Viper® 4 and Viper 4+ Installation Manual

016-0171-559 Rev. C *03/16* *E26927*

CHAPTER 1

Important Installation Safety Information

⚠ CAUTION

Electrical Safety

While installing the Raven Viper® 4 or 4+ and other electrical system components:

- Disconnect the ROS device and all electrical components of the Raven system before jump-starting the vehicle or welding on any component of the equipment.
- Always verify that the power leads are connected to the correct polarity as marked. Reversing the power leads could cause severe damage to the equipment.
- To ensure that any system components are not activated automatically while installing system components, install power cables, leads or connectors last.

Hydraulic Safety

While installing any hydraulic system components with the Viper 4 or 4+:

- Wear appropriate protective equipment at all times when working on any hydraulic system.
- Ensure the ROS device is disabled prior to starting any maintenance work on the machine or components of the control system.
- Never attempt to open or work on a hydraulic system with the equipment running. Care should always be taken when opening a system that has been previously pressurized.
- Use caution when disconnecting the hydraulic hoses or purging is required, be aware that the hydraulic fluid may be extremely hot and under high pressure.
- Any work performed on a hydraulic system must be done in accordance with the machine manufacturer's approved maintenance instructions.
- When installing hydraulics or performing diagnostics, maintenance or routine service, take precautions to prevent any foreign material or contaminants from being introduced into the machine's hydraulic system. Objects or materials that are able to bypass the machine's hydraulic filtration system will reduce performance and possibly damage the hydraulic valves.

NOTICE

Read this manual and the operation and safety instructions included with the equipment and/or controller carefully before installing the Raven Viper 4 or 4+.

- Follow all safety information presented within this manual.
- If you require assistance with any portion of the installation or service of Raven equipment, contact a local Raven dealer for support.
- Follow all safety labels affixed to the system components. Be sure to keep safety labels in good condition and replace any missing or damaged labels. To obtain replacements for missing or damaged safety labels, contact a local Raven dealer.

When operating the machine after installing the Viper 4 or 4+, observe the following safety measures:

- Be alert and aware of surroundings.
- Do not operate the Viper 4 or 4+ while under the influence of alcohol or an illegal substance.
- Remain in the operator's position in the machine at all times when the Viper 4 or 4+ is engaged in product control functions or while any additional automated features are operating. Disable these functions or features when exiting the operator's position.
- Maintain a safe working distance from other individuals. The operator is responsible for disabling the Viper 4 or 4+ or any system features when the safe working distance has been diminished.

Instructions for Wire Routing

The word harness is used to mean all electrical leads and cables, bundled and unbundled. When installing harness, secure it at least every 30 cm (12in) to the frame. Follow existing harness as much as possible and use these guidelines:

Harness should not contact or be attached to:

- Lines and hoses with high vibration forces or pressure spikes
- Lines and hoses carrying hot fluids beyond harness component specifications

Avoid contact with any sharp edge or abrading surfaces such as, but not limited to:

- Sheared or flame cut edges
- Edges of machined surfaces
- Fastener threads or cap screw heads
- Ends of adjustable hose clamps
- Wire exiting conduit without protection, either ends or side of conduit
- Hose and tube fittings

Routing should not allow harnesses to:

- Hang below the unit
- Have the potential to become damaged due to exposure to the exterior environment. (i.e. tree limbs, debris, attachments)
- Be placed in areas of or in contact with machine components which develop temperatures higher than the temperature rating of harness components
- Wiring should be protected or shielded if it needs to route near hot temperatures beyond harness component specifications

Harnessing should not have sharp bends

Allow sufficient clearance from machine component operational zones such as:

- Drive shafts, universal joints and hitches (i.e. 3-point hitch)
- Pulleys, gears, sprockets
- Deflection and backlash of belts and chains
- Adjustment zones of adjustable brackets
- Changes of position in steering and suspension systems
- Moving linkages, cylinders, articulation joints, attachments
- Ground engaging components

For harness sections that move during machine operation:

- Allow sufficient length for free movement without interference to prevent: pulling, pinching, catching or rubbing, especially in articulation and pivot points
- Clamp harnesses securely to force controlled movement to occur in the desired harness section
- Avoid sharp twisting or flexing of harnesses in short distances
- Connectors and splices should not be located in harness sections that move

Protect harnesses from:

- Foreign objects such as rocks that may fall or be thrown by the unit
- Buildup of dirt, mud, snow, ice, submersion in water and oil
- Tree limbs, brush and debris
- Damage where service personnel or operators might step or use as a grab bar
- Damage when passing through metal structures
- High pressure wash

Instructions for Hose Routing

The word hoses is used to mean all flexible fluid carrying components. Follow existing hoses as much as possible and use these guidelines:

Hoses should not contact or be attached to:

- Components with high vibration forces
- Components carrying hot fluids beyond hoses component specifications

Avoid contact with any sharp edge or abrading surfaces such as, but not limited to:

- Sheared or flame cut edges
- Edges of machined surfaces
- Fastener threads or cap screw heads
- Ends of adjustable hose clamps

Routing should not allow hoses to:

- Hang below the unit
- Have the potential to become damaged due to exposure to the exterior environment. (i.e. tree limbs, debris, attachments)
- Be placed in areas of or in contact with machine components which develop temperatures higher than the temperature rating of hose components
- Hoses should be protected or shielded if it needs to route near hot temperatures beyond hose component specifications

