



Single and Dual Loop Rate & Blockage System

Operator's Manual MNRT026 for Software

Revision 2.10



Quick Start Guide

1. Turn on the ART 160/260

2. Set the Default Cal (this will set all calibrations back to the default settings)

- Press RATE
- Press MODE
- Press CAL until the screen displays SET DEFAULT CAL?
- Press and hold the OK button until the screen displays DEFAULT CAL SET!

All calibration settings are now reset to their default values.

3. Set the Test Speed (speed you will travel in the field)

- Press RATE
- Press MODE
- Press CAL
- The screen displays: TEST SPEED MPH
- Press the UP or DOWN arrow keys to set the speed you will be seeding at (ex: 5.5 MPH)

You need a speed in order to set up the monitor using the Seed Rate Wizard

IMPORTANT! You must be seeding to perform a complete calibration.

4. Set up blockage monitoring

When Default Calibration is performed, a sensitivity value of 15 is set for each loop, if a blockage alarms while seeding and there are no blockages decrease the sensitivity as necessary.

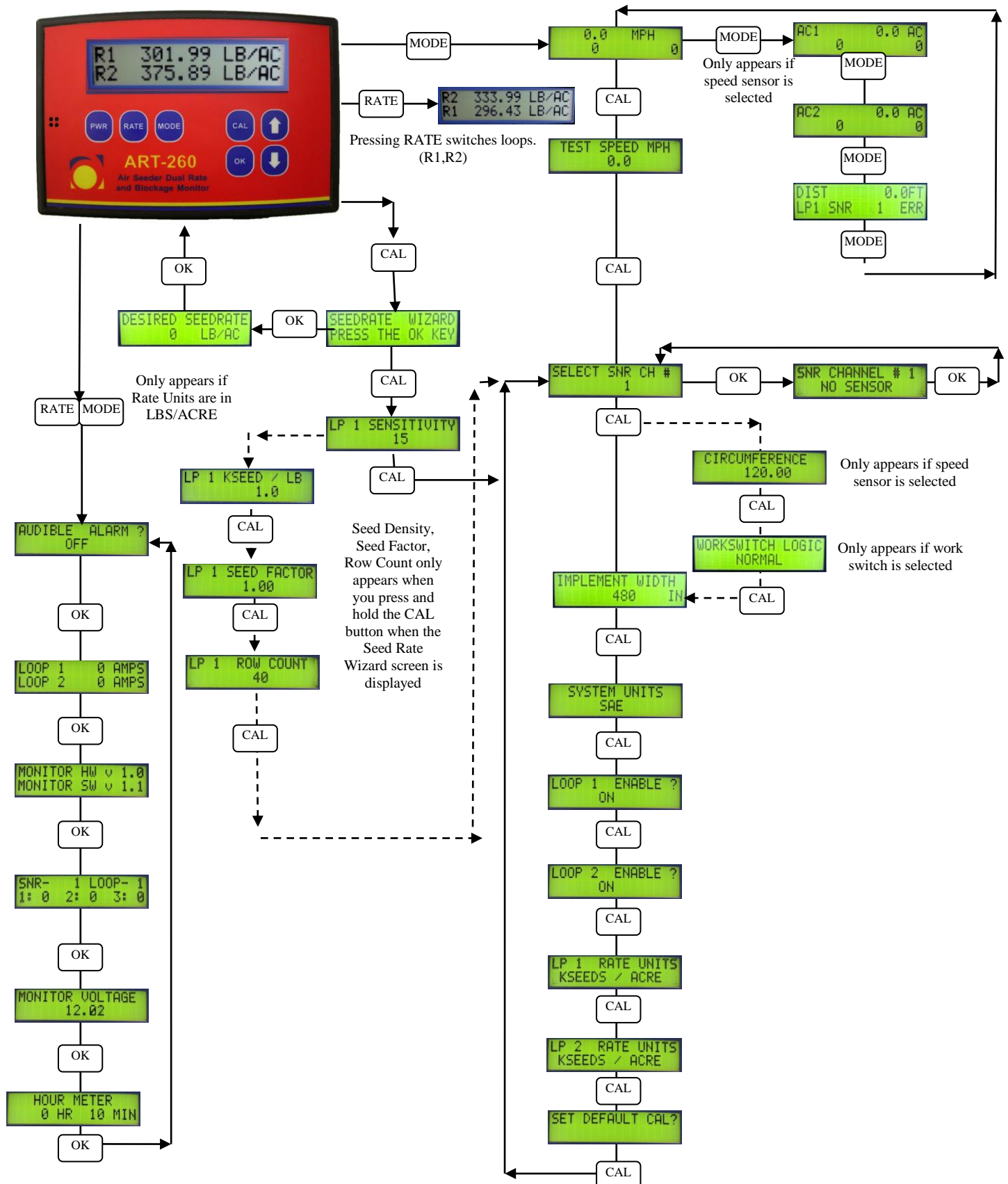
- Press RATE
- Press RATE again to select the loop you want to set up (with Dual Loop)
- Each time you press RATE, Loop 1 (R1) and Loop 2 (R2) are switched on the top line of the display. The Loop shown on the top line will be changed
- Press CAL until you get to the SENSITIVITY screen
- Press the UP arrow to increase the value and the Down arrow to decrease the value
- Press RATE again and check for a blockage message

5. Set up the Seed Rate using the Seed Rate Wizard while seeding

- Press RATE
- Press RATE again to select the Loop you want to set up (with Dual Loop)
- Each time you press RATE, Loop 1 (R1) and Loop 2 (R2) are switched on the top line of the display. The Loop shown on the top line will be changed
- Press CAL
- The screen displays: SEEDRATE WIZARD PRESS THE OK KEY
- Press OK
- The screen displays: DESIRED SEEDRATE LB/AC
- Press the UP or DOWN arrow keys to set how many LB/AC you want to seed (e.g. 120LBS)
(If you have seed and fertilizer in the same loop set the total LBS/AC for seed and fertilizer together)

You must be on the RATE screen in order to hear alarms.

Flow Chart



Follow safety Instructions

- *Be sure to follow all safety instructions in your air seeder operator's manual.*

Read and Understand This Manual Before Operating This Machine.

- *Learn how to operate and service the machine correctly. Failure to do so could result in personal injury or equipment damage. Agtron Enterprises Inc. will not accept any responsibility for any damage or malfunctions resulting from failure to comply with the operator's manual.*
- *If you do not understand the information in this manual, or if you have any questions, contact Agtron Enterprises Inc. Customer Service 1-800-667-0640.*
- *This manual should be considered a permanent part of your machine and should remain with the machine when you sell it.*
- *The contents of this manual are the intellectual property of Agtron Enterprises Inc. All use and/or reproduction not specifically authorized by Agtron Enterprises Inc. is prohibited.*
- *All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. Agtron Enterprises Inc. reserves the right to make changes at any time without notice.*
- *ATTENTION! Low battery or alternator voltage can cause system errors.*

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Introduction

With this monitor you can confirm your calibration for seed and fertilizer rates, and detect blockages in up to 120 seed and 120 fertilizer runs. You can also monitor six additional tank and toolbar sensors (shaft, bin, speed, fan, work switch) and three in-cab sensors and switches (GPS, radar, work switch).

How Your Rate and Blockage Monitor Works

Single and Dual Loop Rate and Blockage Monitors use infrared seed sensors to measure seed rate and check for blockages. The sensors operate on a similar principle to that of a motion detector in a security system. The Dual Loop system includes a second sensor Loop so seed and fertilizer can be measured separately in double shoot systems. In both systems, sensors are connected in a Loop each communicating in turn and each including built-in diagnostics. The system determines the number of sensors in a Loop automatically. A maximum of 120 sensors can be connected in a Loop.

Additional sensors for shafts, bin and fan monitoring can be added. (Six for the Single Loop and nine for the Dual Loop.)

The User Interface

The user interface for Single and Dual Loop monitors includes a 16 character by two line display and seven buttons (PWR, RATE, MODE, CAL, OK, ↑, ↓).

Figure 1.0



The display, the backlit display will always show the currently operating mode on the top line. The bottom line shows alarms and rate information.

Abbreviations Used on Display

Abbreviation	Meaning
KSD	Thousands of seeds
KPH	Kilometers per hour
MPH	Miles per hour
SAE	English/US
KG	Kilograms
HA	Hectares
LP	Sensor loop
LB	Pounds
AC	Acres
R1	Rate 1
R2	Rate 2
RPM	Revolutions per minute

Display Buttons

Key	Function
PWR	Press to turn power on and off
RATE	Press to toggle between R1 and R2 Rate display; also used to go back to the "home" screen
MODE	Press to cycle through modes of operation
CAL	Press to enter a new calibration menu
OK	Press to acknowledge alarms; or save entered calibration values
↑ ↓	Select high/low alarm values; Enter calibration values

Installation

Monitor Installation

Figure 1.1

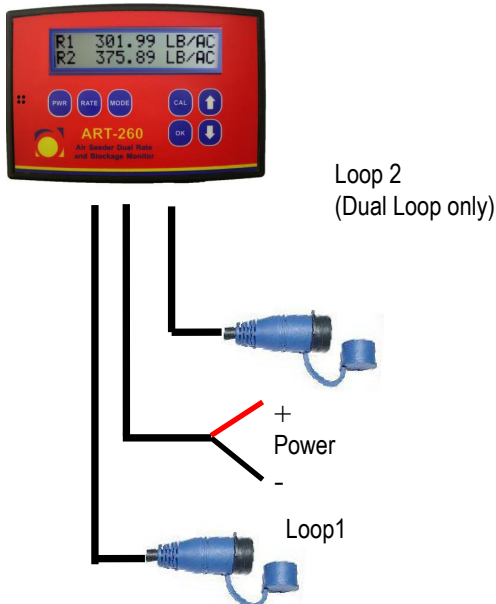
Mounting the Monitor



1. Screw the RAM Mount to the back of the monitor with supplied M5 hex screws (Agtron Part# 450014004).
2. Attach base of RAM Mount to preferred location (mounting hardware not included).

