OV20i Setup Guide

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Install the OV20i

Time: **15-20 minutes**

You've opened the box. Let's get the camera physically set up and ready to go.

OV20i

What's in the box

Your shipment includes:

OV20i Camera

Mounting Plate

M12 Power Cable

M12 Ethernet Cable

Power Adapter

Terminal Block

OV20i camera

WHAT IT'S FOR: The camera unit itself

Mounting plate + hardware

WHAT IT'S FOR: Secures the camera to your fixture

M12 power cable

WHAT IT'S FOR: Connects camera to 24V DC power

M12 Ethernet cable

WHAT IT'S FOR: Connects camera to your network/computer

Power adapter (if included)

WHAT IT'S FOR: Provides 24V DC power

Lens (may be pre-installed)

WHAT IT'S FOR: Captures the image

Two M12 cables

You'll find **two M12 cables** in the box: one for power, one for Ethernet. You need both connected for the camera to work. The power cable has a **17-pin M12 A-coded** connector. The Ethernet cable is standard M12 D-coded.

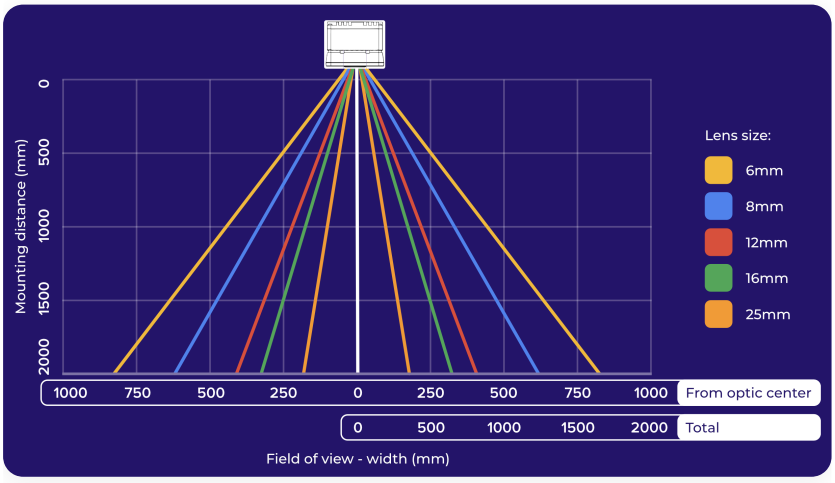
Choosing the right lens

info

Lens selection is typically handled by your Sales or Applications Engineer before deployment. The information below is provided for reference if needed.

The lens determines what the camera sees and how much detail it captures. This choice directly impacts everything downstream.

The goal: Fill the frame with your part as much as possible. If the part only occupies a small portion of the image, you're wasting pixels, and pixels are your resolution.



Short focal length (4-6mm)

BEST FOR: Large parts, short working distance

WATCH OUT FOR: More distortion at edges (barrel/fisheye effect)

Medium focal length (8-12mm)

BEST FOR: Most applications

WATCH OUT FOR: Good balance of field of view and distortion

Long focal length (16mm+)

BEST FOR: Small parts, long working distance

WATCH OUT FOR: Narrower field of view

The OV20i comes with built-in S-mount lenses and software-controlled motorized focus. You can adjust focus from the browser UI without physically touching the camera.

Think about distortion now

If you use a wide-angle lens (short focal length), the image will have barrel distortion. Straight lines appear curved, especially at the edges. This directly impacts alignment accuracy later. You can correct it in software (lens distortion correction), but you need to know your lens causes distortion. We'll cover this in the image settings step.

Calculate before you mount

Use the Optics Calculator to determine your exact field of view, recommended mounting distance, and minimum detectable defect size before installing the camera. Getting optics right at this stage prevents costly rework later.

Setting up your lighting

> **info**
>
> Lighting requirements are typically determined by your Sales or Applications Engineer as part of the system design. The information below is provided for reference if needed.

Lighting is a physical problem that **cannot be solved in software**. The AI can only work with what the camera sees, and what the camera sees depends entirely on how the part is lit.

Good lighting means:

- **Uniform:** no bright spots or dark shadows across the part
- **Repeatable:** the same lighting every time (avoid ambient light changes from windows, overhead lights cycling, day/night variation)
- **Reveals your defects:** if you're looking for scratches, angled lighting makes them visible. If you're looking for color differences, even diffuse lighting works best

The OV20i has built-in LED lighting with adjustable intensity and patterns. You can configure these in software later. The built-in LEDs work well for close-range inspections. For longer working distances or large parts, you may still need external lighting.