Hoses should not have sharp bends

Allow sufficient clearance from machine component operational zones such as:

- Drive shafts, universal joints and hitches (i.e. 3-point hitch)
- Pulleys, gears, sprockets
- Deflection and backlash of belts and chains
- Adjustment zones of adjustable brackets
- Changes of position in steering and suspension systems
- Moving linkages, cylinders, articulation joints, attachments
- Ground engaging components

For hose sections that move during machine operation:

- Allow sufficient length for free movement without interference to prevent: pulling, pinching, catching or rubbing, especially in articulation and pivot points
- Clamp hoses securely to force controlled movement to occur in the desired hose section
- Avoid sharp twisting or flexing of hoses in short distances

Protect hoses from:

- Foreign objects such as rocks that may fall or be thrown by the unit
- Buildup of dirt, mud, snow, ice, submersion in water and oil
- Tree limbs, brush and debris
- Damage where service personnel or operators might step or use as a grab bar
- Damage when passing through metal structures
- High pressure wash

CHAPTER

2

Viper® 4 and 4+ Introduction and Technical Specifications

Overview

The Viper 4 and Viper 4+ are multi-purpose precision agriculture management devices capable of offering multiple features simultaneously during field operations including product application control, coverage mapping and reporting tools, and field guidance features. Both devices are capable of interfacing with several optional Raven systems to enhance the capabilities of the ROS. Contact a local Raven dealer for a full list of add-on systems and features available for use with the Viper 4, Viper 4+and for purchasing assistance.

FIGURE 1. Raven Viper 4 Field Computer with ROS

Viper 4

Viper 4+

This document provides information regarding the following aspects of the Raven Viper 4 field computers and ROS:

- Features, Care, and Maintenance
- Installation

Viper® 4 and 4+ Features

The following sections provide an overview of the Raven Viper 4 and 4+ capabilities and interface possibilities.

ROS

The Raven Operating Software, or ROS, assists with managing an implement fleet and multiple equipment operators.

Secure User Login

Multiple user profiles allow the system administrator to set up unique Personal Identification Numbers (PIN) to secure the application system from unauthorized use. As well as secure access, each user profile may configure various user preferences such as language and display units to ensure that each operator is comfortable operating the system.

Widget Based Field Operation Displays

The ROS features widget based screens for field operation and guidance. The operator may select from various widgets to customize the information displayed on the screen during field operations and may customize the widget layout to keep important operation information or operation tools available at a glance. Each screen profile may be saved and recalled quickly to view additional information as necessary or as different tasks become more critical for the field operation.

Note: *Refer to the Raven Operating Software (ROS) Basic Operation Manual for additional information about creating, saving, and using screen widget profiles.*

Machine Configurations

Machine Configurations allow the system administrator to configure multiple machine profiles. As the ROS device is moved from implement to implement, the device will automatically detect the machine configuration for the implement on which the device is currently running to simplify set up and preparations for field operations.

Product Configurations and Job Profiles

Preconfigured product configurations and job profiles allow the system administrator to set up product and job information and allow the operator to quickly select the product loaded and the job or operation to perform to begin field work.

The system administrator may view and use the above information from the job report to make administrative decisions required with as much information as needed for the specific operation.

Note: *Please review the Raven Operating Software (ROS) Basic Operation Manual for details on setting up user and job profiles or equipment and product configurations.*

Enclosed Display

The Viper 4 and Viper 4+ enclosures are designed to resist the conditions experienced in the field to help ensure that the field computer is ready to operate when you are. The enclosed case design provides dust and splash resistance, even in open or exposed cabin vehicles and tractors. The lightweight magnesium alloy provides excellent heat transfer properties to keep the Viper 4 and Viper 4+ operating efficiently, even in direct sunlight.

Note: *The case is designed to allow a small air gap 1/8 inch [3 mm] between the mounting bracket and the case to allow air flow over the case cooling fins. Do not seal or obstruct this air gap, or otherwise modify the case.*

It is normal for the case to become warm to the touch while in operation.

Touch Screen

Viper 4

Transflective screen technology provides clear screen visibility across a range of lighting conditions and even in direct sunlight. Resistive touch screen functionality places menus and options at the operator's finger tips. A 12.1 in. [30.7 cm] high resolution display provides a large viewing area and easy to read display that allows the operator to quickly reference information during in field operations.

Viper 4+

In addition to the standard Viper 4 features, the Viper 4+ utilizes an enhanced brightness display and a Projected Capacitance (PCAP) touchscreen for added visibility and functionality.

Two and Three Dimensional Field Operation Views

During field operations, the Viper 4 and 4+ provide either a two or three dimensional view of the equipment location within the field area. The ROS is capable of providing swath guidance for the configured equipment using the configured equipment geometry to assist the operator and keep the equipment on track during the field operation.

Note: *Swath guidance may also be used by automated steering systems such as Raven SmarTrax to automatically steer the equipment onto the displayed swath guidance line. These systems are available to help reduce operator fatigue and can allow the operator to monitor various input or application systems during the field operation.*

Contact a local Raven dealer for additional information about automated steering systems available for use with the Raven Viper 4.