Figure 1.2

Power Cable



1. Connect the **red** wire directly to the positive battery terminal.
2. A fuse is not required.
3. Connect the **black** wire directly to the negative battery terminal.

Do not connect to the cab. Not all tractor cabs are

Tip:

Avoid connecting at starter terminals and on 24 volt systems be sure to connect the monitor to the correct battery. It should be the one with its negative terminal connected to the tractor chassis (ground). Connect the red (+) lead of the monitor to the positive (+) terminal of that battery and the black (-) lead of the monitor to the tractor chassis. Incorrect wiring could result in damage to your monitor.

Cable Ties and Main Extension Cable Installation

Figure 1.3

Colored Cable Ties

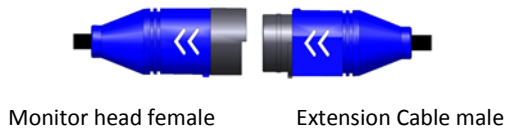


The colored cable ties included in this kit are to assist in easy installation and to differentiate between the two loops of sensors

1. Attach blue ties for all Loop 1 cables.
2. Attach yellow ties for all Loop 2 cables.

Main Extension Cables

Figure 1.4



When making Extension Cable connections, make sure you align the molded arrows. If they are difficult to push together, check the condition of the pins. For each Loop (1 for Single; 2 for Dual):

1. Connect the cable from the Monitor to a 10ft or 20ft Main Extension Cable inside the tractor.
2. Route the Main Extension Cable to the tractor hitch, allowing extra for hitch movement.

Figure 1.5



Tip:

To help avoid electrical interference problems, create a figure eight shape with excess cable before securing.

Seed Sensor and Sensor Loop Cable Installation

Figure 1.6



Figure 1.7



1. Select a mounting location near the distributor.
Mount the Seed Sensors in the hose above the implement chassis to protect the Seed Sensors and cables from field debris damage.
The Sensor Loop Cables should not be stretched tight when connected.
3. Secure the Seed Sensors in the hose using metal hose clamps on each side (Agron Part# 400TRHS16 not included).
4. Select a seed sensor on the far left of the machine to be sensor #1. Leave the female plug of this sensor unplugged, but connect the male plug to the sensor beside it. This will be sensor #2.
5. Continue connecting sensor #2 to sensor #3 and so on, until the manifold is all connected. Attach a Sensor Loop cable to the male end of the last sensor on the first manifold.
6. Connect the male end of the Sensor Loop Cable to the female end of the first sensor on the 2nd manifold. Continue in this fashion until you reach the far right side of the implement, leaving the male end on the last sensor unplugged.
7. Using cable ties attach all cables to the frame of the implement. Avoid pinch points such as wing lift and opener lift points.

Tip:

If necessary, apply heat to the hose ends in order to fit the hose over the sensor.

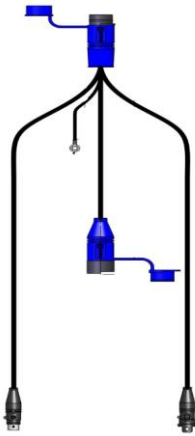
Sensors should be mounted on a relatively straight part of the hose for best performance.

Y-Cable Installation

For the following installation procedures refer to the Installation Diagrams figure 1.10, 1.11

Figure 1.8

Y-Cable



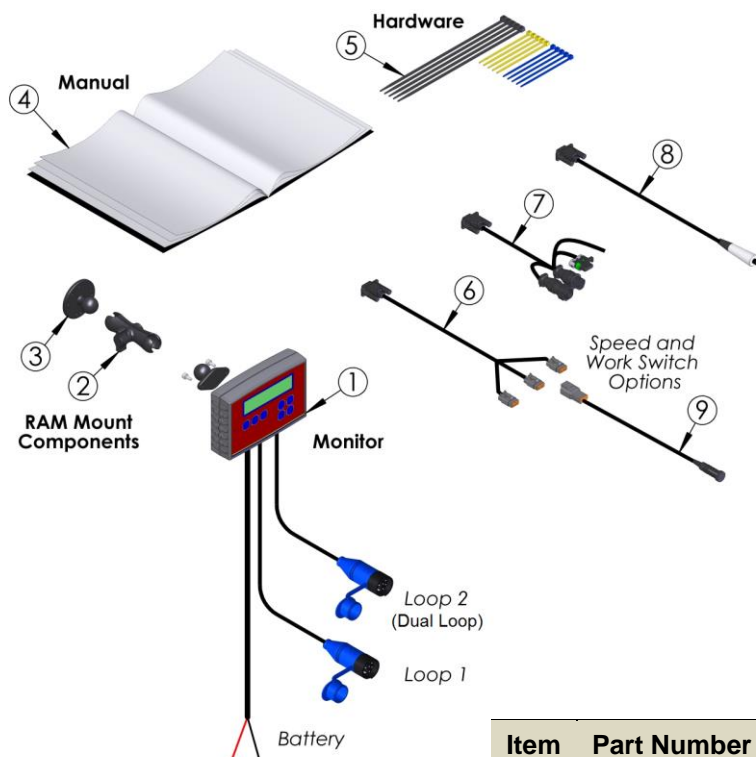
1. Select a mounting location for the Y-Cable in the center of the implement.
2. Secure the ring terminal of the Y-Cable to the chassis of the implement to ground the cable.
3. Connect the Y-Cable's male Sensor Loop Cable to Seed Sensor 1 (normally located on the far left side of the implement) using Sensor Loop Cables as needed.
4. Connect the Y-Cable's female Sensor Loop Cable to the last Seed Sensor (normally located on the far right side of the implement) using Sensor Loop Cables as needed.

Y-Cable (More than 60 Sensors)

1. On systems with more than 60 Seed Sensors, an additional Y-Cable must be installed in the middle of the loop to improve power distribution.
2. When making Sensor Loop cable connections, make sure you align the molded arrows. If they are difficult to push together, check the condition of the pins.
3. To prevent cable damage, route the cables so they follow the hydraulic hoses whenever possible.
4. Connect the blue male end of the second Y-Cable to the blue female end of the first Y-Cable.
5. Connect the second Y-Cable's male and female Sensor Loop Cables into the middle of the seed sensor loop(Using in place of a Sensor Loop cable)

Figure 1.09: Installation

Diagram IS NOT to scale



Tip:

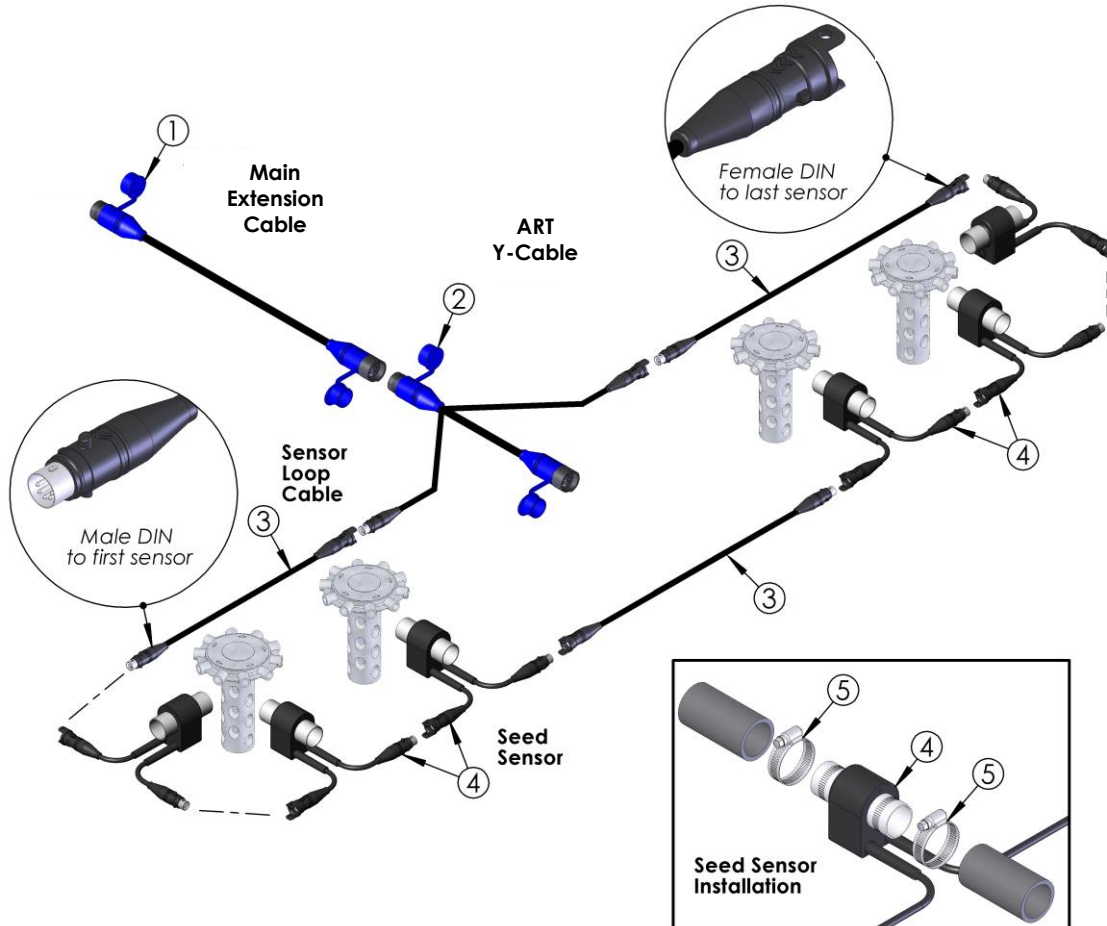
Part numbers with an asterisk beside it are optional parts

