slingshot™ by RAVEN

Installation Manual

Slingshot™-Enabled Kit for Trimble® *Ag*GPS® 262/AG-372 Receiver

Disclaimer

While every effort has been made to ensure the accuracy of this document, Raven Industries assumes no responsibility for omissions and errors. Nor is any liability assumed for damages resulting from the use of information contained herein.

Raven Industries shall not be responsible or liable for incidental or consequential damages or a loss of anticipated benefits or profits, work stoppage or loss, or impairment of data arising out of the use, or inability to use, this system or any of its components. Raven Industries shall not be held responsible for any modifications or repairs made outside our facilities, nor damages resulting from inadequate maintenance of this system.

As with all wireless and satellite signals, several factors may affect the availability and accuracy of wireless and satellite navigation and correction services (e.g. GPS, GNSS, SBAS, etc.). Therefore, Raven Industries cannot guarantee the accuracy, integrity, continuity, or availability of these services and cannot guarantee the ability to use Raven systems, or products used as components of systems, which rely upon the reception of these signals or availability of these services. Raven Industries accepts no responsibility for the use of any of these signals or services for other than the stated purpose.

CHAPTER 1

Important Safety Information

NOTICE

Read this manual and the provided safety information carefully before installing Slingshot™ via the Trimble® *Ag*GPS® 262/AG-372 receiver.

- Follow all safety information presented within this manual.
- If you require assistance with any portion of the installation, contact the Raven Industries Applied Technology Division for support.

FCC Statement

This device complies with Part 15 of FCC Rules. Operation of this device is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment generates, uses, and may radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is not guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception (which can be determined by turning the equipment off and on), the user is encourage to try to correct the interference using one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

CHAPTER 2

Installation & Configuration

Introduction

Congratulations on your purchase of the Raven Slingshot™ system! Slingshot is a new approach to precision agriculture powered by a major leap in connectivity, delivering advance RTK correction signal technology, high-speed Internet, and live remote support. More importantly, it can deliver satisfaction in a job well-done - even in regions that previously couldn't maximize agricultural technology.

The purpose of this manual is to provide step-by-step instructions on installing and configuring the Slingshot system utilizing the Trimble *Ag*GPS 262/AG-372 receiver.

Required Components

- RTK unlocked Trimble *Ag*GPS 262 receiver with firmware version 2.00 or greater or RTK unlocked Trimble AG-372 GNSS receiver
- Slingshot Field Hub™
- Trimble *Ag*GPS 262/AG-372 receiver to Slingshot adapter cable (P/N 115-0171-935)

Installation

Install the Slingshot Field Hub

Install the Slingshot Field Hub following the instructions outlined in the enclosed Field Hub™ Installation Guide (P/N 016-0171-380).

Connect the Trimble AgGPS 262/AG-372 Receiver to the Field Hub

1. Connect the PORT C, Input - To Field Hub connector on the Trimble 262/AG-372-to-Slingshot adapter cable (P/N 115-0171-935) to the RS232 serial port of the Field Hub.
2. Connect the other end of the installed cable to the Deutsch Port B connector of the Trimble 262/AG-372 GPS receiver.

FIGURE 1. **Slingshot to Trimble *Ag*GPS 262/AG-372 Receiver Cabling**

Important: *Do not use the PORT B connector on the Trimble 262/AG-372-to-Slingshot adapter cable for CMR input. It will not work for CMR input. Configuring two ports for CMR input causes erratic operation of the Trimble AgGPS 262/AG-372 receiver. Additionally, Port B settings are not retained through a power cycle of the Trimble AgGPS 262/AG-372 receiver, whereas Port C settings will survive the power cycle. Refer to the appropriate Trimble service bulletin(s) for further information. These can be obtained from Trimble or authorized Trimble dealers.*

