

USER'S MANUAL

Model Numbers:
GWR 1.1 (Robot) | GWC 1.0 (Controller) | GWV 1.1 (Camera)



GRAIN WEEVIL

DOING THE WORK NO HUMAN SHOULD



**Model Numbers:
GWR 1.1 (Robot) | GWC 1.0 (Controller) | GWV 1.1 (Camera)**

GRAIN WEEVIL

Robot User's Manual

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WELCOME



The Grain Weevil is a semi-autonomous robot designed to improve grain bin safety, operational efficiency, and grain quality. It eliminates the need for humans to enter confined grain storage spaces, handling tasks like leveling, crust breakup, and feeding grain into augers with precision and control.

This manual contains essential safety information and operating instructions—please read carefully before use to ensure safe operation, maximize performance, and protect your investment.

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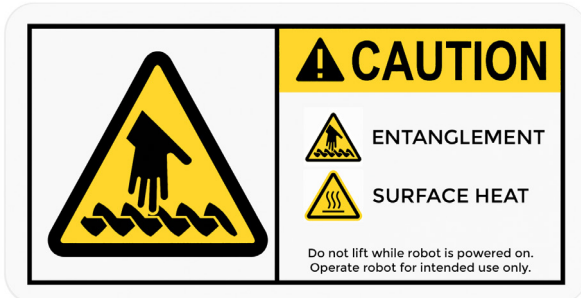
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Safety Warnings

ROBOT



ENTANGLEMENT

Do not lift or carry robot while powered on. Pinch points and entanglement possible.



SURFACE HEAT

Gear boxes may be hot during and after operations.



HEAVY OBJECT

Robot weighs 50 lbs but is also an unusual shape. Use caution when lifting / carrying

LIFT SYSTEM



FALL HAZARD

Do not attempt to lift or carry robot into the grain bin manually. Fall risk increases when carrying heavy objects. While operating Lift System - use caution and wear all required personal protective equipment including a fall harness.



FALLING OBJECTS

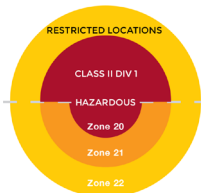
Do not stand within the fall danger zone while lifting or lowering the robot. If using a single person operation, ensure winch is located in a safe orientation. If using a two-person operation, ensure both parties are clear of danger before winching robot.

GRAIN BIN WARNING



ZERO BIN ENTRY

Follow all recommended bin entry protocols. Grain Weevil recommends zero bin entry and has provided suggested procedures to recover a stranded robot that can be achieved with zero entry.



RESTRICTED LOCATIONS

Do not use the Grain Weevil or any of the associated equipment within a Zone 20 / Class II Div 1 Hazardous Environment without written consent from Grain Weevil, accompanied by a company wide safety exemption.

ELECTRICAL SAFETY



Powered by:
Toshiba LTO
See Battery Manual



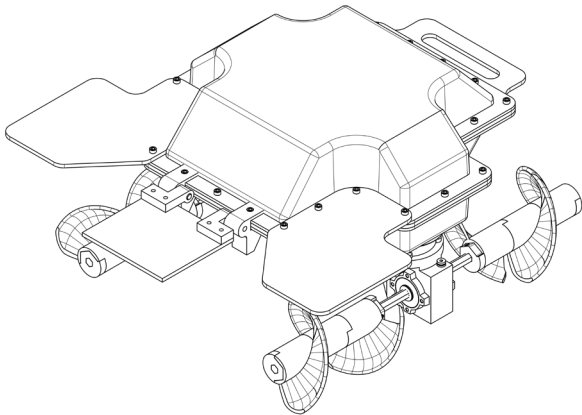
Do Not Charge
While Robot is in
the Bin



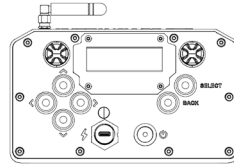
Engineered to IP65
Standards
DO NOT SUBMERGE

Getting Started

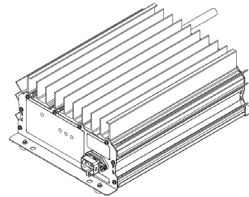
Core Components



GW Series I Robot w/Shovel & Wings

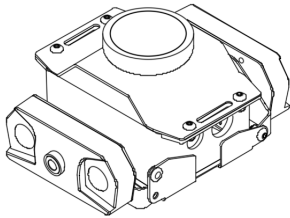


Remote Controller

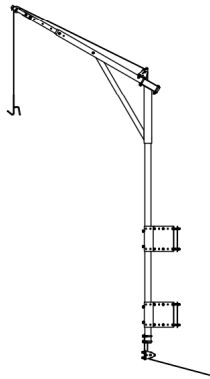


Standard Charger

Safety Components



FPV Dual Camera System



Robot Lift System

Additional Items Included:

- Light Bar
- Safety Signage
- Tether Kits

Additional Items Required: (Not Included)

- Android based phone or tablet

Training Requirements

Before Operating the Grain Weevil Robot, all users must:

- Review this User's Guide in full
- Be familiar with bin entry standards and personal protective equipment required
- Ensure the bin is NOT classified as a Class II Div I (or Zone 20) hazardous location

Where to Get Help

Support Contact: Scan QR Code on your robot

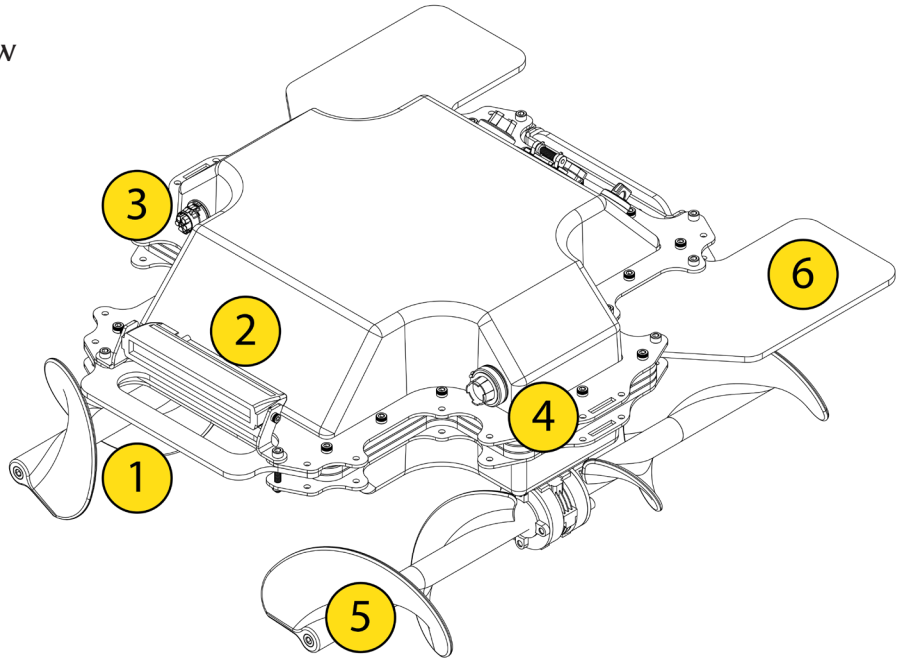
Visit www.grainweevil.com for links to training materials

Always contact support before attempting to open the robot body or perform non-routine repairs.

