BarrierView Barrier Arm System: Product Manual

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1. Introduction

The barrierView barrier arm system is engineered to control vehicle or machine access to hazardous areas. It provides wireless operation for physical barriers equipped with appropriate signage. The operator, typically the individual responsible for managing the hazard, controls the barrier arm(s) operation. The system provides continuous status messages, displayed on the operator's phone, which include barrier arm position, controller battery level, and received signal strength (RSSI). Design emphasis has been placed on wind resistance and barrier arm mobility.



2. System Description and Operation

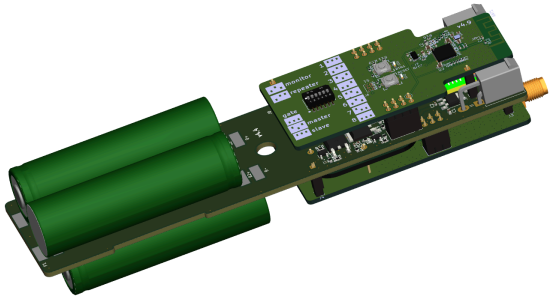
Operation is carried out by the operator using the dedicated barrierView phone application to transmit commands via the bluetooth controller to the barrier arm controllers, which, in turn, actuate linear actuators to move the barrier arms. Refer to reference image 1.

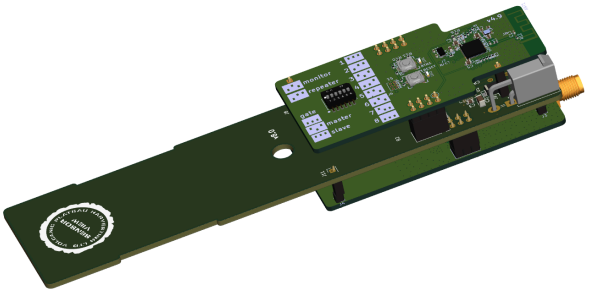
- **Commands and Feedback:** Controllers issue an **acknowledgement message** upon command reception, confirming acceptance and in-range status.
- **Status Messages:** Following an acknowledgement, and subsequently at **3.5-minute intervals**, **status messages** are transmitted, indicating the current position of the barrier arm(s).
- **Collision Prevention:** Message address filtering, coupled with varying radio frequencies and parameters that establish distinct "channels," prevents interference from nearby installations.

3. Electronic System Components

3.1 BarrierView Radios

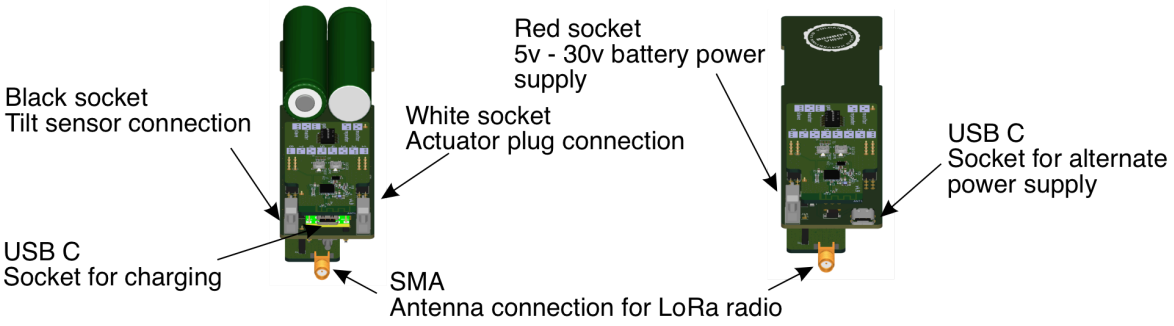
Model	Radios	Roles Performed	Key Features
AV504760	Bluetooth & LoRa	Bluetooth Controller & Barrier Controller	Integrated battery for power source.
AV508160	Bluetooth & LoRa	Bluetooth Controller & Repeater Only	External battery connection provided. Input voltage range: **5V to 30V**. Barrier control functionality is removed.

