Sperantus
Make data speak to you

pack® &trace edge

Maintenance and Troubleshooting

Updated to September 25, 2024

For more information and the latest version go to www.packandtrace.tech/help

Table of Contents

System troubleshooting **3**
- Blocking Errors 3
  - Error types and how to solve them 4
- Maintenance mode 5
  - How to use the maintenance mode? 5
  - How to set up and verify the Matrix camera is reading the labels correctly, using maintenance mode? 7
    - How should a properly scanned image look? 8
  - How to adjust the vision camera using the Maintenance screen? 9
- Hotspot for Vision camera visualization 12
  - How to use the hotspot? 12
- Handling Degraded Mode for OCR+ 17
- Network Diagnostics 20
  - How to use the network diagnostics? 20
- Extra troubleshooting 23

Hardware maintenance references **24**
- Installation Best Practices 24
  - Matrix - Traditional setup 24
    - Camera 24
  - Trigger 25
  - Matrix - Inverted setup 26
  - OCR Camera 28
  - Labeling Machine 29

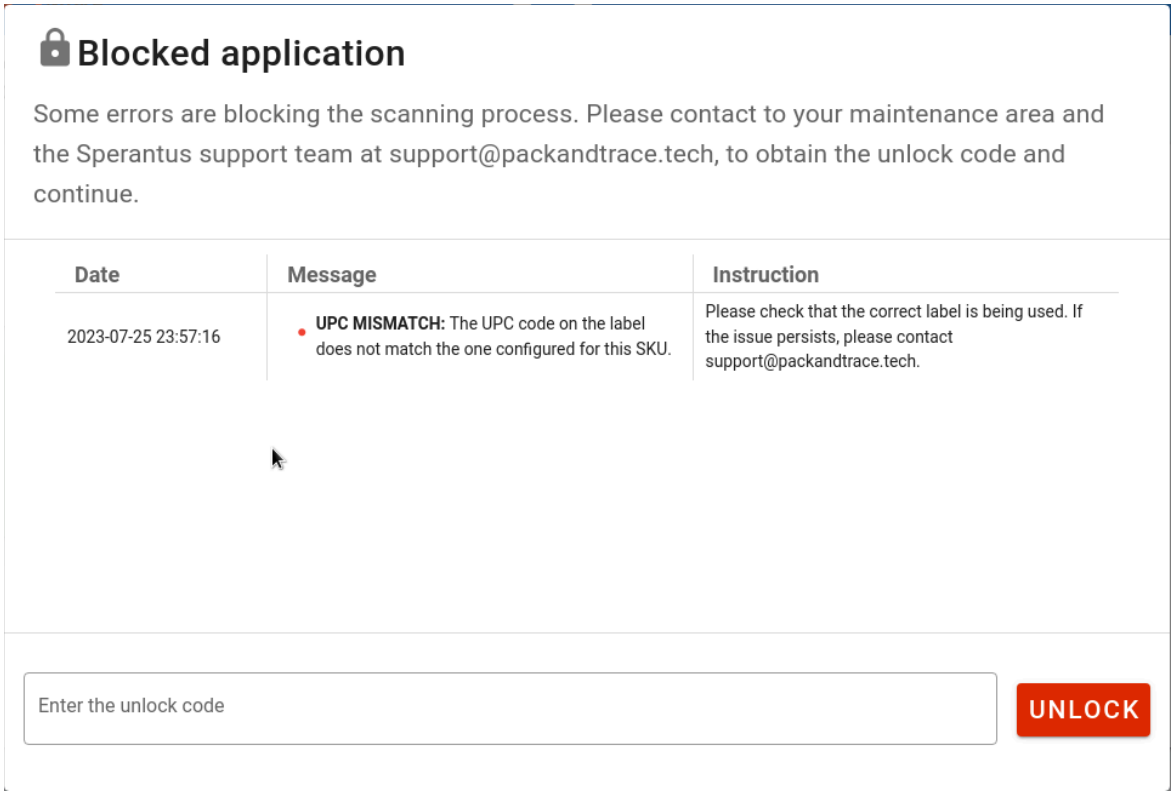
System troubleshooting

Blocking Errors

These critical errors can affect the proper functioning of the app and will appear as a blocking dialog screen when there is a high risk of data loss and critical labeling inaccuracies. Such issues could adversely affect the end-users, leading to negative consequences and potential penalty fees. **It is crucial to address and resolve these errors promptly to ensure the app operates smoothly and serves its purpose effectively.**

When encountering an error, the system will prompt the user to enter the supervisor code. **Ignoring the error and attempting to enter the supervisor code three times will trigger the need for a higher-level unlock code, which is usually managed exclusively by Sperantus.**

Example of blocking error:



Error types and how to solve them

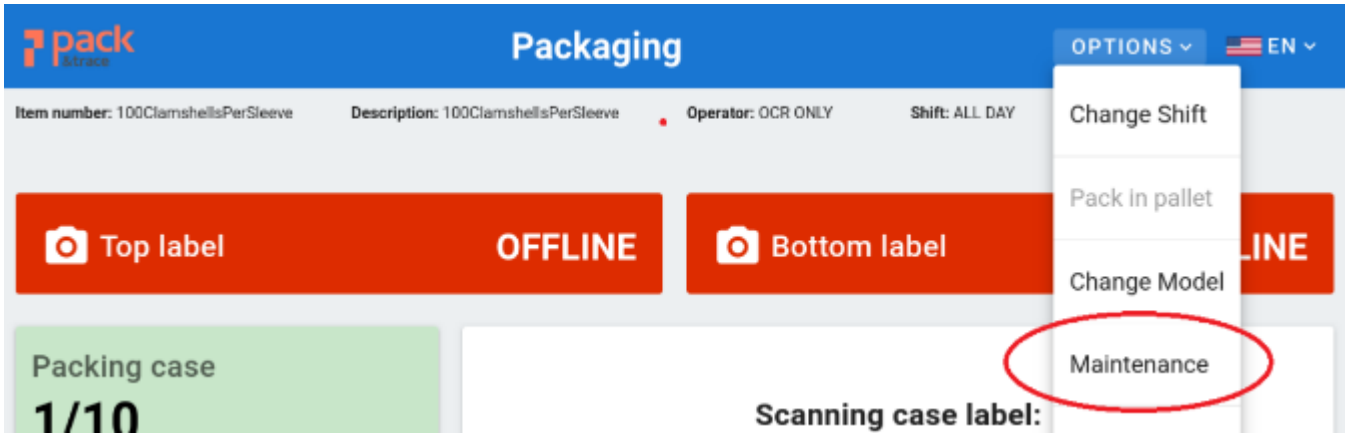
Message	Correction
CAMERA TROUBLE: The camera is not able to read the label codes correctly.	Contact the maintenance team so they can align the camera correctly and according to the maintenance guide.
UPC MISMATCH: Edge has detected a UPC mismatch between the top and the bottom labels.	Confirm the correct labels are being used. If they are, a printing issue might be the cause.
UPC MISMATCH: The UPC code on the label does not match the one configured for this SKU.	Ensure the correct labels are being applied in the clamshells. If the issue persists, reach out to Sperantus for further assistance.
VISION CAMERA OCR MISMATCH: Top label does not match the expected SKU	Make sure that the correct labels are being used according to the item that was set up to be packed on the production line.
LABELING ISSUES: 2 UPC labels were detected on a single scan.	Ensure the reading area is free from any scraps labels on the conveyor belt.
LABELING ISSUES: The UPC label wasn't detected in the clamshell	Make sure that the camera is properly aligned with the clamshell and that the clamshell is correctly labeled.
CAMERA TROUBLE: The clamshell scanned on Edge was not detected by the camera.	Verify the camera's power connections, or alternatively, check the camera's network cable connection to the computer. Correct if it’s necessary.
CAMERA TROUBLE:: The last 3 scans on Edge were not detected by the camera.	Ensure the sensor and reflector are perfectly aligned, allowing the camera to activate when the clamshell is passed through.
OUT OF SYNC: Edge has not synced to the server for more than 16 hours.	Resolve the network issue. If an immediate solution isn't possible, contact Sperantus for a temporary fix.

Maintenance mode

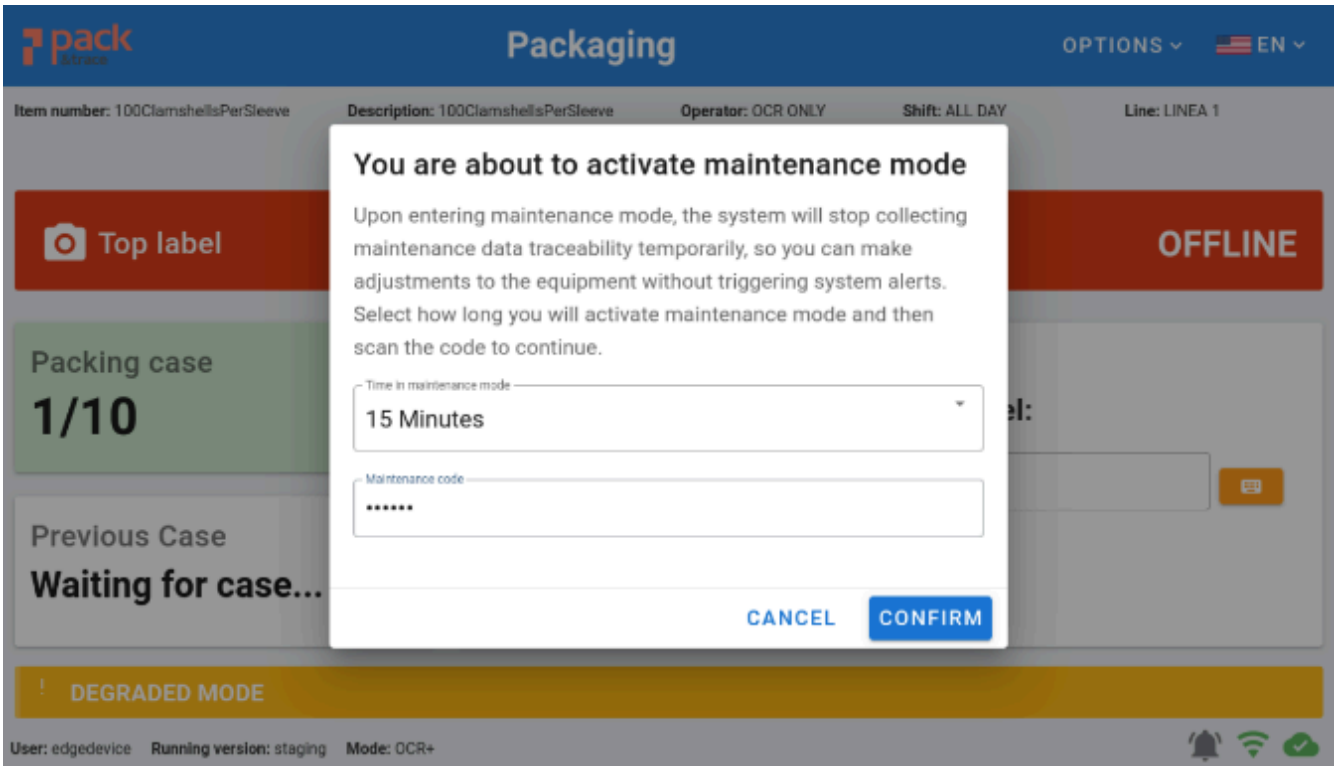
This option unifies the maintenance for the matrix camera and the OCR camera in one place, this will allow you to adjust the cameras without any system interruption, because all alerts and blockings will be on pause.

