

TeeJet® 814-FM

Monitor

Programming and Operating Manual (2.00)

98-70014-R0

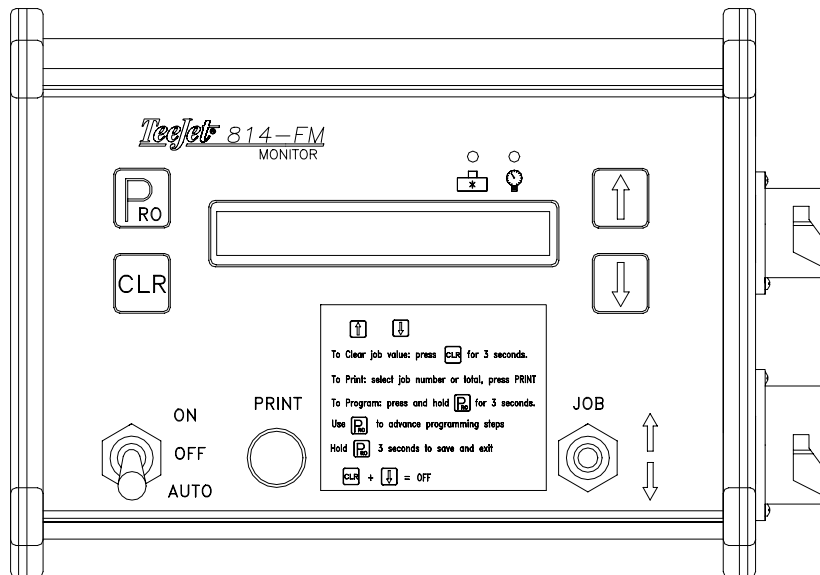
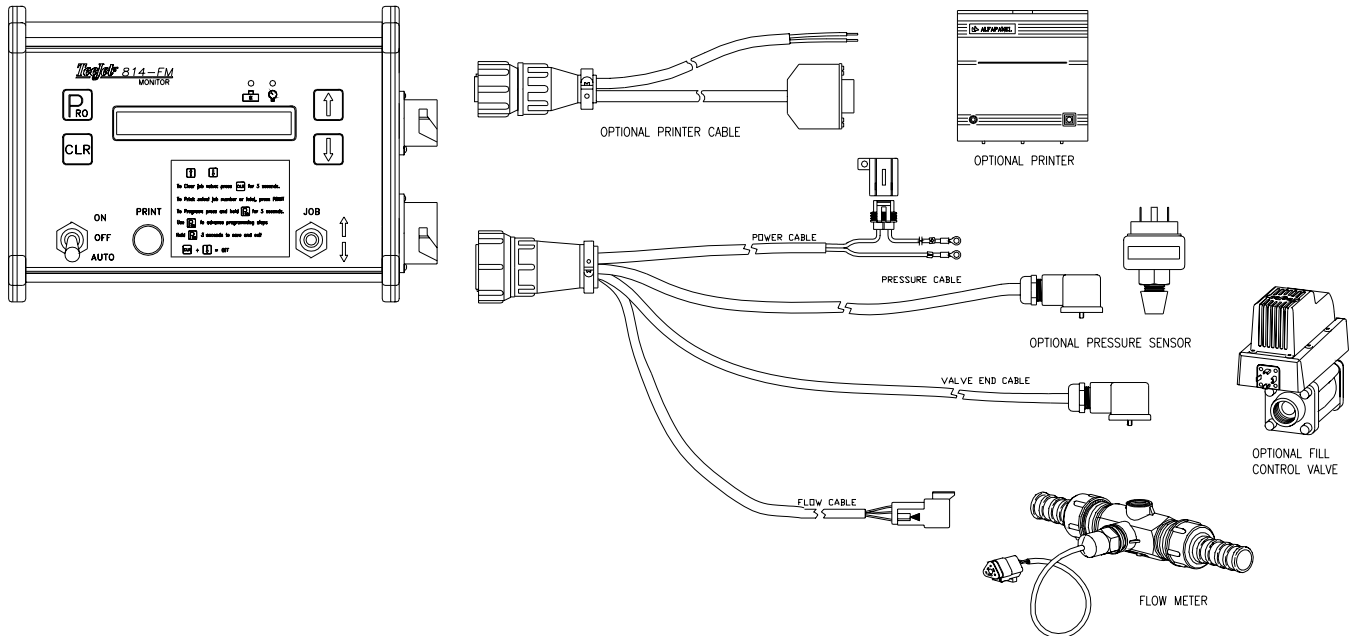


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Installation



- ✦ The TeeJet 814-FM monitor is powered by **+12VDC**. The fused power lead (brown wire) should go to the positive terminal of the battery. The blue or white wire to the negative or ground terminal of the battery.
- ✦ The **flow meter** should be plumbed so that all liquid passing through it is intended to be measured.
- ✦ The **flow meter** cable lead should be extended and connected to the the flow meter.
- ✦ The **pressure sensor** (if used) can be installed at any point in the plumbing system. It should be mounted in a verticle position on a short stand pipe to help prevent damage from freezing temperatures.
- ✦ The **pressure sensor** lead should be extended and connected to the pressure transducer, if used. If no pressure transducer is used, this cable lead can be tied back for possible future use.
- ✦ The valve lead should be extended and connected to the optional **auto fill valve**. If an auto fill valve is not used, this cable can be tied back for possible future use.
- ✦ The **auto fill valve** used with this system must be a negatively switched valve. This system can also be used to disengage a pump if desired. Refer to the Pump Cut-off instructions in the following section.
- ✦ If an optional **printer** will be used with the system, it requires a separate cable connection to the console. The printer has two connections, one is the data connection and the other is power for the printer.

