

RAVEN

Installation and Operation Guide



CAN Switch Box™
for use with OmniRow Systems

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Overview

The Raven CAN Switch Box is designed to interface with Raven field computers such as the Envizio Pro and Envizio Pro II and offer product and section control features at the operator's finger tips.

**CAN Switch Box
for OmniRow Systems
(P/N 063-3001-011)**



The CAN Switch Box features:

- Internal boom sense and speed node and CANbus terminator for simplified cabling and installation. The CAN Switch Box provides section status information (based upon switch positions) to the product control console or field computer for section mapping and rate control adjustments.
- Bright backlit switch panel.
- Four section switches for quick implement section control.
- A Master/Override switch for full boom or implement control.
- An Increase/Decrease switch for quick application rate adjustments.
- A Logic Power LED.
- In addition to the above features, the CAN Switch Box for use with OmniRow systems offers implement control switches which may be used to control several functions connected to the OmniRow control system.

Care and Maintenance

Refer to the following items when selecting a mounting location for the CAN Switch Box and Raven control console.

- The switch box is not weatherproof. Mount the switch box inside of the machine cab or driver compartment within easy reach of the driver or operator.
- The switch box should be mounted in a location where it will not be jarred during normal equipment operation. Keep the console and switch box clear of moving elements within the cab.
- Route all cables to avoid pinching, kinking or damaging the cable and to avoid tripping hazards.

At Raven Industries, we strive to make your experience with our products as rewarding as possible. One way to improve this experience is to provide us with feedback on this manual. Your feedback will help shape the future of our product documentation and the overall service we provide. We appreciate the opportunity to see ourselves as our customers see us and are eager to gather ideas on how we have been helping or how we can do better. To serve you best, please send an email with the following information to

techwriting@ravenind.com

-Cruizer II™ Operation Guide

-Manual No. 016-0171-415 Rev. E

-Any comments or feedback (include chapter or page numbers if applicable).

-Let us know how long have you been using this or other Raven products.

We will not share your email or any information you provide with anyone else. Your feedback is valued and extremely important to us.

Thank you for your time.

Installation

Refer to the following sections to install the console specific mounting bracket and to connect the CAN Switch Box.

Mounting the CAN Switch Box

Envizio Pro XL Bracket (P/N 107-0172-197)

Note: The supplied mounting bracket must be attached to the Envizio Pro XL so that the CAN Switch Box is mounted below the field computer.

1. Set the mounting bracket over the mounting posts on the back of the field computer.
2. Set the RAM mounting arm over the mounting plate and secure using the screws supplied with the field computer.



3. Align the CAN Switch Box with the remaining predrilled holes and secure using screws supplied with the switch box.

Envizio Pro or Envizio Pro II Bracket (P/N 107-0171-841)

Note: The supplied mounting bracket must be attached to the Envizio Pro or Envizio Pro II field computer so that the CAN Switch Box is mounted below the field computer.

1. Set the mounting bracket over the mounting posts on the back of the field computer.
2. Set the RAM mounting arm over the mounting plate and secure using four screws (P/N 311-0007-015).



3. Align the CAN Switch Box with the remaining predrilled holes and secure using two lock washers (P/N 313-4000-007) and two screws (P/N 311-0001-007).

Cable Connections

The CAN Switch Box connects to the control console and CANbus system with the Viper Pro/Envizio Pro chassis interface cable (P/N 115-0171-926).

To connect the CAN Switch Box:

1. Connect the 4-pin Deutsch connector on the console or interface cable to the CANbus port on the back of the CAN Switch Box.
2. Connect the 2-pin Deutsch connector on the console or interface cable to the switched power port on the back of the CAN Switch Box.



3. If connecting to an Envizio Pro using the chassis interface cable (P/N 115-0171-926), connect the round, 3-pin connector on the interface cable to the speed sensor port on the back of the CAN Switch Box.

Note: If the CAN Switch Box is connected as instructed above, the switch box will be powered on or off using the Raven console or field computer switched power. Refer to the console or field computer manual for instructions to properly power down the console.

CAN Switch Box Operation

Important: The CAN Switch Box must be used as the primary control interface for section, master or product control status.

Make sure to toggle the master switch to the off position when closing or exiting a job to avoid unintentional product application once the field computer or control console closes application management functions. It is also good practice to shut off product and section switches when the application system is not being used.

