# RioV360

# User Manual

AI Pedestrian Detection System · Installation, setup and operation




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# Legal notice and safety

## Legal notice

This manual is published by RioDatos LLC for installers, operators, and fleet safety personnel. It is free to use. You may copy, print, translate, share, and redistribute it, in whole or in part, without permission from RioDatos. Sharing it with your installers, dealers, and safety teams is encouraged.

Specifications are subject to change without notice as product improvements are introduced. RioV360 is an AI pedestrian detection system designed to assist operators by improving visibility and awareness of people and vehicles in blind spot areas. It is not a substitute for safe vehicle operation, proper training, mirrors, direct observation, or compliance with applicable local, state, and federal workplace safety regulations.

## Safety information

Read and follow all safety instructions before installing or operating RioV360.

> **WARNING:** Always disconnect vehicle power before wiring, servicing, or removing any component of the RioV360 system.

- Do not install components near moving vehicle parts, hot surfaces, hydraulic lines, or pinch points.
- Use appropriate personal protective equipment (PPE) during installation.
- Confirm all mounting hardware is secure before operating the vehicle.
- Never rely solely on RioV360 to avoid collisions. Operators must continue to use mirrors and direct observation.
- Do not route cables where they could be pinched, cut, or exposed to extreme heat.
- Use the power source and voltage range specified in this manual.
- Do not open, modify, or repair internal components. Contact RioDatos for service.
- Cameras and monitors must not obstruct the operator's field of view.

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**NEED HELP?** Call 520-501-0602, email info@riodatos.com, or book a free Microsoft Teams setup call: calendly.com/john-buttery-riodatos/30min

SECTION 1

# System overview

RioV360 is an AI pedestrian detection system for forklifts, loaders, excavators, dump trucks, telehandlers, skid steers, and other industrial and construction machines. Four HD cameras, a 7-inch in-cab AI monitor, an external flashing beacon, onboard recording, and configurable alert zones work together to improve operator awareness and reduce blind-spot incidents.

## Key features

- Four-camera, 360-degree coverage with AI detection
- 7-inch HD in-cab monitor with built-in AI processing
- Alert zones set per camera: a single alarm zone or graduated green, yellow, and red zones
- Onboard recording on a High Endurance microSD card: about 30 hours on 256 GB, about 60 hours on 512 GB. No Wi-Fi or cloud connection required
- External flashing beacon warns people near the machine
- Detects pedestrians, cyclists, and vehicles with no wearable tags
- IP69K waterproof cameras rated for construction and outdoor environments
- Operating voltage 8 to 32 VDC, compatible with most industrial vehicles
- Sold and supported from Arizona by RioDatos

## Configured and ready to install

1. Factory configuration. RioDatos configures the monitor, sets the detection zones, and sets the default parameters for your system before it ships.
2. Bench test before installation. Set the system up on a conference table or workbench before installing it on the machine. Connect the cameras, power on the monitor, and get familiar with the display and alerts (Section 3).
3. Guided walkthrough. A RioDatos technician can walk you through the monitor menu and settings on a Microsoft Teams call at no charge.

**SCHEDULE YOUR SETUP CALL**

BOOK ONLINE (30 MIN, MICROSOFT TEAMS)
**calendly.com/john-buttery-riodatos/30min**

EMAIL
**info@riodatos.com**

PHONE
**+1 (520) 501-0602**

SCAN TO BOOK

SECTION 2

# Before you install

## Recommended tools

- Cordless drill and drill bits
- Self-tapping screws and socket set
- Wire crimpers and heat shrink connectors
- Electrical tape and split loom conduit
- Zip ties (assorted sizes)
- Multimeter for voltage verification
- Fish tape for routing cables through panels
- Silicone sealant for outdoor camera mounting
- Relay kit (if the vehicle requires ignition-controlled power)

## Pre-installation checklist

> **NOTE:** Complete all checklist items before beginning permanent installation. Bench test the system first to confirm all components work.

- Confirm vehicle voltage is within the 8 to 32 VDC range
- Identify a fused power source and ground points on the vehicle
- Plan cable routing from each camera position to the monitor
- Confirm the monitor location gives the operator a clear view
- Confirm camera locations based on the vehicle's blind spots
- Confirm the beacon location is visible and audible
- Bench test all components before mounting (Section 3)

SECTION 3

# Bench test and initial setup

Set RioV360 up for the first time on a conference table or workbench. The RV360-PWR power adapter (Section 7) runs the complete system from a standard wall outlet, so you can learn the display and alerts before installing anything on the machine.

**IMPORTANT:** Twist the Red (power) and Yellow (accessory) wires together and connect them to positive (+). Connect the Black (ground) wire to negative (-). The remaining wires are not used for the bench test and can be insulated.

1. Connect the RV360-PWR or RV360-BAW adapter to the harness as shown above. Do not mount anything yet.
2. Connect the wire harness to the monitor, then connect all four camera cables. Each connector threads on by hand.
3. Connect the beacon cable.
4. Confirm the microSD card is in the monitor. RioDatos installs and formats it before shipping.
5. Power on the monitor with the power button.
6. Verify all four camera images appear on screen.
7. Verify left and right image orientation for each camera.
8. Walk through each camera's field of view to confirm detection and alerts.
9. Verify the beacon activates when a detection alert fires.
10. Verify the recording icon appears on screen.
11. Confirm the date and time are correct (Section 11.5).

**CONNECTORS:** Every connector threads on by hand with no resistance. If you feel resistance, stop, separate the connectors, and line up the arrows again. Never use tools. See Section 6 for details.

**NOTE:** If a camera image does not appear, check the cable connection at both the camera and monitor ends before assuming a component has failed.

SECTION 4

# Monitor installation

Mount the monitor where the operator can see it clearly without blocking the view of the road, forks, or surroundings. The RV360-EXT Monitor Extension and Mounting Kit (Section 7) adds an extension arm, rail clamp, and other mounting options.

## Recommended location

- A-pillar or roll cage vertical bar within easy sightline
- Overhead cab frame if side visibility is unobstructed
- Away from direct sun glare: angle the screen away from front glass reflections
- Within arm's reach for occasional menu adjustments

## Mounting steps

1. Position the mounting bracket and mark drill points.
2. Drill pilot holes using hardware suited to the cab material (metal, ROPS frame).
3. Attach the bracket using the three self-tapping screws provided.
4. Slide the monitor onto the bracket knobs. Do not tighten yet.
5. Adjust the monitor angle for the best view from the operator's seat.
6. Tighten all bracket screws and monitor knobs firmly.
7. Connect the wire harness to the monitor. The plastic ring threads on by hand and tightens with your fingers.

> **WARNING:** Make sure the monitor does not interfere with any controls, levers, steering, or the operator's forward view. Verify clearance before operating the vehicle.

SECTION 5

# Camera installation

Position cameras to cover the machine's blind spots. Each camera is waterproof to IP69K and rated for outdoor and construction environments.

## Front camera

- Mount above or on the front mast, overhead guard, or bumper area
- Position to capture the fork tips or front bumper edge at the bottom of the frame
- Angle downward to show about 2 to 5 meters in front of the vehicle

## Rear camera

- Mount on the rear counterweight, rear bumper, or rear edge of the overhead guard
- Position to show the rear bumper edge at the bottom of the frame
- Adjust to show the full rear travel zone

## Left side camera

- Mount on the left side of the overhead guard, mast, or frame
- Angle slightly downward to capture the wheel area and adjacent zone
- Avoid pointing too high; minimize sky in the image

## Right side camera

- Mirror the left camera setup on the right side
- Cover the right travel path and any dock or racking approach areas

## Camera mounting steps

1. Rotate the camera body to set the viewing direction.
2. Mark drill points on the mounting surface.
3. Drill pilot holes. Apply silicone sealant if mounting outdoors or in wash-down areas.
4. Attach the camera bracket with the screws provided.
5. Run the camera cable through split loom conduit toward the monitor.
6. Check the camera view on the monitor before tightening the final screws.

> **NO-DRILL OPTION:** RV360-MAG magnets (two per camera bracket) hold a camera on any steel surface without drilling. Use them for pilot units, rentals, or to test camera positions before drilling permanent mounts (Section 7).

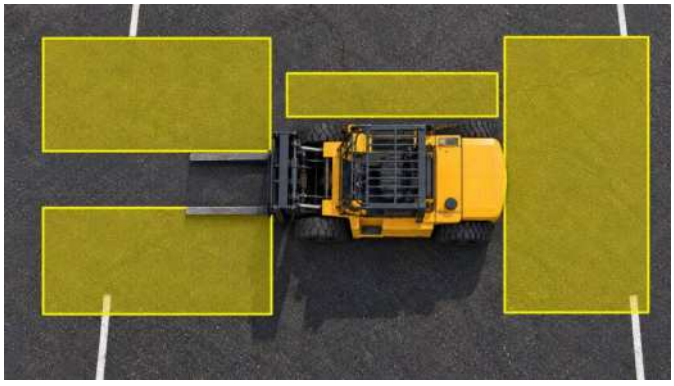
## Choosing a camera layout

The standard layout puts one camera on each side of the machine: front, rear, left, and right. It suits most loaders, skid steers, and telehandlers. Some machines need a different layout. The channel names on the monitor (F, B, L, R) only identify the camera inputs, so any channel can be aimed where coverage is needed.

## Forklift layout: two front cameras

On a forklift, the mast is the largest blind spot in front of the operator, and one front camera cannot see past it. Many fleets use this layout instead:

| CHANNEL | MOUNT | COVERS |
|---|---|---|
| **F** | Left side of the mast, facing forward, angled slightly outward | Front and front-left corner; one fork visible |
| **L** | Right side of the mast, facing forward, angled slightly outward | Front and front-right corner; one fork visible. A second front channel, not a left-side view |
| **B** | Centered on the rear counterweight, just above the grille, angled down | Rear travel zone |
| **R** | Right side of the overhead guard or cab | A narrow curtain zone along the right side of the machine |
| **None** | Left side, where the operator sees directly through the door | No camera needed |



**Overhead view**

Two forward zones from the mast cameras, a rear zone, and a right-side curtain. Section 13.4 shows the matching monitor view.

## Mounting the rear camera

Mount the rear camera as far back as possible, centered on the counterweight just above the grille. On a long machine, a camera on the cab roof looks over the engine hood and misses the ground directly behind the machine, where people are most at risk when it reverses. Keep the camera tucked in so it does not stick out past the counterweight.

> **TIP:** A camera tucked in above the grille is protected from impacts and debris. Other layouts, such as two rear cameras on an excavator, are shown in Section 13.

SECTION 6

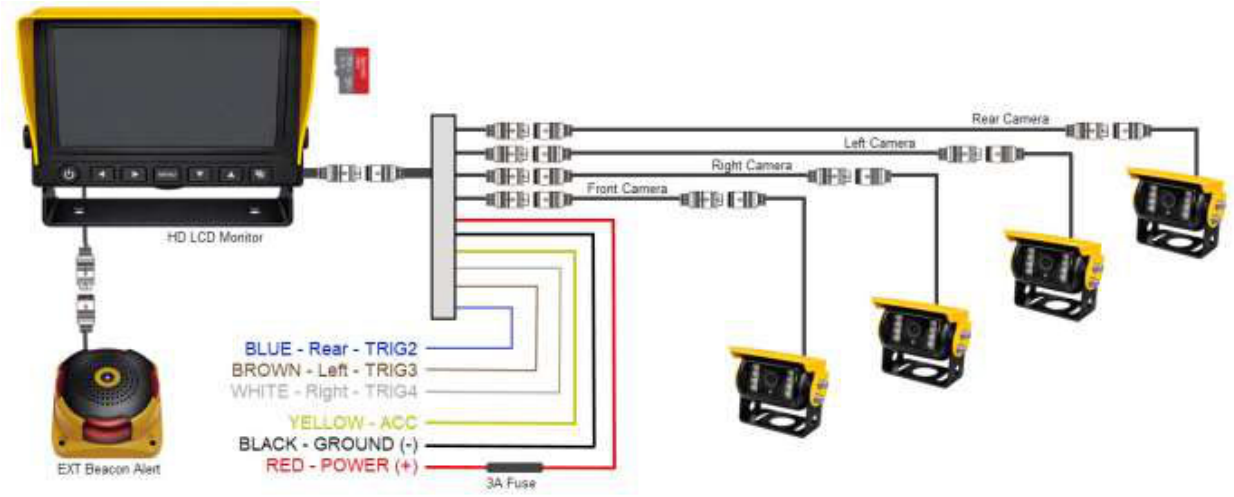
# Beacon and wiring

## Beacon installation

The external beacon flashes and sounds when a person is detected in an alert zone. Mount it where it is clearly visible and audible.