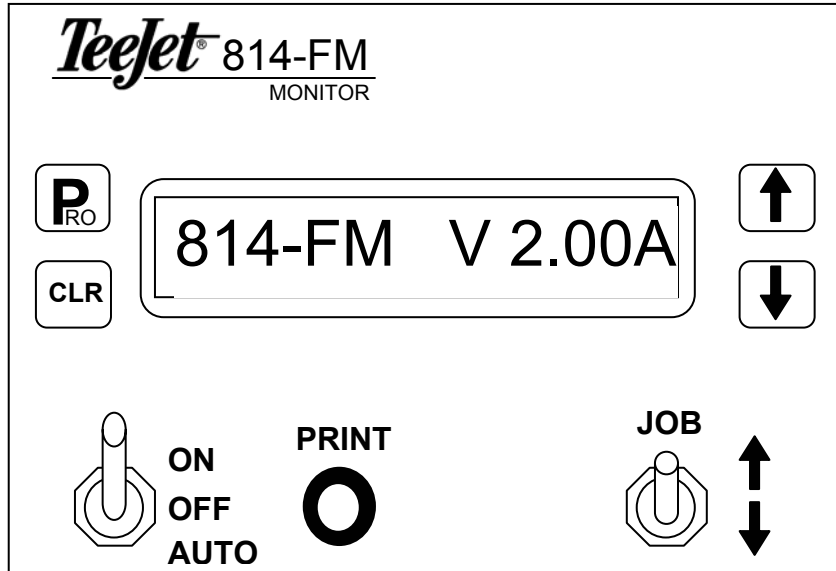
PUMP CUT-OFF INSTRUCTIONS

While the 814-FM is capable of switching an auto fill valve, it can also switch an electric transfer pump. The 814-FM is limited to switching 1.8 amps directly. If the pump requires a higher current to activate, a relay must be used to isolate/protect the 814-FM. When using a relay for switching higher currents, it is important that the power supply for the relay and load come through a correctly sized fuse and directly from the pump power source, not the 814-FM. Keep in mind that the 814-FM is negatively switched and the relay will need to be wired accordingly.

Powering Console On/Off

POWER ON

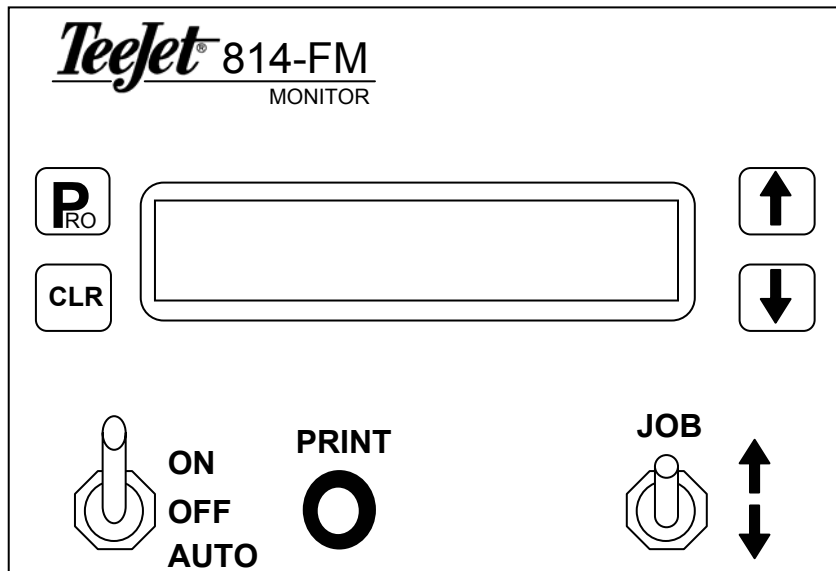
After all the necessary electrical connections have been made the console is ready to be powered on. To power the 814-FM on press the **P_{RO}** key once. Initially the console will display the software version of the console in the display for approximately 2 seconds. This information will be needed when calling for support. After 2 seconds the display will show the normal operating view.



POWER OFF

To manually power the console off, press the **↓** and **CLR** keys simultaneously. The console will then save any new information (volume counters) to memory and will power off.

