Sperantus
Make data speak to you

pack® &trace edge

Maintenance and Troubleshooting

Updated to August 13, 2025

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

Table of Contents

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, according to the required actions for each error.**

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.

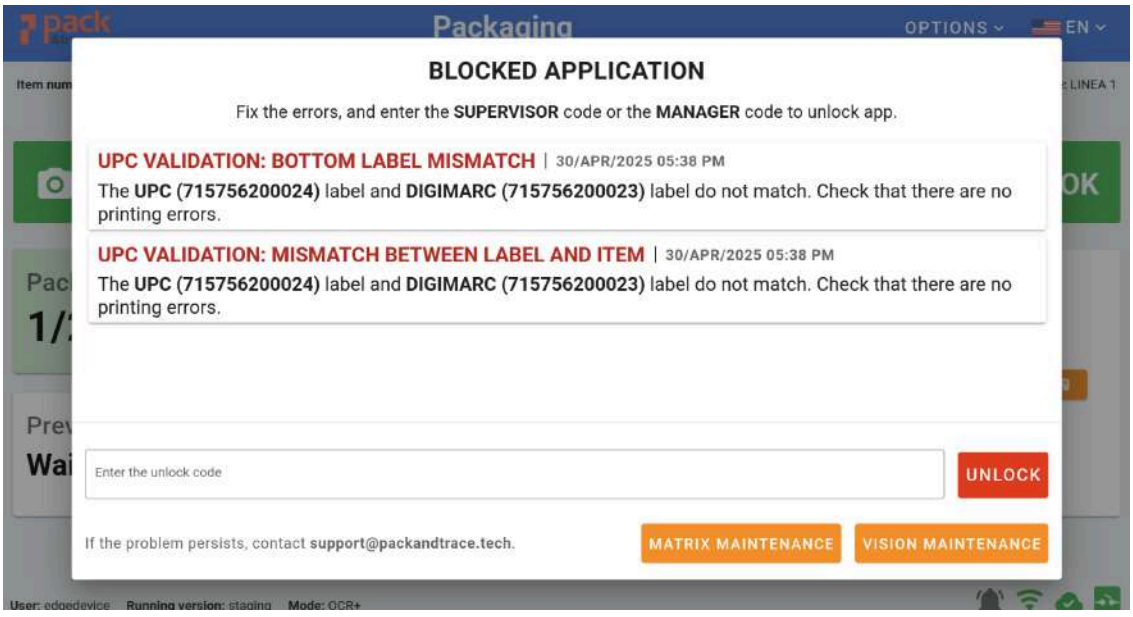
These errors will also have direct access to **Maintenance Mode**, allowing users to review camera details and assist in resolving the detected issues.

UPC Mismatch errors - Line stopping

These errors are triggered when discrepancies are found between the scanned UPC and the items being packed. Due to their critical nature, **UPC mismatch errors will cause the line to stop *only* if the optional relay function is activated**.

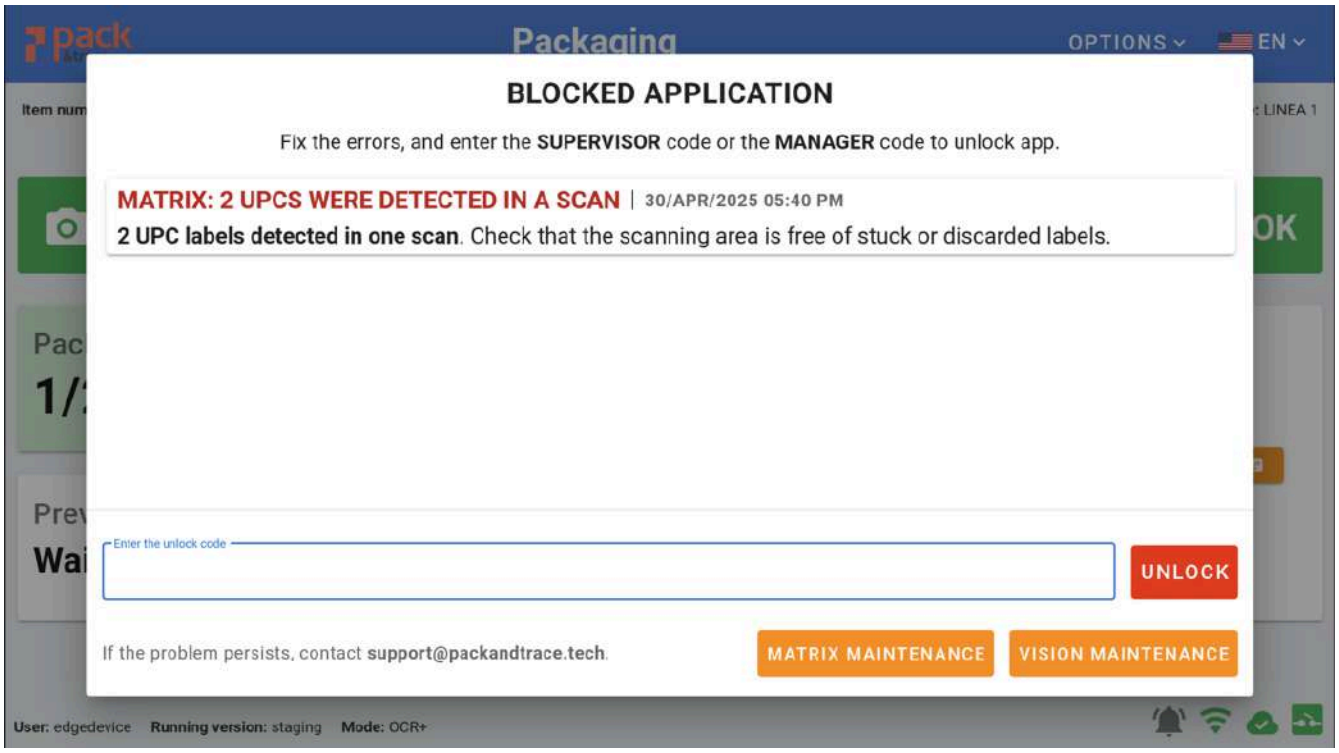
Blocking scenarios

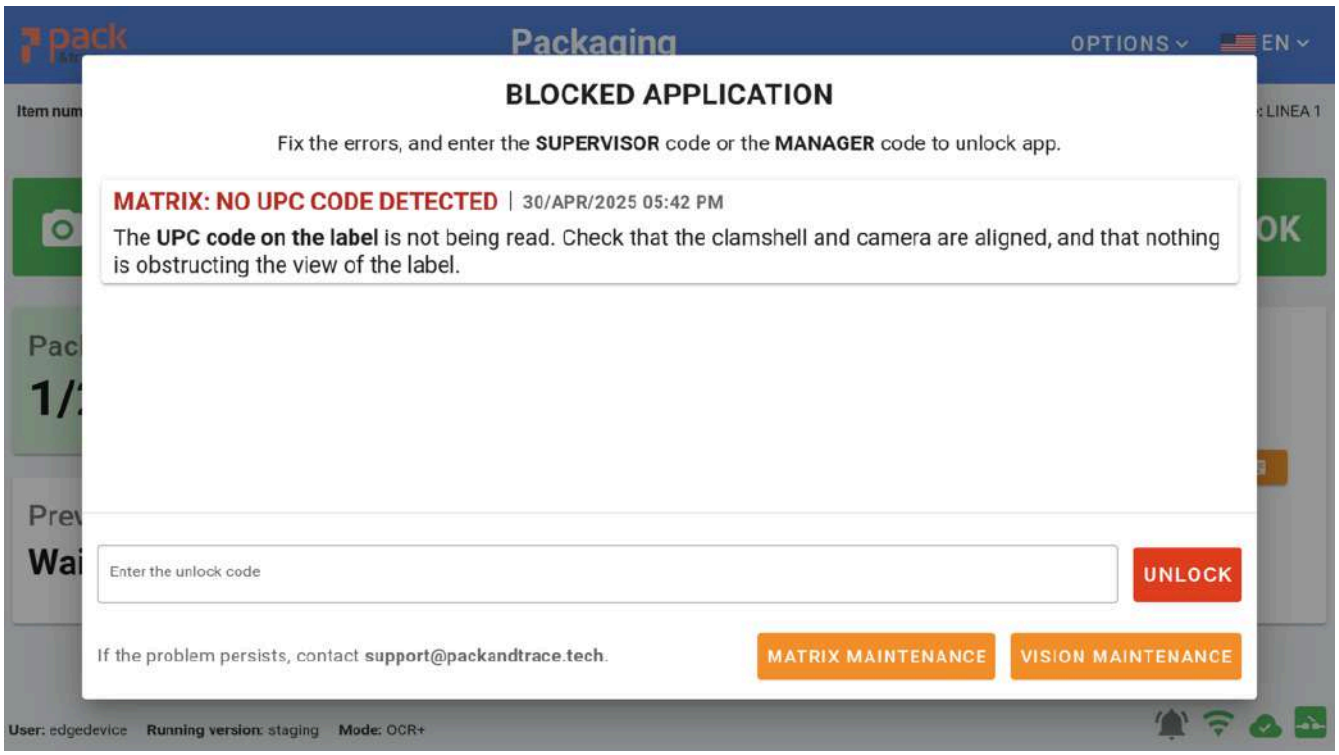
- If the UPC code is incorrect, the system will block immediately, even if there is only one incorrect reading.
- When the clamshell also includes a DigiMarc label, both the barcode and the DigiMarc must have the same UPC. If the barcode is correct but the DigiMarc is not, a discrepancy will still occur, and the system will lock on the first reading.

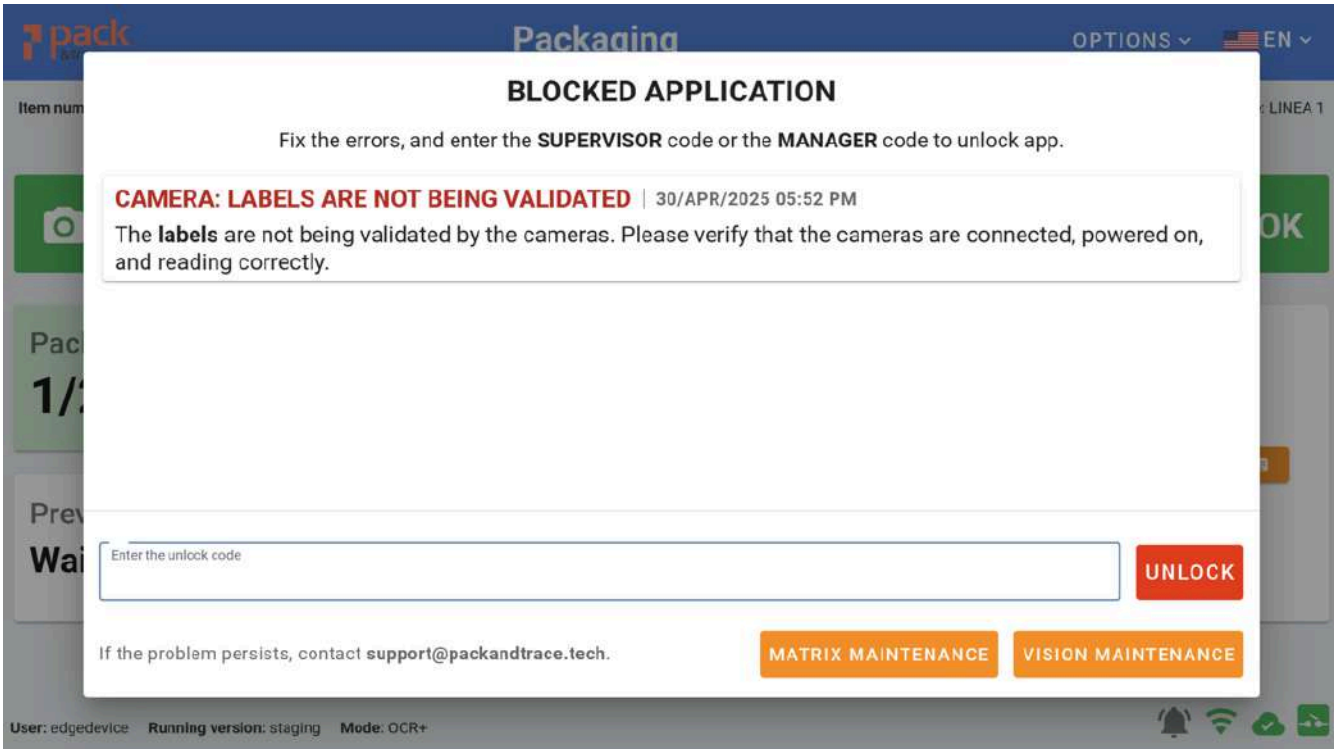


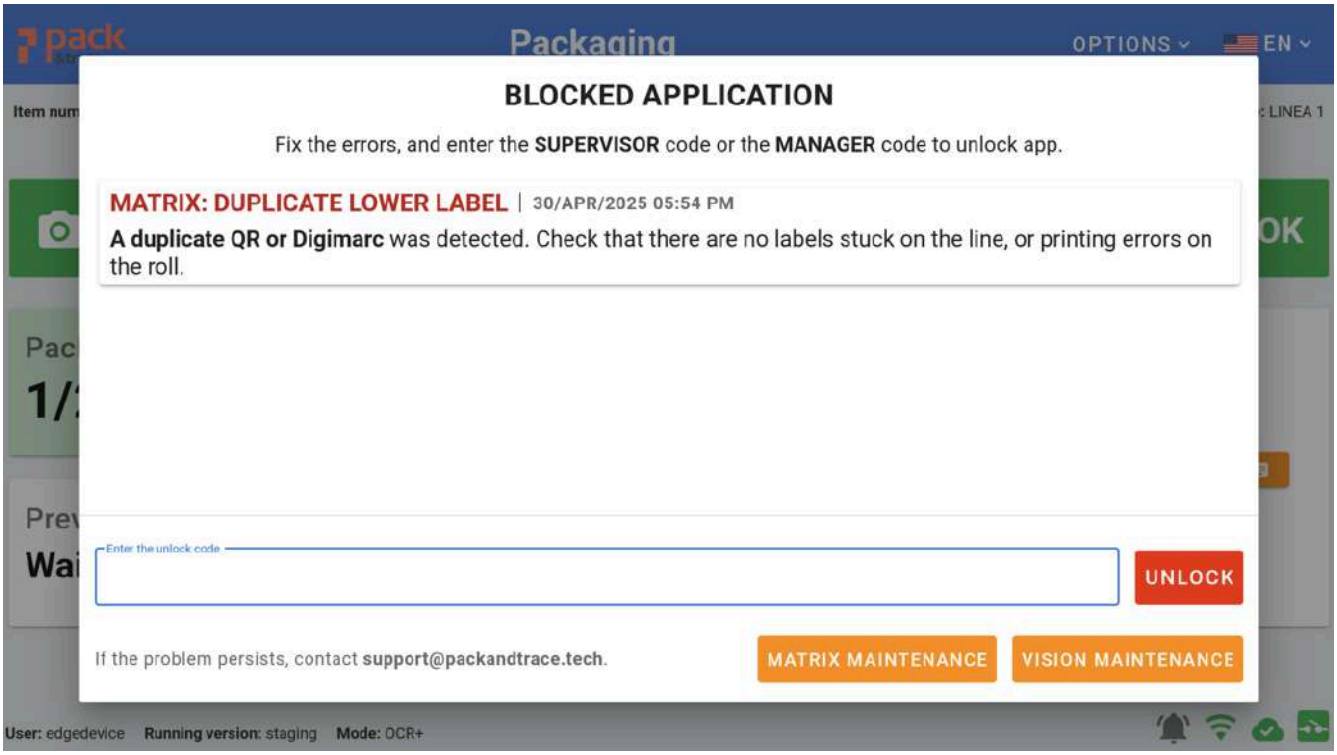
Matrix camera errors

These errors are related to the operation of the matrix camera or its trigger sensor. None of them cause the line to stop.






