.
- RC calculates and displays the new Cal Factor.
- Press **Save** to record it.

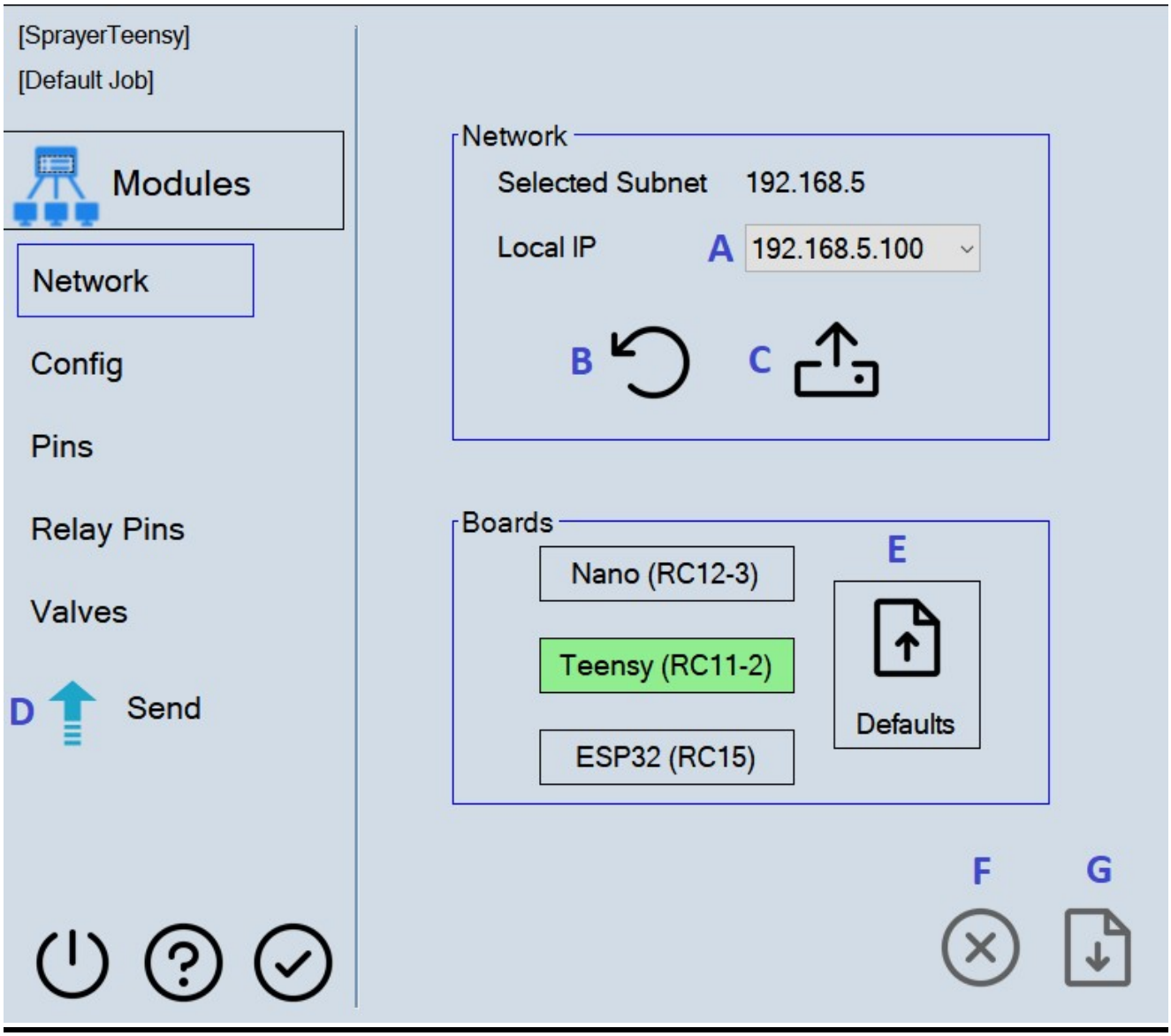
4. Optional Adjustments

- To redo meter speed: press **Unlock**, repeat Step 2.
- To reuse a saved setting: press **Lock**, proceed to Step 3.