On-Screen Mapping and Job Reporting

During field operations, the Viper 4 and Viper 4+monitors and tracks the vehicle location and records input or application systems. As active sections or the working equipment width covers field area, the Viper 4 and Viper 4+ create live maps of previous equipment coverage. When the job is complete, the Viper compiles the location and any population, rate, or yield information into a report file for transfer to a home or office computer. The reports may be edited and used for customer billing, tracking product input or application for governmental agencies or environmental purposes, or to help plan future crop inputs and field operations.

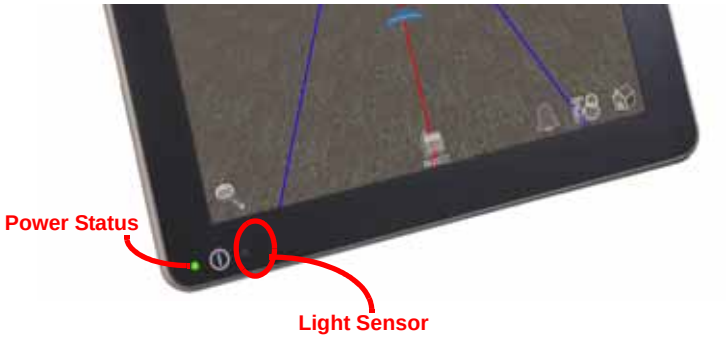
Transfer job reports to a Slingshot user account via either a Slingshot® Field Hub or a USB flash drive. The Slingshot web service is free and does not require any hardware or monthly subscriptions to utilize the reporting features of the web site. With a Slingshot Field Hub, files may be transferred from the home or office to the equipment in the field and completed job reports may be transferred back to the home or office via a wireless network connection.

Power Button and Status Indicator

Viper 4

The Viper 4 features a LED indicator to provide device status information at a glance.

FIGURE 2. Raven Viper 4



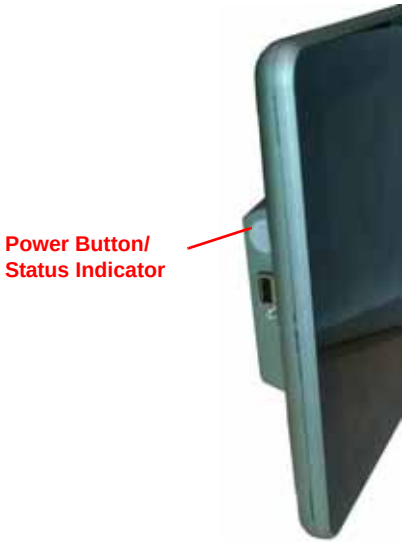
Power Status LED. When the Viper 4 is powered up, the LED will flash red for a few seconds and will then switch to green.

Light Sensor. The light sensor is not currently used with the Viper 4.

Viper 4+

Power Status LED. The power button on the Viper 4+ also doubles as the status indicator. When the Viper 4+ is powered up, the LED will flash red for a few seconds then switch to green.

FIGURE 3. Viper 4+ Power Button and Status Indicator



Integrated DGPS Receiver Option

The Viper 4 and Viper 4+ are available with either of the following options:

- Viper 4 base unit without an integrated DGPS solution (P/N 063-0173-410)
- Viper 4+ base unit without an integrated GPS solution (P/N 063-0173-776)
- Viper 4 with integrated, scalable dual frequency DGPS receiver (P/N 063-0173-409)
- Viper 4+ with integrated, scalable dual frequency DGPS receiver (P/N 063-0173-775)

These configurations allow the Viper 4 or Viper 4+ to integrate into existing precision agriculture systems or installed as the first building block for equipping a precision agriculture solution your current operations.

The Viper 4 and Viper 4+ with integrated DGPS receivers provide the in-cabin components necessary to start adding precision agriculture tools into a few implements in the machine shed or an entire fleet. With an integrated DGPS receiver, the Viper 4 or Viper 4+ may be quickly transferred between tractors, applicators, swathers, and harvesters for use throughout the growing season.

Whether equipped with an integrated DGPS receiver or not, the Viper 4 or Viper 4+ may be integrated into machines with existing DGPS solutions to utilize or enhance existing DGPS equipment already in the vehicle cabin.

Note: *Review the installation information provided with any external DGPS equipment to install and connect the Viper 4 or Viper 4+.*

When used with an external DGPS receiver, the internal receiver will not be used during field operations. If the external receiver stops providing signal during the field operation, the internal DGPS receiver may be enabled to allow operations to continue.

Speed Compensated Monitoring and Control

The Viper 4 and Viper 4+ provide speed compensated monitoring or automatic control features for a variety of field operations. Whether monitoring seed population, application rate, or harvest yield information, the information displayed to the operator is automatically adjusted for the current equipment speed. If the console is configured for automatic equipment control, the console will automatically make adjustments to the seed or product rate control system to adjust for changes in the equipment speed. These features allow the operator to observe other equipment functions and guide the vehicle during field operations, help reduce operator fatigue during long operating sessions, and reduce critical input, application, or yield errors.

