NOVA 110

Orchard Rate Control Computer

Installation & User Manual

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About this Document

Document Information

Document Type	Installation & User Manual
Document Abstract	Overview and detailed instructions for the installation and usage of NOVA 110 Rate control computer.
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Document Prepared By	Timdigitize Documentation Team

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1.	0.1	18-June-2025	First Release
2.			
3.			
4.			

1. Symbols & Abbreviations

This manual is for qualified technicians only. The tasks described in this manual may only be performed by qualified technicians.

1.1 Symbols Used

The following types of safety instructions and general information appear in this document described as below:

Symbol	Type of Hazard	Description
	**DANGER**	- Indicates a hazardous situation that needs immediate attention. - If not avoided, serious injury or even death may occur.
	**WARNING**	- Indicates a hazardous situation that could lead to death or serious injury if precautions are not taken.
	**CAUTION**	- Indicates a hazardous situation that might result in minor or moderate injury if not avoided.
	**NOTE**	- Provides you tips that are valuable for the optimal operation of your product.

	Carefully read all the safety instructions. Otherwise, there exists a risk of an accident or a fatal injury.
	Never clean equipment with direct water jets. This may cause irreparable damage to the product.
	Do not use solvents or fuel to clean the case outer surface. It may cause serious damage to the product assembly.
	Comply with the specified power voltage (12 VDC).
	Only use Tim spare parts.

2.1. Important safety instructions

2.1.1 Risk of fire

	*This is an electrical product and is susceptible to fires.*

- Do not store or place any flammable substances near the product components or wiring.
- Keep cigarettes and other open flames away from the product. There is a danger of fire damaging the product or wiring.
- Do not expose the product to temperatures in excess of 70°C.
- Reverse polarity will cause irreversible damage to the circuitry.
- Do not store or operate in a location where it may be at risk of getting in contact wit chemicals

2.1.2 Electrostatic Discharge

	*This is an electrical product and is susceptible to static charge buildup.*

- Electronic components on the Printed Circuit Boards within the product are susceptible to damage from Electrostatic Discharge (ESD).
- Observe ESD precautions when handling ESD sensitive components. Refer to site specific procedures if applicable.

2.1.3 Usage/Installation Pre-requisites

	*This is an electrical product and is susceptible to static charge buildup.*

Before Usage/installation, carefully verify the below-mentioned prerequisites.

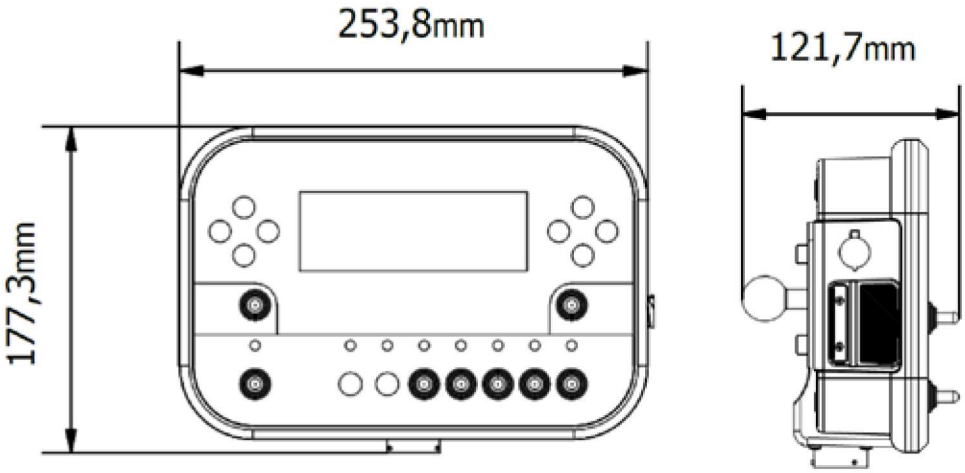
1. There is no excessive humidity in the usage/installation area.
2. There are no flammables or explosives stored nearby.
3. There is no excessive dust and dirt in the area.
4. All federal, state and local site safety requirements are in place.

