

TeeJet® 814p
Sprayer Monitor

**Programming and Operating Manual
(V1.00)**

Table of Contents

Programming Guidelines	3
Start	4
System Setup Mode	5
Speed Sensor Calibration	5
Simulated Speed	5
Tip spacing	6
Section Width	6
Pressure sensor calibration	6
Step 1	6
Step 2	6
Programmable tip	7
Completing the System Setup Mode	7
Normal Monitor Mode	8
Introduction	8
Tip selection	8
Density	8
Speed and Dose Rate	9
Dose rate and Pressure	9
Flow and Pressure	9
Sprayed area and sprayed volume	9
Working width	10
Operating Instructions	11
Sprayer Checkout	11
The Spraying Operation	11
Automatic Power Down	13
LED indications	13
Appendix A: Overview of Monitor Displays	14
Appendix B: Overview of Programming Steps	15

Programming Guidelines

Make sure that all hardware components are properly installed and tested. Before you start the programming process you should first check if the Console and all sensors are working properly.

Important Preliminary Information

Before you begin, we recommend that you review the following Programming Guidelines that control the programming process:

- ➡ The Pro key is used for power ON
- ➡ Clr + Up + Down key combination is used to power OFF (when not spraying)
- ➡ Holding Pro key is used to enter or leave programming mode
- ➡ Shortly pressing the Pro key saves the current parameter and advances to the next programming step
- ➡ Shortly pressing the Clr key restores the parameter with the default value
- ➡ Holding the Clr key restores the parameter with its minimum value (mostly zero)
- ➡ The value of a parameter is changed with the Up and Down keys. Holding the Up or Down key changes the parameter rapidly.

Start

To begin the programming process:

- ☞ Read above for programming tips.
- ☞ Be sure the Main Valve toggle switch is “OFF.”
- ☞ Turn console “ON” by pressing the Pro key. When the Control Console is turned on, the software version will be displayed.
This information will be needed when calling for service support.

814p SI V1.20

Example: the 814p-spray monitor is working in SI units and the software version is V1.20.

- ☞ After a short time the Console will change to the normal monitor mode. The display now shows the selected tip e.g. an _04 tip with specific flow of 1.29 l/min at 2 bar.

_04 1.29 Lpm

System Setup Mode

The System Setup Mode contains the programming steps that customize the monitor to the sprayer or sprayer components. These include calibration steps and parameters that, once programmed, will likely never change. An overview of all programming steps is shown in “Appendix B: Overview of Programming Steps”.

To enter the System Setup Mode:

- ☛ First be sure that the Console is ON (if not put it on by pressing the Pro key and wait until the normal display is visible).
- ☛ Check if the Main valve switch is OFF
- ☛ Then press and hold the Pro key to enter the System Setup Mode.

SPEED SENSOR CALIBRATION

Default = 250 pulses/100m

>250 puls/100m

The speed sensor needs to be calibrated in order to provide the proper speed and area readings. The value for this step is the number of pulses generated by the speed sensor in 100 meters.

Manual Calculation

To manually calculate the proper value for Wheel Speed Sensor pulses, you need to know the circumference of the wheel to which the sensor is mounted. It can be measured by marking the tire and measuring the distance covered as that mark makes one full revolution.

Then use the following formula:

$$\frac{10,000 \times \#bolts\ on\ wheel}{Wheel\ Circumference\ in\ cm} = e.g. \frac{10,000 \times 4}{160} = 250$$

Use the Up or Down keys to adjust the value. Press the Pro key to validate the value and advance to the next programming step.

Note: The wheel calibration should be repeated if you are changing to another wheel diameter.

Simulated Speed

If you enter 0 in this programming step, then the Console always shows a simulated speed of 6.0 Km/h. This can be used to test out the sprayer at stand still. The simulated speed feature allows you to check out the sprayer at a certain speed without actually moving the sprayer. This can be done prior to any spraying activity.

TIP SPACING

Default = 50 cm

>50 cm ^<--->^

Enter the spacing between the tips in cm. Normally this is 50 cm. The distance can be changed with the Up and Down keys.

Depress the  key to accept the spacing value and advance to the next program step.

SECTION WIDTH

Default = 3.00 m

In the next 9 programming steps the width of each section has to be entered. If a certain section is not used then the value must be programmed to zero.

