396-3252Y1
Sentinel Row Flow Monitor Setup

Table of Contents

Sentinel and Commander II Speed Sensor note

When used with the Commander II, the Sentinel must have its own speed input. If used on a demo stand with a speed/flow simulator, plug the Commander II into the speed simulator and the Sentinel into the flow simulator. It will be necessary to adjust both the speed and flow dials so the same speed is shown on each display.

On an implement controlled by a Commander II, 2 Astro speed sensors must be used. One will be plugged into the Commander II, the other will be plugged into the Sentinel.

One or more rows of the Sentinel are not reading

On some demo units one or more rows of the Sentinel may not show flow when liquid is flowing through the Sentinel. When there is liquid in the system, but the liquid is not flowing, each row light should be on for 3 sec. followed by a short off period. That means the unit detects liquid in that row.

If, when liquid is not flowing, the light on any row is OFF for 3 seconds, followed by a short blink ON, that means the unit does not detect liquid in that row.

Some mixes of RV antifreeze or even some water samples may not have enough conductivity to register on the Sentinel. Putting some fertilizer in the mix should allow the Sentinel to see the liquid. Distilled water will not be read by the Sentinel and some other processed waters may not have enough conductivity to be read by the Sentinel. **Adding a pint of fertilizer or compatibility agent (or a little salt) to a couple gallons of water or RV antifreeze should give a mixture with enough conductivity to be read by the Sentinel.**

Front of Sentinel Display

Back of Sentinel Display
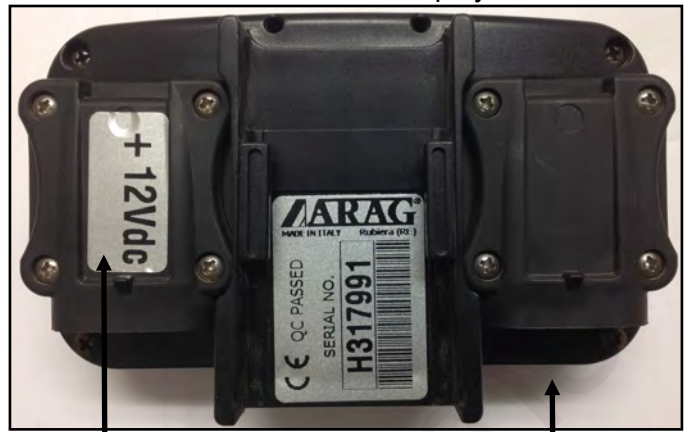
Harness 225-02-2988Y1

Plug in *VISIO POWER*   Plug in *AUXILIARY*

Front of Sentinel Multiflow Flowmeter

Side View of Sentinel Multiflow Flowmeter

Plug in CAN DEVICE connector here

Sentinel Display Mounted To Main Display Ram Stop

Navigating The Sentinel Display

 Fig. 5	**Switching ON** **A** Press for 1 second to turn display ON. *Every time the display is switched on, it will briefly show a page with the name of the device and the software version.* **B** Press the key a few times to view the various values in extended mode (on display central part) **Switching OFF** **A** Press for 1 second to turn display OFF.
 Fig. 6	**Access to Setup Menu** From the main page, press keys at the same time for 2 second to open the setup menu.
 Fig. 7	**Selection and access to Menu items** **A** Press a few times to scroll through items (selected item is indicated by a black line) **B** Press to open the selected menu item. *The three dots under an item indicate the presence of more items on another setup menu.*
 Fig. 8	**Editing a Value** **A** Press to move through digits **B** Press a few times to edit the highlighted digit. **C** Press to Confirm. The display goes back to previous page **D** Press to exit page without confirming modification *Edited value must fall within the range shown.*

Sentinel Setup Menu Structure
**** Indicates items that must be set in Initial Setup
Setup Menu

Alarms   **Sensors**   **Options**   **Job Settings**   **Setup Management**   **Test**

Alarms
- Min Flowrate
  - **OFF**
  - 0.10 to 300.00
- Max Flowrate
  - **OFF**
  - 0.10 to 300.00
- Min Speed
  - **OFF**
  - 1.0-70.0
- Max Speed
  - **OFF**
  - 1.0-70.0
- **Min app rate**
  - **1-20%**
- **Max app rate**
  - **1-20%**
- Flowmeters status
  - **OFF**
  - ON
- Alarm act. Delay
  - 1.0-5.0 sec.