3.1 About Nova 110 (Orchard Rate Control Computer)

The Nova 110 is a control unit that makes it possible to control all phases of treatment in spraying applications directly from the tractor's cabin. The computer enables desired spraying per unit area independent of tractor speed (lt/ha) and helps to ensure that the correct spray is applied to the crops, reducing waste, and improving effici cy. Application rate, speed, Pressure, flow rate, sprayed quantity, tank level, the area covered, spraying duration, and distance covered can be displayed on the rate controller screen.

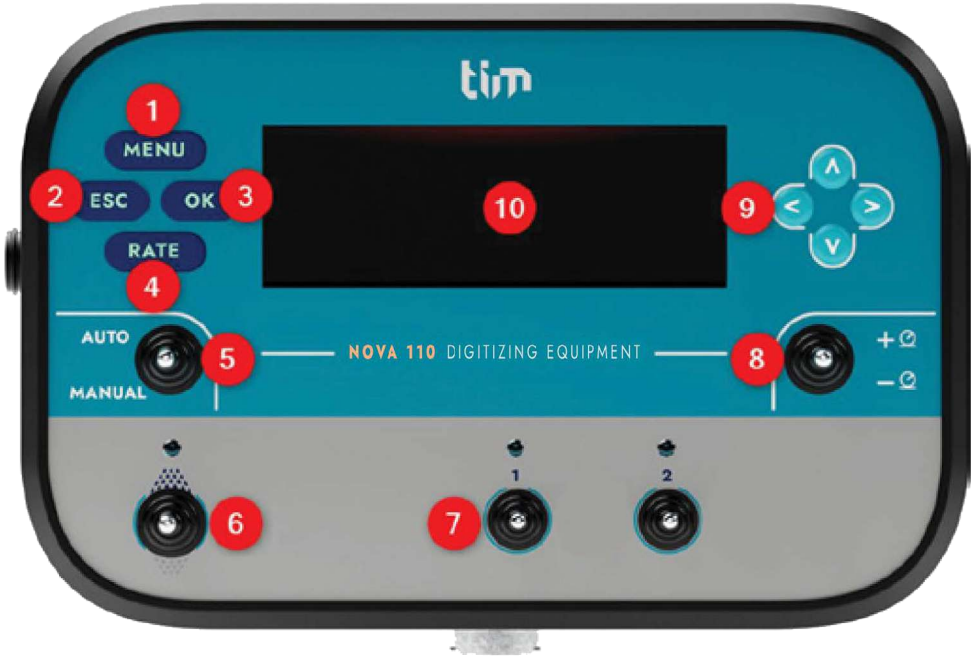
Key capabilities include:

- **In-cabin control:** Allows the operator to manage all phases of spraying applications directly from the tractor cabin.
- **Speed-independent application rate:** Enables desired spraying per unit area (liters per hectare) regardless of the tractor's speed.
- **Ensures accurate spraying:** Helps apply the correct amount of spray to crops.
- **Reduces waste:** Minimizes the unnecessary use of spraying materials.
- **Improves effici cy:** Streamlines the spraying process.
- **Displays key parameters:** Shows application rate, speed, pressure, flow rate, sprayed-quantity, tank level, area covered, spraying duration, and distance covered on the rate-controller screen.



Specifications	Values
Dimensions	25.4 cm x 17 cm x 11.8cm
Weight	1.2 KG
Operating Temperature	-20°C Min. 70°C Max.
Display	20 × 4 DOT MATRIX Display
Power	12VDC
Protection	IP 65