Common lighting mistakes:

- Relying on factory overhead lights (they change throughout the day)
- Creating glare on shiny or reflective surfaces
- Under-lighting so the image is dark and noisy

Step 1: Mount the camera

This is more important than it sounds. **The camera must be mounted stably and must not move.** Any vibration or shifting will undermine everything that follows: alignment, inspection accuracy, AI training, all of it.

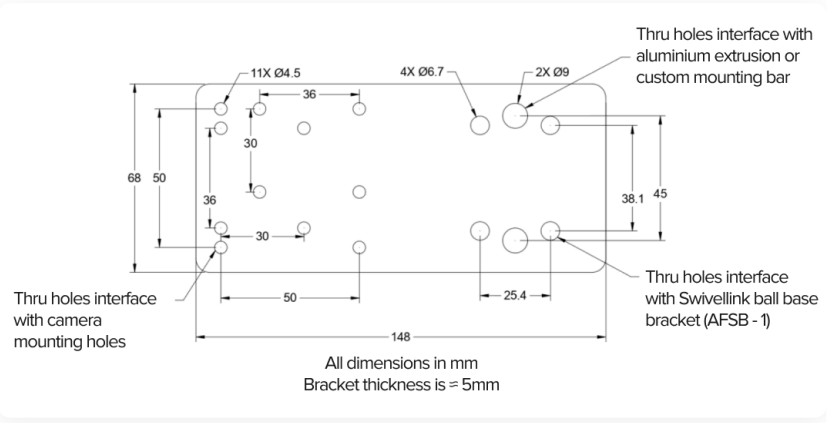
- Use the mounting plate and brackets provided
- Tighten all fasteners fully
- If mounting on a machine frame, check for vibration. A camera that shakes even slightly will produce inconsistent results
- Consider the angle: mount the camera so it looks straight down (or straight at) the part

> ⚠ **Stability is everything**
>
> A camera that moves even 1-2 pixels between captures will cause alignment drift and AI accuracy issues that

are very hard to diagnose later. Spend the extra minute here to make sure the mount is rock-solid.

Mounting dimensions and 2D drawings

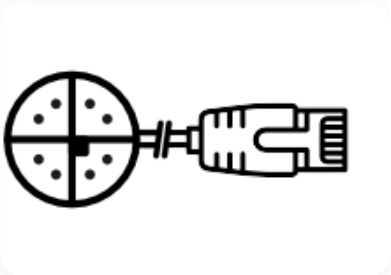
Use the dimensioned drawing below for mounting hole locations, spacing, and clearance planning. These dimensions are critical for designing custom mounting plates or brackets.



OV20i mounting plate 2D dimensioned drawing

Step 2: Connect the cables

M12 17-pin power (OV20i)



M12 to RJ45 Ethernet

1. **Power cable:** Connect the M12 power cable between the camera and your 24V DC power source (19-24 VDC, minimum 1A, max 18W typical 15W)
2. **Ethernet cable:** Connect the M12 Ethernet cable between the camera and your computer, switch, or network

Both cables must be connected. The camera needs power to run and Ethernet to communicate.

> **Connector gender**
>
> The OV20i has **female** M12 connectors on the camera body for both power and Ethernet. Your cables need **male** M12 ends on the camera side.

> **Power requirements**
>
> - **Voltage:** 19-24 VDC regulated
> - **Current:** Minimum 1A
> - **Power:** Typical 15W, max 18W
> - **Pins 13 or 14 = 24V DC (+), Pins 5 or 6 = GND**
> - Do not use unregulated power supplies; voltage spikes can damage the camera

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Step 3: Power up and verify

Once both cables are connected:

1. Apply power
2. Watch the LEDs on top of the camera:
    - **Power LED** turns solid green: power is good

- **System Status LED** blinks slowly during boot, then turns solid: system is ready
- Boot takes approximately 30 seconds

3. If LEDs don't light up, check your power connections and voltage

Power LED solid green

MEANING: Power OK

Power LED off

MEANING: No power; check cables and supply

System LED slow blink

MEANING: Booting up; wait 30 seconds

System LED solid

MEANING: Camera ready

System LED fast blink

MEANING: Error; check connections

All four LEDs are located on the top of the OV20i.