Packaging
OPTIONS
EN
BLOCKED APPLICATION
Fix the errors, and enter the SUPERVISOR code or the MANAGER code to unlock app.
CAMERA: LABELS ARE NOT BEING VALIDATED | 30/APR/2025 05:52 PM
The labels are not being validated by the cameras. Please verify that the cameras are connected, powered on, and reading correctly.
Enter the unlock code
UNLOCK
If the problem persists, contact support@packandtrace.tech.
MATRIX MAINTENANCE
VISION MAINTENANCE
User: edgedevice Running version: staging Mode: OCR+


Packaging
OPTIONS
EN
BLOCKED APPLICATION
Fix the errors, and enter the SUPERVISOR code or the MANAGER code to unlock app.
MATRIX: DUPLICATE LOWER LABEL | 30/APR/2025 05:54 PM
A duplicate QR or Digimarc was detected. Check that there are no labels stuck on the line, or printing errors on the roll.
Enter the unlock code
UNLOCK
If the problem persists, contact support@packandtrace.tech.
MATRIX MAINTENANCE
VISION MAINTENANCE
User: edgedevice Running version: staging Mode: OCR+

Vision camera errors

These errors are related to the operation, focus or lighting of the vision camera. Discrepancy errors **will cause the line to stop *only* if the optional relay function is activated**.

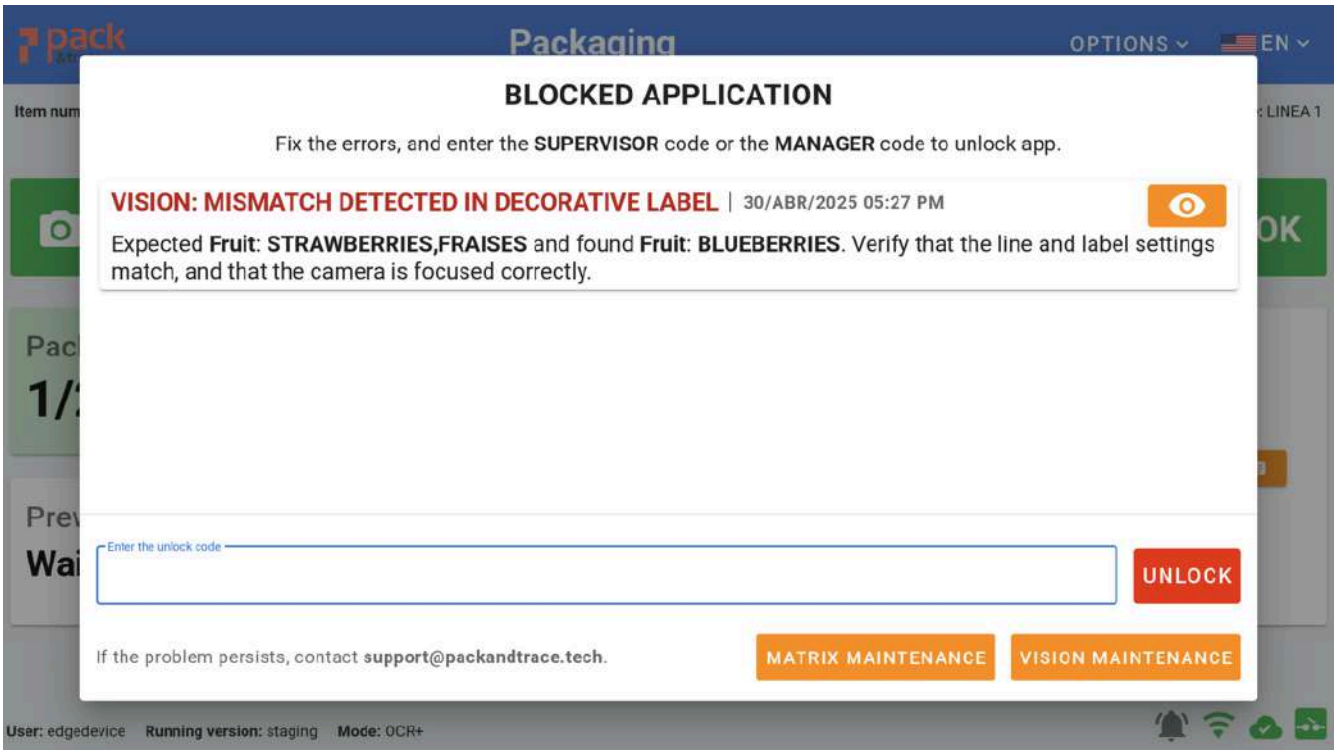
Blocking Scenarios

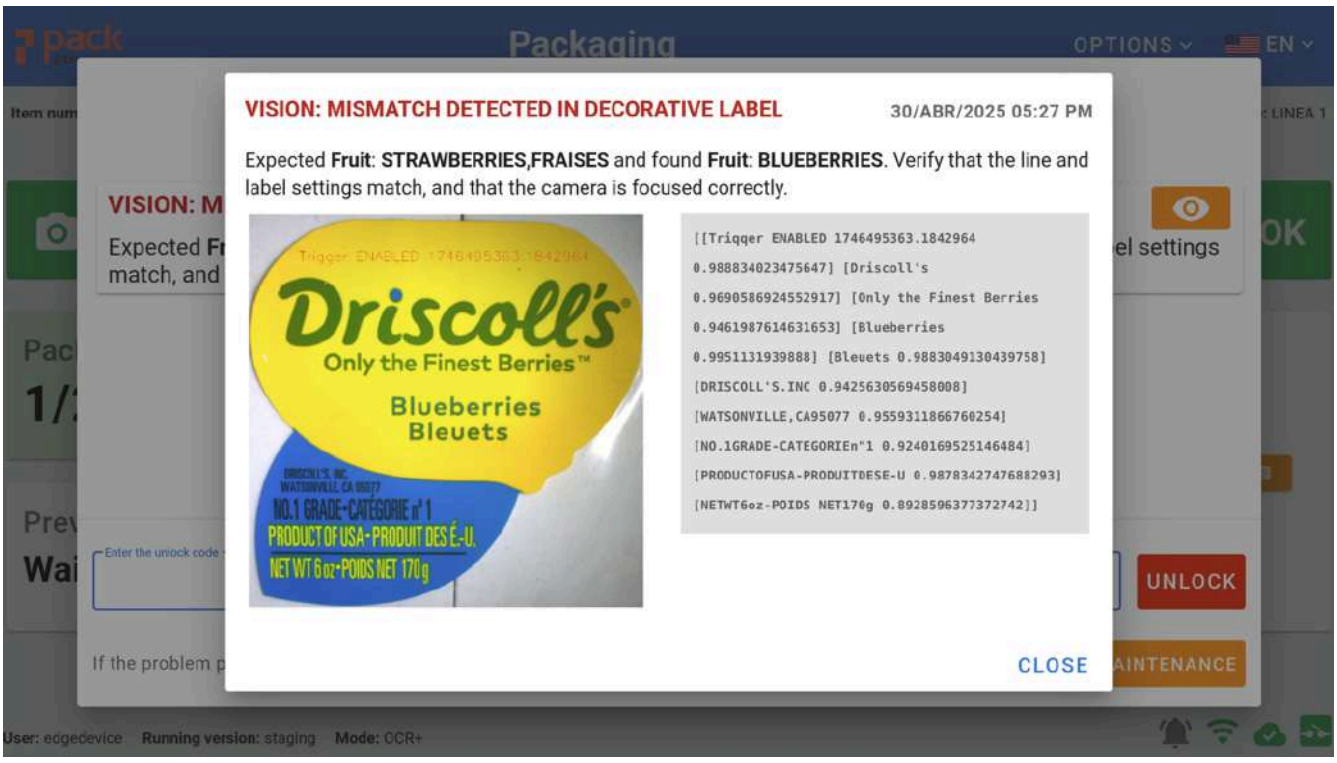
- **Item with classic label (no QR)**:
  Since this label doesn't have a QR code, the system must read and validate all the printed data.
    - If a label with incorrect data is used, the system will block at the **third reading**. The first two attempts are allowed in case the system misreads the data.
    - If the label is correct but can't be read properly (for example, due to a blurry camera or low lighting), the system will stop after the **tenth scan**.
    - If decorative labels with QR codes are used by mistake, they might still pass validation if the scanned data appears correct. **The system cannot detect or block this situation.**

- **Item with new label that includes a QR code**:
  In this case, the system only reads the QR code to check the information.
    - If the QR code doesn't match the item configuration, the system will stop immediately **on the first scan**.
    - If the label is correct but the QR code can't be read, the system will stop after the **tenth attempt**.
    - If you try to use a label without a QR code, the system will keep waiting to read one. Since none will appear, it will also block after the **tenth attempt**.

Vision mismatch errors - line stopping

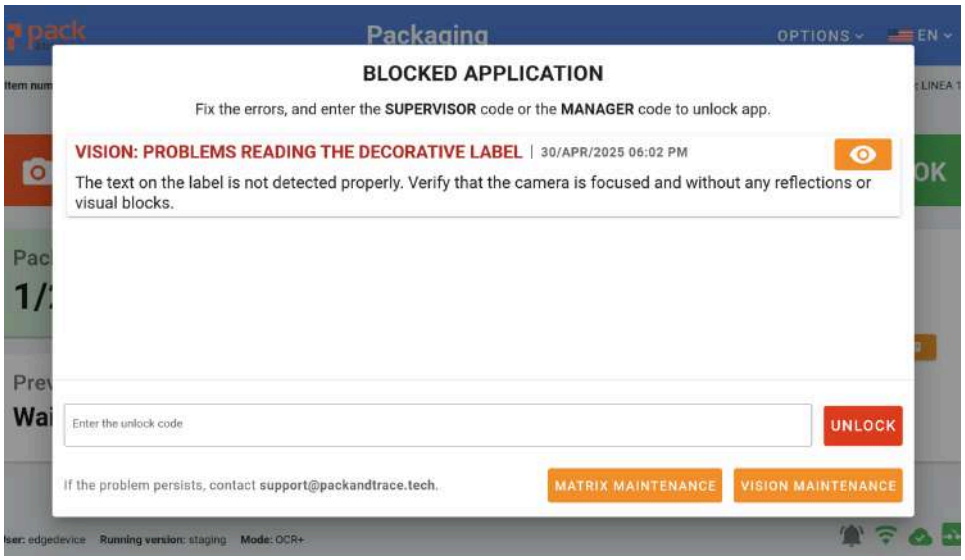
The  button opens a preview of the shot that triggered the error, which helps in resolving the issue.

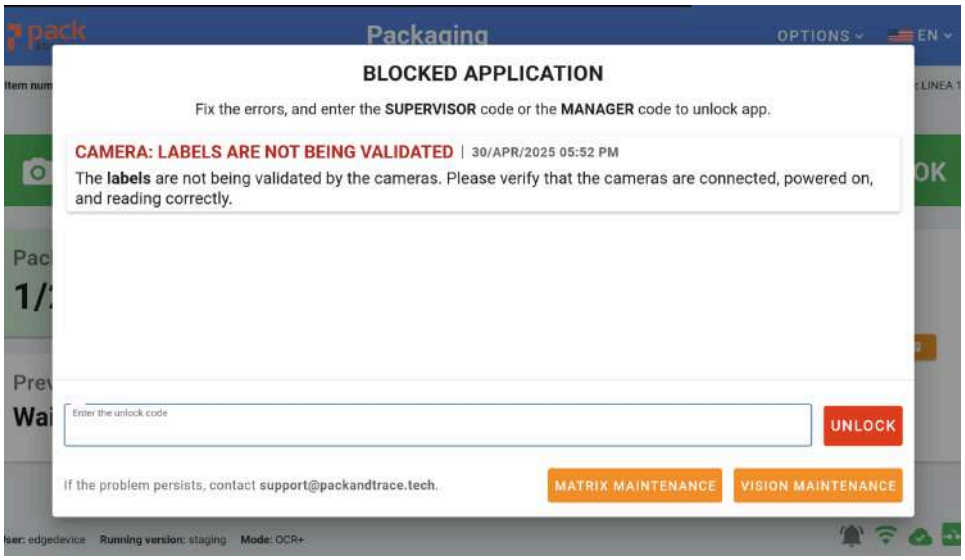


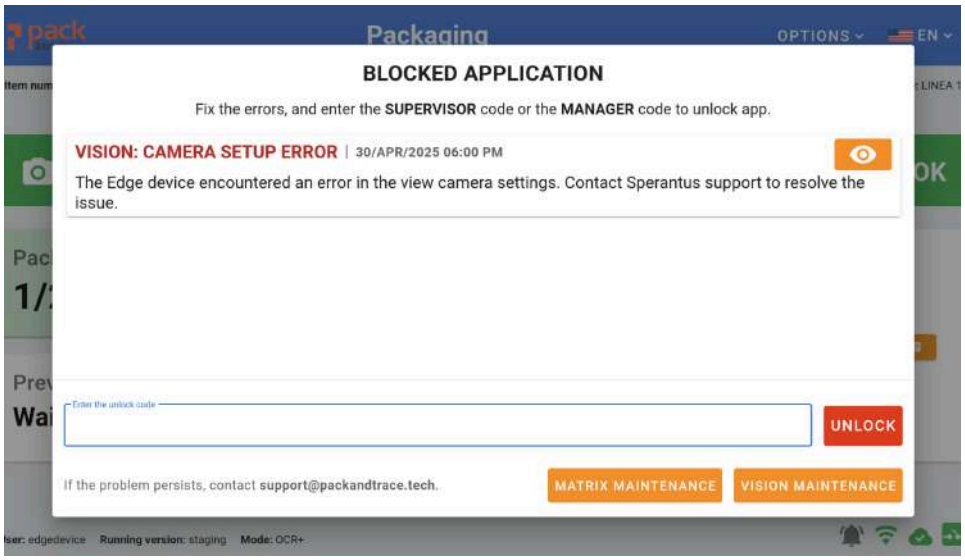


Other errors on vision camera

These errors are related to the operation of the camera or its trigger sensor. None of them cause the line to stop.







Label manual validation

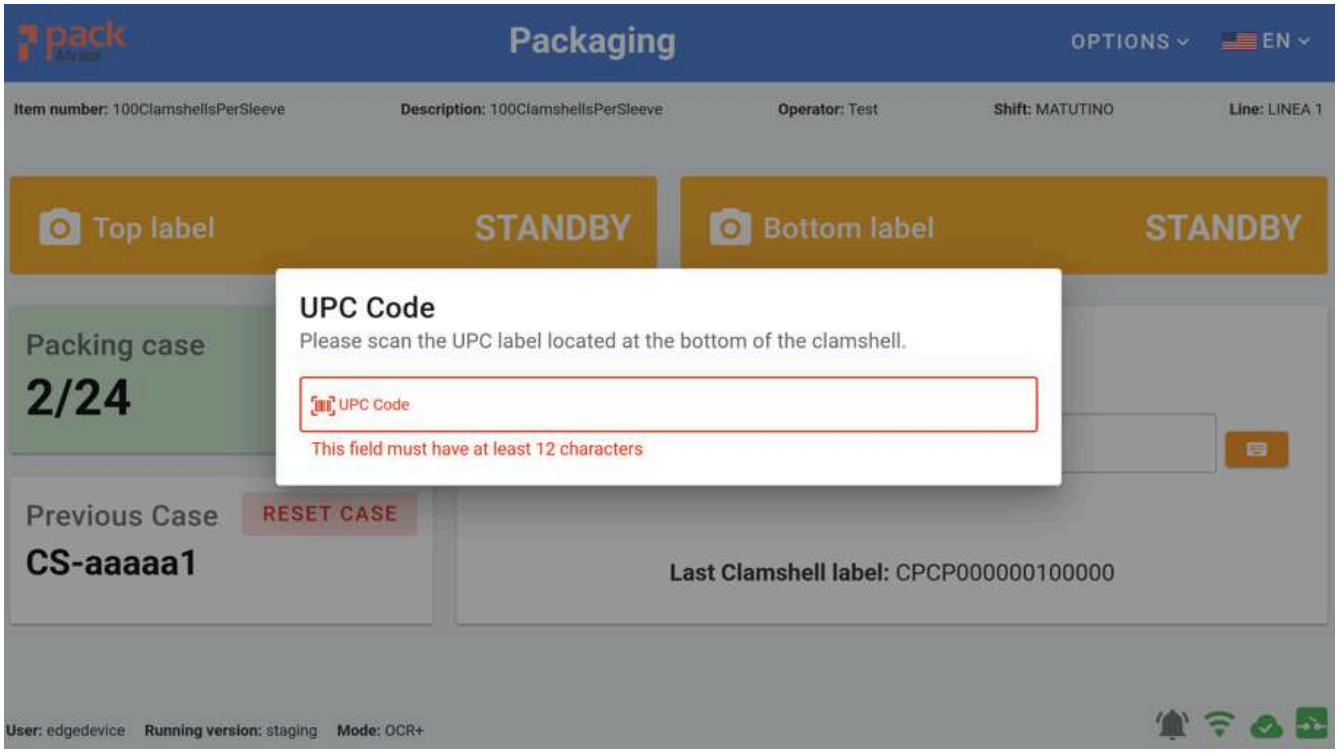
During the clamshell scanning process on the packaging screen, the system performs several checks to determine whether the clamshell's labels from the case can be validated by the Matrix and Vision cameras. If the system detects that some labels could not be validated, it will prompt the operator to perform one or more manual validations, depending on which labels failed validation.

