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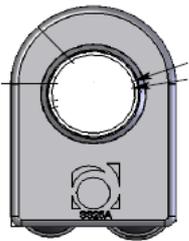
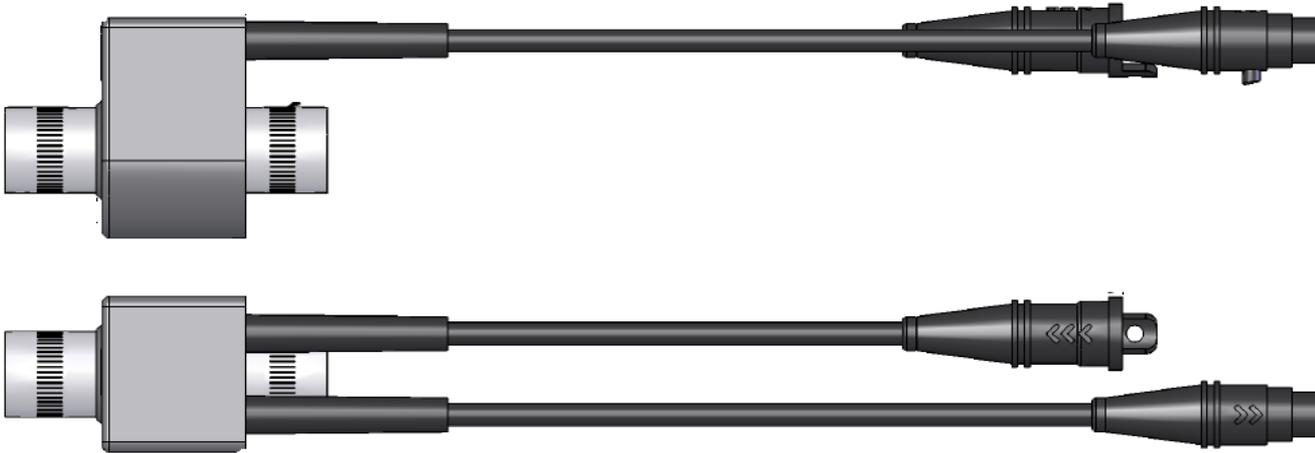
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**Morris Industries 2015**

# Agenda

- ART Sensors, Cables and Installation
- ART100 Advanced Blockage Monitor
- ART260 Dual Loop Rate & Blockage System
- Wi-Fi ART Diagnostic Service Tool
- Questions

# Seed Flow Sensors



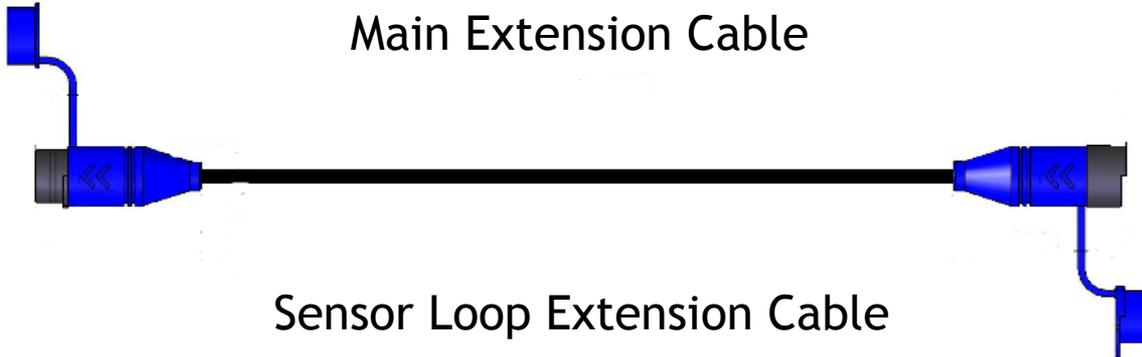
- Use infrared technology to detect particles moving through the sensor
- Connect in a loop, communication is directional (one-way)
- Compatible with all Agtron ART systems