Product Overview

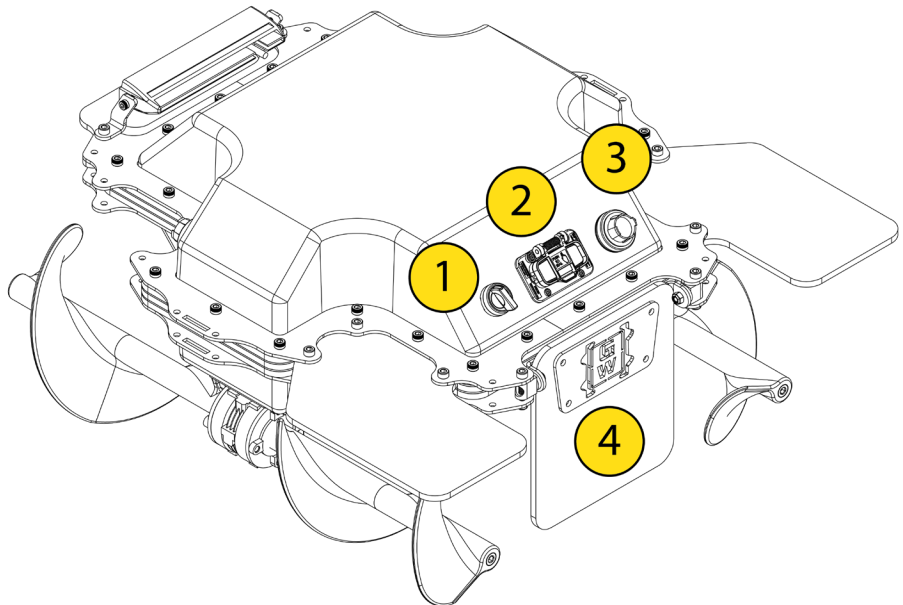
Essential Components: Front View

1. Robot handle
2. LED Headlight
3. Accessory Power Port
4. Accessory Data Port
5. Auger Drive System
6. Stabilizer Wings



Essential Components: Rear View

1. On / Off Switch
2. Charge Port
3. USB Programming Port
4. Shovel Accessory



Regulatory Statements

Applicable Products

Product	Grain Weevil Robot	Grain Weevil Remote
Model Number	GWRI.I	GWCI.O
FCC ID:	2BRGK-GWRBT100	2BRGK-GWRMT300
IC:	35446-GWRBT100	35446- GWRMT300

United States (FCC)

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

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

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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 no guarantee that interference will not occur in a particular location. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment of and on, the user is encouraged to try to correct the interference by 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/TV technician for help.

Canada (ISED)

This product complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

- 1) This device may not cause interference; and
- 2) This device must accept any interference, including interference that may cause undesired operation of device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

- 1) l'appareil ne doit pas produire de brouillage;
- 2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Brazil (ANATEL)

Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados. Este produto não é apropriado para uso em ambientes domésticos, pois poderá causar interferências eletromagnéticas que obrigam o usuário a tomar medidas necessárias para minimizar estas interferências.

Intellectual Property

The Webpage and the List provided below are posted on the Internet to give notice to the public of patent rights in compliance with the virtual patent marking provisions of the United States under 35 U.S.C. § 287(a). There is no charge or other requirement for accessing this publicly available information.

The List is posted on the Internet at the web address or Link (Pat. www.grainweevil.com/patents) fixed on or otherwise associated with a corresponding patented article to give constructive notice to the public of the patent(s) listed. Other patent rights may be identified on the List relating to patent rights in other jurisdictions.

The List might not be all inclusive and other Products not on the List may be associated with one or more Properties in the United States or elsewhere. Absence of a Property and/or associated Product from the List should not be construed to mean that there is no constructive notice. Properties currently not associated with a Product and Properties having method claims are but two examples of why a Property might not be on the List yet entitled to the full measure of constructive notice available under law. Absence of any Property and/or Product from the List does not prevent nor limit enforcing any and all legal rights and remedies associated with the Property and/or Product. In addition, including on the List Properties not currently associated with a Product and, similarly, Properties with method claims associated with a Product resulting from or otherwise related to the method claim(s) may be provided to provide disclosure and abundant notice to the public even if currently not required under 35 U.S.C. § 287(a) and applicable judicial interpretations.

QUICK Installation & Setup Guide

SITE PREP

Evaluating and preparing your grain bin sites for safe and efficient operations is key to early success. Please use the QR code to watch a site prep video.



REGISTER YOUR SYSTEM

Using your cell phone or mobile device, scan the QR code on your robot's name plate. Once inside the Gripp App, create your account password and begin the New Robot Setup Routine.

SAFETY CHECKLIST

The first step of the New Robot Setup Routine on your app is to complete and sign off on a safety checklist. Please complete this step to ensure you understand the safe operations of the robot system.

BINASSIST & CUSTOMER SUPPORT

During your deployment consultation, your BinAssist Partner will ensure you know how to reach them using the QR code on your robot, find self-help instructions for frequently asked questions, and initiate customer support services.

LIFT INSTALL

Please refer to the the Lift Install instruction manual for full details on how to properly install your permanent lift system. The QR code links you to a video demonstration of the lift install.



CHARGING INSTRUCTIONS

Each time you plan to operate the robot you should charge your robot battery, your remote control battery, and your camera battery. You can find specific instructions for each in their individual quick start guides

GETTING TO KNOW YOUR ROBOT

While operating your robot is relatively intuitive, please ensure that you understand the operating procedures, the operational best practices, and maintenance routines.

Safety Guidelines

2.1 Required PPE and General Safety

Before operating the Grain Weevil system, all personnel must wear:

- Tight-fitting work gloves
- Safety glasses or goggles
- Dust mask or respirator when working in dusty environments
- Slip-resistant footwear
- Close-fitting clothing (no loose sleeves, jewelry, or drawstrings)

Operators must not enter grain bins during or after robot deployment. Always observe from outside the bin using camera or tethered view tools.

2.2 Hazard Classifications and Bin Entry Conditions

Grain bins present multiple hazards including:

- Entrapment/engulfment in flowing grain
- Crusted grain collapse
- Auger entanglement
- Poor air quality (dust, fumigants, mold)
- Structural failure

No operations should occur in bins classified as Class II Div 1 (Zone 20) hazardous environments unless the robot is explicitly certified for those conditions. This includes:

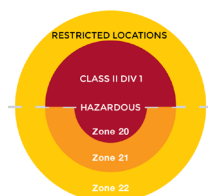
- Most commercial grain facilities
- Bins with high dust ignition risk

Confirm your bin is not at risk for dust explosion before deploying robot. If in doubt, do not use the robot in that environment.



ZERO BIN ENTRY

Follow all recommended bin entry protocols. Grain Weevil recommends zero bin entry and has provided suggested procedures to recover a stranded robot that can be achieved with zero entry.



RESTRICTED LOCATIONS

Do not use the Grain Weevil or any of the associated equipment within a Zone 20 / Class II Div 1 Hazardous Environment without written consent from Grain Weevil, accompanied by a company wide safety exemption.

Safety Guidelines

2.3 Safety Expectations and Checklist

The following expectations are required for all users of the Grain Weevil system:

Statement of Safety Expectations – Checklist

ESTABLISH FARM / ORGANIZATIONAL POLICIES

- ☐ Develop and implement a fall protection program for your farm/organization. Ensure all family members and/or employees are trained on the program and maintain records of the training. Make available, maintain, and replace as needed the necessary equipment for a fall protection program.
- ☐ Develop and implement a grain bin entry program for your farm/organization. Ensure all family members and/or employees are trained on the program and maintain records of the training. Make available, maintain, and replace as needed the necessary equipment for a grain bin entry program.
- ☐ Develop and implement a respiratory protection program for your farm/organization. Ensure all family members and/or employees are trained on the program and maintain records of the training. Make available, maintain, and replace as needed the necessary equipment for a respiratory protection program.
- ☐ Verify that the grain bin OWNER is aware that the Grain Weevil robot does not have Class II, Division I certification for use in a combustible dust environment. When the operation employs more than 10 people, OSHA compliance is required by law.

PERSONAL SAFETY AND PROTECTION

- ☐ Wear adequate eye protection when working with the robot.
- ☐ Avoid wearing loose clothing when working with the robot.
- ☐ When gloves are worn, use tight fitting gloves to avoid entanglement.
- ☐ Wear appropriate dust masks or respirators when working around grain bins.
- ☐ Always use caution when working from heights.