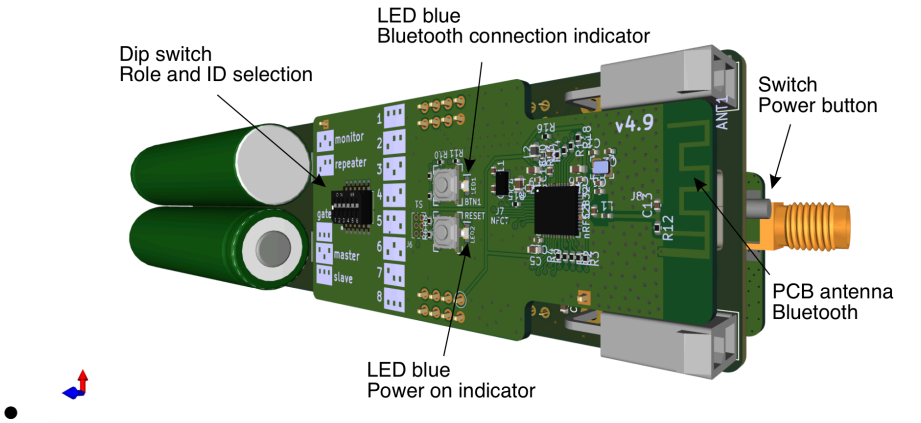




3.2 Connectors

Ensure proper connection by aligning plug and socket color indicators: Black-to-Black, White-to-White, and Red-to-Red.





3.3 Charging Procedures

Critical Safety Note: The device **MUST be powered off** during charging. Operation during charging (indicated by a blinking blue LED) may cause damage.

- **Charging Port:** A USB-C socket connects to a standard 5V USB power supply.
- **Battery Management:** An integrated Battery Management System (BMS) provides cell balancing and short circuit protection. A USB power cord may need to be connected to the charge socket to reset the BMS after a short circuit event.
- **Flat Battery:**
    - The radios should not be left in a discharged state for longer than 1 month to avoid battery damage.
    - If the device is fully discharged, the power LED will not illuminate when the power switch is cycled. The blinking blue LED may activate upon inserting the charge cord, requiring a power switch cycle to ensure the device is off for charging.

3.4 Indicators (LEDs)

- **Power Indicator LED:** Blinks briefly on and off at 2.5-second intervals when the device is powered on. If the LED is non-functional, charging may be required.
- **Bluetooth Connection LED:** Remains illuminated until a successful connection with the phone app is established, at which point it turns off.

3.5 Radio Enclosure

The radio device enclosure serves to protect the radio from environmental elements. The radio is secured within the case by a 6mm pin.

- **Outdoor Use:** When the device is placed outdoors or exposed to the elements, the open end of the case must always face the ground.
- **Handling:** The radio device is not designed for use outside its case. Removal is only permitted to the extent necessary to access the dip switches for role and ID adjustments.
- **Static Caution:** Avoid touching the printed circuit board (PCB) or any electronic components, as static electricity can cause damage.
- **Antenna Mount:** The case incorporates a metal pad on the top surface, which acts as a mounting surface for the magnetic antenna.

3.6 Antennas

Two LoRa radio antennas are supplied with a barrier arm set:

- **Magnetic Antennas:** Provided for the Master, Gate, and Bluetooth controllers, offering **superior range** capabilities.
- **Stub Antenna:** Provided for the Slave controller.

The overall condition and quality of the antenna installation and storage directly impact the system's range performance, requiring careful handling.

3.7 Linear Actuator

The linear actuator is remotely controlled to move the barrier arms.

