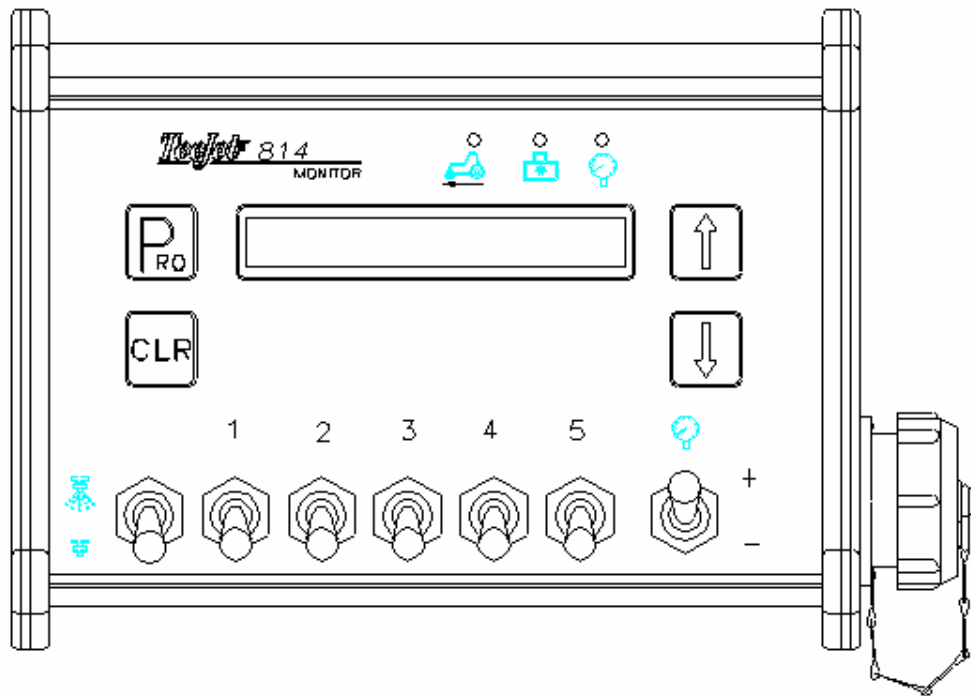


# TeeJet® 814 Sprayer Monitor

Programming and Operating Manual  
(v2.10A)

98-70013-R0



# Table of Contents

|   |                              |
|---|------------------------------|
| Programming Guidelines .....                    | 3                            |
| Start .....                                     | 4                            |
| System Setup Mode .....                         | 5                            |
| <b>Speed Sensor Calibration</b> .....           | 5                            |
| Simulated Speed .....                           | Error! Bookmark not defined. |
| <b>Flow Meter Calibration</b> .....             | 7                            |
| <b>Section Width</b> .....                      | 7                            |
| <b>Pressure sensor calibration</b> .....        | 8                            |
| Step 1 .....                                    | 8                            |
| Step 2 .....                                    | 8                            |
| <b>Boom Control Valve Type</b> .....            | 8                            |
| <b>Completing the System Setup Mode</b> .....   | 9                            |
| Normal Monitor Mode .....                       | 10                           |
| <b>Introduction</b> .....                       | 10                           |
| <b>Speed and Dose Rate</b> .....                | 10                           |
| <b>Dose rate and Pressure</b> .....             | 10                           |
| <b>Flow and Pressure</b> .....                  | 10                           |
| <b>Sprayed area and sprayed volume</b> .....    | 11                           |
| <b>Working width</b> .....                      | 11                           |
| Operating Instructions .....                    | 12                           |
| <b>Sprayer Checkout</b> .....                   | 12                           |
| <b>The Spraying Operation</b> .....             | 12                           |
| Automatic Power Down .....                      | 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 for 3 seconds is used to enter or exit the 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 Master switch is “OFF.”
- ☛ Turn console “ON” by pressing the Pro key. When the Control Console is turned on, the software version will be displayed for approximately 5 seconds. This information will be needed when calling for service support.

**814 US      V2.10A**

**Example :** the 814-spray monitor is working in US units and the software version is V2.00A.

- ☛ After a short time the Console will change to the normal monitor mode.

**0.0 MPH      0 GPA**

# 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 Master switch is OFF
- ☛ Then press and hold the Pro key to enter the System Setup Mode.

---

## SELECTING UNITS

Default = US

**>US units**

Select the units that the monitor will be operating in. Select US units for English measurement units or select SI units for metric measurement units.

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

---

## SPEED SENSOR CALIBRATION

Default = 250 pulses/300 ft (100m)

**>250 puls/300 ft**

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 300 ft (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:

$$\frac{3,600 \times \# \text{ magnets on wheel}}{\text{Wheel Circumference in inches}} = e.g. \frac{3,600 \times 4}{30} = 480$$

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. If a radar calibration number is to be entered manually, the Clr key must be pressed so that the r is displayed with the calibration number

### **Auto calibration**

The speed sensor can be automatically calibrated by driving 300ft. The console will automatically detect a RADAR sensor (if used).