****Job Settings ****
- ******Rows number ******
  - 1-16
- ******Row width ******
  - 1.00 to 40.00 ft
- Application rate
  - **Auto**
  - 0.0-100.0 GPA

Setup management
- Insert USB drive in bottom of display
- Save setup
- Load setup

****Sensors ****
- ******Speed sensor ******
  - ******Man calibration ******
  - ******Must set at 0.38**   0.10 to 80.00 in/pls
  - Auto calibration
    - Constant calc
    - 0 pls
    - Go! 300 ft
- ******Multiflow Orient ******
  - Rear facing A=1
  - **Front facing D=1**

Options (continued)
- Display settings
  - Data 1
    - **Volume TOT 1**
    - Volume TOT 2
    - Surface TOT 1
    - Surface TOT 2
    - Distance TOT
    - Working Time 1
    - Working Time 2
  - Data 2
    - Volume TOT 1
    - Volume TOT 2
    - **Surface TOT 1**
    - Surface TOT 2
    - Distance TOT
    - Working Time 1
    - Working Time 2
  - Data 3
    - Volume TOT 1
    - Volume TOT 2
    - Surface TOT 1
    - Surface TOT 2
    - **Distance TOT**
    - Working Time 1
    - Working Time 2
- ******ID reset ******
  - ******Confirm?******

Options
- Language
  - **English**
  - Others
- Units of measurement
  - Flowrate
    - **GPM**
    - l/min
    - m³/h
  - Volume
    - **gal**
    - l
    - m³
  - Speed
    - **MPH**
    - km/h
  - Length
    - **ft**
    - m
  - Surface
    - **ac**
    - ha
    - ksqft
  - Application rate
    - **GPA**
    - l/ha
    - GPK
  - Distance
    - **miles**
    - km
- Display contrast
  - set % (**50%**)
- Alarm Tones
  - OFF
  - **ON**
- Key tones
  - OFF
  - **ON**

Sentinel Setup Menu Structure (cont)

Test

    Firmware version

        1.1.0

    Power

    voltage

        13.80 v

    Display

        OK-

        blank screen

    Keys

        Touch a key-

        that quadrant

        will darken

    Sensors

        Speed sensor

            0.0 hz

            or current reading

        External enable

            OFF

            ON

    Multiflow

        Installation

            Multiflow 1 (or 2* or 3 or 4)

                Status

                    Disconnected

                    or connected

                Power Voltage

                    should be 13.8

                Temperature

                    fluid temperature

                Flowmeter 1*

            or 2 or 3 or 4

                Flow

                    current flow

                Status code

                    0

                    1

                    2

                Error code

                    0

                    1

                    2

Multiflow 2 will show flowmeters 5-8, etc.

The **Test** section has items that may be helpful in diagnostic and troubleshooting situations.

Initial Setup

With display on, press these two keys to go to the **Setup Menu.**

Initial Setup requires going to **Job Settings,** and entering **Rows number** and **Row width (in feet).**

Other things to do for Initial Setup:

1. Calibrate the unit for the Astro speed sensor:

Sensors > Speed sensor > Man calibration > 0.38

(fine tune this as needed to match the tractor speed)

2. Tell the display which channel is Row 1:

Sensors > Multiflow Orient > Front facing D = 1

> (set this if Row 1 is on Channel D,
> Set Rear facing A = 1 if Row 1 is on Channel A)

3. Tell the display which Multiflow Flowmeter unit is #1, etc...

Options > ID Reset (OK) > Confirm (OK) > ESC > ESC

To home screen. Then unplug Multiflow unit 1, wait 5 seconds, plug it in. Unplug Multiflow unit 2, wait 5 seconds, plug it in. Do the same on 3 and 4 if using them.

If you are using 8 rows there should be 8 boxes across the top of the display.

DISABLE A ROW

To disable a Row (for example, if you are only using 6 rows)

Push the Arrow button until the row you want to disable is selected. When that row is selected, push and hold the Arrow button. An X will appear in the box for that row, indicating it is disabled.