- **Service Life:** To extend the outdoor service life, linear actuators should be mounted **upside down** when exposed to wet weather or when not in use to facilitate water drainage.
- **Cold Weather:** Avoid operation if actuators are wet and frozen, as this may cause damage. Defrosting may be necessary in sub-zero temperatures.
- **Installation:** Route the actuator cord through a hinge pin ring to keep the cord from catching on the actuator when it moves. Refer to reference image 4. Ensure the motor component is rotated to always face away from the waratah pole to prevent the motor housing from binding with the barrier arm.

3.8 Tilt Sensor

Tilt sensors are installed at the barrier arm hinge point. They report the barrier arm's position relative to a 45-degree angle. A green status message (controlled access) is only possible when both tilt sensors are connected and stable in a horizontal position (below a 45-degree angle).

3.9 Dip Switch Configuration

Dip switches determine the device's functional role and Device ID. A power cycle (on/off) is mandatory for new settings to take effect.

- **Functional Role:** Determined by the three switches closest to the batteries.
- **Device ID:** Determined by the remaining three switches. Eight selectable device IDs (1-8) are available.

4. Functional Roles

4.1 Monitor (Bluetooth Controller)

Transmits and receives LoRa communications with barrier controllers and BLE communications with the barrierView phone application for command and status exchange.

4.2 Repeater

Re-transmits signals that match its configured Device ID. Used to extend signal transmission over long distances or around radio transmission obstacles.

4.3 Master Barrier

Operates in conjunction with a Slave controller for a dual barrier arm system. Upon power-on, it transmits a status message and attempts to extend the connected actuator arm.

4.4 Slave Barrier

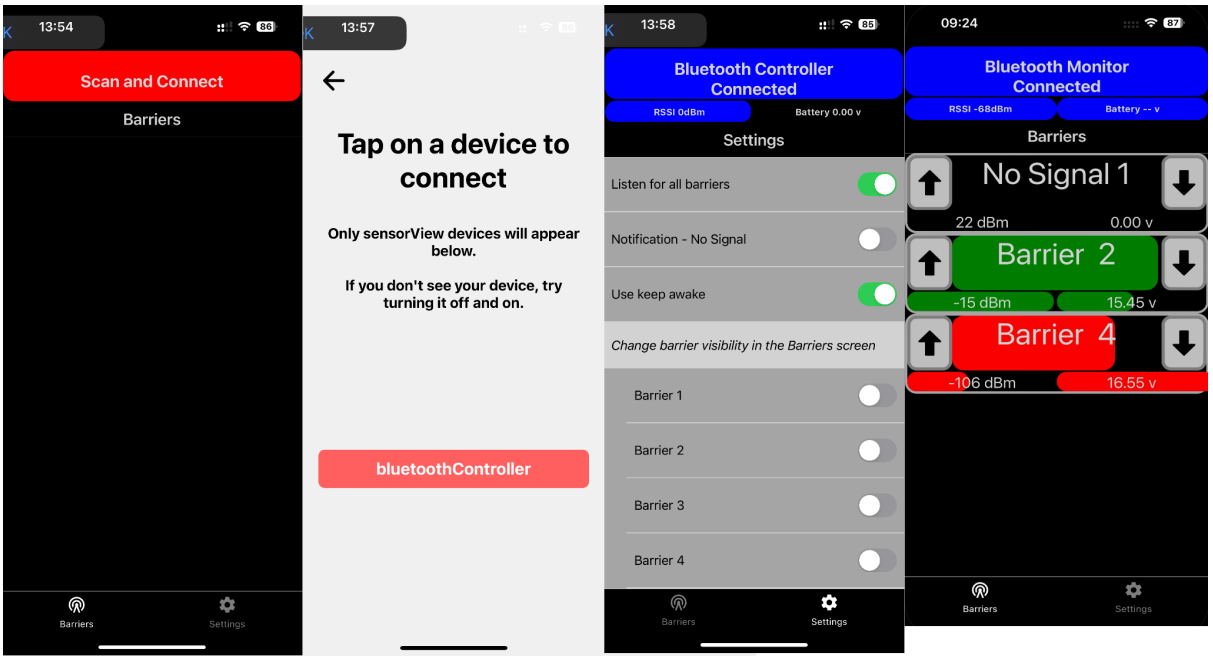
Operates in conjunction with a Master controller for a dual barrier arm system. Upon power-on, it attempts to extend the connected actuator arm. The slave controller initiates the sending of the status message at 3.5 minute intervals.