See Appendix for Optional sensors description

Item	Part Number	Description
1	AGRTH16 AGRTH26	Single Loop Rate and Blockage Monitor Dual Loop Rate and Blockage Monitor
2	850033007	RAM Mount Double Socket Arm
3	850033008	RAM Mount Base 1" Ball
4	MNART026	Single / Dual Loop Rate and Blockage System Manual
5	4TYWR14.0 850040001 850040002	Black Cable Ties (14.5") Blue Cable Ties (4") Yellow Cable Ties (4")
6	9ART087*	ART Monitor Sensor Breakout Harness 6ft (1.8m)
7	9KRA002*	ART Monitor Radar Sensor Cable Kit
8	9AWS001*	Handheld Work Switch
Optional Sensors		
Item	Part Number	Description
9	9ART089*	3P Deutsch Connector with Bare Wire Ends
	AGSH001* AGSH002*	Low RPM Reed Switch Sensor 20ft (6m) Low RPM Reed Switch Sensor 6ft (1.8m)
	AGIND01* AGLS002*	Inductive Proximity Sensor 20ft (6m) Inductive Proximity Sensor 18mm High Sensitivity (1.8m)
	9KRT069*	3P Deutsch DTM Connector to Relay Kit
	9ART091*	3P Deutsch DTM to AMP CPC Radar Y-Cable
	9ART090*	3P Deutsch DTM to AMP CPC Radar Adapter
	9AGPS01* 9AGPS02*	GPS Speed Sensor (5Hz Update Speed) GPS Speed Sensor (1Hz Update Speed)

Figure 1.10: Installation (Less than 60 sensors)

Diagram IS NOT to scale



Tip:

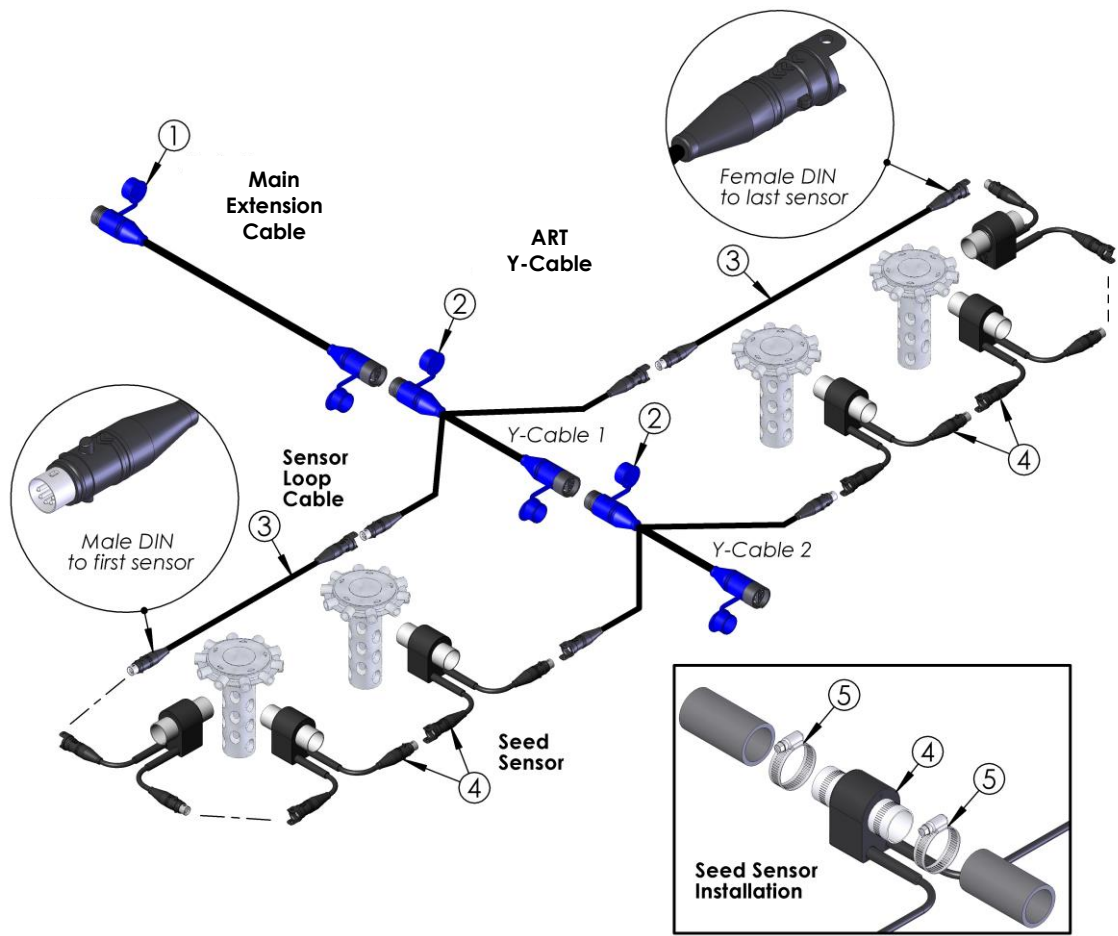
Part numbers with an asterisk beside it are optional parts

Same parts for Figure Installation (More than 60 sensors)

Item	Part Number	Description
1	9ARTM10	Main Extension Cable 10ft (3m)
	9ARTM20	Main Extension Cable 20ft (6m)
2	9ARTY10	ART Y-Cable
3	9ARTX02	ART Sensor Loop Cable 2ft (0.6m)
	9ARTX04	ART Sensor Loop Cable 4ft (1m)
	9ARTX10	ART Sensor Loop Cable 10ft (3m)
	9ARTX20	ART Sensor Loop Cable 20ft (6m)
4	AGSS22	Seed Sensor 7/8" (22mm)
	AGSS24	Seed Sensor 15/16" (24mm)
	AGSS25	Seed Sensor 1" (25mm)
	AGSS32	Seed Sensor 1 1/4" (32mm)
5	400TRHS16*	Hose clamp size 16

Figure 1.11: Installation (More than 60 sensors)

Diagram IS NOT to scale



Optional Sensor Installation

****Refer to Appendix Optional Sensors for more information****

GPS/Radar Speed Sensor

Tips:

The Single and Dual Loop monitors require a pulse or radar style signal output from the GPS.

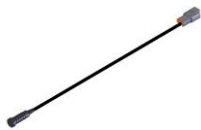
A mating cable may be required from the maker of the GPS/Radar unit.

See Appendix DB9 (9 Pin) connector Pin-out for more information .



1. Using one of the connectors or the unterminated end of the ART Monitor Radar Sensor Cable or ART Monitor Sensor Breakout Harness, connect to the output of your GPS/Radar unit.
2. Connect the Radar Sensor Cable or Sensor Breakout Harness to the bottom of the ART monitor head via the DB9 (9 Pin) connector.

Wheel Speed Sensor



1. Install the Speed Sensor (Low RPM Reed Switch) and magnet on a wheel or shaft that turns when the seeder is in motion. Mounting within 1/2" of the magnet.
2. Connect the Speed Sensor to one of the leads on the ART Toolbar Sensor Breakout Harness.

Hand Held Workswitch

Tips:

The monitor requires an open/close circuit switch for a Work Switch. DO NOT use a powered switch without a relay.

See Appendix DB9 (9 Pin) connector Pin-out for more information .



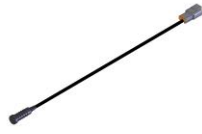
1. Plug the Agtron Hand Held Work Switch cable into the DB9 (9 Pin) connector on the bottom of the monitor.

Or

If there is already an existing Work Switch in tracor you can connect your own switch to the unterminated end of an ART Monitor Radar Sensor Cable or ART Monitor Sensor Breakout Harness.

2. Plug the ART monitor Radar Sensor Cable or ART Monitor Sensor Breakout Harness into the DB9 (9 pin) connector on the bottom of the monitor.

Automatic Work Switch



Tips:

The monitor requires an open/close circuit switch for a Work Switch. DO NOT use a powered switch without a relay.

See Appendix Deutsch DTM Connector Pin-out for more information when connecting to an existing Work Switch.

1. Install the Work Switch Sensor (Low RPM Reed Switch) and magnet on the toolbar, mounting within 1/2" of the magnet.

The switch can be located such that the magnet closes the switch when the drill is up, or closes it when the drill is down. However, the Work Switch logic must be configured appropriately. See Work Switch Setup.

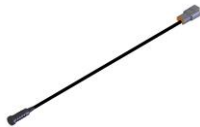
Connect the sensor to one of the connectors on the Toolbar Sensor Breakout Harness.

Or

If there is already an existing Work Switch on the toolbar you can connect your own switch by splicing into one of the connectors on the Toolbar Sensor Breakout Harness.

2. Connect the sensor to one of the connectors on the Toolbar Sensor Breakout Harness.

Shaft Sensor

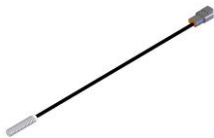


Tips:

There can be up to four Shaft Sensors installed.

1. Attach the magnet to the shaft (rotation under 1000 RPM).
2. Select a mounting location for the sensor within 1/2" (13mm) of the magnet.
3. Connect the sensor to one of the connectors on the Toolbar Sensor Breakout Harness.

Fan Sensor



Tips:

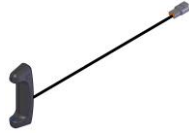
There can be up to two Fan Sensors installed.

Loop power must be turned on for sensor to work.

1. Mount the sensor within 1/16" (1 mm) of a ferrous metal target such as a bolt head. (over 500 RPM).
2. Connect the sensor to one of the connectors on the Toolbar Sensor Breakout Harness.

Bin Sensor

Tips:



There can be up to four Bin Sensors installed using a Dual Loop Monitor.

Loop power must be turned on for sensor to work.

1. Select a mounting location in the air tank at the desired empty product level. The Bin Level Sensor alarms when product does not cover it.
2. Connect the sensor to one of the connectors on the Toolbar Sensor Breakout Harness.