3.2 Product Overview

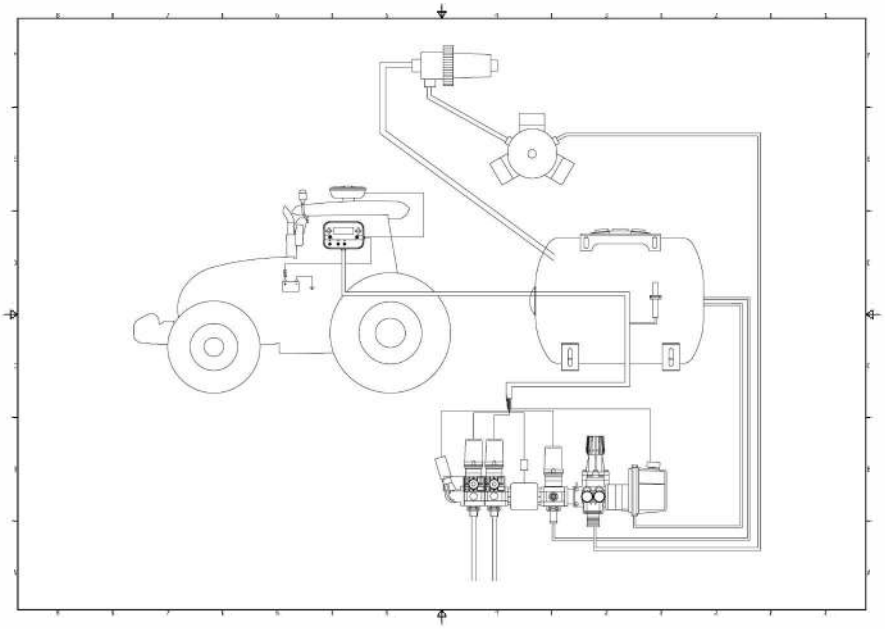


Note: *The final product may differ from the description depending on the requirements and customer specifications.*

Sr. #	Part Name
1.	Menu Button
2.	ESC Button
3.	OK Button
4.	RATE Button
5.	AUTO / MANUAL Switch
6.	Main Valve Switch
7.	Section Valve Switches (2 individual section switches are available in NOVA 110)
8.	Rate Switch
9.	Navigation Buttons (Up, Down, Left, Right)
10.	Display Unit

4.1 Device Installation

The installation must be carried out by a skilled professional only.



Typical Installed Setup on a Tractor

Step 1. *Unbox the equipment and place the NOVA 110 computer on a flat and clean surface.*

NOVA110 can be installed in TWO Configurations.
- Using the Triple Suction cup mount
- Using the Screw mount

Step 2. *Choose your preferred installation configuration (triple suction mount or screw mount) and ensure that the mounting bracket is securely fastened.*

If the mounting bracket is not securely fastened, it may result in movement or detachment during operation and may cause damage to product or operator.

Step 3. *For proper connection of the Nova 110 Rate Controller to the tractor, the harness must be constructed to ensure reliable power supply, signal transmission, and compatibility with existing equipment.*

Step 4. *The harness includes a dedicated power line (preferably fused) connected directly to the tractor battery (12V) as shown below.*

Connectors must be waterproof (IP65 or higher rated) for agricultural environments.

Step 5. *Clearly labeled wires for boom control, flowmeter, pressure sensor, speed input (e.g., GPS or wheel sensor), and section valves as shown below.*