4.5 Gate Controller

Controls and monitors a single arm barrier or a gate. Upon power-on, it transmits a status message and attempts to extend the connected actuator arm.

5. barrierView Phone Application

The application enables remote control of the linear actuator by connecting via Bluetooth to the Bluetooth Controller.



5.1 Installation and Connection

- **Installation:** Available on the Google Play Store (Android) and Apple App Store (iPhone).
- **Permissions:** Bluetooth and notification permissions are required.
- **Pairing: DO NOT** attempt to pair the phone with the Bluetooth Controller using the phone's native settings.
- **Procedure:** Open the app, power on the Bluetooth Controller and press the ‘Scan and Connect’ button. Tap the red ‘bluetoothController’ button to establish a connection.

5.2 Application Operation

- **Visibility:** Barriers display only after the connected Bluetooth Controller receives a controller message (up to 3.5 minutes) or after visibility settings are changed.

- **Information Displayed:** Each barrier arm displays its unique ID, the **Master Controller's** last received signal strength indicator (RSSI), and battery level.
- **Commands:** Sent via the grey up and down buttons. The barrier ID should correspond to the barrier sign number for proper identification in multi-barrier setups.
- **Out of Range Indicator:** A barrier arm status change to black displaying 'No signal' indicates that a status message has not been received within the last 3.5 minutes, suggesting the operator may have moved out of range.

6. Physical System Components

6.1 Barrier Arm Hinge

A pin position is available to lock the barrier arms in the upright position when not in use, securing the arms and preventing wind damage. Refer to reference image 2.

6.2 Actuator Pivots

The horizontal arm pivot may be locked. However, the vertical arm pivot **must** be allowed to slide on the vertical arm as shown in the product image to prevent damage to the controller. Refer to reference image 3

6.3 Waratah Brackets

Two brackets are used: one at the top of the waratah pole and one midway, secured by a pin in the vertical square pipe.

- **Installation Note:** The waratah cutouts are not designed to accommodate waratah deformation. A waratah rammer is essential for accurate and proper installation. If the top of the pole is deformed, it must be cut down to an undeformed section. A waratah extractor is recommended for safe removal.

7. Known Issues and Troubleshooting

Symptom	Remedy 1	Remedy 2	Remedy 3
Cannot connect app to bluetooth controller.	Power cycle the Bluetooth controller (off/on).	Kill and restart the app, then attempt Remedy 1.	Verify that Bluetooth is enabled on the phone.
Strange behaviour from barrier arms	Ensure the lower actuator pivot bracket is installed as per the reference image 3.		
One barrier arm up and one down	Ensure correct actuator cord routing through hinge pin ring as per reference image 4.	Ensure both controllers have sufficient charge.	

8. Safety and Warnings

8.1 General Warnings

- **Repair:** Do not dismantle or attempt repairs of the radio devices or linear actuators.
- **Pinch Hazard:** The barrier arms contain pinch/crush points where moving parts meet. Follow all assembly instructions and maintain a safe distance while the barrier is in motion.

8.2 Lithium-ion Battery Safety

WARNING: This product contains lithium-ion batteries. Improper handling poses a safety risk. Adhere to all instructions and warnings for use, charging, and storage.

