# ENGAGE® SPREADCONTROL

# TROUBLESHOOTING GUIDE

Document revision: 1.1

Last revised: October 13, 2020

# Engage® SpreadControl
# Troubleshooting Guide

Intelligent Agricultural Solutions, 1810 NDSU Research Circle North, Fargo, ND 58102 USA.

Visit us online at www.intelligentag.com/support
Questions? E-mail us at info@intelligentag.com

# Record of Revision

| Revision Number | Change Description | Revision Date | Inserted By |
|---|---|---|---|
| 1.0 | Initial release | 7/28/20 | AAL |
| 1.1 | Updated tools list, added part numbers, updated harness diagram. | 10/13/20 | AAL |

# Table of Contents

**TIP:** Refer to the wiring harness diagram in Appendix A and the pinout information in Appendix B.

# Commonly used tools and equipment

- Crescent wrench
- Dry cloth
- Contact cleaner
- Philips screwdriver
- 7/16" wrench (qty. 2) and socket
- 9/16" wrench and socket
- 15/16" wrench
- 7/8" wrench
- M13 socket
- Torque wrench
- Wire cutter

# What Raven Viper 4 firmware version should I have?

Intelligent Ag recommends firmware version 3.5.2.2. For instructions to update your firmware, refer to your Raven Viper 4 Operation Manual.

# Machine doesn't maintain application rate

1. Recalibrate the rate valves (Refer to *Calibrating Rate Valves and PWM Settings* in the Engage SpreadControl Operator's Guide).

2. Swap the wiring of the affected rate valve with another rate valve. If the issue switches to the other bin, contact your AGCO dealer for a new rate valve.

3. Check the motor mounted conveyor drive manifold (353070-000345 or 353070-000346) for obstructions. If the manifold assembly is open when it should be off, or closed when it should be on, contact Intelligent Ag.

4. Recalibrate the bins (Refer to *Calibrating the Bins* section in the Engage SpreadControl Operator's Guide).

5. Refer to your AGCO Air Max Precision operator's manual for additional troubleshooting steps.

# Conveyor will not turn on

1. Make sure that the fan is on.

2. Make sure that the bins are enabled in the SpreadControl screen.

3. Make sure that all section switches in the cab are up (enabled).

4. Make sure that the rates are a non-zero number. Check both SpreadControl and Raven rates.

5. Make sure that the master apply switch is on.

6. If running from Raven, make sure you have GPS lock.

7. Refer to the steps in *Machine doesn't maintain application rate* above.

8. Refer to the hydraulics section of your AGCO Air Max Precision operator's manual for additional troubleshooting steps.

# Conveyor will not turn off

Debris may be caught in the valve, keeping it open. Refer to the steps in *Machine doesn't maintain application rate* above.

# Bin shows empty when there's product in it

Check for an issue with the signal wire.

1. Unplug the bin level sensor. If the bin reads full, Contact your AGCO dealer for a new bin level sensor.

2. Unplug the PM4X (153510-000046) connector(s) for the correct bin level sensor (power, ground, and signal lines).

   • If the bin reads full, check the harnessing and its connectors for damage.

   • If it still reads empty, contact Intelligent Ag for a new PM4X.

# Product isn't dispensing at the correct rate

1. Refer to the steps in *Machine doesn't maintain application rate*.

2. Check the bin motor encoder harnessing and connectors for damage.

3. Turn the motor and verify that the shaft on the encoder spins.

4. Refer to the hydraulics section of your AGCO Air Max Precision operator's manual for additional troubleshooting steps.

# Fan speed shows zero even though fan is running

1. Make sure that the fan speed sensor mounting is aligned with the fan.

2. Check the fan speed sensor harnessing and connectors for damage.

3. Contact your AGCO dealer for a new fan speed sensor.

# Machine spreads unevenly across the boom

1. Verify that the right funnel box (153510-000141) is installed on the right side of the machine, and the left funnel box (153510-000144) is installed on the left side of the machine.