To disable row 7, move the arrow to row 7, then push and hold the Arrow key until the X shows up in Row 7 box. Row 7 is disabled. (Repeat to disable Row 8.)
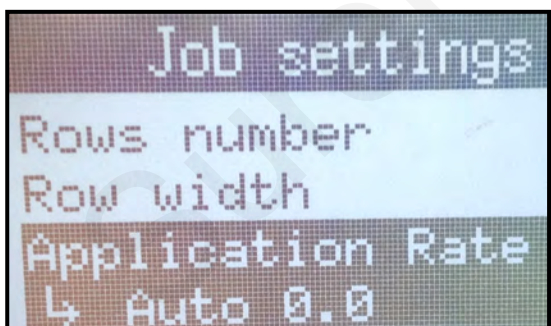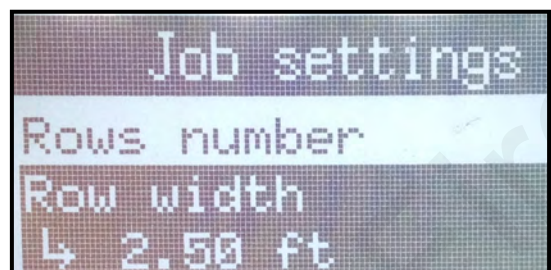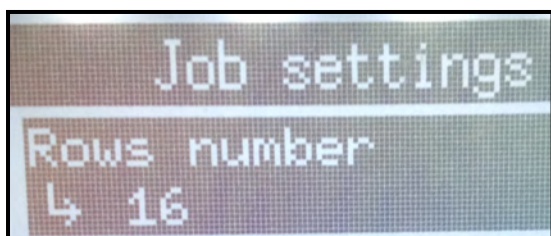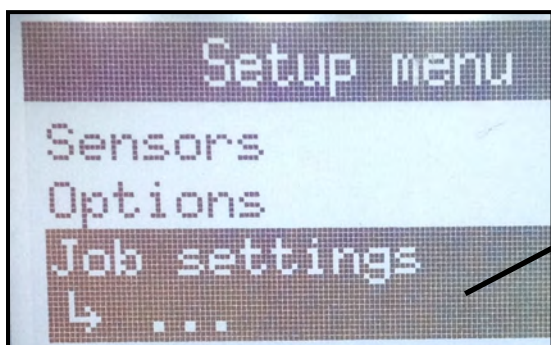
Setting Alarms

The default alarms are 20% above or below for 3.5 seconds to trigger an alarm. The percentages can be set in **Alarms > Min app rate and Max app rate.** The time before alarming can be set in **Alarms > Alarm act Delay.**

Sentinel Startup Light Sequence to identify Sentinel Multiflow Modules

After the Sentinel has been set up, when the Sentinel is turned on there will be some lights that light up on the flowmeter units. The Sentinel Multiflow unit that contains Rows 1-4 (Multiflow 1) should have an alternate flashing of lights A-B and C-D. (A-B, C-D, A-B, C-D,A-B, C-D, A-B, C-D, A-B, C-D). While these lights are flashing on Multiflow 1, Multiflow 2 (Rows 5-8) should have light B lit. Multiflow 3 (Rows 9-12) should have lights A & B on. Multiflow 4 (Rows 13-16) should have light C on.

See ID Reset (next page) on setting these so the system knows the order in which the Multiflows are set up.

Multiflow Module 1 will alternately flash A-B, C-D several times when the Sentinel is turned on.

Multiflow Module 2 will show light B when the Sentinel is turned on.

Multiflow Module 3 will show lights A & B when the Sentinel is turned on.

Multiflow Module 4 will show light C when the Sentinel is turned on.

Other LED Signals

When liquid is flowing, there will be a flashing of LEDs on the channels with flowing liquid, with the frequency proportional to the flowrate.

When liquid is not flowing, the LED on each channel will be lit to indicate there is liquid in the unit. (These lights will blink off shortly once every 3 seconds.)

When liquid is not flowing but is present in the flowmeter, if the LED is OFF (with a short blink every 3 seconds), that indicates the flowmeter on that row is not detecting any liquid. If all rows are like this, it could indicate a low conductivity fluid that the units will not read. If one or two rows are like this, it could be a marginally conductive liquid or faulty flowmeter on that channel.

Initial Setup

We need to do some initial setup before using for the first time.

Start by going to the **Setup Menu.**

Do this by pressing and holding the two keys shown here.

Then, go to:

Job Settings– Set number of rows and row width (in feet)

Then, set the Mulitflow Orientation:

Sensors...Multiflow Orientation... Rear Facing, A=1 or Front Facing, D=1 (The way the Sentinel is mounted and plumbed, is Row 1 of the implement connected to the A outlet or the D outlet?)

Then, we need to let the system know which Multiflow flowmeter module is number 1, number 2, etc. To do this, go to:

Options. . .

Scroll down to:

ID Reset: OK

Confirm? : OK

Then, press:

To return to the main display screen

Once you are on the main display screen, unplug Multiflow modue 1 (rows 1-4), wait 5 seconds, and plug it back in.