# Seed Flow Sensor Installation



# ART System Cables

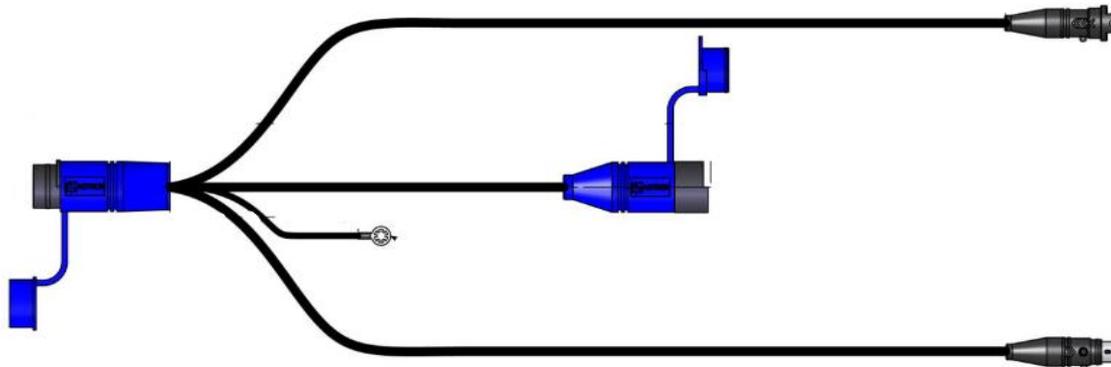
Main Extension Cable



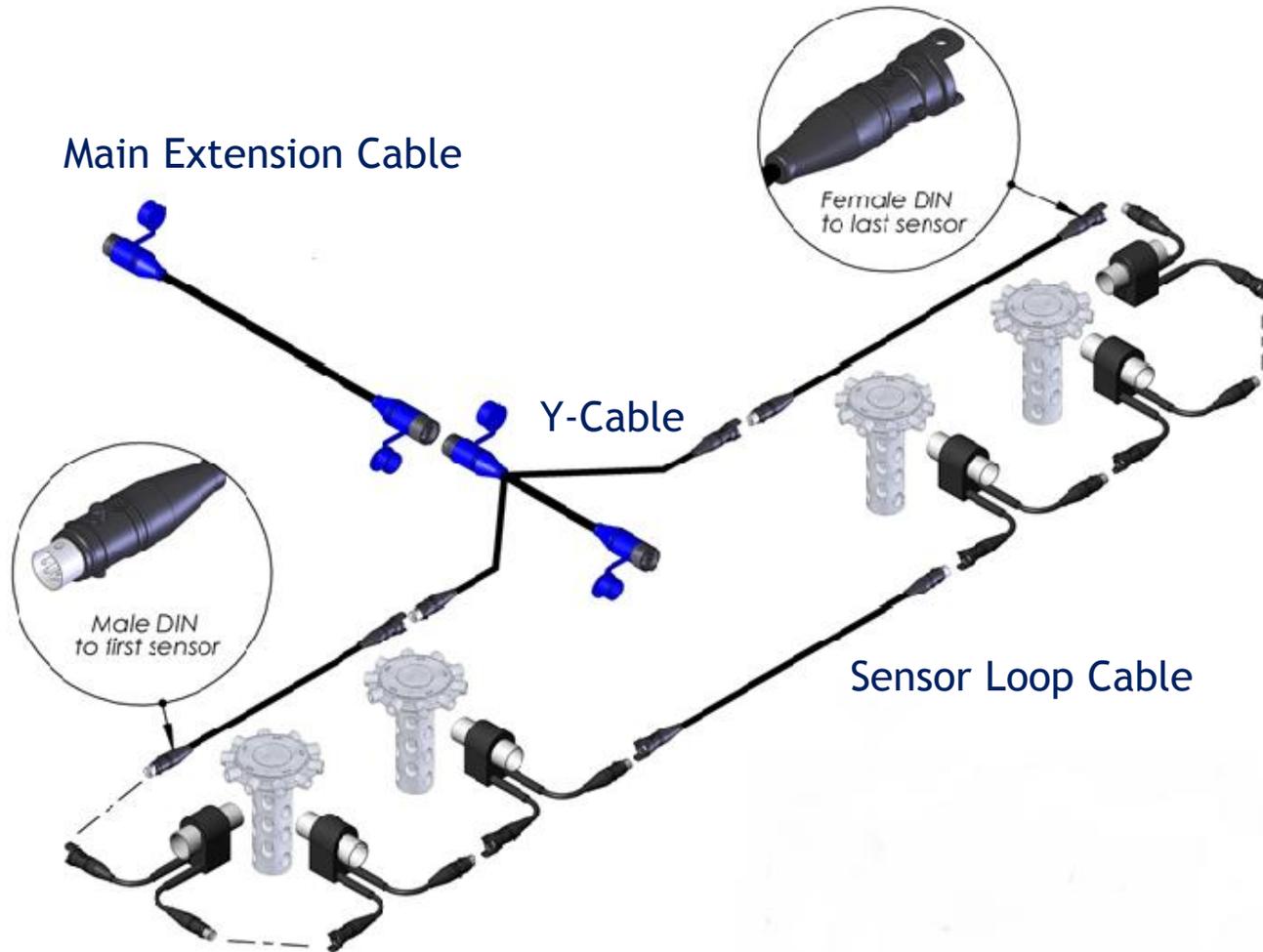
Sensor Loop Extension Cable



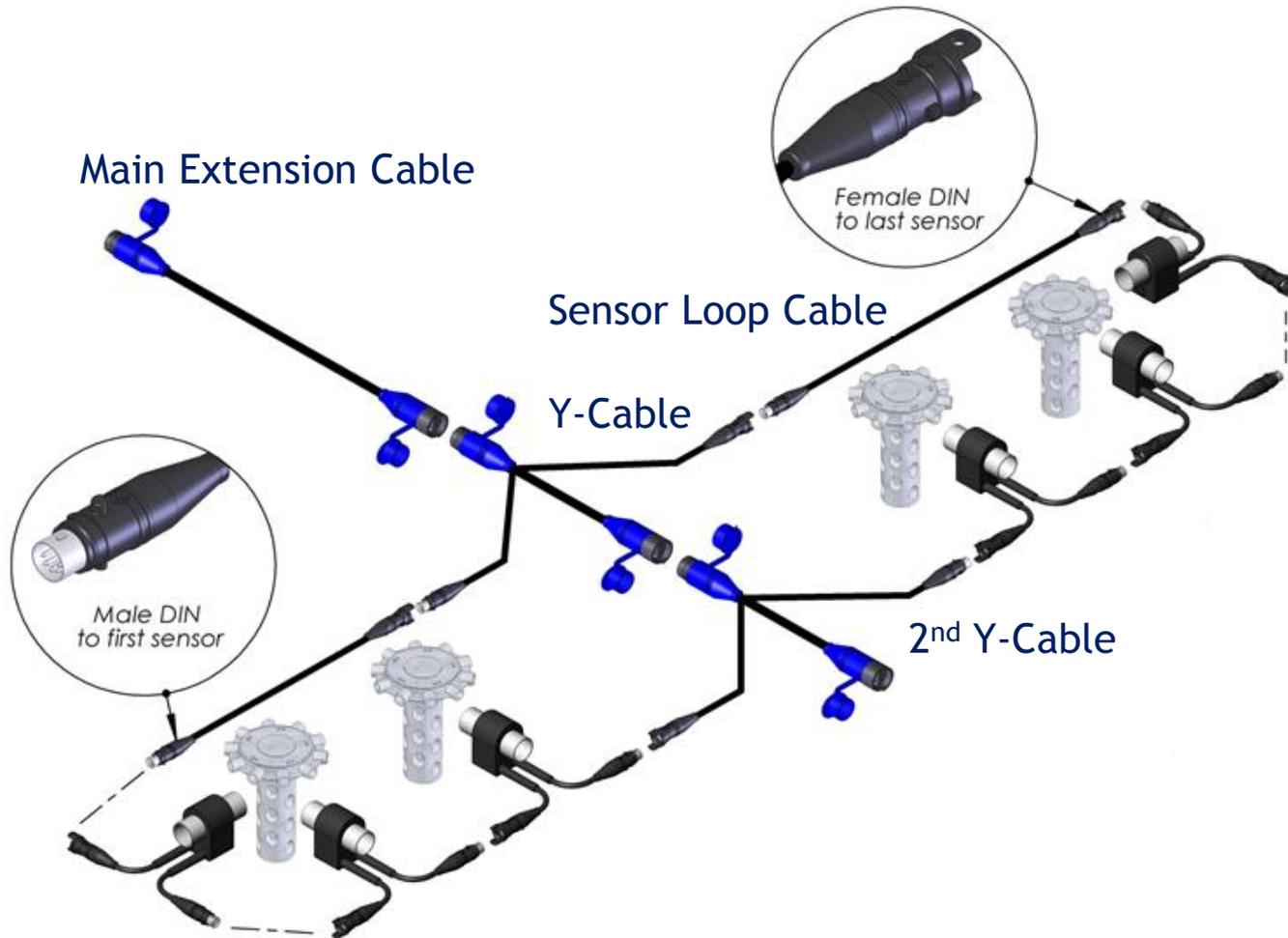
Y-Cable



# Installation with Less than 60 Sensors



# Installation with More than 60 Sensors



# ART100 Advanced Blockage Monitor



## Key Features

- Blockages are indicated by sensor number
- 100 Blockage Sensitivity Levels
- Rate feedback in Seeds/Min
- Connect up to 120 ART type Seed Flow Sensors

# Setup/Calibration

MNART1004

## Quick Start Guide

To turn on, press the POWER button. To turn the system off, press and hold the POWER button for five (5) seconds.

### Set Sensitivity

The Sensitivity value must be set for Block mode to function. Follow this procedure to change the Sensitivity value:

1. Press the Sens button.
2. Use the arrow buttons to set the Sensitivity value; See **Appendix A** for sensitivity values.
3. Press any mode button to complete the change.

Follow one of these two procedures to set the Sensitivity value for the Seed Sensors.

#### Method 1:

1. Manually check for any blockages.
2. Begin seeding.
3. Press the Block button.
4. Press the SENS button. If blockage alarms are not issued, use the UP arrow button to increase the sensitivity value by 10 until blockage alarms occur, repeating Step 2 to 4.