Equipment Guidelines

3.1 EQUIPMENT CARE

- Never pick up a robot to inspect, perform maintenance, transport, or otherwise handle unless the robot has been powered off.
- Perform the recommended inspection, maintenance, component replacement, and cleaning per Grain Weevil instructions, including applicable instructions from component manufacturers.
- Do not open the robot enclosure unless you are an authorized Grain Weevil service technician.
- The robot utilizes a rechargeable, lithium-ion battery. Lithium-ion batteries may explode or cause fires when not properly cared for. Follow all safety, maintenance, operation, and storage recommendations from the battery manufacturer. Do not attempt to repair, replace, or remove the battery.
- Follow all battery and charger safety protocols when charging the battery.
- Follow all cord safety protocols when setting up the charger and when charging the battery.
- Store robot inside a building while not in use.

3.2 EQUIPMENT USE

- Only use the robot for its intended purpose of grain management.
- Only use the crane and winch assembly for their intended purpose of lifting and lowering the components of the Grain Weevil system.
- Post the overhead hazard sign. Ensure work area is clear prior to lifting and lowering operations.
- Do not operate the robot in flowing grain.
- Follow robot recovery procedures.



FALL HAZARD

Do not attempt to lift or carry robot into the grain bin manually. Fall risk increases when carrying heavy objects. While operating Lift System - use caution and wear all required personal protective equipment including a fall harness.



FALLING OBJECTS

Do not stand within the fall danger zone while lifting or lowering the robot. If using a single person operation, ensure winch is located in a safe orientation. If using a two-person operation, ensure both parties are clear of danger before winching robot.

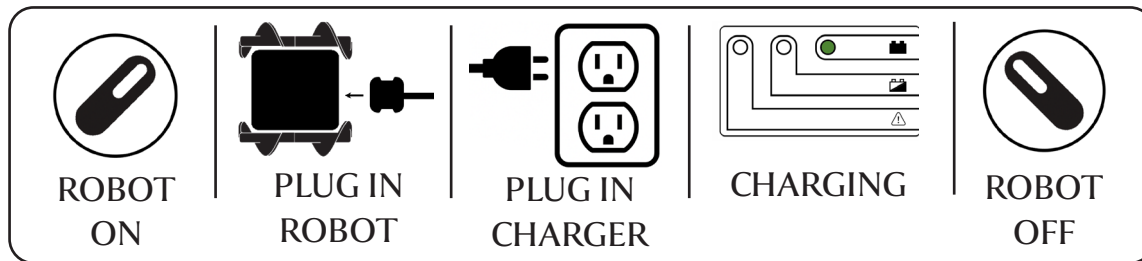
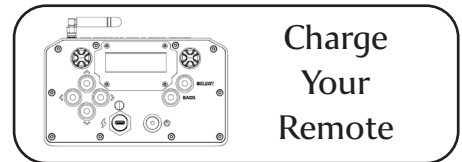
Deployment: From Charging to Retrieval

Follow this step-by-step example to deploy the Grain Weevil safely and effectively.

Step 1: Charging the Robot

Your Robot is shipped DISCHARGED - you must charge first

1. Power the robot on (must be on to charge).
2. Connect the charging cable to the robot's charger port. (Connect before plugging in charger into AC Power)
3. Plug the charger's AC power cord into a standard 120V or 220V outlet (if using a Super Charger), ensuring the unit is grounded and dry.
4. Confirm charging LEDs status on charger
5. Wait until the LED on charger shows solid green = full charge.
6. Turn the robot off
7. Disconnect the charger, store and prepare for transport.



ELECTRICAL SAFETY



Powered by:
Toshiba LTO
See Battery Manual



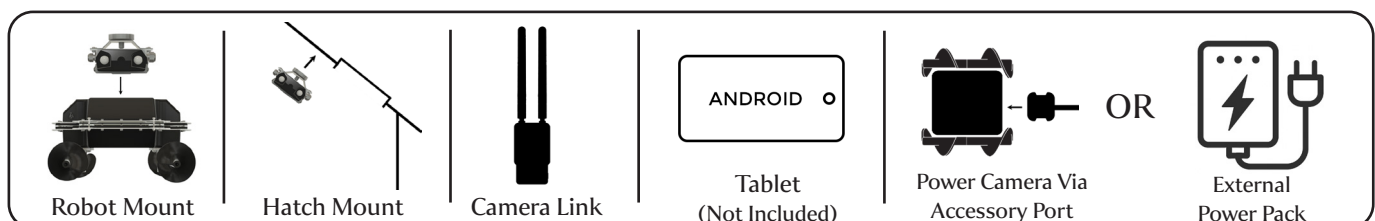
Do Not Charge
While Robot is in
the Bin



Engineered to IP65
Standards
DO NOT SUBMERGE

Step 2: Preparing for Deployment

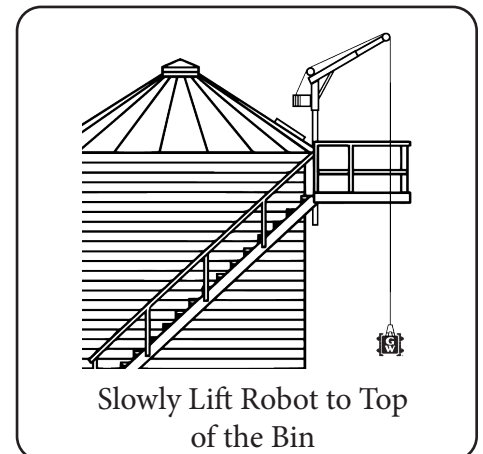
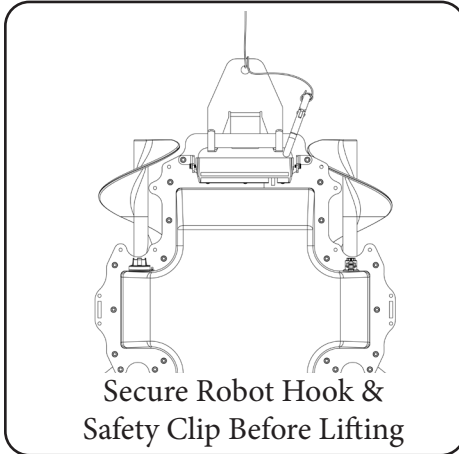
1. Confirm bin access is clear and all required PPE is in use.
2. Prepare the Permanent Lift System (as shown in Lift System User Guide)
3. Inspect hook, cable, and winch frame for damage.
4. Safely climb to open the hatch and prepare for a safe deployment from the bin platform.
5. Set up Bin Camera System inside of bin above the hatch door or mount directly to the robot.