How to use the maintenance mode?

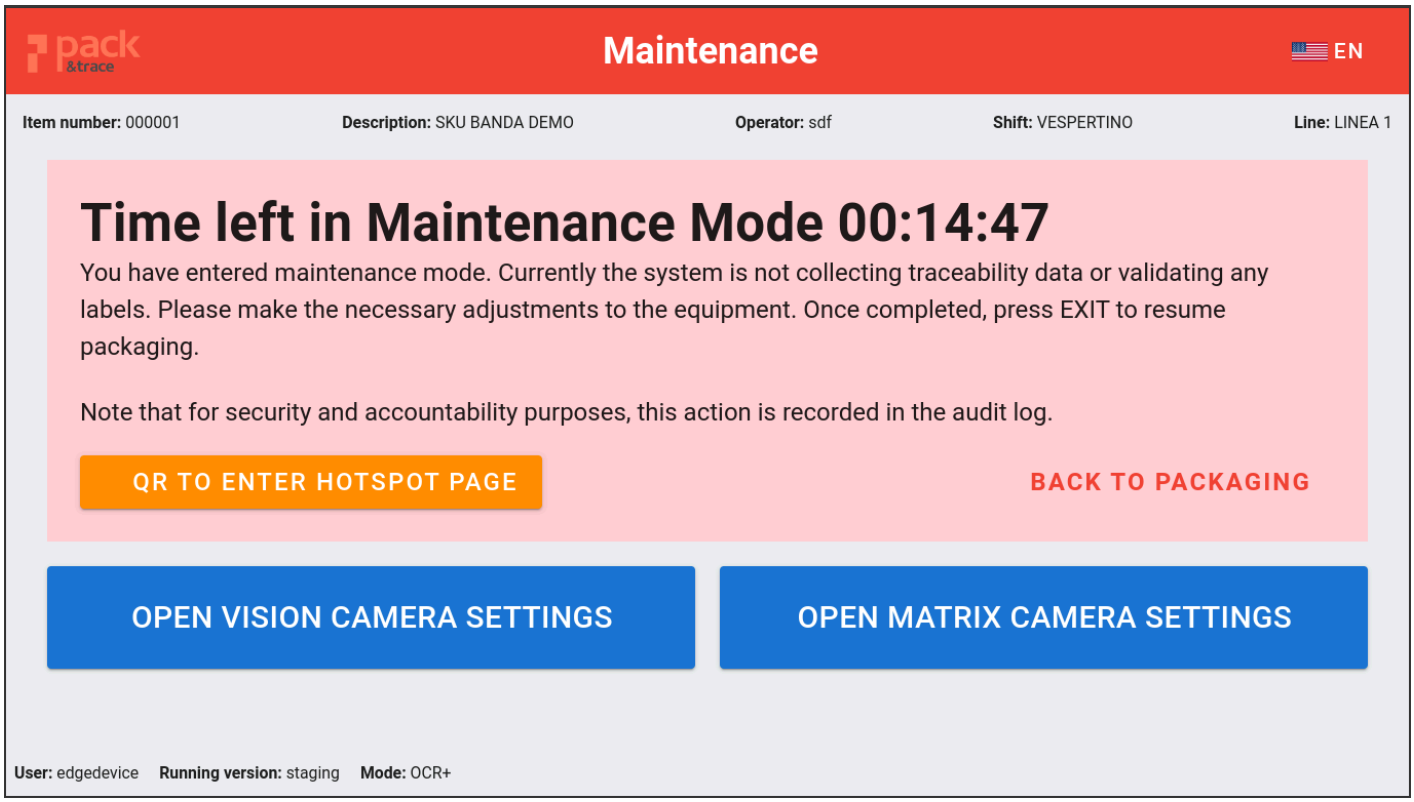
1. Press the **Options** button to open the dropdown menu, then select the **Maintenance** option.



2. Select the amount of time the system will be in this mode. Then confirm the action by entering the password that is generated with the credentials that were shared separately.



3. Once the system is in maintenance mode, the design will change to let you know that it is in that mode.

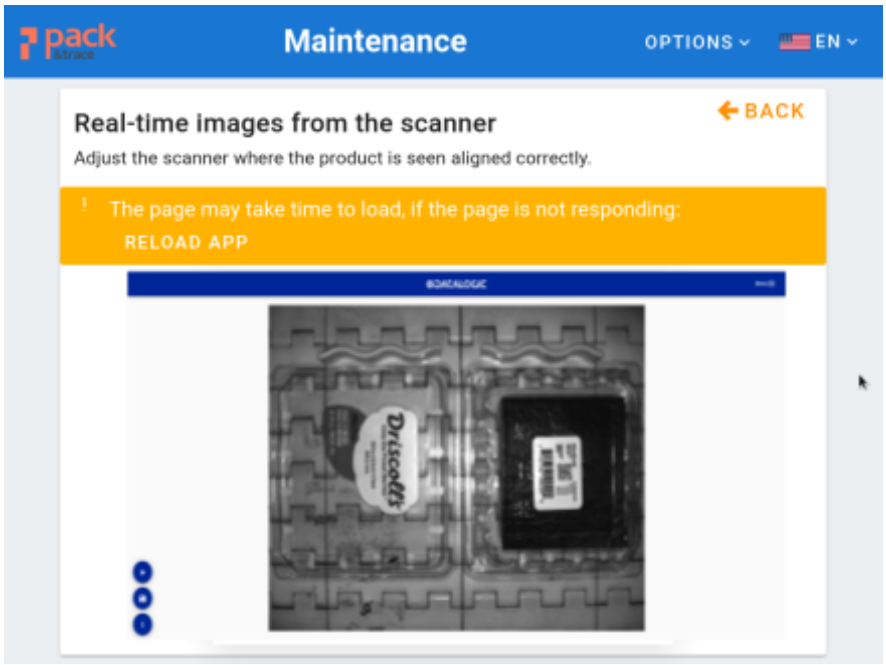


As indicated on the screen, no alerts will be sent, nor will the system be locked to facilitate work when adjustments are made to the labeller or cameras.

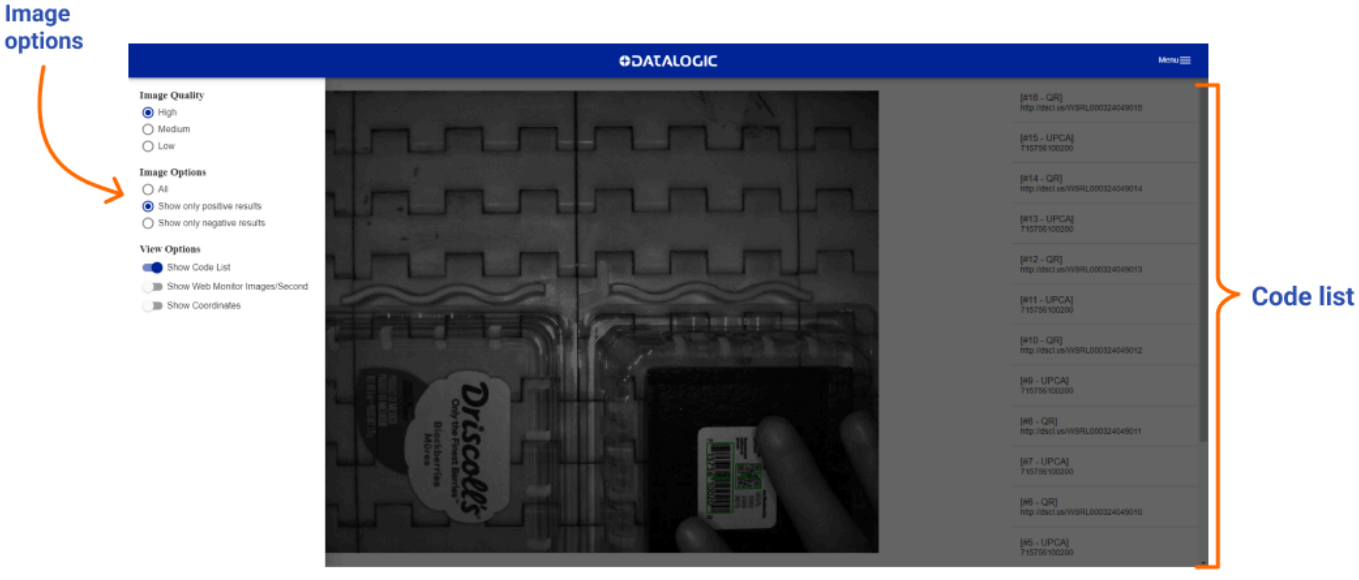
Likewise, **the system will NOT SAVE ANY INFORMATION that is scanned when in this mode**, so it is very important to be careful not to package products labeled in this mode.

How to set up and verify the Matrix camera is reading the labels correctly, using maintenance mode?

1. When opening the **matrix camera settings**, the captured images will show. Ensure that the clamshell is perfectly aligned and there are no obstructions within the camera's field of view. **The picture will only be updated when the trigger is activated.**



2. In the Maintenance screen, the camera's field of view will show. To check the reading status, press the ⋮ button to see more options.
3. From the menu, select "**Show Code List**."
    a. A list of the read codes will be displayed on the right side of the screen, allowing you to verify that all the expected codes are scanned.
4. In the **Image Options** section, click on the option "**Show only positive results.**"
    a. With this setup, the image will only appear when there are readable codes, which will be marked with a green square. If the camera is activated but there's nothing to read, the image won't show.