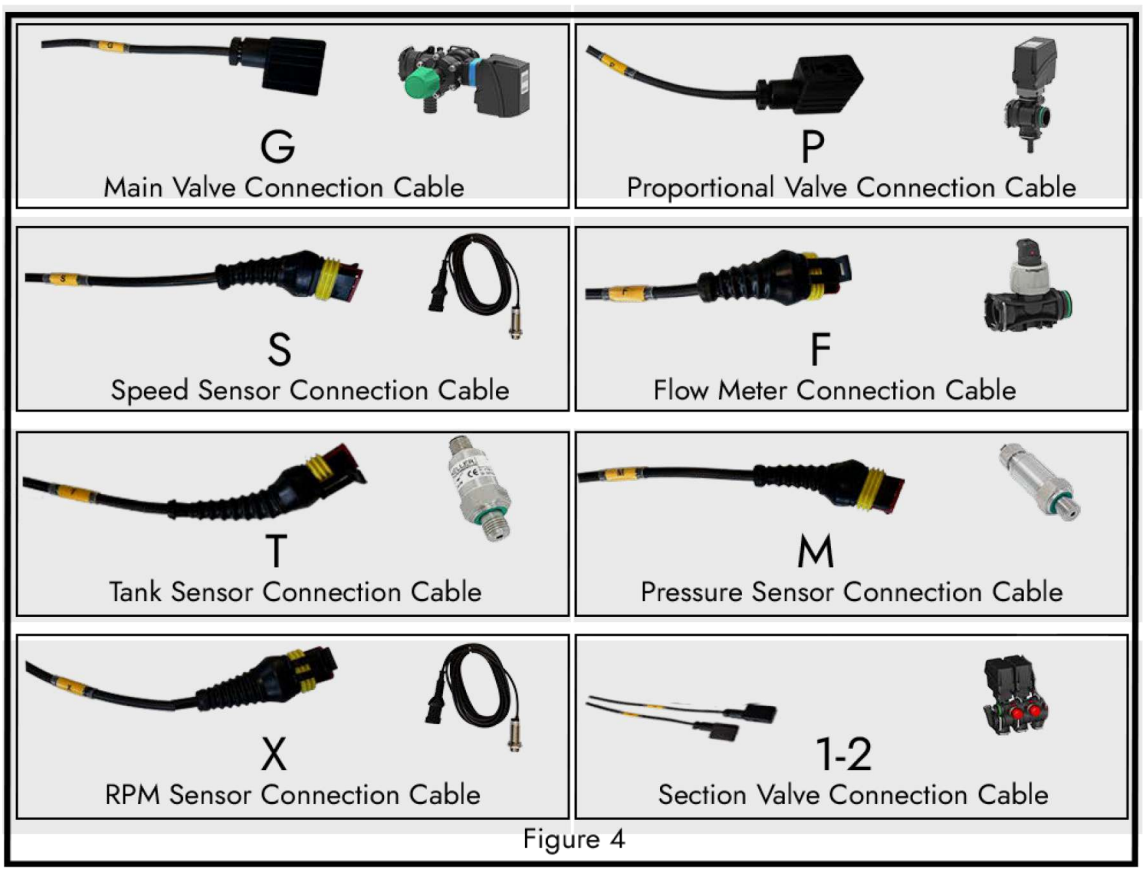
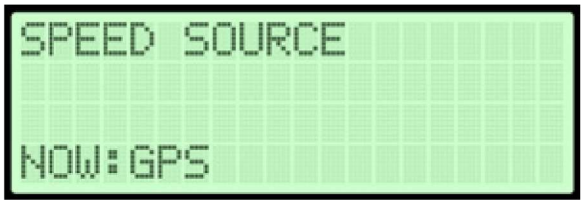


Figure 4

5.1 User Menu

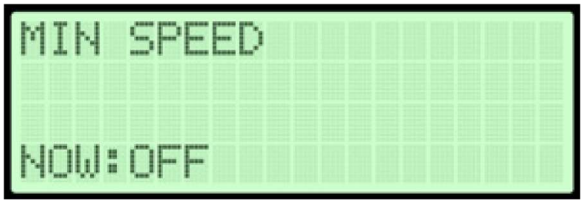
5.1.1 Speed Source



The source to calculate the current speed. User can set any of the below mentioned values.

a. *Simulation:* The user can simulate the speed by selecting a speed value.
b. *Wheel+GPS:* The speed value is primarily obtained by GPS if GPS is not working or precise enough the source is obtained by the wheel sensor.
c. *GPS:* The source of speed is solely obtained by GPS.
d. *Wheel:* The source of speed is solely obtained by wheel sensor.

5.1.2 Minimum Speed



Minimum speed is the threshold speed value below which the spraying will automatically stop. User can set any of the below mentioned values

a. *OFF:* The minimum speed feature is disabled.
b. *XX:* Any value in KM/H set by the user.

5.1.3 Refill Tank

Sets the level of the spray storage tank and alerts if the tank is empty. User can set any of the below mentioned values

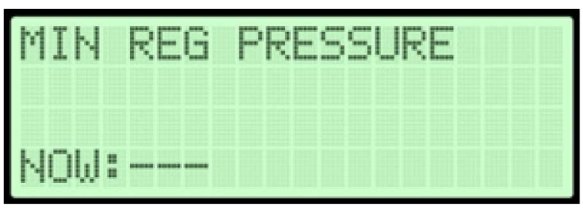
a. *OFF:* The feature is disabled.

b. *XX:* Tank level value set by the user.

5.1.4 Tank Level

Sets the tank level value of the system. User can set the appropriate value here.