Note: *Additional hardware may be required to allow the field computer to control equipment functions automatically. Contact a local Raven dealer for a complete list of available features for use with the* console *and more information on optional control systems and components.*

Connectivity Features

Viper 4

FIGURE 4. Viper 4 Ports and Connectors

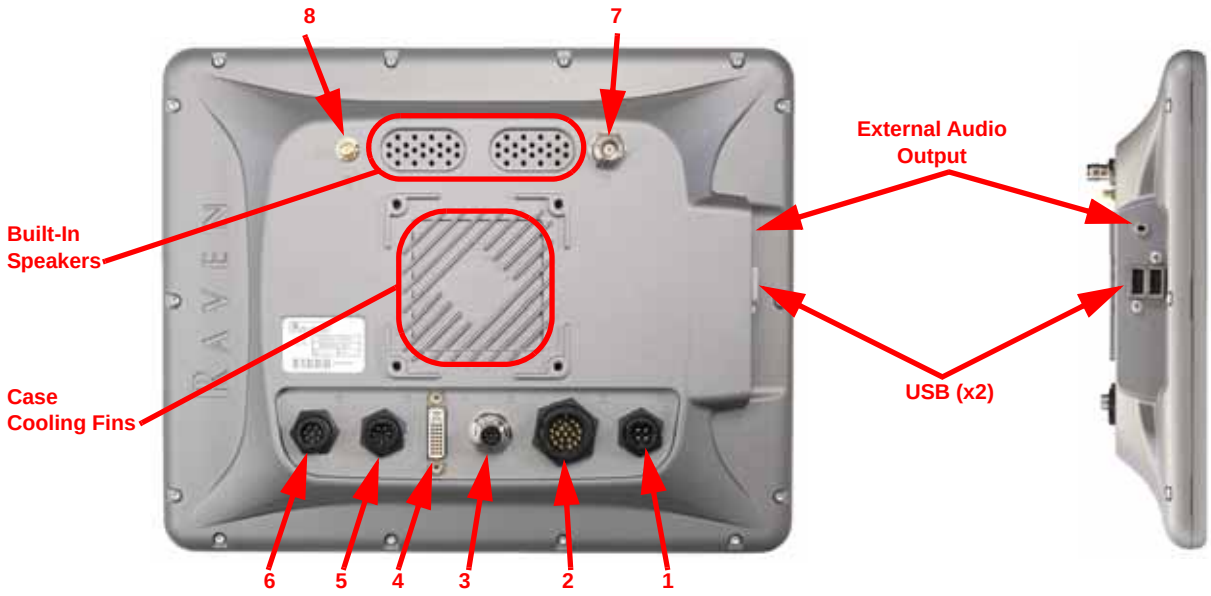


TABLE 1. Viper 4 Port and Connector Detail

Port Label	Description	Pin Count	Connector Type
1.	Power Connector	4	Conxall
2.	Main Interface Connector	20	Conxall
3.	Ethernet Connector	8	Turck
4.	Video Output/External Display	32	DVI
5.	Auxiliary CANbus Channels (2-4)	7	Conxall
6.	Video Camera Input	8	Conxall
7.	GPS Antenna	-	Coaxial
8.	Wi-Fi Antenna	-	Coaxial

FIGURE 5. **Viper 4+ Ports and Connectors**

TABLE 2. **Viper 4+ Port and Connector Detail**

Port Label	Description	Pin Count	Connector Type
1.	Power Connector	4	Conxall
2.	Main Interface Connector	20	Conxall
3.	Ethernet Connector	8	Turck
4.	Video Output/External Display	32	DVI
5.	Auxiliary CANbus Channels (2-4)	7	Conxall
6.	Video Camera Input	8	Conxall

Note: *The power and main interface ports will be the primary inputs with many systems and machine configurations. Refer to Chapter 5, Viper® 4 and Viper 4+ System Connections, for additional installation information.*

External Audio Output (Viper 4 Only)

The audio jack is available for connecting the Viper 4 to an external sound system or a head set.

USB Ports

Two USB 2.0 ports are available on the side of the Viper 4 and the Viper 4+. These ports are used to perform system updates, file maintenance if wireless communications are unavailable in the vehicle cabin, or allow the operator to connect other USB devices as necessary.

Note: *Insert the USB flash drive only when necessary. Do not start the field computer with a flash drive connected or leave the drive inserted during normal operation.*

⚠ CAUTION

Damage to the field computer may occur if the USB ports are used to charge mobile devices such as cellular phones, tablets, or mp3 devices. The USB ports should only be used for performing file transfer and maintenance.

Camera Inputs

Up to four separate video cameras may be connected to the Viper 4 and the Viper 4+ to help the operator monitor equipment functions or product levels on the system.

DGPS Antenna

The antenna ports on the Viper 4 and the Viper 4+ are used to pass position information onto the integrated DGPS receiver (if available). This port is used only if the integrated DGPS receiver will be used during field operations for location and course corrections.

For equipment utilizing or requiring an external receiver for location and course correction, the connector labeled “DGPS” on the console cable must be used to pass correction information to the Viper 4 and the Viper 4+.

Wi-Fi Antenna

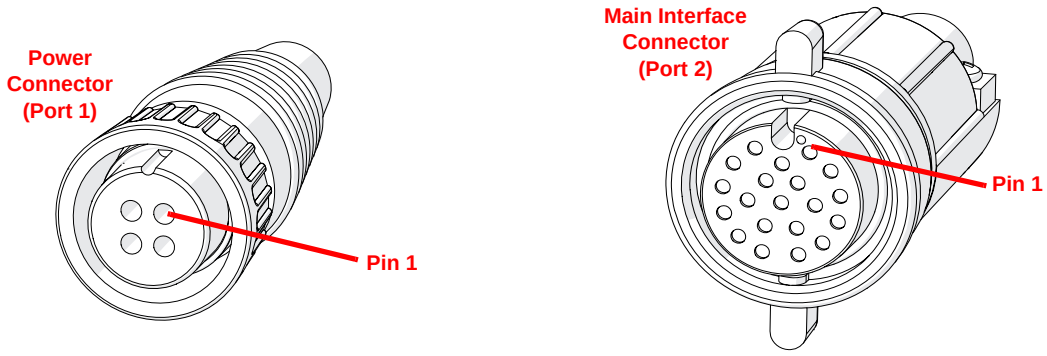
The Raven Viper 4 and the Viper 4+ field computers are ready for future wi-fi connectivity and communication options.