- Recommended location: cab frame, overhead guard, or ROPS bar
- Avoid exterior mounting if the vehicle operates in heavy wash-down environments
- Route the beacon cable through the cab frame with split loom protection
- Secure with cable ties every 30 cm

## Wiring diagram




| WIRE | FUNCTION | CONNECT TO |
|---|---|---|
| **Red** | Power (+) | Constant 12/24 V through the 3 A fuse. Keeps the clock and settings |
| **Yellow** | Accessory (ACC) | Switched power that is on only while the machine is in use: ignition ACC, or an approved isolated relay/interface (Never wire directly to seat-belt or park-brake circuits) |
| **Black** | Ground (-) | Clean chassis ground point. Avoid painted surfaces |
| **Blue / Brown / White** | Trigger inputs (TRIG2 rear, TRIG3 left, TRIG4 right) | Optional. Switches the monitor view; leave insulated if not used |

## Wiring and power connection

RioV360 operates on 8 to 32 VDC. Connect Red to constant fused power (3 A), Yellow (ACC) to approved switched power, and Black to a clean, unpainted chassis ground.

**INSTALLATION SAFETY:** Use an ignition-switched, fused source approved for the vehicle. Never connect directly to seat-belt or park-brake safety circuits; use an approved isolated relay or interface.

- Route camera cables along protected existing cable runs where possible.
- Keep cables away from exhaust, hydraulics, sharp edges, and moving parts.
- Secure cable runs with ties and protect exposed sections with split loom.
- Label each camera cable at the monitor end (Front, Rear, Left, Right) before final routing to simplify future servicing.

**AVIATION CONNECTORS:** Line up the arrows on both connector ends and push the bodies together until they seat about halfway. Start the locking ring by hand. Every camera and beacon connector threads on very easily. If you feel any resistance, stop: the connectors are not aligned. Separate them, line up the arrows, and try again. Tighten the ring by hand only, no tools. A cross-threaded or stripped ring will not seat, and the camera signal will drop. Do not use the ring to pull the connectors together.

**MONITOR-TO-HARNESS:** The monitor-to-harness connection matters most. The plastic ring must thread on easily and tighten with your fingers until it sits flush. Never force it.

**WARNING:** Always disconnect the vehicle battery negative terminal before making wiring connections. Failure to do so may damage the unit or cause electrical injury.

## Installation checklist

Complete this list before returning the machine to service, then keep a copy with the machine records.

- ☐ Verify all kit contents against the packing list
- ☐ Mount all four cameras in the correct positions
- ☐ Mount the monitor in the cab: visible but not obstructive
- ☐ Route the wire harness away from pinch points and moving parts
- ☐ Hand-tighten every aviation connector, no tools; the monitor-to-harness ring sits flush
- ☐ Connect POWER (Red) to constant power through the 3 A fuse
- ☐ Connect ACC (Yellow) to ignition-switched power or an approved isolated interface
- ☐ Connect GROUND (Black) to a clean chassis ground
- ☐ Power on and verify all four camera feeds appear
- ☐ Confirm the detection zones and set the Smart Driving toggle to Settings (10.1)
- ☐ Walk all zones and confirm alerts trigger correctly

Installed by: _____ Date: _____ Vehicle / unit: _____

SECTION 7

# Accessories and parts

Every RioV360 ships complete and ready to install. Add mounting options, bench power, longer cables, more storage, or longer warranty coverage, with your system or any time later.

## 7.1 Price list and ordering

| PART | DESCRIPTION | PRICE |
|---|---|---|
| SYSTEMS AND UPGRADES | | |
| **RIOV360-001** | **RioV360 complete system.** Add coverage to another machine. Four cameras, AI monitor, beacon, harness, installation kit, and 256 GB card | $1,795 |
| **RV360-512** | **512 GB High Endurance microSD.** Upgraded storage: about 60 hours of four-camera video (7.5) | $280 |
| **RV360-EXT** | **Monitor Extension and Mounting Kit.** Extension arm, rail clamp, and three more mounting options (7.3) | $240 |
| **RV360-MAG** | **Magnetic Camera Mounting Kit.** No-drill camera mounts for pilots, rentals, and position testing (7.4) | $120 |
| **RV360-CAB** | **Cable Extension Kit.** Five 10 m camera/beacon cables and one 5 m monitor cable for large machines (7.6) | Call |
| **RV360-COL** | **Factory Color Package.** Camera visors and beacon finished in safety yellow | $190 |
| POWER | | |
| **RV360-PWR** | **Bench Test AC Power Adapter.** 12 V, 3 A, ETL-listed. Bench test, training, demos, and firmware updates (7.2) | $40 |
| **RV360-BAW** | **20V Battery Adapter.** Temporary portable power for demos and system testing (7.2) | $30 |
| EXTENDED WARRANTY | | |
| **RV360-3YW** | **3-year warranty.** Extends the standard 18-month warranty to 3 years from purchase | $295 |
| **RV360-5YW** | **5-year warranty.** Extends the standard 18-month warranty to 5 years from purchase | $495 |
| REPLACEMENT PARTS | | |
| **RV360-CAM** | **Replacement camera.** Specify position: front, rear, left, or right | Call |
| **RV360-MON** | **Replacement monitor.** 7-inch HD AI monitor with harness | Call |
| **RV360-BCN** | **Replacement beacon.** External flashing alert beacon | Call |

**TO ORDER:** Call 520-501-0602 or email info@riodatos.com with part numbers and quantities. In-stock orders ship from Arizona in 2 business days. Ask about fleet pricing for several machines; dealers, ask for dealer pricing. US dollars, current October 2026, shipping extra. ACH, wire, check, or credit card.

## 7.2 Power adapters

**RV360-PWR Bench Test AC Power Adapter.** 12 V, 3 A ETL-listed AC wall adapter. Runs the complete system from a 100 to 240 V outlet for the bench test (Section 3), firmware updates (12.4), training, and demonstrations. Specifications are in 12.4.

**RV360-BAW 20V Battery Adapter.** Battery adapter for 20 V batteries. Provides temporary power for portable RioV360 operation, demonstrations, and system testing.

**IMPORTANT:** Both adapters plug into the harness jack with screw terminals. Twist the Red (power) and Yellow (accessory) wires together to positive (+) and Black (ground) to negative (-). Insulate the remaining wires.

**NOTE:** The system needs 8 to 32 VDC and will not run on a 5 V adapter. Adapters are for bench, demo, and test use. On the machine, wire to vehicle power (Section 6).

## 7.3 RV360-EXT Monitor Extension and Mounting Kit

The kit gives you several ways to mount the monitor. The goal is simple: the operator sees the screen without turning away from the work.

- **Extension arm:** the double-socket arm and plate set the monitor's reach and angle exactly where the operator needs it. Three of the four plate holes align with the RioV360 monitor bracket, and three bolts secure the monitor. To use all four, drill one more hole in the plate. Tighten the center knob firmly once the monitor is positioned.
- **Rail clamp:** clamps the extension arm to a bar, rollover tube, or handrail. No drilling.
- **Round base mount:** a hardened plastic disc with a ball mount that screws to a flat metal surface. Good for small spots on the dash, and it handles vibration well.
- **Bracket mount:** bolt the monitor bracket directly to the cab's steel frame where the operator can easily see it.
- **T-attachment with ball mount:** for machines that run on smooth surfaces only, such as warehouse floors. On rough terrain, vibration can stress the monitor's plastic housing.



**Monitor bracket on the extension plate.** Three mounting bolts align with the bracket slots. Confirm all hardware is tight.



**Ball mount plate for the extension arm.** Round ball mount and adjustable mounting-hole pattern.

## 7.4 RV360-MAG Magnetic Camera Mounting Kit

Heavy-duty neodymium magnets attach to the camera brackets, two per bracket, and hold the cameras on any steel surface without drilling. They are ideal for pilot units, rentals, and finding the best camera positions before drilling permanent mounts.



Camera with two magnets attached; eight individual RV360-MAG mounts shown at right.

1. Select a clean, flat, bare steel surface for the camera location.
2. Position one round magnet below each elongated slot in the camera bracket.
3. Pass each magnet's threaded stud upward through its bracket slot.
4. From above the bracket, add the washer and tighten the self-locking nut.
5. Set the viewing angle, check the camera image, and verify the mounts are secure.

> **IMPORTANT:** Verify magnet contact and mounting security before operating the machine. Check camera positions at the start of each shift, and switch to permanent mounting on machines with heavy vibration.

## 7.5 Memory cards

| PART | CARD | FOUR-CAMERA RECORDING |
|---|---|---|
| **Included** | 256 GB High Endurance microSD (Class 10, U3, V30) | About 30 hours |
| **RV360-512** | 512 GB High Endurance microSD upgrade (Class 10, U3, V30) | About 60 hours |

Every RioV360 includes a 256 GB card, installed and formatted in the monitor. RV360-512 upgrades video storage to 512 GB. Replacement cards must be High Endurance, Class 10 or faster, with a minimum speed of 80 MB/s; format any new card in the monitor before use (12.1). Recording time varies with video format and conditions.

## 7.6 RV360-CAB Cable Extension Kit

The Cable Extension Kit provides additional cable length for routing the cameras, external flashing beacon, and monitor on larger machines or installations that need longer cable runs.

| QTY | COMPONENT | LENGTH |
|---|---|---|
| **5** | 4-pin camera / beacon extension cables | 10 m each |
| **1** | 18-pin monitor-to-harness extension cable | 5 m |

**When to use the kit.** Use extension cables when the supplied wiring does not reach the selected camera, beacon, or monitor locations along a protected routing path. Measure the actual cable path before installation, allowing slack for turns, mounting adjustments, and service access.

1. With vehicle power disconnected, identify the cable run that needs additional length.
2. Connect the correct extension between the existing cable and the camera or beacon, or between the monitor and its main harness.
3. Align connector markings and secure locking rings by hand only. Never force or cross-thread a connector.
4. Route cables in protective loom away from exhaust heat, hydraulic lines, sharp edges, hinges, and moving parts. Secure cable runs and leave strain relief at connectors.
5. Before returning the vehicle to service, confirm all four camera views, AI detection alerts, beacon operation, and stable monitor power.

> **IMPORTANT:** Use only extension cables confirmed compatible with the RioV360 connector wiring and pinout. Matching pin counts alone do not establish compatibility. Bench-test the system with the extensions before final installation.

To order accessories or parts, see 7.1, contact info@riodatos.com, or call 520-501-0602. Parts ship from Tucson, Arizona.

SECTION 8

# Monitor controls

Seven buttons along the bottom of the monitor run every menu in this manual. Most operators never need them: the system starts with the machine and runs on the RioV360 defaults.




| # BUTTON | FUNCTION |
|---|---|
| **1 Power** | Press to turn on or off. Hold 5 seconds to force off if the screen freezes. |
| **2 Left** | Live view: show a single camera. Menus: move left. |
| **3 Right** | Live view: switch between multi-screen views. Menus: move right. |
| **4 MENU** | Open or close System Settings. In a submenu, go back one level. Long press: return to live view. |
| **5 Down** | Menus: scroll down. During recording, long press to lock or unlock the current video file (see 9.8). |
| **6 Up** | Menus: scroll up. Playback: go to the previous video. |
| **7 Confirm** | Menus: confirm a selection. Live view: single screen. Playback, long press: delete the current file. |
| **8 Status light** | Lit when the monitor has power. |

## Using the menus

- Press MENU to open System Settings. If Cipher Mode is on, enter the password (default 1111).
- Use Left and Right to move between tiles, then Confirm to open one.
- Use Up and Down to pick an option, then Confirm. A check mark shows the active setting.
- Select the » tile for the next page of settings and « to go back. There are three pages.
- After 5 seconds without a button press, the monitor returns to the main settings screen.

## Screen icons

| ICON | MEANING |
|---|---|
| **Recording active** | Solid record icon in the corner of the screen |
| **Locked recording** | Lock icon over the record indicator |
| **Memory card installed** | Card icon in the status bar |
| **No memory card** | Card icon with an X: recording unavailable |
| **Detection box** | Tracking box over a detected person or vehicle |
| **Parking time-lapse on** | Clock icon in the status bar |

## Default settings at a glance

Every RioV360 ships with these settings. If a system behaves differently, compare it to this table first.

| SETTING | MENU PAGE | RIOV360 DEFAULT |
|---|---|---|
| **Video Resolution (Format Settings)** | Page 1 | 1080N |
| **Loop Recording** | Page 1 | 15 minutes |
| **Parking Time-Lapse** | Page 1 | Off |
| **Record Audio** | Page 1 | Off |
| **Channel Settings** | Page 1 | Rear camera mirrored |
| **Split Screen Mode** | Page 1 | Quad (F, B, L, R) |
| **License** | Page 1 | Off |
| **Smart Driving toggle** | Page 1 | Settings |
| **Warning settings** | Page 1 | One-level warning |
| **Alarm zones** | Page 1 | Preset by RioDatos |
| **Monitor Type** | Page 1 | Pedestrians/Non-motor |
| **Sensitivity** | Page 1 | Middle |
| **Front, Rear, Left, Right BSD** | Page 1 | All On |
| **Screen Saver** | Page 2 | Off |
| **Key Voice** | Page 2 | Off |

| SETTING | MENU PAGE | RIOV360 DEFAULT |
|---|---|---|
| **Speaker** | Page 2 | Middle |
| **Language** | Page 2 | English |
| **Display (backlight)** | Page 2 | 90 |
| **VCOM** | Page 2 | 92 (do not change) |
| **Cipher Mode (password)** | Page 2 | Off, password 1111 |

SECTION 9

# Recording and display

The first page of System Settings controls how video is recorded and shown on the monitor.