5. Use the DOWN arrow button to decrease the sensitivity value by three until blockage alarms are no longer issued.

#### Method 2:

1. Calculate the ground speed in feet or meters per second. Ex: *The ground speed is 8 Km/h. (8 Km/h X 1000 m) / 3600 s = 2.22 m/s.*
2. Calculate the area coverage per second. The width of the implement is required. Ex: *The implement width is 12 m. (2.22 m/s X 12 m) = 0.002664 hectares/s.*
3. Using the average of the number of seeds per pound or kilogram from **Appendix B**, calculate the application rate. Ex: *Two row barley has an average of 22,046 seeds/Kg. 35 Kg/Ha X 22,046 seeds/Kg = 771,610 seeds/ Ha.*
4. To calculate the application rate in seeds per second, multiply the area coverage calculated in Step 2 by the application rate calculated in Step 3. Ex: *0.002664 hectares/s X 771,610 seeds/ Ha = 2056 seeds/s*
5. To calculate the Sensitivity value, divide the application rate calculated in step 4 by twice the number of openers. Record the product name and sensitivity value in **Appendix A**. Ex: *The implement has 50 openers, 2056 seeds/s / 100 = 21 seeds/s. The sensitivity value is 18*

#### Tips:

The goal is to have the Sensitivity value as high as possible without giving constant alarms. If a seed sensor measures fewer seeds per second than the Blockage Sensitivity value indicates, a blockage alarm is occurs.