The CAN Switch Box puts the section and product control modes right at the operator's finger tips.

Refer to the following sections for detailed operation of the CAN Switch Box:

Logic Power LED

This LED indicates the status of CAN logic power into the CAN Switch Box. This LED should be on (solid) during normal operation.

The Logic Power LED will begin flashing if low logic power is supplied to the CAN Switch Box. Troubleshoot the logic power system before proceeding with operations.

If this LED is not lit when the Raven console or field computer is powered up, troubleshoot the CANbus system before starting any system operations.

Transport/Plant Mode Switch

Logic Power LED



Transport/Plant Mode Switch

The transport mode switch is used lock out switch box functions when the implement is being transported over the road or when ready for work in the field.

TRANS. Toggle the mode switch to “TRANS” mode when transporting the implement. This mode allows the operator to use the fold, wing, and latch features.

PLANT. Toggle the switch to field “PLANT” mode to use the switch box during field operations.

Transport Mode Switch Functions

Note: The implement proximity switch installed with the OmniRow system will override the section and master switches when the implement is raised to transport height.



1 - Fold Switch. (Only functional in transport mode) Use the Fold switch to fold or unfold the implement. Toggle the switch up to fold the implement or down to unfold the implement.

Note: Operation of this switch requires the implement to be raised to at least the high field limit position before folding the implement in.

2 - Wing Wheel Switch. (Only functional in transport mode) Use the Wing Wheel switch to raise or lower the wing wheels.

3 - Latch Switch. (Only functional in transport mode) Use the Latch switch to lock or unlock the wing folding functions if equipped on the implement during transportation.

4 - Tool Bar Raise/Lower Switch. In transport mode, the Tool Bar switch will only actuate the implement valves while the switch is held. Hold the Tool Bar switch in the up position to raise the implement or in the down position to lower the implement.

Plant Mode Switch Functions



1 - Marker Mode Switch. Toggle the marker mode to select the left marker, right marker, or automatic marker control modes.

Select the left or right marker to manually raise or lower the left or right marker using the marker function switch.

Set the marker mode switch to automatic (AUTO) to control each marker in sequence during an active job.

Note: The automatic marker mode will only function while in an active job on the field computer. If the field computer is not in an active job, toggling the switch to the up position will raise both markers simultaneously. The down position will not function outside of an active job with the Marker Mode switch set to automatic.

2 - Marker Raise/Lower Function Switch. Toggle the marker function switch to raise or lower the implement markers as determined by the Marker Mode switch.

To utilize the automatic marker control mode during an active job:

1. Toggle the Marker Mode switch to the AUTO position.
2. Toggle the Marker Function switch to the down position to lower the first marker.
3. At the end of the swath, toggle the Function switch to the up position to raise the first marker.
4. When starting the next swath, toggle the Function switch to the down position to lower the second marker in sequence.

3 - Tool Bar Raise/Lower Switch. In plant or field mode, hold the Tool Bar switch in the up position for at least two seconds to automatically raise the implement to the field high limit position. Hold the Tool Bar switch in the down position for at least two seconds to automatically lower the implement for 10 seconds.

4 - Auxiliary (AUX) Controls Switch. Toggle the AUX switch on (I) or off (O) to engage the fan or vacuum system or a down pressure control system connected to the OmniRow system for seed handling and singulation.

5 - Lights Switch. The Lights switch may be connected to a work light system or provide auxiliary output for general purpose use.

6 - Section Switches. The 3-way selectable section switches may be used to toggle each section (up to four individual sections).

The section switches may be used to toggle up to ten individual sections. Raven field computers are also capable of controlling additional sections using the section mapping feature to group sections to the same switch. Refer to the field computer *Installation and Operation Manual* for additional information.

Note: Envizio Pro software version 3.5 or newer is required to access section mapping. Contact a local Raven dealer for additional information.

Each of the four section switches may be toggled individually to one of the three following positions:

- ON - manually control the section on. AccuBoom control of the section is disabled and will not automatically control this section based on coverage, zone maps or field boundaries.
- ACCU - AccuBoom automatic section control is enabled for the section. If installed and properly set up for the active job, the AccuBoom features will automatically turn sections on or off based upon previous coverage, zone maps or field boundaries created or active in the job.
Refer to the control console or field computer operation manual for more information about using the AccuBoom system.
- OFF - manually control the section off. This section will remain off regardless of AccuBoom control features.