## 9.1 Video Resolution

MENU › PAGE 1 › FORMAT SETTINGS




Sets the recording resolution for all four cameras. RioV360 records at 1080N: full 1080-line detail at about half the card space of 1080P, for about 30 hours of four-camera recording on 256 GB or 60 hours on 512 GB.

**TIP** Leave this at 1080N. 1080P fills the card much faster and cuts recording time. This tile is labeled Format Settings but it changes resolution only; it does not erase the card (see 12.1).

OPTIONS

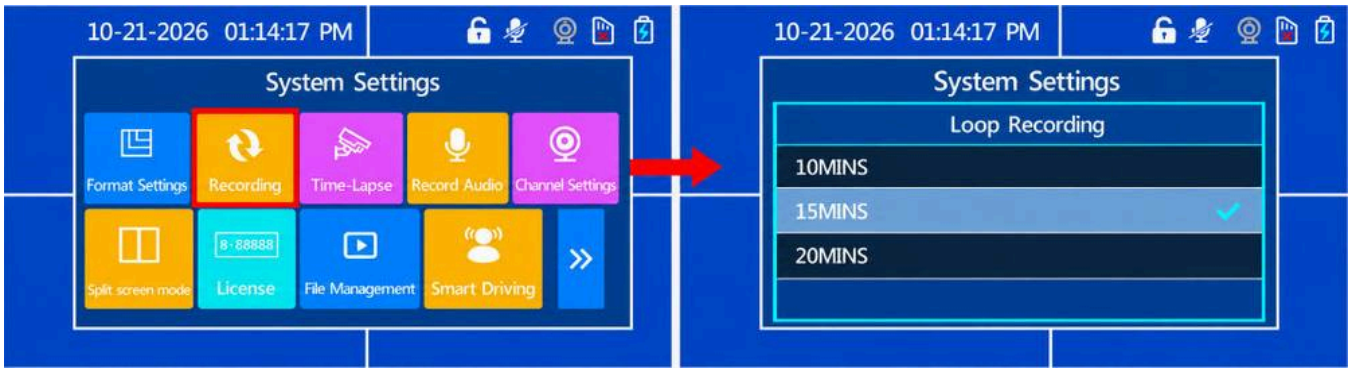
1080P | **1080N** | 720P | 720N

RIOV360 DEFAULT

**1080N**

## 9.2 Loop Recording

MENU › PAGE 1 › RECORDING




Saves video in files of the selected length. When the card is full, the oldest unlocked files are overwritten automatically, so recording never stops.

**TIP** Locking is optional. After an incident, RioDatos recommends removing and keeping the SD card instead (9.8).

OPTIONS

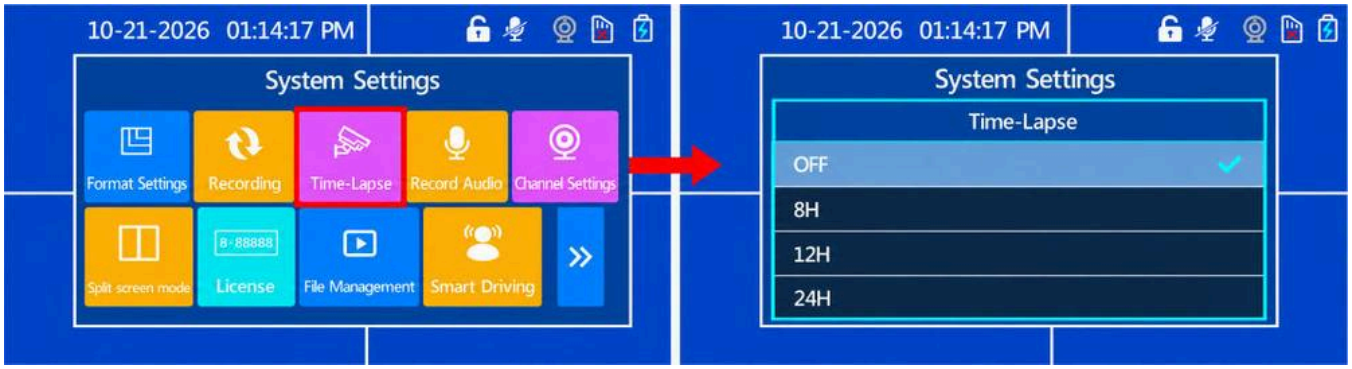
10MINS | **15MINS** | 20MINS

RIOV360 DEFAULT

**15MINS**

## 9.3 Parking Time-Lapse

MENU › PAGE 1 › TIME-LAPSE




Keeps recording at a low frame rate after the machine is shut off, for the selected number of hours. A clock icon shows in the status bar while it is on.

**TIP** Time-lapse draws power from the machine while it is parked. Leave it off unless the site needs after-hours coverage.

OPTIONS

**OFF** | 8H | 12H | 24H

RIOV360 DEFAULT

**OFF**

## 9.4 Record Audio

MENU › PAGE 1 › RECORD AUDIO




Adds sound from the monitor's built-in microphone to the recorded video.

> **TIP** Check company policy before turning audio on. Many sites require operator notice or consent for audio recording.

OPTIONS

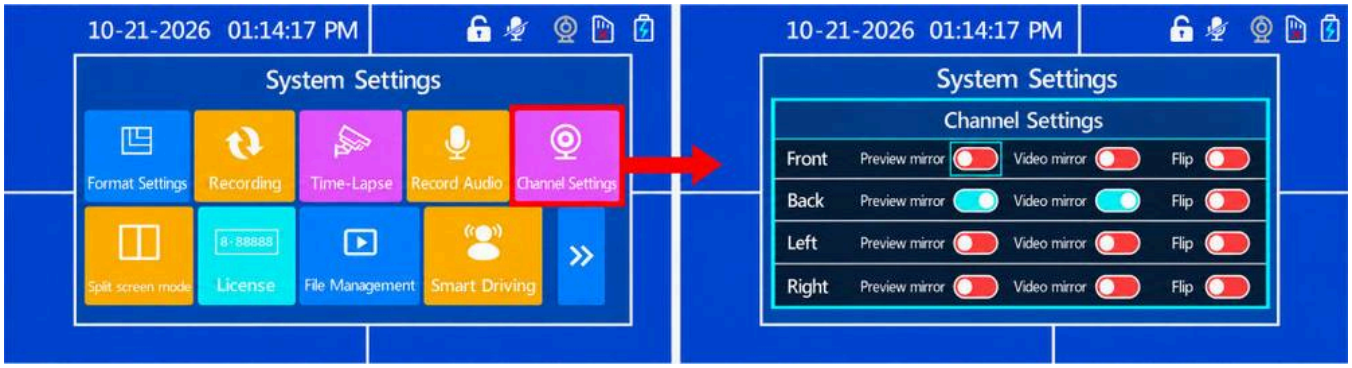
**OFF** ON

RIOV360 DEFAULT

**OFF**

## 9.5 Channel Settings

MENU › PAGE 1 › CHANNEL SETTINGS




Mirrors or flips each camera image. Preview mirror changes the live screen, Video mirror changes the recording, and Flip turns the image upside down for a camera mounted inverted.

> **TIP** The rear camera is mirrored so it reads like a rear-view mirror. If a side image looks reversed, adjust it here.

OPTIONS

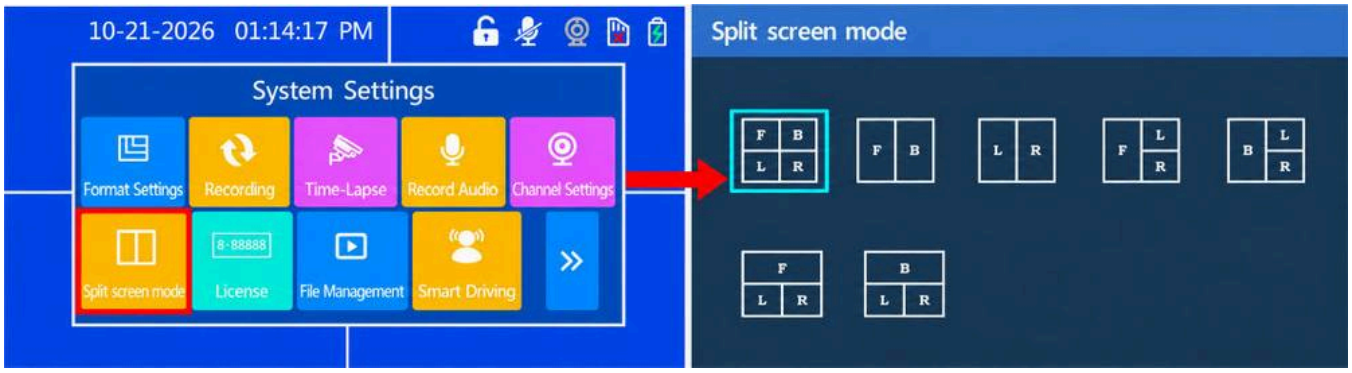
Mirror Flip

RIOV360 DEFAULT

**Rear mirrored**

## 9.6 Split Screen Mode

MENU › PAGE 1 › SPLIT SCREEN MODE




Sets the layout the monitor shows at startup: all four cameras, two side by side, or one large view with two smaller views.

**TIP** Quad is recommended so the operator sees all four sides at once. Left and Right change the view during operation without changing this default.

OPTIONS

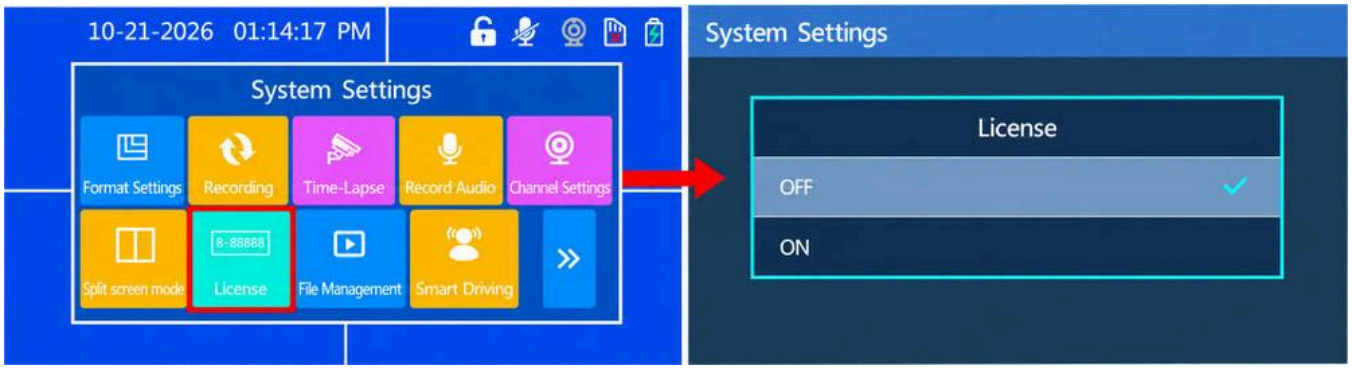
**Quad** | Dual | Triple

RIOV360 DEFAULT

**Quad**

## 9.7 License

MENU › PAGE 1 › LICENSE




Turns on a license plate or unit ID overlay on the display. Leave it off unless your fleet identifies recordings by unit number.

OPTIONS

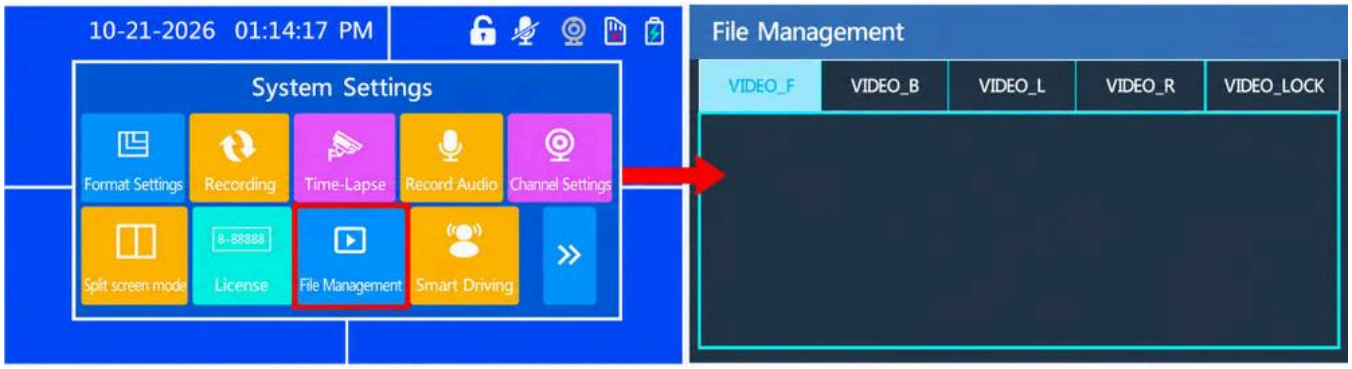
**OFF** | ON

RIOV360 DEFAULT

**OFF**

## 9.8 File Management

MENU · PAGE 1 · FILE MANAGEMENT




Plays back recordings and locks video files so loop recording does not overwrite them. Open a camera folder (VIDEO_F, VIDEO_B, VIDEO_L, or VIDEO_R) to review recordings; VIDEO_LOCK holds locked files.