**To start the auto calibration procedure**, press simultaneously on the Up and Downkeys. The display now will show :

**Start auto cal**

Now you have to drive to the starting point of the 300ft distance. Push the Up key to start counting speed pulses. Drive 300ft and press Up key again to stop the pulse counting.

**Drive300ft 176**

**Note:** During the pulse counting the Speed Indication LED will be flashing.

Press the Up key when crossing the end point of the 300ft course. The number now on the display is the number of pulses corresponding to 300ft.

**223 puls/300ft**

To accept the value and advance to the next step press the Pro key.

A radar speed sensor will be indicated with an "r" on the display e.g.

**Drive300ft r 11**

The "r" will automatically appear during the auto calibration process when the console has determined that a radar is being used. When manually entering a radar calibration number the "r" must be turned on by pushing the Clr key. With this key you can toggle between radar or wheel sensor. The calibration value itself is adjusted with the Up and Down keys.


>r12.4puls/300ft

The auto calibration procedure can be escaped with the Pro or Clr keys. The console will then return to the previous calibration value..

**Note: The auto speed calibration should be repeated at least twice and an average of the calibration numbers should be entered.**

### Simulated Speed

If you enter 0 in this programming step, then the Console always shows a simulated speed of 6 mph. 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.

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

---

### FLOW METER CALIBRATION

Default = 650 pulses/liter

> 650 puls/l

First, locate the factory calibrated Flow Meter pulse rate tag on the Flow Meter. If this varies from the default value of the console, use the Up and Down keys to modify the value.

**Note: The Flow Meter Calibration number will always be expressed in pulses/l. The monitor will automatically make the necessary conversion if operating in US units.**

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

---

### SECTION WIDTH

Default = 10 ft (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 (i.e. If your sprayer only has 3 sections, only program values for the first 3 sections. All others should be set to 0).

Use the Up and Down keys to change the value.

> 10.0ft 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 acres (hectares) and the correct application rate per acre (hectare). Therefore it must always be related to the effectively sprayed area.

---

## **PRESSURE SENSOR CALIBRATION**

If you don't have a pressure sensor connected to your system, you only have to program the maximum pressure to zero in step 2.

If a pressure sensor is connected, it 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.

If no pressure sensor is connected then zero must be entered in this step.

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

---

## **BOOM CONTROL VALVE TYPE**

Default = 2 Way

In this programming step, the type of section valve (2-Way or 3-Way) must be selected.

Use the Up and Down keys to change the value.

**>2 Way**



This programming step is used to distinguish the type of on-off boom control valves you have on your system. There are two types of valves that can be used, 2-way control valves or 3-way control valves.

A 2-way control valve is simply an on/off valve. Flow is either directed to the boom section(s) or it is blocked. A 3-way control valve is known as a by-pass valve. Flow continuously passes through this valve. When the valve is activated (on), flow is directed to the boom section(s). When the valve is not activated (off), flow is directed through a bypass port, back to the supply tank.

If you are using the 3-way type of boom control valves in your system, change the value using the Up and Down keys. Depress the Pro key to accept the value and advance to the next programming step.

If the default value is correct, depress the Pro key to accept the value and advance to the next programming step.

**Note: If using 3-way, bypass boom control valves, refer to the instruction manual of the valve you are using for proper calibration instructions. Every time you change to another tip on the boom you should mechanically re-calibrate the return flow of the boom control valves. If the boom section valves are calibrated for the current tip on the boom then no further actions are necessary on the controller (no calibration needed on the controller).**

---

## 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.**

**Note: Cutting the power to the controller while in the System Setup Mode will not save any changes made into the computer's memory.**

# Normal Monitor Mode

---

## INTRODUCTION

The normal monitor mode is the normal working mode of the Console after power up.

The screen always shows one or two values at the same time (one on the left and/or 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 MPH (km/h) units.

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

- Pro key is used to power ON
- Clr & 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 Ac, Gal (Ha, l)

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

---

## SPEED AND APPLICATION RATE

The default display is the speed and application rate display. On the left the current speed is shown in MPH (km/h) and on the right hand side the current application rate in Ac (l/ha) is shown. When the Master switch is off, the application rate shown is zero.

**5.0 MPH 100 GPA**

Press the Up or Down key to select another display.

---

## APPLICATION RATE AND PRESSURE

In this display the application rate in GPA (l/ha) and the pressure in PSI (bar) is shown. The pressure is only shown when there is a pressure sensor installed.

**20 GPA 30 PSI**

Press the Up or Down key to select another display.

---

## FLOW RATE AND PRESSURE

In this display the flow rate in GPM (l/min) and the pressure in PSI (bar) is shown. The pressure is only shown when there is a pressure sensor installed.