If the manual validations fail, the system blocks and **will cause the line to stop *only* if the optional relay function is activated**.

Manual validation for UPC label

This validation is required when the system detects that the Matrix camera was unable to validate the clamshells' UPC codes.

1. A dialog will appear prompting the operator to scan the UPC label located at the bottom of the clamshell.



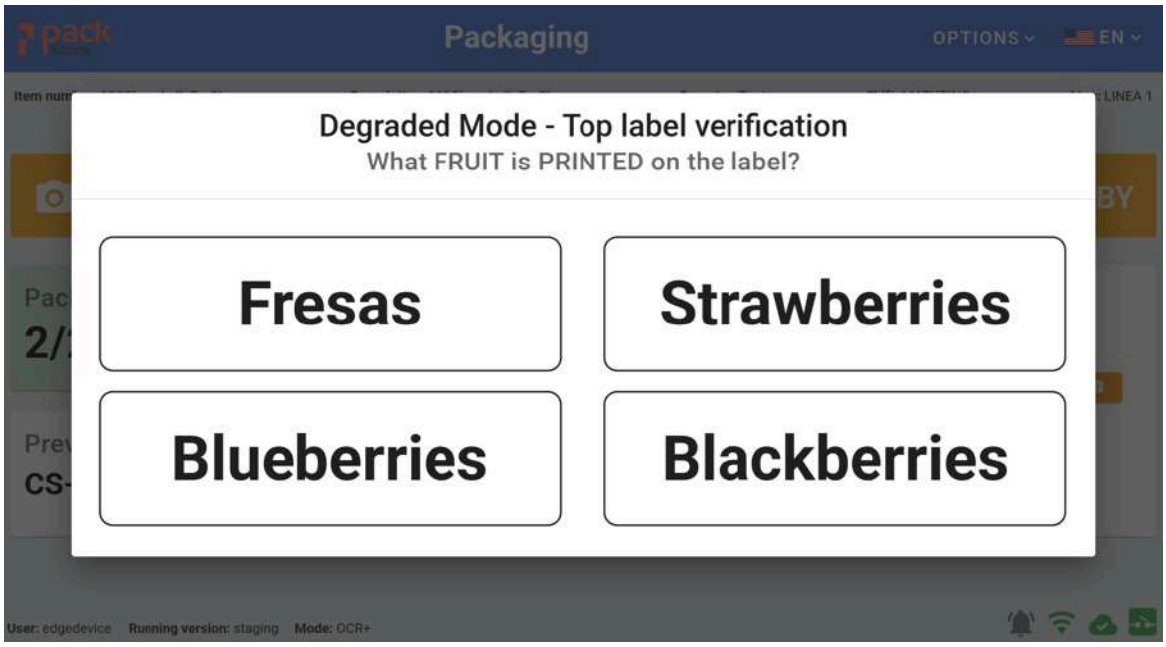
2. If the UPC matches the configured item, the dialog will close, and the operator can proceed with the packaging process. If the UPC does not match, the system will block and require the corresponding unlock code to continue.

Manual validation for top label

This validation is required when the system detects that the Vision camera was unable to validate the clamshells' top label.

Item with classic label (no QR)

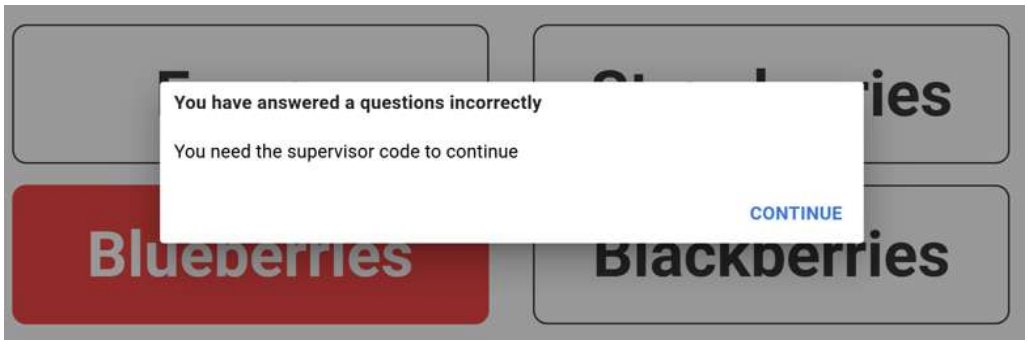
1. A dialog will appear prompting the operator to answer a quiz based on the top label data. The operator must select the correct answer by pressing the corresponding button.



   a. **If the answer is correct**, the system will proceed with the labeling process as normal.

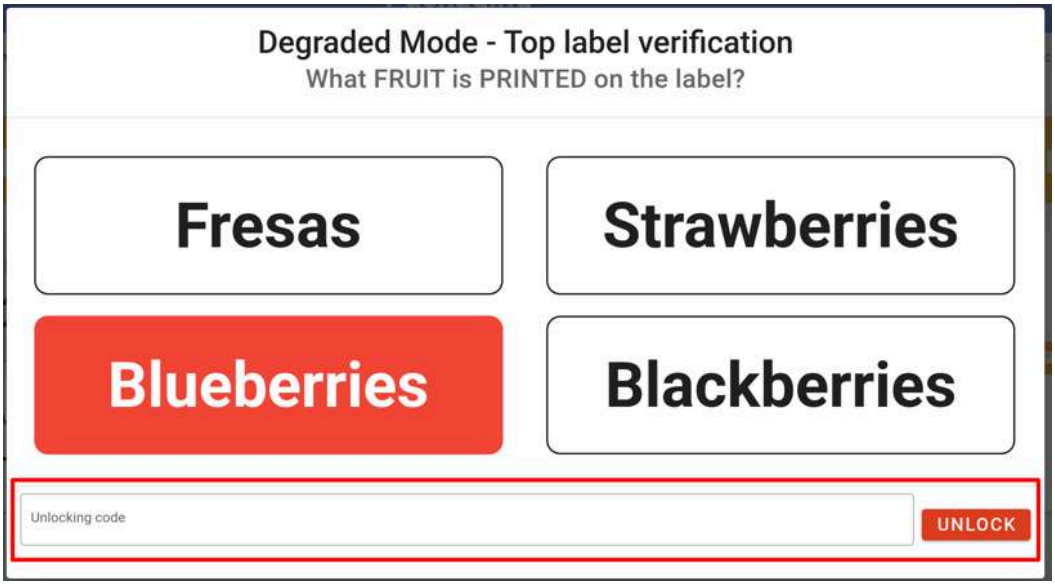
   b. **If the answer is incorrect**, the following will occur:

      i. A message will appear requesting the supervisor code.



      ii. Press the **CONTINUE** button to close the message.

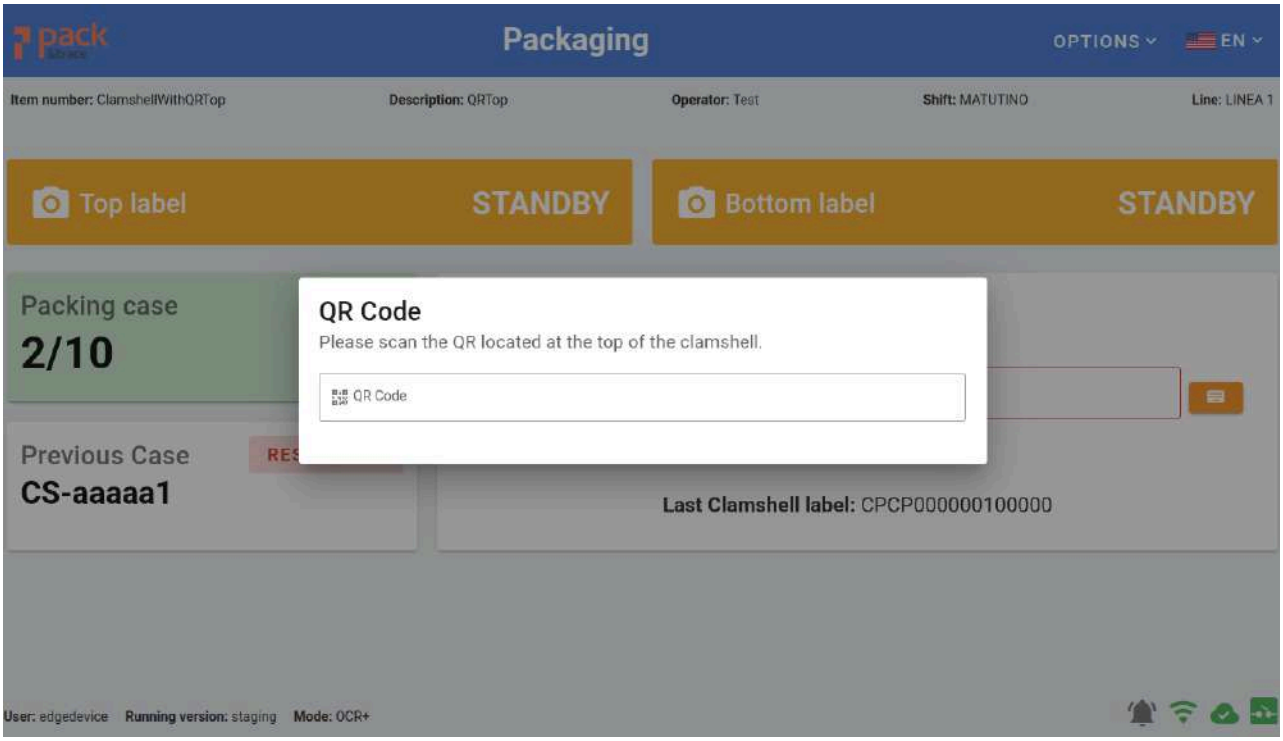
      iii. A text field will be displayed for scanning the supervisor code. Once scanned, the process will resume.



c. If the operator provides incorrect answers **three times**, the system will block and require the corresponding unlock code to continue.

Item with new label that includes a QR code

1. A dialog will appear prompting the operator to scan the QR located at the top of the clamshell.



2. If the QR data matches the configured item, the dialog will close, and the operator can proceed with the packaging process. If the QR data does not match the configured item, the system will block and require the corresponding unlock code to continue.

Maintenance mode

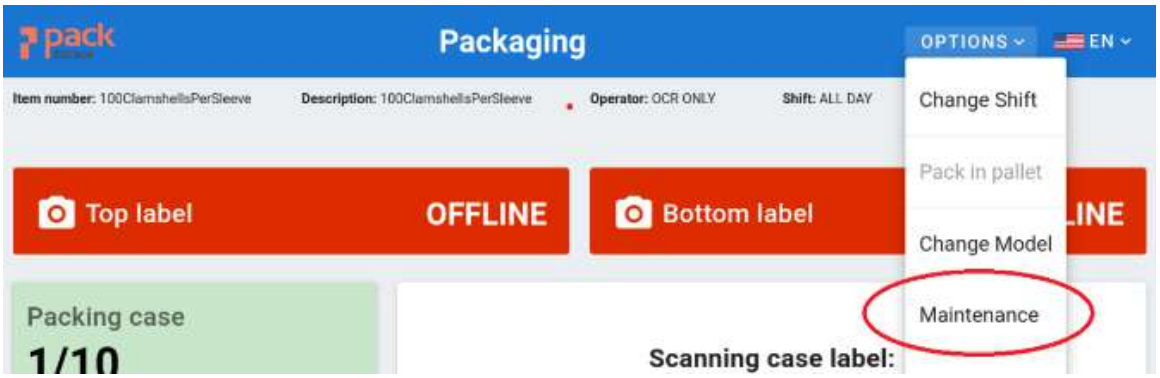
This option consolidates the **maintenance of the matrix camera, the OCR camera, and the relay that controls the line stopping.**

For camera maintenance, this mode allows adjustments without any interruptions from the system, as all alerts and locks will be stopped.

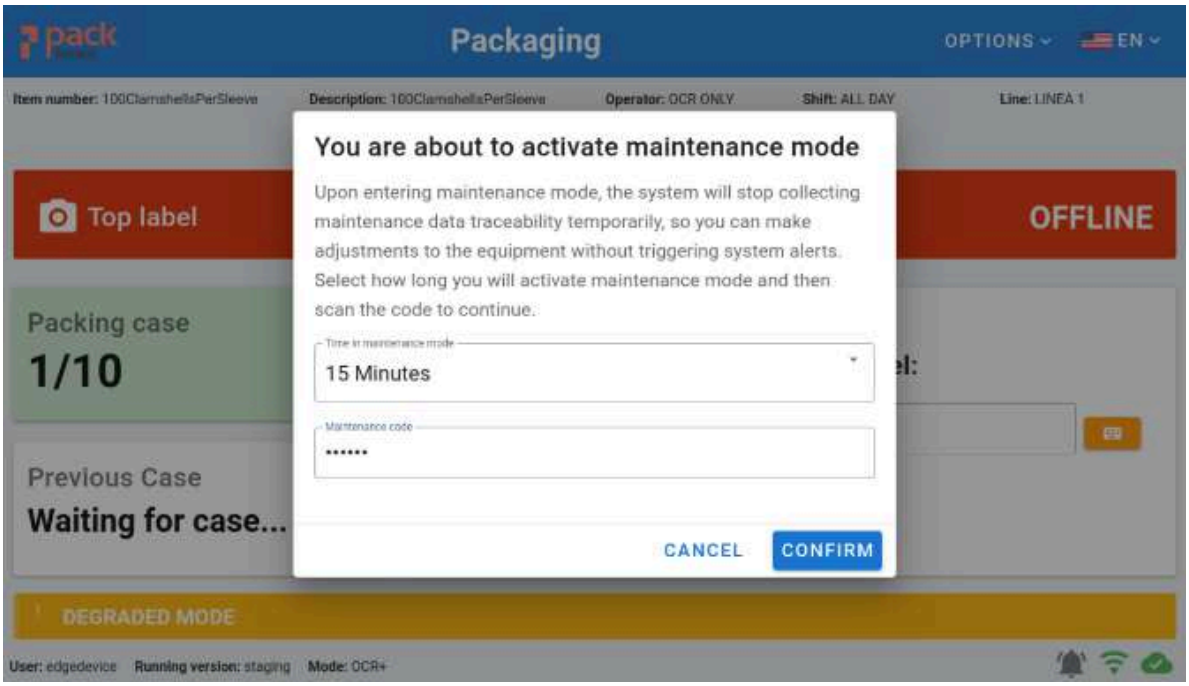
Regarding the relay, the maintenance mode will be used to test the proper functioning of the channels.

How to use the maintenance mode?