Use the Up and Down keys to change the value.

> 3.00 m Sect 1

Press the Pro key to save this parameter and to advance to the next section width. After programming the ninth section, the Pro key advances to the next programming step.

Very Important

The section widths are used to calculate the treated hectares and the correct dose rate per hectare. Therefore it must always be related to the effectively sprayed area.

PRESSURE SENSOR CALIBRATION

The pressure sensor is calibrated with two programming steps. The first step calibrates the sensor at 0 bar, while the second step calibrates the maximum pressure of the sensor. The sensor can only be a 4 to 20 mA or 0 to 20 mA type.

Step 1

Default = 4.0 mA

In the first step the number of mA corresponding to 0 bar must be entered.

Use the Up and Down keys to change the value.

>4.0 mA 0.0 Bar

Press the Pro key to save this parameter and to advance to the next programming step.

Step 2

Default = 10.0 Bar

The second pressure calibration step specifies the maximum pressure of the sensor at 20mA.

Use the Up and Down keys to change the value.

>10.0 Bar 20 mA

Press the Pro key to save this parameter and to advance to the next programming step

PROGRAMMABLE TIP

Default = 1.29 l/min

In this programming step, you can program a special tip (which is not in the ISO color table). The specific flow in l/min at 2 bar must be specified. E.g. an ISO red tip has a specific flow of 1.29 l/min at 2 bar.

Use the Up and Down keys to change the value.

>1.29 Lpm _P

If you want to use this tip then you have to select the _P tip in the normal mode.

COMPLETING THE SYSTEM SETUP MODE

When you have completed the last calibration or programming step, you have completed the System Setup Mode.

NOW, PRESS AND HOLD THE Pro KEY FOR THREE SECONDS AND THE CONSOLE WILL RETURN TO THE NORMAL MONITOR MODE.

Note: For your protection, the 814 console will not automatically power down while in the System Setup Mode. You must exit properly as described above to enable the auto power down feature.

Normal Monitor Mode

INTRODUCTION

The normal monitor mode is the normal working mode of the Console after power up. The screen can show two parameters at the same time (one on the left and one on the right hand side). The displayed value can be recognized by the unit text string displayed after the value e.g. the speed value is shown in km/h units.

The usage of the keys during monitoring is summarized as follows:

- Pro key is used to power ON
- Clr + Up + Down key combination is used to power OFF (when not spraying)
- Up and Down arrow keys are used for scrolling through the list of display information
- Holding Clr key is used to clear counters (Ha, I)
- Quickly pressing and releasing the Pro key allows you to change the tip and the density (only when the corresponding value is visible).

In the following, the different monitor displays will be described in more detail. An overview is given in “Appendix A: Overview of Monitor Displays”.

TIP SELECTION

The first display after start up is the tip selection display. On the left the selected tip size is shown and on the right hand side the corresponding specific flow at 2 bar is shown. E.g. when you are using a 11004 tip then you must select here _04 as tip size. The programmable tip is represented by _P.

_04 1.29 Lpm

Press the Up or Down key to select another display.

The tip size can be changed by quickly pressing the Pro key. The tip size symbol will now be flashing. Use the Up or Down keys to select another tip size and press Pro to accept.

DENSITY

This step shows the density factor. When spraying with a water solution, the density factor is normally 1.00, but when a different liquid is used e.g. liquid fertilizer, then it is possible that the density is different from 1.00 e.g. 1.28 is a common value for liquid fertilizer.

1.00 D

Press the Up or Down key to select another display.

The density can be changed by quickly pressing the Pro key. The density value will now be flashing. Use the Up or Down keys to change the value and press Pro to accept. When the density value is different from 1.00 then the green flow LED will be lit to indicate that the monitor is working with a density different from 1.00.

Don't forget to reset this value to 1.00 when spraying again with water based solutions.

SPEED AND DOSE RATE

In this display the speed and dose rate are shown. On the left the current speed is shown in km/h and on the right hand side the current dose rate in l/ha is shown. When the main valve is switched off, the shown dose rate is zero.

5.0 kmh 100 Lha

Press the Up or Down key to select another display.

DOSE RATE AND PRESSURE

In this display the dose rate in l/ha and the pressure in bar is shown at the same time.

100 Lha 2.3 Bar

Press the Up or Down key to select another display.