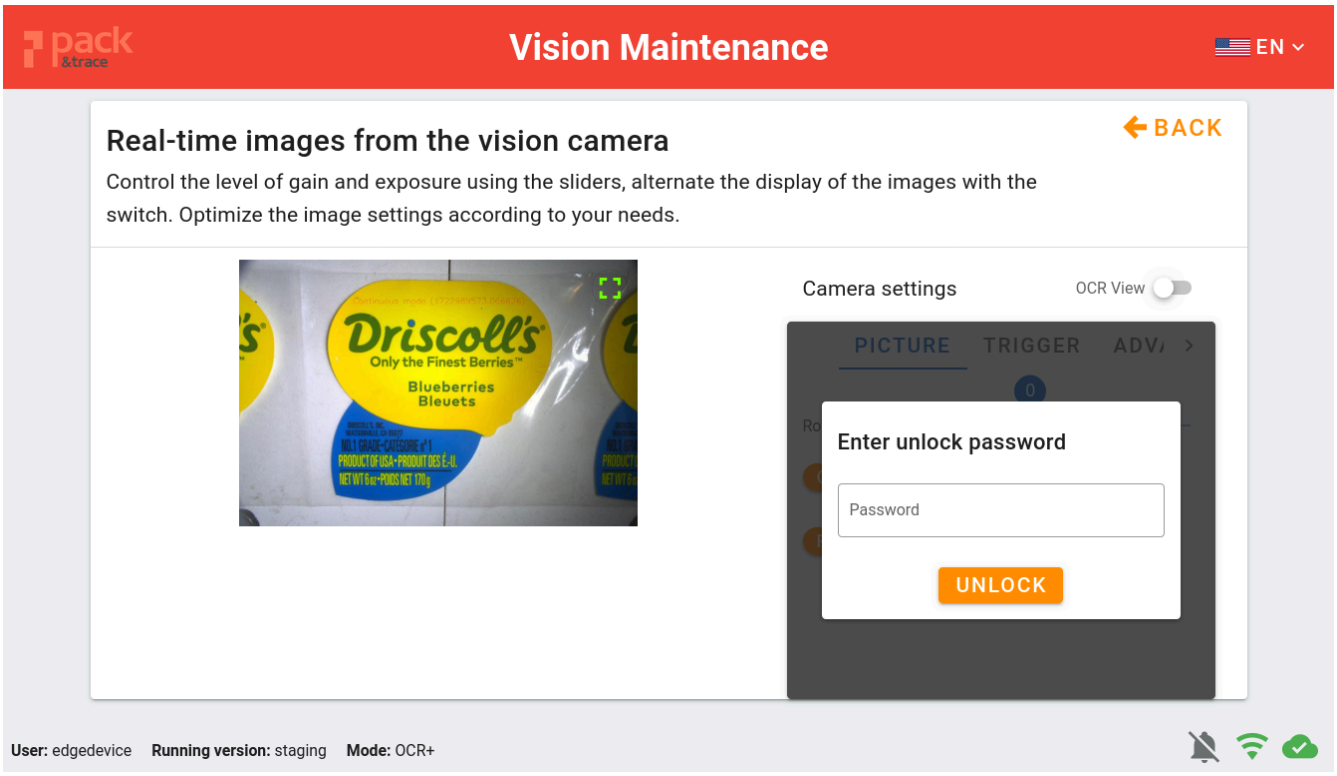


How should a properly scanned image look?

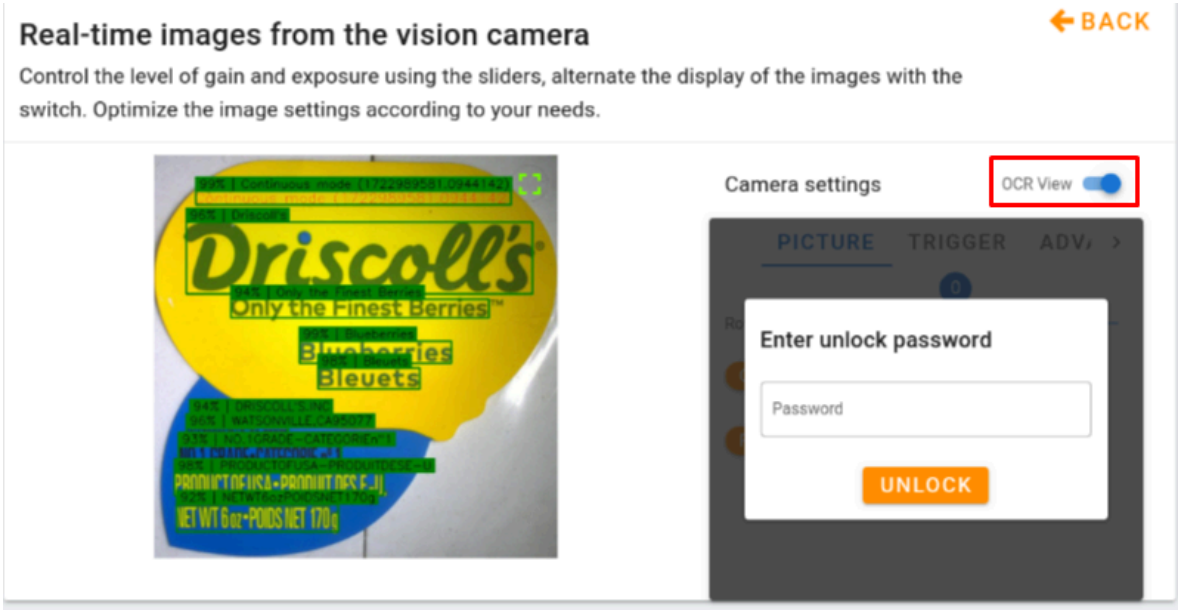
- The camera divides the image into two parts, left and right, in order to read the codes for Bottom (UPC) and Top (Decorative) labels. This allows us to determine, through the reading, which code corresponds to each type of label on either side.
- This setup also enables the reading of labels even if the clamshell is rotated 180°. Considering the image above as a reference, it would still work even if the UPC is on the left side and the decorative label is on the right, as both labels are within their respective frames.
- It is **EXTREMELY IMPORTANT** to ensure proper positioning, as if any of the codes are at the center of the image (where the division is), the camera will not be able to read them. Therefore, it is necessary for each label to be within its designated quadrant and slightly away from the center (to avoid the camera flash's glare).
- It is also crucial to avoid any parts of the machine obstructing the camera's field of view, specifically, ensuring that the label to be read is not covered by any objects, as this may prevent the information from being captured accurately.
- When adjusting the camera using the maintenance screen, it is essential to consider both of these points carefully.

How to adjust the vision camera using the Maintenance screen?

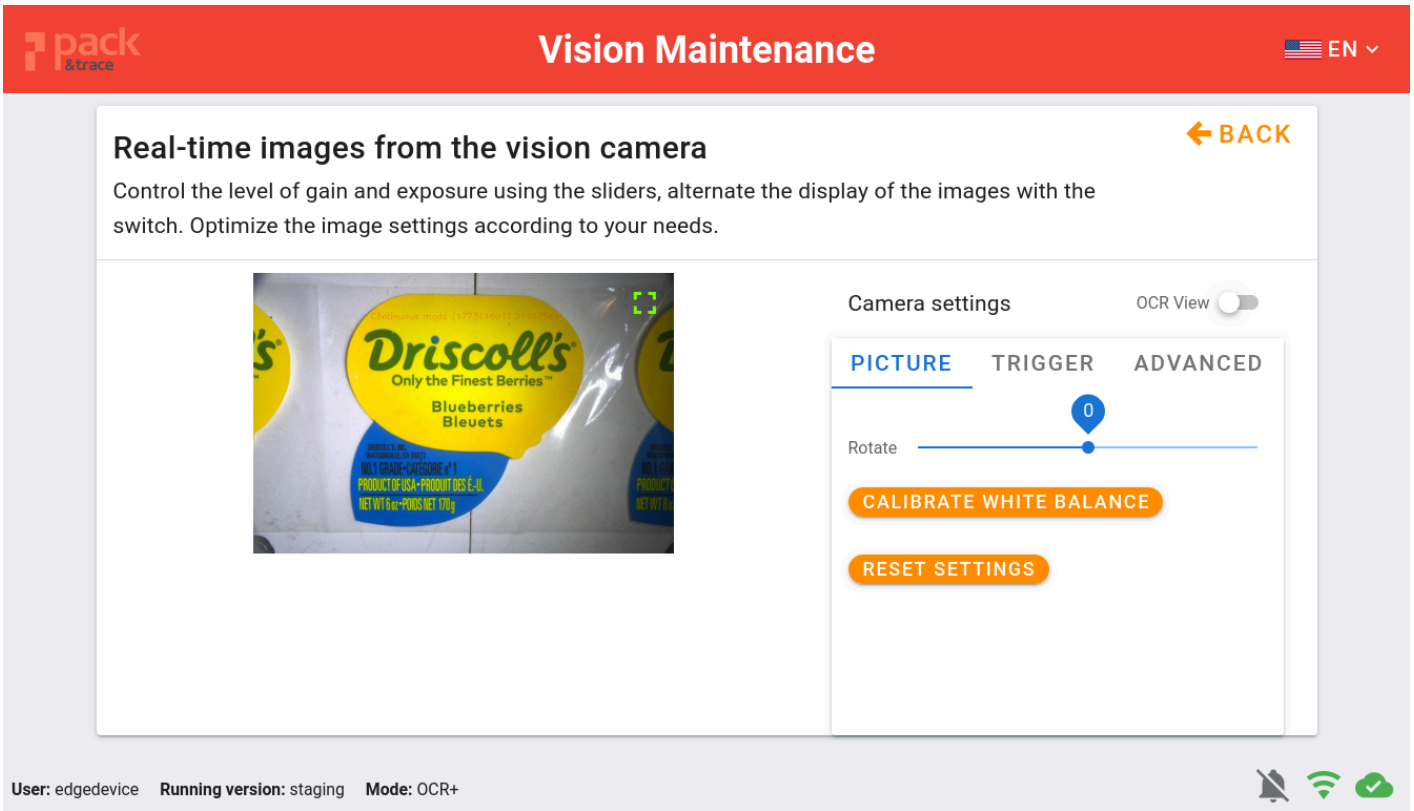
1. When opening the **vision camera settings**, the top labels captured by the camera will show, considering that only the label visible in the center provides the best possible image.



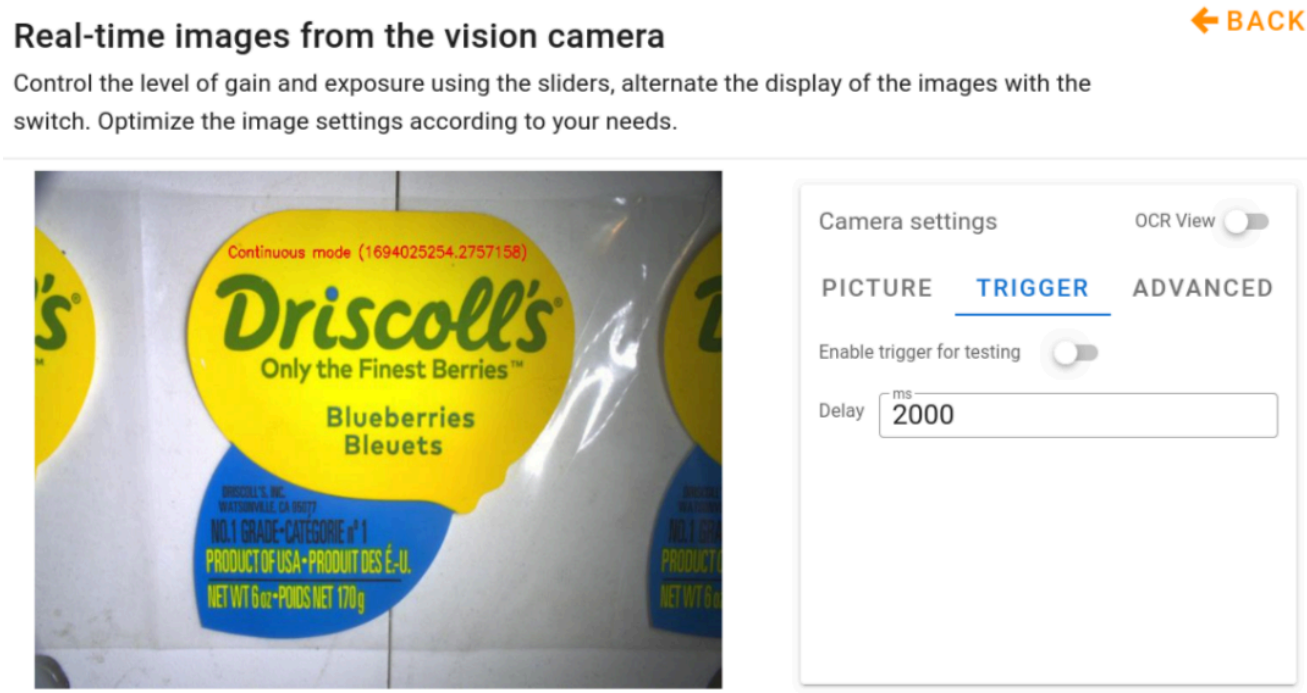
2. To verify the data captured by the OCR, toggle the OCR View switch. This will analyze the last image captured by the camera.