A Sensitivity value of zero (0) will disable the power and alarms to the Seed Sensor Loop. The default value is 15.

- Sensitivity is the minimum seeds/second sensors need to detect or blockage alarms will occur
- Calibrate when changing product or rates
- Write it down

# Error Messages

- END: Indicates a complete loop of seed sensors is detected
- ERR: Communication error at the identified Seed Flow Sensor number
- CLN: Clean error, look for a complete blockage at the opener or buildup on the sensor eyes
- ---: Blocked seed flow sensor indicated by number
- OFL: Seed Rate above 99.99 millions of seeds per minute detected

# Troubleshooting ERR

- Communication error at the identified sensor number
- Look for cable disconnect or damage between the identified sensor and the previous sensor
- Bypass the identified sensor
- Bypass the previous sensor
- Replace any Sensor Loop Extension cables between the two sensors
- Questions?

# ART260 Dual Loop Rate & Blockage Monitor



# Blockage Mode & Sensitivity

- Minimum seeds/second seed sensors need to detect or blockage alarms will occur
- Used only for blockage monitoring
- Calibrate when changing product or rates
- Calibrate Loop 1 & 2 separately
- Write it down



# Rate Mode & Seed Rate Wizard

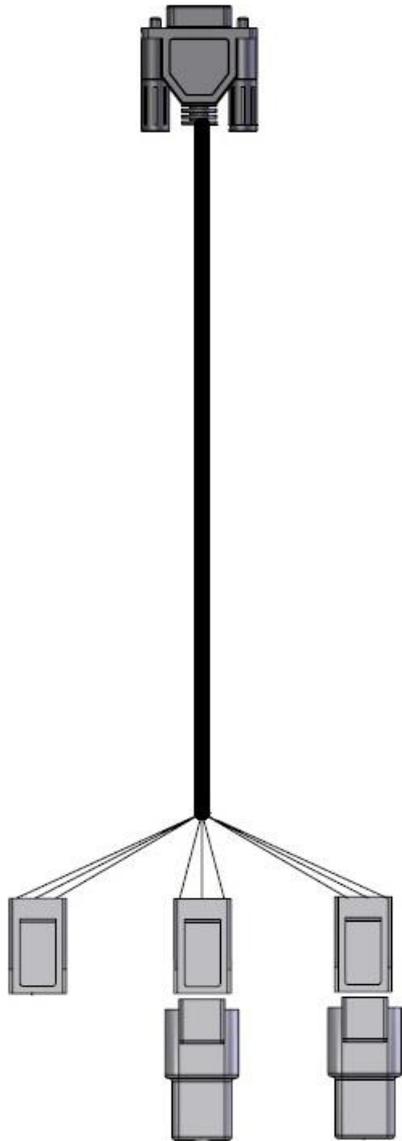
- Monitors changes in rate, use to detect partial or full blockages
- Must be seeding, with no errors or blockage alarms
- Speed input is needed (Test, Wheel, Radar, GPS)
- Should not be used to calibrate air cart seed rates



# Optional Sensors

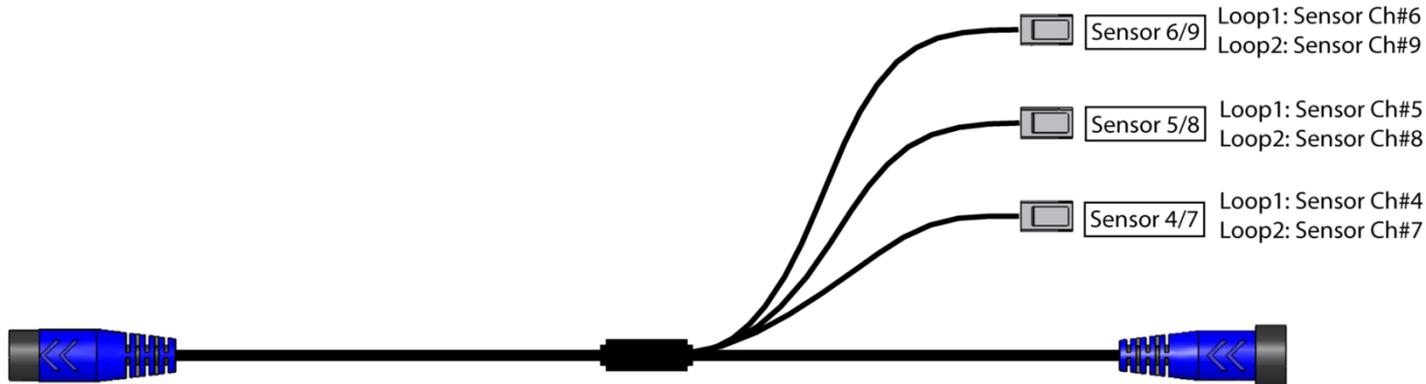
- Can connect up to 9 Optional Sensors
- Fan Sensor
- Shaft Sensor
- Bin Sensor
- Meter Sensor
- Speed Sensor
- Work Switch Sensor