FLOW AND PRESSURE

In this display a combination of flow in l/min and pressure in bar is shown.

35.2 Lpm 2.3 Bar

Press the Up or Down key to select another display.

SPRAYED AREA AND SPRAYED VOLUME

In this display the area and volume counters are shown. The area is measured in hectares and the volume is measured in liters. The counters can be reset to zero by pressing and holding the Clr key until the values are reset to zero. This can only be done when there is no spraying activity and the main valve is switched OFF. The volume in liters is calculated and based on pressure measurements. This volume will only be accurate when spraying with new nozzles and with perfect calibration of the pressure sensor and also when there are no pressure losses between pressure sensor and nozzles. The volume will not be accurate when the tips are worn.

0.000 Ha 0 L

Press the Up or Down key to select another display.

WORKING WIDTH

In this display the current working width is shown. The working width depends on the number of closed sections and whether or not the main valve is closed.

12.00 m <--->

Press the Up or Down key to select another display.

Operating Instructions

SPRAYER CHECKOUT

Before spraying check all connections related to the Sprayer Control assembly. Particular attention should be given to the speed sensor to be sure the sensor and bolts are in-line, and properly secured.

Very important: Whenever you are working around a sprayer or farm chemicals, be sure to wear protective clothing and eyewear.

Partially fill the sprayer tank with water to flush the system and to make a visual check of the spray tips to be sure all tips are delivering a good spray pattern.

Follow these steps, in sequence, being sure the Main Valve Switch is in its “OFF” position:

- ☛ Be sure the tank shut-off valve is open.
- ☛ Start the engine, engage pump, and set the rpm to that which will be used when spraying.
- ☛ Switch the computer on by depressing the Pro key on the display panel.
- ☛ Turn “ON” the toggle switches for each of the spray booms on your sprayer.
- ☛ Now, toggle the Main Valve switch to “on.”
- ☛ Adjust the pressure with the +/- switch.

At this point, the sprayer will be activated and spray tip performance can be visually checked. The +/- switch can be used to raise or lower your spraying pressure. To stop spraying, toggle the Main Valve switch to “OFF”.

The above steps provide a quick way to check-out your sprayer and computerized monitor system.

THE SPRAYING OPERATION

You have filled the sprayer tank and have thoroughly mixed the chemical(s). Your application rate has been determined as well as the spray tip you will be using, with the sprayer data programmed into the computer.

- ☛ Switch the computer on by depressing the Pro key on the display panel.
- ☛ Toggle the boom switches to their “ON” position, for each of the booms on your sprayer.
- ☛ Take note of the “numbered” booms on each side of the sprayer, so that the appropriate boom can be toggled “OFF” as necessary.
- ☛ While spraying with the Main Valve switch “ON”, you can scroll through the different displays until the information you want is on the display :
 - ◆ selected tip size
 - ◆ density value

- ◆ actual application rate in l/Ha
- ◆ vehicle speed in Km/h
- ◆ pressure in Bar
- ◆ actual working width in m
- ◆ application area covered in Ha
- ◆ total volume applied in L.

✎ Adjust the pressure and target dose rate with the +/- switch.

As you enter the field to the point where you will begin spraying, turn the Main Valve switch to “ON” position. This will activate the spraying operation. Maintain your usual vehicle speed for spraying. Use the +/- key to maintain the application rate. Mostly small changes in vehicle speed are compensated by automatic pressure increases or decreases (when the pump is driven by the PTO).

If for any reason you need to stop, turn the MAIN VALVE SWITCH to “OFF.”

Automatic Power Down

The TeeJet 814 Sprayer Monitor has an automatic power down feature. With the Main Valve switch in the “OFF” position, the Console will automatically shut down after 10 minutes of no inputs (when in normal monitor mode). This prevents possible battery drainage.

You can also power down the controller by the following key combination: press simultaneously the Clr, Up and Down keys and the Console will power down immediately (only with Main valve switch OFF).