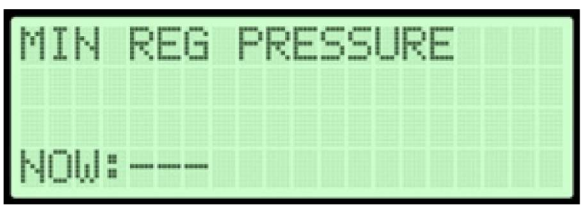
5.1.5 Minimum Regulation Pressure



Using the Minimum Regulation Pressure, the user can enter the minimum pressure at which the rate regulation will be performed.

For calculation, the pressure sensor must be mounted

5.1.6 Maximum Regulation Pressure



For calculation, the pressure sensor must be mounted

Using the Maximum Regulation Pressure, the user can enter the maximum pressure at which the rate regulation will be performed

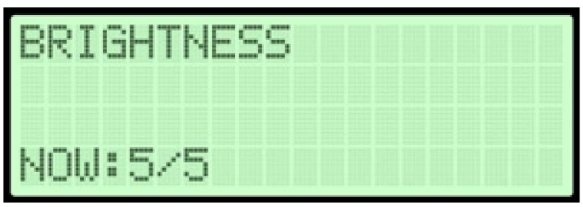
5.1.7 Pressure Sensor Zeroing

In case there is any residual pressue in the system, the user can use this option to reset the pressure to zero.

5.1.8 Reset Area Values

Resets the area values of the system i.e., the applied area and the total area covered by the equipment.

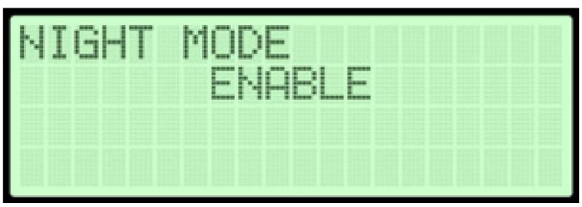
5.1.9 Brightness



Sets the LCD brightness value. User can set any of the below mentioned values

a. *1 – 5:* Brightness levels of the LCD. 5 is the maximum value while 1 is the minimum.

5.1.10 Night Mode

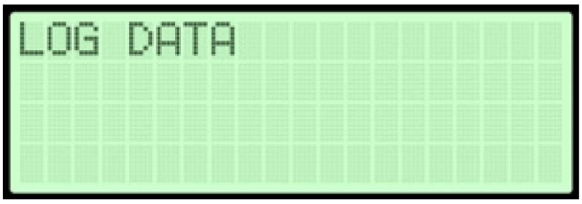


Enables or disables the Night Mode to alter LCD brightness value. User can set any of the below mentioned values

a. ***Enable:*** Brightness levels of the LCD are set to minimum i.e., 1.

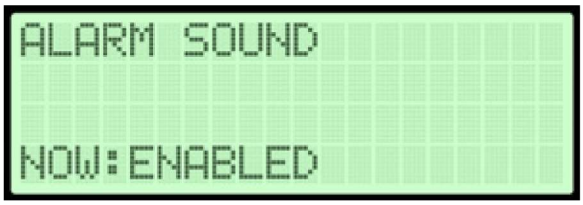
b. ***Disable:*** Night mode is disabled and the LCD brightness is set to the previous / default value.

5.1.11 LOG Data



Using the Nova 110, log data can be recorded for information such as device, job, date, time, latitude, longitude, current rate, target rate, speed, covered area, sprayed volume, flow rate, tank level, and more.

5.1.12 Alarm Sound



Enables or disables the Alarm sound. User can set any of the below mentioned values

a. ***Enable:*** Alarm sounds are enabled.

b. ***Disable:*** Alarm sounds are disabled.

5.1.13 Button Sound

Enables or disables the button (Key Press) sound. User can set any of the below mentioned values

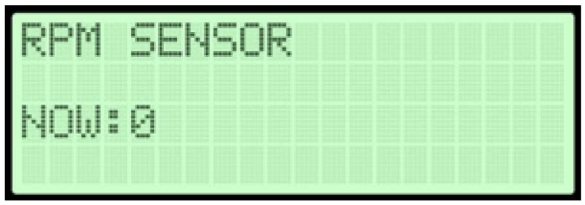
a. ***Enable:*** Key Press (Button) sounds are enabled.

b. ***Disable:*** Key Press (Button) sounds are disabled.