# Monitor Sensor Breakout Harness



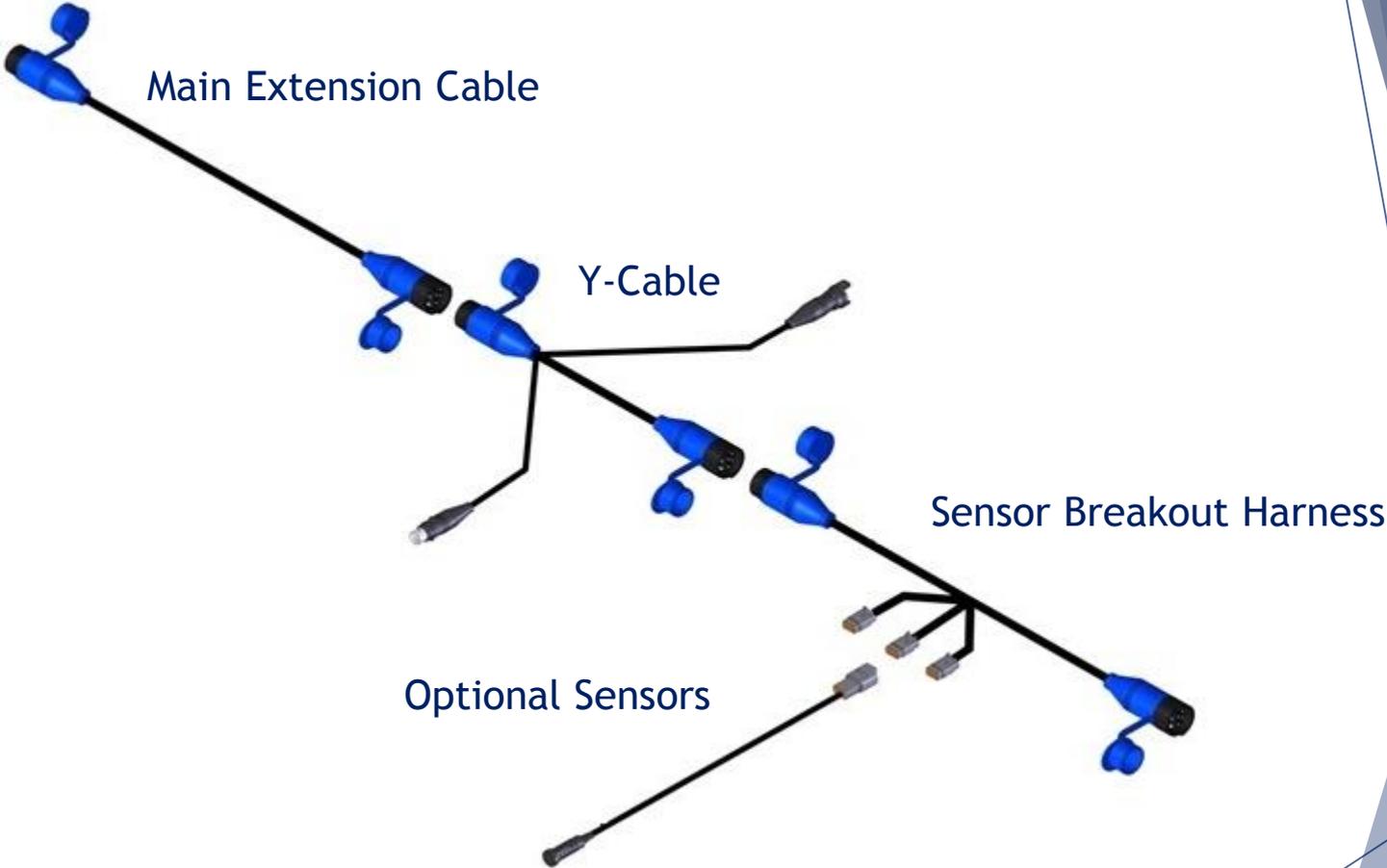
- Used to connect up to 3 optional sensors directly to the ART260 Monitor Head
- Typically used for GPS or Radar speed sensor connectivity