**35.2 GPA**

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 acres (hectares) and the volume is measured in gallons (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 Master switch is OFF.

**0.000 Ac      0 Gal**

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 Master switch is turned on.

**45.0 ft      <---->**

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 or magnets 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 Master 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 Master 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 Master 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 Master switch “ON”, you can scroll through the different displays until the information you want is on the display :
  - ◆ actual application rate in GPA (l/Ha)
  - ◆ vehicle speed in MPH (Km/h)
  - ◆ pressure in PSI (bar)
  - ◆ actual working width in ft (m)
  - ◆ application area covered in Ac (Ha)

- ◆ total volume applied in Gal (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 Master 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.

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

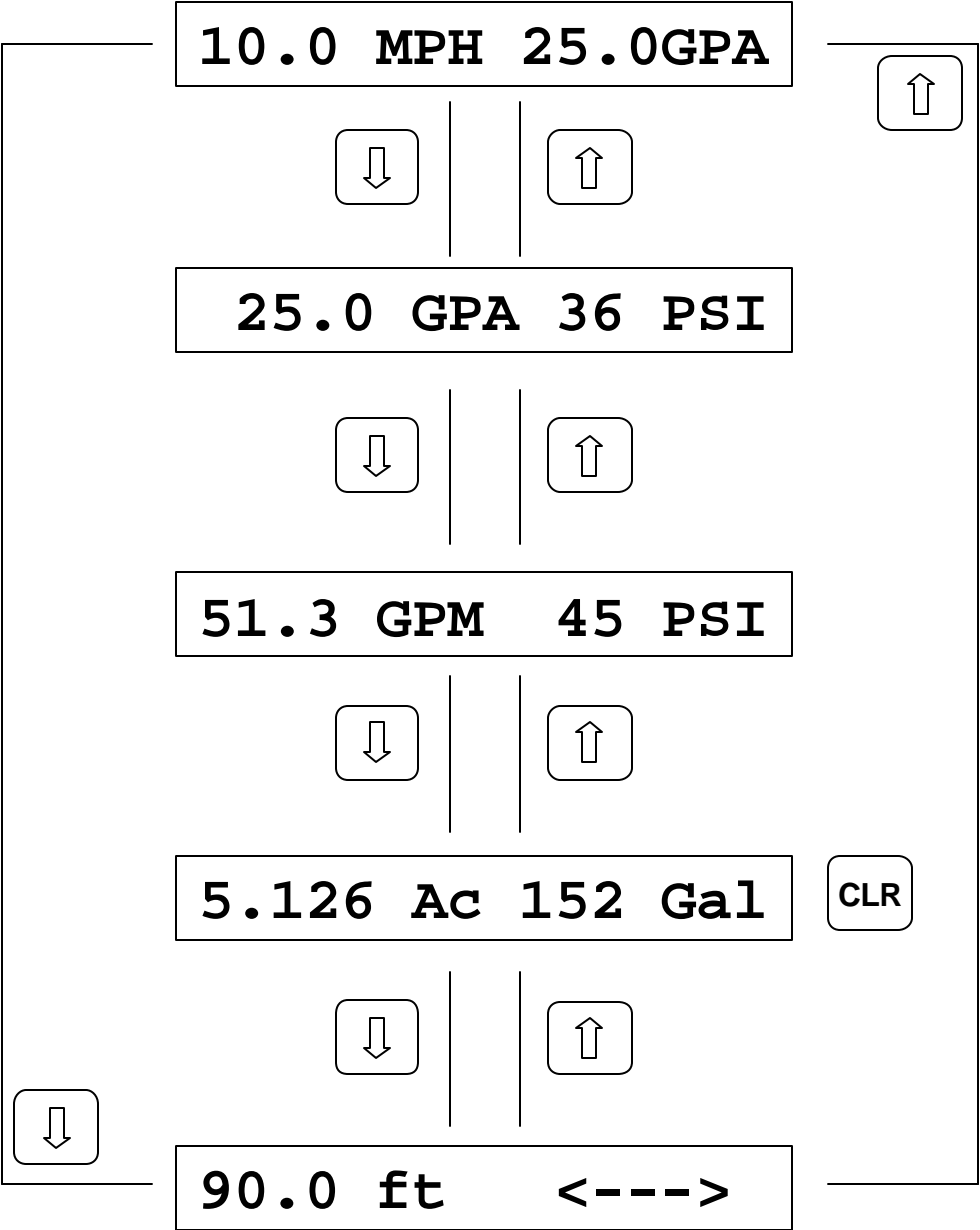
## Automatic Power Down

The TeeJet 814 Sprayer Monitor has an automatic power down feature. With the Master 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!**

# Appendix A: Overview of Monitor Displays



# Appendix B: Overview of Programming Steps