2. Verify that the boxes are actuating properly. Refer to the steps in *Actuators won't move* below.

# Actuators won't move

1. Check both connectors on the actuator power harness (353050-000068) for corrosion or damage. Clean any corrosion with contact cleaner.

2. Try to manually move the deflector.

   a. Uninstall the funnel box (153510-000141 or 153510-000144) from the floater. Then, remove the funnel box cover and remove the pin that connects the funnel box to the actuator.

   b. Try to manually move the deflector. If you cannot manually move the deflector, clean the deflector and funnel box.

3. Make sure that the actuator power fuse (by the battery terminals) is not blown.

4. Manually move the actuator to the middle position.

   a. Use a Phillips screwdriver to unscrew the plastic cap on the back of the actuator.

   b. Use a 6mm socket to twist the exposed hex stud.

   - Turn the stud counter-clockwise to extend the box position.
   - Turn the stud clockwise to retract the box position.

# There is an actuator alarm on the VT screen

| Alarm | Red Color | Green Color |
|---|---|---|
| Voltage | No power. Check the connection on the 2 pin connector on the funnel box actuator | No issue |
| Overload | Funnel box actuator is overloaded.<br>1. Clean the funnel box, especially around the actuator.<br>2. Inspect funnel box for mechanical damage which impedes motion of the pivot.<br>3. Power-cycle (i.e. un-mate and re-mate the power connector) the affected actuator with the system powered up and operating. | No issue |
| Connection | No communication. Check the connection on the 4 pin connector on the actuator. | No issue |
| Bin Empty Alarms | Bin is empty | Bin is full |

# There is a PM4X alarm on the VT screen *or* The PM4X LED is blinking

When the red LED on the PM4X (153510-000046) is blinking, check the Engage SpreadControl Alarms screen for more information.

If the problem does not resolve after completing the troubleshooting steps below, make note of the error message and call Intelligent Ag for further information.

| PM4X Blinks* | Meaning | Alarm Text | Troubleshooting Steps |
|---|---|---|---|
| 1, 2, or 3 | CAN Comm Error | IO400 Bin *X* Timeout | 1. If all bins report this error, check the Main System harness (353050-000065). Check the 4-pin connector power (red), black (ground), green and yellow (CAN) wires of the Main System harness connected to the PM4X (153510-000046) with the error.<br>2. Swap the 4-pin power/CAN connector with another PM4X.<br>• If the error **changes** to the second bin's PM4X, contact Intelligent Ag for a replacement harness.<br>• If the error **does not change** to the second bin's PM4X, contact Intelligent Ag for a replacement PM4X. |

| 4 or 8 | Output Overcurrent | Bin *SN* Bank *X* Pin 5-6 Overcurrent<br><br>*SN = PM4X serial number* | 1. Check for damage to the wiring both at the PM4X (153510-000046) and the sensor, valve, or switch that it connects to. Repair any damage.<br>2. Unplug the sensor, valve, or switch and cycle power to the system. If the error goes away, install a new sensor, valve, or switch.<br>3. Swap the 6-pin connector with another bank on the same PM4X and cycle power to the system.<br><ul><li>If the error **follows** the connector swap, contact Intelligent Ag for a replacement harness.</li><li>If the error **stays the same**, contact Intelligent Ag for a replacement PM4X.</li></ul> |
|---|---|---|---|
| 5 or 7 | Output Overcurrent | Bin SN Bank X Pin 1-2 Overcurrent<br><br>*SN = PM4X serial number* | 1. Check for damage to the wiring both at the PM4X (153510-000046) and the sensor, valve, or switch it connects to. Repair any damage.<br>2. Unplug the sensor, valve, or switch and cycle power to the system. If the error goes away, replace the sensor, valve, or switch.<br>3. Swap the 6-pin connector with another bank on the same PM4X and cycle power to the system.<br><ul><li>If the error **follows** the connector swap, contact Intelligent Ag for a replacement harness.</li><li>If the error **stays the same**, contact Intelligent Ag for a replacement PM4X.</li></ul> |
| Continuous | Invalid Firmware Image | IO400 Bin *X* Timeout | 1. Cycle the system power.<br>2. Swap the 4-pin power/CAN connector with another PM4X (153510-000046). If the error persists, contact Intelligent Ag for a replacement PM4X. |
| 6 | PM4X Device Overcurrent | Bin *SN* Device Overcurrent<br><br>*SN = PM4X serial number* | 1. Check for damage to the 4-pin connector power (red) and black (ground) wires. Repair any damage.<br>2. Check the wiring on the four 6-pin connectors on the PM4X (153510-000046), particularly pins 1-2.<br>3. Swap all 5 connectors with another PM4X.<br><ul><li>If the error **changes** to the second bin's PM4X, harnessing is bad.</li><li>If the error **does not change** to the second bin's PM4X, contact Intelligent Ag for a replacement PM4X.</li></ul> |