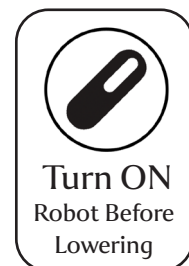
Deployment: From Charging to Retrieval

Step 2: Preparing for Deployment (continued)

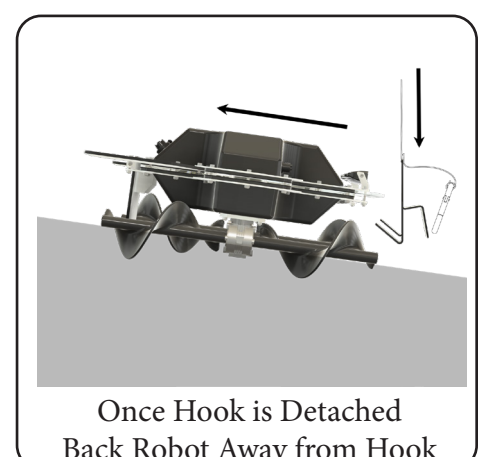
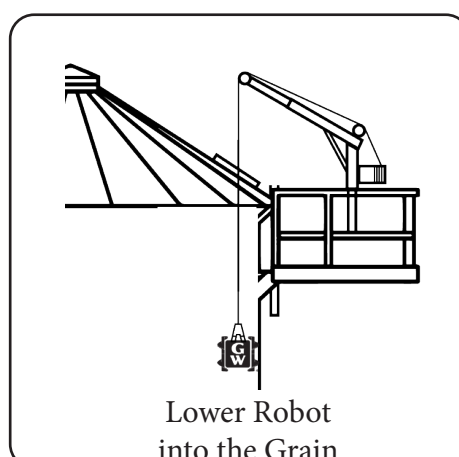
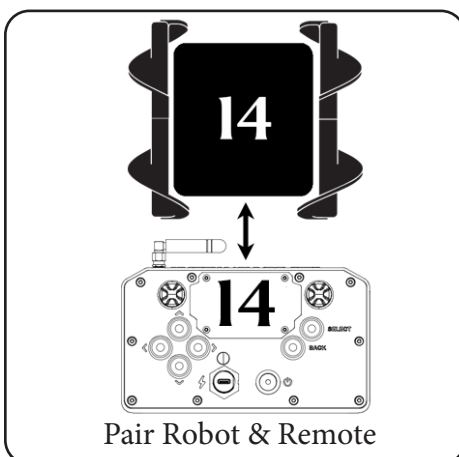
6. Ensure lowering and lifting area is clear of humans or property. Use overhead lifting signage in lifting area.
7. Use the winch and portable drill (user provided) to lower hook to ground or safe robot access point.
8. For all lifting & lowering activities outside of the bin, connect the carabiner hook securely to the robot handle.
9. Validate that the robot and remote control function as intended while still on the ground - then turn off.



9. Use the winch to slowly lift robot to hatch door or access area.
10. Remove secured carabiner from robot hook attachment
11. Power on the robot; LED ring should glow solid green when paired.
12. Safely transfer Robot into the Bin.
13. When robot is positioned on the grain, the robot hook will release itself.
14. Power on the controller and pair it to the robot using ID Select screen.
15. Slowly back the robot away from the hook to disengage.
16. Retrieve the robot hook by reversing the drill and lifting far enough to not impede robot operations



**** If required, please follow the special instructions for operating the robot while tethered ****



Deployment: From Charging to Retrieval

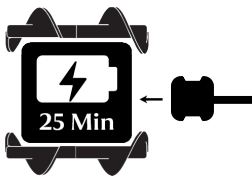
Step 3: Running Operations

1. Using the Robot Controller buttons and screen, navigate to Manual Mode page to test drive. (as shown in Robot Controller User Guide)
2. Adjust speed using the on-screen speedometer speed adjustment selector
3. Determine your operational task:
 - Leveling: push grain from peaks or edges.
 - Crust breakup: approach slowly and let augers engage.
 - Extraction assist: push grain toward grain sump or auger opening.
4. Ensure robot operations, controller, and camera are performing as expected.
5. Return to the safest location to operate the robot remotely - We suggest sitting in a vehicle near the base of the bin you are working on.
6. Refer to Section 4 in your User’s Manual or scan the QR code on your robot for operational best practices and driving techniques by task.

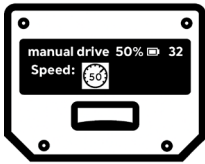
Robot Operation Specs



1HR
RUN TIME



25 Min
RECHARGE



50-70
DRIVE SPEED

- Watch for Robot Status Light Changes
- Always Start at Lower Speeds Then Progress to Comfortable Pace
- If Robot Becomes Disabled in Bin Follow All Safe Retrieval Recommendations

OPERATIONAL SAFETY

Do Not Charge
While Robot is in
the Bin

Consider Tethering
if Crust or Bridge
Present
(KNOW THE LIMITS OF
THE ROBOT)

LED Light Indicator	
COLOR	MEANING
Solid Green	Operating Normally
Solid Amber	Low Battery Mode
Solid Red	Error
Blue	Disconnected
Yellow	Startup Sequence in Process

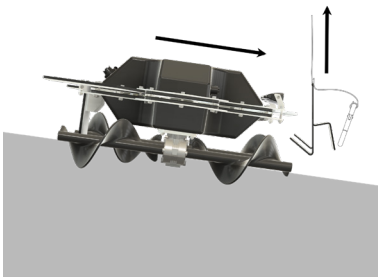
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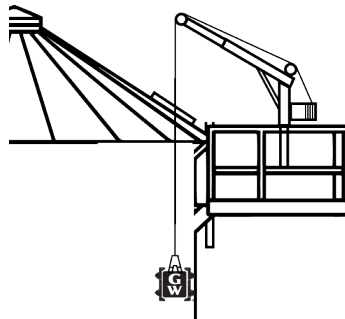
Deployment: From Charging to Retrieval

Step 4: Retrieving the Robot

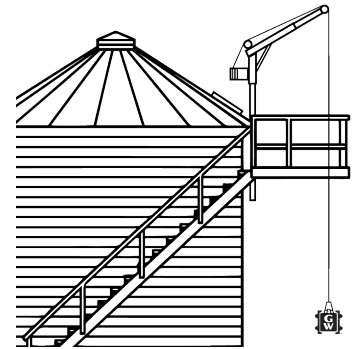
1. Bring robot to below hatch door access point using controller and camera system.
2. Lower winch cable and reattach hook securely by slowing driving the robot into the hook
3. Slowly winch or lift the robot out of the bin.
4. Power off the robot.
5. If re-charging is required to complete the task, be sure the charge port is free of debris and repeat **Step I: Charging the Robot** before re-entering robot into bin.
6. If the task is complete, clean off any grain dust or debris.
7. Reconnect the carabiner hook securely to the robot handle.
8. Ensure lowering and lifting area is clear of humans or property. Use overhead lifting signage in lifting area.
9. Use the winch to lower robot to ground or safe robot access point.
10. Remove Bin Camera System, Robot Charger and Portable winch and prepare for next task.



Lower Hook to Grain Surface
Drive Robot onto Hook



Carefully Lift Robot
to Remove from Bin

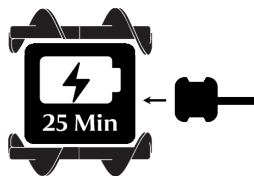


Follow Safety Procedures to
Lower Robot to Ground

After Each Use



CLEAN ROBOT

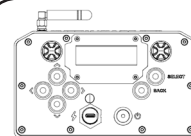


RECHARGE



INSPECTION

- **CLEAN:** Wipe off grain dust with a dry cloth (Deep clean if necessary)
- **RECHARGE:** Recharge your robot and your remote before the next use.
- **INSPECTION:** Visually inspect for impact damage or loose hardware



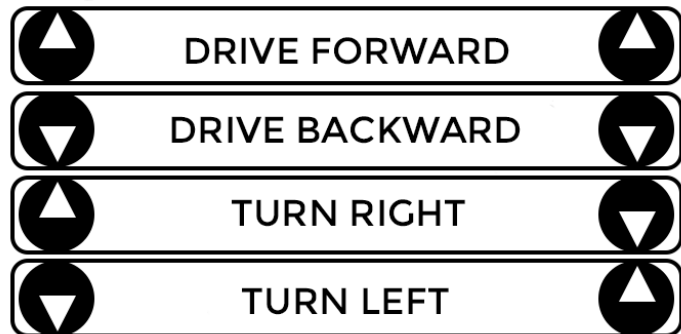
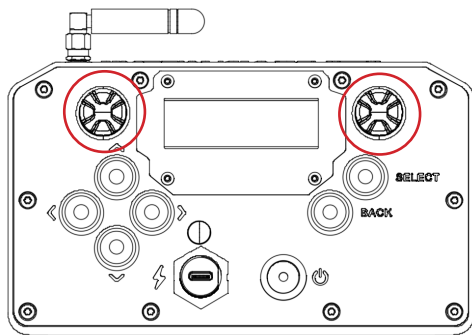
Charge
Your
Remote

Operations & Best Practices

4.1 Operating Modes

4.1.1 Manual Drive

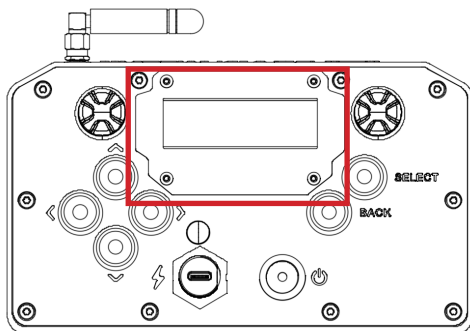
Use the joysticks on the controller to operate the augers directly. Left joystick controls left auger, right joystick controls right auger.