Technical Specifications

TABLE 3. Viper 4 Technical Specifications

		Viper 4		Viper 4+	
		U.S.	Metric	U.S.	Metric
Dimensions	Height	9.629 in.	24.457 cm	9.629 in	24.457 cm
	Width	12.015 in.	30.518 cm	12.015 in	30.518 cm
	Depth	1.786 in.	4.536 cm	1.786 in	4.536 cm
	Diagonal (screen)	12.1 in.	30.7 cm	12.1 in	30.7 cm
		(portrait or landscape)		(portrait or landscape)	
	Weight	approximately 4.7 lbs.	approximately 2.1 kg	approximately 4.7 lbs	approximately 2.1 kg
Power	Operating Voltage	9 to 16 V DC nominal (6.5 V drop-out to 32 V spike tolerant)		4 to 35 V DC Nominal	
Input/Output	USB	2 (USB 2.0)		2 (USB 2.0)	
	Ethernet	Category 5 Connectivity with Adapter Cable		Category 5 Connectivity with Adapter Cable	
	Audio	3.5 mm Stereo Minijack		N/A	
	Video	Camera/Video Input - PAL/NTSC Formats		Camera/Video Input - PAL/NTSC Formats	
		Display Output - DVI Port		Display Output - DVI Port	
	GPS	TNC Antenna Port - NMEA Messages		TNC Antenna Port - NMEA Messages	
	CAN	4 CAN Communication Ports (Raven Proprietary CANbus, ISOBUS, J1939, Open)		4 CAN Communication Ports (Raven Proprietary CANbus, ISOBUS, J1939, Open)	
	Switch	2 Digital Switch Inputs		2 Digital Switch Inputs	
Mounting	Plate/Arm	RAM Mounting Plate and Socket Arm		RAM Mounting Plate and Socket Arm	
	Hardware (provided)	Screws - 10-32 x 1/2” and 1/4-20 x 3/8” (Black) Washers - Flat and Split Lock		Screws - 10-32 x 1/2” and 1/4-20 x 3/8” (Black) Washers - Flat and Split Lock	
Environmental	Operating Conditions	32° to 158° F	0 to 70° C	32° to 158° F	0 to 70° C
	Storage Conditions	-40° to 185° F	-40° to 85° C	-40° to 185° F	-40° to 85° C
	Relative Humidity	non-condensing		non-condensing	

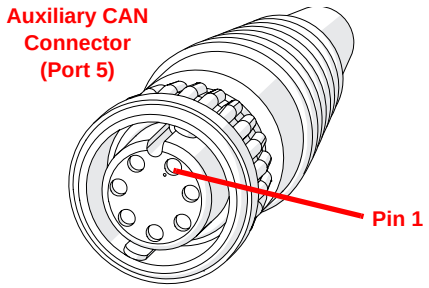
FIGURE 6. **Power and Main Interface Cable Pin Outs**



Port 1 - Power Connection	
Pin #	**Description**
1.	Battery Negative (Ground)
2.	Switched Ignition
3.	Switch Battery Output
4.	Battery Positive

Port 2 - Main Interface Connection			
Pin #	**Description**	**Pin #**	**Description**
1.	GPS Data Input	**11.**	COM A CTS
2.	GPS Data Output	**12.**	COM D Input
3.	COM A Input	**13.**	COM C Output
4.	RTK Corrections Input	**14.**	External Switch Input (0)
5.	COM B Input	**15.**	CANbus High Voltage
6.	COM A Output	**16.**	COM D TX Data
7.	COM A RTS	**17.**	CANbus Low Voltage
8.	RTK Corrections Output	**18.**	External Switch Input (1)
9.	COM B Output	**19.**	Simulated Radar Output
10.	COM C Input	**20.**	Ground

FIGURE 7. **Auxiliary CANbus Cable Pin Outs**



Port 5 - Auxiliary CAN Connector			
Pin #	**Description**	**Pin #**	**Description**
1.	Battery Negative (Ground)	**5.**	CAN2 Lo
2.	CAN1 Hi	**6.**	CAN3 Hi
3.	CAN1 Lo	**7.**	CAN3 Lo
4.	CAN2 Hi		

Memory Resources

The Viper 4 and Viper 4+ both feature a 32 gigabyte (GB) solid state hard drive for storage of application and job related files.