3. To unlock the calibration camera controls, you will need to enter the maintenance or admin password. The manager password will not work in this section.
    a. Press the white balance calibration if the obtained image has a weird hue on it (yellow or blue, or even green or purple).
    b. If by any chance the camera was set up in a rotated position, you will need to use the Rotate slider to make the picture look in an upright position.
    c. You can reset the calibration process any time pressing the Reset Settings button.



4. By default, the Vision Maintenance screen sets the camera in a "live" mode. To check the trigger, you can go into the "Trigger" section and enable it, now when you manually activate the trigger, you will see the actual result on the screen.
    a. In case a time delay is needed (if the position cannot be moved physically), add the value in milliseconds to fit the required image .



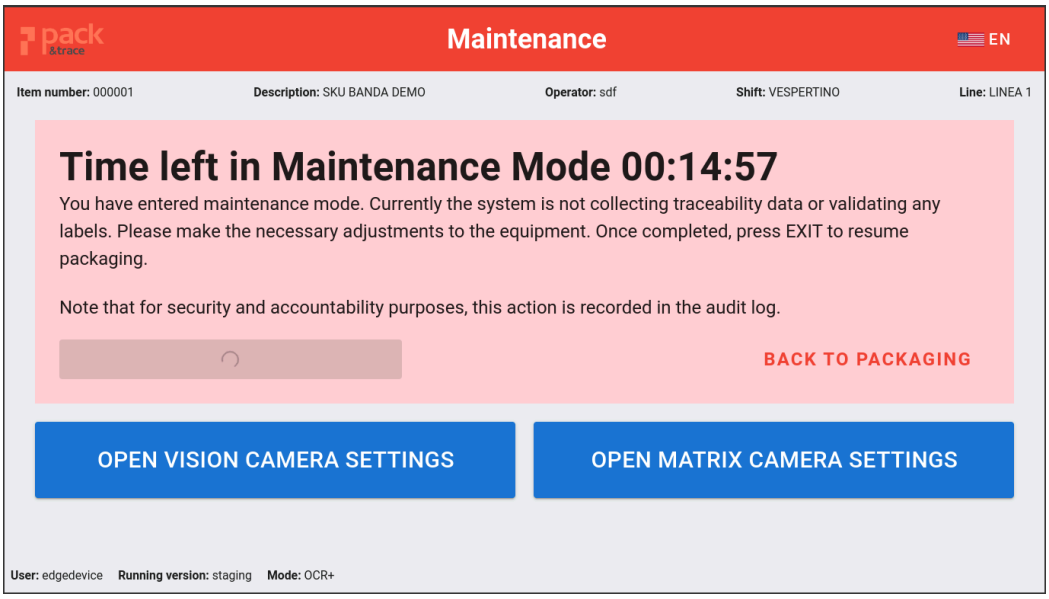
5. **As of the "Advanced" section, nothing should be adjusted in this section** unless specified otherwise by Sperantus.

Hotspot for Vision camera visualization

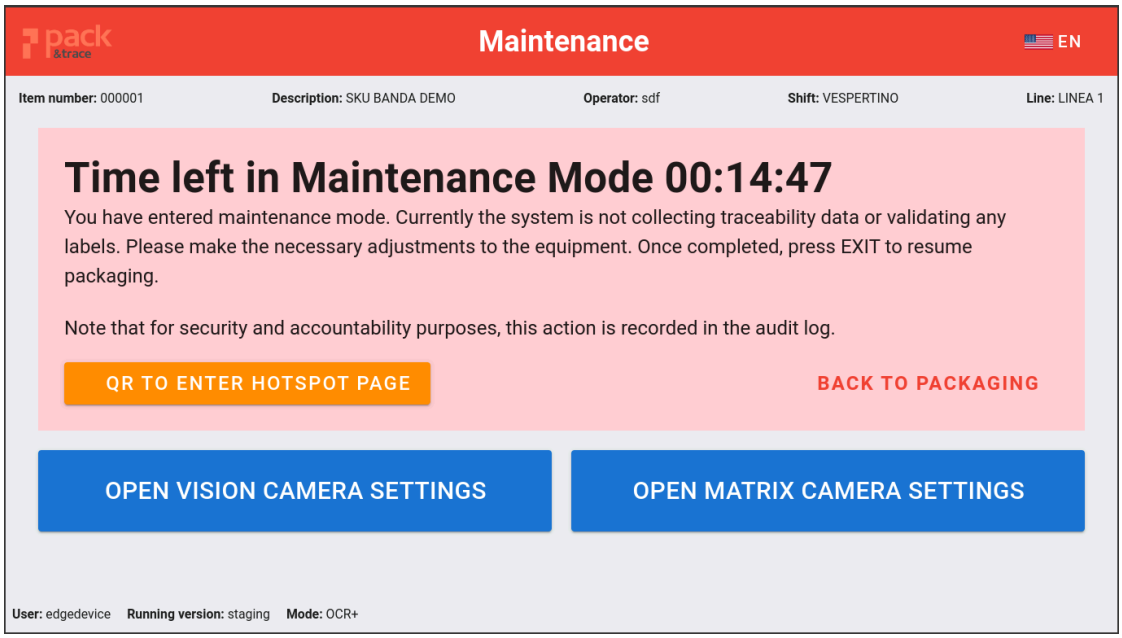
In maintenance mode, you'll not only have access to the camera's configuration but also be able to activate a hotspot. This will enable remote viewing of the images captured by the vision camera and allow for adjustments as needed.

How to use the hotspot?

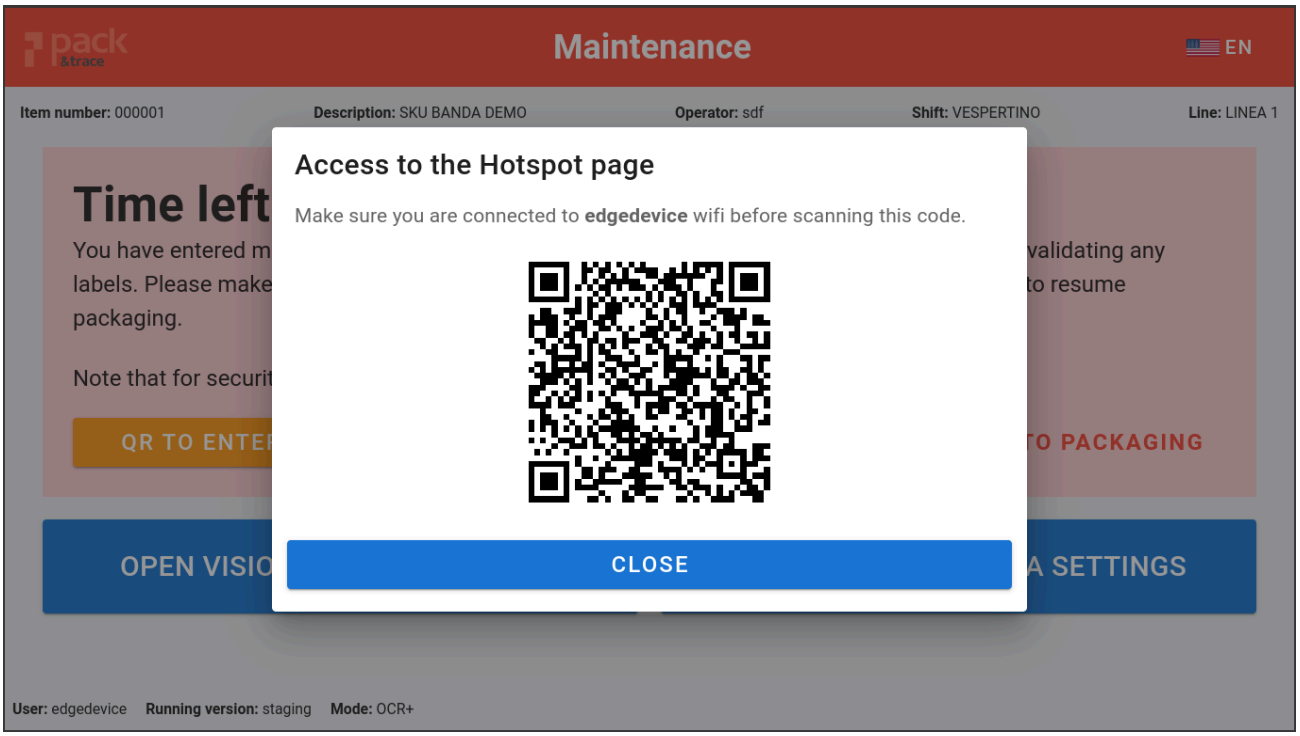
1. Enter maintenance mode by pressing the Options button. Then wait for the gray button to load.



2. Once the button QR TO ENTER HOTSPOT PAGE appears, the hotspot will be ready to use. Press it to continue.

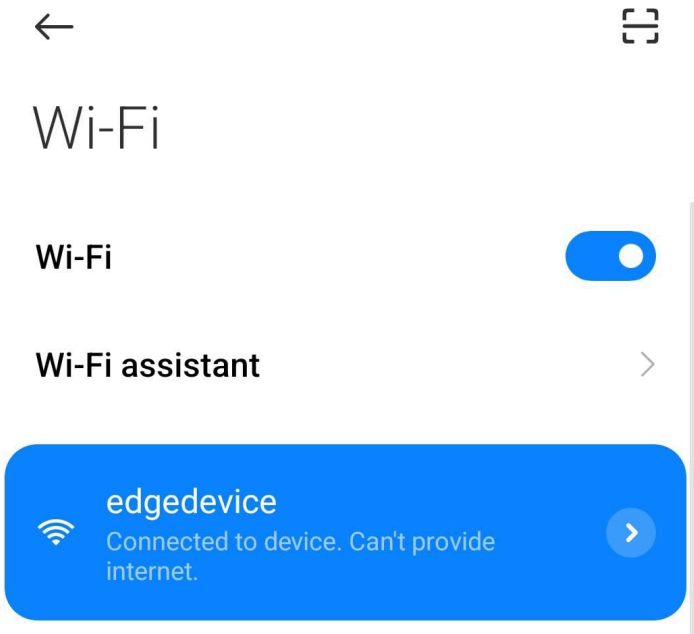


3. A pop-up window will open displaying important information:
    a. The name of the Wi-Fi network you need to connect to on your mobile device to access the hotspot.
    b. A QR code that, when scanned, will direct you to the webpage for viewing the vision camera's output.