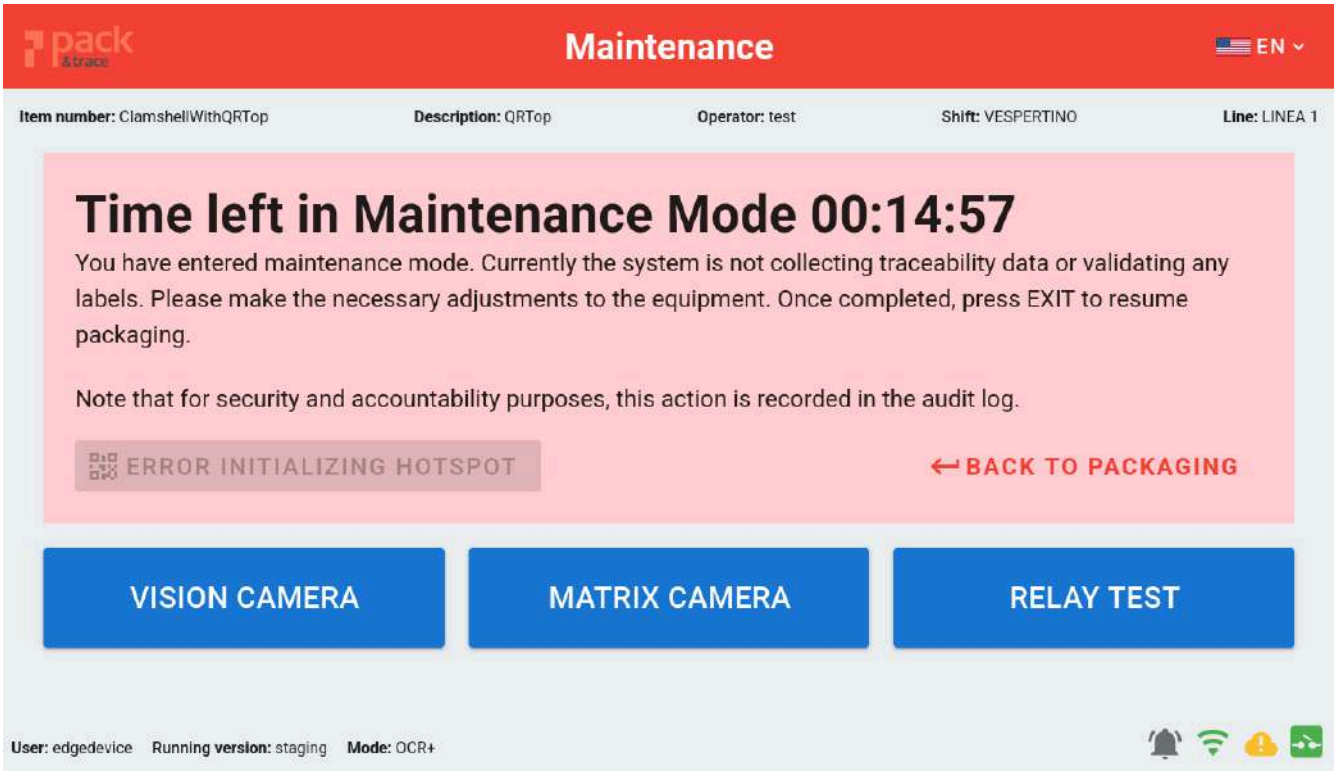
1. Press the **Options** button to open the dropdown menu, then select the **Maintenance** option.



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.

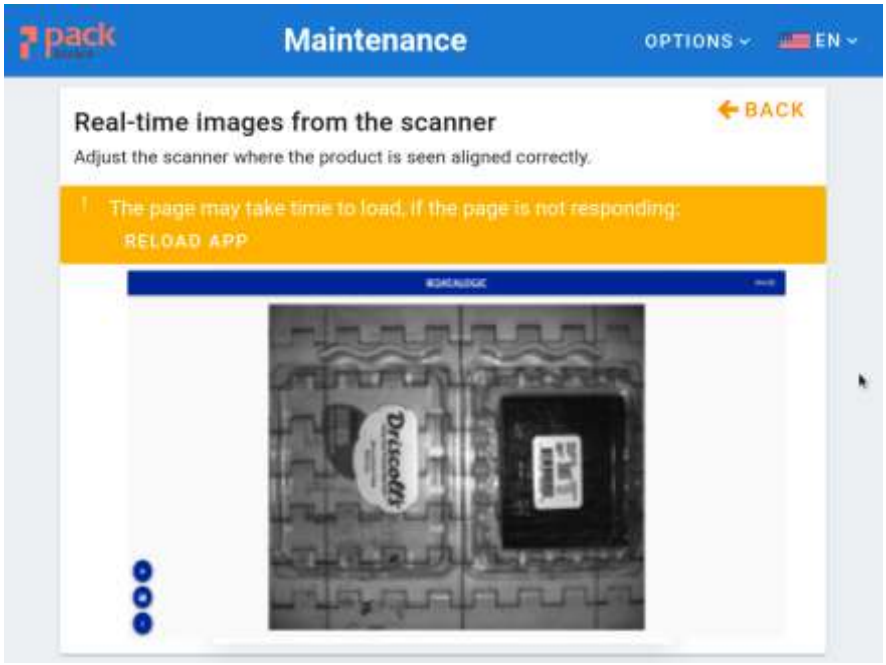


As indicated on the screen, no alerts will be sent, nor will the system be locked to facilitate work when adjustments are made to the labeller or cameras.

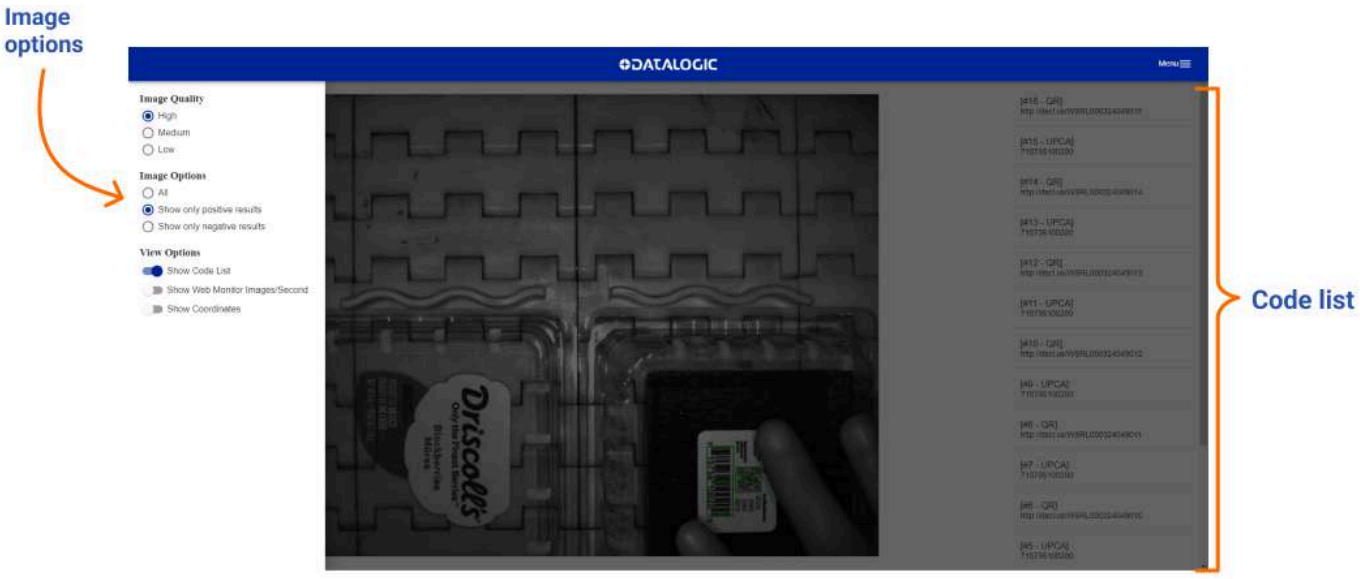
Likewise, **the system will NOT SAVE ANY INFORMATION that is scanned when in this mode**, so it is very important to be careful not to package products labeled in this mode.

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.

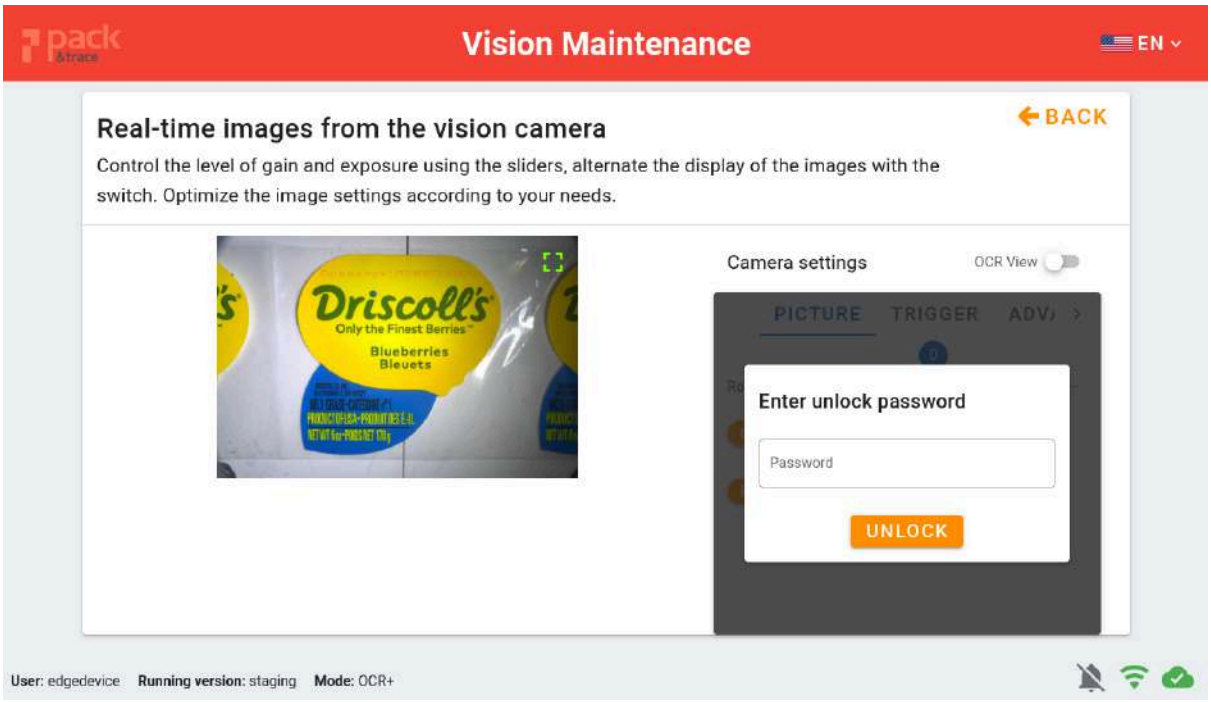


How should a properly scanned image look?

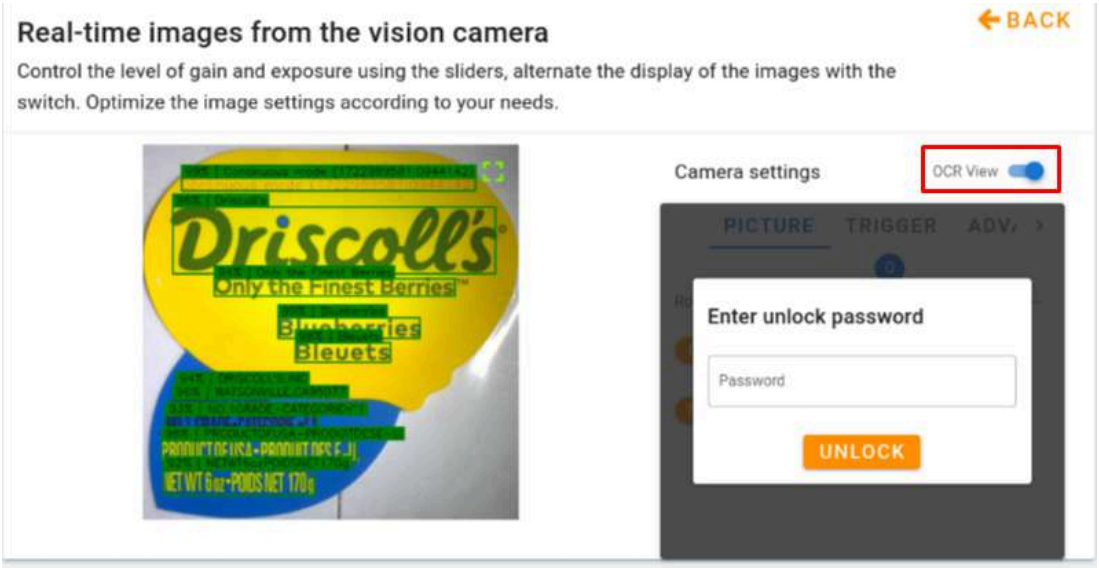
- The camera divides the image into two parts, left and right, in order to read the codes for Bottom (UPC) and Top (Decorative) labels. This allows us to determine, through the reading, which code corresponds to each type of label on either side.
- This setup also enables the reading of labels even if 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?

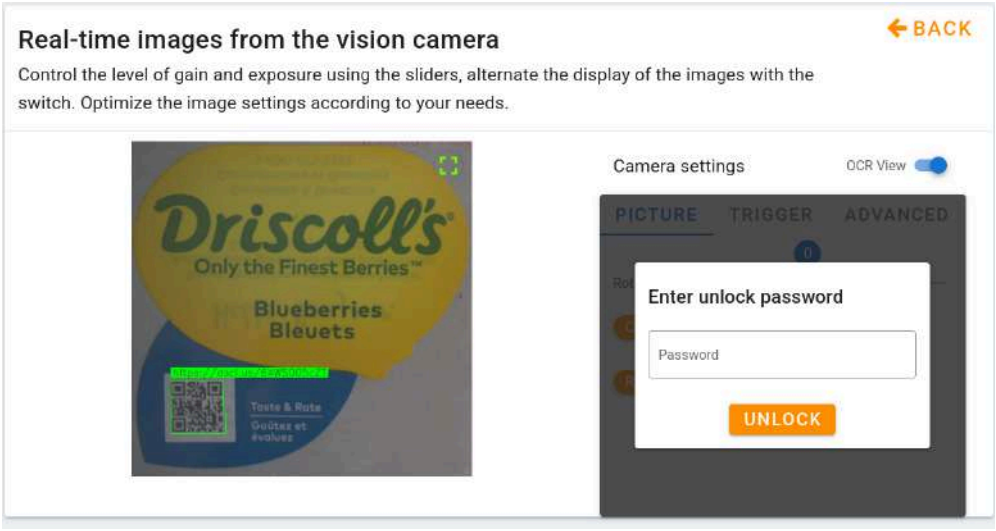
1. When opening the **vision camera settings**, the top labels captured by the camera will show, considering that only the label visible in the center provides the best possible image.



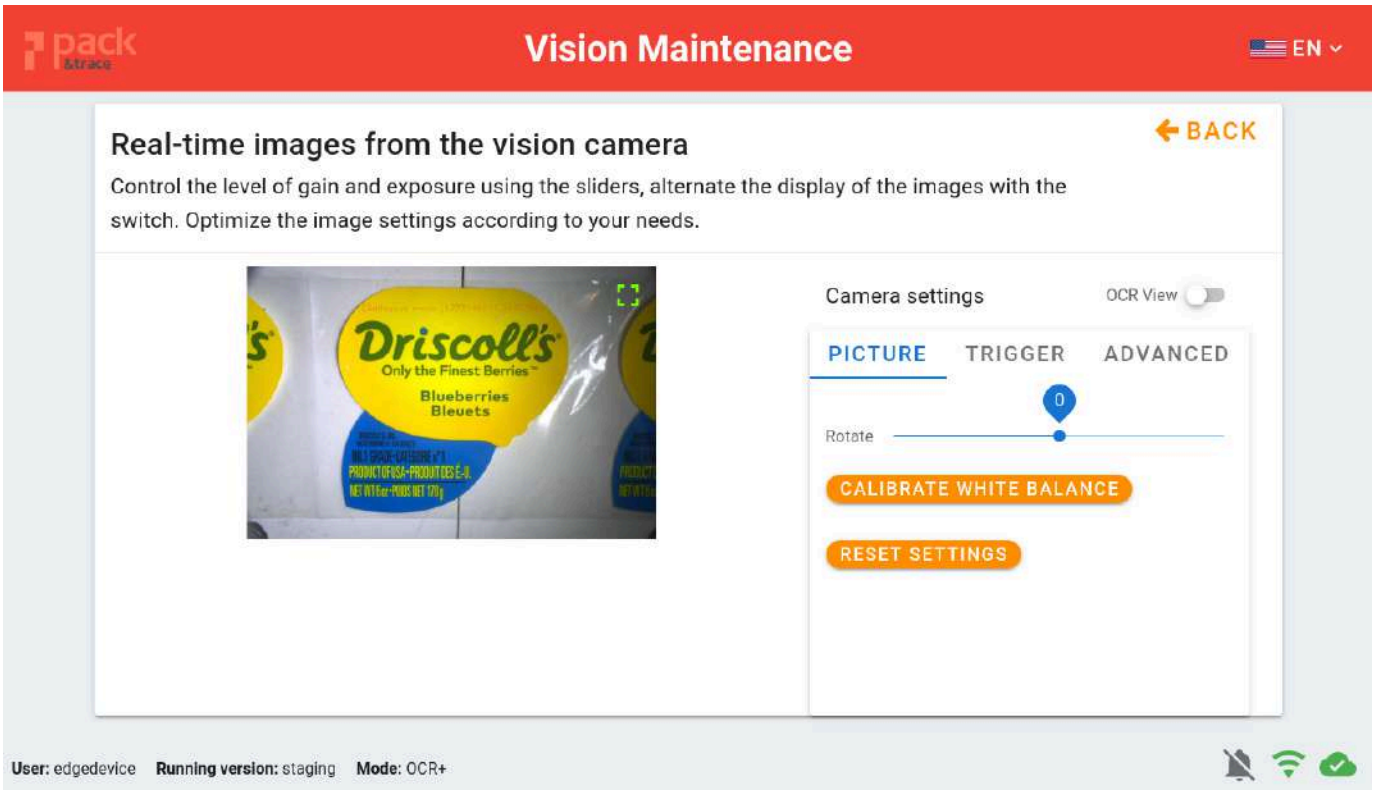
2. To verify the data captured by the OCR, toggle the OCR View switch. This will analyze the last image captured by the camera.
    a. If the captured label corresponds to an item that will have its full text analyzed, the entire label will be displayed, highlighting the detected text fields.