Download 3D CAD models

Desktop required for CAD downloads

3D CAD models (.STEP, .SLDPRT) are available for download when viewing on a desktop computer. These files require CAD software to open.

Install checklist

Before moving on, confirm:

- [ ] Camera is mounted stably (give it a shake test; it shouldn't budge)
- [ ] Lens is appropriate for your working distance and part size
- [ ] Lighting is set up and consistent
- [ ] Power cable connected, Power LED is green
- [ ] Ethernet cable connected
- [ ] System LED is solid after boot

All green? Head to Open the OV20i in Your Browser.

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Open the OV20i in Your Browser

Time: **5 minutes**

The camera is mounted and powered. Now let's see what it sees.

The OV20i is controlled entirely through a web browser; no special software to install. You just need a computer (or tablet) on the same network as the camera.

Step 1: Get on the same network

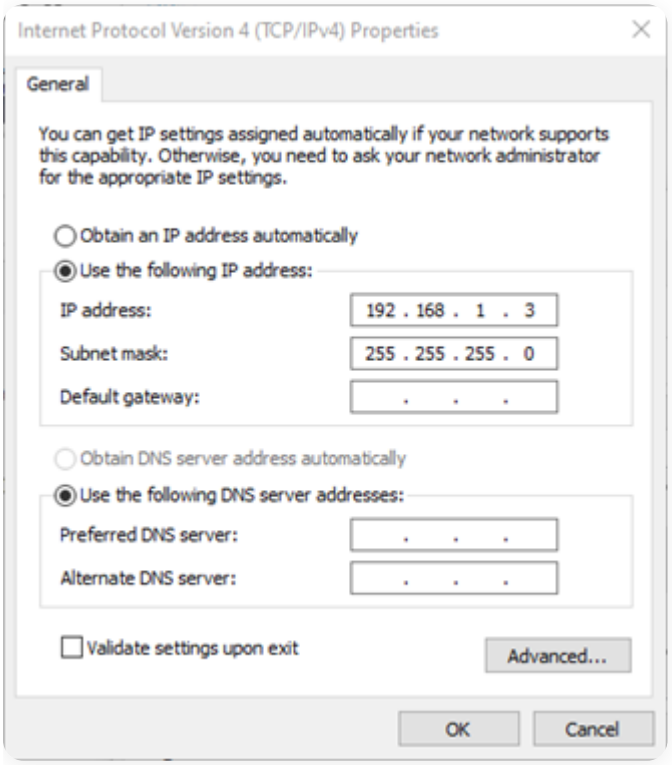
Connect your computer to the same network as the camera. You can do this two ways:

Option A: Direct connection (simplest for setup)

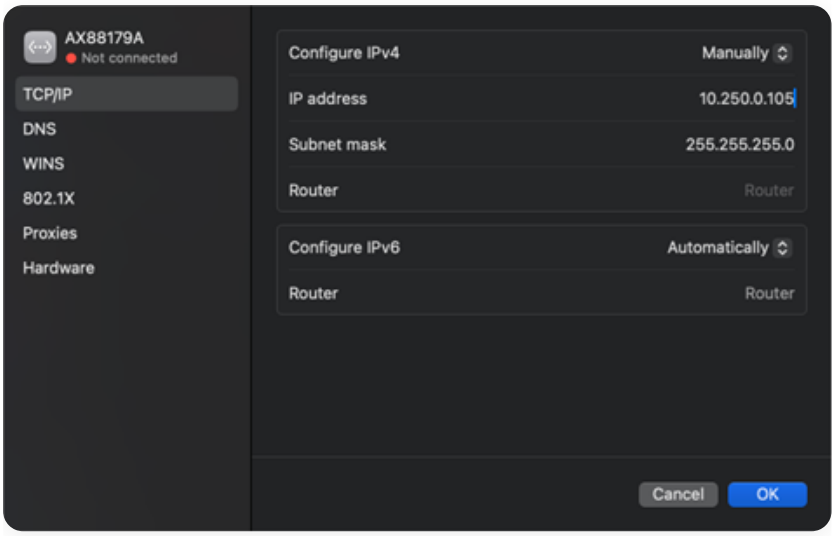
Best when you're setting up the camera for the first time, working at a bench or test station, or don't have a network switch nearby. This gives you a private one-to-one link with no other network traffic.