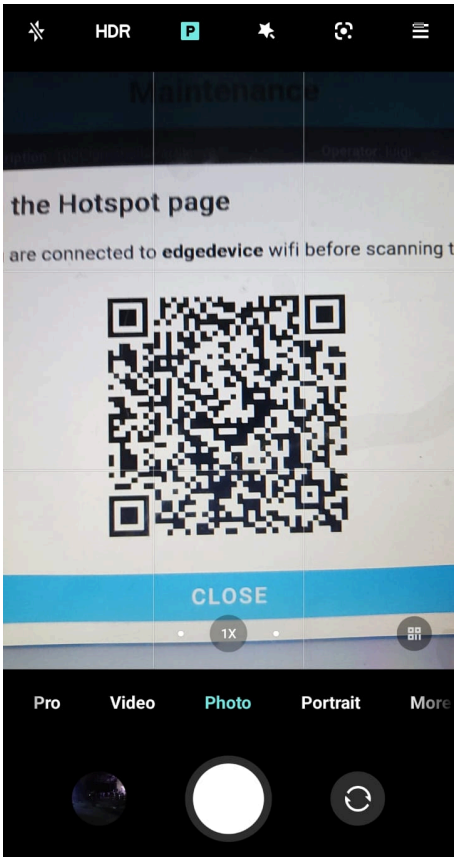


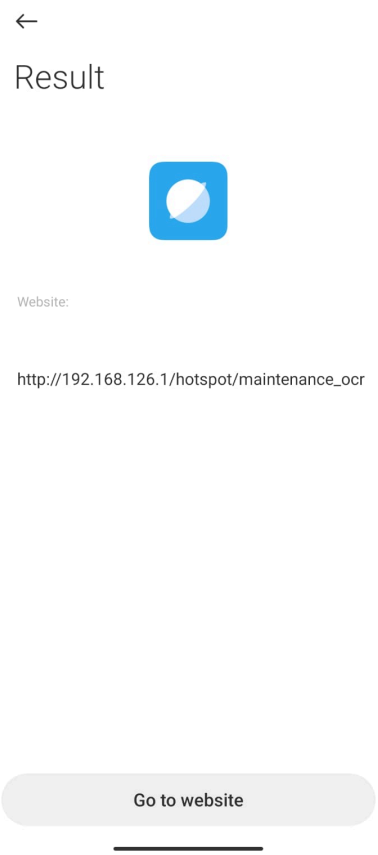
Please note that when the maintenance mode countdown ends, or if you exit the screen, the hotspot will stop.

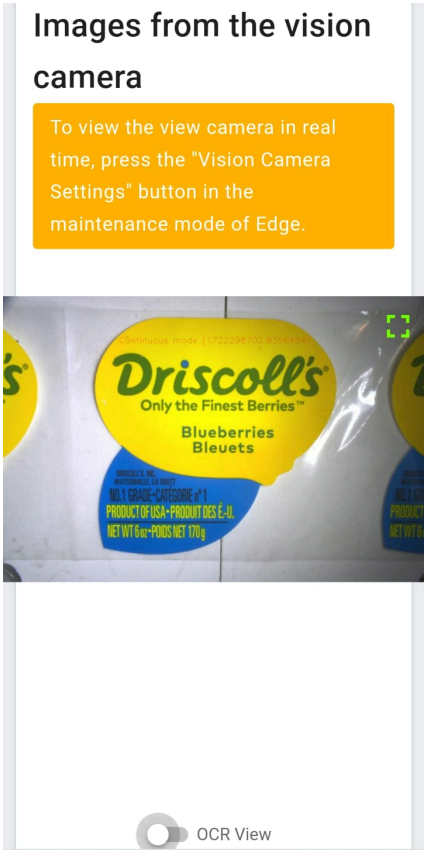
4. On your mobile device, go to the Wi-Fi settings and connect to the network displayed on the Edge machine.

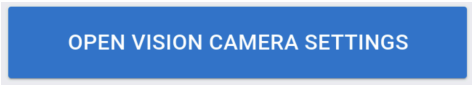


5. Scan the QR code to access the hotspot website.







6. On the Edge machine, press the button 

7. On your mobile device, toggle the "OCR View" switch to see the values detected by the vision camera.

Please note that **using the hotspot in OCR View may introduce latency to the image**. It is not recommended for use when adjusting the camera; it should be used only for reviewing the read values.

8. To view the images in full screen, tap the full-screen icon.

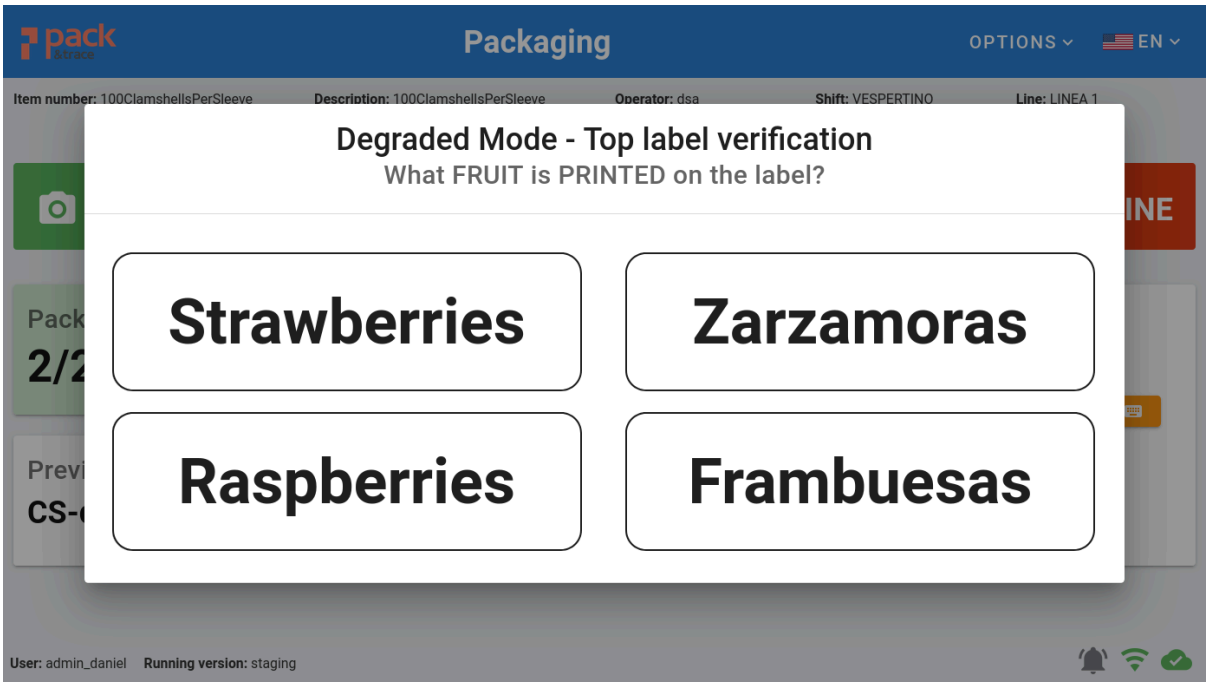
9. To close the hotspot, exit the maintenance mode.

Handling Degraded Mode for OCR+

If the top label camera disconnects and it is not possible to stop the packaging process, degraded mode will be activated when scanning a third box. This mode will allow the system to verify that the product is being packaged correctly according to the selected item and the UPC code.

Degraded mode consists of the following steps:

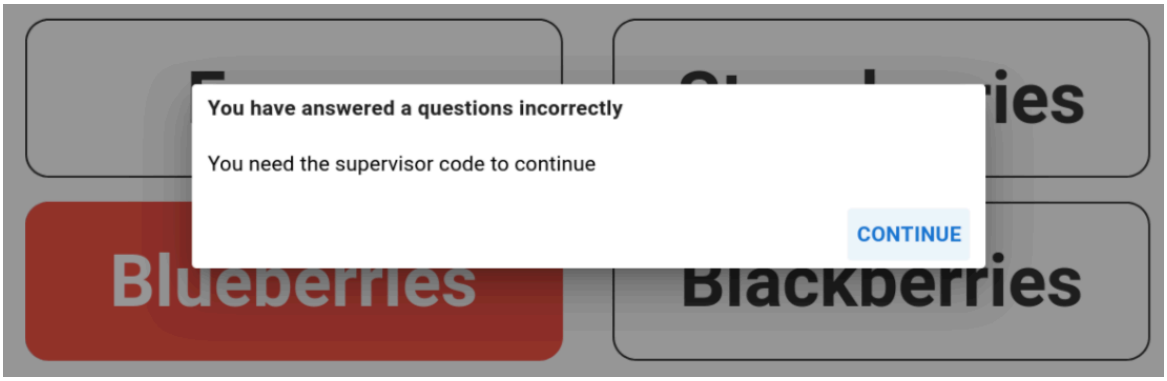
1. A dialog box will appear, asking the operator to answer a set of questions about the data on the top label. To do this, simply press the button corresponding to the correct answer.



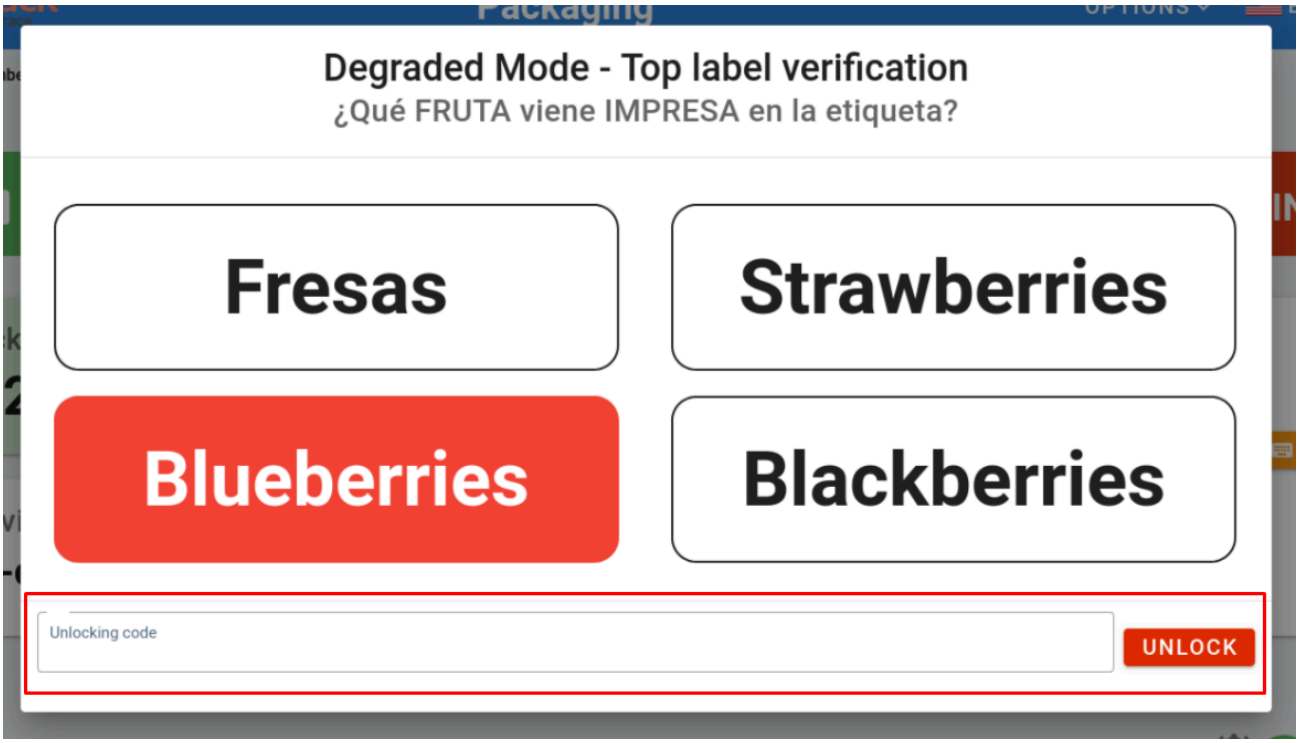
If answered correctly, the system will continue with the labeling process as usual.