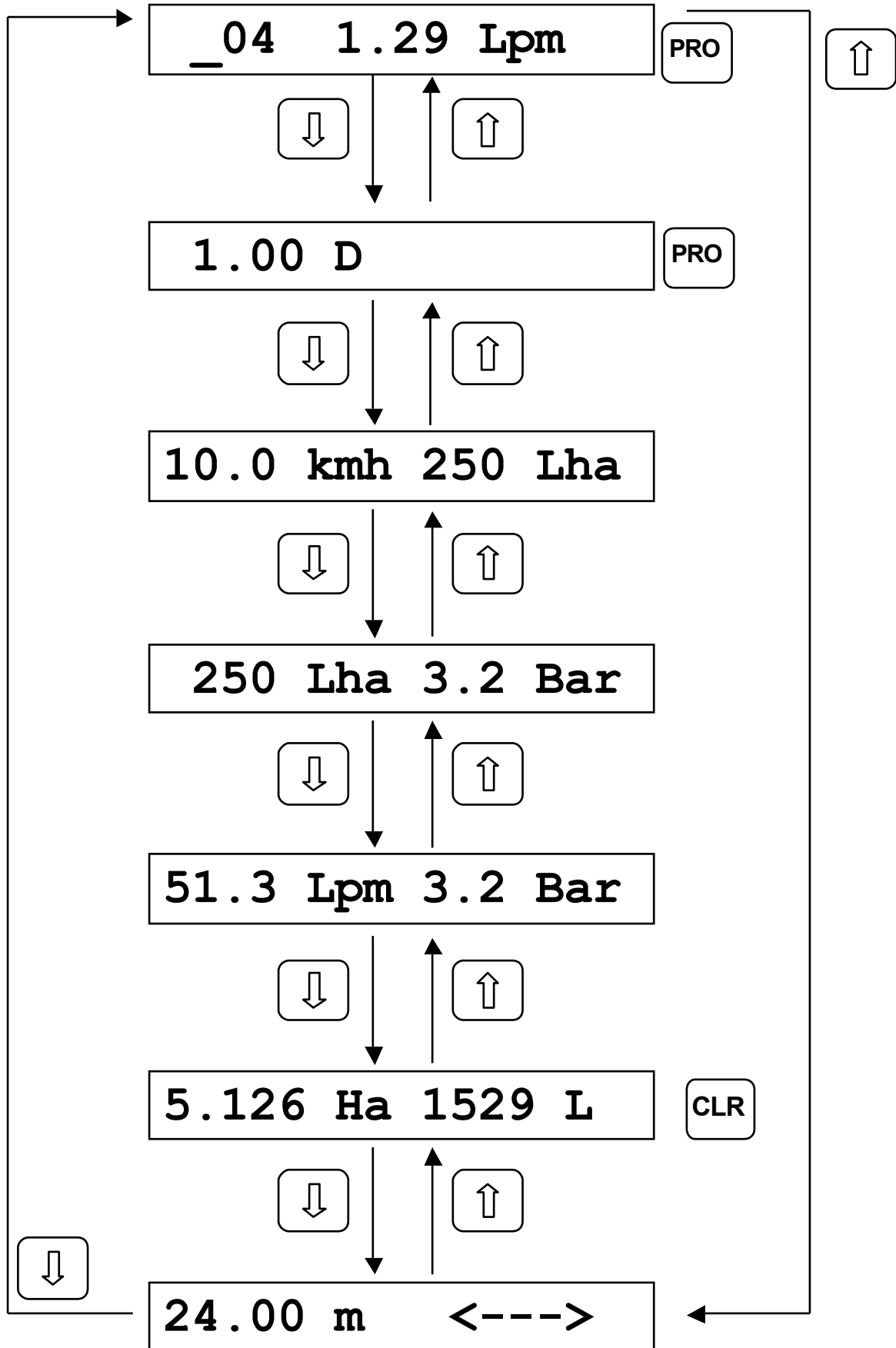
WARNING: Do NOT SWITCH OFF THE CONSOLE BY REMOVING THE MAIN CABLE!

LED indications

There three indicator LED's on the front of the spray monitor.

- The first LED is a speed monitor LED and flashes every time a pulse is received from the speed sensor.
- The second LED is used here as a warning for spraying with density different from 1.00. This LED will be on when the density is different from 1.00.
- The third LED is used to monitor the pressure sensor signal. When the pressure sensor is working properly then the LED will be lit. When the pressure sensor is not working properly the LED will be OFF (sensor current lower than 4.0 mA).

Appendix A: Overview of Monitor Displays



Appendix B: Overview of Programming Steps