Then, unplug Multiflow module 2 (rows 5-8), wait 5 seconds, and plug it in. Do the same with Multiflow 3 and 4 if using them.

Turn off the Sentinel. When turning it back on, check the light sequence displayed on each Multiflow flowmeter module while the system is starting. It should show the light sequence described on the previous page.

From the Setup Menu, we can set other items or we can use the default settings: See the menu structure list for a complete list of items.

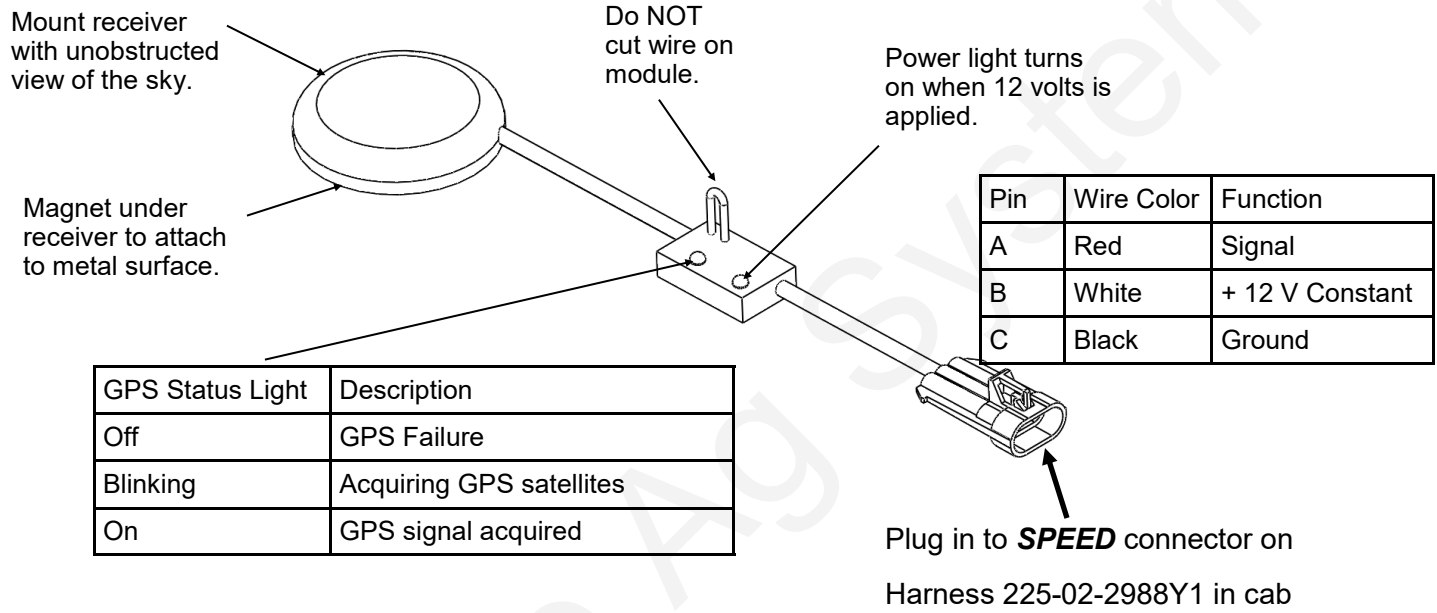| **Alarms**…	Minimum Application Rate… 1 to 20%	Default is 20% (How far below rate a row must be before alarm sounds)
	Maximum Application Rate...1 to 20%	Default is 20%
	Alarm act. Delay 1 to 5 sec	Default is 3.5 sec (How long a row must be off rate before the alarm sounds)

Astro GPS Speed Sensor

The Astro GPS Speed Sensor is the speed sensor to use with the SureFire Sentinel. The GPS receiver uses the GPS satellites to track only speed. The output from Astro is a pulse to communicate speed to the Sentinel display.

PN 203-01-01410   Astro 2, 2 Hz GPS Receiver

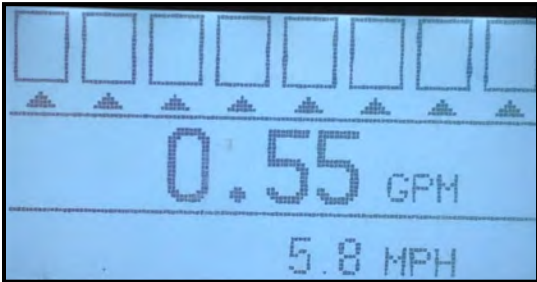**Speed Calibration for Sentinel: 0.38** *This must be set in the display on initial setup of the Sentinel.*

Astro Minimum Operating Speed: 1.0 MPH

Mount receiver with unobstructed view of the sky.