> **TIP** We do not recommend the locking function. If an incident occurs, power off the system, remove and keep the SD card, and install a replacement card before recording resumes.

SECTION 10

# Smart Driving (detection)

Smart Driving holds the AI pedestrian detection settings: the alarm zone for each camera, what the system detects, and how sensitively. Every RioV360 is preset by RioDatos. Change these only when the site requires it, and walk test after every change.



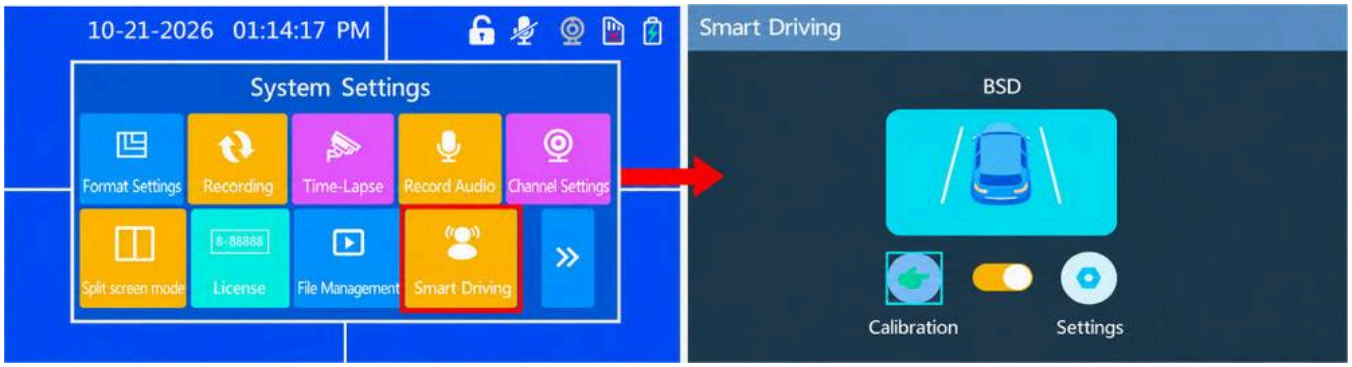

Each camera has its own alarm area. With graduated zones, green, yellow, and red show how close a person is to the machine. With a one-level warning, a single zone sets off the alarm.

Rear zones are usually set larger than front and side zones because of the higher risk and limited visibility when reversing.

> **WARNING:** Do not shrink detection zones below site-approved distances without authorization from the facility EHS or safety manager. Base zone size on machine speed, stopping distance, operator visibility, and traffic.

## 10.1 Smart Driving (BSD)

MENU › PAGE 1 › SMART DRIVING




BSD (blind spot detection) is the RioV360 pedestrian detection. Calibration sets the alarm zone for each camera. Settings chooses what is detected and how sensitively. The yellow toggle between them selects the active mode.

**CAUTION** Always leave the yellow toggle on Settings. On Calibration, the detection zones do not display on the monitor.

OPTIONS

Calibration | **Settings**

TOGGLE POSITION

**Settings**

## 10.2 Warning Settings

MENU › PAGE 1 › SMART DRIVING › CALIBRATION




Warning settings offers four choices: **One-level warning**, **Two-level warning**, **Three-level warning 1**, and **Three-level warning 2**. One-level uses a single alarm zone for each camera. The other three divide each camera's area into graduated zones that warn earlier as a person gets closer. Below Warning settings, each camera has its own zone calibration (10.3).

OPTIONS

**One-level warning** | Two-level warning | Three-level warning 1 | Three-level warning 2

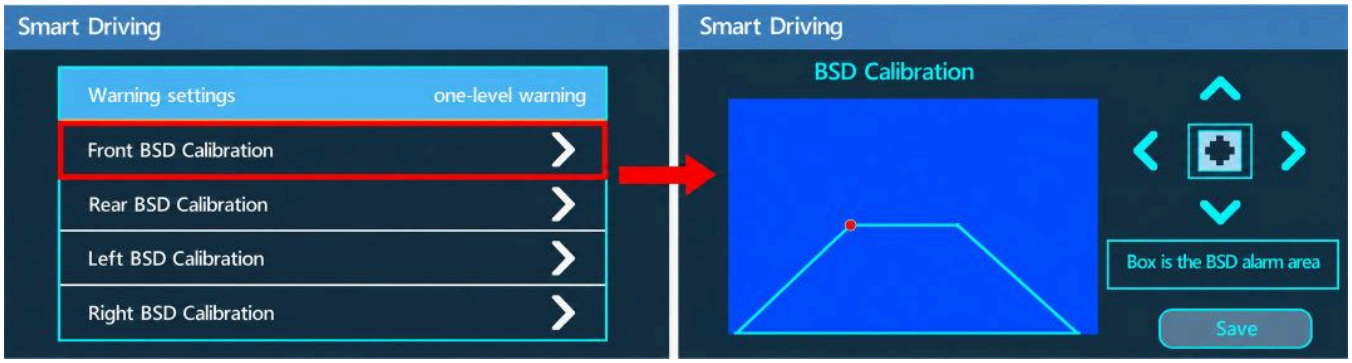
RIOV360 DEFAULT

**One-level warning**

**SELECT ONE-LEVEL WARNING.** RioV360 is configured and supported on One-level warning. One zone per camera gives the operator one clear alarm, is the easiest to calibrate, and avoids overlapping zones that cause nuisance alarms. If a monitor shows a two- or three-level setting, change it to One-level warning and recalibrate each camera's zone (10.3).

## 10.3 BSD Calibration

MENU › PAGE 1 › SMART DRIVING › CALIBRATION › CAMERA




The box is the alarm area for that camera. Select the camera, use the arrow buttons to move the corners of the box (the red dot marks the active corner) to the desired distance from the machine, then select Save. Repeat for each camera.

**TIP** After saving, walk a person through each zone edge and confirm the alarm sounds at the right distance.

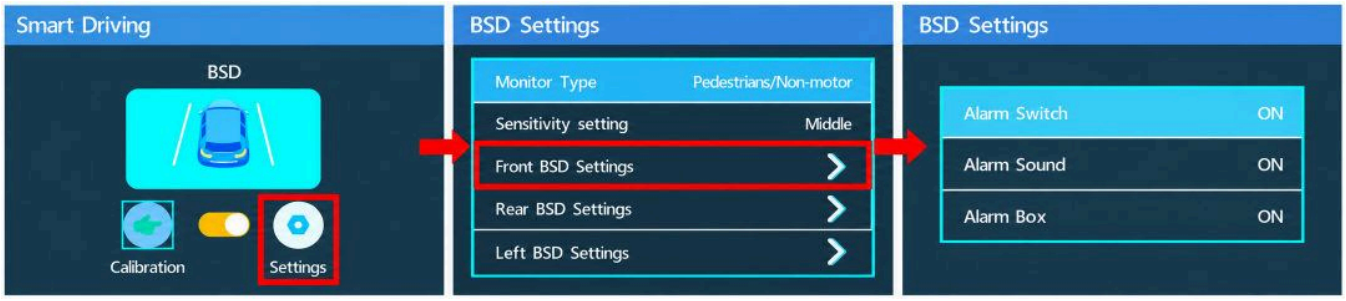
RIOV360 DEFAULT

**Preset by RioDatos**

**CALIBRATION HELP** Section 13 shows how the detection box should look on screen for each sample machine. Refine the zones in the cab at installation. For tips, call 520-501-0602 or email info@riodatos.com.

## 10.4 BSD Settings

MENU › PAGE 1 › SMART DRIVING › SETTINGS

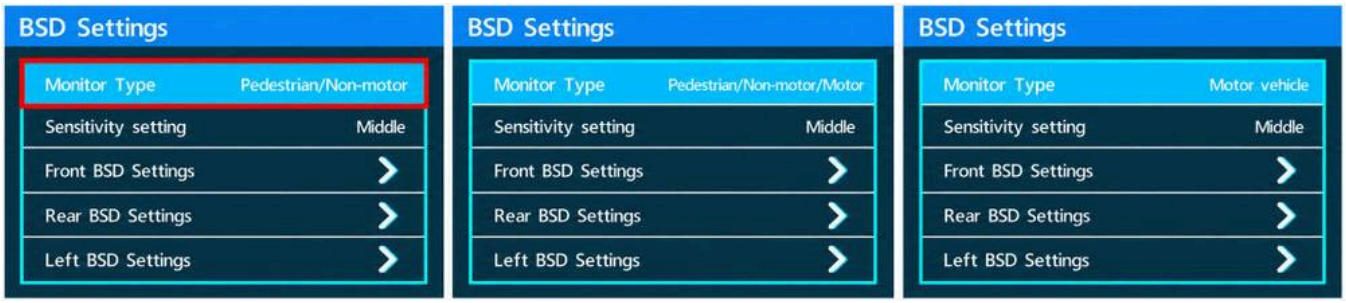



Monitor Type selects pedestrians, non-motor vehicles, or both. Sensitivity sets how readily an alarm fires: Low, Middle, or High. RioV360 ships at **Middle**.

Open **Smart Driving > Settings > Front BSD Settings** to reach the nested BSD Settings panel shown above. It contains **Alarm Switch**, **Alarm Sound**, and **Alarm Box**, shown ON. Each camera has its own BSD Settings entry; all four cameras ship with detection ON.

**CAUTION:** When configuration is finished, return to the Smart Driving screen and move the yellow toggle to Settings. If it is left on Calibration, the detection zones will not display on the monitor.

## Monitor Type options




**Select Pedestrian/Non-motor**, outlined in red above, for the recommended RioV360 pedestrian detection setup. The other Monitor Type choices are **Pedestrian/Non-motor/Motor** and **Motor vehicle**. Open MENU > Page 1 > Smart Driving > Settings > Monitor Type.

> **NOTE:** RioV360 ships at Middle sensitivity. To reduce false alerts from vegetation, reflective surfaces, or background movement, shrink the zones to the machine's actual working area, lower the sensitivity, or both. If a walk test shows missed detections, raise the sensitivity or enlarge the zone.

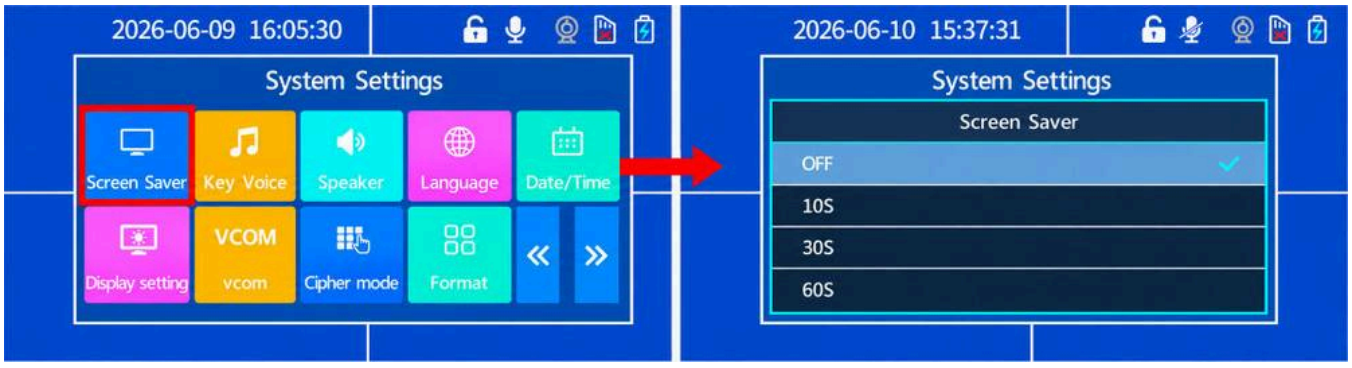
SECTION 11

# Monitor preferences

Select » on the first settings page to reach page 2. These settings control the screen, sound, language, and clock.

## 11.1 Screen Saver

MENU › PAGE 2 › SCREEN SAVER




Turns the screen off after the selected time without a button press.

> **TIP** Keep it off. The operator should see the camera views at all times.