4.1.2 Semi-Autonomous Mode

Use the controller screen to access the autonomous menu and select between:

- Level with Obstacle Avoidance Mode: Start a leveling operation that can detect bin walls to change directions
- Timer Mode: Set time intervals to alternate directions. Best used in larger grain storage.



4.2 Driving Tips

Driving Tips:

- Anti-flipping Techniques
Drive up & down slopes not across | Slow down | Avoid turning into flowing grain
- Speed Adjustments
Start at 50% | Work up to 70% | Slow down in crusts
- Wet Grain Adjustments
Shorten drive times to 45-50 minutes | Use shorter patterns to improve efficiency
- Bin Size Strategies
For Bins larger than 50' in diameter - consider using multiple robots
- Leveling a Bin
Use “up and down the slope” patterns to maximize the benefits of the robot shovel.
- Breaking Crusts
Remove the shovel | Work cautiously around the edges of the crust | Tether if necessary
- Grain Extraction
Always run inspection pattern before pulling out grain | Run robot periodically as you withdraw grain, especially if grain is sticking to the bin wall | Do not run robot when extraction augers are running
- Tethering When Necessary
Attach robot to winch with carabiner clip | Utilization: On extremely wet crust; when pillars or cliffs may collapse on robot; If bridging is suspected; Any doubts that you can safely operate without the tether

Robot Recovery

DO NOT ENTER THE BIN.

Please follow the exact instructions on robot recovery found in your GRIPP app Self-help section. Recovery can be done via the lift as a tether or by contacting your local BinAssist partner for support on recovering with a second robot.

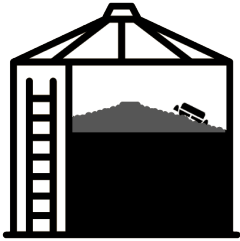


ZERO BIN ENTRY

Follow all recommended bin entry protocols. Grain Weevil recommends zero bin entry and has provided suggested procedures to recover a stranded robot that can be achieved with zero entry.

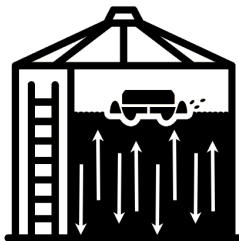
4.3 Suggested Use Cases

Harvest



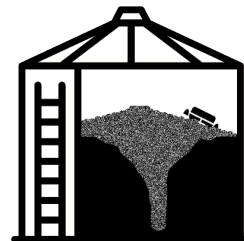
Mitigate troubled grain as soon as it is loaded during harvest

Drying / Cooling



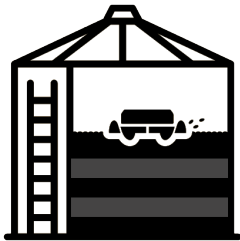
Reduce drying and cooling times (and inputs)

Spread



Evenly disperse BGFM while loading, or before unloading

Layer



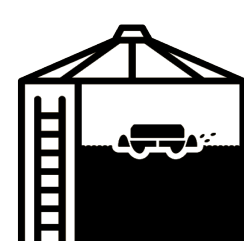
Control grain quality layer by layer to ensure maximum quality

Coring



Following 'Coring' by leveling out the 'W' surface

Level



Level grain to improve airflow uniformity - quality grain longer

Inspect



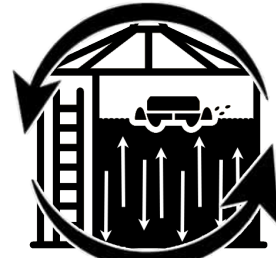
Drive the robot where no human should go for an upclose view

Insect Mitigation



Help deploy insecticides and fumigants | Disrupt insect habitat

Condition



Recondition grain with more confidence and control

Clean Out



Improve clean out efficiencies

Clean Up



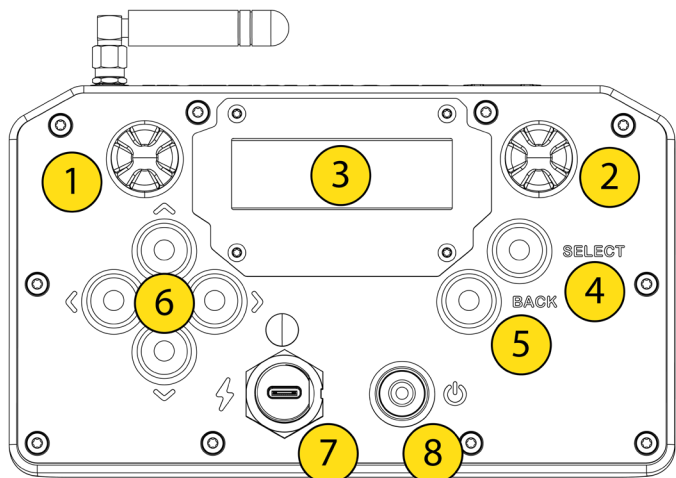
Sweeper accessories coming soon

Mitigate



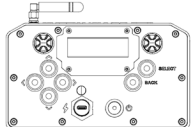
Break up crusts and bridges as well as disperse wet spots

4.4 Remote Control Quick Start Guide



Essential Components

1. Left Joystick
2. Right Joystick
3. Screen
4. Select Button
5. Back Button
6. Navigation Buttons
7. Charge Port
8. On / Off Switch

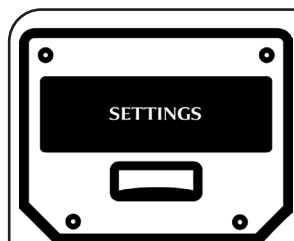
	Charge Your Remote		Power On	Select Robot ID & Manual Drive	
---	--------------------------	---	-------------	--------------------------------------	---

	Speed: 	Get Data
1. Press 'Select', Icon will flash 2. Use Navigation Buttons to Set Speed 3. Press 'Select', Icon will Stop Flashing	1. Press 'Select' 2. Wait 1-3 Seconds 3. Robot Data Will Display in a List	

	[time] / Up:5 Down:10	Time Based Forward / Backward On Repeat
	1. With 'Time' selected - use navigation buttons to highlight 'UP' 2. Press 'Select' to activate Up time - Use navigation buttons to increase or decrease time - Press 'Select' to enter time 3. Repeat with 'Down' settings - Navigate to Start/Pause icon 4. Press 'Select' to start/stop autonomous driving (using joysticks also stops autonomous)	

	[angl] / [Calibrate]	Peak Finding Leveling Pattern
	1. With 'angl' selected - use navigation buttons to highlight 'Calibrate' 2. Drive robot to the top of the peak (or bottom of the extracted cone) 3. Press Select - Navigate to the Start/Pause icon 4. Press 'Select' to start/stop autonomous driving (using joysticks also stops autonomous) 5. Repeat 'Calibrate' after each charging period for the robot	

4.4 Remote Control Quick Start Guide Cont.



CALIBRATE JOYSTICKS

1. Bring joysticks into center resting position
2. Press 'Select' and calibration sets to:
L: 0
R: 0

Timer Mode : ☐ off
Angle Correct : ☐ off

'Select'
to Swap

'ON' will add peak finding feature to
Timer Autonomous Mode

'OFF' will drive forward/backwards
regardless of slope

Tips & Troubleshooting

- Charge Remote Overnight
- You Must Power Off Remote to Select New Robot ID
- Clean screen with microfiber cloth or lens wipe

Keep Controller Clean

Regularly clean the
controller with air and or a
dry cloth.