Note: Leave the section switch in the off position for any sections not connected or controlled by the Raven control console or field computer.

7 - Increase/Decrease Rate Switch.

Note: The INC/DEC switch only controls the selected product in automatic or manual mode. Refer to the field computer or control console manual for more information on selecting products during application.

For selected products set to automatic control mode, the INC/DEC switch is used to increase or decrease the target rate of products selected and actively displayed on the console or field computer.

In order for this switch to work properly, a 'Rate Bump' (Rate +/-) value must be programmed for each product. Refer to the control console or field computer operation manual for more information on programming this feature.

For selected products set to manual control mode, holding the INC/DEC switch will open or close the product control valve, increasing or decreasing the flow of product respectively. Refer to the control console or field computer operation manual for instructions on programming products or switching a product to manual mode.

8 - Master/Override Switch. The master switch toggles all section switches on or off. When the master switch is in the 'ON' position, each section will function according to the corresponding section switch (see the "Section Switches" section on page 6). Toggle the master switch to the 'OFF' position to turn all boom or implement sections off.

Toggle the master switch to the 'OVERRIDE' position to operate all seed disks one full revolution to prime the seed disks. Holding the master switch in the 'OVERRIDE' position will temporarily override any sections controlled by an optional AccuRow system on.

Troubleshooting

General Issues

Issue	Possible Cause	Solution
Console or field computer does not power up	No power to console	Check chassis cable battery connections.
		Check chassis cable fuses.
Logic power LED not lit	No power to CAN Switch Box	Check CAN Switch Box switched power connection.
		Ensure console or field computer is powered on.
		Check chassis cable power and ground connections.
		Check chassis cable fuses.
Console or field computer not detecting CAN nodes	CAN Switch Box not connected to CANbus	Check CANbus connector on CAN Switch Box.
		Check CAN connections and cabling.
		Check CAN terminator on end of CANbus line.
		Check for +12 volts on switched power connector.
	Console not set up for CANbus control	Verify that the console or field computer product control configuration is set to CAN.
Boom valves do not turn on	Faulty CAN high current power connection	Verify high current (HC) power LED on product controller node is lit. If LED not lit, refer to troubleshooting information in control console or field computer manual.
Boom sections do not turn off	Remote section switches in incorrect position	Remote section switches must be in the OFF position to allow the CAN Switch Box to control sections.

Setup Issues

Issue	Possible Cause	Solution
Previous calibration data lost	Poor CAN connections	Refer to the “CAN Troubleshooting” section on page 11.

Job Issues

Issue	Possible Cause	Solution
Section status displays as inactive	CAN Switch Box switches in the off position	Toggle the section and master switches to the on position.
	Automatic section control enabled but sections do not turn on	Check the speed sensor connection on the back of the CAN Switch Box.
		Move vehicle into a previously unapplied area and maintain a speed of at least 0.7 mph [1.1 km/h].
Section status does not turn green (ON) when sections enabled	Master switch must be toggled off at power-up	Cycle the master switch off then back on.
	Sections not properly configured	Verify section setup on the control console or field computer.
	Nodes not programmed properly	Verify all node calibration data is entered.
Product function switches do not work	Master switch must be toggled off at power-up	Cycle the master switch off then back on.
	Product application turned off	Toggle product control switches to AUTO or MAN mode to turn product(s) on.

Issue	Possible Cause	Solution
Product applied to zero rate zones	Wrong valve type installed	A fast close or PWM close valve must be selected to shut off product application in zero rate zones. Refer to field computer or control console manual for more information about selecting valve type.
	Incorrect valve setting	Check valve or PWM settings.
	Section switches toggled on in zero rate zones	Toggle the section switches to the ACCU or OFF positions.
Sections enabled but field computer not recording coverage	Remote section switches left in the ON position	Toggle all remote section switches to the off position. Remote switches will override the section switch status and automatic section control features.

CAN Troubleshooting

Although the control algorithm is located within the CAN node(s), the same troubleshooting techniques that apply to traditional hard wired control systems still apply to a CANbus control network. CAN allows for modularization of the control system, but the behavior of the system remains the same. Flow and speed sensors, the control valve and any boom valves, are used in the same manner.