OPTIONS

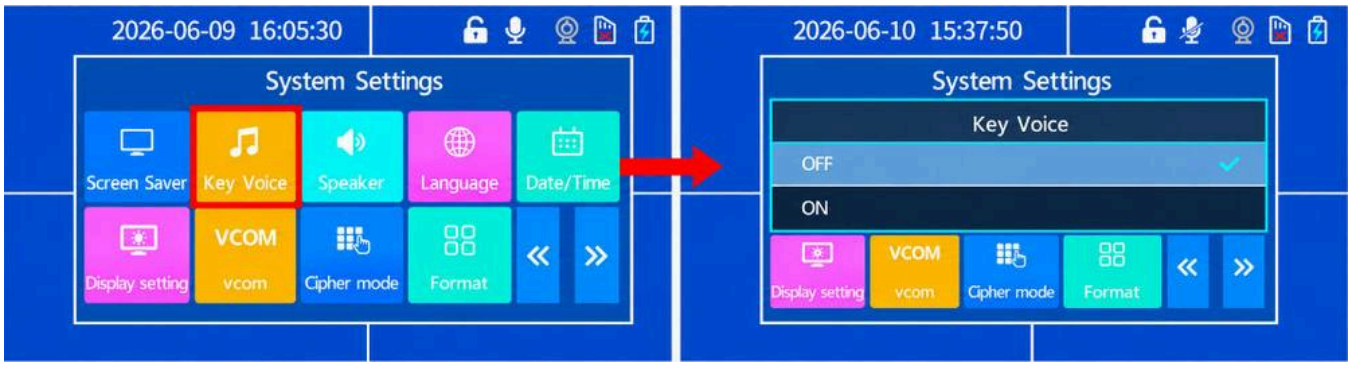
**OFF** | 10S | 30S | 60S

RIOV360 DEFAULT

**OFF**

## 11.2 Key Voice

MENU › PAGE 2 › KEY VOICE




Beeps when a button is pressed.

OPTIONS

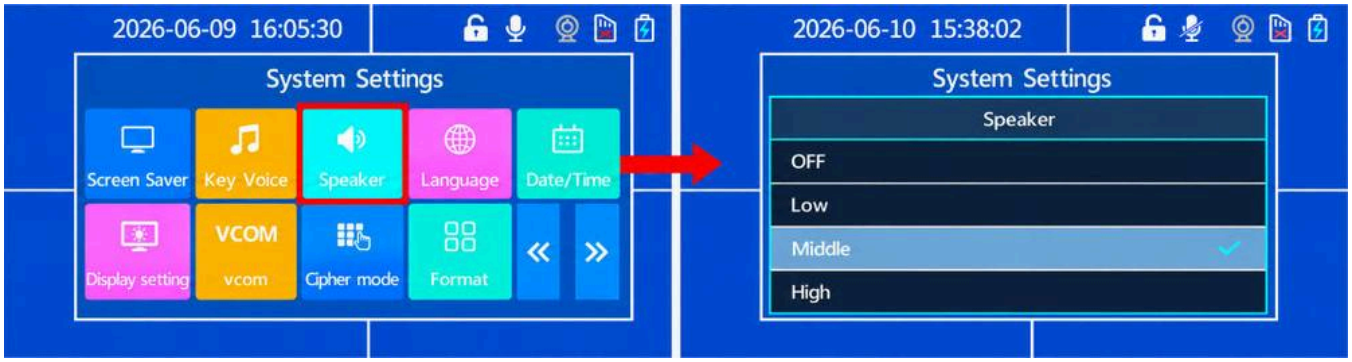
**OFF** | ON

RIOV360 DEFAULT

**OFF**

## 11.3 Speaker

MENU › PAGE 2 › SPEAKER




Sets the volume of the monitor's built-in speaker.

> **TIP** If the monitor makes no sound, check that Speaker is not set to OFF.

OPTIONS

OFF | Low | **Middle** | High

RIOV360 DEFAULT

**Middle**

## 11.4 Language

MENU › PAGE 2 › LANGUAGE




Sets the menu language. Scroll down for more languages, including Russian, Thai, and Vietnamese.

OPTIONS

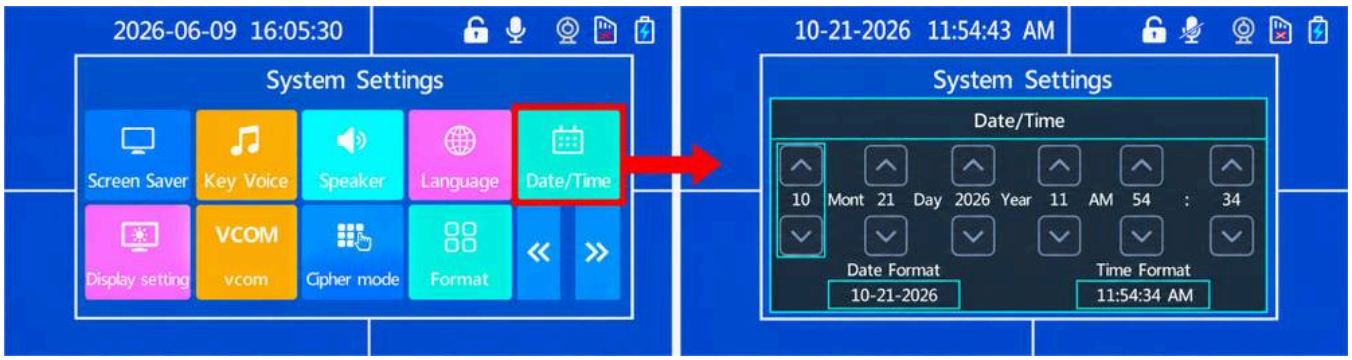
English | Chinese | Japanese | More

RIOV360 DEFAULT

**English**

## 11.5 Date / Time

MENU › PAGE 2 › DATE/TIME




Use Up and Down to set month, day, year, and time, and choose the date and time format. Recordings are named by date and time, so set the clock at installation.

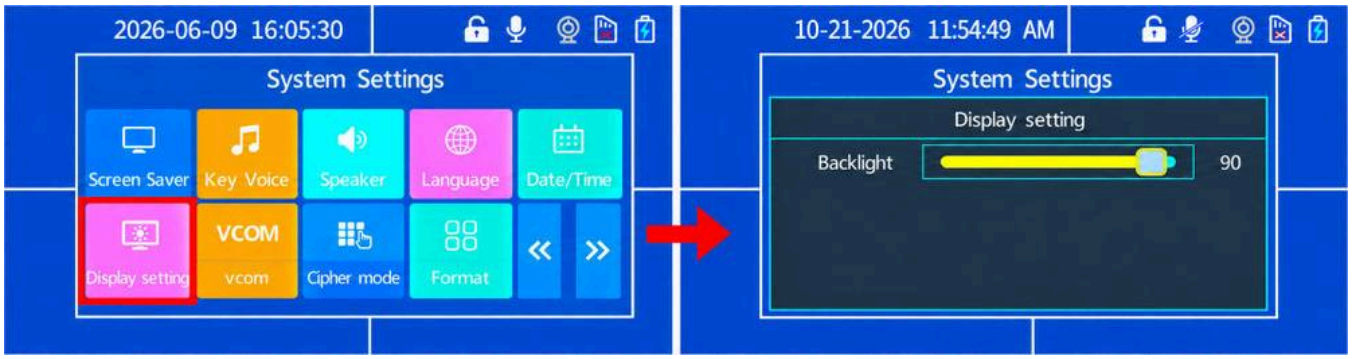
> **TIP** An accurate clock matters when footage is used for incident review.

AT INSTALLATION

**Set to local time**

## 11.6 Display Setting

MENU › PAGE 2 › DISPLAY SETTING

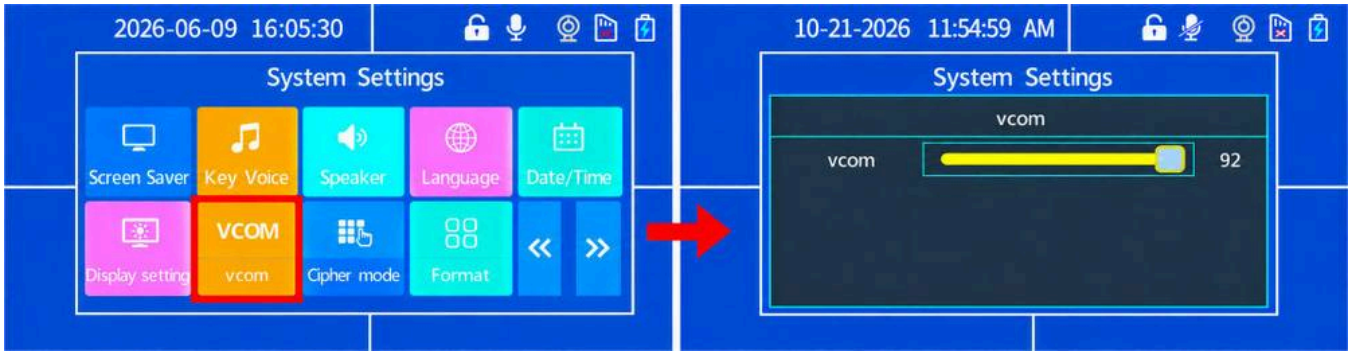



Sets screen brightness (backlight) from 1 to 100. Raise it for bright sun; lower it for night work.

**RIOV360 DEFAULT**
**90**

## 11.7 VCOM

MENU › PAGE 2 › VCOM



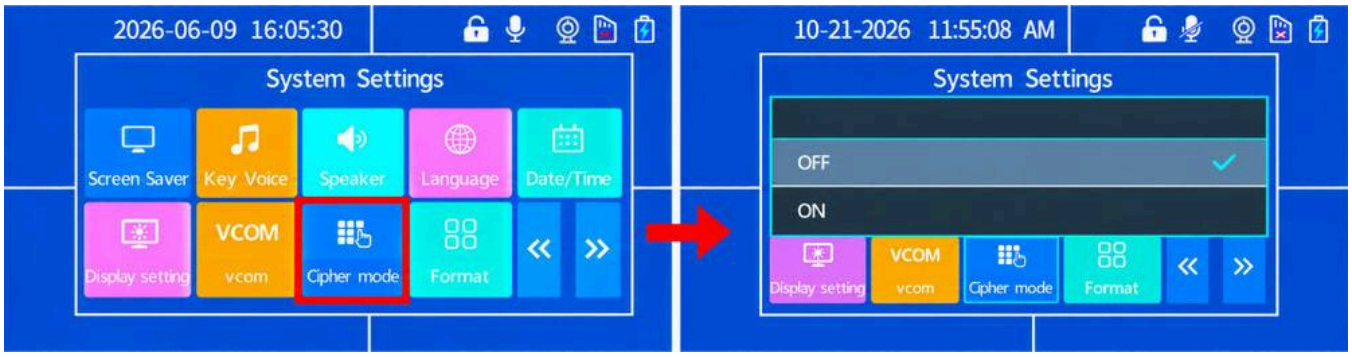

Factory calibration for the screen panel.

**CAUTION** Do not change this setting. A wrong value can make the screen flicker or wash out.

**RIOV360 DEFAULT**
**92**

## 11.8 Cipher Mode

MENU › PAGE 2 › CIPHER MODE




Requires a password to open the settings menu. The default password is 1111.

**TIP** Turn Cipher Mode on to keep operators from changing detection zones or settings.

OPTIONS

**OFF** ON

RIOV360 DEFAULT

**OFF**

SECTION 12

# Card and system maintenance

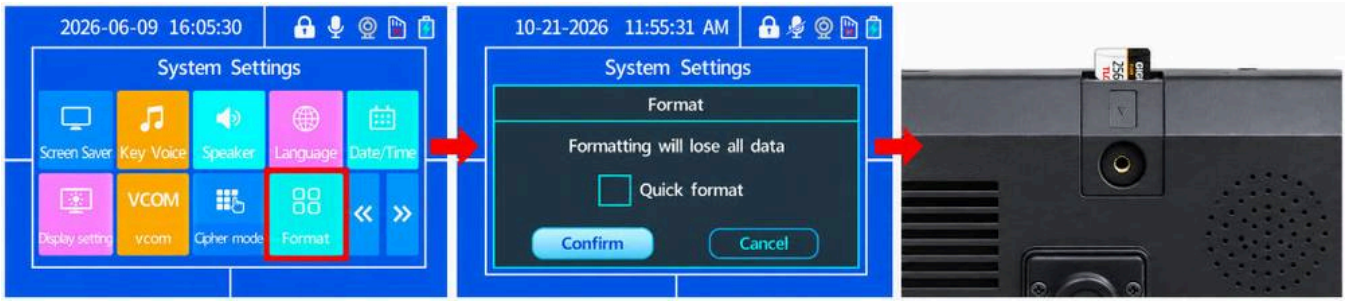
Use these functions when installing a new memory card, troubleshooting, or calling RioDatos support.