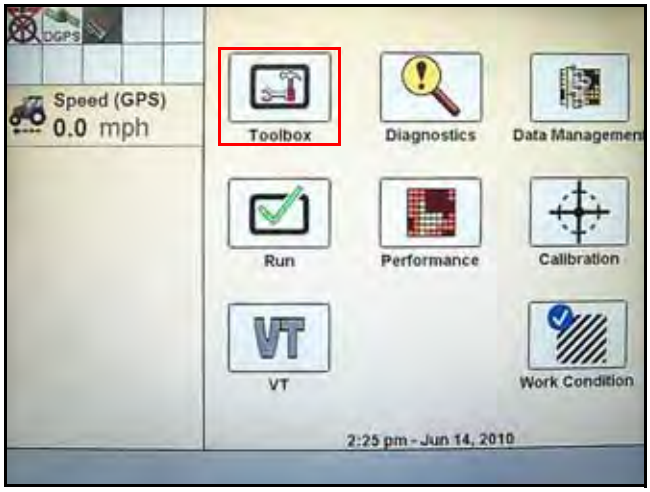
Configuration

Once the Slingshot Field Hub is installed and connected to the Trimble *Ag*GPS 262/AG-372 receiver, it is necessary to configure the system to ensure proper communication between the components. Configuration is performed using the AFS® Pro 600/700 or Trimble AgRemote™ software.

Note: *Depending the version of software being used, the screens may appear slightly different.*

Configure the Trimble *Ag*GPS 262/AG-372 Receiver Via the AFS Pro 600/700

FIGURE 2. AFS Pro 600/700 Main Menu



3. Select **Toolbox**.

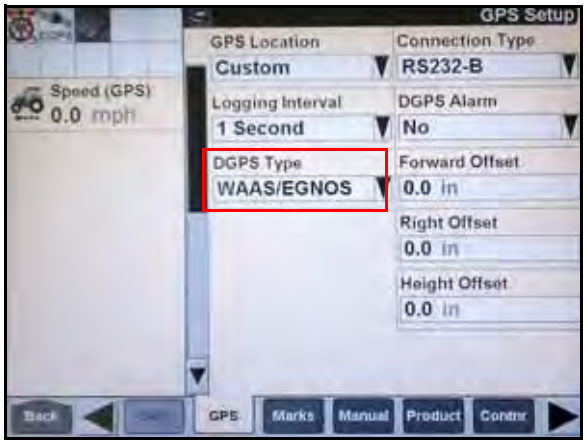
FIGURE 3. Display Setup Screen

4. Select ▶ .

FIGURE 4. Display Setup Screen

5. Select **GPS.**

FIGURE 5. GPS Setup Screen



6. Select the **DGPS Type** drop-down box.

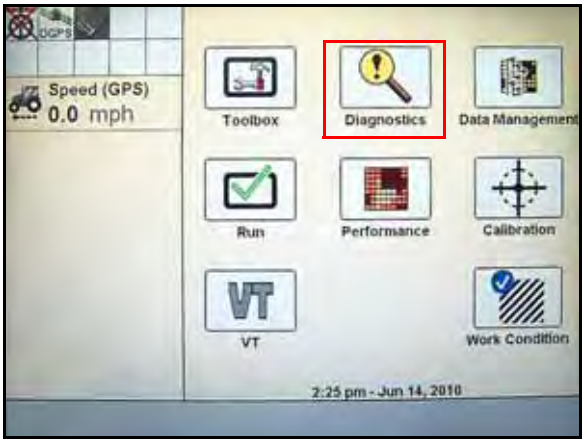
FIGURE 6. GPS Setup Screen

7. Select **RTK**.

FIGURE 7. GPS Setup Screen

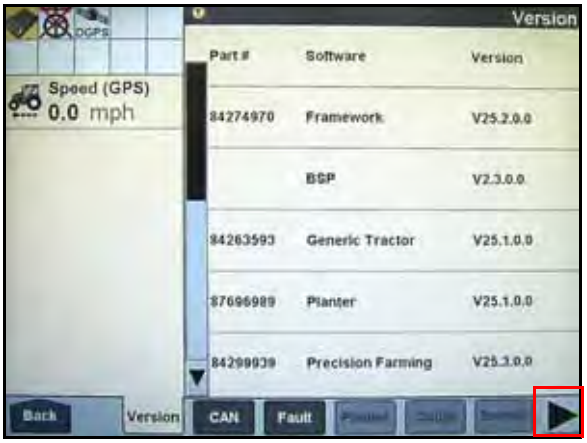
8. Verify that the Channel ID field displays “No Radio” and that the RTK/RTX Source is set to AgGPS Radio.
9. Press the **Back** button on the GPS Setup screen.