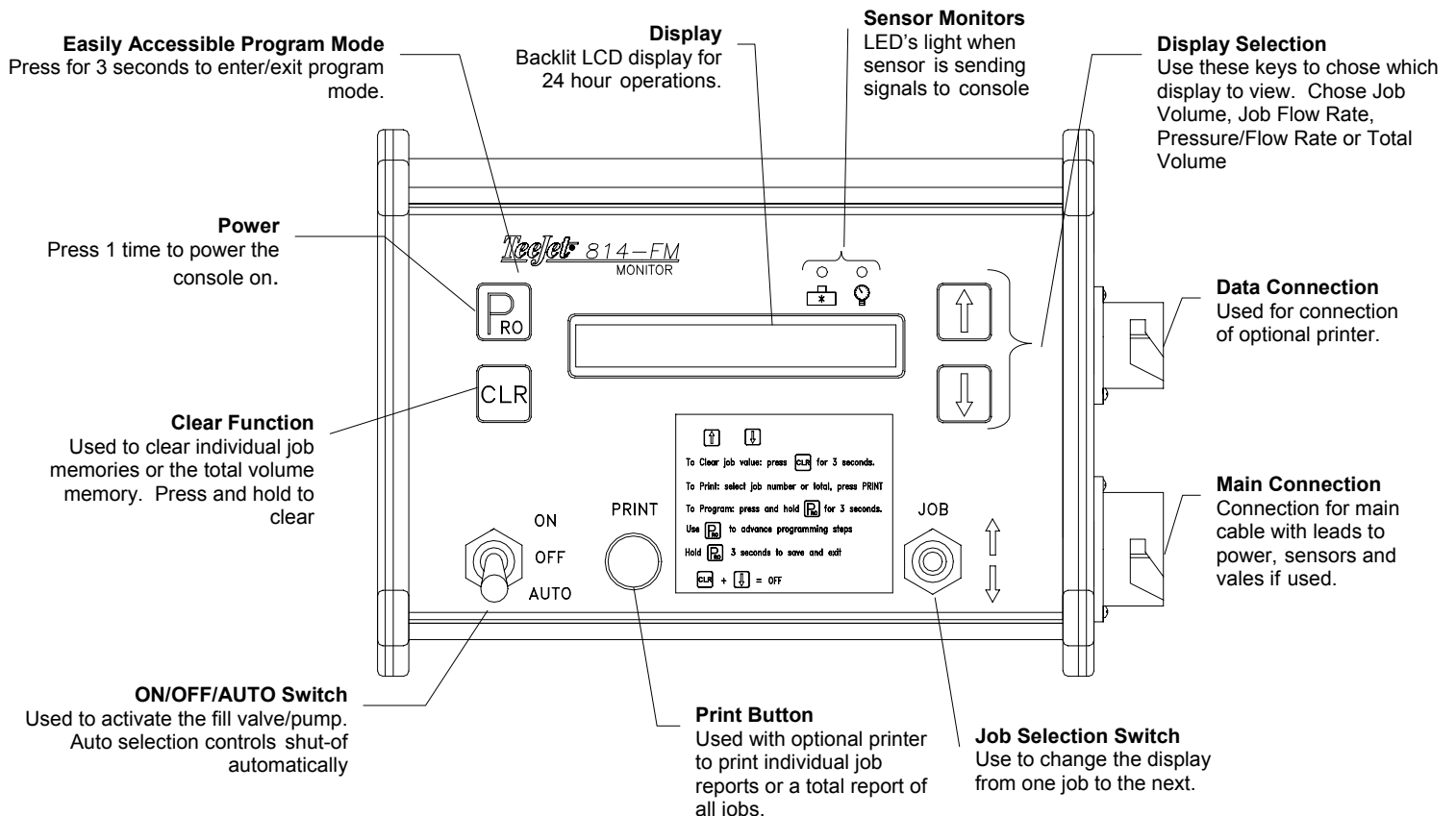
Note: The console also has an Auto Power Down feature. The console will power itself off after 10 minutes if not receiving any inputs.



Overview of Monitor Displays

- and keys are used for scrolling through the list of display information or for changing values when a value is flashing.
- Holding the key for 3 seconds is used to clear a job volume memory (only one job or all job memories when the total counter is displayed).
- A short press on the key allows you to enter amount to be filled if the Fill Valve option has been activated. You can only enter this step when the job number is visible.
- The fill valve is always switched ON when the switch is in the ON position.
- The fill valve will be automatically controlled when the switch is in the AUTO position.
- The Job selection switch is used to scroll through the possible job settings. You can only change jobs when the job number is visible.
- The print button is used to print the volume of the selected job or to print the list of all non zero jobs and the total value.
- GAL (L) or GPM (LPM) is flashing on the screen when automatic filling is busy. Automatic filling can be stopped by pressing shortly on the key.

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



Displays

JOB VOLUME

In this display the console will show the total accumulated volume for the job number selected.

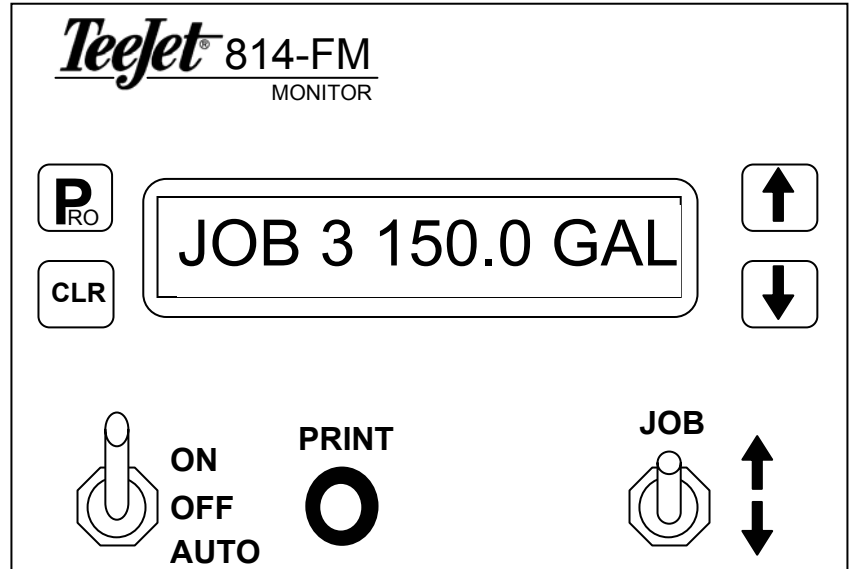
To change to a new job selection use the job selection switch. Pushing up on the job switch will increase the job number, down will decrease the job number.

This volume will be counted any time that the master boom switch is in the ON or AUTO position and flow is going through the flow meter.

Maximum amount 6500 Gallons
(6500 Liters)

To clear this value, press and hold the **CLR** key for 3 seconds.


Press the  key to advance to the next display.

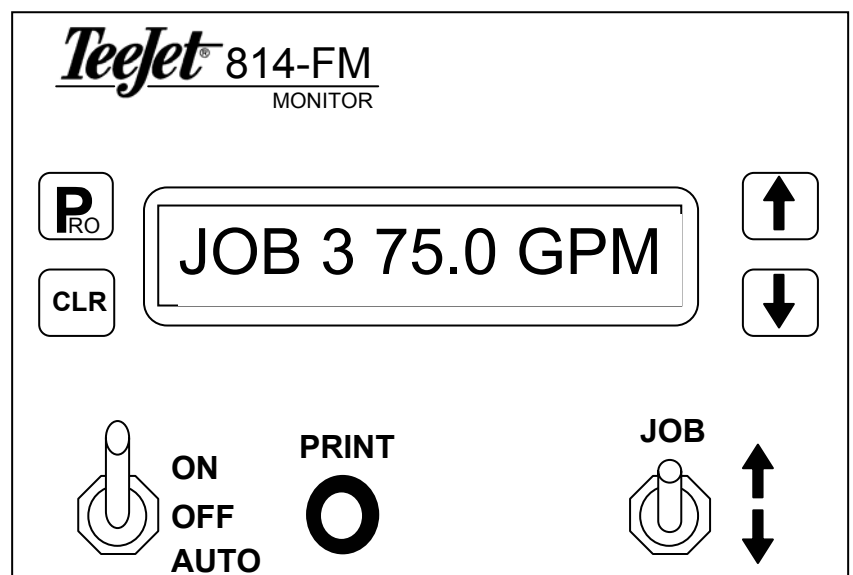


JOB FLOW RATE

In this display the console will show the current flow rate in GPM (LPM) that is going through the flow meter.