Meter Sensor

Tips:

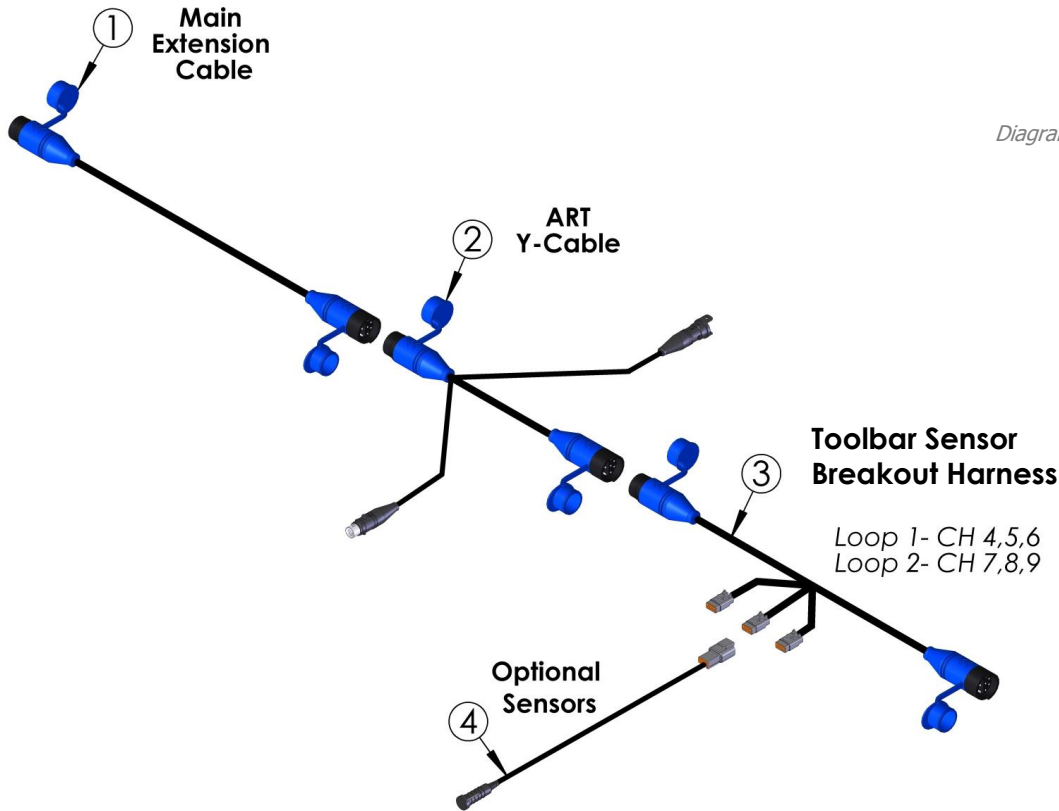


There can be up to four (4) Meter Sensors installed using a Dual Loop Monitor.

Loop power must be turned on for the sensor to work.

1. Select a mounting location for the sensor and mount it.
The meter sensor alarms when product stops moving through the meter and fills up with product.
2. Connect the sensor to one of the connectors on the Toolbar Sensor Breakout Harness.

Figure 1.12: Installation (Sensor Breakout Cable)



Tip:

Part numbers with an asterisk beside it are optional parts.

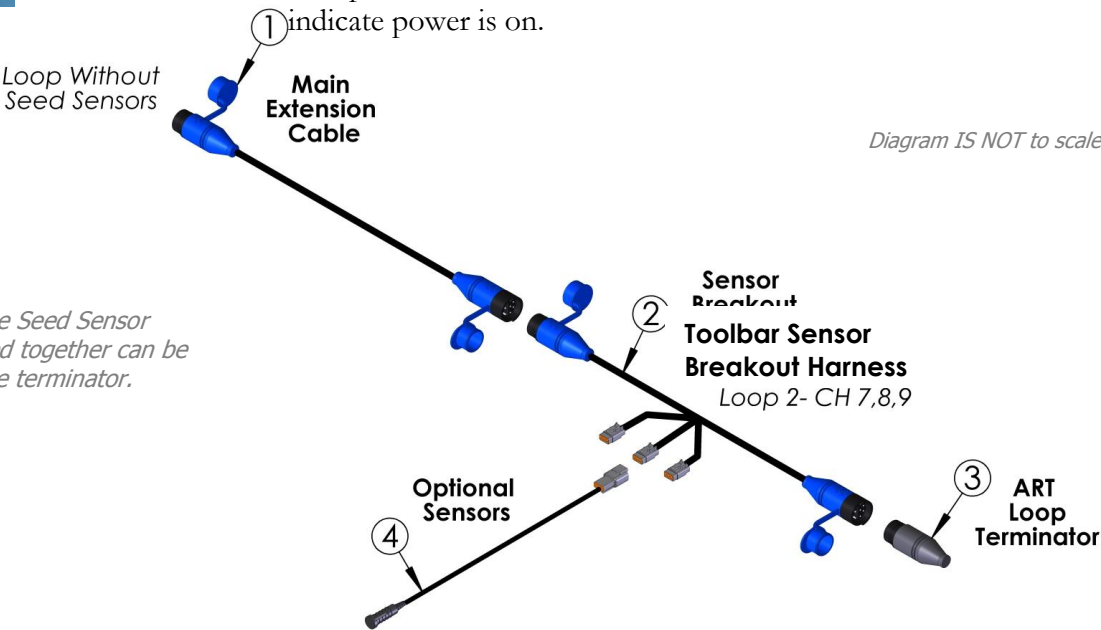
See Appendix for Optional Sensors description.

Item	Part Number	Description
1	9ARTM10	Main Extension Cable 10ft (3m)
	9ARTM20	Main Extension Cable 20ft (6m)
2	9ARTY10	ART Y-Cable
3	9ART036*	Tool Bar Sensor Breakout Harness w/3 Sensor Extension 10ft (3m)
Optional Sensors		
Item	Part Number	Description
4	9AGPS01*	GPS Speed Sensor (5Hz Update Speed)
	9AGPS02*	GPS Speed Sensor (1Hz Update Speed)
	AGBN007*	Bin Level Sensor 6ft (1.8m)
	AGBN008*	Bin Level Sensor 20ft (6m)
	9ART090*	3P Deutsch DTM to AMP CPC Radar Adapter
	9ART091*	3P Deutsch DTM to AMP CPC Radar Y-Cable
	AGIND01*	Inductive Proximity Sensor 20ft (6m)
	AGLS002*	Inductive Proximity Sensor 18mm High Sensitivity (1.8m)
	AGSH001*	Low RPM Reed Switch Sensor 20ft (6m)
	AGSH002*	Low RPM Reed Switch Sensor 6 ft (1.8m)
	9KRT069*	3P Deutsch DTM Connector to Relay Kit
	9ART089*	3P Deutsch DTM Connector with Bare Wire Ends

Figure 1.13: Installation (ART Loop Terminator)



It is possible to use a Rate and Blockage Monitor System without Seed Sensors installed. An ART Loop Terminator is required to provide constant power. It must be installed at the end of the Toolbar Sensor Breakout Harness. The monitor will recognize this as a loop with zero Seed Sensors. The terminator has a red LED to indicate power is on.



Tip:

A Y-Cable with the Seed Sensor connections mated together can be substituted for the terminator.

Item	Part Number	Description
1	9ARTM10	Main Extension Cable 10ft (3m)
	9ARTM20	Main Extension Cable 20ft (6m)
2	9ART036*	Toolbar Sensor Breakout Harness w/3 Sensor extensions 10ft (3m)
3	AGRT071*	ART Loop Terminator
Optional Sensors		
Item	Part Number	Description
4	9AGPS01*	GPS Speed Sensor (5Hz Update Speed)
	9AGPS02*	GPS Speed Sensor (1Hz Update Speed)
	AGBN007*	Bin Level Sensor 20ft (6m)
	AGBN008*	Bin Level Sensor 6ft (1.8m)
	9ART090*	3P Deutsch DTM to AMP CPC Radar Adapter
	9ART091*	3P Deutsch DTM to AMP CPC Radar Y-Cable
	AGIND01*	Inductive Proximity Sensor 20ft (6m)
	AGLS002*	High Sensitivity Inductive Proximity Sensor 6ft (1.8m)
	AGSH001*	Low RPM Reed Switch Sensor 20ft (6m)
	AGSH002*	Low RPM Reed Switch Sensor 6ft (1.8m)
	9KRT069*	3P Deutsch DTM Connector to Relay Kit
	9ART089*	3P Deutsch DTM Connector with Bare Wire Ends

Tip:

Part numbers with an asterisk beside it are optional parts.

See Appendix for Optional Sensors Description.

Setup

Tip:

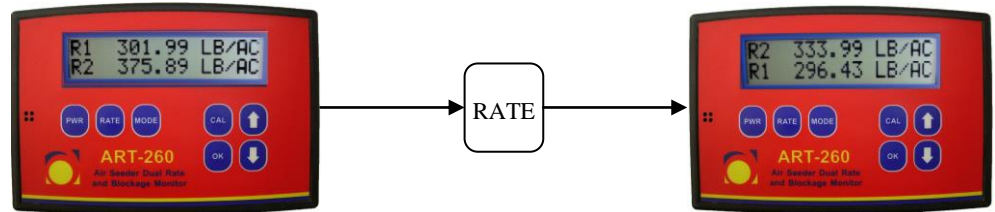
When you are not seeding, the monitor will display all sensors blocked

The following section describes how to set up the Single/Dual Loop systems.

Whenever the procedure mentions LP1 (Loop 1), the same procedure can be performed on LP2 (Loop 2) on the Dual Loop monitor., on the RATE screen press the RATE button to toggle between R1(LP1) and R2(LP2).

****Monitor must be turned off using PWR button or all entered calibration values will be LOST****

Figure 2.0



Load the Default Calibration Values

Tip:

Default Calibration will automatically activate if the memory check fails at power up.

Setting the Default Calibration reverts the monitor back to its initial state, the state before you turned on the monitor for the first time

See Appendix for Default Calibration values.

1. Press RATE to get to RATE screen
2. From the RATE screen, press MODE.
3. Press CAL several times until the screen displays SET DEFAULT CAL?
4. Hold the OK button until the screen displays DEFAULT CAL SET! (Approx. 5 seconds)

Set System Units

1. From the RATE screen, press MODE.
2. Press CAL several times until the screen displays SYSTEM UNITS.
3. Use the UP or DOWN arrows to select SAE or METRIC

Set Implement Width

1. From the RATE screen, press MODE.
2. Press CAL several times until the screen displays IMPLEMENT WIDTH.
3. Enter the width of your implement in inches or centimeters (depending on which System Units were selected).

The value can be between 1 and 99999.