Additional Notes

- **AgOpenGPS** is not used.
- **Switchbox** is not used.
- Ensure **master switch is OFF** if switchbox is present.
- Calibration uses **Constant UPM, Mode 2**.
- All sections are activated during calibration.
- After calibration, original mode and section states are restored.

Modules - Network



1. Refresh IP list with (B). Select an IP with (A). Send to module at (C).

2. The mod icon should turn green. 

The module must be connected before sending any other settings.

3. Select a board that is similar to what is used on the module. The defaults button with (E) will be selected. Save changes with (G) or cancel with (F).

4. Make necessary changes on the remaining module pages, save with (G) on each page. Once all edits are complete send the settings to the module with (D). (D) can also be used for single page edits.

Modules - Config

1. Relays
    0. no relays
    1. GPIOs, use the micro-controller pins.
    2. PCA9555, use 8 relay module.
    3. PCA9555 , use 16 relay module.
    4. MCP23017
    5. PCA9685
    6. PCF8574

2. Pins

	RC 5	RC 8	RC 11	RC11-2	RC 12	RC 12-3	RC 15
Controller	Nano	Nano	Teensy	Teensy	Nano	Nano	ESP32
Module ID							
Sensor Count	2	2	2	2	1	2	2
Wifi Serial Port			1				
Relay Control	4	4	1	1	2	4	5
Invert Relay	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Invert Flow	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Flow 1	2	2	28	28	D3	3	17
Flow 2	3	3	29	29		2	16
Dir 1	4	4	37	37	D6	4	32
Dir 2	6	6	14	14		6	25
PWM 1	5	5	36	36	D9	5	33
PWM 2	9	9	15	15		9	26
Work Switch				30		15	
Pressure				40		14	
Relay 1	8	8	8	8		0	
2	9	9	9	9		15	
3	10	10	10	10		1	
4	11	11	11	11		14	
5	12	12	12	12		2	
6	13	13	25	25		13	
7	14	14	26	26		3	
8	15	15	27	27		12	
9	7	7				4	
10	6	6				11	
11	5	5				5	
12	4	4				10	
13	3	3				6	
14	2	2				9	
15	1	1				7	
16	0	0				8	

3. Nano Pins

Nano Pins	
D0	0
D1	1
D2	2
D3	3
D4	4
D5	5
D6	6
D7	7
D8	8
D9	9
D10	10
D11	11
D12	12
D13	13
A0	14
A1	15
A2	16
A3	17
A4	18
A5	19
A6	20
A7	21

Help

No Relays:

1. Is module config for board and relay type correct?
2. Subnet set in app? Uploaded to module?
3. Section count and width set?
4. Is Auto on?
5. Section assigned to relay?
6. Switch assigned to section?
7. If auto on, sensor counts/unit and base rate are needed.

No UPM:

1. Check speed.
2. Check working width.
3. Check sensor control settings.
4. AOG connected?
5. Module connected?
6. Check sensor counts/unit.
7. Check base rate.
8. Did the control values get sent to the module?
9. Control type, is it a valve or motor?
10. Connector fully plugged in?
11. Up to date version of module firmware?
12. Auto on?

No rate adjust:

1. In manual the master switch must be on.
2. Minimum pwm too low?

Motor won't shut off:

1. Minimum pwm should be 0.
2. Master override on?

After Updating firmware:

1. Resend subnet.
2. Resend module config settings.

Tips

- long press (right click) some screens, including the rate map, to drag to position. For the menu screen long press the icon in the top left corner.
- click on current rate to cycle rate display
- click on target rate to switch between target rate and alternate rate
- click on quantity to cycle quantity display
- click on quantity amount to reset
- click on coverage to cycle coverage display
- click on coverage amount to reset
- using the standard screen, click on AOG or MOD to minimize and display the rate only
- using the large screen, click on the graph to select a product