The flow rate will be displayed any time flow is going through the flow meter regardless of the position of the master boom switch. In this example, the total volume is still being accumulated in Job

Press the  key to advance to the next display.




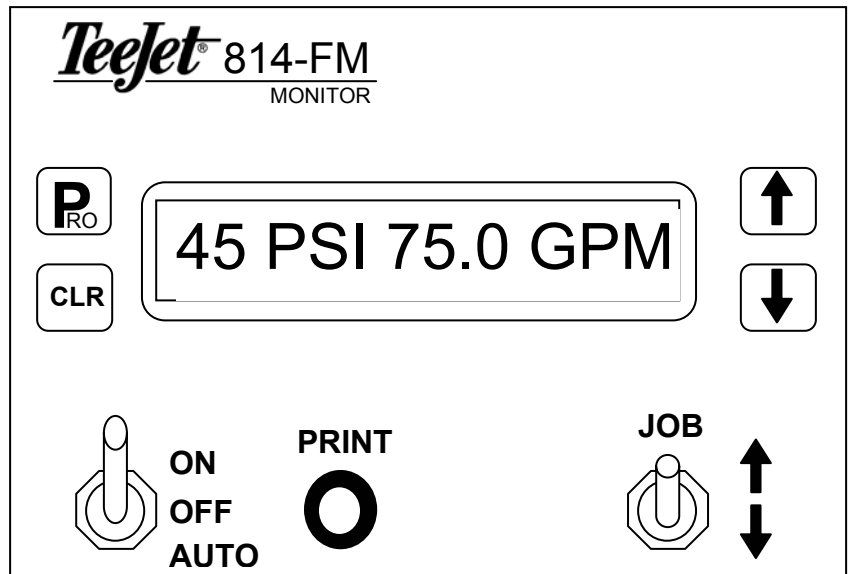
PRESSURE / FLOW RATE

This display shows the current pressure and flow rate in GPM (LPM).

The flow rate and pressure will be displayed any time flow is going through the flow meter and pressure is acting on the pressure transducer, regardless of the position of the master boom switch.

Note: This display is only available when a pressure transducer has been installed, connected and properly programmed into the console.


Press the  key to advance to the next display.



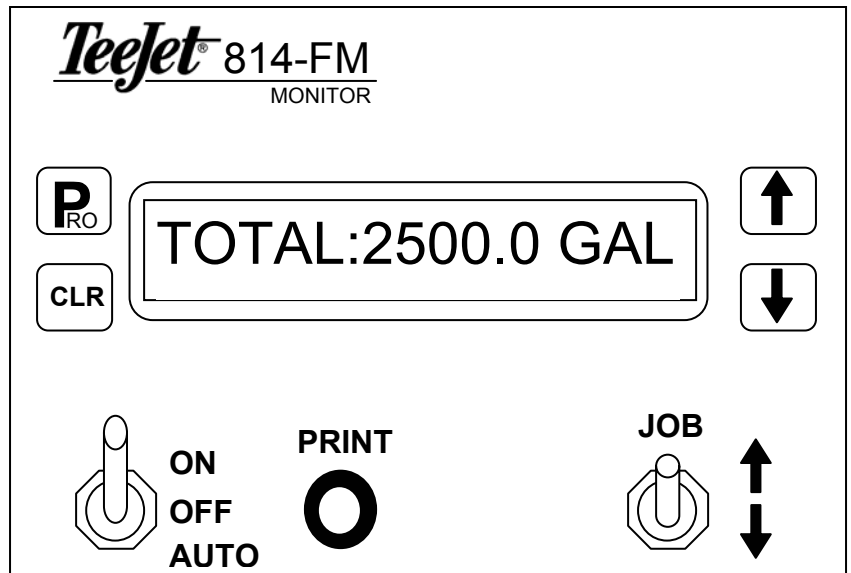
TOTAL VOLUME

This display shows the total accumulated volume for all jobs.

This volume will be counted any time that the master boom switch is in the ON or AUTO position and flow is going through the flow meter.

To clear this value, press and hold the  key for 3 seconds.

Note: Clearing this value also clears all individual job totals. Insure all individual job information has been printed and/or recorded before clearing the Total Volume.