Do NOT cut wire on module.

Power light turns on when 12 volts is applied.

Magnet under receiver to attach to metal surface.

Pin	Wire Color	Function
A	Red	Signal
B	White	+ 12 V Constant
C	Black	Ground

GPS Status Light	Description
Off	GPS Failure
Blinking	Acquiring GPS satellites
On	GPS signal acquired

Plug in to **SPEED** connector on

Harness 225-02-2988Y1 in cab

Navigating the Run Screen

Display run screen examples:

Arrows under all rows indicate that the average flow for all rows is 0.55 GPM per row.
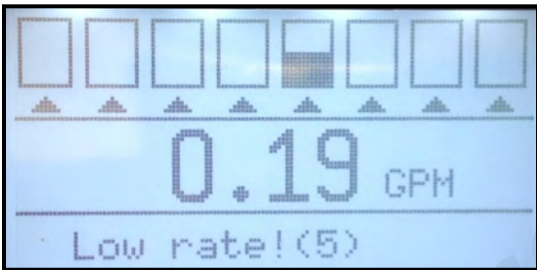
(Push the top right button to show GPA.)

Arrow under Row 1 means the flow in Row 1 is 0.52 GPM.

Push the arrow key to move from row to row.

Arrows under all rows indicate that the average flow for all rows is 0.19 GPM per row.

The bottom half of Row 5 is black, indicating the flow in Row 5 is LOW (under the % specified in setup).

Push the Arrow key to select Row 5 to see what the flow in Row 5 is.

Arrows under all rows indicate that the average flow for all rows is 0.23 GPM per row.

The top half of Row 1 is black, indicating the flow in Row 1 is HIGH (greater than the % specified in setup).

Push the Arrow key to select Row 1 to see what the flow in Row 1 is.

Sometimes a blockage on 1 row may also trigger a high flow warning on another row. Use the Arrow key to scroll across and check the flow on each row when multiple alarms are shown.
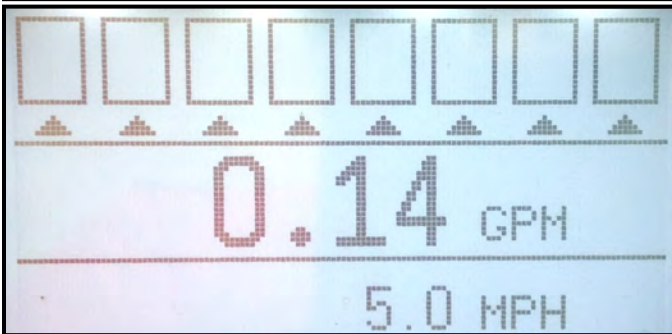
To silence the alarm for 30 seconds, press OK.

Run Screen display views—Can show GPA, GPM, and / or MPH.

To toggle from one view to another, press the top right button.
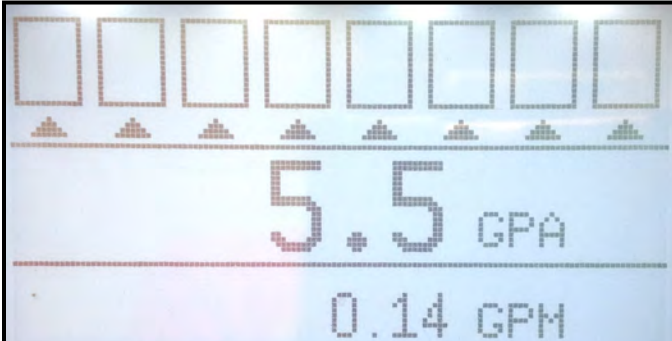
The triangles under all the rows indicate that the GPA or GPM number shown is the average of all rows.