If answered incorrectly, the following will happen:

1. A notice will appear requesting the supervisor's code.

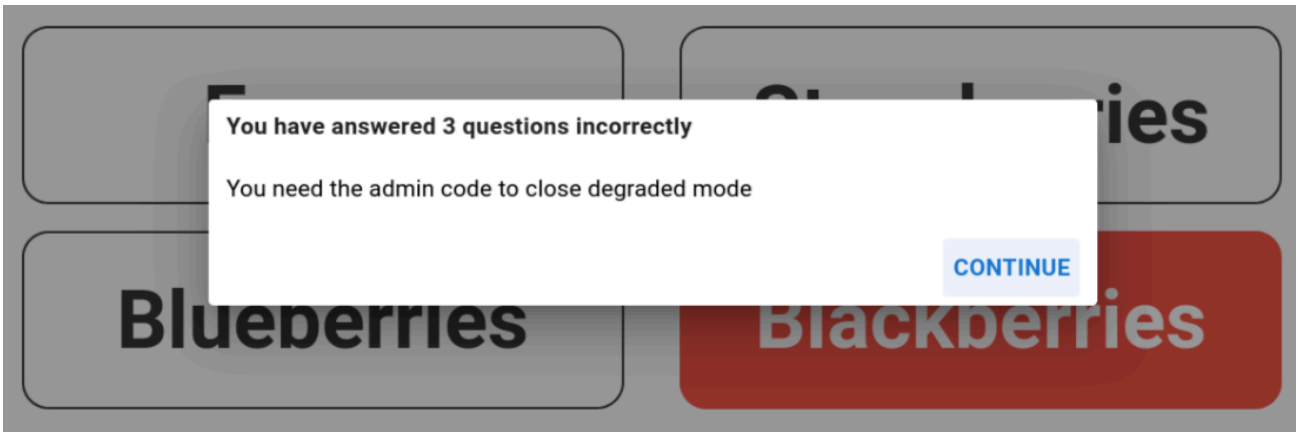


a. Press the CONTINUE button to close the message.
b. A text field will appear for scanning the supervisor's code. Once scanned, the scanning can continue.

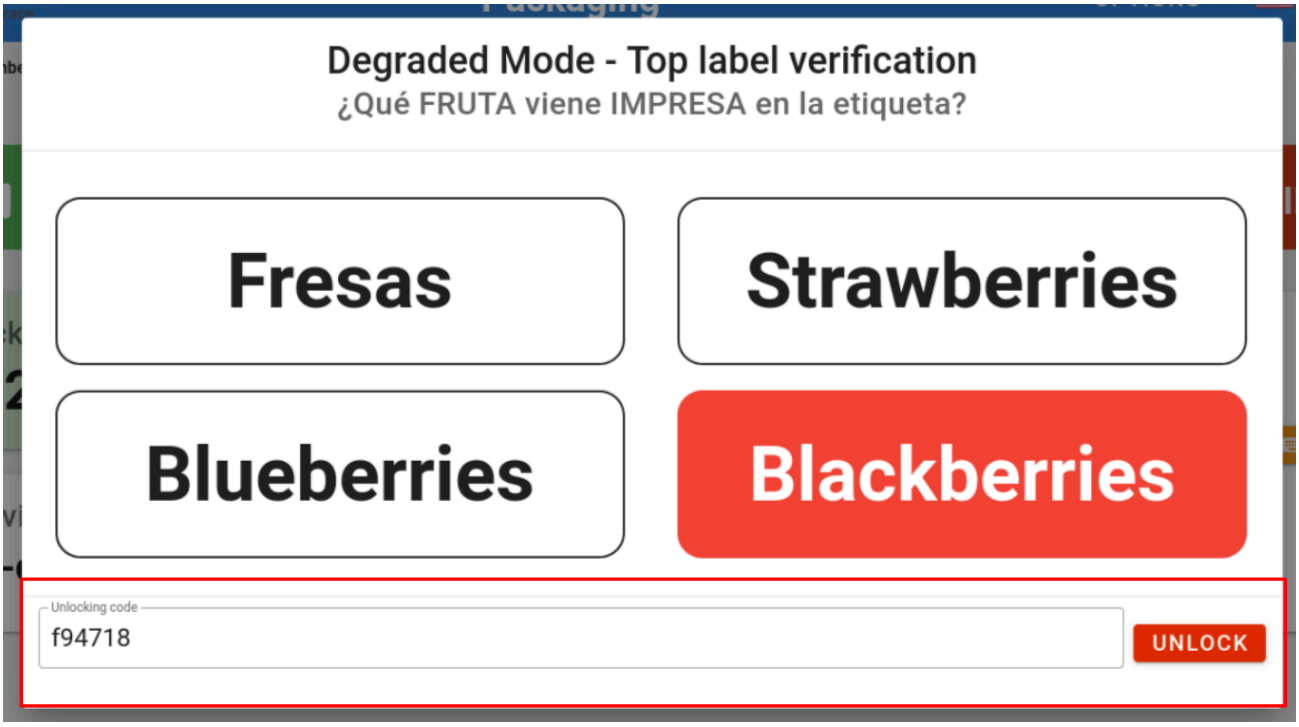


If answered incorrectly a third time, the following will happen:

1. A notice will appear requesting the administrator's code, which consists of 6 digits.



a. Press the CONTINUE button to close the message.
b. A text field will appear to enter the administrator's code. Once entered, scanning can continue."

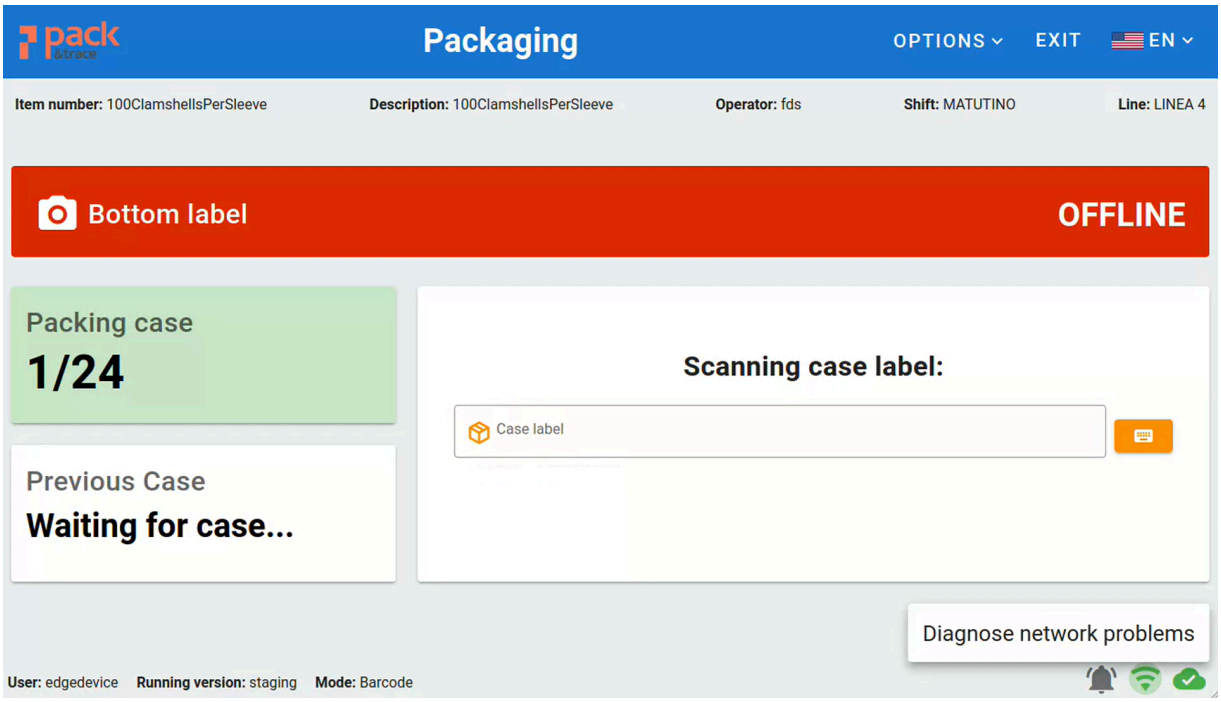


Network Diagnostics

This function allows the system to run a review of the different points with which the system is kept running and connected to the internet. The results provided by this review will help facilitate troubleshooting by both the internal maintenance team and the Sperantus support team.

How to use the network diagnostics?

1. Press the connection status indicator button to open the drop-down menu.



2. The system will load the diagnostic process, and when finished, the results will be displayed and grouped in a new screen. At the top of the screen an alert will show summarizing the result obtained. If there is at least one error, the alert will be displayed in red, otherwise in green.

Network Diagnostics

EN

No problems detected from the network diagnostics.

EXIT | RETRY NETWORK DIAGNOSTIC

Edge Backend Connection

System Version: **staging**

Reachability: **OK**

LAN Connectivity

IP: **192.168.1.13/24**

Gateway reachable: **OK**

DHCP connection: **OK**

Network Interfaces

ID: **wlp2s0**
MAC address: **30:03:C8:02:54:15**
IP address: **192.168.1.13/24**
Connection: **STARLINK-WIFI-5G**
Gateway: **192.168.1.1**
Gateway reachable: **OK**

ID: **enx44a92c551f1a**
MAC address: **44:A9:2C:55:1F:1A**
IP address: **--**
Connection: **--**
Gateway: **--**
Gateway reachable: **N/A**

ID: **veth75bc61f**
MAC address: **CA:19:3F:17:F2:5F**
IP address: **--**
Connection: **--**
Gateway: **--**
Gateway reachable: **N/A**

ID: **veth83da7e9**
MAC address: **AE:27:C9:40:B2:0B**
IP address: **--**
Connection: **--**
Gateway: **--**
Gateway reachable: **N/A**

NTP Time Synchronization

Edge backend time: **2024-04-24T18:56:35.000Z**

Status: **OK**

DNS: Domain Name Resolution

IP: **192.168.1.1**

Balena connection: **OK**

ZeroTier connection: **OK**

P&T Cloud connection: **OK**

Pack & Trace Cloud Connectivity

Endpoint: **driscolls-staging.packandtrace.tech/api/configuration**

Connection: **OK**

Balena Connectivity

Endpoint: **api.balena-cloud.com/v6/user**

Connection: **OK**

ZeroTier Connectivity

IP: **10.241.52.20/16**

Network name: **ztbpakgdl4**

Connection: **OK**

Network Diagnostics

EN

Errors found in network diagnostics.