The following are some common causes for communication failures:

Issue	Possible Cause	Solution
Console or CANbus cannot find nodes	Switch Box is not properly connected	Check switched power connection.
		Check the CANbus connection to the Switch Box and reinitialize the console to detect the Switch Box nodes.
		Ensure console is powered on.
	No power to Switch Box	Check chassis cable power and ground connections.
	Weak or dirty power to CAN nodes	Verify at least +10V DC is present on the switched power connector.
	Corrosion in CAN connections	Disconnect and clean the cable connections
CANbus not terminated properly	Check the CAN Terminator(s)	

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Limited Warranty

What Does this Warranty Cover?

This warranty covers all defects in workmanship or materials in your Raven Applied Technology Division product under normal use, maintenance, and service when used for intended purpose.

How Long is the Coverage Period?

Raven Applied Technology Division products are covered by this warranty for 12 months from the date of retail sale. In no case will the Limited Warranty period exceed 24 months from the date the product was issued by Raven Industries Applied Technology Division. This warranty coverage applies only to the original owner and is non-transferable.

How Can I Get Service?

Bring the defective part and proof of purchase to your Raven dealer. If the dealer approves with the warranty claim, the dealer will process the claim and send it to Raven Industries for final approval. The freight cost to Raven Industries will be the customer's responsibility. The Return Materials Authorization (RMA) number must appear on the box and all documentation (including proof of purchase) must be included inside the box to be sent to Raven Industries.

What Will Raven Industries Do?

Upon confirmation of the warranty claim, Raven Industries will (at our discretion) repair or replace the defective product and pay for the standard return freight, regardless of the inbound shipping method. Expedited freight is available at the customer's expense

What is not Covered by this Warranty?

Raven Industries will not assume any expense or liability for repairs made outside our facilities without written consent. Raven Industries is not responsible for damage to any associated equipment or products and will not be liable for loss of profit, labor, or other special damages. The obligation of this warranty is in lieu of all other warranties, expressed or implied, and no person or organization is authorized to assume any liability for Raven Industries.

Damages caused by normal wear and tear, misuse, abuse, neglect, accident, or improper installation and maintenance are not covered by this warranty.

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Extended Warranty

What Does this Warranty Cover?

This warranty covers all defects in workmanship or materials in your Raven Applied Technology Division product under normal use, maintenance, and service when used for intended purpose.

Do I Need to Register My Product to Qualify for the Extended Warranty?

Yes. Products/systems must be registered within 30 days of retail sale to receive coverage under the Extended Warranty. If the component does not have a serial tag, the kit it came in must be registered instead.

Where Can I Register My Product for the Extended Warranty?

To register, go online to www.ravenhelp.com and select Product Registration.

How Long is the Extended Warranty Coverage Period?

Raven Applied Technology products that have been registered online are covered for an additional 12 months beyond the Limited Warranty for a total coverage period of 24 months from the date of retail sale. In no case will the Extended Warranty period exceed 36 months from the date the product was issued by Raven Industries Applied Technology Division. This Extended Warranty coverage applies only to the original owner and is non-transferable.

How Can I Get Service?

Bring the defective part and proof of purchase to your Raven dealer. If the dealer approves with the warranty claim, the dealer will process the claim and send it to Raven Industries for final approval. The freight cost to Raven Industries will be the customer's responsibility. The Return Materials Authorization (RMA) number must appear on the box and all documentation (including proof of purchase) must be included inside the box to be sent to Raven Industries. In addition, the words "Extended Warranty" must appear on the box and all documentation if the failure is between 12 and 24 months from the retail sale.

What Will Raven Industries Do?

Upon confirmation of the product's registration for the Extended Warranty and the claim itself, Raven Industries will (at our discretion) repair or replace the defective product and pay for the standard return freight, regardless of the inbound shipping method. Expedited freight is available at the customer's expense.

What is Not Covered by the Extended Warranty?

Raven Industries will not assume any expense or liability for repairs made outside our facilities without written consent. Raven Industries is not responsible for damage to any associated equipment or products and will not be liable for loss of profit, labor, or other damages. Cables, hoses, software enhancements, and remanufactured items are not covered by this Extended Warranty. The obligation of this warranty is in lieu of all other warranties, expressed or implied, and no person or organization is authorized to assume any liability for Raven Industries.

Damages caused by normal wear and tear, misuse, abuse, neglect, accident, or improper installation and maintenance are not covered by this warranty.

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