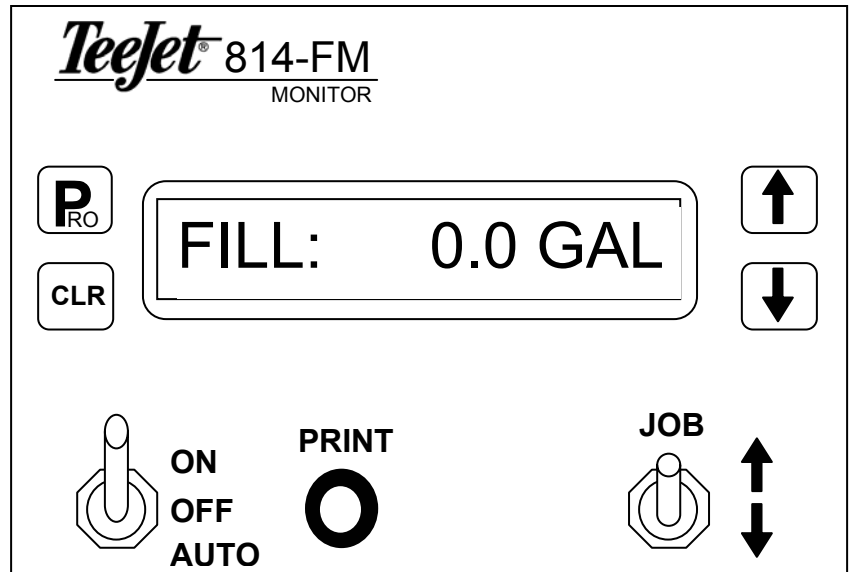


AUTOMATIC FILLING

Automatic filling is used to deliver a predefined volume of liquid by opening a filling valve (switching on a pump) until the desired volume has been measured. The electric fill valve is driven by the console.

To use the automatic filling feature the console must first be programmed for this function. Refer to the “Fill Valve” step in the programming section of this manual. This step should be set to “YES”.

To begin auto filling, first select the job number you would like to use with the Job Selection switch. Next press the **P_{RO}** key once to access the amount to be filled. Use the **↑** and/or **↓** keys to adjust the volume to be filled. After the volume has been set, press the **P_{RO}** again. This will advance back to the job selection display. The GAL (L) or GPM (LPM) text will be flashing to indicate that the console is waiting for further action. Next move the master switch to the AUTO position. This will activate the fill valve (transfer pump) to begin the filling process.



During the filling process you can temporarily close the filling valve by turning the master switch back to the OFF position. The filling is continued after switching back to the AUTO position. When the desired volume is reached the console will automatically close the filling valve (disengage the pump).

If you want to stop the automatic filling you can press the **CLR** key and the GAL (L) or GPM (LPM) text will stop flashing and the fill valve will be closed.

The filling valve can be driven manually by switching the master switch to the ON or OFF positions.

Programming Guidelines

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

IMPORTANT PRELIMINARY INFORMATION

Before you begin, it is recommended that you review the following Programming Guidelines that control the programming process:




- ☞ To enter the program mode press and hold the **PRG** key for 3 seconds. The master switch must be in the off position.
- ☞ To exit the program mode press and hold the **PRG** key for 3 seconds, your inputs will be stored and the computer will exit the program mode. This action can be done at any time but will not be necessary until the last programming step has been completed.
- ☞ To increase the value of a programmable digit, press the **↑** key. To decrease the value, press the **↓** key. These keys are located directly to the right of the display. For some programming steps, pressing and holding the **↑** or **↓** key will change the programmable value rapidly. Pressing the **↑** or **↓** key once will change the value by one increment.
- ☞ Pressing the **↑** and **↓** keys simultaneously in some programming steps will start an automatic calibration.
- ☞ A short press of the **CLR** key in program mode will reset the value to its default value.
- ☞ Holding the **CLR** key for 2 seconds will clear the value to zero.
- ☞ Pressing the **PRG** key will advance you to the next programming step. After the last programming step, the console will return to the first programming step.
- ☞ **Note: Due to differences in fonts, some letters on the displays shown in this manual are not identical with the corresponding letters on the display of the controller. We tried to match them as close as possible.**

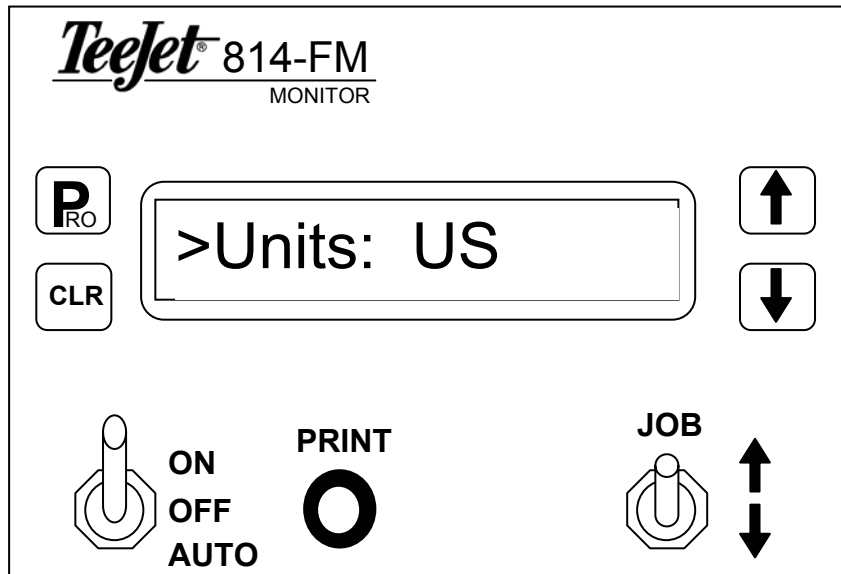
Programming the 814-FM Sprayer Control System

To enter the Program Mode, press and hold the  key for 3 seconds. The first programming step should appear on the display.

UNITS

In this step you indicate if you will be using US units (GPM, GAL, PSI) or SI Standard International units (l/min, L, bar).



Use the  or  keys to adjust the value. Once you have selected the appropriate units, press the  key to advance to the next programming step.