5.1.14 AGG Value

In cases where the flow rate (L/min) is low, the aggressiveness value should be reduced to achieve more precise rate control. If the target application rate (L/ha) fluctuates continuously, the aggressiveness setting should be lowered.

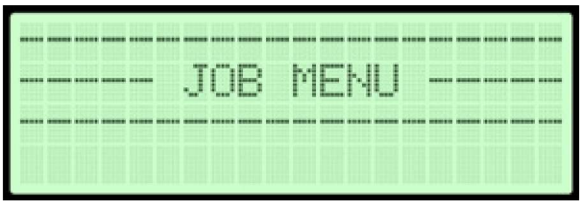
5.1.15 RPM Sensor



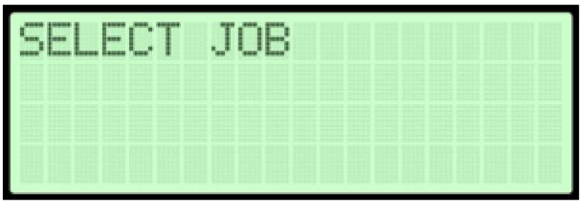
The RPM sensor, which is mounted on the shaft, displays the rotation speed of the PTO (power take-off) shaft.

5.2 Job Menu

Press the **RATE** button on the NOVA 110 to enter the Job Menu

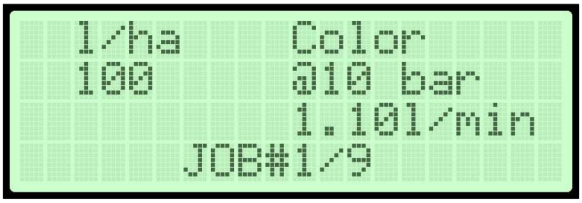


5.2.1 Select Job



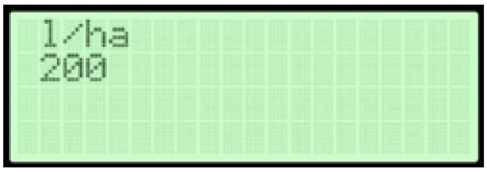
Select Job menu is used to select a previously configured job.

5.2.2 Job List



The Job List menu allows users to view or edit an already available Job. Users may also define /create a new job.

5.2.3 User Nozzle



In case the Nozzle size is not an ISO standard, the user may use this menu to create a new nozzle. For this process, the user first enters the nozzle pressure, followed by the amount of liquid sprayed in one minute under that pressure.

5.3 Advanced Menu

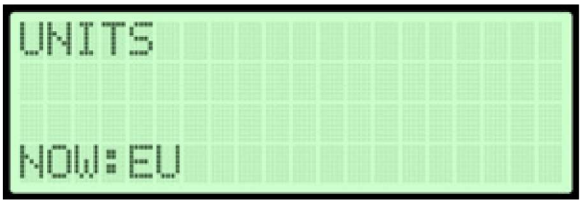
Press the **Menu+OK for 3 seconds** on the NOVA 110 to enter the Advanced Menu

5.3.1 Language

User can select the preferred display language. The user can select from the following values.

a. Türkçe
b. b. English
c. c. Русский
d. d. Ελληνιά

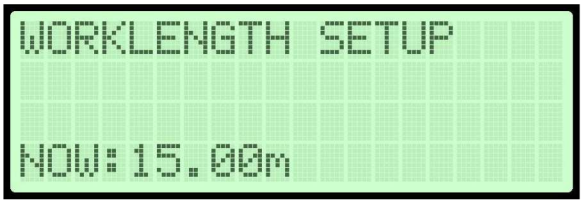
5.3.2 Units



User can select the preferred units to calculate the flow. Following options are available.

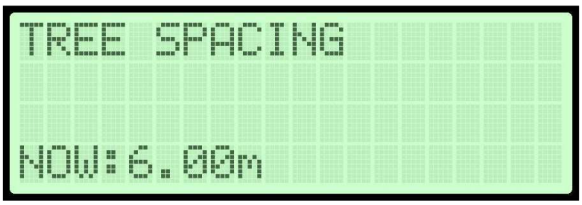
a. EU(L/HA,L,m,cm)
b. US(GAL/AC,GAL,m,cm)

5.3.3 Worklength Setup

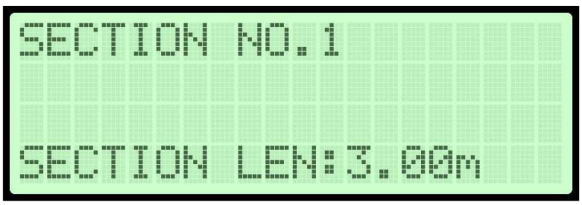


The user first selects the tree-to-tree spacing, which defines the working width per nozzle. Next, the number of nozzles in each section is entered.