EXIT | RETRY NETWORK DIAGNOSTIC

Edge Backend Connection

System Version: **staging**

Reachability: OK

LAN Connectivity

no network interfaces found to run tests with

IP: --

Gateway reachable: Fail

DHCP connection: Fail

Network Interfaces

ID: **enx44a92c551f1a**

MAC address: **44:A9:2C:55:1F:1A**

IP address: --

Connection: --

Gateway: --

Gateway reachable: N/A

ID: **wlp2s0**

MAC address: **30:03:C8:02:54:15**

IP address: --

Connection: --

Gateway: --

Gateway reachable: N/A

ID: **veth75bc61f**

MAC address: **CA:19:3F:17:F2:5F**

IP address: --

Connection: --

Gateway: --

Gateway reachable: N/A

ID: **veth83da7e9**

MAC address: **AE:27:C9:40:B2:0B**

IP address: --

Connection: --

Gateway: --

Gateway reachable: N/A

NTP Time Synchronization

error when running '/usr/bin/chronyc activity' to check NTP activity data: exit status 1.

Edge backend time: --

Status: Fail

DNS: Domain Name Resolution

IP: --

Balena connection: Fail

ZeroTier connection: Fail

P&T Cloud connection: Fail

Pack & Trace Cloud Connectivity

Endpoint: **driscolls-staging.packandtrace.tech/api/configuration**

Connection: Fail

Balena Connectivity

Endpoint: **api.balena-cloud.com/v6/user**

Connection: Fail

ZeroTier Connectivity

IP: **10.241.52.20/16**

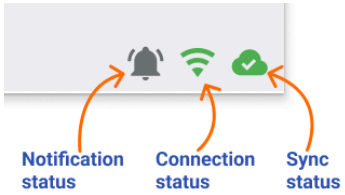
Network name: **ztbpakgdl4**

Connection: Fail

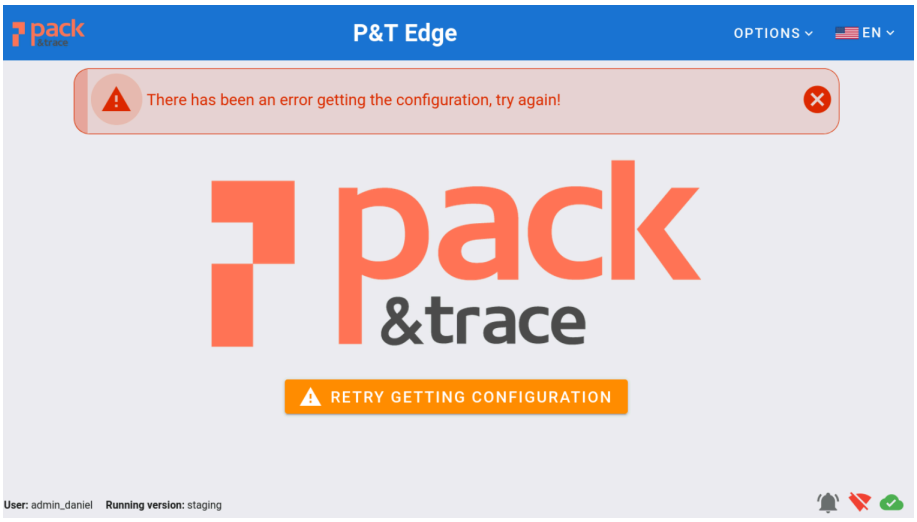
3. To continue the packaging process, you will need to close the network diagnostics by pressing the EXIT button. If the diagnosis is required again, then press the button RETRY NETWORK DIAGNOSTIC.

Extra troubleshooting

- It's crucial to keep the computers always connected to a reliable internet connection. Even if the system can work temporarily without the internet, it is important to sync the collected data and receive system updates.
    - To know if the computer is connected, refer to the status icons located at the bottom of screen:



    - If there are any problems with the internet connection, it is possible to get more detail by running a Network Diagnosis.
- It's also important to close the pallet with partial products if Edge won't be used for a while. This is because the product might later be assigned to a different label, and the system can't be used for another product while a pallet is in progress.
- If the system remains powered off for an extended period and there is no internet connection upon powering it on, an error message will appear. To resolve this, connect the computer to the internet and then press the 'Retry' button.



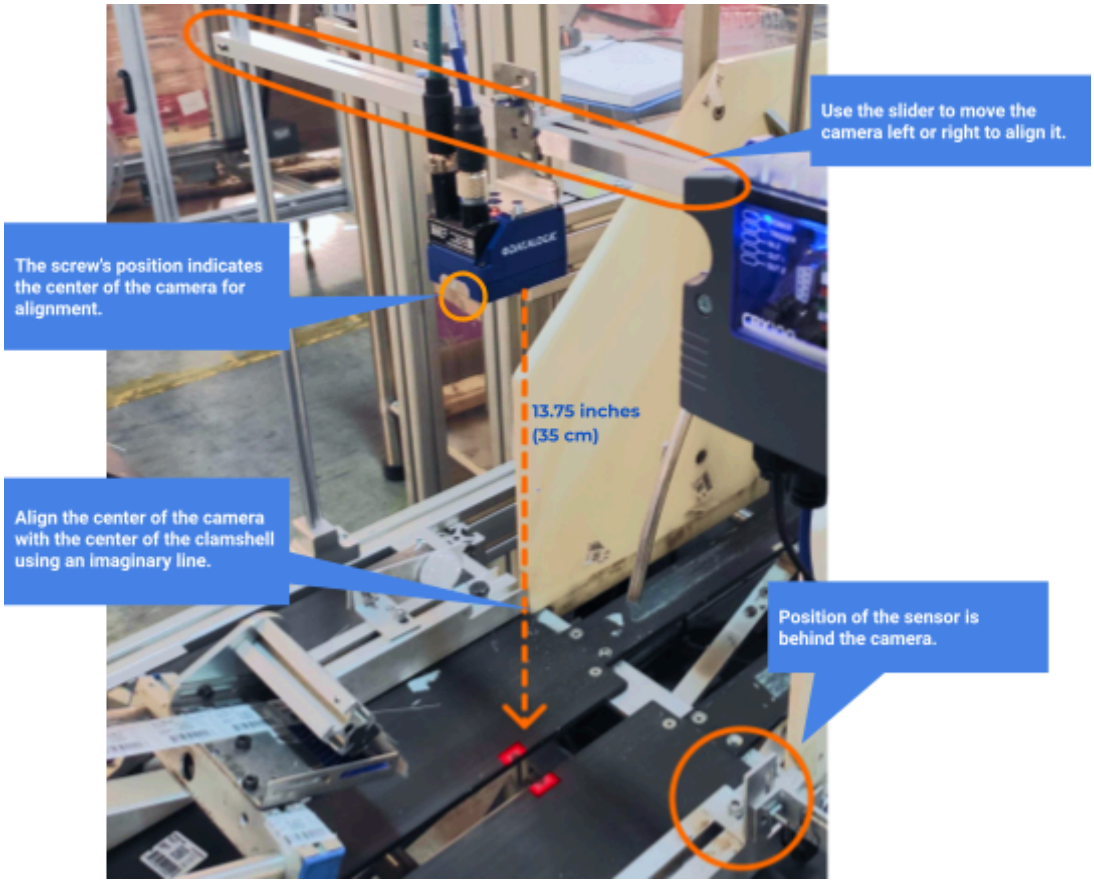
Hardware maintenance references

Installation Best Practices

Matrix - Traditional setup

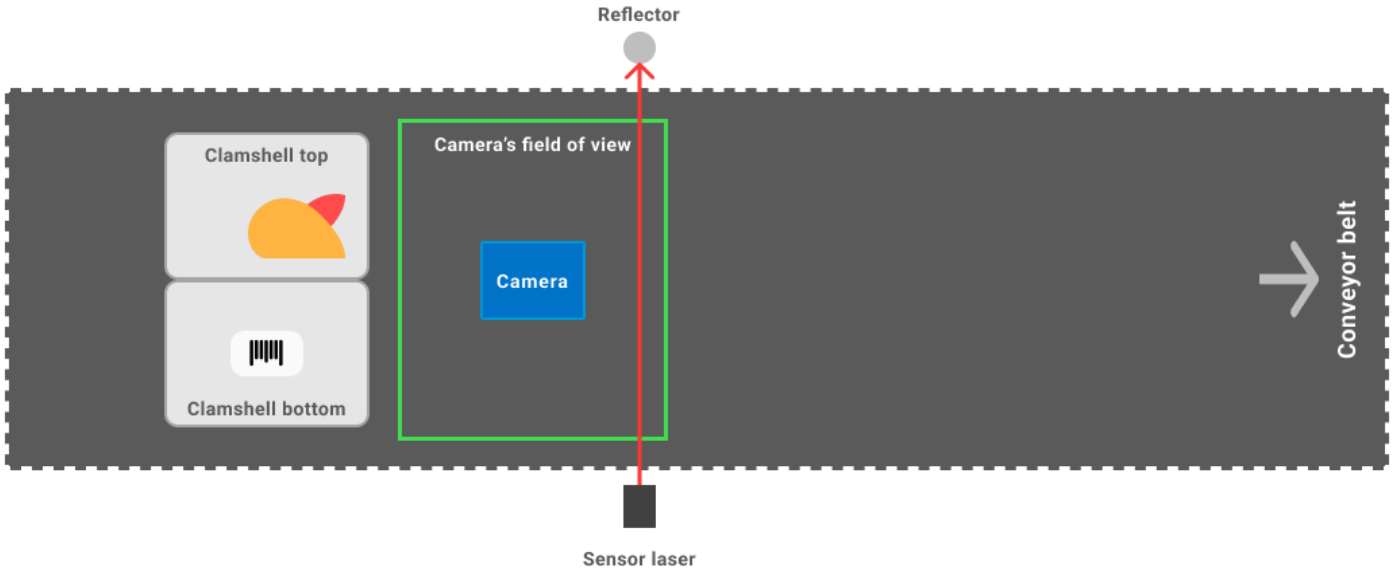
Camera

- The camera is positioned looking straight down into the clamshell (crystal parallel to the conveyor belt), and the center of it should be aligned with the center of the clamshell. As a guide, the camera has 2 screws which identify the middle of it. Also, the camera, when on, will display a visual cue to where it is aiming, which are the 2 square red lights. The space between them is the middle.
    - The focus configuration is set at a height of **13.75 inches (35 cm)**, measured from the conveyor belt to the camera's glass. This gives us a reading field of approximately 10 inches (25 cm) in width and 7 inches (18 cm))in length.
- It is recommended to have a slotted rail, to assist in moving the camera from left to right to help with the proper positioning regarding a clamshell. Up/down movement is not needed due to the fixed focus.
- **NOTE**: Some clamshells may extend beyond the camera's field of view (e.g., 2lb strawberries), and in those cases, it is necessary to ensure that both labels can be seen in the camera image, even if the camera is not centered on the clamshell. **To check that, use the Maintenance mode**.