- Plug an Ethernet cable directly from your computer to the camera
- Set your computer's IP address to something in the same subnet as the camera (e.g., `192.168.0.50` if the camera is at `192.168.0.100`)

Windows: Open Network Connections, right-click your Ethernet adapter, select Properties, then set the IPv4 address:



Mac: Open System Preferences > Network, select your Ethernet adapter, set Configure IPv4 to "Manually":



Option B: Through a network switch

Best when the camera is already installed on the production line, when multiple people need to access the camera at the same time, or when you want the camera to stay connected to your facility network.

- Connect both the camera and your computer to the same switch
- Make sure they're on the same subnet (192.168.0.X)

> **Default camera IP**
>
> The OV20i ships with a default static IP of **192.168.0.100**. If your network uses DHCP, the camera can also obtain an IP automatically, but for first-time setup, using the default static IP is easiest.

Step 2: Find the camera's IP address

If you're using the default setup, the camera is at **192.168.0.100**.

If the IP has changed or you're using DHCP, you can find it by:

- Checking your network's DHCP lease table
- Using a network scanner tool
- Looking at the camera's LED pattern (refer to the LED Behavior Matrix in Reference)

Step 3: Open the browser

Open **Google Chrome** (recommended) or **Microsoft Edge** and navigate to:

```
http://192.168.0.100
```

If this is a new camera, you will see the **Product Activation** page.

Supported browsers: Chrome (recommended), Edge, or Safari. Firefox is not supported and may cause UI or functionality issues.

Step 4: Activate the device

On first connection, the camera shows the Product Activation page. Complete the following to activate your device:

1. Enter your **Company** name
2. Enter your **Company Email** address
3. Expand and review the **End User License Agreement**
4. Check the box to accept the End User License Agreement
5. Click **Activate Device**

> **tip**
>
> Activation requires an internet connection on the camera. If your camera does not have internet access, contact support@overview.ai for assistance.

Once activated, you will see the camera's **All Recipes** page with a navigation sidebar on the left.

> **No internet required after activation**
>
> The camera runs entirely on your local network. You don't need internet access to use the camera, configure recipes, or run inspections. Internet is only needed for activation, firmware updates, and cloud features.

Step 5: Activate a recipe

To start working with the camera, you need an active recipe. If you already have one, click **Activate** on it. If this is a fresh camera, click **+ New** to create your first recipe.

Once a recipe is active, click **Edit** to open the **Recipe Editor**. This is where you'll configure image settings, alignment, inspection regions, and AI training.

Next step: Head to Step 1: Image Settings to configure your camera's live image and verify everything looks right.

Troubleshooting connection issues

▸ Common connection problems and fixes

Emergency USB connection

If you can't reach the camera over Ethernet, you can connect via USB. The emergency USB IP is **192.168.55.1**.

For more detailed network troubleshooting, see Troubleshooting & FAQ.

Connection checklist

- [ ] Browser connects to camera IP (192.168.0.100)
- [ ] All Recipes page loads
- [ ] Recipe activated and Recipe Editor open

You're connected! Next up: Step 1: Image Settings to dial in your camera's image.

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Create Your First Recipe (OV20i)

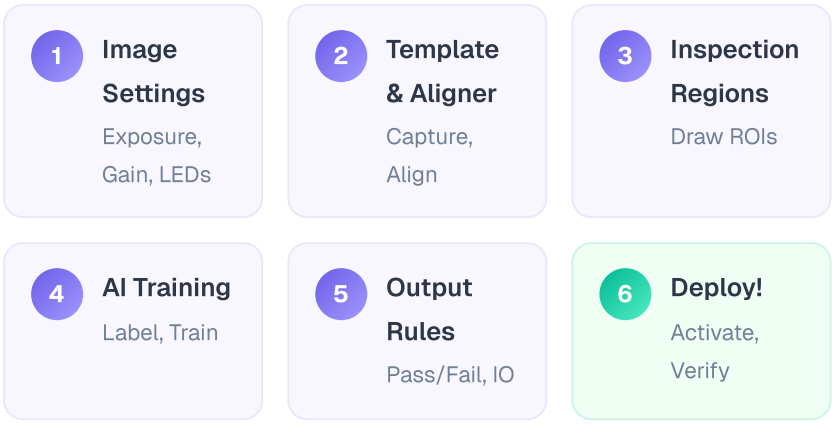
Time: **30-45 minutes**

This is where your camera becomes an AI inspector. A **recipe** is a complete package (image settings, alignment, inspection regions, AI model, and output rules) bundled together for one specific inspection task.