4.4.2 Joystick Performance Issues

Stick Calibration

You will see:

- Augers run without input
- Less fine motor control

Dirty Controller

You will see:

- Buttons not reacting
- Less fine motor control



Low Battery Levels

You will see:

- Frequent disconnections
- Robot stuck on last command (Dangerous)

LOSS OF SIGNAL STOP

A loss of signal between the remote control and the robot lasting 10 seconds or more will result in an operational pause of the robot, indicated by the LED status indicator of the robot flashing yellow for 1 second. Once the connection has been re-established, the robot will be capable of resuming normal operation.

FCC Statement:

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

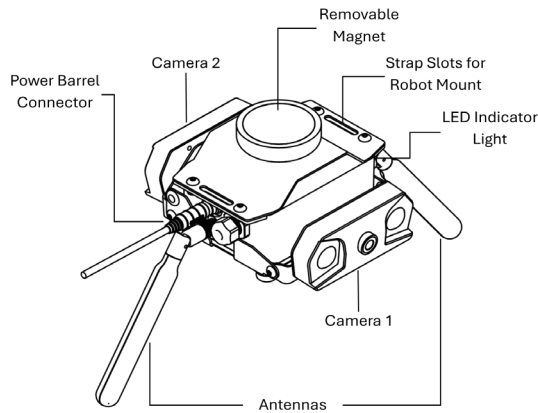
- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

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 no guarantee that interference will not occur in a particular location. 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 encouraged to try to correct the interference by 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.

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

4.5 Camera System Quick Start Guide



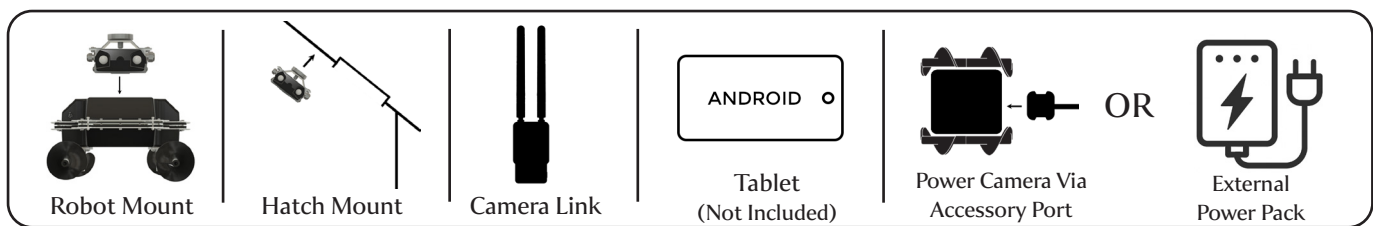
Included Items:

1. Camera unit
2. Camera Link unit

Kit Accessories

(camera power supply/power cord, radio charger, robot power cord, mounting straps, screen mount attached to remote control and protective case)

REQUIRED: (Not included) - Tablet or Phone (must be user supplied)



Start-Up

Camera Link Unit:

1. Attach antennas and battery
2. Press the power button once, the screen will display “Press again to power on”. Then immediately press and hold the power button for about two seconds and until the ground unit is powered on.
3. Set in a safe and secure place out of the sun near where you will be operating from

Camera Unit:

1. Attach antennas and plug in power cord. Tighten down retaining collar onto power port.
2. Adjust camera angles to estimate position for viewing work area.
3. Attach camera unit to bin via magnet, ensure mounting area is clean.
4. Plug-in camera power supply to power up camera unit. Check the green light on the housing to confirm power is ON.
5. Make final adjustments to camera viewing angle.

Alternate Configuration: Attach camera to robot for first person view - use supplied robot power cord and connect to accessory power port. Follow camera set up instructions in the full Camera User's Manual

Connect Streaming Device and Open App:

1. After the radio is powered on and connected to camera, open Android device WiFi settings and select “SIYI.....” network.
2. Default network password: 12345678
3. Open the SIYI FPV application*.
4. Open the setting menu on top right of the screen in the app and set camera feeds and rotate images.

* SIYI App instructions on following page

4.5 Camera System Quick Start Guide

Downloading the Video Stream Application for Android

Application Installation Steps:

1. Ensure your android device is connected to the internet and scan the QR code to access SIYI FPV application download.
2. Application Name: SIYI FPV (include picture of application icon)
3. Operating system requirements: Android 6.0 and above

NOTE: Since this application is not published on the Google Play Store, your device will prompt you to provide additional permissions in the device settings throughout the install process. This is normal during the install process and please follow the following steps to complete installation.

1. Hit “Open” on the pop-up
2. When prompted with a pop up, select “Download” on your device
3. Tap “Download Anyway” on the warning pop up.
4. Once the application file has downloaded, tap “Install” on the application pop-up once prompted.
5. Once installation is complete, please select settings on the permissions pop-up as noted above.
6. Confirm the installation was successful by locating the app icon on your device.

SIYI FPV is a 3rd party application utilized by Grain Weevil for streaming video from the camera system. SIYI reserves the right to make upgrades that may not be compatible with the Grain Weevil setup. Test all updates before deploying the robot.



SIYI FPV
SIYI FPV is an Android application developed by SIYI to configure many SIYI products for video display, camera stream settings, and communication link status monitoring.





Download for
Android

SIYI_FPV_2.5.15.710
Android 6.0 and Above

Downloading the Video Stream Application for iOS

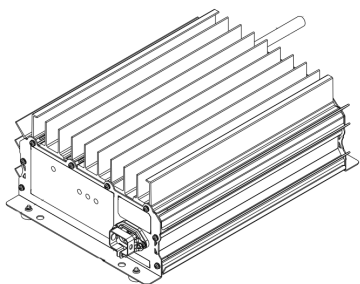
Application Installation Steps:

1. Ensure your apple device is connected to the internet and scan the QR code to access application download.
 - a. Application name: IPCams
 - b. Operating system requirements: iOS 15.0 and later
2. Tap “Get” to start your download
3. Confirm that the installation was successful by locating the app icon on your device.



4.6 Charger Quick Start Guide

Included Standard Charger

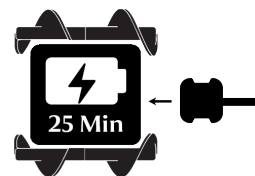


Standard Charger Specs

Input Voltage: 120v

Input Amps: 15 A

Nominal Output Voltage: 29v



RECHARGE



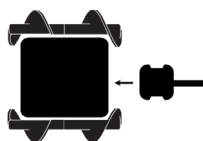
DO NOT CHARGE WHILE ROBOT IS IN THE BIN



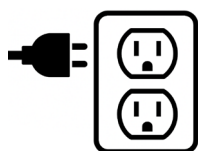
ENSURE CHARGE PORT IS CLEAR OF DEBRIS



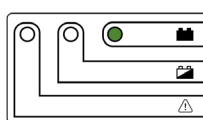
ROBOT
ON



PLUG IN
ROBOT



PLUG IN
CHARGER



CHARGING



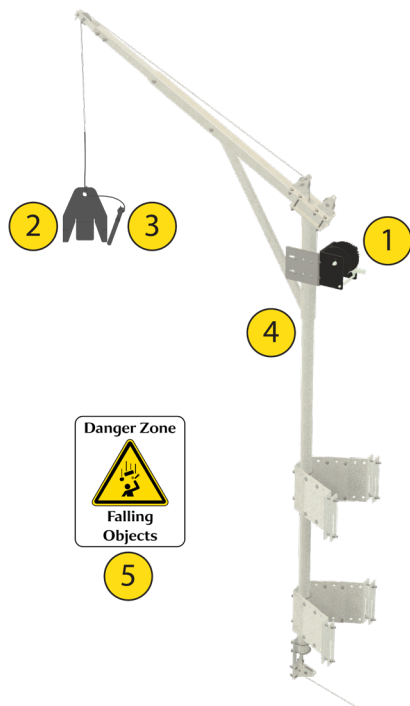
ROBOT
OFF

LED Light Indicator

COLOR	MEANING
Solid Green	Full Balanced Charge
Flashing Green	Fully Charged for Operations
Flashing Amber	Charging
Blue	Charge Unit is Powered On
No Amber or Green	Robot is Not Connected Properly