FIGURE 8. AFS Pro 600/700 Home Screen



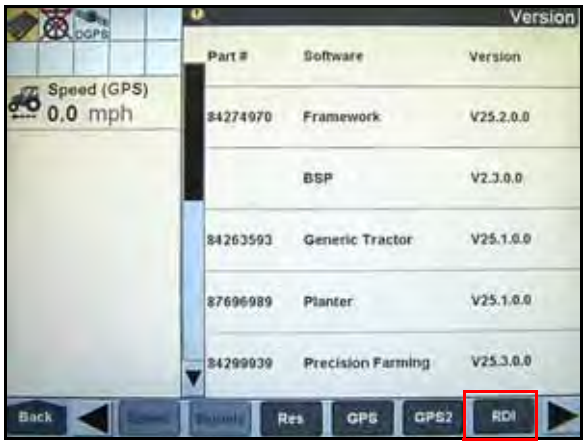
10. Select **Diagnostics**. The following screen will appear:

FIGURE 9. Version Display Screen



11. Select ▶ .

FIGURE 10. Version Display Screen



12. Select **RDI**. The following screen will appear:

FIGURE 11. AFS Pro 600/700 RDI Screen

Important: *The settings contained in the text below have been thoroughly tested and verified. The change in settings resulted in improved RTK availability in real field conditions when used with the Slingshot system. However, Raven Industries in no way guarantees or warranties the equipment configuration of non-Raven equipment. Please contact your Trimble customer support for further details.*

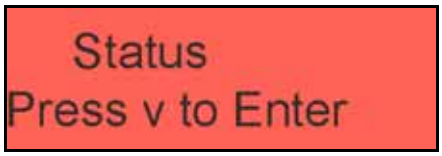
To ensure optimal RTK signal availability with the *Ag*GPS 262/AG-372 receiver, it may be necessary to adjust the DOP mask settings. While a low RTK DOP mask setting provides high confidence in GPS position, GPS constellation settings often drop RTK fix in some geographic regions.

Trimble provides a DOP predictor tool that assists in determining acceptable settings for specific geographical areas. Adjust the receiver settings as indicated below to change the “to fix” and “when fixed” conditions.

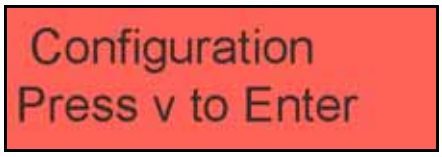
Important: *If the settings do not match what is shown, toggle through the options until the settings change to match the settings shown. To change the settings:*

1. *Press the ► until the item to be changed flashes.*
2. *Select the ▲ or ▼ button to change the setting.*
3. *Select **Enter**.*

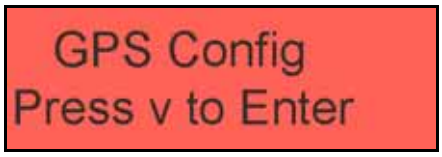
13. Select ►. The following screen will appear:



14. Select ►. The following screen will appear:

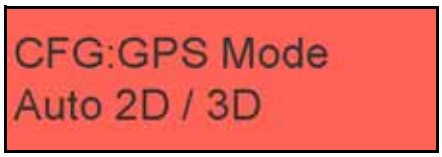


15. Select ▼. The following screen will appear:



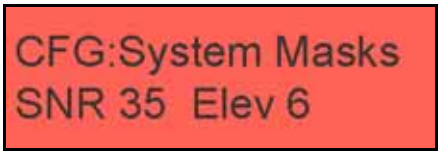
16. Select ▼. The following screen will appear:

17. Select ▼. The following screen will appear:



18. Select ▼. The following screen will appear: (AG-372 Only):

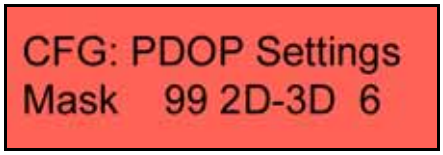
19. Select ▼. The following screen will appear:



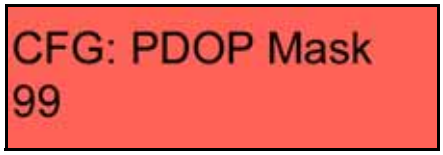
Note: *A lower Elevation Mask setting offers a better view of satellites, which can improve RTK availability.*

20. Select ▼. The following screen will appear:

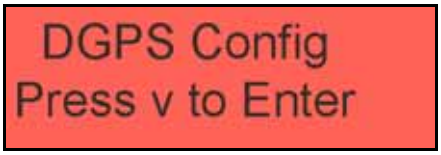
***Ag*GPS 262**



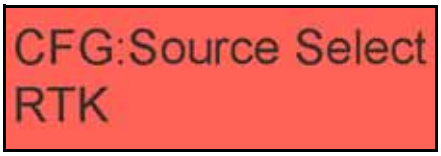
AG-372



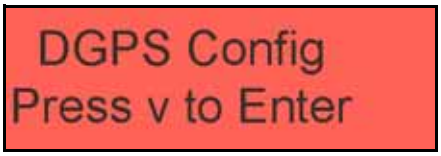
21. Select **ESC**. When the GPS Config screen reappears, select ▶. The following screen will appear:



22. Select ▼. The following screen will appear:



23. Select **ESC**. The following screen will reappear:



24. Select ▶. The following screen will appear:

25. Select ▼. The following screen will appear:

26. Select ▼. The following screen will appear:

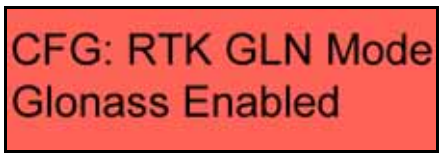
27. Select ▼. The following screen will appear:

Note: *Selecting the Favor Avail setting will result in improved RTK availability.*

28. Select ▼. The following screen will appear:

***Ag*GPS 262**

AG-372



Note: *Selecting the RTK+ mode during programming causes the AgGPS 262 receiver to immediately reset, which is normal behavior.*

29. Select ▼. The following screen will appear:

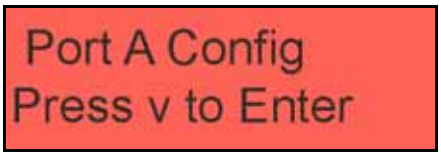
30. Select ▼. The following screen will appear:

31. Select ▼. The following screen will appear:

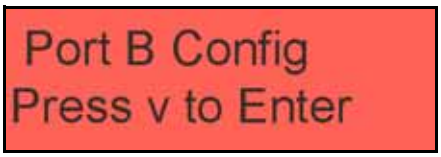
32. Select ▼. The following screen will appear:

33. Select ▼. The following screen will appear:

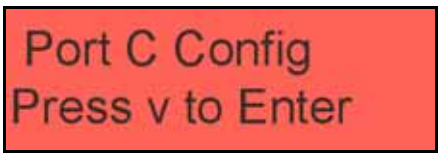
34. Select **ESC**. When the RTK Config screen reappears, press ▶. The following screen will appear:



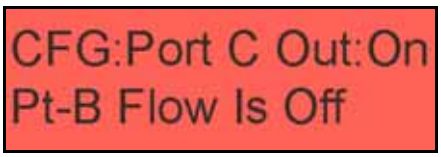
35. Select ▶. The following screen will appear:



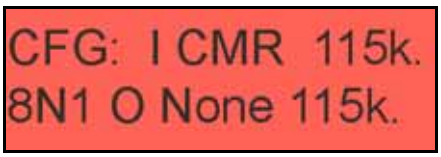
36. Select ▶. The following screen will appear:



37. Select ▼. The following screen will appear:

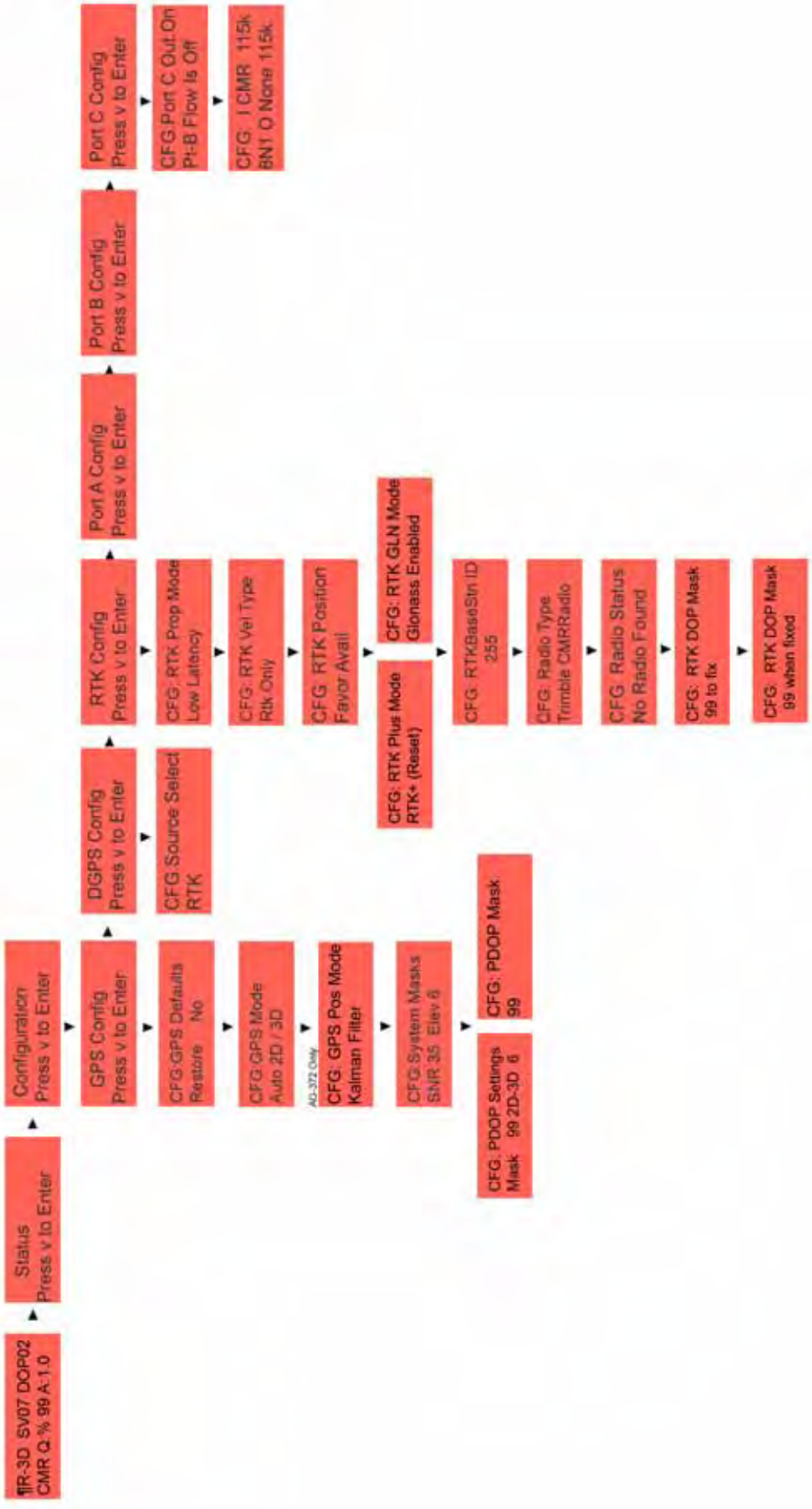


38. Select ▼. The following screen will appear:



39. Select **ESC** until the system returns to the main screen.

FIGURE 12. Configuration Menu Via the AFS Pro 600



Configure the Trimble *Ag*GPS 262/AG-372 Receiver Via the AgRemote Software

Important: *The settings contained in the text below have been thoroughly tested and verified. The change in settings resulted in improved RTK availability in real field conditions when used with the Slingshot system. However, Raven Industries in no way guarantees or warranties the equipment configuration of non-Raven equipment. Please contact your Trimble customer support for further details.*

To ensure optimal RTK signal availability with the *Ag*GPS 262/AG-372 receiver, it may be necessary to adjust the DOP mask settings. While a low RTK DOP mask setting provides high confidence in GPS position, GPS constellation settings often drop RTK fix in some geographic regions.

Trimble provides a DOP predictor tool that assists in determining acceptable settings for specific geographical areas. Adjust the receiver settings as indicated below to change the “to fix” and “when fixed” conditions.

Important: *If the settings do not match what is shown, toggle through the options until the settings change to match the settings shown. To change the settings:*

1. *Press the ▶ until the item to be changed flashes.*
2. *Select the ▲ or ▼ button to change the setting.*
3. *Select **Enter**.*

1. Connect the Trimble *Ag*GPS 262/AG-372 receiver to the console.
2. Access the AgRemote software. The following screen will appear:

3. Select ▶. The following screen will appear:

4. Select ▶. The following screen will appear:

5. Select ▼. The following screen will appear:

6. Select ▼. The following screen will appear:

7. Select ▼. The following screen will appear:

8. Select ▼. The following screen will appear (AG-372 Only):

9. Select ▼. The following screen will appear:

Note: *A lower Elevation Mask setting offers a better view of satellites, which can improve RTK availability.*

10. Select ▼. The following screen will appear:

***Ag*GPS 262**

AG-372

11. Select **ESC**. When the GPS Config screen reappears, select ▶. The following screen will appear:

12. Select ▼. The following screen will appear:

13. Select **ESC**. The following screen will reappear:

14. Select ▶. The following screen will appear:

15. Select ▼. The following screen will appear:

16. Select ▼. The following screen will appear:

17. Select ▼. The following screen will appear:

Note: *Selecting the Favor Avail setting will result in improved RTK availability.*

18. Select ▼. The following screen will appear:

***Ag*GPS 262**

AG-372

Note: *Selecting the RTK+ mode during programming causes the AgGPS 262 receiver to immediately reset, which is normal behavior.*

19. Select ▼. The following screen will appear:

20. Select ▼. The following screen will appear:

21. Select ▼. The following screen will appear:

22. Select ▼. The following screen will appear:

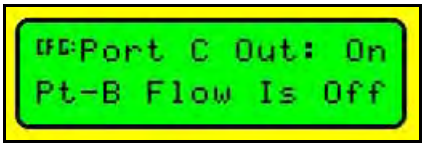
23. Select ▼. The following screen will appear:

24. Select **ESC**. When the RTK Config screen reappears, press ► . The following screen will appear:

25. Select ► . The following screen will appear:

26. Select ► . The following screen will appear:

27. Select ▼. The following screen will appear:



28. Select ▼. The following screen will appear:

29. Select **ESC** until the system returns to the main screen.

FIGURE 13. Configurations Settings Via AgRemote Software

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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 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 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 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.

016-0171-537 Rev. A, E19889

RAVEN

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 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.

Slingshot™-Enabled Kit for Trimble®
*Ag*GPS® 262/AG-371 Receiver
Slingshot™ Installation Manual
(P/N 016-0171-409 Rev D 07/12 E19905)

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