Optional Sensor Setup

When configuring various sensors always remember to press OK after selecting a sensor. If OK is NOT pressed the monitor will revert to its previous setting, which could be No Sensor, or a previously configured sensor.

Area, distance and circumference values are only displayed on the monitor if a Speed Sensor is installed in the system.

Circumference is a value calculated by the monitor when you perform a speed/distance calibration. The circumference value can be adjusted manually, if necessary.

Speed Setup

Configure the GPS/Radar/Wheel Speed Sensor

Tips:

ART Monitor Radar Sensor cable uses SNR Channels 1, 2, 3, refer to information sheet that came with the cable for channel #'s.

ART Monitor Sensor Breakout Harness uses SNR Channels 1, 2, 3.

If Toolbar Sensor Breakout Harness is connected to Loop 1 use channels 4,5, and 6.

If connected to Loop 2 use Channels 7,8 and 9.

See Appendix DB9 (9 pin) connector Pin-out for more information.

1. Press RATE to go to RATE screen, then press MODE.
2. Press CAL several times until the SELECT SNR CH # screen appears.
3. Select the channel that the sensor is plugged into on the cable or harness using the UP or DOWN arrow.
4. Press OK.
5. The SNR CHANNEL #__ screen appears.
6. Press UP or DOWN arrow several times until SPEED SENSOR appears.

Calibrate the GPS/Radar/Wheel Speed Input

1. Press MODE several times until the DIST screen appears.
2. Distance is in meters for METRIC units, feet for SAE units.
3. Clear the accumulated distance by pressing the DOWN arrow, then holding OK for 5 seconds.
4. Drive a known distance.
5. Press CAL and set the Distance Check value to agree with the distance driven (from 0.1 to 9999999.9) using the UP and DOWN arrows.
6. The Circumference value is modified when editing the Distance Check value.

Test Speed Setup

Set Test Speed if no Other Speed Source is Used

Tip:

Area/Distance will not accumulate using a Test Speed.

1. Press RATE to go to RATE screen, then press MODE.
Press CAL until TEST SPEED screen appears.
2. Using the UP or DOWN arrow to enter a value between 0 and 20.0 (ex: 5.5 MPH)
3. Press RATE to return to the RATE screen.

Work Switch Setup

There are multiple options when attaching a Work Switch to the monitor; either on the tractor or the toolbar. Refer to Installation section for more information.

Configure the Work Switch

Tips:

When work switch is selected as a sensor the work switch logic screen becomes available in the CAL screen sequence.

Work Switch alarms re-occur at 5 minute intervals.

ART Monitor Radar Sensor cable uses SNR Channels 1, 2, 3, refer to information sheet that came with the cable for channel #'s.

ART Monitor Sensor Breakout Harness uses SNR Channels 1, 2, 3.

If Toolbar Sensor Breakout Harness is connected to Loop 1 use channels 4,5,and 6.

If connected to Loop 2 use Channels 7,8 and 9.

1. Press RATE to go to RATE screen, then press MODE.
2. Press CAL several times until the SELECT SNR CH # screen appears.
3. Select the channel using the UP or DOWN arrows (Agtron Hand held Work Switch uses channel 3).
4. Press OK.
5. The SNR CHANNEL #__ screen appears.
6. Press the UP or DOWN arrow several times until WORK SENSOR appears.
7. Press OK.
8. The SELECT SNR CH # screen appears.
9. Press CAL.
WORKSWITCH LOGIC screen appears.
10. Press the UP or DOWN arrow to select NORMAL or INVERTED, as required (Default is NORMAL).
11. Press RATE to return to RATE screen.

When the Work Switch is off, it will silence all alarms. Distance continues to accumulate but area totals will not accumulate.

Shaft Setup

Configure the Shaft Sensor

Tips:

Shaft RPM is calculated as:

$RPM = (\text{sensor pulses/min}) / \text{targets}$.

If Toolbar Sensor Breakout Harness is connected to Loop 1 use channels 4,5,and 6.

If connected to Loop 2 use Channels 7,8 and 9.

ART Monitor Radar Sensor cable uses SNR Channels 1, 2, 3, refer to information sheet that came with the cable for channel #'s.

ART Monitor Sensor Breakout Harness uses SNR Channels 1, 2, 3.

1. Press RATE to go to RATE screen, then press MODE.
2. Press CAL several times until the SELECT SNR CH # screen appears.
3. Select the channel that the sensor is plugged into on the cable or harness using the UP or DOWN arrow.
4. Press OK.
SNR CHANNEL #__ screen appears.
5. Press the UP or DOWN arrow several times until SHAFT SENSOR appears.
6. Press OK.
7. Press MODE until the SHAFT _ RPM screen appears.
8. Press CAL.
SHAFT _ TARGETS screen appears.
9. Use the UP and DOWN arrow to set the number of targets (Default is 1).
10. Press OK.
11. Press the UP arrow.
SHAFT HIGH RPM screen appears, displaying the current value. (Default is 250)
12. Use the UP and DOWN arrows to set the value (0 disables the alarm.)
13. Press OK.
14. Press the DOWN arrows.
SHAFT LOW RPM screen appears, displaying the current value (Default is 10)
15. Use the UP and DOWN arrows to set the value. (0 disables the alarm.)
16. Press OK.

Fan Setup

Configure the Fan Sensor

Tips:

Fan RPM is calculated as:

$RPM = (\text{sensor pulses/min}) / \text{targets}$.

Loop power must be turned on for the sensor to work.

If Toolbar Sensor Breakout Harness is connected to Loop 1 use channels 4,5, and 6.

If connected to Loop 2 use Channels 7,8 and 9.

ART Monitor Radar Sensor cable uses SNR Channels 1, 2, 3, refer to information sheet that came with the cable for channel #'s.

ART Monitor Sensor Breakout Harness uses SNR Channels 1, 2, 3.

1. Press RATE to go to RATE screen, then press MODE.
2. Press CAL several times until the SELECT SNR CH # screen appears.
3. Select the channel that the sensor is plugged into on the cable or harness using the UP or DOWN arrow.
4. Press OK.
SNR CHANNEL #__ screen appears.
5. Press the UP or DOWN arrow several times until FAN SENSOR appears.
6. Press OK.
7. Press MODE until FAN_ RPM screen appears.
8. Press CAL
FAN_ TARGETS screen appears
9. Use the UP and DOWN arrow to set the number of targets (Default is 3).
10. Press OK.
FAN HIGH RPM screen appears, displaying the current value. (Default is 9000)
11. Use the UP and DOWN arrow to set the value (0 disables the alarm.)
12. Press OK.
13. Press the DOWN arrows.
FAN LOW RPM screen appears, displaying the current value (Default is 3000)
14. Use the UP and DOWN arrow to set the value. (0 disables the alarm.)
15. Press OK.

Bin Setup

Configure the Bin Sensor

Tips:

The Bin mode displays all four (4) Bins on one line. If the Bin is in alarm, it will display an E; if the Bin is not in alarm it will display the Bin number.

Loop power must be turned on for sensor to work.

If Toolbar Sensor Breakout Harness is connected to Loop 1 use channels 4,5,and 6.

If connected to Loop 2 use Channels 7,8 and 9.

ART Monitor Radar Sensor cable uses SNR Channels 1, 2, 3, refer to information sheet that came with the cable for channel #'s.

ART Monitor Sensor Breakout Harness uses SNR Channels 1, 2, 3.

1. Press RATE to go to RATE screen, then press MODE.
2. Press CAL several times until the SELECT SNR CH #_ screen appears.
3. Select the channel that the sensor is plugged into on the cable or harness using the UP or DOWN arrow.
4. Press OK.
SNR CHANNEL #__ screen appears.
5. Use the UP or DOWN arrow to select BIN_ SENSOR.
6. Press OK.

Meter Setup

Configure the Meter Sensor

Tips:

The Meter mode displays all four (4) Meters on one line. If the Meter is in alarm, it will display an E; if the Meter is not in alarm it will display the Meter number.

Loop power must be turned on for the sensor to work.

If Toolbar Sensor Breakout Harness is connected to Loop 1 use channels 4,5,and 6.

If connected to Loop 2 use Channels 7,8 and 9.

ART Monitor Radar Sensor cable uses SNR Channels 1, 2, 3, refer to information sheet that came with the cable for channel #'s.

ART Monitor Sensor Breakout Harness uses SNR Channels 1, 2, 3.

1. Press RATE to go to RATE screen, then press MODE.
2. Press CAL several times until the SELECT SNR CH #_ screen appears.
3. Select the channel that the sensor is plugged into on the cable or harness using the UP or DOWN arrow.
4. Press OK.
SNR CHANNEL #__ screen appears.
5. Use the UP or DOWN arrow to select METER_ SENSOR.
6. Press OK
- 7.

Operation

****Monitor must be turned off using PWR button or all entered calibration values will be LOST****

Blockage

Blockage operation requires a sensitivity value to determine the minimum number of seeds per second to avoid a blockage alarm. This value should be adjusted everytime you change rates or product. While seeding, initially set the sensitivity high enough to alarm, then decrease the value until no alarms. When you are not seeding, the monitor will display all sensors blocked.

1. Press RATE to go to home screen (R1 on top line)
2. Press CAL repeatedly until the LP 1 SENSITIVITY screen appears(Default is 15).
3. Use the UP arrow to increase the sensitivity value by 10 (changing to 0 disables the Loop showing LP_ SENS OFF)
4. Press RATE to return to home screen.
5. Watch for a blockage alarm
Ex. LP1 SNR_ BLK or LP1 ALL SNSRS BLK
6. If a blockage alarm does not sound repeat steps 2 to 5.
7. If a blockage alarm does sound, go back to the Sensitivity screen and decrease the value by 5.
8. Repeat for Loop 2, pressing RATE until R2 is on the top line.

Rate Units

Tip:

Each time you press the CAL button the display cycles to the next calibration screen.

1. Press RATE to return to home screen, then press MODE.
2. Press CAL several times
LP1 RATE UNITS screen appears. (Press CAL again for LP2 RATE UNITS)
3. Use the UP or DOWN arrow to toggle between
KSEEDS/ACRE and LBS/ACRE (SAE units) or
KSEEDS/HECTARE and KGS/HECTARE (Metric units).