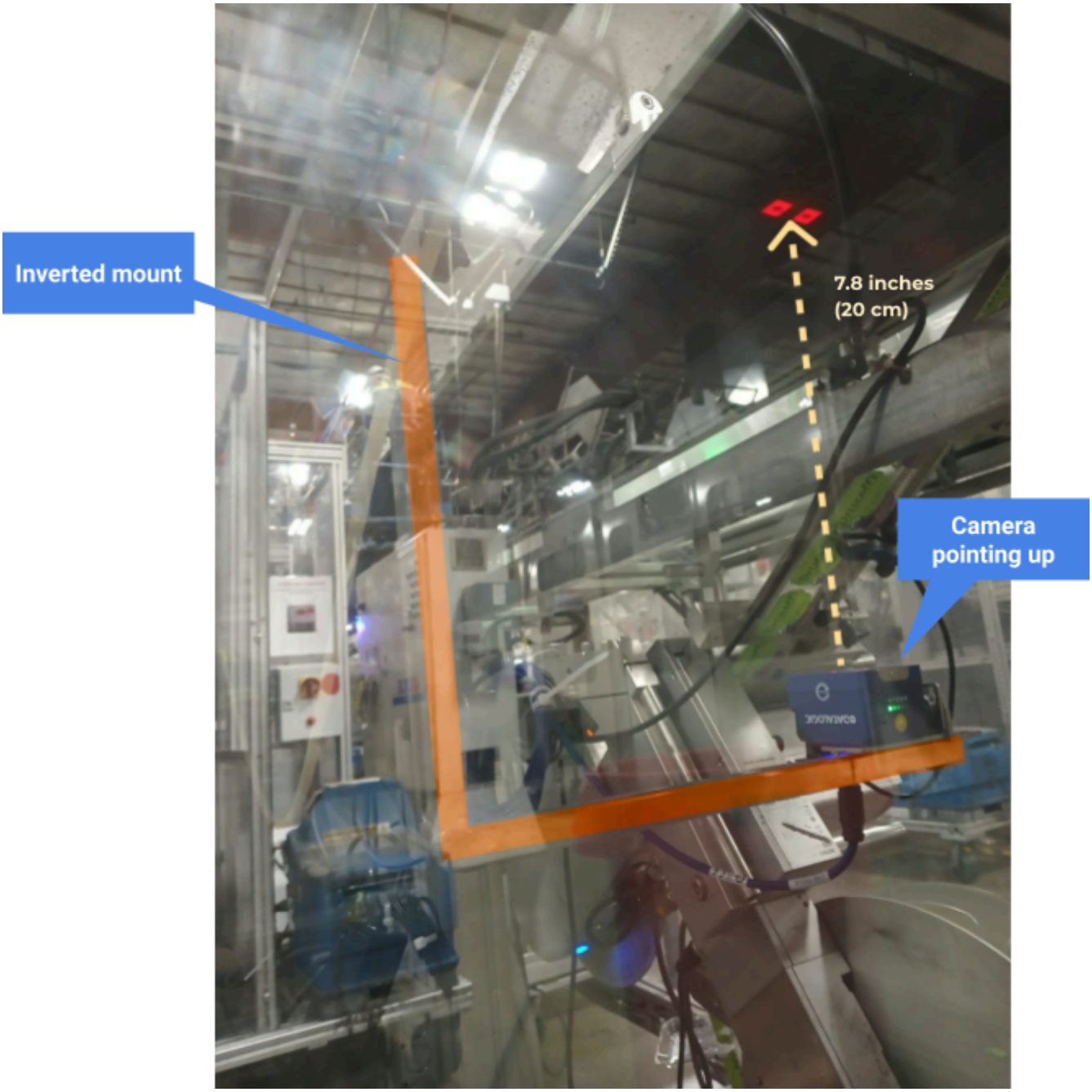
Trigger

- To position it correctly, the LED must be OFF when there is nothing blocking the view towards the reflector. When the sensor's vision is interrupted, the LED lights up, activating the camera.
- Due to the variety of shapes and sizes of clamshells, it's essential to ensure that once activated, the LED remains constantly lit. Clamshells with irregular shapes (wavy base or some punch-outs) and a poorly positioned sensor can cause false readings (the LED may flicker in a clamshell, indicating multiple activations when it should be only one). In such cases, the sensor needs to be repositioned (rotated from vertical to horizontal, or positioned at an angle or moved up/down).
- It is advisable to set the activation point at the mid to end of the camera's field of view so that, at that point, both labels are within the camera's view. For this purpose, we can use the 'Maintenance' screen to fine-tune this point.
- If the required sensor activation point exceeds the physical limitations of the labeling machine, please contact Sperantus, as a distance-based delay can be programmed (emulated by the camera) to achieve the necessary distance.

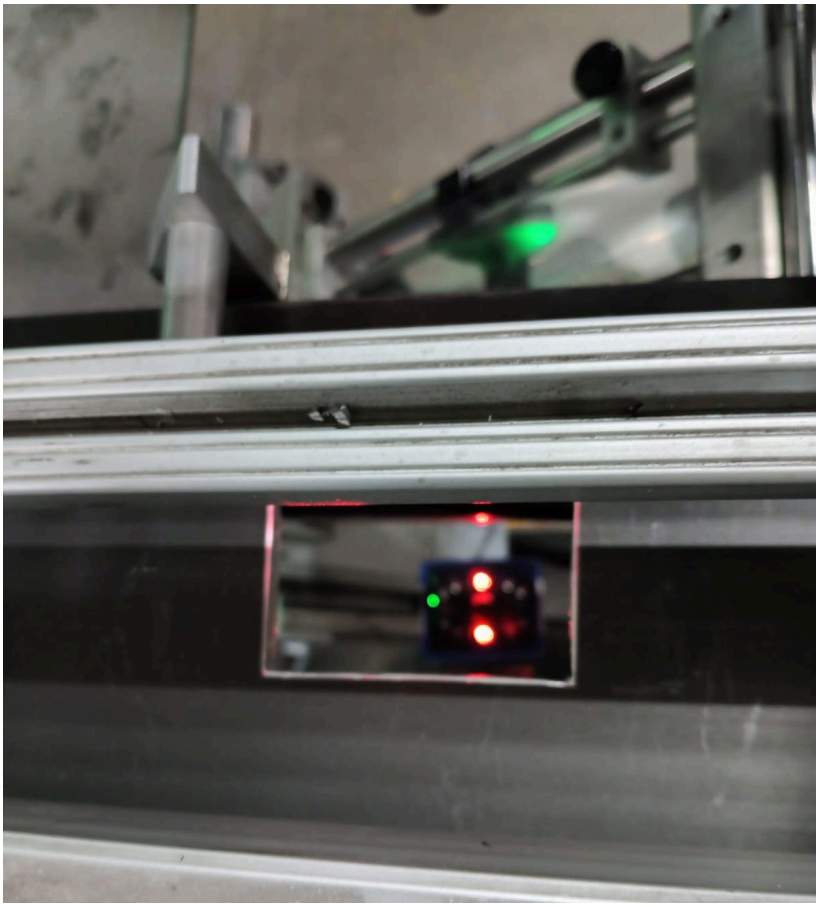


Matrix - Inverted setup

- The camera is placed on the mount, facing from bottom to top, and just in this case, the camera will capture the information only of the bottom label.
    - **The suggested focal configuration is established at a height of 7.8 inches (20 cm), measured from the bottom label on the clamshell to the camera's glass**. However, since this arrangement is not as standard, the necessary height might differ from one machine to another. Therefore, we recommend reaching out to us for guidance during the installation process.



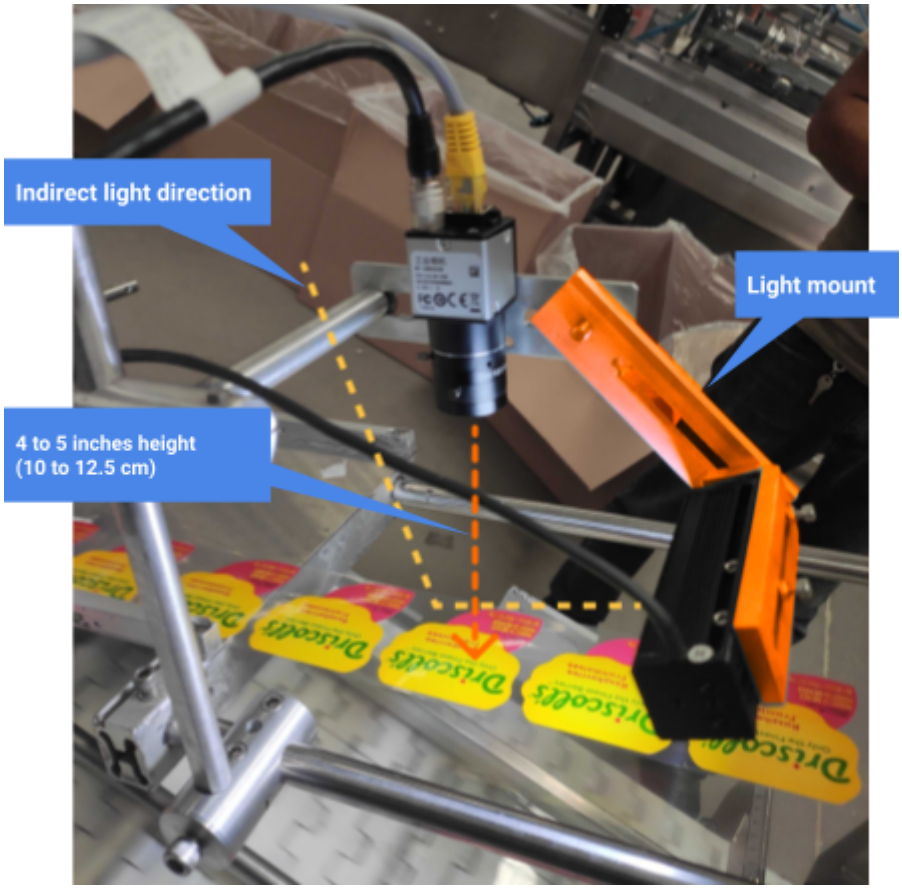
- As a part of the machine obstructs the camera's field of vision, a cut is made to allow the camera to see through it and capture the bottom label of the passing clamshells.
- In contrast to the traditional setup where the clamshell is centered and displays both halves, in this case, only the portion of the clamshell showing the bottom label will be visible.
- The camera will still be parallel to the clamshell, however, the camera needs to be slightly offset to the left/right to prevent hot spots (over-exposed image sections due the flash) off the clamshell from affecting the readability of the label codes.



OCR Camera

- The camera will be mounted on the head of the top label and positioned at the closest point before the label is released and the field needs to show a full label in the center.
    - It needs to be positioned at a height of approximately **4 to 5 inches (10 to 12.5 cm)** between the label and the beginning of the lens.
    - To install the lens to the camera, remove the caps from both components, and then screw the lens onto the camera until it is secure.

    - **The lens's aperture should be set as wide as possible**, corresponding to the smallest aperture number (**f2.8**).
    - The focus will be adjusted using the focusing ring on the lens.
    - Both the aperture and the focus can be fixed by tightening the screws used to adjust them.
- The trigger should be activated by the clamshell that is about to be labeled, however, this position should be when the previous label has already been dispatched, so when it gets activated, the image of the label is static (if the image is blurry, adjustment needs to be made).
- The light needs to be positioned indirectly in relation to the label to avoid hot spots (white blobs due to excessive light) in the image that could interfere with accurate information capture.



    - An angle of approximately 10 to 15 degrees to the label is recommended.
    - The mount will allow the light to be moved into different positions: pivot, forward and backward, and up and down.

Labeling Machine

- It is essential to keep the camera's 'reading zone' free from labels (scraps) as it could cause one of them to be mistakenly detected, leading to errors in the read data.

- For machines with undivided conveyor belts, it is important to ensure a certain separation distance between the clamshells. If the clamshells are too close together in certain trigger positions, it can result in reading failures.