By default, two sections—left and right—are active, each containing six nozzles. Sections can be deactivated if needed; in such cases, the corresponding valve will remain closed even if its control button is switched ON.



The working width of a section is calculated by multiplying the selected tree spacing by the number of nozzles assigned to that section. Nozzle spacing, defined as the fixed distance between adjacent nozzles on the boom, is configured during system calibration. The calculated section widths are used by the controller to perform accurate area measurement and flow rate regulation during spraying operations.

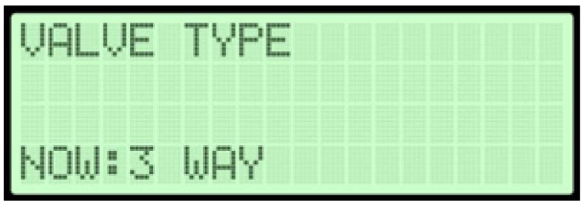


5.3.4 Tank Setup

In the Tank Setup, the user can enter the tank capacity and the minimum level of the tank at which alarm state is triggered.

a. *Tank Capacity (Default 1500L):* Adjust according to your sprayer
b. *Tank Minimum Level (Default 150L):* Adjust to your needs.

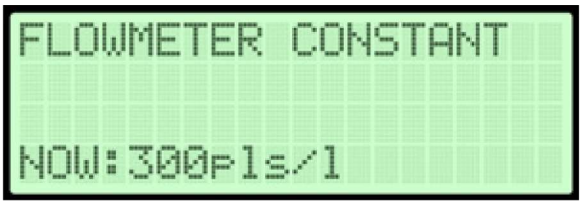
5.3.5 Valve Type



In the Valve Type, the user can determine the section valve type.

a. 2 Way – Without By-pass calibrated
b. 3 Way – With By-pass calibrated

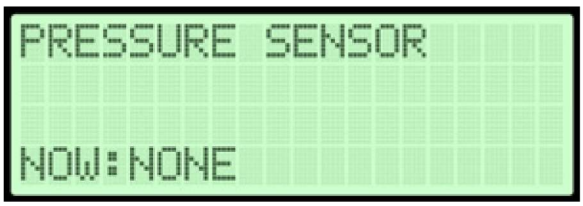
5.3.6 Flowmeter Constant



In the "Flowmeter Constant" section, enter the constant value specified for the flowmeter model used in the electrovalve system.

The default value is set to 300 pls/l

5.3.7 Pressure Sensor



Using the Pressure Sensor, the user can enable/disable the calculation of the pressure of the equipment. The user can set the following values;

a. ***None:*** Pressure value will not be shown
b. ***Yes:*** Pressure sensor is mounted therefore max value should be entered correctly by checking max value on pressure sensor
c. ***Estimation:*** If there is no pressure sensor, pressure value will be estimated by current flow and by nozzle type selected on job menu.

5.3.8 Wheel Sensor Constant

This value is calculated from the sensor input. The user can set the following values;

a. ***Manual Adjustment:*** Calculate the value using the following formula and set it here. *(Kwheel: Distance traveled(cm) /No. of detection points X Wheel RPM)*

b. ***Automatic Adjustment:*** For automatic adjustment, the tank should be half full and tire pressure set correctly. Now move the vehicle 100 meters and then press OK. The system will automatically calibrate and set the value.

☞	For calculation, must be adjusted according to wheel radius of the tractor or trailed type sprayer.
☞	Default value is 50.0 cm/pls

5.3.9 Section Management

The Section Management allows users to choose whether the main valve closes all section valves or not. The user can set the following values;

a. ***Close All:*** Closes all open sections together with main section.