Rate

You must be seeding in order to set the Rate (product must be flowing through the sensors). There must be no errors or blockages occurring as this will cause the calculation to fail showing CALCULATION FAIL BLOCKED SENSORS on the screen. This value should be adjusted everytime you change rates or product.

Tips:

Seed Rate Wizard needs to be set for each Loop individually.

1. Press RATE to go to home screen (R1 on top line)
2. From the RATE screen, press CAL.
SEEDRATE WIZARD screen appears
3. Press OK.
DESIRED SEEDRATE screen appears
4. Use the UP or DOWN arrow to enter your DESIRED SEEDRATE
5. Press OK.
6. Repeat for Loop 2, pressing RATE until R2 is on top line

High and Low Rate Alarms

High and Low Rate alarms are used in Rate Mode only. They must be set individually for each sensor Loop(on a dual loop monitor). These alarms are set to zero(disabled) by default. The alarm values should be set after the SEEDRATE WIZARD has been calibrated, explained in previous section. High Rate Alarms will display as LP_ SNR_ HIGH. Low alarms will display as LP_ SNR_ LOW. This value should be adjusted everytime you change rates or product.

Tip:

High and Low alarms should be set 50% above and below the Desired SeedRate.

To acknowledge High and Low Rate alarms press the OK button.

1. Press RATE to go to home screen (R1 on top line)
2. From the RATE screen, press the UP arrow.
LP 1 HIGH RATE screen appears.
3. Use the UP or DOWN arrow to set HIGH RATE value (0 disables the alarm.)
4. Select OK.
5. Press the DOWN arrow.
The LP 1 LOW RATE screen appears.
6. Use the UP or DOWN arrow to set LOW RATE value (0 disables the alarm.)
7. Press OK

8. Repeat for Loop 2, pressing RATE until R2 is on top line

Turning Loops On and Off

Tip:

Changing Sensitivity to zero also disables the Loop and displays as LP_SENS OFF.

Disabling a Sensor Loop turns off power to the seed sensors AND all additional tractor, toolbar and aircart sensors in that Loop. It will be displayed on screen as LP_ DISABLED.

1. From the RATE screen, press the MODE key once.
2. Press the CAL key repeatedly until the LOOP 1 ENABLE screen appears. (Press CAL again for Loop 2).
3. Use the UP or DOWN arrow to toggle between ON and OFF.
4. Press OK.

Speed Mode

Tip:

Each time you press MODE the display steps through other screens.

1. Press MODE until the Speed screen appears.
2. Speed will show MPH or KPH

If a Speed Sensor is installed, Speed is used in distance and area calculations.

Area Mode

1. Press MODE repeatedly until the AC1/AC2 (SAE), HA1/HA2 (Metric) screen appears.
2. To clear accumulated area, press the DOWN arrow.

RESET AREA _ AC? screen appears

3. Press and hold OK until area resets to zero (approx. 5 seconds).
Area and Distance modes are only accessible if a Speed Sensor is installed.

Distance Mode

1. Press MODE repeatedly until the DIST screen appears.
2. To clear accumulated distance, press the DOWN arrow,

RESET DIST FT? screen appears.

3. Press and hold OK until distance resets to zero (approx. 5 seconds).

Area and Distance modes are only accessible if a Speed Sensor is installed.

Shaft Mode

Shaft Sensor must be installed for Shaft Mode screen to appear.

1. Press MODE repeatedly until the SHAFT screen appears.
2. To acknowledge Shaft Alarms press the OK button.

Fan Mode

Fan Sensor must be installed for Fan Mode screen to appear.

1. Press MODE repeatedly until the FAN screen appears.
2. To acknowledge Fan alarms press the OK button.

Bin Mode

Bin Sensor must be installed for Bin Mode screen to appear.

1. Press MODE repeatedly until the BIN screen appears.
2. To acknowledge Bin alarm press the OK button.

Meter Mode

Meter Sensor must be installed for Meter Mode screen to appear.

1. Press MODE repeatedly until the METER screen appears.
2. To acknowledge Meter alarm press the OK button

Diagnostic Modes

Diagnostic modes are accessed by pressing the RATE and MODE at the same time. No alarms are produced while in any of these modes.

Press OK repeatedly to cycle through these screens.

Audible Alarm

- Set the Audible Alarm value to ON or OFF using the arrow keys.
- No alarms will be audible when Alarm value is OFF. The default value is ON.

Loop Current

- Loop Current displays the Seed Sensor Loop Current in Amps.

Monitor Version

- Monitor Version displays the monitor's Hardware version on line 1 and the software version on line 2.

Seed Sensor Info

4. Select a Seed Sensor by pressing the UP or DOWN arrow.
5. To change between loops (Dual Loop), press and hold the UP or DOWN arrow.

Sensor Info displays the current sensor number and its loop number on line 1 and Calibration values on line 2. This information may be needed when requesting technical assistance from Agtron Service.

Monitor Voltage

- The Battery Voltage detected by the monitor.

Hour Meter

- Displays the total time the monitor has been on
- The minute value ranges from 0 to 59. The hour value ranges from 0 to 999. A larger number will display XXX.
- To clear the accumulated time, press the DOWN arrow
RESET HR METER? Screen appears
- Press and HOLD OK until it resets to zero (approx. 5 seconds).

Diagnostics and Troubleshooting

Troubleshooting Table

Type of Problem	Symptom/Diagnostic Step	Action/Information
Alarms	To acknowledge alarms...	<p>...temporarily, push the CAL, UP or DOWN keys to enter any calibration mode.</p> <p>...for blockage, hold down the OK key for five (5) seconds while in Rate mode for the Loop to be acknowledged.</p> <p>Acknowledging any alarms by pressing OK three times will permanently mute the alarm until the alarm status is restored to normal.</p>
Monitor Displays SNR 1 ERR	The monitor is not detecting any sensors.	<p>Check all the cables and connections from monitor to sensor 1.</p> <p>Bypass Sensor 1 by connecting Sensor 2 to the Sensor Loop Cable from the Y-Cable.</p>
	If the message is no longer displayed...	...replace Sensor 1.
	If the problem persists...	...connect a Seed Sensor directly to the Y-Cable male Sensor Loop Cable.
	If you get a SNR 2 ERR...	...replace the Sensor Loop Cable between the Y-Cable and Seed Sensor 1.
	If the problem persists...	...connect the Y-Cable and a sensor directly to the monitor head.
	If you get a SNR 2 ERR...	...replace the main extension cable.
	If you get a SNR 1 ERR...	...replace the Y-Cable.
	If problem persists...	...contact Agtron Service.
Monitor displays SNR # ERR one number above total sensors installed	The monitor is reading an incorrect number of sensors.	<p>Check all the cables and connections from the last sensor to the monitor head.</p> <p>Bypass the last sensor by connecting the second last sensor to the Sensor Loop Cable to the Y-Cable.</p>
	If the message is no longer displayed...	...replace the last sensor in the loop.
	If the problem persists...	...connect a Seed Sensor directly to the Y-Cable.
	If you get a SNR 2 ERR...	...replace the Y-Cable.
	If you get a SNR 1 ERR...	...replace the Sensor Loop Cable between the Y-Cable and the last Seed Sensor.

Tip:

When bypassing a sensor, remember the seed sensor count will be one less than before.

Type of Problem	Symptom/Diagnostic Step	Action/Information
Monitor displays SNR # ERR	The monitor is detecting an error on the indicated sensor #.	Take note of the indicated sensor number. Inspect the Sensor Loop Cables in the indicated seed sensor number location for damage. Replace or bypass any damaged cables.
	If the problem persists...	Bypass the indicated seed sensor number. This is done by unplugging the seed sensor and plugging in the cables of the seed sensor before and after together. The seed sensor count will be one less than before.
	If the message is no longer displayed...	...replace the bypassed seed sensor.
	If the problem persists...	...bypass the seed sensor before the indicated sensor number error.
	If the message is no longer displayed...	...replace the bypassed seed sensor.
	If the problem persists...	...check the Sensor Loop Cable connecting the seed sensors together, swap the Sensor Loop Cable with another Sensor Loop Cable.
	If the message is no longer displayed...	...replace the Sensor Loop Cable.
Blocked Sensors	If the problem persists...	Bypass everything but one tower and make sure no errors, keep adding piece by piece and bypass sensor or cable when error occurs.
	The sensor indicated is blocked.	Clean blockage from indicated run.
	If the indicated run is not blocked...	...verify the Sensitivity is not set too high. Check inside the distribution towers for any foreign material. This may cause blockages to move from sensor to sensor.
	If it is always the same sensor giving the blocked message...	...trade that sensor with one in another position.
	If the blocked message moves with the sensor...	...replace that sensor.
Monitor displays SNR # CLN	This indicates that the optical detectors inside the sensor tube are dirty.	Take note of the indicated seed sensor number. Clean the indicated seed sensor with warm water and a bristle pipe brush.
	If the problem persists...	...bypass the indicated seed sensor.
	If the message is no longer displayed...	...replace the bypassed seed sensor.
Monitor displays LP # OVERLOAD	This indicates that there is too large of a power draw on the indicated sensor loop number.	Check all cables.
	This is most likely a short in the sensor loop indicated.	Remove one tower, sensor or cable at a time until the message disappears. Replace the last removed part.
Calibration settings are lost	The monitoring system is not getting the proper voltage.	Ensure the monitor is connected directly to the battery terminals. Check the voltage between the red and black wires of the power cable is greater than 10 volts.
	Electrical surges due to faulty electrical system	Check the tractor battery cables, connection to the starter and alternator. Check the red wire is not connected to the starting solenoid terminal.
	If the problem persists...	...send the monitor to Agtron for repair.