### Routine checks

| WHEN | CHECK |
|---|---|
| **Start of each shift** | Monitor powers on with the machine; all four camera views and the recording icon appear |
| **Start of each shift** | Magnetic mounts: magnets seated on clean steel, cameras aimed correctly (7.4) |
| **Weekly** | Walk a person through each zone edge; the alarm and beacon activate (10.3) |
| **Weekly** | Clean the camera lenses; dirt causes blur and missed detections at night |
| **Monthly** | Aviation connectors hand-tight; cables secured with no chafing or damage (Section 6) |
| **Monthly** | Date and time correct, so recordings are named correctly (11.5) |
| **After an incident** | Power off, remove and keep the SD card, and install a replacement card (9.8) |
| **After a firmware update** | Run the full settings check before the machine returns to work (12.5) |

## 12.1 Format Card

MENU › PAGE 2 › FORMAT

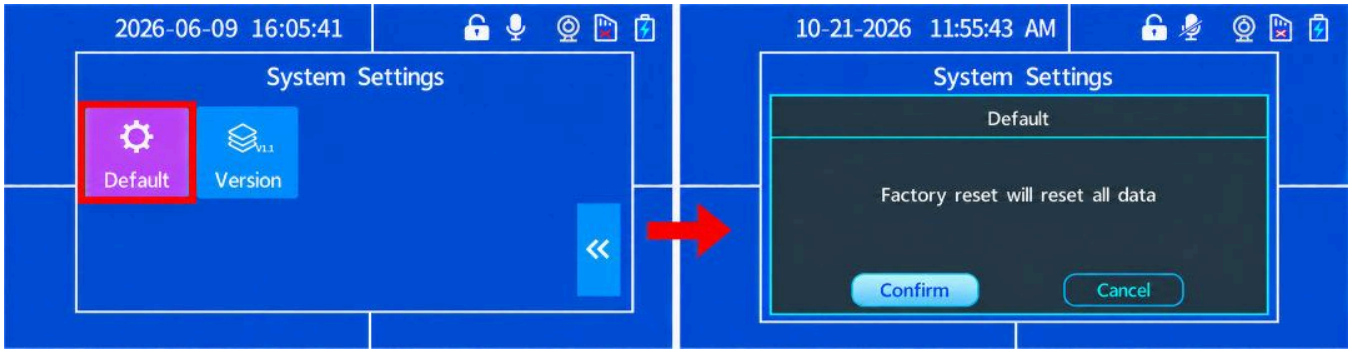



With the system powered off, insert the new or replacement SD card into the slot shown above. Power on, open **MENU > Page 2 > Format**, and confirm to prepare the card for recording. Quick format is faster; leave it unchecked for a full format.

> **CAUTION:** Formatting erases every file, including locked files. Copy any footage you need before confirming. Do not format an incident card that you need to preserve.

## 12.2 Restore Defaults

MENU › PAGE 3 › DEFAULT




Returns all settings to factory values.

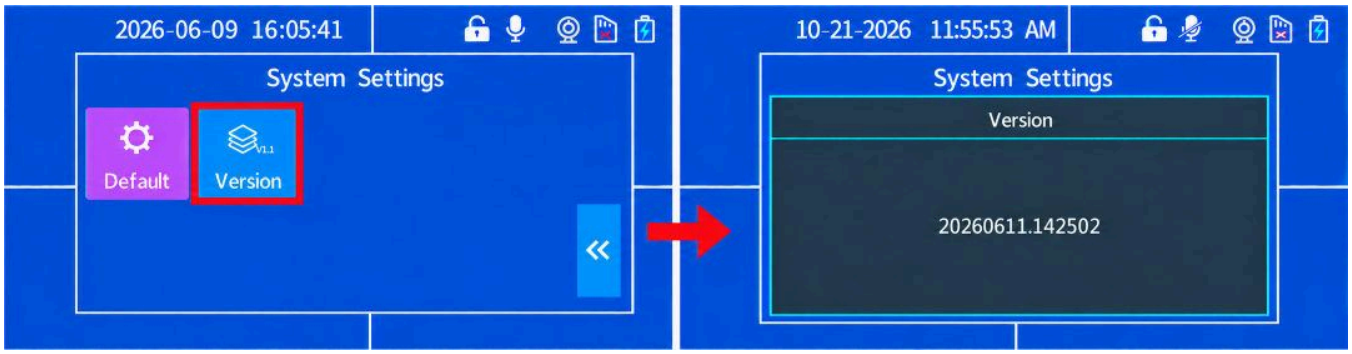
> **CAUTION** Factory reset also clears the RioDatos detection zone setup. Zones must be set again and walk tested before the machine returns to work.

BEFORE YOU USE IT

**Call RioDatos first**

## 12.3 Version

MENU › PAGE 3 › VERSION




Shows the monitor firmware version. Have this number ready when you contact RioDatos support.

To install a new firmware version, see 12.4.

CURRENT FIRMWARE

**20260611.142502**

## 12.4 Firmware Update

MENU › PAGE 3 › VERSION

RioDatos releases firmware updates that improve detection and monitor performance. Check the installed version at **MENU › Page 3 › Version** (12.3). The latest version is **20260611.142502**. If the monitor already shows this number, no update is needed.

> **IMPORTANT: A firmware update changes the monitor settings.** The update loads its own built-in defaults. Most match RioV360, but not all of them. Right after every update, reset the monitor to the RioV360 settings using the checklist in 12.5 before the machine goes back to work.

### Update at your desk, finish on the machine

The best way to update is to remove the monitor from the machine and do it in your office, powered by the RV360-PWR wall adapter or the RV360-BAW battery adapter. The bench gives steady power, a clean place to open the card slot, and room to work through the menus. When the update and settings check are complete, reinstall the monitor and make the final detection zone adjustments on the machine, with the cameras in their mounted positions.

## What you need

| ITEM | DETAILS |
|---|---|
| **Power adapter** | **RV360-PWR** AC wall adapter ($40), recommended, or **RV360-BAW** 20 V battery adapter ($30) with a fully charged battery. Call 520-501-0602 or email info@riodatos.com to order. |
| **Small microSD (TF) card** | A separate card used only for the update. The update file is only 16 MB, so any small card works; a 16 GB card is plenty. **Do not use the RioV360 video recording card.** Label it UPDATE so the two cards are never mixed up. |
| **Firmware file** | Request it from RioDatos at info@riodatos.com. Unzip it before copying. |
| **Computer with card reader** | To copy the firmware file to the update card. |
| **Small Phillips screwdriver** | For the SD card cover plate on the back of the monitor. |

## Install the update

1. Request the firmware .zip file from RioDatos at info@riodatos.com, save it to your computer, and unzip it.
2. Copy the unzipped upgrade program (about 16 MB) directly to the **root directory** of the update card. Do not place it inside a folder.
3. Turn the monitor off with the round power button. Remove the SD card cover plate on the back of the monitor, take out the video recording card, and set it aside.
4. Insert the update card into the monitor while the monitor is powered off.
5. Switch on the monitor. It detects the program automatically and begins the upgrade.
6. **Do not disconnect the power or remove the card during the upgrade.**
7. When the upgrade is complete, turn the monitor off and replace the update card with the video recording card. Reinstall the cover plate and screw.
8. Turn the monitor on and open **MENU › Page 3 › Version**. It should show **20260611.142502**.
9. **Go straight to the settings check in 12.5.** The update changes the monitor settings, and its built-in defaults are not all RioV360 settings. Reset every tile to the RioV360 setting while the monitor is still on your desk, before you reinstall it.

**TIP FROM THE FIELD:** The Phillips screw on the SD card cover plate is very short and easy to drop and lose. Before you unscrew it, make sure it cannot fall down into the cabinet.

**CAUTION** Losing power or removing the card during the upgrade can interrupt it. Keep the monitor on steady power until the upgrade is complete. Never copy the firmware file to the video recording card.

## Power adapters

Either adapter runs the complete system off the machine. Call RioDatos at 520-501-0602 or email info@riodatos.com for product specifications or to purchase an adapter.

| PART | DESCRIPTION | PRICE |
|---|---|---|
| **RV360-PWR** | **Bench Test AC Power Adapter.** 12 V ETL-listed AC wall adapter. Runs the system on a bench before installation and speeds up tech support calls. | $40.00 |
| **RV360-BAW** | **20V Battery Adapter.** Battery adapter for 20 V batteries. Provides temporary power for portable RioV360 operation, demonstrations, and system testing. | $30.00 |

## RV360-PWR specifications

| SPECIFICATION | VALUE |
|---|---|
| **Input** | 100 to 240 V AC, so it works on US and international outlets. Some countries need a plug adapter. |
| **Output** | 12 V DC, 3 A, with a 5.5 x 2.1 mm barrel plug. That is within the system's 8 to 32 V range and covers the 5 W monitor plus four cameras. |
| **Connection** | Plugs into the harness's female barrel jack with screw terminals. |

**NOTE:** The system needs 8 to 32 VDC and will not run on a 5 V adapter. For firmware updates the wall adapter is best. If you use the RV360-BAW, start with a fully charged battery so power cannot drop during the upgrade. Wiring is shown in Section 3 and Section 7.

## 12.5 Settings check after an update

MENU › PAGES 1 TO 3

Complete this check right after every firmware update. The update replaces the RioV360 settings with its own built-in defaults, and several of them differ. Go through the menu one tile at a time. Open each tile, select the RioV360 setting shown below, and check the box. Do this at your desk on the wall adapter; only the zone calibration is left for the machine. Use the same list any time a monitor behaves differently than expected.

| | MENU TILE | WHERE | SELECT |
|---|---|---|---|
| | SYSTEM SETTINGS · PAGE 1 | | |
| ☐ | **Format Settings** | Page 1 | **1080N** (9.1) |
| ☐ | **Recording** | Page 1 | **15MINS** (9.2) |
| ☐ | **Time-Lapse** | Page 1 | **OFF** (9.3) |
| ☐ | **Record Audio** | Page 1 | **OFF** (9.4) |
| ☐ | **Channel Settings** | Page 1 | **Rear camera mirrored** (9.5) |
| ☐ | **Split Screen Mode** | Page 1 | **Quad** (9.6) |
| ☐ | **License** | Page 1 | **OFF** (9.7) |
| ☐ | **Warning settings** | Smart Driving › Calibration | **One-level warning** (10.2) |

| | MENU TILE | WHERE | SELECT |
|---|---|---|---|
| ☐ | **Monitor Type** | Smart Driving › Settings | **Pedestrian/Non-motor** (10.4) |
| ☐ | **Sensitivity setting** | Smart Driving › Settings | **Middle** (10.4) |
| ☐ | **Front, Rear, Left, Right BSD Settings** | Smart Driving › Settings | Alarm Switch, Alarm Sound, Alarm Box: **all ON** for every camera (10.4) |
| ☐ | **Yellow toggle** | Smart Driving | **Settings** (10.1) |
| ☐ | **Front, Rear, Left, Right BSD Calibration (zones)** | Smart Driving › Calibration | Set on the machine (see below). Section 13 shows sample detection boxes. For help: 520-501-0602 or info@riodatos.com. |
| | SYSTEM SETTINGS · PAGE 2 | | |
| ☐ | **Screen Saver** | Page 2 | **OFF** (11.1) |
| ☐ | **Key Voice** | Page 2 | **OFF** (11.2) |
| ☐ | **Speaker** | Page 2 | **Middle** (11.3) |
| ☐ | **Language** | Page 2 | **English** or your local language (11.4) |
| ☐ | **Date/Time** | Page 2 | **Local time** (11.5) |
| ☐ | **Display Setting** | Page 2 | **90** (11.6) |
| ☐ | **VCOM** | Page 2 | **92**. Do not change (11.7) |
| ☐ | **Cipher Mode** | Page 2 | **OFF**, or ON with password 1111 to lock settings (11.8) |
| ☐ | **Format** | Page 2 | No action. Use only for a new card (12.1) |
| | SYSTEM SETTINGS · PAGE 3 | | |
| ☐ | **Default** | Page 3 | **Do not use**. It clears the zone setup (12.2) |
| ☐ | **Version** | Page 3 | **20260611.142502** (12.3) |

## Final adjustments on the machine

1. Reinstall the monitor in the cab and hand-tighten the monitor-to-harness ring until it sits flush (Section 4).
2. Power on and confirm every camera image appears and the date and time are correct.
3. Use Section 13 as a visual reference for each detection box. Keep the front zone clear of the forks and test the zones on the machine.
4. Return the yellow toggle to **Settings** so the zones display on the monitor (10.1).
5. Walk a person through every zone edge and confirm the alarm and beacon activate at the right distance.

**NEED HELP?** For tips on Front BSD Calibration and the other zones, call John Buttery at 520-501-0602 or email info@riodatos.com. Free Microsoft Teams setup call: calendly.com/john-buttery-riodatos/30min.

SECTION 13

# Sample camera configurations

These examples show typical camera layouts and detection zones. They are illustrative, not to scale. Set zones for the machine and site, and walk test every zone after installation or adjustment. See Sections 5 and 10 for installation and calibration.

## 13.1 Using traffic cones to set detection zones

Position two traffic cones at the far left and right corners of the intended detection zone. From inside the cab, display the corresponding camera (F shown) full screen and adjust the detection box to align with the cones. The near edge starts at the machine.