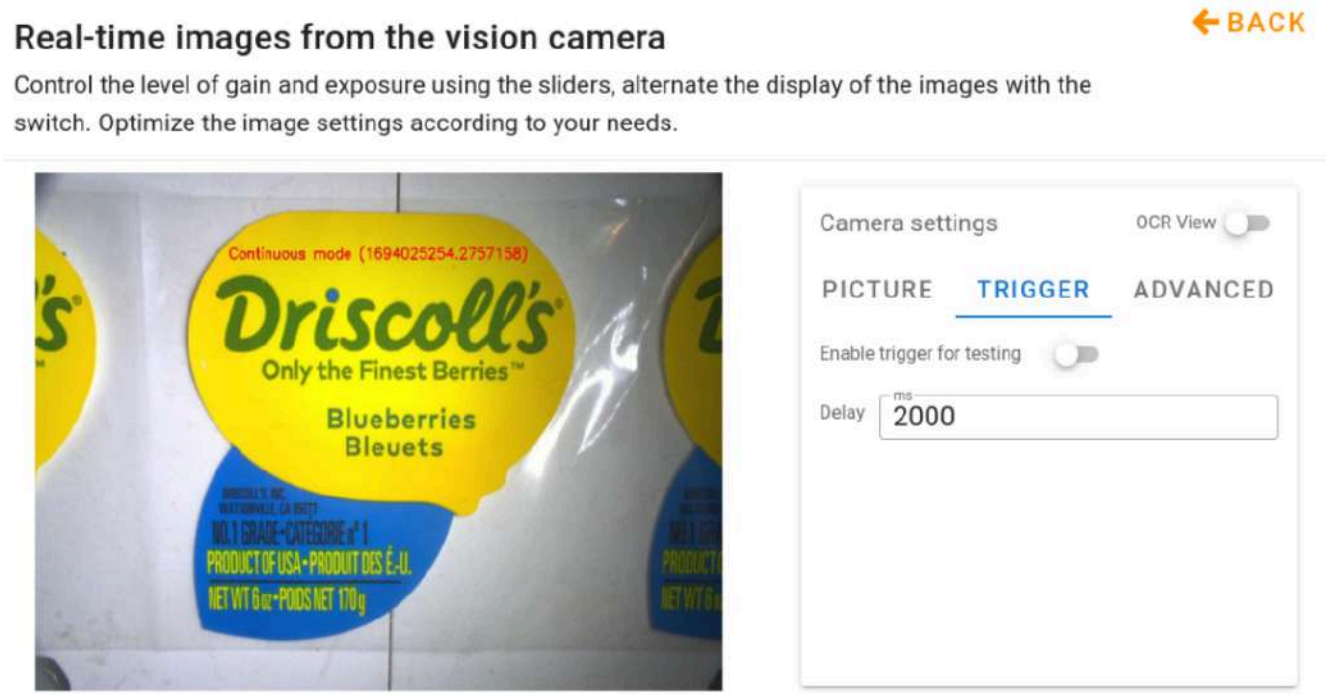
b. If the item has a decorative label with a QR code, only the code and its reading will be highlighted.



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.

How to test the relay in maintenance mode?

1. To test the general operation of the channels, press theses buttons,

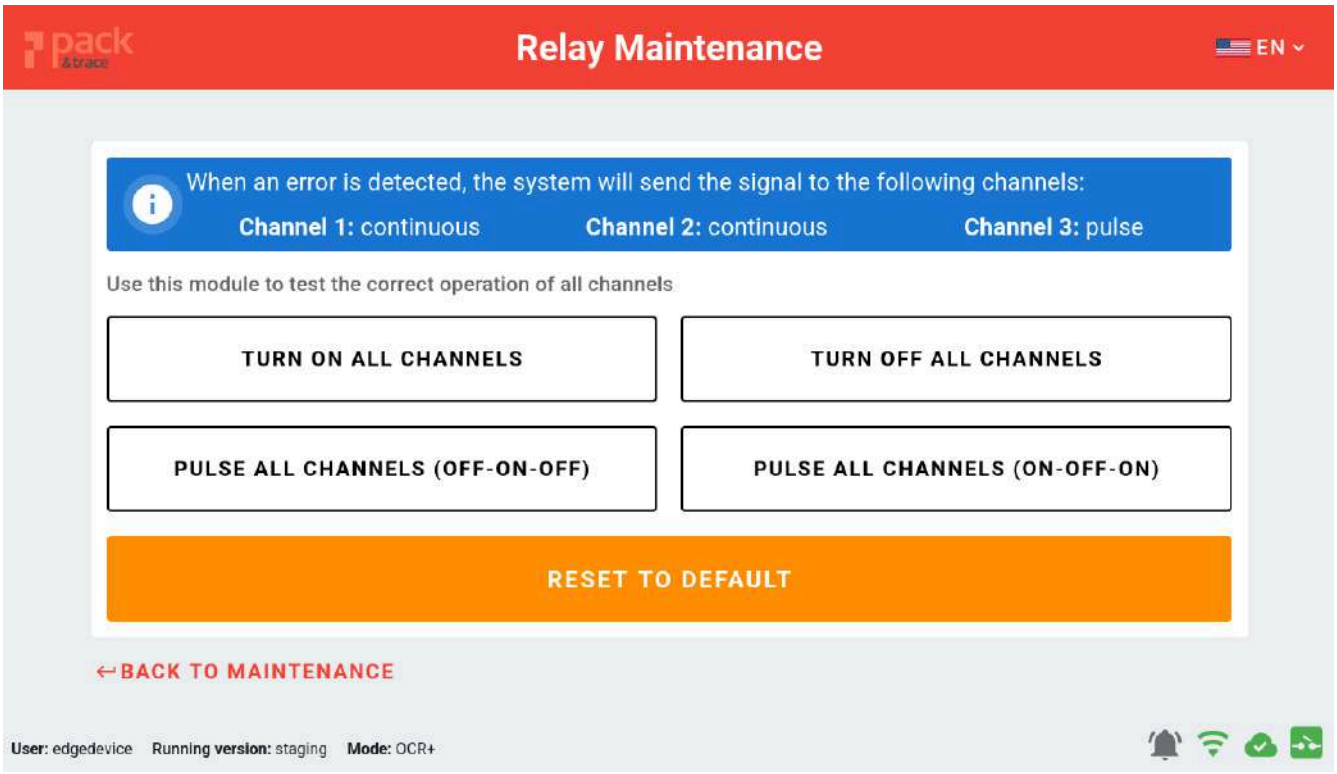
TURN ON ALL CHANNELS	TURN OFF ALL CHANNELS

   which will send a signal to all the relay channels, activating or deactivating them as indicated on the button. This change will be visible on the channel LEDs on the device.
2. To test the pulse on the channels, press these buttons,

PULSE ALL CHANNELS (OFF-ON-OFF)	PULSE ALL CHANNELS (ON-OFF-ON)

   which will send a pulse to all the relay channels, according to the order indicated on the button. This change will also be visible on the device's LEDs.
3. To restore the relay to its default state, press the "Reset to Default" button.
4. To end the tests, press this button ↩BACK TO MAINTENANCE

It is important to note that although the signals will be sent to all channels during these tests, **the system actually sends the line stop error signals through channels 1, 2, or 3**, depending on how the relay is installed.

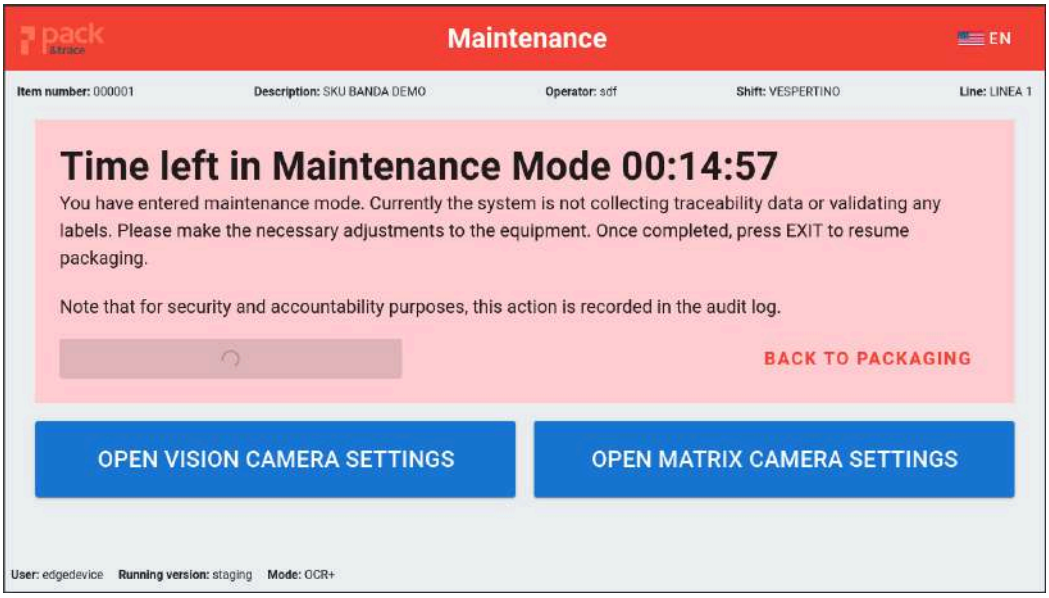


Hotspot for Vision camera visualization

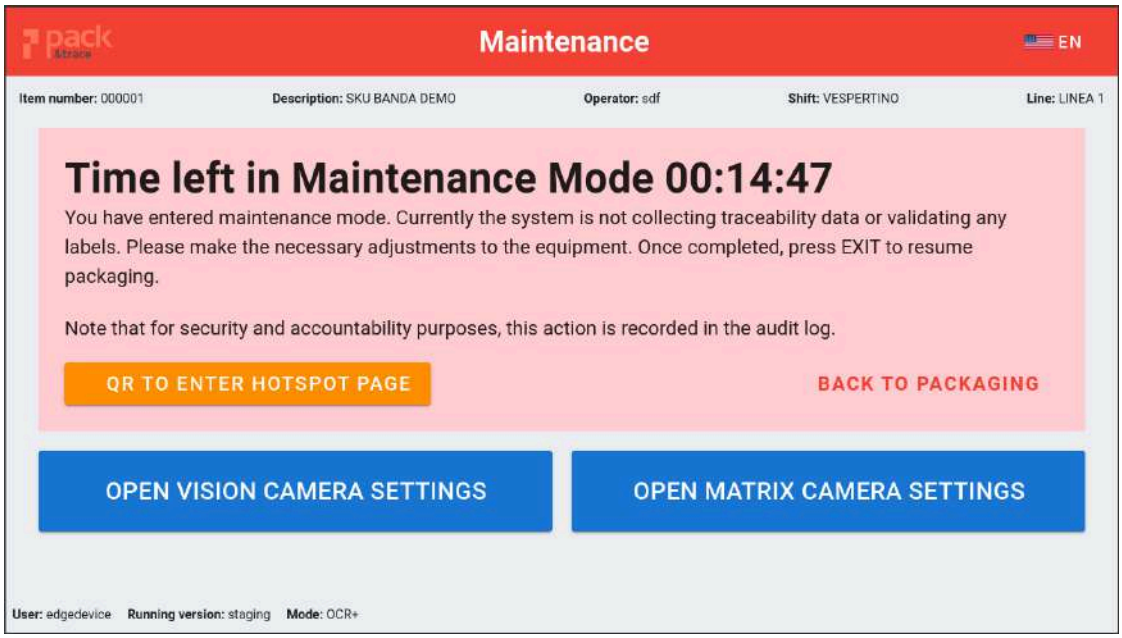
In maintenance mode, you'll not only have access to the camera's configuration but also be able to activate a hotspot. This will enable remote viewing of the images captured by the vision camera and allow for adjustments as needed.

How to use the hotspot?

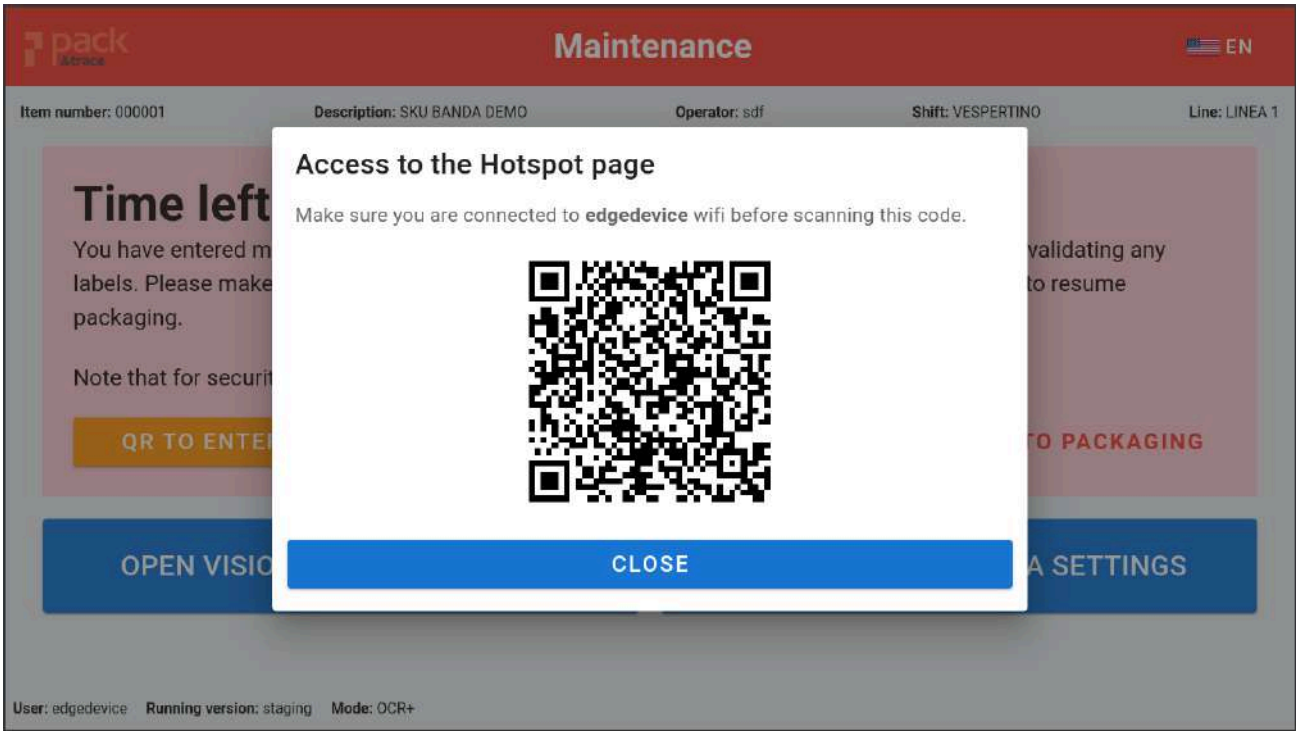
1. Enter maintenance mode by pressing the Options button. Then wait for the gray button to load.