You can have as many recipes as you want on a camera. Each one can be saved, backed up, transferred to other cameras, and version controlled.

Before you start: remember the waterfall

Everything in this section follows the Waterfall Principle. You'll go through six steps in order. **Don't skip ahead.** Verify each step works before moving to the next.

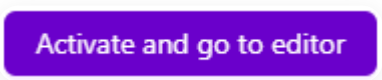


Start with Development Mode enabled

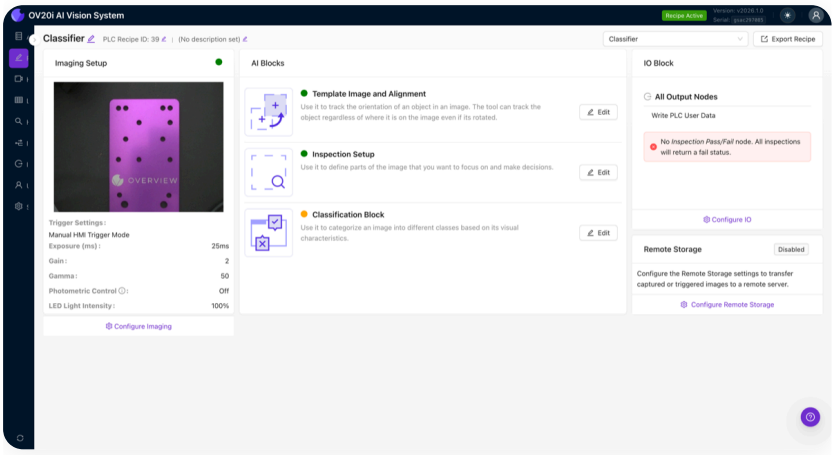
Development Mode lets you test your recipe without affecting production output. It trains a quick model in about 30 seconds so you can verify accuracy at each step. Switch to Production Mode only after you have confirmed the inspection works reliably.

Create a new recipe

1. Go to **All Recipes** in the left sidebar (this is also the landing page when you open the camera)
2. Click **+ New**
3. Give it a name (e.g., "Screw Presence Check")
4. Choose the recipe type:
   - **Classification:** for pass/fail, presence/absence, or multi-category decisions
   - **Segmentation:** for pixel-level defect detection (scratches, stains, measurements)
5. Click **Activate** to enter the recipe editor



Here is what the **Recipe Editor** looks like. The three main sections (Imaging Setup, AI Blocks, IO Block) map directly to the waterfall steps:



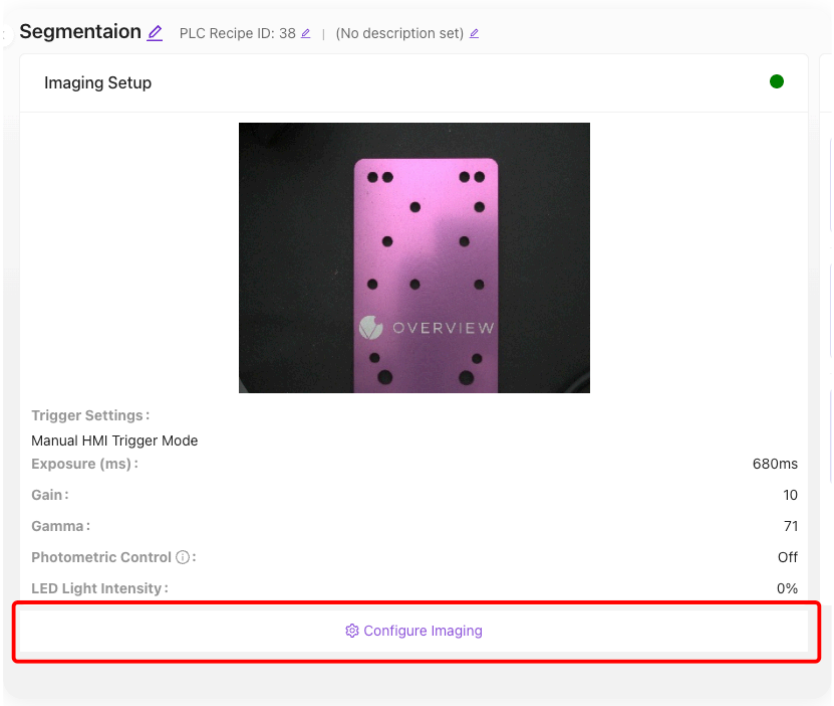
> **Recipe type**
>
> Choose either a **classifier** OR a **segmenter** per recipe (not both). The OV10i supports classifiers only. Segmentation requires an OV20i.
>
> Not sure which to choose? See Classifier vs. Segmenter or ask the AI Assistant at tools.overview.ai.