*Numbers correspond to the number of flashes, followed by a long pause.

# The Engage SpreadControl app won't load

1.  Cycle the system power.

    a.  Power down the VT, then turn the tractor key off.

    b.  Pull the battery key from the battery and keep it out for 10 seconds.

    c.  Re-plug in the battery key.

    d.  Turn the tractor key on, then power on the VT.

2.  Check the CAN wiring between the gateway (153510-000084) and the VT on the Main System Harness (353050-000065) and Raven Viper 4 Cable Adapter (if applicable).

# The Gateway 260 LED is blinking

| LED Color | Meaning |
| --- | --- |
| Flashing Purple to Blue | Gateway is starting up. |
| Solid Yellow | Normal operation. |
| Solid Red | Boot error. Contact Intelligent Ag. |
| Flashing Red | BIT error. Contact Intelligent Ag. |
| Flashing Blue | Gateway is reprogramming. |

# Appendix A:
# Harness Diagram

**Key:**

— 353050-000065 Main System Harness
— 353050-000066 Bin 1 Harness
— 353050-000067 Bin 2 Harness*
— 353050-000068 Actuator Power Harness
— 353050-000069 Micronutrient Harness*

**Notes:**

*Optional depending on system configuration
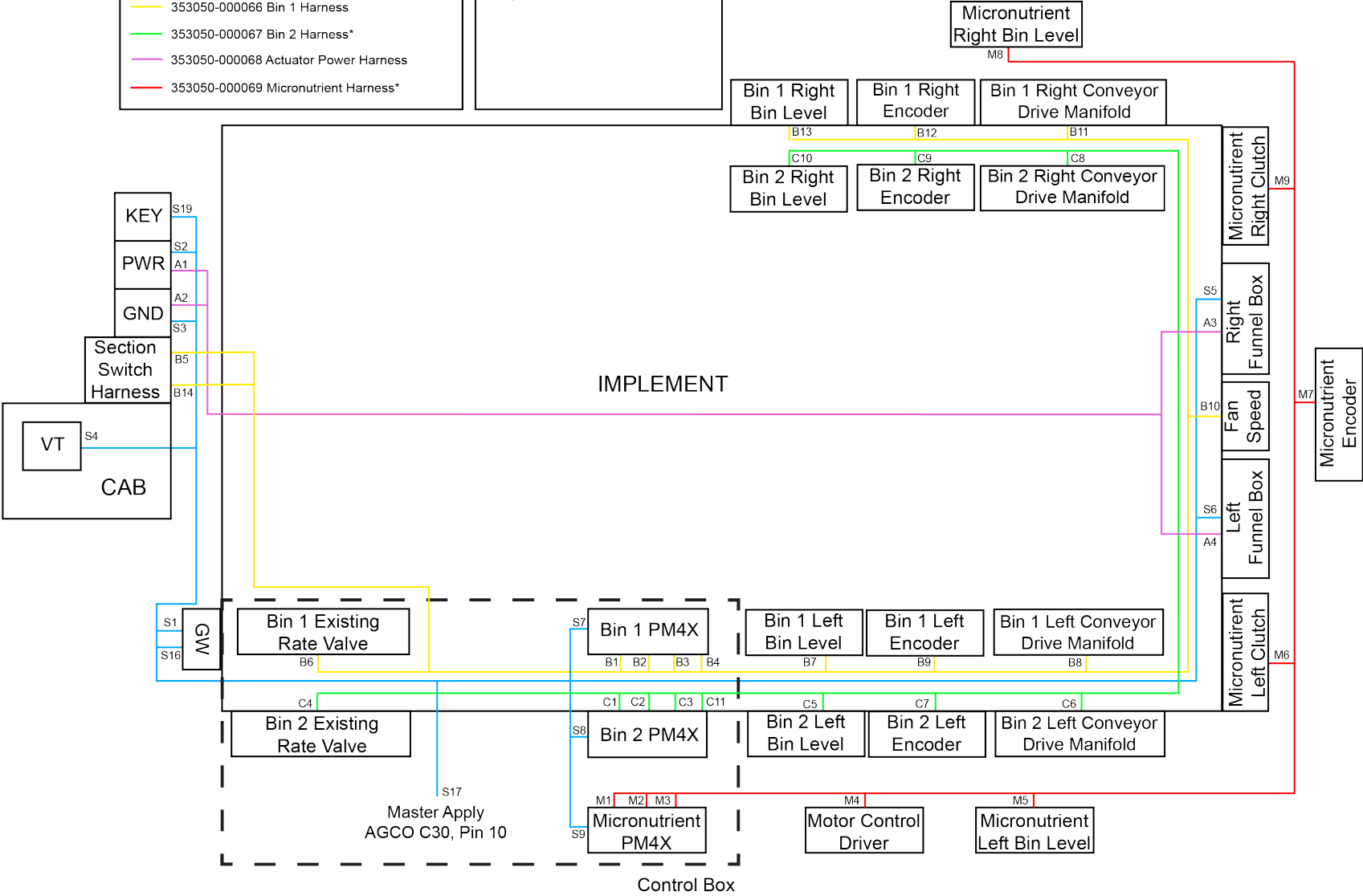
# Appendix B:
# Pinout Information

## Gateway 260 (153510-000084)

### Connector A

| Pin Number | Connection Name | Notes |
|---|---|---|
| 1 | Power | Power Stud |
| 2 | GND | Ground Stud |
| 3 | Digital In 1 | unused |
| 4 | Digital In 0 | Master Apply |
| 5 | CAN 2 High | Funnel Boxes CAN High |
| 6 | CAN 1 High | VT CAN High |
| 7 | CAN 1 Low | VT CAN Low |
| 8 | CAN 2 Low | Funnel Boxes CAN Low |
| 9 | Digital Out 0 | unused |
| 10 | Digital Out 1 | unused |
| 11 | Digital Out 2 | unused |
| 12 | Switched Power | Keyswitch |

### Connector B

| Pin Number | Connection Name | Notes |
|---|---|---|
| 1 | RS232 TX | unused |
| 2 | Unused | unused |
| 3 | CAN 6 High | unused |
| 4 | CAN 5 High | All Bins PM4X CAN High |
| 5 | CAN 4 High | unused |
| 6 | CAN 3 High | unused |
| 7 | CAN 3 Low | unused |
| 8 | CAN 4 Low | unused |
| 9 | CAN 5 Low | All Bins PM4X CAN Low |
| 10 | CAN 6 Low | unused |
| 11 | RS232 GND | unused |
| 12 | RS232 RX | unused |