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

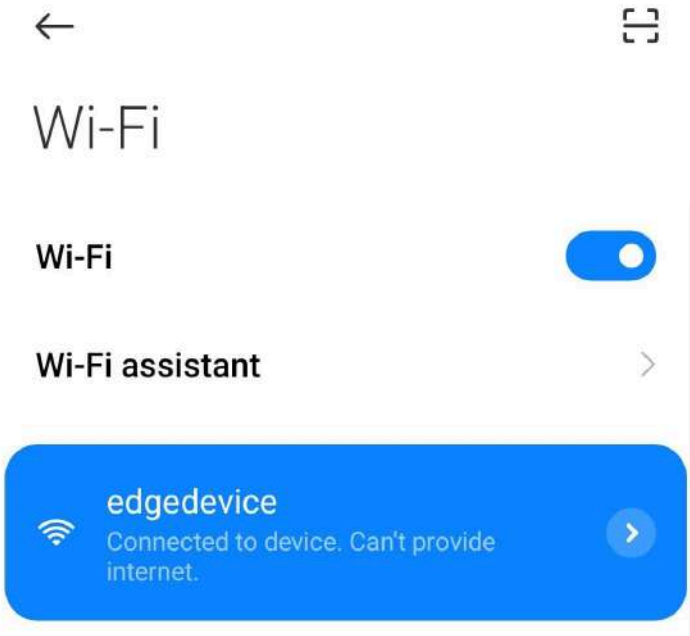


3. A pop-up window will open displaying important information:
    a. The name of the Wi-Fi network you need to connect to on your mobile device to access the hotspot.
    b. A QR code that, when scanned, will direct you to the webpage for viewing the vision camera's output.

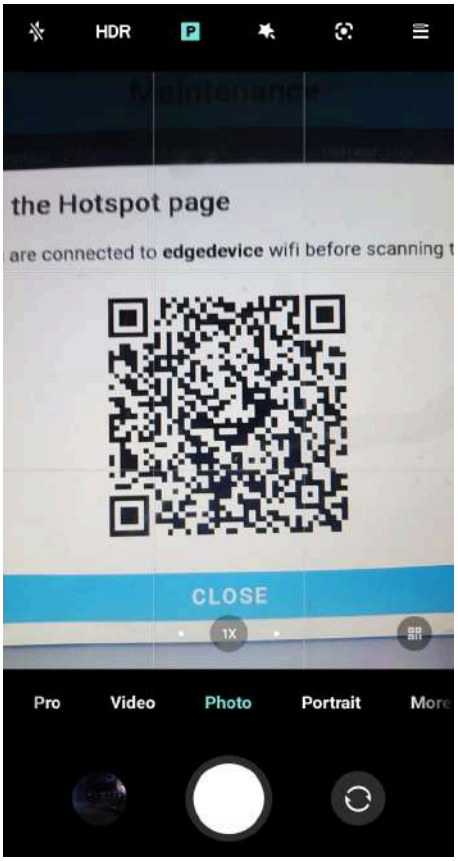


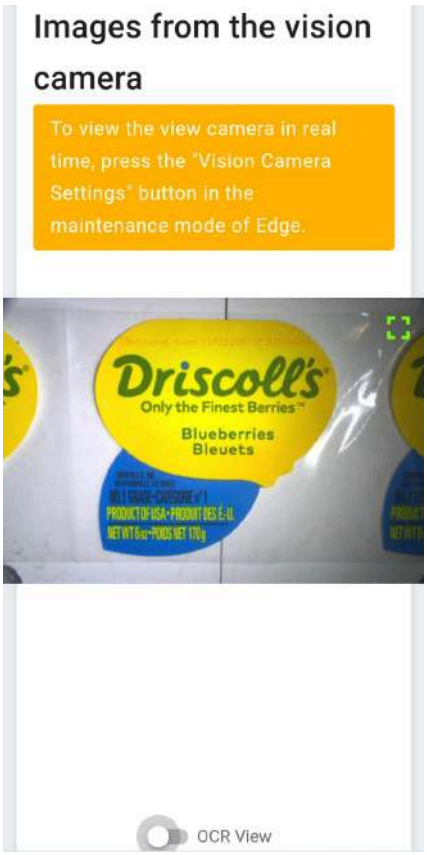
Please note that when the maintenance mode countdown ends, or if you exit the screen, the hotspot will stop.

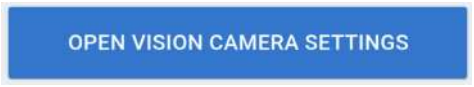
4. On your mobile device, go to the Wi-Fi settings and connect to the network displayed on the Edge machine.



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

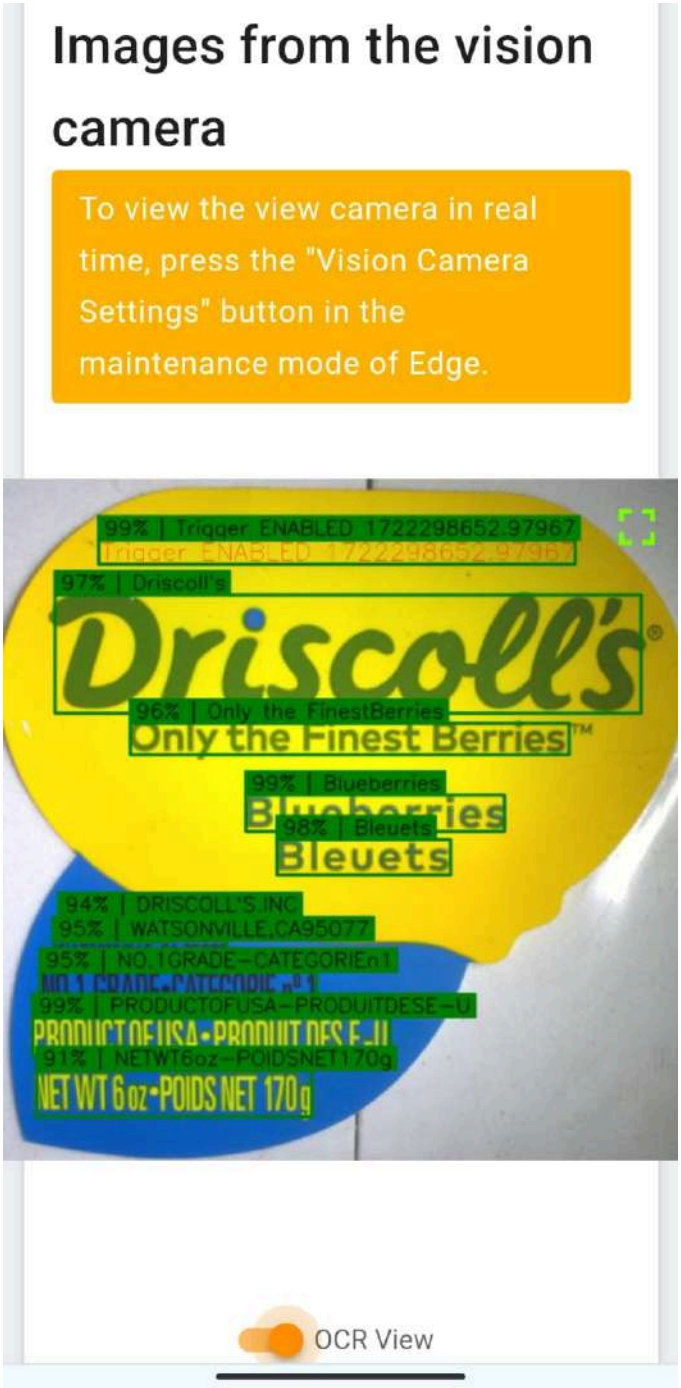




6. On the Edge machine, press the button 

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.

Degraded Mode

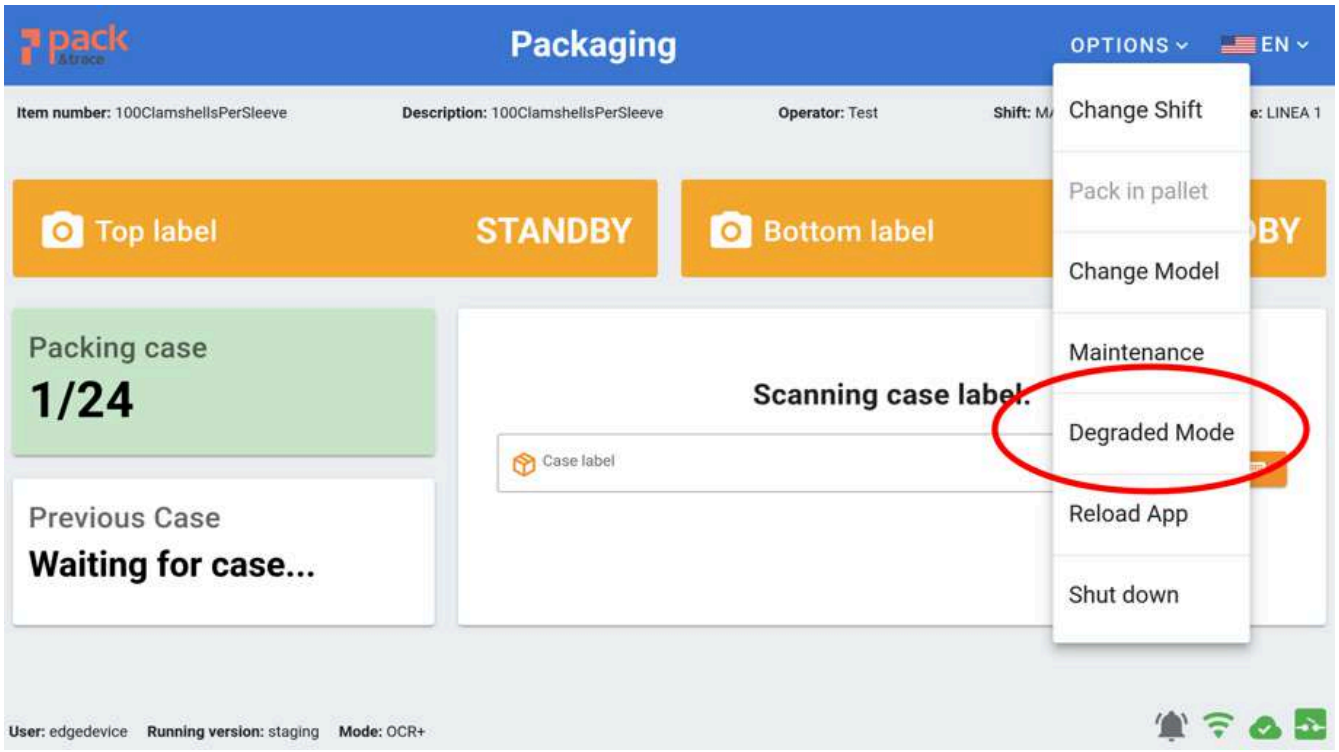
This option allows the complete deactivation of Matrix and Vision camera validations. In this mode, the operator manually validates both the top and bottom labels of the clamshells.

Degraded Mode is intended for scenarios where the cameras are unable to reliably read the clamshells, and the issue cannot be resolved in the short term. It enables the packaging process to continue without repeated system interruptions.

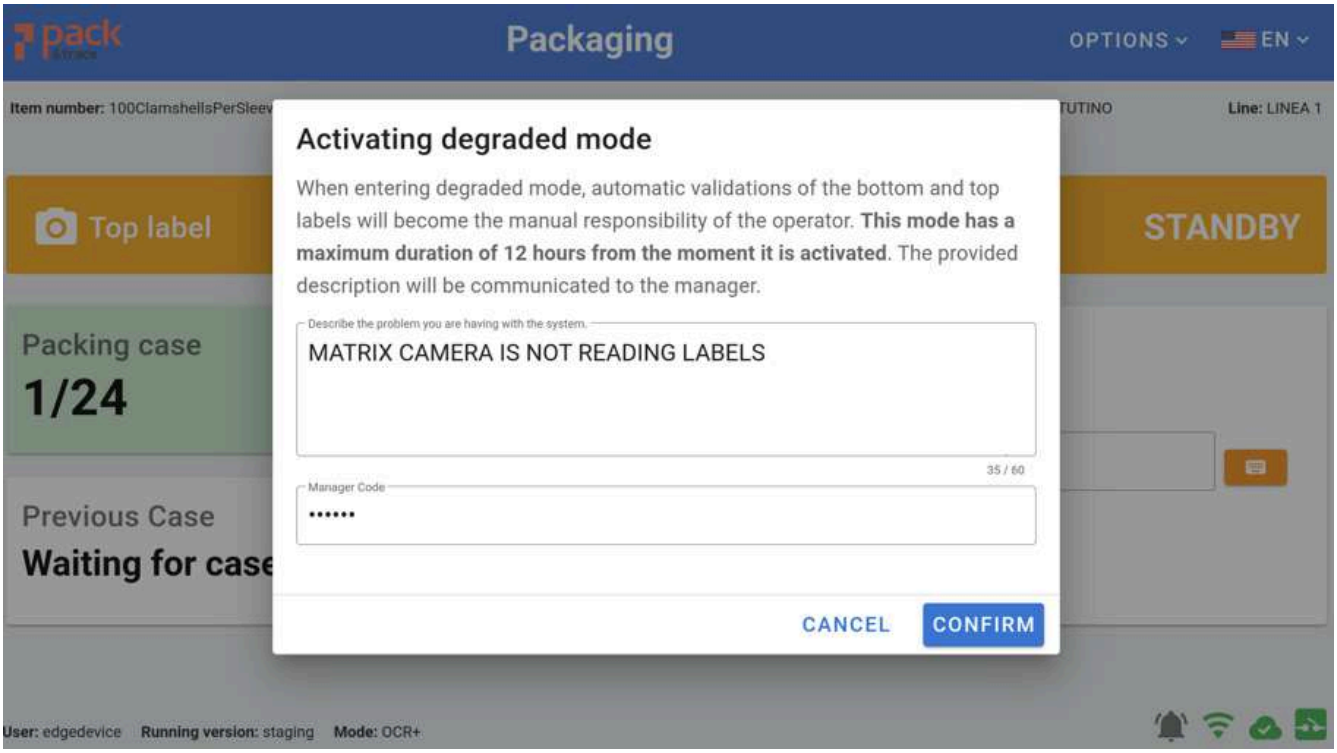
How to activate the degraded mode?

Due to the risks of continuing the packaging process without camera validations, **Degraded Mode should only be used as a last resort—after all efforts to restore camera functionality have been exhausted.**

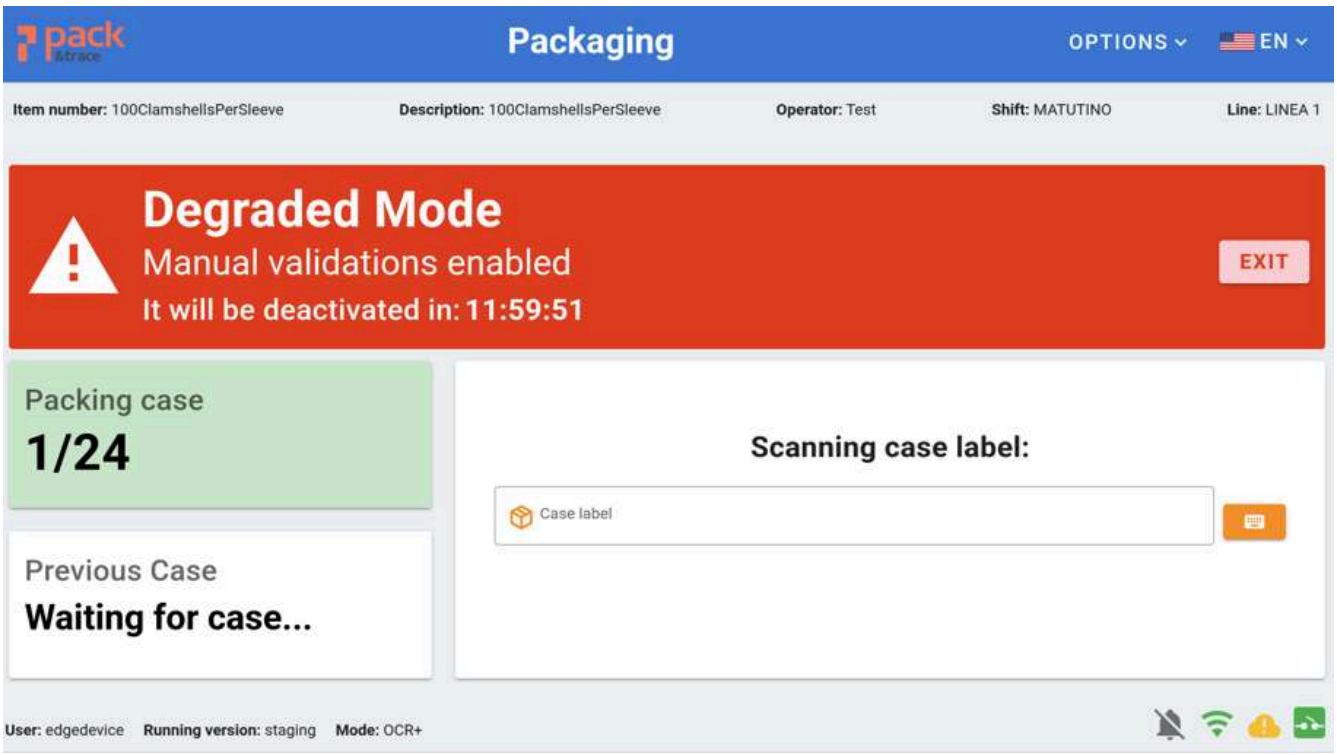
1. Press the **Options** button to open the dropdown button, and select the **Degraded Mode** option (available for Barcode and OCR+ versions only).