If there is only a triangle under one row, the GPA or GPM number shown is the flow for that row.
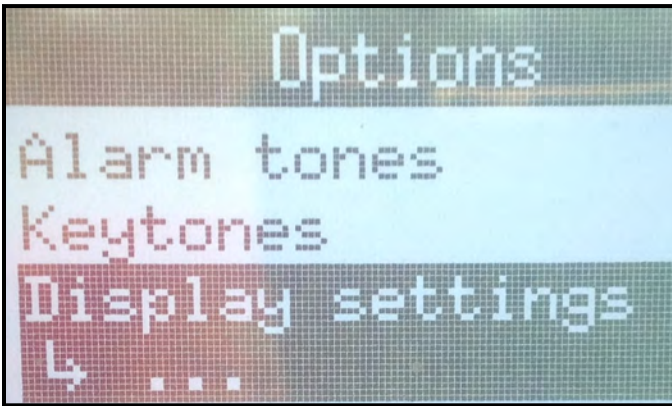
USB stick to Save or Load Settings

Insert a USB drive in the bottom of the display.

Go the Setup Menu > Setup Management > Save Setup (to save the current setup values to the USB)

Or Setup Menu > Setup Management > Load Setup (to load a previously saved setup from the USB to the display)

There are 2 volume totals, 2 surface totals, 1 distance total, and 2 working time totals that are kept.

The Display Setting can be set here to tell which values will be shown on the extended display screen (see next page).

All of the totals are accumulated, regardless of which ones are set to display.

For example, TOT 1 values could be used to be keep track of a specific field, while TOT 2 values might be used to keep track of a farm or planting season.

TOT 1 values could be read and reset after the field is done, while the TOT 2 values would continue accumulating.
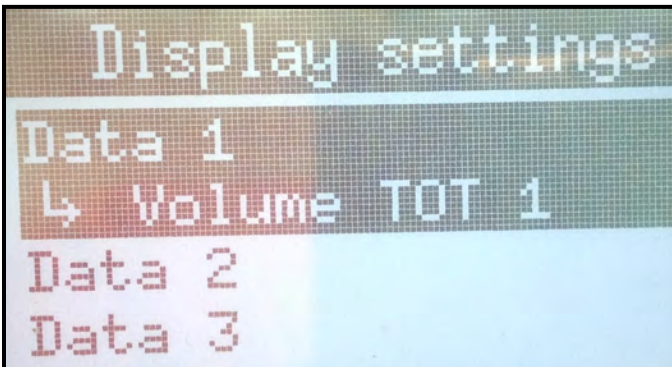
The default Display Settings are:

Data 1: Volume TOT 1

Data 2: Surface TOT 1

Data 3: Distance TOT

These values will show on the extended view screen (see next page).

To view the other Totals (such as Volume TOT 2) reset the Display Settings so that Data 1 is set for Volume TOT 2. Then, go to the Extended display screen to view and/or reset the value.
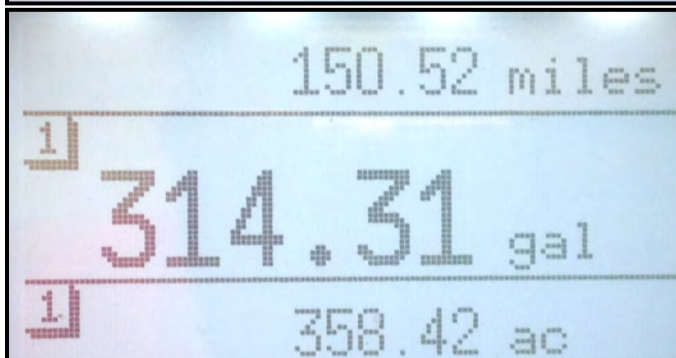
Extended View—Cumulative Totals

Press and hold top right button to toggle between run screen and extended display view which shows the totalized values.
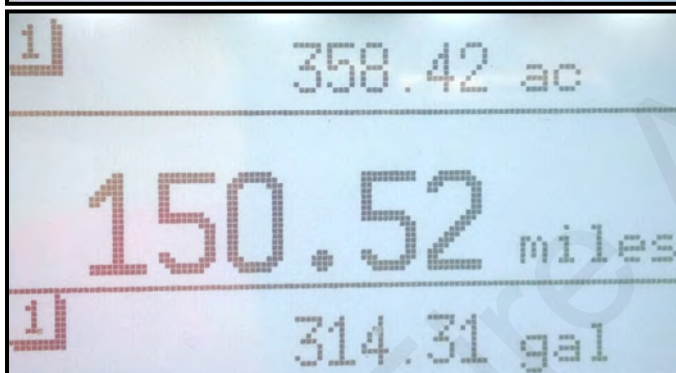
Volume TOT 1 is 314.31 gal.

Surface TOT 1 is 358.42 acres.

Distance TOT is 150.52 miles

Press the top right key to move these data displays from top to middle to bottom.

To reset a counter to 0, when that total is in the center position (miles here), press and hold the arrow key.