Note: *It is recommended to perform file maintenance regularly to copy job or report files to a home or office computer for archiving. File maintenance may be performed with either a USB flash drive up to 32 GB or a Slingshot® Field Hub to transfer files to the office wirelessly from the field.*

Care and Use

Refer to the following guidelines for proper care and use of the Viper 4 and the Viper 4+:

⚠ CAUTION

- Do not apply liquid or glass cleaner directly to the surface of the touch screen. Harsh chemicals may damage the touch screen. Clean the touch screen and exterior enclosure as needed with a soft cloth dampened with glass cleaner. Apply the cleaner to the cloth and then wipe the screen gently.
- Do not use any type of pointed or sharp instrument on the touch screen. Only a fingertip or an approved stylus should be used.
- Damage to the Viper 4 may occur if the USB ports are used to charge mobile devices such as cellular phones, tablets, or mp3 devices. On the Viper 4, the USB ports should only be used for performing file transfer and maintenance. On the Viper 4+, the USB port may also be used for charging mobile devices.
- While the Viper 4 and Viper 4+ are resistant to limited exposure to the elements, they are not weatherproof. Mount the unit inside of the machine cabin or drivers compartment and not exposed to precipitation, condensation, or other liquids for extended periods. If the vehicle cabin is not enclosed, remove the unit at the end of each days use. Store the Viper 4 and Viper 4+ in a dry environment when not in use.
- When temperatures are expected to be 0° F [-17° C] or lower, remove the Viper 4 from the vehicle and store it in a climate controlled environment. At these temperatures, the unit will not sustain damage, however, the Viper 4 and Viper 4+ may not operate as expected until the temperature of the unit is raised above this temperature.
- Mount the Viper 4 and Viper 4+ securely and route cables to prevent tripping hazards and keep the wires from pinching or breaking.
- Always remove the power connections for the Viper 4 and Viper 4+ and any control nodes or ECUs from the machine battery before jump starting or welding on any component of the machine or implement. Jump starting or welding on the equipment will damage the Viper 4 and Viper 4+ and CANbus nodes or ECUs.

Updates

Product software and documentation updates may be made available periodically on the Raven Applied Technology web site:

www.ravenhelp.com

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

-Viper® 4 and Viper 4+ Installation Manual
-Manual No. 016-0171-559 Rev. C
-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.

CHAPTER 3

Installation Overview and Kit Contents

Overview of the Installation Process

The information provided in this section cover basic installation of the Raven Viper® 4, Viper 4+ and supplied components. Perform the following procedures to complete installation of a Viper 4 control system:

1. Review Chapter 3, *Installation Overview and Kit Contents* and verify necessary components are on hand before starting the installation process.
2. Review to Chapter 4, *Mounting the Viper® 4 and Viper 4+* for details on mounting the ROS device.
3. Mount and connect GPS antenna (integrated receiver) or install external GPS components. Review the *DGPS Antenna Mounting Recommendations* section on page 25 for assistance with mounting the GPS antenna.
4. Install any optional CANbus components.
5. Route and connect chassis and console cabling. Refer to Chapter 5, *Viper® 4 and Viper 4+ System Connections*.
6. Connect power leads to vehicle battery.

Note: *Review the Raven CANbus Network Installation Manual for additional information on building a CAN (Controller Area Network) system. For instructions on installing additional or optional hardware with the Viper 4 or Viper 4+, refer to installation documentation provided with the additional or optional component(s).*

Viper® 4+ Kit Contents

Before proceeding with the installation of the Viper 4+, review the following components provided with the field computer:

TABLE 1. Viper 4+ Kit Contents

		Viper 4+ Kits (P/N 117-5010-010)							
		B	BM	W	WM	L	C	D	KG
Components	Part Number	without GPS	without GPS	WAAS/ SBAS	WAAS/ SBAS	without GPS Antenna	Slingshot GS	Satellite GS	RTK
Console, Viper 4+ (with integrated DGPS receiver)	063-0173-775	-	-	1	1	1	1	1	1
Console, Viper 4+	063-0173-776	1	1	-	-	-	-	-	-
Antenna, Helix (MBA-6)	063-0172-651	-	-	1	1	-	1	1	1
Plate, Aerial Antenna Mounting	063-0172-971	-	-	1	1	-	1	1	1
Cable, Antenna - 15' [4.5 m]	115-0171-117	-	-	1	1	-	1	1	1
Wi-Fi Antenna	121-0000-037	1	1	1	1	1	1	1	1
Kit, Mounting (RAM Mount and Hardware)	117-0171-132	1	1	1	1	1	1	1	1
Cable Adapter, Viper 4 to VPro	115-0172-023	-	1		1				
Serial Extension Cable	115-0172-002	-	-	-	-	-	1	-	1
Ethernet Cable	115-0172-090	-	-	-	-	-	1	-	1
Slingshot Field Hub Power Cable	115-0171-999	-	-	-	-	-	1	-	1
Manual, Viper 4 and Viper 4+ Installation	016-0171-559	1	1	1	1	1	1	1	1
Manual, Raven CANbus Installation	016-0171-504	1	1	1	1	1	1	1	1
Manual, ROS Product Control	016-0171-552	1	1	1	1	1	1	1	1
Manual, ROS Accuboom	016-0171-087	1	1	1	1	1	1	1	1
Manual, ROS Autoboom	016-0130-076	1	1	1	1	1	1	1	1
Manual, ROS Smartrax	016-9001-022	1	1	1	1	1	1	1	1
Manual, ROS Operation Manual	016-0171-539	1	1	1	1	1	1	1	1
Pre-authorized Features									
GLONASS	077-0180-083						X	X	X
GS (Slingshot or Satellite Services)	077-0180-116						X	X	
RTK with GLONASS	077-0180-117								X
Single Product Variable Rate (VRA)	077-0180-100		X		X				
Multi-Product Variable Rate (VRA)[a]	077-0180-101		X		X				