# Toolbar Sensor Breakout Harness

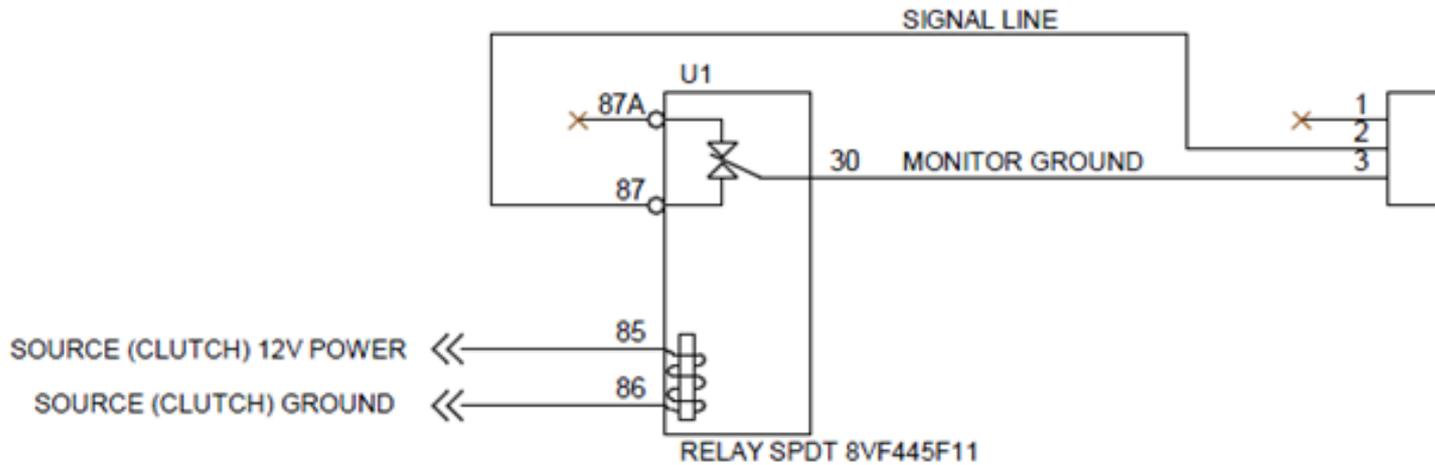


- Channels 4,5 and 6 are used if sensor breakout harness is connected to Loop 1
- Channels 7,8 and 9 are used if sensor breakout harness is connected to Loop 2

# Connecting to a Morris work switch



# Connecting to a clutch



# ART260 Troubleshooting

## Points of Failure

- Cables
- Sensors
- Monitor Head

# ART260 Alarms

- BLK - sensor detects blockage
- LOW - rate below low alarm setting
- HI - rate above high alarm setting
- ERR - error with a sensor and/or cable
- CLN - sensor optics require cleaning
- XXXX- counter above max number

# Problem: Loop Overload

Diagnosis: Loop Overload is triggered when there is a current draw greater than 15 amps.

**NOTE:** In order to reset a Loop Overload Error - you **MUST** disconnect the system from the battery, otherwise the Monitor head will not reset.



## Solution:

1. Use the power button to turn off the monitor, then disconnect the system from the battery.
2. Create a loop of 0 sensors by plugging the Y-Cable into itself. If the monitor powers on and still displays Loop Overload, replace the monitor. If monitor doesn't display error follow steps below.
3. Create a loop of only half the manifolds on the machine. (ex. Between manifold 4-5 on an 8 manifold toolbar). Then reconnect the monitor to the battery and power up.
4. If the Loop Overload error is gone, you know the cable issue is in the 2<sup>nd</sup> half of the sensor loop and you should continue adding parts back into the system until you find the failed part.

OR

4. If the Loop Overload alarm remains, you know the cable issue is in the 1<sup>st</sup> half of the sensor loop and you should split the system in half again, but don't forget to reset the monitor's power at the battery.
5. Continue adding or removing parts one at a time until you find the failed part.

# Problem: Loop 1 Sensor 65 Error on a system with only 64 sensors

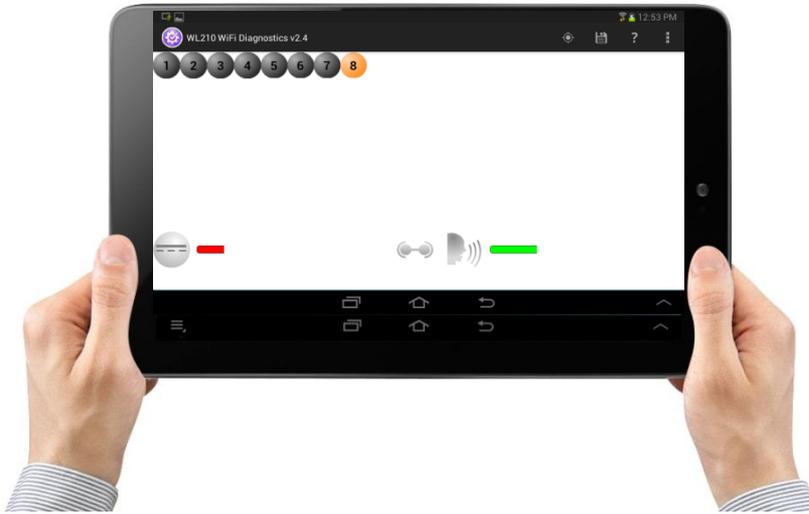
**Diagnosis:** There is a communication error between the last sensor in the loop, #64, and the y-cable.