4.7 Robot Lift System Quick Start Guide



Lift must be pre-installed following instructions in the Lift Installation Guide

Essential Components

1. Drill Operated Winch
2. Robot Hook
3. Safety Carabiner
4. Rotating Jib Crane
5. Danger Zone Safety Sign

User Provided Tools

1. Cordless Drill
(Milwaukee M18 Drill Driver or Similar)
2. Gloves & Other Necessary PPE

Only Deploy Robot When Safe to Do So

Wind Below 20mph
No Rain
No Ice

Lift System Operation

Lift From Ground:

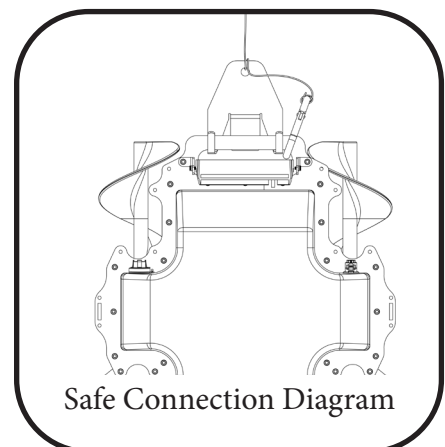
1. Visually inspect the lift stability, winch operations, rope condition, robot lift & carabiner knots
2. Secure the robot with both the robot hook and the safety carabiner - connected to robot handle
3. Ensure no one is near the falling objects danger zone
4. Use the cordless drill to safely lift the robot to the top of the bin

Transition:

1. When it is safe to do so, remove the safety carabiner from the robot handle
2. Spin jib crane to position robot over the hatch door
3. Follow the robot deployment steps ensuring the robot is powered on and paired with remote control

Deploy:

1. Lower robot to grain surface inside of the bin
2. Robot hook will release from robot
3. Back robot safely away from robot hook and winch rope



Reverse lift operations to safely remove robot from bin and lower to the ground



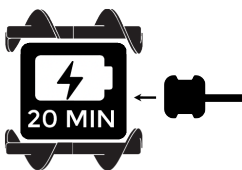
Maintenance, Troubleshooting & Repairs

5.1 Routine Maintenance

After Each Use



CLEAN ROBOT

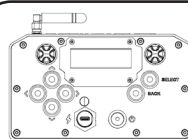


RECHARGE



INSPECTION

- **CLEAN:** Wipe off grain dust with a dry cloth (Deep clean if necessary)
- **RECHARGE:** Recharge your robot and your remote before the next use.
- **INSPECTION:** Visually inspect for impact damage or loose hardware



Charge
Your
Remote

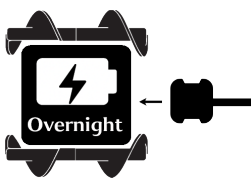
Monthly Maintenance

DEEP



CLEAN ROBOT

BALANCE



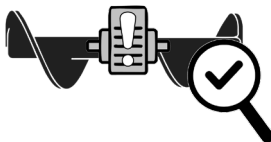
RECHARGE

DEEP



INSPECTION

DRIVE SYSTEM



CHECK

- **DEEP CLEAN:** Use compressed air and/or a scrub brush with soap and water to remove all dust and grime. Blow out ports with compressed air (Less than 30psi)
- **BALANCE RECHARGE:** Recharge your robot overnight to prompt internal battery maintenance charge
- **DEEP INSPECTION:** Visually inspect for impact damage or loose hardware
- **DRIVE SYSTEM CHECK:** Check the robot's drive system and augers for wear, grain accumulation, or binding
- **REGULAR MAINTENANCE BULLETINS:** Check your Gripp app regularly for maintenance bulletins and reminders

Deep Cleaning Procedures

- Always power the robot off before cleaning
- Never use a pressure washer unless specified in Grain Weevil instructions
- Use dry compressed air for delicate parts (camera, vents, connectors)
- If water or disinfectant is necessary, use only damp cloths—avoid spraying directly onto seams or ports
- Follow PPE guidance when cleaning after operations in dusty or treated bins

5.1 Routine Maintenance

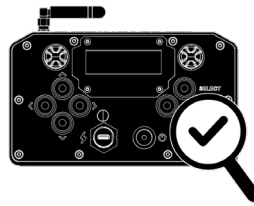
Remote Controller Maintenance



CLEAN REMOTE



CALIBRATE
JOYSTICKS



INSPECT
REMOTE

- **CLEAN:** Wipe off grain dust with a dry cloth (Use can of air if necessary)
- **CALIBRATE JOYSTICKS:** Regularly calibrate joysticks to ensure safe operations
- **INSPECTION:** Visually inspect for case damage or loose hardware

Camera Maintenance



CLEAN
CAMERA UNIT



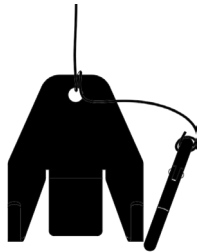
KEEP ANDROID
APP UPDATED



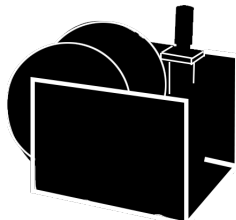
INSPECT
CAMERA UNIT

- **CLEAN:** Wipe off grain dust with a dry cloth (Use can of air if necessary)
- **APP UPKEEP:** Follow all suggested maintenance and upkeep from your SIYI FPV app.
- **INSPECTION:** Visually inspect for case damage or loose hardware

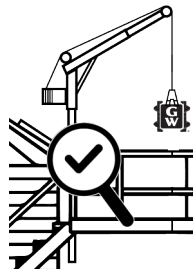
Lift Maintenance



INSPECT
ROBOT HOOK



REGULARLY
APPLY GREASE



INSPECT
LIFT UNIT

- **CHECK:** Check the condition of the robot hook and safety carabiner including securing the knots
- **GREASE:** Regularly add appropriate grease to the winch's worm gear mechanism
- **INSPECTION:** Visually inspect for damage or loose hardware especially note winch rope condition

5.2 Performance Indicators and Diagnostics

Please follow all safety protocols when diagnosing, updating, or repairing the robot.



**CAUTION**

ENTANGLEMENT

SURFACE HEAT

Do not lift while robot is powered on.
Operate robot for intended use only.



ENTANGLEMENT
Do not lift or carry robot while powered on.
Pinch points and entanglement possible.



SURFACE HEAT
Gear boxes may be hot during and after
operations.