2. Enter a reason for activating the degraded mode. Then confirm the action by entering the password (credentials will be provided separately)



3. Once activated, a red banner will appear at the top of the screen indicating that Degraded Mode is active.



Manual validations in degraded mode

While Degraded Mode is active, all camera validations are disabled. Instead, the operator must manually validate that clamshells are correctly labeled:

- Bottom (UPC) Label: Manual validation is required for each case.
- Top Label: Manual validation is required every three cases.

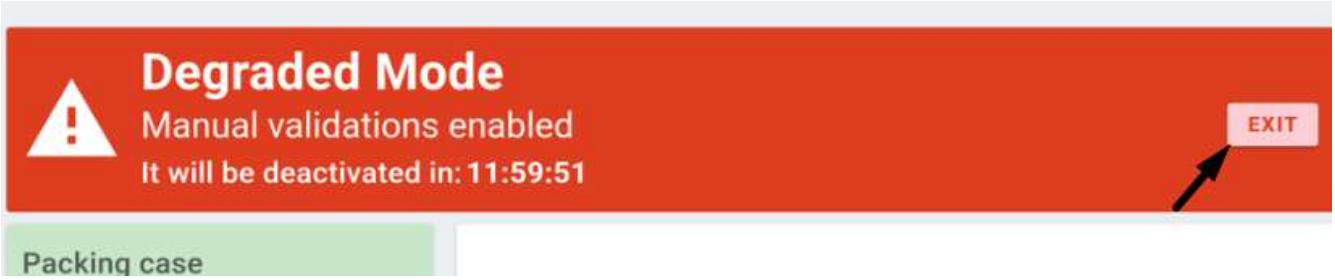
For detailed instructions, refer to the Label Manual Validation section.

How to deactivate the degraded mode?

Degraded Mode will deactivate automatically once the countdown displayed in the top banner ends.

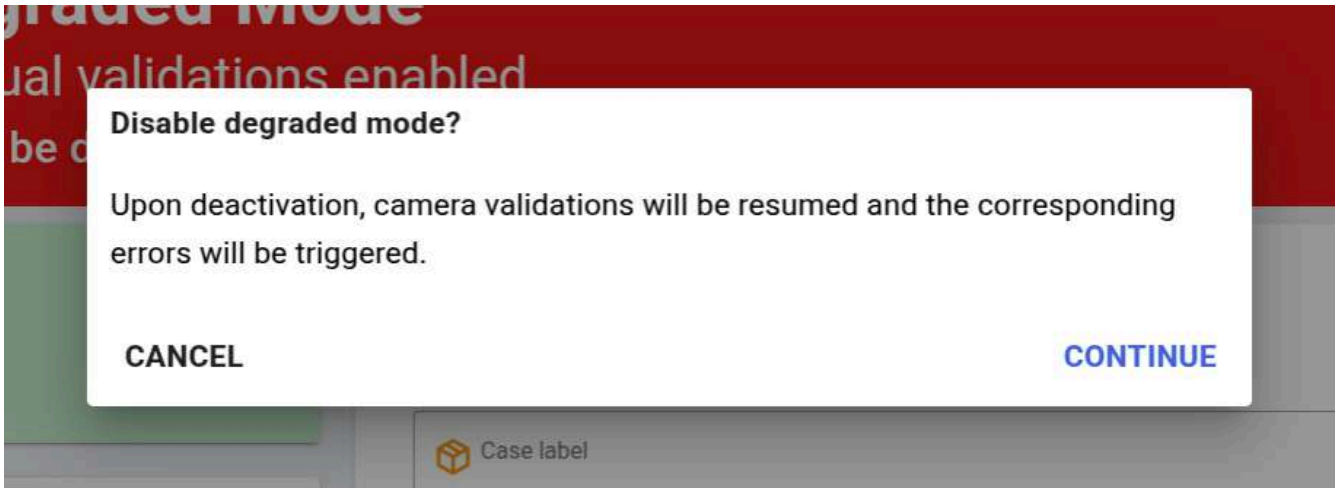
To deactivate it manually before the countdown ends:

1. Press the **EXIT** button located on the right side of the red banner.



2. A confirmation message will appear.

3. Press the **Continue** button to close the message and exit Degraded Mode.

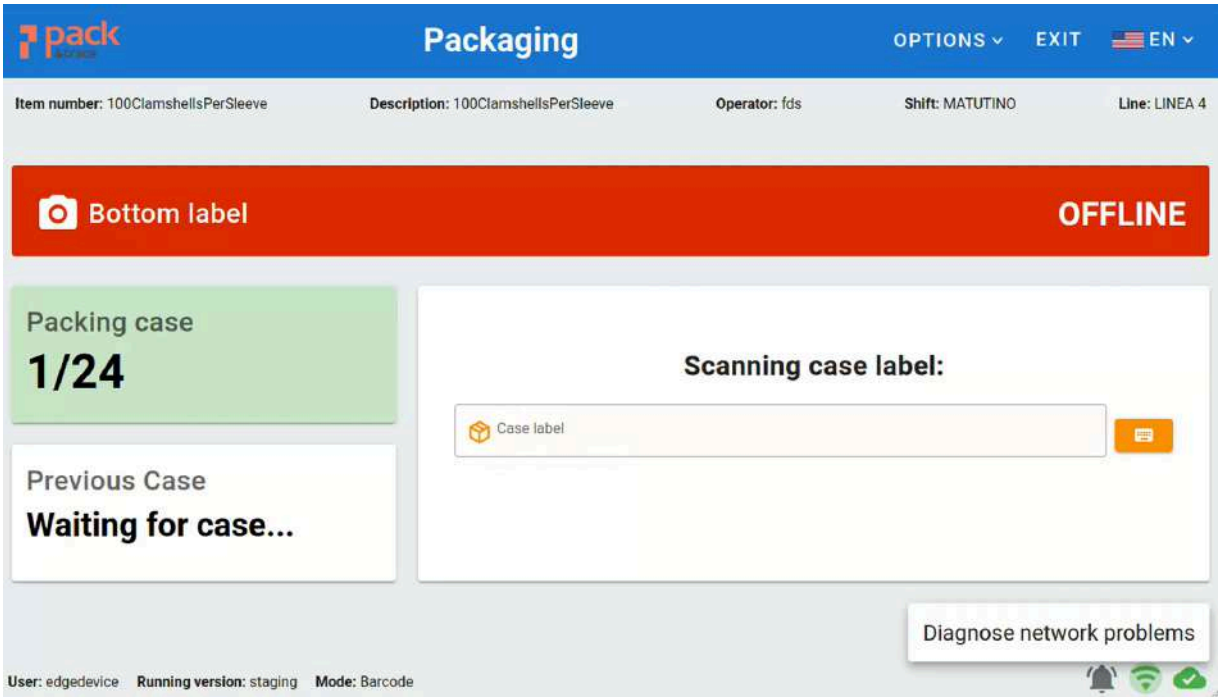


Network Diagnostics

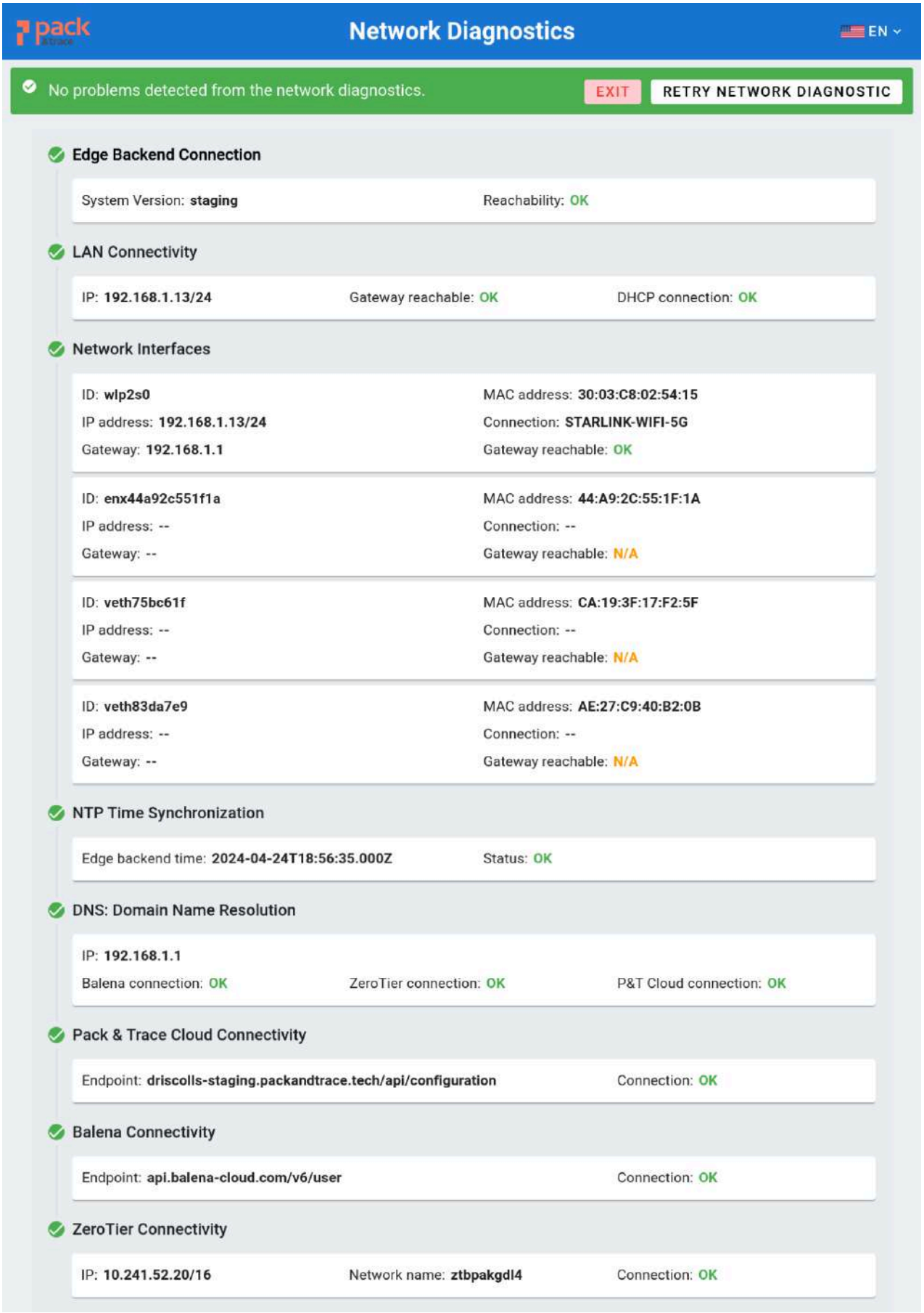
This function allows the system to run a review of the different points with which the system is kept running and connected to the internet. The results provided by this review will help facilitate troubleshooting by both the internal maintenance team and the Sperantus support team.

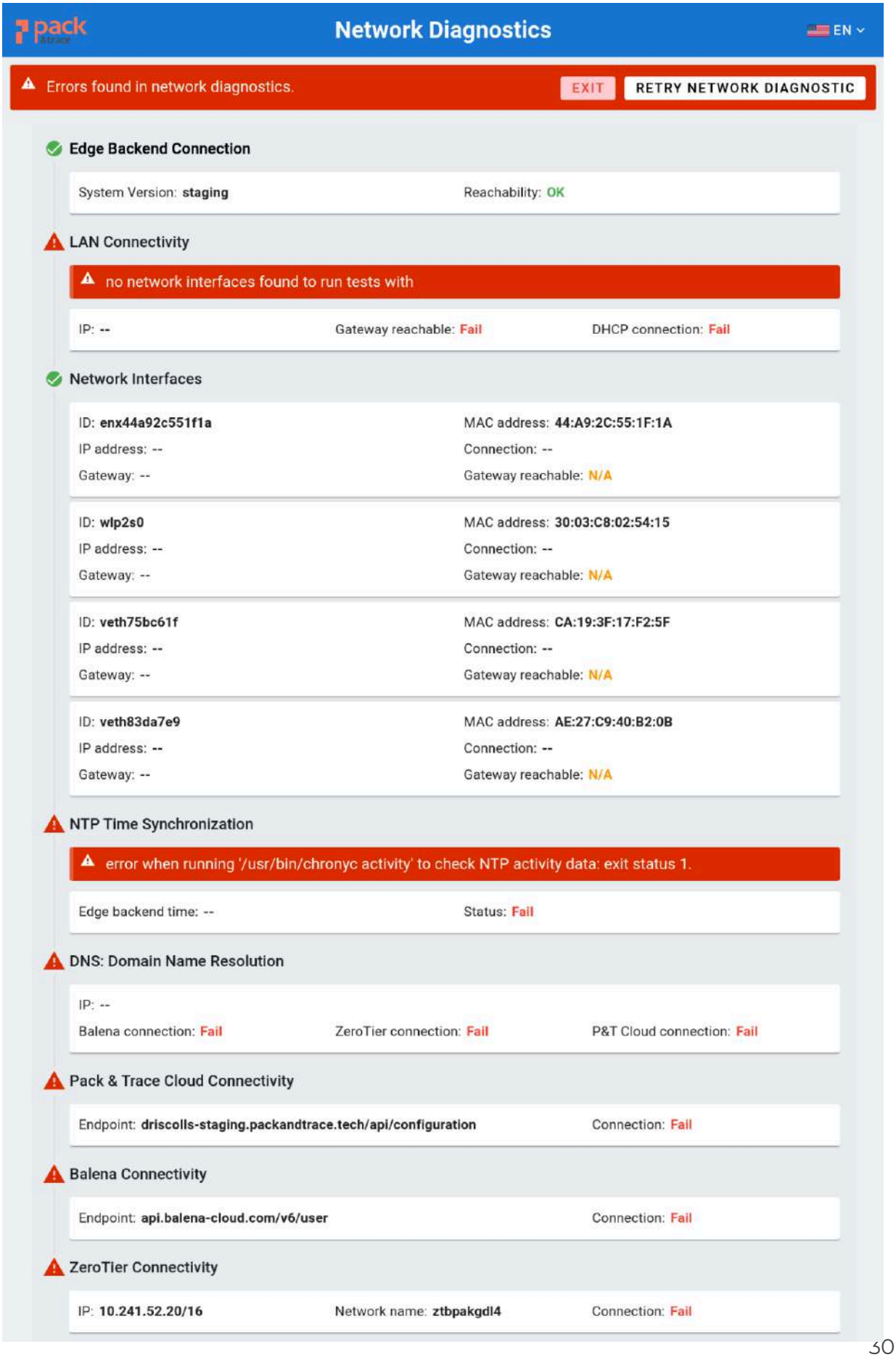
How to use the network diagnostics?

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.