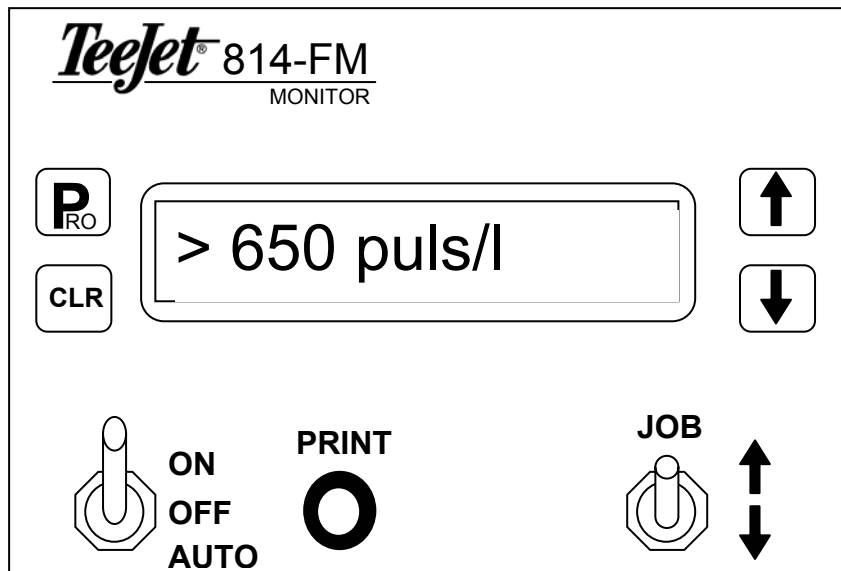


FLOW METER PULSES



In this step the flow meter calibration number can be entered manually from the factory flow meter tag or an auto calibration procedure can be activated to determine the flow meter pulses based on a known volume of fluid.

Manual Entry

First locate the factory flow meter tag on the flow meter. If this varies from the default value (it usually does) of the console, use the  or  keys to modify the value.



Automatic Calibration

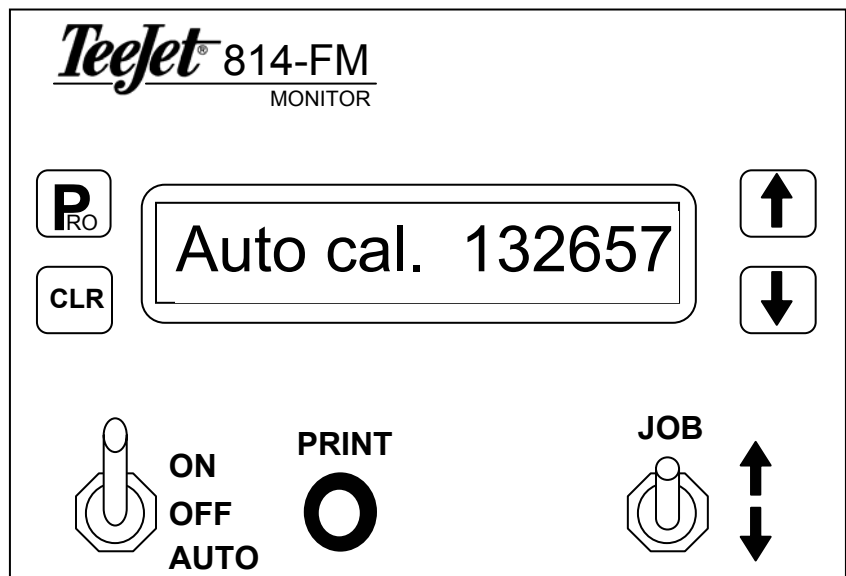
To complete an automatic calibration of the flow meter, press the  and  keys simultaneously. This will clear the existing value and initiate the calibration procedure.

“**Start auto cal**” will be displayed in the screen. This indicates that the controller is ready to begin the calibration process.



Engage the sprayer pump. Now turn the Master switch to “ON” and begin spraying or pumping a known volume of fluid (e.g. 100 gallons or 100 liters). As you spray the known amount, the console will count the pulses.

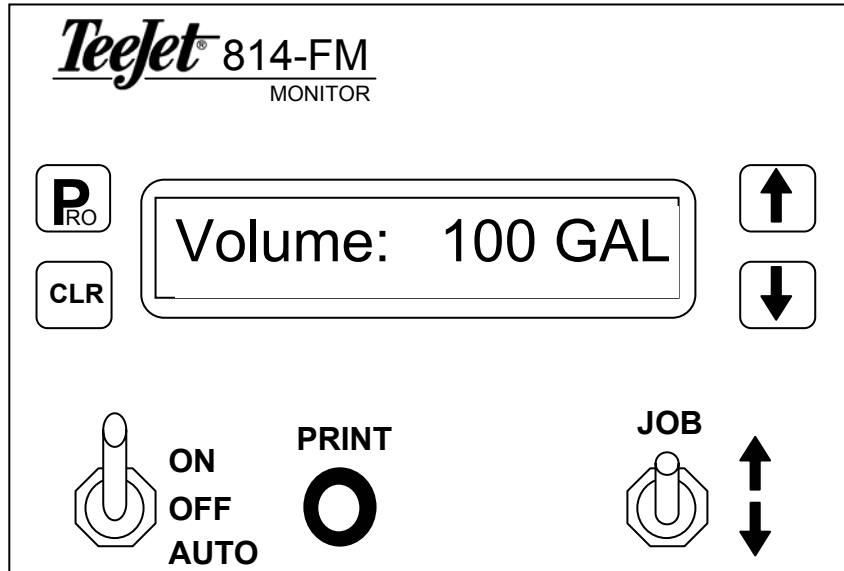
After the known volume has been pumped out, turn the Master switch off to stop counting pulses.



Now press the **P_{RO}** key. The console will now ask what volume was pumped (max 9999).

Use the **↑** or **↓** keys to adjust the value to match the volume transferred/pumped (in gallons or liters).

Now press the **P_{RO}** key to return to the programming mode. Your new flow meter calibration number will be displayed. To accept this value press the **P_{RO}** to advance to the next step. If you wish to repeat the calibration procedure refer to the steps above.