## **Solution:**

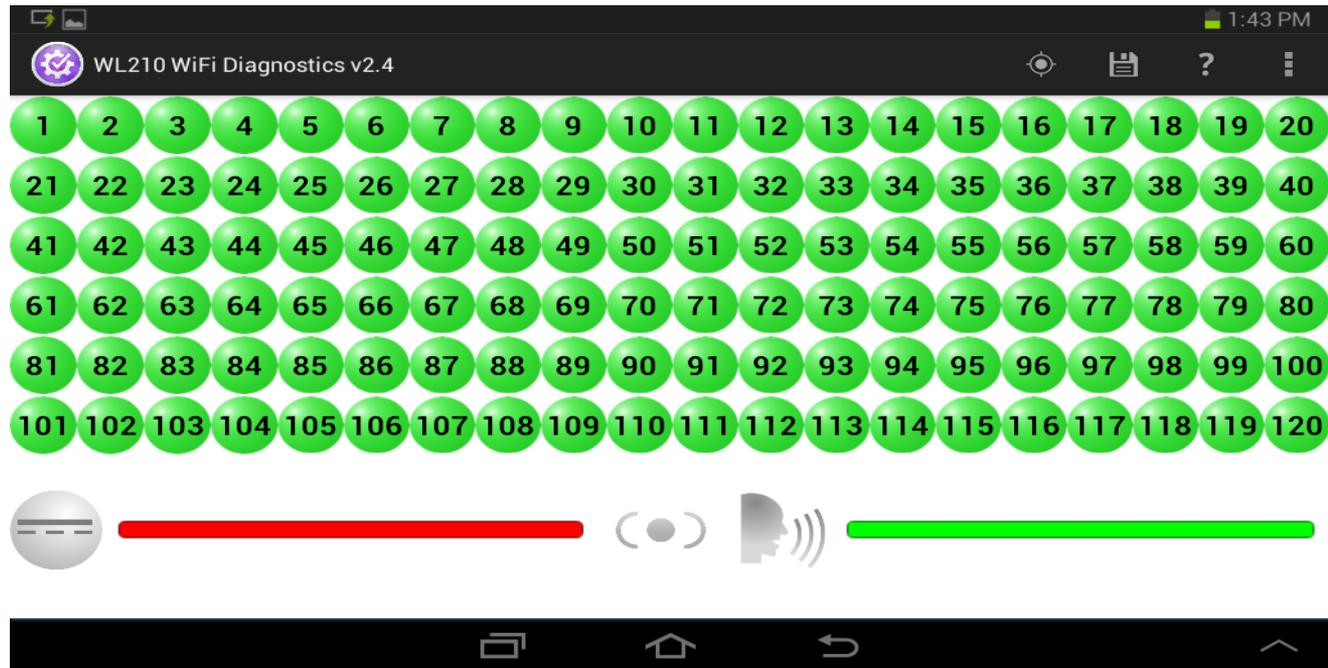
- 1. Bypass the last sensor, replace if the error disappears.**
- 2. If the error remains, connect a single sensor to both ends of the y-cable, if you see a LP1 SNR 2 ERR, replace the y-cable**
- 3. If the monitor finds a loop with 1 seed sensor. Replace all sensor loop cables between the Y-Cable and the last seed sensor.**

# Wi-Fi ART Diagnostic Service Tool



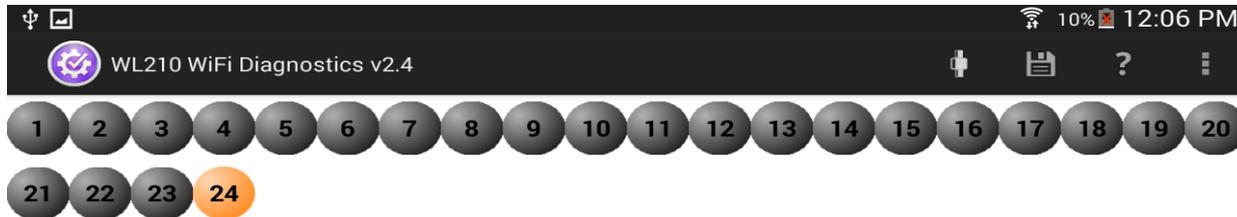
- Help diagnose sensor & cable failures in the field
- Works on any systems that use ART type sensors
- Android app runs on a tablet for wireless operation

# Wi-Fi ART Diagnostic Operation



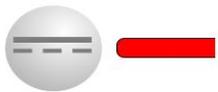
- Sensors are represented by an icon on the main screen. Green icons identify sensors as communicating and operating correctly
- Up to 120 sensors in a single loop can be checked at a time