Type of Problem	Symptom/Diagnostic Step	Action/Information
Monitor displays REBOOT SYSTEM 01	This indicates a memory error due to application and removal of power to the monitor.	Ensure the monitor is not connected to switched power.
	If the monitor connected to switched power...	<p>...Change the wiring to connect the monitor directly to the battery terminals of the tractor.</p> <p>Remove both the positive and negative wires from the battery and touch them together, this will reboot the system.</p> <p>Re-connect to the battery and restart the monitor as usual.</p>
	If the problem persists...	...contact Agtron Service.
Speed Sensor installed, but no speed showing	<p>This indicates that the speed sensor is not on the proper sensor channel</p> <p>OR...</p> <p>The magnet is too far from the sensor</p>	<p>Check sensor is connected properly</p> <p>Channels 1, 2, and 3 are dedicated to the DB9 connector at the bottom of the monitor head. Channels 4, 5, and 6 are dedicated to Loop 1 using the Toolbar Sensor Breakout Harness. Channels 7, 8, and 9 are dedicated to Loop 2 using the ART Toolbar Sensor Breakout Harness</p> <p>Make sure the sensor is within 1/2" of the magnet.</p>
	<p>This indicates that the shaft sensor is not on the proper sensor channel</p> <p>OR...</p> <p>The magnet is to far from the sensor</p> <p>OR...</p> <p>Wrong number of targets are entered</p>	<p>Check sensor is connected properly</p> <p>Channels 1, 2, and 3 are dedicated to the DB9 connector at the bottom of the monitor head. Channels 4, 5, and 6 are dedicated to Loop 1 using the Toolbar Sensor Breakout Harness. Channels 7, 8, and 9 are dedicated to Loop 2 using the ART Toolbar Sensor Breakout Harness</p> <p>Make sure sensor is within 1/2" of the magnet</p> <p>Make sure correct number of targets are entered (default is 1)</p>
Fan Sensor installed, but no RPM showing	<p>This indicates that the Fan Sensor is not on the proper sensor channel</p> <p>OR...</p> <p>The magnet is to far from the sensor</p> <p>OR...</p> <p>Wrong number of targets are entered</p>	<p>Check sensor is connected properly</p> <p>Channels 1, 2, and 3 are dedicated to the DB9 connector at the bottom of the monitor head. Channels 4, 5, and 6 are dedicated to Loop 1 using the Toolbar Sensor Breakout Harness. Channels 7, 8, and 9 are dedicated to Loop 2 using the ART Toolbar Sensor Breakout Harness</p> <p>Make sure sensor is within 1/16" of a ferrous metal target such as a bolt head</p> <p>Make sure correct number of targets are entered (default is 3)</p>

Type of Problem	Symptom/Diagnostic Step	Action/Information
Bin Sensor installed, but not alarming when empty	This indicates that the Bin Sensor is not on the proper sensor channel	<p>Check sensor is connected properly</p> <p>Channels 1, 2, and 3 are dedicated to the DB9 connector at the bottom of the monitor head. Channels 4, 5, and 6 are dedicated to Loop 1 using the Toolbar Sensor Breakout Harness. Channels 7, 8, and 9 are dedicated to Loop 2 using the ART Toolbar Sensor Breakout Harness</p>
Meter Sensor installed, but never alarms	This indicates that the Bin Sensor is not on the proper sensor channel	<p>Check sensor is connected properly</p> <p>Channels 1, 2, and 3 are dedicated to the DB9 connector at the bottom of the monitor head. Channels 4, 5, and 6 are dedicated to Loop 1 using the Toolbar Sensor Breakout Harness. Channels 7, 8, and 9 are dedicated to Loop 2 using the ART Toolbar Sensor Breakout Harness</p>
	To select the proper sensor channel for all Optional Sensors...	<p>From the main RATE screen, press MODE once, then CAL until the SELECT SNR CH# screen appears.</p> <p>Select the channel that the sensor is plugged into using the UP or DOWN arrows; then press OK. The SNR CH# screen appears.</p> <p>Use the arrow keys to select the Speed Sensor and then press OK.</p>
Monitor displays ERR alarms when one loop is disabled, but no alarms when both loops are enabled	This indicates loops connected but cables are crossed either going to sensor 1 or coming back from the last sensor.	<p>Carefully trace one loop of sensors to determine where the cables are crossed.</p> <p>Switch the incorrect connections to make two independent loops.</p> <p>Cycle power on the monitor head to reset the system.</p>
Monitor displays HIGH/LOW alarms, but HIGH/LOW alarms are set to 0	This indicates a problem with System Units. If the problem persists...	<p>Power down the system and turn it back on.</p> <p>...press MODE, then CAL until SYSTEM UNITS screen appears.</p> <p>Change units from SAE to METRIC using the arrow keys.</p> <p>Return to the main RATE screen and confirm HIGH/LOW alarms are set to 0.</p> <p>Change units from METRIC back to SAE.</p>
	If alarms persist...	<p>...press MODE, then CAL until the SET DEFAULT CAL screen appears.</p> <p>Press and hold OK until DEFAULT CAL is set message appears to restore to factory defaults.</p>

Type of Problem	Symptom/Diagnostic Step	Action/Information
Intermittent Communication Errors (Random Communication errors)	For stationary system testing.	<p>Check all cables for stretching or pinching. Clean any connections that may have been left open and re-apply silicone grease (Agtron part number 850039001). Look for damaged cable jackets from over-tightened tie-straps.</p> <p>Spray sensors with water if indication that the system fails after rain. Try to spray the sensor body where the cables join.</p> <p>Disconnect the last Seed Sensor output cable from the sensor loop cable.</p> <p>Disconnect tower #2 from tower #1 and check the diagnostic message. For example, if there are 10 sensors on tower #1, there should be an error showing no connection to sensor 11.</p> <p>Reconnect tower #2 to tower #1.</p> <p>Disconnect tower #3 from tower #2 and check the diagnostic message.</p> <p>Repeat for all towers.</p> <p>Reconnect the last sensor output cable to the sensor loop cable. The loop should now be complete, with no errors.</p> <p>Set the blockage Sensitivity to mid-point. For example, if the range is 1 to 100, set it to 50.</p> <p>Make sure the fan is off. Verify that each sensor reads as blocked on the second cycle.</p>
Intermittent Communication Errors (Random Communication errors)	Errors occur only when seeding (will need two 20ft Sensor Loop Cables part# 9ARTX20).	<p>Bypass all the towers except tower #1 and check for reliable operation while seeding. Bypass individual Seed Sensors until reliable operation is achieved.</p> <p>Add tower #2 and check for reliable operation. Bypass individual Seed Sensors until reliable operation is achieved.</p> <p>Repeat for all towers.</p> <p>If a reliable loop cannot be made with a single Seed Sensor, replace the main extensions, Y cable and sensor loop cables.</p>
Seed Rate shows XXXXX	Occurs when reading is above maximum number display can handle	<p>Go to Seed Rate Wizard press OK. Enter zero (0) for the desired seed rate press ok, press power make sure says maintaining and saving, power back on do seed rate wizard again(make sure seed is flowing through sensors, and no errors/blockages occurring).</p> <p>If display goes back to XXXXX do a default cal, power down head, power back on re-enter all settings.</p>

Appendix

Appendix A: Parts List

Part Number	Description
AGRTH16	Single Loop Rate and Blockage Monitor
AGRTH26	Dual Loop Rate and Blockage Monitor
850033007	RAM Mount Double Socket Arm
850033008	RAM Mount Base 1" Ball
9KRA002	ART Monitor Radar Sensor Cable Kit
9ART087	ART Monitor Sensor Breakout Harness
MNART026	Single / Dual Loop Rate and Blockage System Manual
4TYWR14.0	Black Cable Ties (14.5")
850040001	Blue Cable Ties (4")
850040002	Yellow Cable Ties (4")
9ARTM10	Main Extension Cable 10ft (3m)
9ARTM20	Main Extension Cable 20 ft (6m)
9ARTY10	ART Y-Cable
9ARTX02	ART Sensor Loop Cable 2ft (0.6m)
9ARTX04	ART Sensor Loop Cable 4ft (1m)
9ARTX10	ART Sensor Loop Cable 10ft (3m)
9ARTX20	ART Sensor Loop Cable 20ft (6m)
AGSS22	Seed Sensor 7/8" (22mm)
AGSS24	Seed Sensor 15/16" (24mm)
AGSS25	Seed Sensor 1" (25mm)
AGSS32	Seed Sensor 1 1/4" (32mm)
400TRHS16	Hose clamp size 16
AGRT071	ART Loop Terminator
Optional Sensors	
Part Number	Description
9AWS001	Handheld Work Switch
9ART089	3P Deutsch DTM Connector with Bare Wire Ends
AGSH001	Low RPM Reed Switch Sensor 20ft (6m)
AGSH002	Low RPM Reed Switch Sensor 6ft (1.8m)
AGBN008	Bin Level Sensor 20ft (6m)
AGBN007	Bin Level Sensor 6ft (1.8m)
AGIND01	Inductive Proximity Sensor 20ft (6m)
AGLS002	Inductive Proximity Sensor 18 mm High Sensitivity 6ft (1.8m)
9KRT069	3P Deutsch DTM Connector to Relay Kit
9ART091	3P Deutsch DTM to AMP CPC Radar Y-Cable
9ART090	3P Deutsch DTM to AMP CPC Radar Adapter
9AGPS01	GPS Speed Sensor (5Hz Update Speed)
9AGPS02	GPS Speed Sensor (1Hz Update Speed)

Appendix B: Optional Sensors

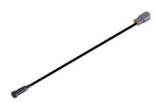
This section describes the optional sensors that can be added to the cart.
See installation Figures.

Bin Level Sensor-AGBN007/AGBN008



Infrared bin level sensor 5 1/2" x 1 1/2" x 1 3/4", mounts using 2 x #8 Phillips screws – #32 x 1/2" or #32 x 1" (included), 2 x P-Clips and 2 x #10 self-tapping screws 3/4" x 3/16" (included for securing cable), 6FT or 20FT cable with 3 pin DTM series Deutsch connector.

Shaft/Speed/Work Switch Sensor-AGSH001



Low RPM Reed Switch Sensor 1/2" diameter, mounts using 1/2" P-clip and #10 self-tapping screw 3/4" x 3/16" (included), 3/16" P-clip and #10 self-tapping screw 3/4" x 3/16" (included for securing cable), 2 x magnet .950" x .500" x .125" (included), 20FT cable with 3 pin DTM series Deutsch connector.