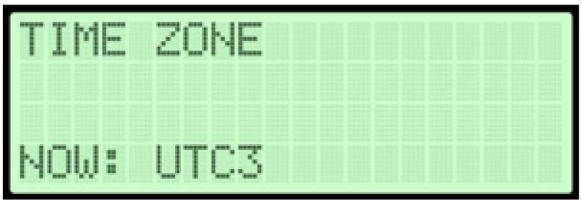
b. ***Only Main:*** Just the main section is closed.

5.3.10 GPS Max HDOP

The GPS Max HDOP is the rate at which information is obtained from the GPS.

☞	Speed source will be switched to wheel sensor if current HDOP value is more than selected value
☞	Default value is 4.0

5.3.11 Time Zone



The current time of the NOVA 110 system. The user can set the appropriate time zone.

☞	User can select the time zone UTC +/- 12

5.3.12 Tank Level Calibration

The user can set the Tank Level Calibration method. The user can set the following values;

a. *None:* The calibration is not done.
b. *Manual:* The calibration is done set to manual.

5.4 Instant Menu

Nova 110 offers five different Instant Menus to provide real-time operational data. You can switch between these menus using the navigation buttons on the device.

5.4.1 Instant Menu – 1

Displays current speed and flow rate.

5.4.2 Instant Menu – 2

Displays current speed and pressure (available if a pressure sensor is connected or pressure estimation is enabled in the Advocated Menu).

5.4.3 Instant Menu – 3

Displays tank level, remaining area, and total sprayed volume.

5.4.4 Instant Menu – 4

Displays current speed, covered area, and total target area.

5.4.5 Instant Menu – 5

Displays current speed and PTO RPM value.

☞	Available if an RPM sensor is connected and activated

6. Alarms

The NOVA110 is equipped with an alarm system that triggers an alarm whenever a specific condition is met. Specific conditions and necessary actions to clear the alarm are me tioned below.

Sr. #	Alarm	Reason(s)	Action to be Taken
1.	 HIGH SPEED	Tractor speed is high for rate regulation	Reduce speed
2.	 LOW SPEED	Tractor speed is low for rate regulation	Increase speed
3.	 MIN SPEED	Tractor speed is below the specified minimum speed value	Increase speed
4.	 NO FLOW	The tractor is moving but the system does not detect any flow.	Check flow nozzle
5.	 MIN TANK	Tank level is below the specified minimum tank level	Refill the tank
6.	 NO SPEED	The system detects the flow but the tractor is not moving.	Start moving
7.	 BELOW MIN REG. PRESSURE	Application pressure is lower than the minimum regulation Pressure	Increase Pressure
8.	 ABOVE MAX REG. PRESSURE	Application pressure is higher than the maximum regulation	Reduce Pressure

7.1 Package Contents

Sr. #	Item Code	Description
1	TNOV110.01	Nova 110 Computer  Power Cable 3m 

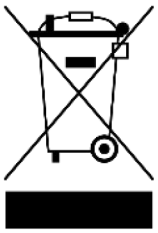
7.2 To be Ordered Contents

Sr. #	Item Code	Description
1	KYP030	Speed Sensor with 2m Cable 
2	SIM021	4.5m Valve Cable 

7.3 Optional Package Contents

Sr. #	Item Code	Description
1	SIM016	12 m Valve Cable 
2	KYP029	Triple Suction Cup Mount 
3	KYP37	Screw Screen Holder 
4	SAL 400504	Kit Blister 3 Hole Plug Tractor Side 
5	KYP028	GPS Antenna with 5m Cable 
6	KYP021	Level Sensor 0,4 Bar with 2m Cable 
7	KYP022	Pressure Sensor 25 Bar- G1/4 

8. Disposal of Used Packaging Material



The meaning of the symbol on the product, its accessory or packaging indicates that this product shall not be treated as household waste. Please, dispose of this product at your applicable collection point for the recycling of electrical & electronic equipment waste. Alternatively, in some states of the European Union or other European states you may return your products to your local retailer when buying an equivalent new product. The correct disposal of this product will help save valuable natural resources and help in preventing the potential negative impact on the environment and human health, which could be caused as a result of improper liquidation of waste. Please ask your local authorities or the nearest waste collection center for further details. The improper disposal of this type of waste may fall subject to national regulations for fines.

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