### SMA Connectors

| Connector Number | Connection Name | Notes |
|---|---|---|
| 1 | Bluetooth/WiFi | Connected to WiFi Antenna Cable |
| 2 | Iridium | unused |
| 3 | 433MHz | Connected to 433MHz Antenna Cable but Unused |
| 4 | Cellular Main | Connected to Cell Antenna Cable |
| 5 | GPS | unused |
| 6 | Cellular Div. | unused |

## PM4X (153510-000046) - Bin1

**Power/CAN**

| Pin Number | Connection | Notes |
|---|---|---|
| 1 | CAN HIGH | CAN5 High (to Gateway) |
| 2 | CAN LOW | CAN5 Low (to Gateway) |
| 3 | POWER | A/M1K Raven Rate Controller Harness 12-pin DTM |
| 4 | GND | A/M1K Raven Rate Controller Harness 12-pin DTM |

**Bank 1**

| Pin # | Connection | Notes |
|---|---|---|
| 1 | H-Bridge+ | Bin 1 LH Proportional Valve |
| 2 | H-Bridge- | Bin 1 LH Proportional Valve |
| 3 | Frequency/Analog Input (1A) | Bin 1 LH Encoder (application rate) |
| 4 | Frequency/Analog Input (1B) | Left Outer Section Override Switch |
| 5 | 5V Out | Bin 1 LH Encoder Power |
| 6 | Ground | Bin 1 LH Encoder Ground |

**Bank 2**

| Pin # | Connection | Notes |
|---|---|---|
| 1 | H-Bridge+ | Bin 1 RH Proportional Valve |
| 2 | H-Bridge- | Bin 1 RH Proportional Valve |
| 3 | Frequency/Analog Input (2A) | Bin 1 RH Encoder (application rate) |
| 4 | Frequency/Analog Input (2B) | Left Inner Section Override Switch |
| 5 | 5V Out | Bin 1 RH Encoder Power |
| 6 | Ground | Bin 1 RH Encoder Ground |

**Bank 3**

| Pin # | Connection | Notes |
|---|---|---|
| 1 | H-Bridge+ | Bin 1 Rate Valve |
| 2 | H-Bridge- | Bin 1 Rate Valve |
| 3 | Frequency/Analog Input (3A) | Right Inner Section Override Switch |
| 4 | Frequency/Analog Input (3B) | Bin 1 Level Sensor Signal |
| 5 | 5V Out | unused |
| 6 | Ground | unused |

**Bank 4**

| Pin # | Connection | Notes |
|---|---|---|
| 1 | H-Bridge+ | Bin 1 Level Sensor Power |
| 2 | H-Bridge- | Bin 1 Level Sensor Ground |
| 3 | Frequency/Analog Input (4A) | Right Outer Section Override Switch |
| 4 | Frequency/Analog Input (4B) | Fan Speed Output |
| 5 | 5V Out | Fan Speed Power |
| 6 | Ground | Fan Speed Ground |

## PM4X (153510-000046) - Bin 2

**Power/CAN**

| Pin # | Connection | Notes |
|---|---|---|
| 1 | CAN HIGH | CAN5 High (to Gateway) |
| 2 | CAN LOW | CAN5 Low (to Gateway) |
| 3 | POWER | A/M2K Raven Rate Controller Harness 12-pin DTM |
| 4 | GND | A/M2K Raven Rate Controller Harness 12-pin DTM |

**Bank 1**

| Pin # | Connection | Notes |
|---|---|---|
| 1 | H-Bridge+ | Bin 2 LH Proportional Valve |
| 2 | H-Bridge- | Bin 2 LH Proportional Valve |
| 3 | Frequency/Analog Input (3A) | Bin 2 LH Encoder (application rate) |
| 4 | Frequency/Analog Input (3B) | unused |
| 5 | 5V Out | Bin 2 LH Encoder Power |
| 6 | Ground | Bin 2 LH Encoder Ground |