Fan Sensor-AGIND01



Inductive Proximity Sensor 1/2" diameter, mounts using 1/2" mounting bracket (not included), 1/2" P-clip and #10 self-tapping screw 3/4" x 3/16" (included for securing cable), 20FT cable with 3 pin DTM series Deutsch connector.

GPS Speed Sensor-9AGPS01/9AGPS02



GPS Speed Sensor 2 1/2" diameter, bottom plate on the receiver provides a magnetic mount or 2 x dual lock Velcro (included), 10FT cable with 3 pin DTM series Deutsch connector.

Relay Kit-9KRT069



Relay mounts using #10 self-tapping screw 3/4" x 3/16" (included), 2 x Butt splices for connecting power and ground (included), 1FT cable with 3 pin DTM series Deutsch connector.

Bare Wire Cable-9ART089



Bare Wire cable allows connection of 3rd party sensors White wire power, Red wire signal and Black wire ground, 4FT cable with 3 pin DTM series Deutsch connector.

Radar Cable-9ART090



Radar Cable uses a 4 pin CPC connector which connects to DICKY-john's Radar II or equivalent. A mating cable may be required from the maker of the radar to mate to the 4 pin CPC connector, the cable has a 2 position Deutsch DT series connector that allows you to select if the radar is powered from our monitor or not. Power would be removed if the radar signal is connected via a Y-Cable and is already powered by another device. To disconnect the 12V power, remove the connector with the jumper wire and install a connector with just sealing plugs (included), 4FT cable with DTM series Deutsch connector.

Radar Y-Cable-9ART091



Radar Y-Cable uses 4 pin CPC connectors which connect to DICKY-john's Radar II or equivalent. A mating cable may be required from the maker of the radar to mate to the 4 pin CPC connectors, This Y-Cable allows the radar to still be connected to a 2nd monitor. Only the signal and ground wires are spliced into the monitor. In this configuration, the Agtron product does not power the radar, 4FT cable with DTM series Deutsch connector.

Appendix C: Monitor Display Messages

Message	Meaning
BLK	Blockage in sensor
CLN	Clean sensor
SYSTEM VOLT LOW	Low Voltage
XXXXXXX.X	Accumulated value too large to display
LP1 DISABLED LP2 DISABLED	All sensors in loop are turned off
ERR	Error in sensor
LOW	below low alarm setting
HIGH	above high alarm setting
WORKSWITCH OFF WORKSWITCH ON	Work Switch is in the Off position Work Switch is in the On position
REBOOT SYSTEM 01	Internal memory error
LP1 OVERLOAD LP2 OVERLOAD	Power draw in loop too large
LP1 SENS OFF LP2 SENS OFF	Sensitivity is set to 0
LP1 SEARCHING LP2 SEARCHING	No sensors detected in loop (followed by an error message)
LP1 ALL SNRS BLK LP2 ALL SNRS BLK	All sensors blocked (usually shown when not seeding)
CALCULATION FAIL BLOCKED SENSORS	An error or blockage was occurring while doing the Seed Rate Wizard
MAINTAIN POWER SAVE IN PROGRESS	Monitor is saving settings before powering down. Do not disconnect from power during this process

Appendix D: Seed Sensor Sensitivity Values

The following sensitivity settings provide a guideline for setting your Seed Rate Monitor sensitivity:

Sensitivity	Seeds/second	Sensitivity	Seeds/second
0	Loop is off	80	281
1	1 seed 30 seconds	90	539
5	1 seed 20 seconds	100	1043
10	1 seed 10 seconds	110	2019
15	1	120	4400
20	7	121	4800
30	17	122	5300
40	27	123	5800
50	44	124	6400
60	80	125	7000
70	148		

Product	Sensitivity

Appendix E: Conversion Factors

To convert from Imperial to Metric measurements, multiply by the following factors.

To Convert	To	Multiply By
Inches	Millimeters	25.4
Feet	Meters	0.3048
Yards	Meters	0.9144
Miles	Kilometers	1.609
Square Foot	Square Meters	0.0929
Acres	Hectares	0.4047
Pounds	Kilograms	0.4536
Cubic foot	Cubic Meter	0.02832
Bushels	Cubic Meters	0.03524
Pounds/Square Inch	Kilopascals	6.8948
Pounds/Square Inch	Bar	0.06895
Pounds-Force-Foot	Newton-Meters	1.3568
Miles-Per-Hour	Kilometers-Per-Hour	1.609
Pounds-Per-Acre	Kilograms-Per-Hectare	1.1209
Acre-Per-Hour	Hectare-Per-Hour	0.405
Feet-Per-Minute	Meters-Per-Second	0.005
Feet-Per-Second	Meters-Per-Second	0.305
Horsepower	Kilowatt	0.746
27 in. of Water =1 psi		

Appendix F: Default Calibration Values

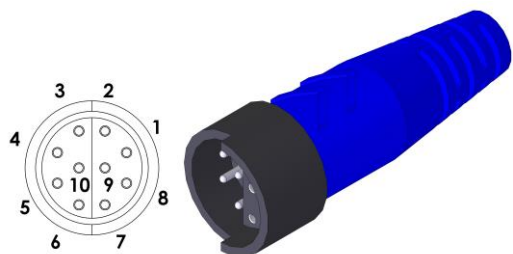
You can reset all values to their defaults using the CAL key. This is useful if the system is not operating as expected. If the memory is corrupted, a Default Cal message will be shown.

Parameter	Value	Parameter	Value
Loop 1 sensitivity	15	Loop 2 sensitivity	15
Loop 1 Enable	ON	Loop 2 Enable (Dual Loop)	ON
Loop 1 Low alarm	0	Loop 2 Low alarm	0
Loop 1 High alarm	0	Loop 2 High alarm	0
Loop 1 Rate Units	LBS/AC	Loop 2 Rate Units	LBS/AC
Test speed	0	Audible alarm	ON
Width	480	Hours	0
System Units	SAE	Mins	0

The following are Default Calibrations when Optional Sensors are installed, When a Default Calibration is performed on the monitor the following will no longer be saved on the monitor.

Parameter	Value	Parameter	Value
Fan Sensor MUST be Installed for the following		Shaft Sensor MUST be Installed for the following	
Fan 1 targets	3	Shaft 1 targets	1
Fan 1 Low alarm	3000	Shaft 1 Low alarm	10
Fan 1 High alarm	9000	Shaft 1 High alarm	250
Fan 2 targets	3	Shaft 2 targets	1
Fan 2 Low alarm	3000	Shaft 2 Low alarm	10
Fan 2 High alarm	9000	Shaft 2 High alarm	250
Speed Sensor MUST be installed for the following		Shaft 3 targets	1
Circumference	120.00	Shaft 3 Low alarm	10
Area 1	0	Shaft 3 High alarm	250
Area 2	0	Shaft 4 targets	1
Distance	0	Shaft 4 Low alarm	10
Work Switch Sensor MUST be installed for the following		Shaft 4 High alarm	250
Work Switch Logic	Normal		

Appendix G: ART Toolbar Sensor Breakout Connector Pin-out

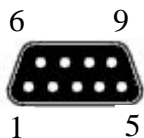


When looking at the cable arrows are at the top.

Pin #	Color	Use
1	Grey	Shield
2	Black	Ground
3	Yellow	Seed sensors (do not use)
4	Green	Seed sensors (do not use)
5	Brown	Loop 1 – sensor channel 4 Loop 2 – sensor channel 7
6	Red	Loop 1 – sensor channel 5 Loop 2 – sensor channel 8
7	White	12 Volt power
8	Blue	Seed sensors (do not use)
9	Violet	Seed sensors (do not use)
10	Orange	Loop 1 – sensor channel 6 Loop 2 – sensor channel 9

Appendix H: DB9 (9 Pin) Connector Pin-out

When looking at the monitor head:



Pin #	Signal
1	12 Volt power
2	Not used
3	Not used
4	Ch 2 signal
5	Ground
6	Not used
7	Not used
8	Ch 1 signal
9	Ch 3 signal

Appendix I: Deutsch DTM Connector Pin-out



Pin #	Color	Signal
1	White	Power
2	Red	Signal
3	Black	Ground

Notes

Warranty

Warranty Guidelines

Warranty covers all defects in workmanship or materials in your Agtron Enterprises Inc. product under normal use .

1. This warranty coverage applies only to the original owner and is not transferrable.
2. To receive warranty, send the defective part and proof of date of purchase to your local dealer. The dealer will contact Agtron Enterprises Inc. for a return authorization number and supply the replacement warranty parts.
3. If replacement parts are sent by Agtron Enterprises Inc., the customer will have 30 days to return the original defective product. A credit card is required and after 30 days the customer will be charged if the defective product is not received by Agtron Enterprises Inc. Go to www.agtron.com for shipping details.
4. Any product failures during the warranty period may be repaired or replaced with new or rebuilt product by Agtron Enterprises Inc. discretion.
5. Troubleshooting, removal, installation labor and shipping to Agtron are the responsibility of the customer.
6. Damage from neglect, accidents, fire, liquids, chemicals, other substances, flooding, vibrations, excessive heat, power surges, excess supply voltage, incorrect supply voltage, radiation, electrostatic discharges including lightning, other external forces and impacts are not covered under warranty.
7. There are no customer serviceable parts. Removing a security screw will void the warranty.
8. Unauthorized modifications will void the warranty.
9. Any usage outside of the intended use will void the warranty.

Product Returns

1. If unsatisfied, a full refund is offered within 30 days from the date of purchase. To receive the refund, contact Agtron Enterprises Inc. for a return authorization number. Product returned after 30 days will be charged a 15% restocking fee. No refund is available on product returned 52 weeks after the date of purchase. Go to www.agtron.com for shipping details.

Conditions of Use

1. Agtron Enterprises Inc. takes no responsibility for injuries, damages, or losses due to the use, misuse, abuse, or failure of this equipment. It is the responsibility of the customer to understand the operation and to ensure that it is operating properly.
2. All products produced by Agtron Enterprises Inc. are intended for use with agricultural implements. Any other application has not been considered; therefore complying with regulations is the sole responsibility of the customer.