5.2.1 Robot Won't Move

Battery Levels

You will see:

- Indicator light warnings
- One or both augers slowed or not moving

FIX: Fully Charge Robot

Joystick Pairing

You will see:

- No green LED light
- No response from robot

FIX: Ensure correct robot ID is selected on remote

Intentional Safety Disconnect

The robot will intentionally restart if it does not receive a quality signal from a remote for a period of 10 seconds. This is intentional and should be treated as a normal operational function

5.2.2 Joystick Lags

Stick Calibration

You will see:

- Augers run without input
- Less fine motor control

FIX: Run Joystick Calibration in Controller Settings

Dirty Controller

You will see:

- Buttons not reacting
- Less fine motor control

FIX: Thourougly clean controller especially joysticks

Battery Levels

You will see:

- Frequent disconnections
- Robot stuck on last command (Dangerous)

FIX: Fully Charge Remote

5.2.3 Camera Not Streaming

Check Power

The camera system requires adequate power on the camera unit, on the radio unit and on your viewing device. Ensure cable connections are secure and all required batteries are charged

Location

You will see:

- Frequent disconnections
- Video feed freezing

FIX: Move camera unit and radio unit closer in proximity

Camera+Device Pairing

You will see:

- Camera Not Available error
- No video feed on screen

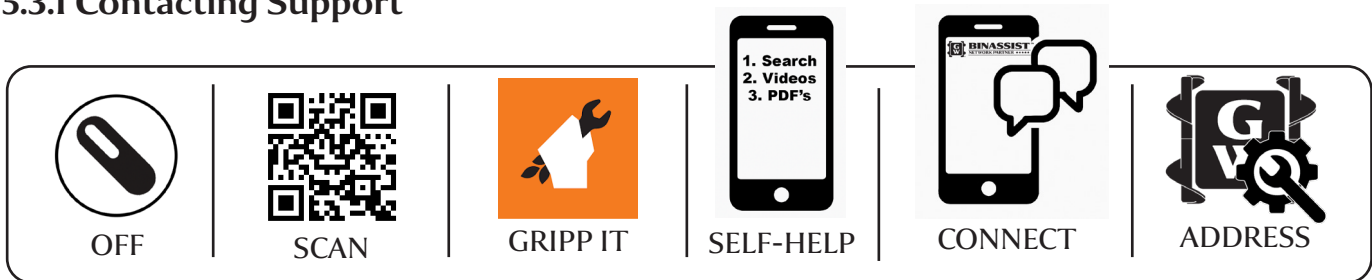
FIX: Restart both devices and follow pairing instructions

5.3 Getting Support

Warning:

- **Minor repairs on attachments, fasteners, and winch system can be performed by operators.**
- **DO NOT Open the sealed robot enclosure without authorization - this will result in a voided warranty.**
- **If the robot is dropped or damaged, remove it from services and contact support.**
- **Firmware updates are performed by Grain Weevil technicians and authorized partners, users are not permitted to access internal electronics or firmware systems.**

5.3.1 Contacting Support



1. Turn off all devices including robot, remote, and camera.
2. Scan the QR Code on the back of the robot (even if support is for remote or camera).
3. Using the GRIPP asset management app - log your issue with as much detail as possible.
4. Use the search feature in the GRIPP app to find your issue in the Self-Help materials.
5. Connect directly with your BinAssist partner and Grain Weevil right within the GRIPP app.
6. Address the issue with the following services:
 - Self-Help
 - Texting with BinAssist Partner
 - Phone Call with BinAssist Partner
 - On-Site Service Call with BinAssist Partner
 - On-line Consultation with Grain Weevil Subject Matter Experts
 - Warranty Work and/or Certified Grain Weevil Repair Service

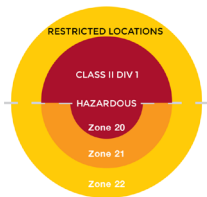
Legal / Acceptable Uses

6.1 Permitted Use Environments

Grain Weevil Robots are approved for use in the following conditions:

- On-farm grain bins and storage structures not classified as hazardous environments
- Commercial grain bins only if a formal site assessment has verified that the structure is not classified as Class II Div I and does not present a safety threat
- Industrial storage areas involving non-combustible materials (must have express written consent by Grain Weevil through a special materials license)

6.2 Restricted Use Environments



RESTRICTED LOCATIONS

Do not use the Grain Weevil or any of the associated equipment within a Zone 20 / Class II Div 1 Hazardous Environment without written consent from Grain Weevil, accompanied by a company wide safety exemption.

Grain Weevil Robots are **NOT** approved for use in the following conditions:

- Class II Division I Grain Dust Environment (Zone 20)
- Any environment with know explosive dust or flammable gas hazards
- Bins with active grain flow (e.g. actively being filled or unloaded)
- Temperature Restriction: Do not operate with ambient temperatures below (-25 °C) (-13 °F)
- Temperature Restriction Do not operate with ambient temperatures above 45 ° C (113 ° F)

6.3 Warranty Overview

The Grain Weevil includes a limited warranty covering:

- Robot internal electronics (sealed enclosure) and gearboxes:
2 years against manufacturer defects
Robot Controller, Bin Camera System and Robot Charger:
1 year standard manufacturers warranty
- Winch, attachments, and accessories:
6 months under normal use

Warranty does not cover:

- Damage from improper handling or storage
- Unauthorized repair or modification
- Use in restricted or uncertified environments including materials not identified in your Terms & Conditions and/or licensing agreement.
- Normal wear and tear from regular operations, including consumables like the drive augers
- Use of robot to provide for-profit services unless specifically granted by Grain Weevil through an Enterprise License agreement

Warranty Disclaimer

This User's Manual does not represent the legal documents covering warranty, terms of use, and licensing. Please see the appropriate Terms & Conditions or Licensing Agreement

6.4 Ownership, Resale, & Transfer

- Customers may transfer ownership of the robot in on-farm settings.
- In commercial or industrial settings, ownership transfers must be validated by Grain Weevil to maintain warranty and service eligibility.

6.5 Software and Data Policy

- Grain Weevil reserves the right to push software updates to improve safety and functionality
- Robots may transmit operational and diagnostic data to Grain Weevil servers for performance tracking
- All transmitted data is anonymized and scrubbed of personal or location-identifiable metadata
- Data may be used to improve robot algorithms and service support

Privacy Disclaimer

Please see the Grain Weevil Privacy Policy in your GRIPP app (scan QR code) or by visiting www.grainweevil.com

Robot & Accessory Specifications

7.1 Robot Specifications

Robot: GWR 1.0	
ITEM	VALUE
Mass	22 kg (48.5 LBS)
Dimensions	61 cm x 61 cm x 35 cm (24" x 24" x 14")
Operational Temperatures	-25 °C to 50 °C (-13 °F to 122 °F)
Battery	24v - 22 Ah
Communications Protocol	LoRa (915 Mhz)
Sensor Stack	Accelerometer/Gyroscope, Radar
Run Time / Charge Time	90 Minutes / 25 Minutes
SAFETY FEATURES	Brushless DC motors, Battery Management System, Custom Safety Designed Electronics, Dust Ignition Proof

7.2 Remote Control Specifications

Remote: GWC 1.0	
ITEM	VALUE
Mass	0.45 kg (~1 LBS)
Dimensions	10 cm x 18 cm x 5 cm (4" x 7" x 2")
Operational Temperatures	-25 °C to 50 °C (-13 °F to 122 °F)
Battery	3.4v Lithium Ion
Communications Protocols	LoRa (915 Mhz)
Run Time / Charge Time	6 Hours / 6 Hours



7.3 Camera Sustem Specifications

Camera Unit: GWV 1.0	
ITEM:	VALUE:
Weight	1.2 kg (2.75 LBS)
Dimensions	20 cm x 18 cm x 13 cm (8" x 7" x 5")
Operational Temperatures	-25 °C to 50 °C (-13 °F to 122 °F)
Power Input	18v DC
Ingress Protection	Engineered to IP65
Communications Protocols	5 GHz Band

7.4 Radio Communications Table

LoRa Radio Region:	Utilize Frequencies:
US & Canada	902-928 MHz
Brazil	902-907.5, 915-938 MHz
South America	902-928 MHz
Australia - New Zealand	915-928 MHz