		Viper 4+ Kits (P/N 117-5010-010)							
		B	BM	W	WM	L	C	D	KG
Components	Part Number	without GPS	without GPS	WAAS/ SBAS	WAAS/ SBAS	without GPS Antenna	Slingshot GS	Satellite GS	RTK
Combo (Single/Multi) Variable Rate	077-0180-102								
Weather Station	077-0180-103								
GreenSeeker	077-0180-123								
ISOBUS Virtual Terminal (VT) with Task Controller[b]	077-0180-148								
ISOBUS Section Control[c]	077-0180-149								

a. Single product VRA authorization is required to allow multi-product VRA features to be authorized.

b. Provides access to VT and ISO task controller capabilities of the ROS platform. Available at no-cost. VRA capabilities may require additional feature authorization.

c. Automatic section control features for ISOBUS control systems.

Contact a local Raven dealer for additional assistance or to purchase additional components.

Chassis and Console Cabling

Note: *A console cable is not supplied in kits and will be required to power up and connect the console with the control or guidance system(s). Contact a local Raven dealer for details on available console cables and purchasing a cable appropriate for your specific operations.*

One of the following cables will be required with the Viper 4 or Viper 4+ field computer:

TABLE 2. Available Cabling for Viper 4 or Viper 4+ Field Computers

Description	Part Number
Cable, Viper 4 Gen 2 Console	115-0172-025
Cable, Gen 1 to Viper 4 Adapter	115-0172-023

Many existing systems that currently have a Raven field computer installed may be upgraded to the Raven Viper 4 by using the adapter cable listed above. This adapter cable allows the Viper 4 to replace the existing field computer without replacing any existing system cables.

For new installations, the Viper 4 generation 2 console cable connects directly to an equipment specific chassis cable. The generation 2 cabling platform and hitch connection design is well suited for using Viper consoleswith tractors and various towed implements. This highly modular design allows the operator to quickly switch the control system for different field operations throughout the growing season.

Optional Cabling and Components

Review the following table for cabling options and other components available for use with the Raven Viper 4. Contact a local Raven dealer for details or purchasing information.

TABLE 3. Viper 4 and Viper 4+ Optional Equipment Cables

Description	Part Number
Cable, Anti-vibration Ethernet 6.5’ [2 m]	115-0172-090
Cable, Anti-vibration Ethernet 13’ [4 m]	115-0172-210
Cable, DVI Monitor 6’ [1.8 m]	115-0172-091
Cable, 4 Input Closed Circuit Camera	115-0172-077
Cable, 3 Input Auxiliary CANbus	115-0172-078

Note: *Refer to the Raven CANbus Installation Manual for additional cable platform and connection information.*

Optional Feature Installation

Several optional systems and features are available for use with the Raven Viper 4, such as automated steering, automatic section or row control, product control and automated boom leveling and height control systems.

Contact a local Raven dealer for a complete list of features compatible with the Viper 4, for additional information on required hardware, or for purchasing or installation assistance with these optional systems.

CHAPTER 4

Mounting the Viper® 4 and Viper 4+

NOTICE

- The Viper 4 and Viper 4+ are resistant to limited exposure to the elements, however, the field computer is not weatherproof. Mounted the unit inside of the machine cabin or drivers compartment within easy reach of the driver or operator. If the vehicle cabin is not enclosed, remove the field computer at the end of each days use.

  The Viper 4 and Viper 4+ may be exposed to ambient conditions that do not pose a problem to field operations such as light rain or windblown dust, however, if conditions require stoppage of field activities, leave the Viper 4 or Viper 4+ in an enclosed vehicle cabin or moved to a dry location until field operations resume.
- The case is designed to allow a small air gap 1/8 inch [3 mm] between the mounting bracket and the case to allow air flow over the case cooling fins. Do not seal or obstruct this air gap, or otherwise modify the case.

Note: *It is normal for the case to become warm to the touch while in operation.*

- Securely fasten the RAM mounting arm to a suitable, flat surface. Once mounted, the RAM mounting arm must provide a stable base for the console and should not impede normal machine operation.
- The field computer should be mounted in a location where it will not be jarred during normal equipment operation. Keep the computer clear of moving elements within the machine cabin.
- Route all cables to avoid tripping hazards and protect the cable from kinking or breaking during operation.

Mounting the Field Computer

Read and perform the following steps to use the provided RAM® mount and hardware to mount and secure the Viper 4 or Viper 4+ field computer.

Orientation

The Viper 4 and Viper 4+ may be mounted in either a portrait or landscape orientation to best suit field operations, operator needs, or implement cabin space.

FIGURE 1. Raven Viper 4 Field Computer with ROS

Note: *When mounted in portrait orientation, the Viper 4 power button must be in the lower, right corner of the device.*

FIGURE 2. Raven Viper 4+ Field Computer with ROS

Note: *When mounted in the portrait orientation, the USB ports on the Viper 4+ will face down.*

Mount the Field Computer

Note: *If a CAN switch box or Switch Pro will be installed with the field computer, use the mounting hardware provided with the switch box. Refer to the switch box installation guide for assembly and mounting instructions.*

1. Loosen the RAM socket arm and remove the circular base.
2. Mount the circular base to a flat surface within the operator's cabin or compartment.
3. Place the square base over the mounting posts on the back of the console.