# Wi-Fi ART Diagnostic Operation



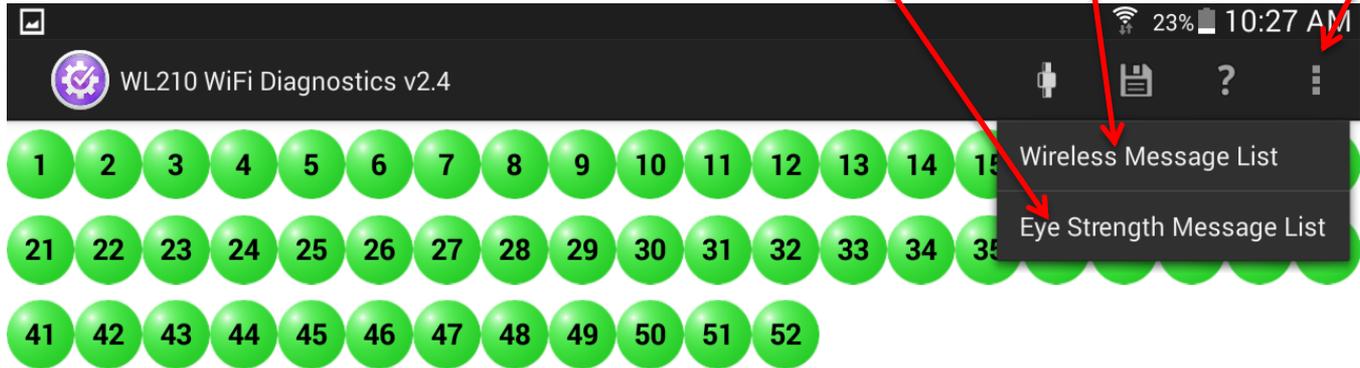
- Communication Errors are identified by an Orange Icon
- Grey icons indicate those sensors are not currently communicating with the tablet

# Wi-Fi ART Diagnostic Operation



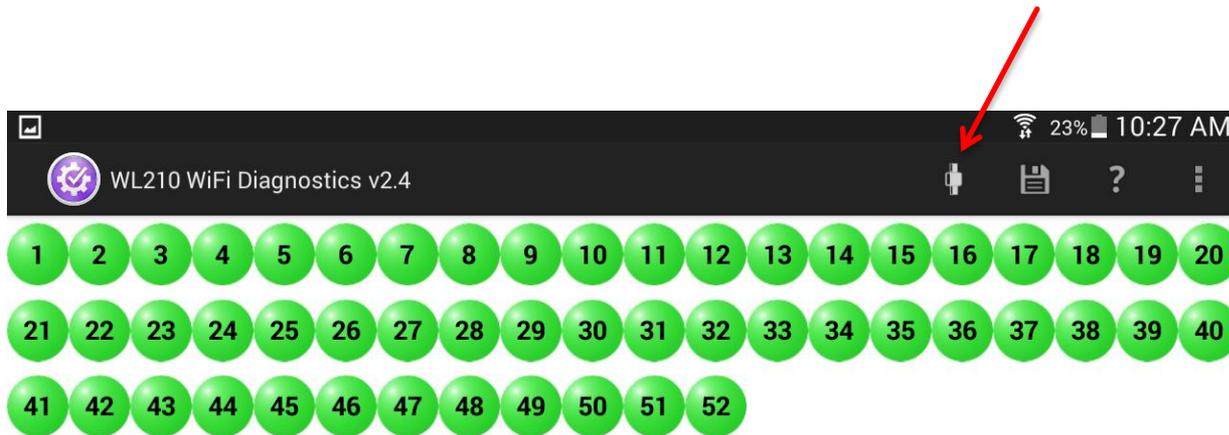
- Faulty sensors are indicated by a red icon

# Wi-Fi ART Diagnostic Operation



- Additional Diagnostic Information available to help troubleshoot if needed

# Wi-Fi ART Diagnostic Operation



- Single Sensor testing available to confirm faulty sensors, test results can be saved as needed



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**Questions?**

- What does the ART100 monitor?
  - Seeding rate in lbs/ac
  - Speed
  - Blockage
  - Acres
- How many sensors can be connected to the ART100?
  - 240
  - 120
  - 100
  - 110
- What does it mean when ERR with a number is displayed on the ART100?
  - That sensor is blocked
  - That sensor is dirty
  - That sensor has something stuck inside of it
  - That sensor is not communicating
- What does --- beside a number mean on the ART100?
  - That sensor is disconnected
  - That sensor is blocked
  - That sensor is not communicating
  - That sensor is dirty

➤ What is a sensor breakout harness and where is it used?

- For adding sensors for fan speed or work switch
- For adding more seed sensors in the middle of a seed loop
- For adding sensors to the monitor in the tractor
- For adding sensors to monitor blockage

➤ How many optional sensors can be added to an ART260?

- 13
- 4
- 9
- 6

➤ Why would you need a 2<sup>nd</sup> y-cable in a sensor loop?

- To provide power to the seed sensors
- To plug a sensor breakout harness into
- To terminate the sensor loop
- To hook up another sensor loop

➤ What is the Sensitivity setting for?

- To set the work switch sensitivity
- To set the seed sensor infrared beam strength
- To set the minimum pulses/s of the speed sensor
- To set the minimum seeds/s the sensors must detect

- What is the Seed Rate Wizard?
  - A function for setting the sensitivity for blockages
  - A function for calibrating the air cart
  - A function for setting the seed rate
  - A function for calibrating the speed sensor sensitivity
- What causes an OVERLOAD alarm?
  - A damaged cable or sensor causing a current draw of over 15 amps
  - A damaged cable or sensor causing a current draw of over 10 amps
  - A damaged cable causing voltage less than 12 volts
  - A damaged work switch causing intermittent communication

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