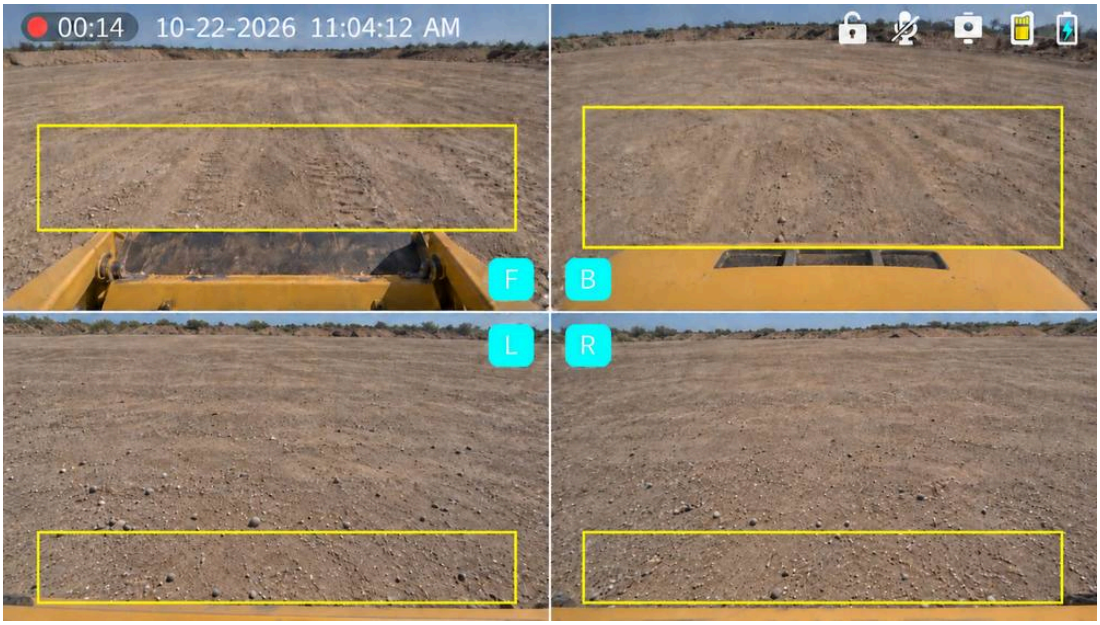

### CONFIRM THE ZONE

Repeat for each camera as needed. Check the near edge against the machine and position the far corners at the site-approved distance. Save the settings and perform a stationary walk test to verify detection before returning the machine to service.

## 13.2 Skid steer

Four cameras cover the front, rear, left, and right. A broad front zone, a larger rear zone, and equal side curtains form the illustrated configuration.

### MONITOR VIEW



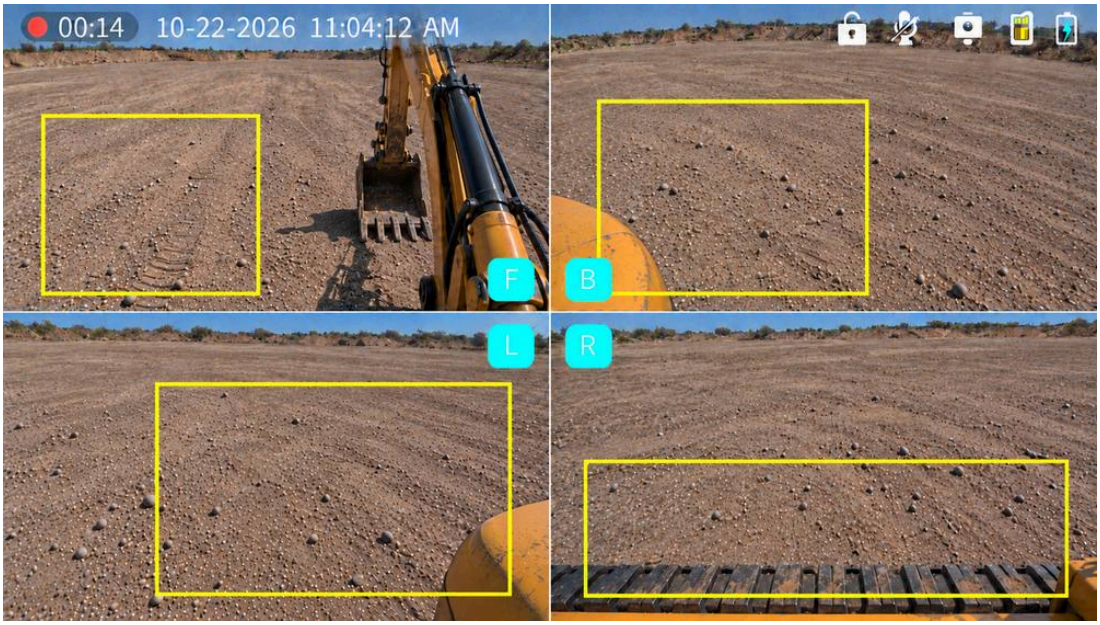

### OVERHEAD ZONE CONCEPT



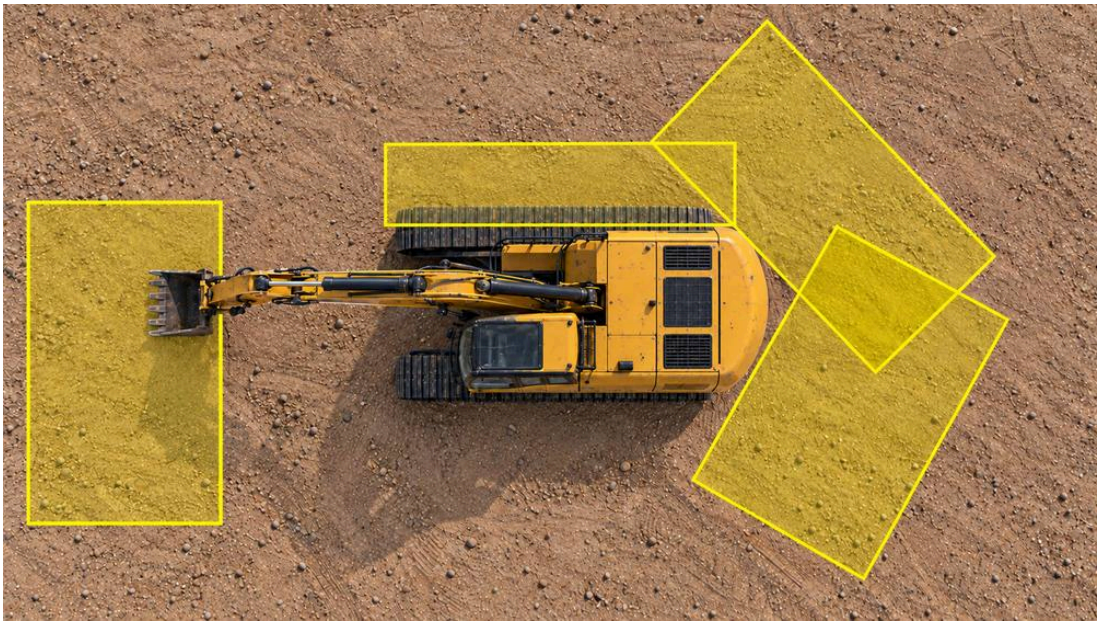
## 13.3 Excavator

Four cameras cover three sides: front, right, and two overlapping rear views. B and L are the rear channels; L is repurposed, so there is no dedicated left-side camera.

### MONITOR VIEW



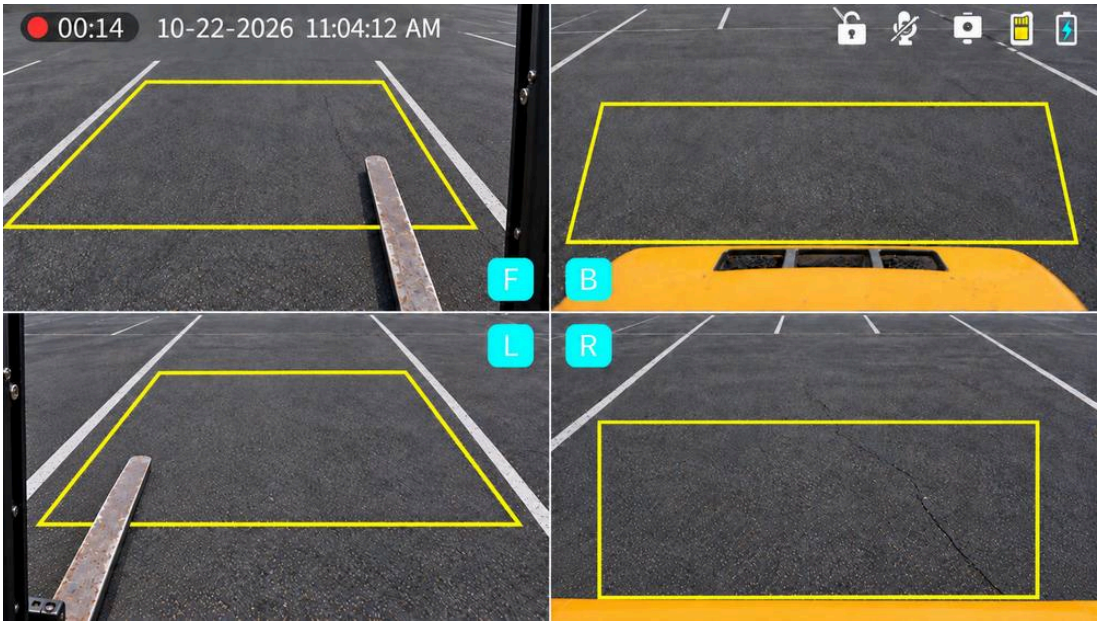

### OVERHEAD ZONE CONCEPT



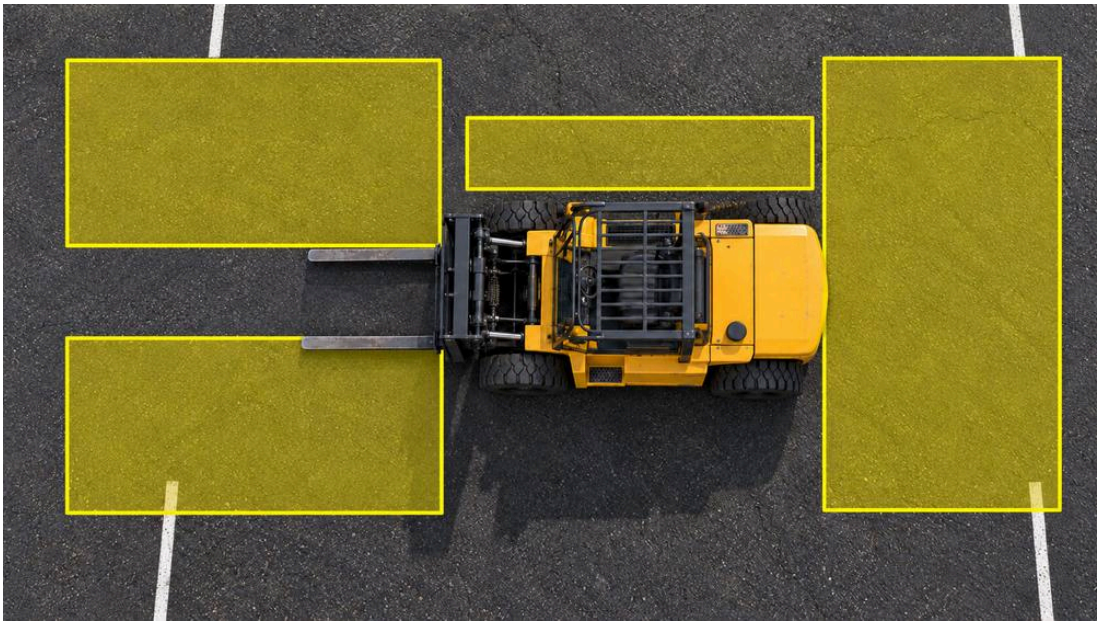
## 13.4 Forklift

F is mounted on the left mast and L on the right mast; both face forward, with one fork visible in each view. R covers the right-side curtain and B covers the rear. L is a second front channel, not a left-side view.

### MONITOR VIEW




### OVERHEAD ZONE CONCEPT

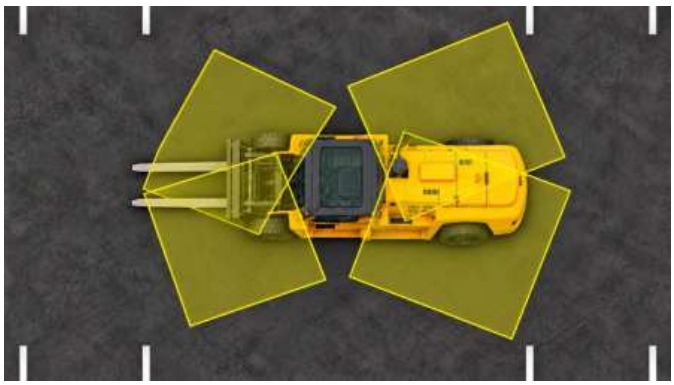


SECTION 14

# Incorrect camera and detection setup

Four common setup mistakes and how to correct them. Each fix ends with a stationary walk test.

## 14.1 Incorrect camera placement



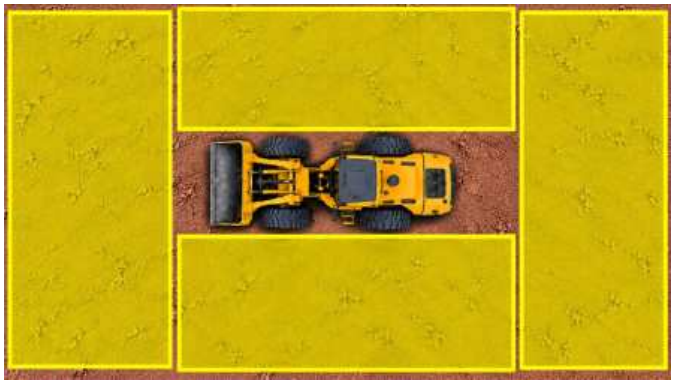
### Problem

The detection zones overlap substantially, and much of their coverage falls directly on the machine rather than the surrounding pedestrian approach areas.