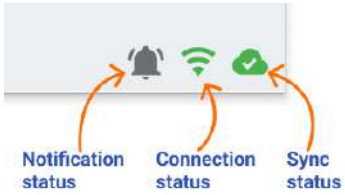

pack trace
Network Diagnostics
EN
No problems detected from the network diagnostics.
EXIT
RETRY NETWORK DIAGNOSTIC
Edge Backend Connection
System Version: staging
Reachability: OK
LAN Connectivity
IP: 192.168.1.13/24
Gateway reachable: OK
DHCP connection: OK
Network Interfaces
ID: wlp2s0
MAC address: 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


pack
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

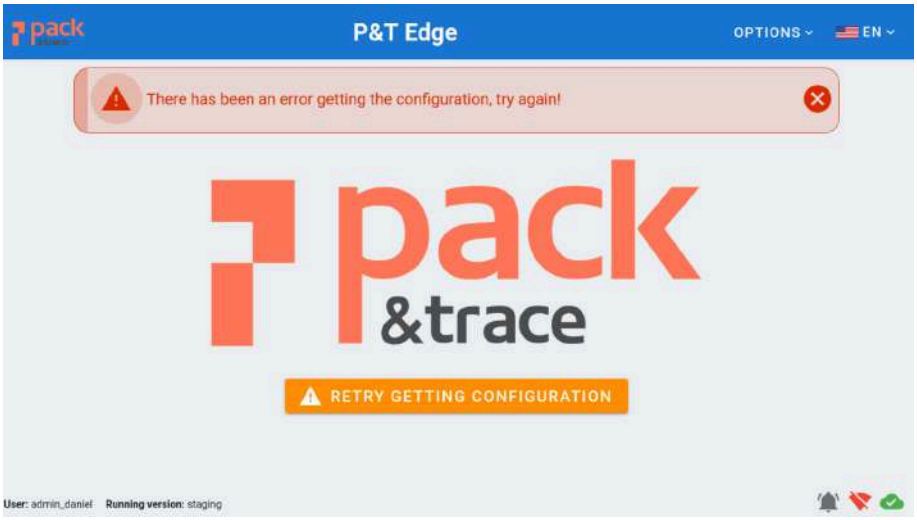
3. To continue the packaging process, you will need to close the network diagnostics by pressing the EXIT button. If the diagnosis is required again, then press the button RETRY NETWORK DIAGNOSTIC.

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.



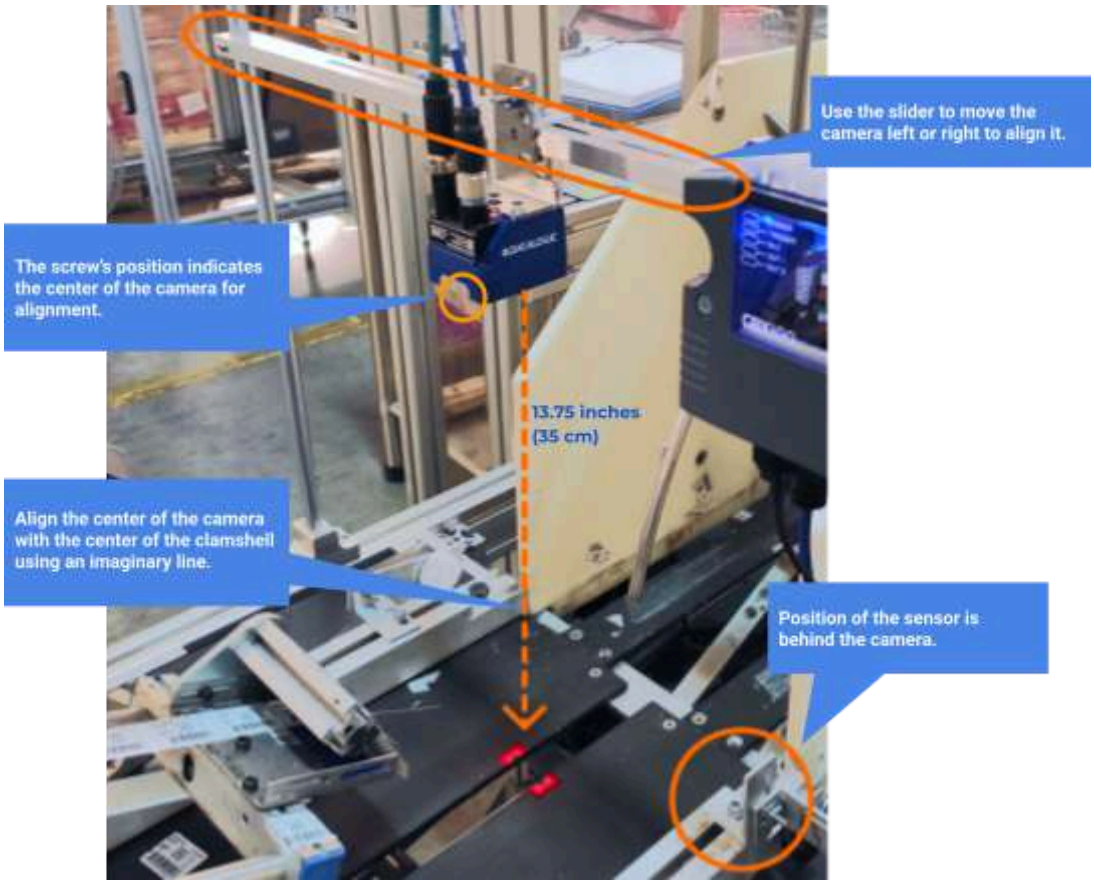
Hardware maintenance references

Installation Best Practices

Matrix - Traditional setup

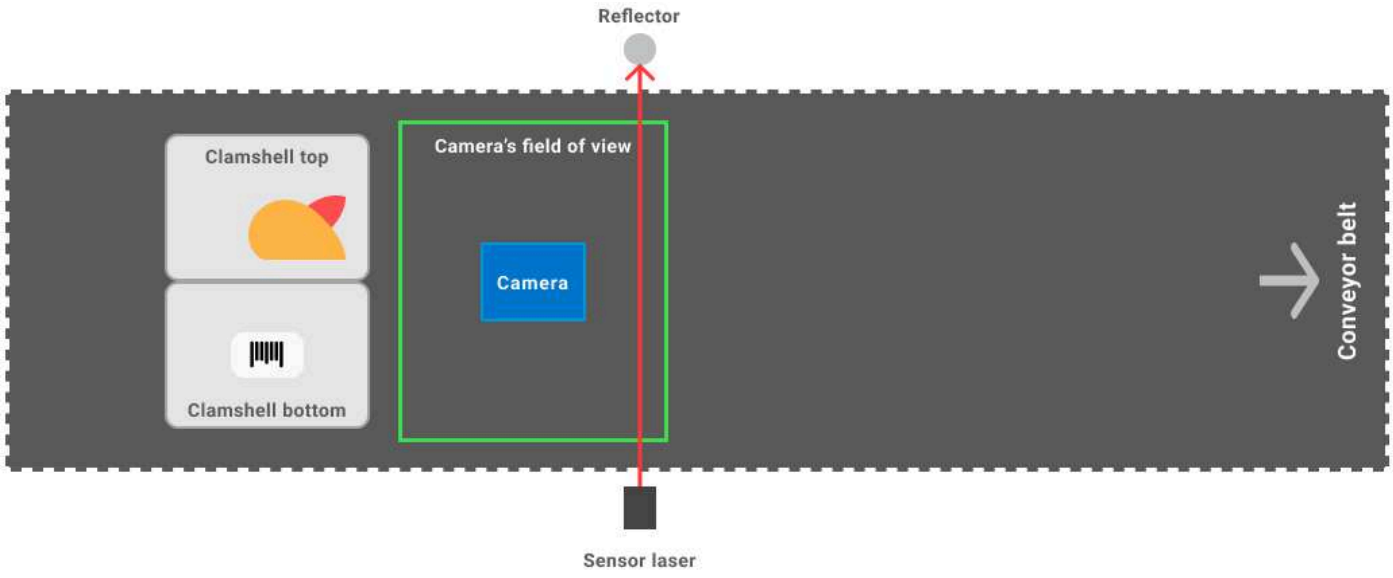
Camera

- 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**.



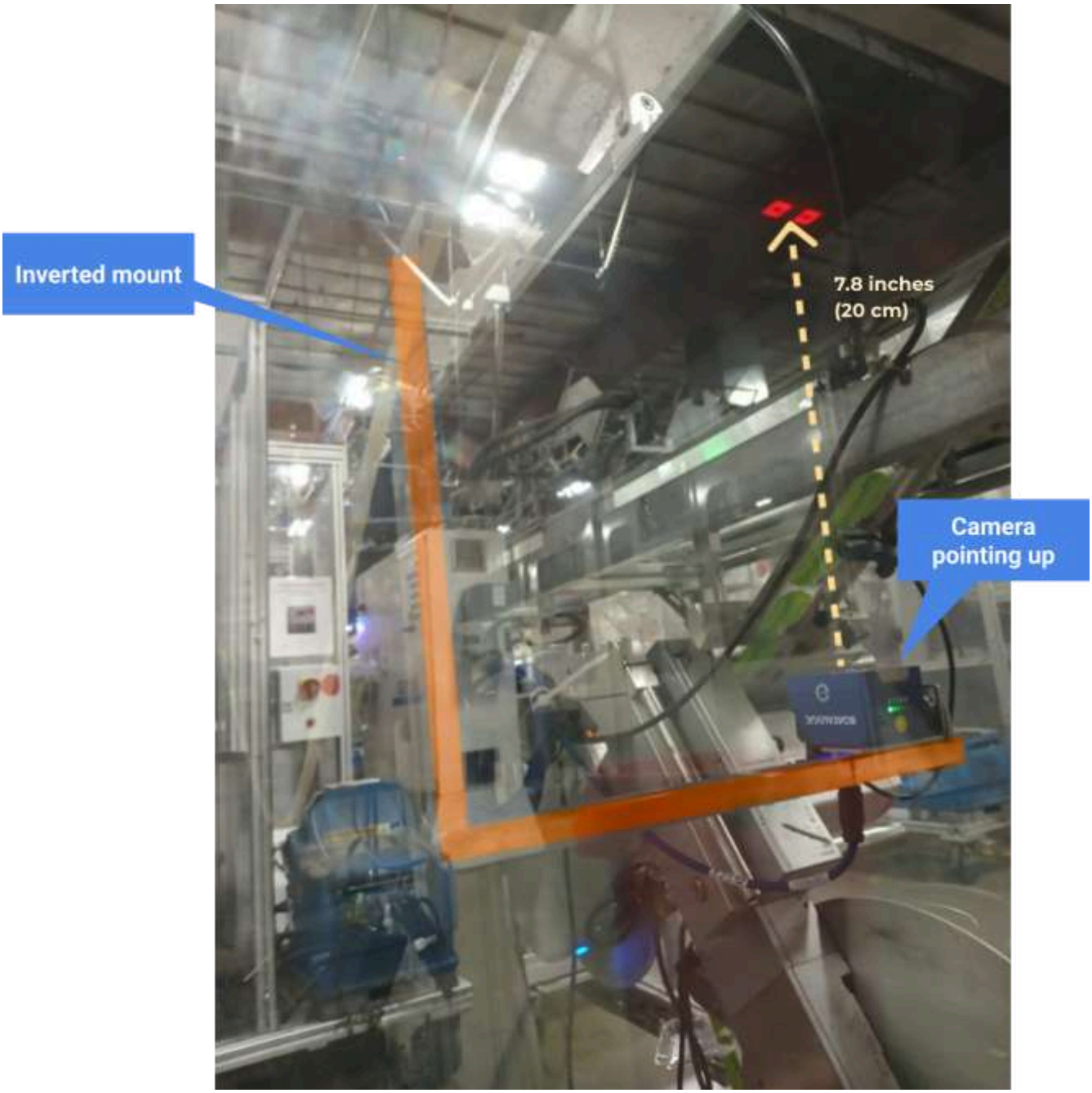
Trigger

- 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.

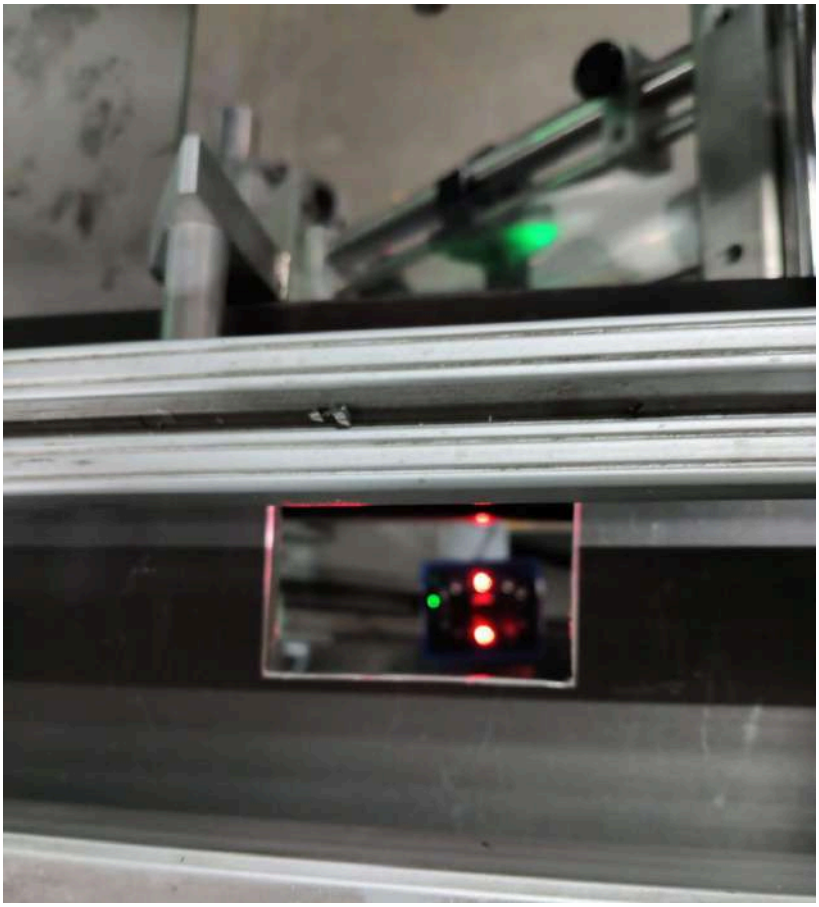


Matrix - Inverted setup

- 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.



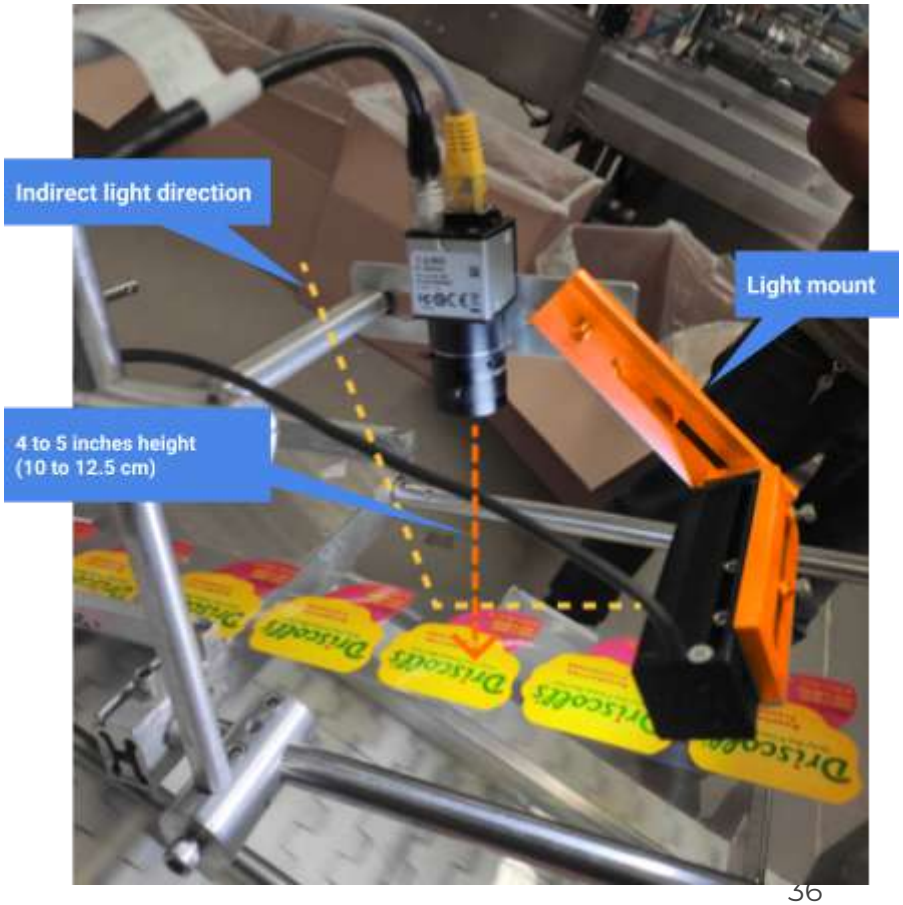
- As a part of the machine obstructs the camera's field of vision, a cut is made to allow the camera to see through it and capture the bottom label of the passing clamshells.
- In contrast to the traditional setup where the clamshell is centered and displays both halves, in this case, only the portion 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.