Prohibition (Do Not)	Emergency Procedure
Disassemble, crush, puncture, or incinerate the battery.	**Leakage:** Do not touch the substance. Wear gloves and dispose of the battery according to local regulations.
Expose the battery to extreme temperatures (fire or direct sunlight).	**Overheating/Explosion:** Immediately remove the battery from the device and place it on a non-flammable surface in a secure location. Contact emergency services if necessary.
Short-circuit the battery terminals.	N/A
Immerse the battery in water or other liquids.	N/A
Use the battery if it is damaged, leaking, or deformed.	N/A
Keep the battery within reach of children and pets.	N/A
Use charging equipment not specifically designed for this product.	N/A
Charge the battery for longer than the recommended time.	N/A
Dispose of used batteries improperly (do not throw them in household trash).	N/A

Please retain this manual for future reference.

REFERENCE IMAGES

Image 1

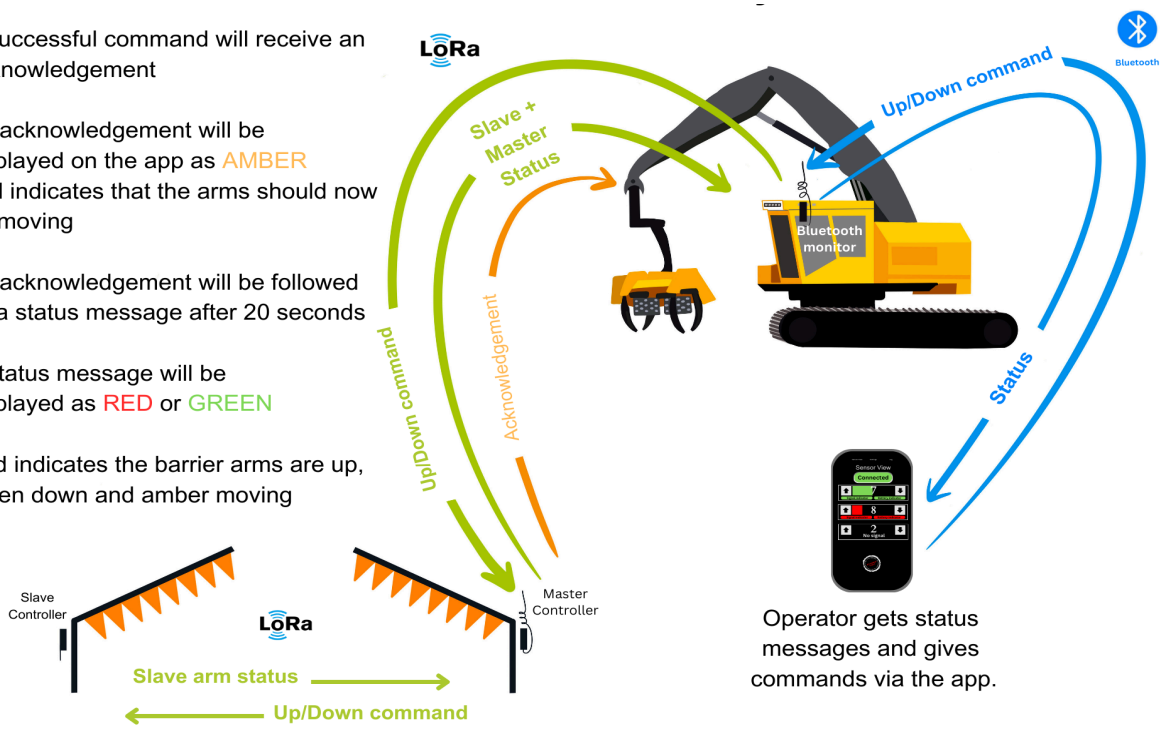
A successful command will receive an acknowledgement

An acknowledgement will be displayed on the app as AMBER and indicates that the arms should now be moving

An acknowledgement will be followed by a status message after 20 seconds

A status message will be displayed as RED or GREEN

Red indicates the barrier arms are up, green down and amber moving



Operator gets status messages and gives commands via the app.

Image 2



Image 3



Image 4