Note: *The ball on the square base is offset to provide additional clearance or mobility of the console. The base may be oriented with the ball toward either the top or bottom of the console as necessary or desired for the selected mounting position.*

4. Use the provided flat washers, lock washers and screws to secure the square base to the back of the Viper 4 console.
5. Replace the RAM socket arm onto the circular base and tighten the arm to secure the console.
6. Adjust the console as necessary for optimal viewing and operation.

Note: *It is normal for the case to become warm to the touch during operation.*

DGPS Antenna Mounting Recommendations

Note: *The following recommendations are provided to assist with mounting an aerial antenna for use with the Viper 4 or the Viper 4+ integrated receiver. These instructions are not intended to replace instructions provided with any external DGPS equipment. Please refer to, and follow, all mounting and installation instructions for optional or additional DGPS components provided from the equipment manufacturer.*

Best Practices

- Mount the DGPS antenna to the tallest point of the vehicle (usually the vehicle cabin) using the standard magnet mount.
- Make sure that the DGPS antenna has a clear 360° view of the sky.
- Mount the DGPS antenna at least 36" [92 cm] from other antennas (e.g. radio, cellular, etc.) to avoid signal interference.
- The simplest setup is achieved by mounting the antenna on the center-line of the vehicle.
- An optional aerial antenna mounting plate (P/N 063-0172-971) is available for mounting helix style DGPS antennas. If no suitable magnetic mounting location exists on the vehicle, this mounting plate may be affixed to the tallest point of the vehicle to provide a magnetic surface for mounting the DGPS antenna.

CHAPTER 5

Viper® 4 and Viper 4+ System Connections

Connecting the Field Computer

Best Practices

- Use dielectric grease on any connections outside the vehicle cabin to help protect connectors exposed to dirt, debris, moisture, chemicals, liquids, or the outside environment.
- Route all cables to avoid tripping hazards and to protect the cable from kinking or breaking during normal equipment operation. Be sure to allow enough slack for any folding or articulating joints along the cable route.

Connecting the Adapter Cable

1. Connect the generation one adapter cable (P/N 115-0172-023) to the back of the field computer:
   a. Insert the round, 4-pin connector into the receptacle labeled “1” on the back of the device.
   b. Connect the round, 20-pin connector to the receptacle labeled “2.”
2. Disconnect the round connectors from the back of the existing Raven field computer.
3. Connect the adapter cable to the mating harness connectors.

Connecting the Console Cable

1. Connect the console cable, or generation one adapter cable, to the back of the field computer:
   a. Insert the round, 4-pin connector into the receptacle labeled “1” on the back of the device.
   b. Connect the round, 20-pin connector to the receptacle labeled “2.”
2. Route the console cable out of the vehicle cabin and connect to the generation 2 chassis cable.
3. If the internal DGPS receiver will be used, ensure that the DGPS input and output connectors on the console cable are connected together. Otherwise, use these connectors to route GPS position information from the receiver to the field computer.

Integrated DGPS Receiver Antenna Cable

Note: *The coaxial antenna receptacle on the Viper 4 and Viper 4+ is only available if the Viper 4 or Viper 4+ was purchased with the optional integrated DGPS receiver.*

Viper 4 and Viper 4+ systems without an integrated DGPS receiver will require an external receiver connected to the DGPS input and output connector on the interface cabling to utilize the guidance and mapping features of the and Raven Operating Software (ROS).

1. Connect the coaxial antenna cable to the coaxial connector in port “7.” Refer to Figure 4 on page 10.
2. Route the antenna cable to the DGPS antenna and connect to the coaxial port on the antenna.

Connect an External DGPS Receiver

Note: *A field computer utilizing an external DGPS receiver will require an console cable with the “DGPS” connector.*

1. Install the console or adapter cable as described in the *Connecting the Console Cable* section on page 27 or the *Viper 4 Connecting the Adapter Cable* section on page 25.
2. Locate the connector labeled “DGPS” on the console cable in the vehicle cabin.
3. Refer to the receiver installation procedure for details on connecting the receiver to this connector.

Optional Connections

Wi-Fi Antenna

Connect the supplied wi-fi antenna to the coaxial receptacle labeled “8” for future wi-fi communication capabilities. Refer to Figure 4 on page 10.

Ethernet

An ethernet adapter cable is required for the Turck receptacle labeled “3” to connect the Viper 4 or Viper 4+ to a Slingshot Field Hub to receive RTK corrections. Refer to Figure 4 on page 10.

The adapter cable may also be used to connect the Viper 4 or Viper 4+ with an ethernet enabled device such as a wireless modem.

Auxiliary Controller Area Network (CANbus) Interface

In addition to Raven CANbus systems, Viper 4 and Viper 4+ are capable of interfacing with ISObus systems and networks using the J1939 protocol. This capability allow the Viper 4 and Viper 4+ to interface with several systems installed by the original equipment manufacturer. Contact a local Raven dealer or an equipment service center for more information and purchasing.

Connect the auxiliary CANbus cable to the Conxall receptacle labeled “5” to connect the Viper 4 or Viper 4+ to auxiliary CANbus systems.

FIGURE 1. **Viper 4+ Cable Connections (D/N 054-5010-010)**