**Bank 2**

| Pin # | Connection | Notes |
|---|---|---|
| 1 | H-Bridge+ | Bin 2 RH Proportional Valve |
| 2 | H-Bridge- | Bin 2 RH Proportional Valve |
| 3 | Frequency/Analog Input (4A) | Bin 2 RH Encoder (application rate) |
| 4 | Frequency/Analog Input (4B) | unused |
| 5 | 5V Out | Bin 2 RH Encoder Power |
| 6 | Ground | Bin 2 RH Encoder Ground |

**Bank 3**

| Pin # | Connection | Notes |
|---|---|---|
| 1 | H-Bridge+ | Bin 2 Rate Valve |
| 2 | H-Bridge- | Bin 2 Rate Valve |
| 3 | Frequency/Analog Input (3A) | unused |
| 4 | Frequency/Analog Input (3B) | Bin 2 Level Sensor Signal |
| 5 | 5V Out | unused |
| 6 | Ground | unused |

**Bank 4**

| Pin # | Connection | Notes |
|---|---|---|
| 1 | H-Bridge+ | Bin 2 Level Sensor Power |
| 2 | H-Bridge- | Bin 2 Level Sensor Ground |
| 3 | Frequency/Analog Input (4A) | unused |
| 4 | Frequency/Analog Input (4B) | unused |
| 5 | 5V Out | unused |
| 6 | Ground | unused |

# PM4X (153510-000046) - Micronutrient

## Power/CAN

| Pin # | Connection | Notes |
|-------|------------|-------|
| 1 | CAN HIGH | CAN5 High (to Gateway) |
| 2 | CAN LOW | CAN5 Low (to Gateway) |
| 3 | POWER | Gran Raven Rate Controller Harness 12-pin DTM |
| 4 | GND | Gran Raven Rate Controller Harness 12-pin DTM |

## Bank 1

| Pin # | Connection | Notes |
|-------|------------|-------|
| 1 | H-Bridge+ | Micro Motor Driver |
| 2 | H-Bridge- | unused |
| 3 | Frequency/Analog Input (3A) | Micro Encoder (application rate) |
| 4 | Frequency/Analog Input (3B) | unused |
| 5 | 5V Out | Micro Encoder Power |
| 6 | Ground | Micro Encoder Ground |

## Bank 2

| Pin # | Connection | Notes |
|-------|------------|-------|
| 1 | H-Bridge+ | Micro LH Clutch |
| 2 | H-Bridge- | unused |
| 3 | Frequency/Analog Input (4A) | Micro LH Bin Level Sensor Signal |
| 4 | Frequency/Analog Input (4B) | unused |
| 5 | 5V Out | Micro LH Bin Level Sensor Power |
| 6 | Ground | Micro LH Bin Level Sensor Ground |

## Bank 3

| Pin # | Connection | Notes |
|-------|------------|-------|
| 1 | H-Bridge+ | Micro RH Clutch |
| 2 | H-Bridge- | unused |
| 3 | Frequency/Analog Input (3A) | Micro RH Bin Level Sensor Signal |
| 4 | Frequency/Analog Input (3B) | unused |
| 5 | 5V Out | Micro RH Bin Level Sensor Power |
| 6 | Ground | Micro RH Bin Level Sensor Ground |

## Bank 4

| Pin # | Connection | Notes |
|-------|------------|-------|
| 1 | H-Bridge+ | unused |
| 2 | H-Bridge- | unused |
| 3 | Frequency/Analog Input (4A) | unused |
| 4 | Frequency/Analog Input (4B) | unused |
| 5 | 5V Out | unused |
| 6 | Ground | unused |

## Section switch harness "T" connector

| Deutsch Pin | Description |
|:---:|:---:|
| 1 | Section 1 |
| 2 | Section 2 |
| 3 | Section 3 |
| 4 | Section 4 |
| 5 | unused |
| 6 | LH Boom Apply |
| 7 | RH Boom Apply |
| 8 | unused |
| 9 | unused |
| 10 | LH End Row |
| 11 | RH End Row |
| 12 | Master Apply |