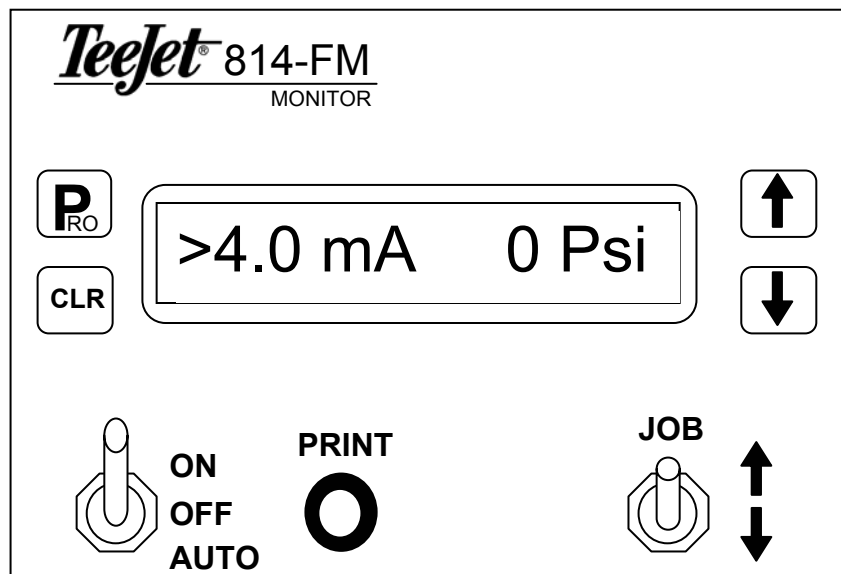
Note: To achieve an accurate flow meter calibration, a volume of at least 50 gallons should be pumped during calibration. The more volume used for calibration the more accurate the flow meter will be.

PRESSURE TRANSDUCER LOW PRESSURE CALIBRATION

This step is used to determine the "0" pressure setting of the pressure transducer installed in your system (if used). The pressure transducer used with the 814-FM is a current type transducer and uses a 4-20 mA reading. 4.0 mA represents 0 pressure.

If a different pressure transducer will be used with the system check the specifications of that transducer in the manufacturers literature.

Press the **P_{RO}** key to advance to the next step.



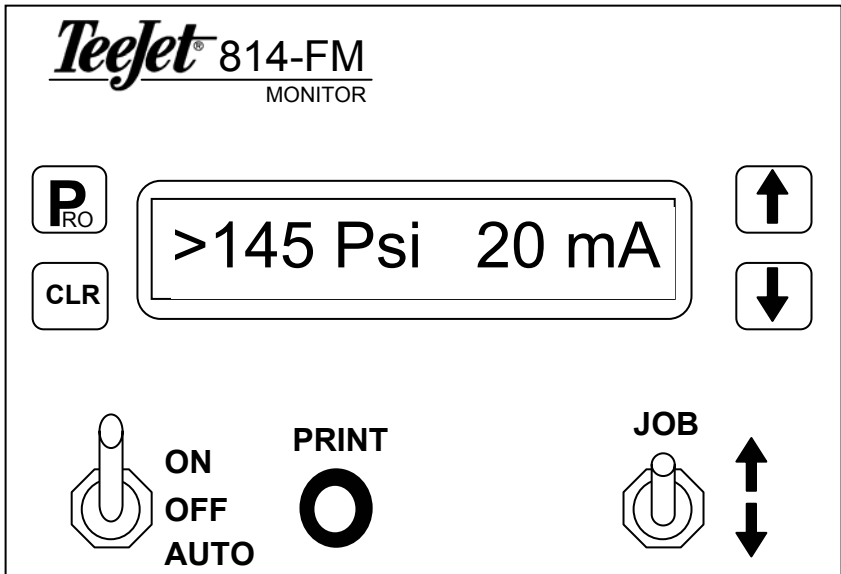
If a pressure transducer is NOT being used, press the **P_{RO}** key to skip this step and advance to the next programming step.

PRESSURE TRANSDUCER MAXIMUM RATING (P HI)

This step is used to set the maximum rating of the pressure transducer in your system. This number can be found stamped on the pressure transducer itself.

If your transducer has a maximum rating of 145 psi (10 bar) and that number is shown in the display, then advance to the next step by pressing the **P_{RO}** key. If however, the maximum rating is 363 psi (25 bar), use the **↑** or **↓** keys to change the value. Press the **P_{RO}** key to advance to the next step.

If a pressure transducer is NOT being used, set this value to zero (there will be no pressure monitor screen) and press the **P_{RO}** key to skip this step and advance to the next programming step.



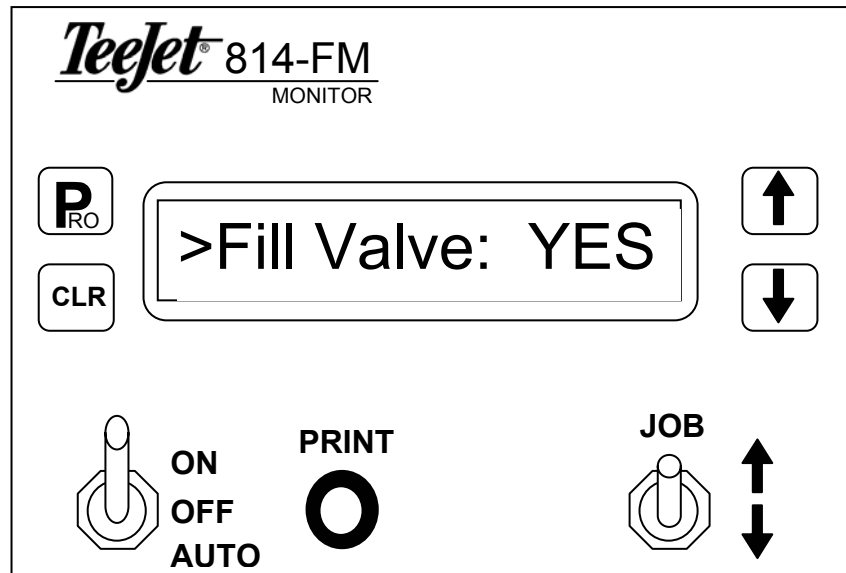
FILL VALVE

The 814-FM is capable of automatically shutting off an electric valve or a pump motor. An optional valve is available with the kit.