### Corrective action

Reposition and aim the cameras to improve useful outward coverage. Verify all intended blind spots with a stationary walk test.

## 14.2 Incorrect detection zone setup



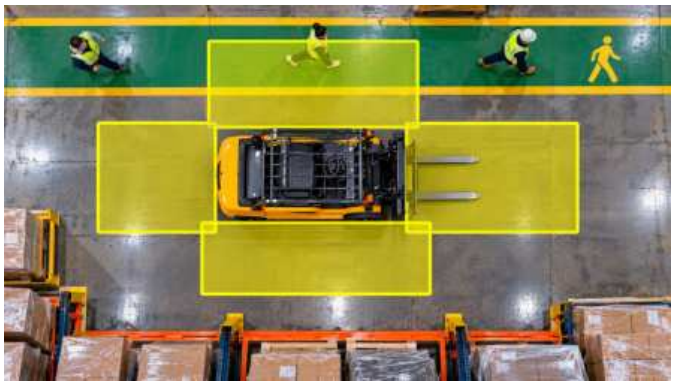
### Problem

The front and rear detection zones extend well beyond the machine's relevant working area. People farther away may trigger unnecessary warnings, increasing the risk of operator alert fatigue.

### Corrective action

Set each zone according to travel speed, stopping distance, visibility, and the site safety plan. Test before returning the machine to service.

## 14.3 Detection zone overlaps pedestrian walkway



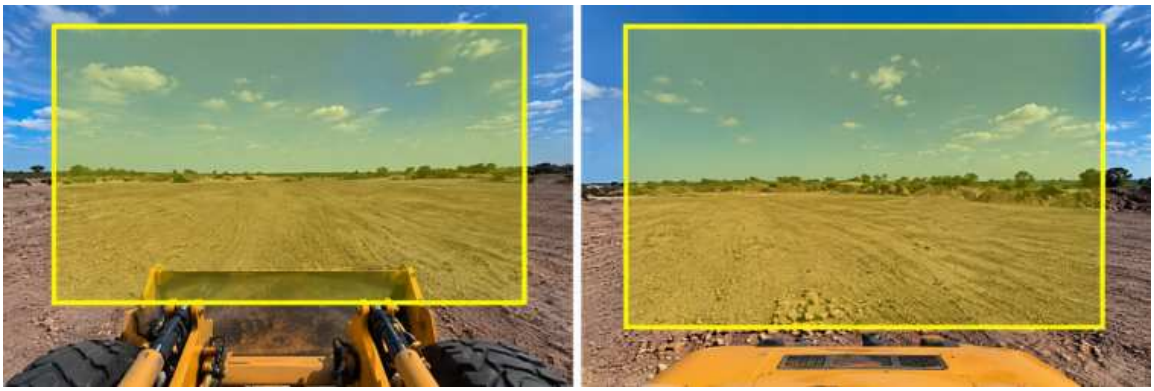
### Problem

A detection zone encroaches on a known pedestrian walkway. When the forklift travels down the aisle, pedestrians who remain in their designated walking area can trigger repeated alerts.

### Corrective action

Reduce the top and bottom detection zones shown in the illustration, without changing the left and right zones. Confirm the required hazard coverage with the site safety team and a stationary walk test.

## 14.4 Incorrect camera angle



**Problem.** The cameras are aimed too high, allowing detection zones to extend into the sky and distant horizon instead of covering the ground around the machine.

**Corrective action.** Aim both cameras downward and adjust their detection boxes to the intended ground-level pedestrian approach areas. Complete a stationary walk test.

SECTION 15

# Troubleshooting

## Top three reasons a system is not working

1. **ACC wire not connected to an approved switched-power supply.** Connect Yellow to an ignition-switched fused supply or an approved isolated relay/interface. Do not connect directly to seat-belt or park-brake circuits.
2. **Loose or cross-threaded aviation connector.** Each ring must thread on easily and be hand-tightened until snug. A cross-threaded or stripped ring will not seat and breaks the camera signal. The plastic monitor-to-harness ring should turn freely and sit flush.
3. **Smart Driving toggle in the wrong position.** The toggle must be on Settings for the detection zones to appear. On Calibration, the zones are hidden and no alerts display, although the camera feed still shows.

| PROBLEM | POSSIBLE CAUSE | WHAT TO DO |
|---|---|---|
| **Monitor does not power on** | No power or blown fuse | Check the vehicle fuse, verify 8 to 32 V at the power input, check harness connections |
| **Camera image does not appear** | Camera cable disconnected or faulty | Check cable connections at both the camera and monitor ends |
| **One camera shows a black screen or No Signal** | Connector not seated, or cable damaged | Reseat and hand-tighten the aviation ring; swap camera cables to isolate the issue |
| **No recording / SD card error** | No card, or card not formatted | Insert a High Endurance card rated 80 MB/s or faster and format it in the monitor (12.1) |

| PROBLEM | POSSIBLE CAUSE | WHAT TO DO |
|---|---|---|
| **Recording stops unexpectedly** | Card full or too slow | Use a High Endurance card rated 80 MB/s or faster; check storage |
| **Detection zones not shown on screen** | Smart Driving toggle left on Calibration | Move the yellow toggle to Settings (10.1) |
| **Too many alerts** | Zones larger than the working area, camera angle, or background movement | Shrink the zones to the machine's actual working area, lower the sensitivity, or both; check the camera angle |
| **No alert when a person is present** | Camera BSD turned off or zone not calibrated | Check Front/Rear/Left/Right BSD Settings are On and recalibrate the zone |
| **Poor image quality or blur** | Dirty lens or wrong video format | Clean the lens; confirm Video Resolution is 1080N |
| **Image appears mirrored** | Channel settings incorrect | Adjust mirror or flip in Channel Settings (9.5) |
| **Beacon not activating** | Beacon cable disconnected | Check the beacon cable at the monitor |
| **Monitor screen frozen** | System error | Hold the power button 5 seconds to force off, then restart |
| **Night image dark or noisy** | Infrared not activating or dirty lens | Clean the camera lens; check the camera's IR-CUT |
| **No sound from the monitor** | Speaker set to Off | Raise the volume in Monitor preferences > Speaker (11.3) |

## Common questions

### What is the detection range?

0 to 5 meters (up to about 16 ft), set per camera and zone. Actual range depends on camera angle, mounting height, and zone configuration.

### Does the system work at night?

Yes. All four cameras have built-in infrared night vision for detection in low light and darkness.

### Can I use fewer than four cameras?

Yes. The system supports one to four cameras. Detection is active only on connected, configured cameras, and the display layout can be set for the number of cameras (9.6).

### How long does recording last?

About 30 hours on a 256 GB card and 60 hours on 512 GB. Recording loops automatically, overwriting the oldest unlocked files first.

SECTION 16

# Technical specifications

## Monitor

| SPECIFICATION | VALUE |
|---|---|
| **Screen** | 7-inch IPS, 1024 x 600 |
| **Viewing angle** | Left/right 85°, up/down 85° |
| **Video input** | 4-channel AHD 1080P / 720P |
| **Recording** | H.264 TS, four simultaneous channels, 25 FPS per channel |
| **Storage** | microSD up to 512 GB, High Endurance, 80 MB/s minimum. 256 GB about 30 h, 512 GB about 60 h |
| **Power input** | 8 to 32 VDC, 5 W maximum |
| **Operating temperature** | -20 °C to +70 °C |
| **Storage temperature** | -30 °C to +80 °C |
| **Dimensions** | 218 x 149 x 82 mm (bracket and sunshade included) |
| **Audio** | Built-in microphone and speaker |
| **Video system** | PAL / NTSC |
| **AI detection** | People and vehicles, with configurable alert zones |
| **Screen modes** | Single, dual, triple, quad |

## Cameras

| SPECIFICATION | VALUE |
|---|---|
| **Type** | AI-compatible AHD 1080P vehicle camera |
| **Image sensor** | 1/2.9" CMOS, 1920 x 1080 |
| **Minimum illumination** | 0 lux with built-in infrared |
| **IR-CUT** | Automatic day / night switching |
| **Viewing angle** | 130° |
| **Waterproof rating** | IP69K |
| **Impact rating** | IK06 |

| SPECIFICATION | VALUE |
|---|---|
| **Operating temperature** | -20 °C to +60 °C |
| **Storage temperature** | -30 °C to +80 °C |
| **Operating voltage** | 12 VDC, 5 W |

### System

| SPECIFICATION | VALUE |
|---|---|
| **Operating voltage** | 8 to 32 VDC (full system) |
| **Detection range** | 0 to 5 meters, configurable per camera and zone |
| **Alert configuration** | One-level or graduated green, yellow, and red zones per camera, preset by RioDatos |
| **Recording format** | H.264 TS, four simultaneous channels |
| **Support** | Sold and supported from Arizona by RioDatos |

SECTION 17

# Warranty, support, and contact

## Important notice

Please read this section carefully before using RioV360. By installing or operating the RioV360 system, the owner and user acknowledge and agree to the terms below. If you do not agree to these terms, contact RioDatos before proceeding.

RioV360 is an AI pedestrian detection system designed to improve operators' awareness of people and vehicles in blind-spot areas around industrial equipment. It is an aid to the operator. It does not replace the operator, operator training, operator vigilance, or operator responsibility. The operator must not rely solely on the RioV360 system and must not become distracted from normal vehicle operation while using it.

As with all detection technology, RioV360 cannot guarantee 100% accuracy. False positives and false negatives are possible. Supervision and control of the vehicle, and overall operational safety, always remain the responsibility of the operator and the employer.

## Product warranty

RioDatos warrants the RioV360 system against defects in materials and workmanship for eighteen (18) months from the date of original purchase. During the warranty period, RioDatos will, at its sole discretion, repair or replace any component found defective under normal operating conditions. Proof of original purchase is required to obtain warranty service.

## Warranty exclusions

- Products damaged by misuse, negligence, accident, or improper installation
- Products modified, repaired, or altered by anyone other than RioDatos or an authorized RioDatos representative
- Products installed or operated outside the conditions described in this manual
- Products combined with hardware or software not supplied or approved by RioDatos
- Damage caused by conditions beyond RioDatos's control, including power surges, extreme environmental conditions, or vehicle electrical faults
- Normal wear and consumable components
- Products from which identification labels have been removed or altered

## Limited use license

The owner and user are granted a non-exclusive, non-transferable license to use the software embedded in the RioV360 system solely for its intended purpose as described in this manual. The owner and user may not modify, adapt, reverse engineer, decompile, disassemble, sublicense, transfer, or attempt to derive source code from any software in the RioV360 system. This license covers the embedded software only. This manual may be freely copied and shared.

## Limitation of liability

To the fullest extent permitted by applicable law, RioDatos and its suppliers, partners, and affiliates shall not be liable for any indirect, incidental, special, consequential, punitive, or exemplary damages, including but not limited to loss of profits, revenue, data, or use, or any other intangible losses, arising from or related to the use or inability to use the RioV360 system, even if RioDatos has been advised of the possibility of such damages.

RioDatos' total liability under any claim arising from or related to the RioV360 system shall not exceed the original purchase price of the product.

RioV360 is not a fail-safe system. RioDatos shall not be liable for injury to persons, damage to equipment, or property loss resulting from vehicle operation, regardless of whether the RioV360 system was in use at the time.

## Warranty claim procedure

1. Contact RioDatos at info@riodatos.com or 520-501-0602.
2. Provide proof of original purchase.
3. Provide a description of the defect or failure.
4. RioDatos will assess the claim and advise on next steps.

Return shipping costs are the owner's responsibility unless RioDatos confirms a warranty-covered failure, in which case RioDatos covers return shipping within the continental United States.

## Governing law

These terms are governed by the laws of the State of Arizona, United States, without regard to conflict of law principles. Any disputes arising from or related to the RioV360 system or these terms are subject to the jurisdiction of the courts of the State of Arizona.

The complete RioDatos General Terms and Conditions of Sale, including order, payment, delivery, and dispute resolution terms, are provided with all order documentation and are available at riodatos.com.

## Technical support and contact

| CONTACT | DETAILS |
|---|---|
| **Company** | RioDatos LLC, Tucson, Arizona, USA |
| **Phone** | 520-501-0602 |
| **Email** | info@riodatos.com |
| **Website** | riodatos.com |
| **Online manual** | riodatos.com/riov360/user-manual (text version for quick search) |
| **AI assistant** | RioV360 ChatGPT assistant for instant answers, linked from the online manual |
| **Setup call** | calendly.com/john-buttery-riodatos/30min (30 min, Microsoft Teams, no charge) |
| **Support hours** | Monday through Friday, 8:00 AM to 5:00 PM Arizona time |