In this step you must let the console know if an auto fill valve or automatic shut off will be used.







If a fill valve or auto shut off will be used, use the **↑** or **↓** keys to select YES for this step. If no fill valve or auto shut off will be used select NO.

Press the **P_{RO}** key to accept the value and advance to the next programming step.





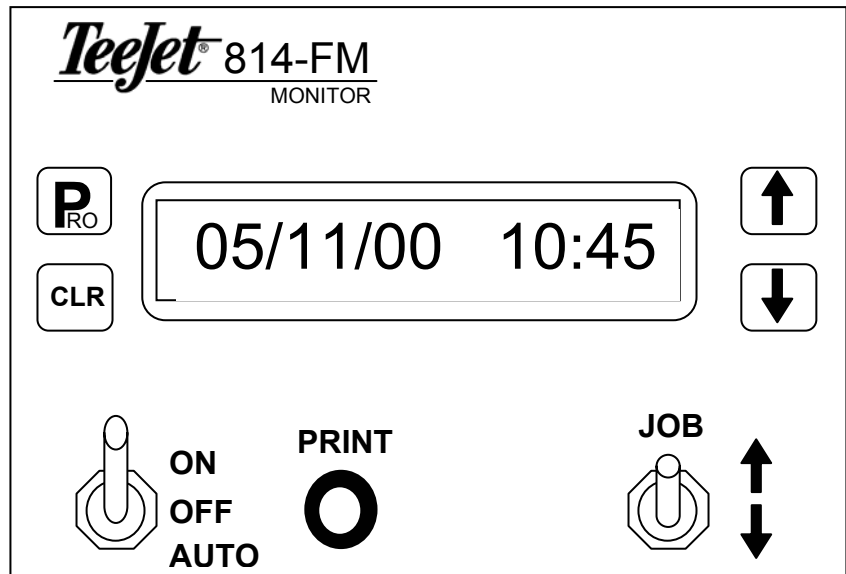
DATE/TIME

The 814-FM has a date/time function so that the printed reports can reflect when the filling/application occurred.

The month will be flashing first. Use the  or  keys to adjust the month if necessary. Press the  key to advance to the date. Use the  or  keys to adjust the date. Press the  key to advance to the year. Only the last 2 digits of the year will be used.

Continue the above procedure to program the time if necessary. Most 814-FM models have a real time clock and will not need to have the date/time adjusted.

After you have completed the adjustments to the date and time, press the  key to advance to the beginning of the programming steps. The 814-FM has now been programmed. To save all the steps and exit the program mode, **press and hold** the  key for 3 seconds.



Printing

The 814-FM is capable of printing two reports, an individual Job Report and a Total Report.

JOB REPORT

To print an individual job report as shown on the right, simply press the PRINT key while viewing the appropriate job number in the Job Volume display. This report will show the volume that has accumulated for the job selected.

Job Report
JOB 2: 50.3 GAL
DATE: 06/07/00 10:14
JOB NAME _____
MATERIAL 1 _____
MATERIAL 2 _____
MATERIAL 3 _____
REM: _____




TOTAL REPORT

To print a total report as shown on the right, simply press the PRINT key while viewing the Total Volume display. This report will show the volume accumulated for each of the individual jobs as well as a total volume.

Total Report
JOB 1: 50.7 GAL
JOB 2: 50.3 GAL
JOB 3: 25.4 GAL
JOB 4: 100.7 GAL
JOB 5: 10.4 GAL
TOTAL: 237.5 GAL
DATE: 06/07/00 10:14
REM: _____

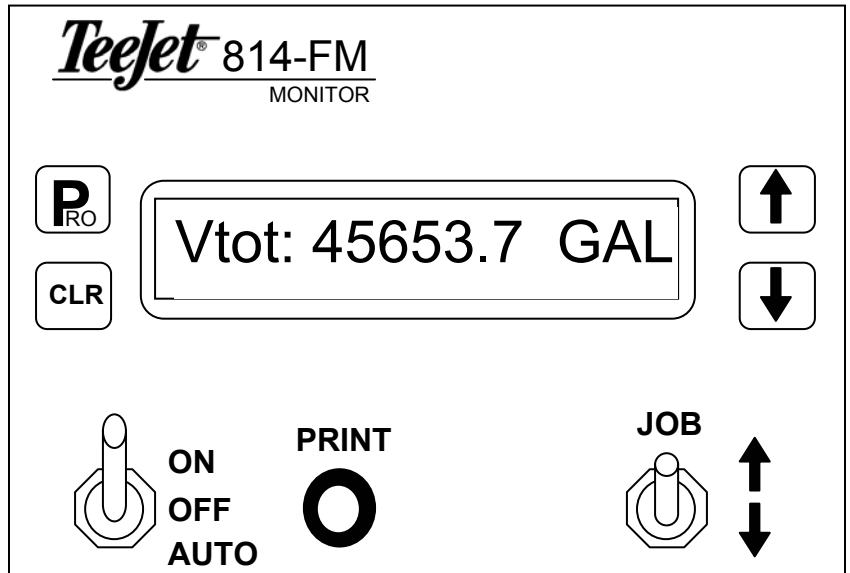
Hidden Total Volume Counter

The 814-FM has an additional volume counter. This counter will continue to accumulate volume even if the Total Volume counter has been cleared or reset to 0. To access the Hidden Total Volume Counter the console must first be powered OFF (see Power On/Off section of this manual).

Press and hold the  and  keys, then press the  key to power the console on. After the initial software version display the Hidden Total Volume display will appear.

Press and hold the  key to reset the value to 0.

Press the  key to return to the normal mode.



OEM REPORT

To print an OEM report as shown on the right, simply press the PRINT key while viewing the Hidden Total Volume display. This report will show the total volume accumulated since the last clearing of this value.