> **One model type per recipe on the OV20i**
>
> The OV20i supports both classifiers and segmenters, but each recipe uses one type per inspection. Choose based on your inspection needs. If you need both pixel-level detection and classification in the same capture, consider the OV80i which supports multi-model recipes.

Now follow the six steps:

Step 1: Image Settings

Full guide: Image Settings



Get your camera image looking clean and consistent. Adjust exposure, gain, white balance, and, critically, **enable lens distortion correction** if you're using a wide-angle lens.

Key settings:

- **Exposure:** How long the sensor captures light. Higher = brighter but more motion blur
- **Gain:** Digital brightness boost. Higher = brighter but noisier
- **Lens Correction:** Fixes barrel distortion from wide-angle lenses. **Enable this now if applicable.** Don't skip it
- **LED settings (OV20i):** Adjust intensity and pattern to reduce glare

Verify before moving on: Click Live Preview. The image should be sharp, well-lit, and consistent shot to shot.

Step 2: Template Image & Alignment

Full guide: Alignment Explained

This is the step most customers find challenging, and the one that makes the biggest difference. The aligner is the foundation of your entire inspection. It dynamically moves your inspection boxes to track the part as it shifts and rotates on the conveyor. Good alignment lets you draw smaller ROIs, which means less training data and more accurate AI. **Aligner → ROIs → Classifier/Segmenter**: if the first link is weak, everything downstream breaks.

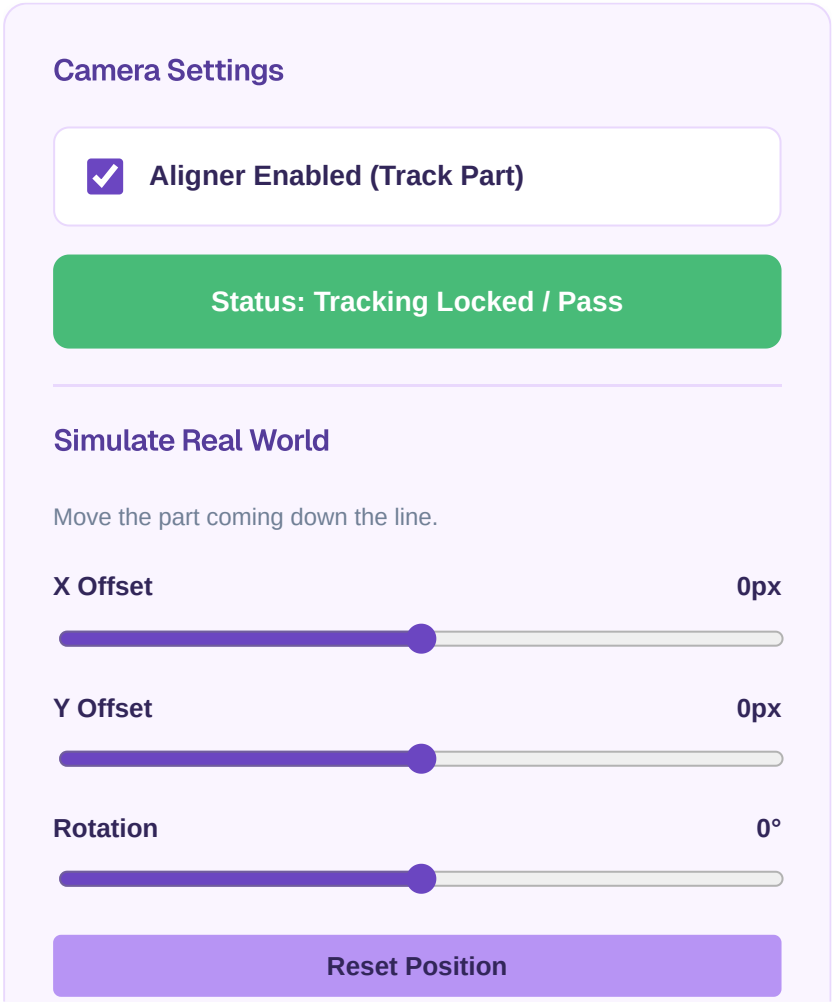
The short version:

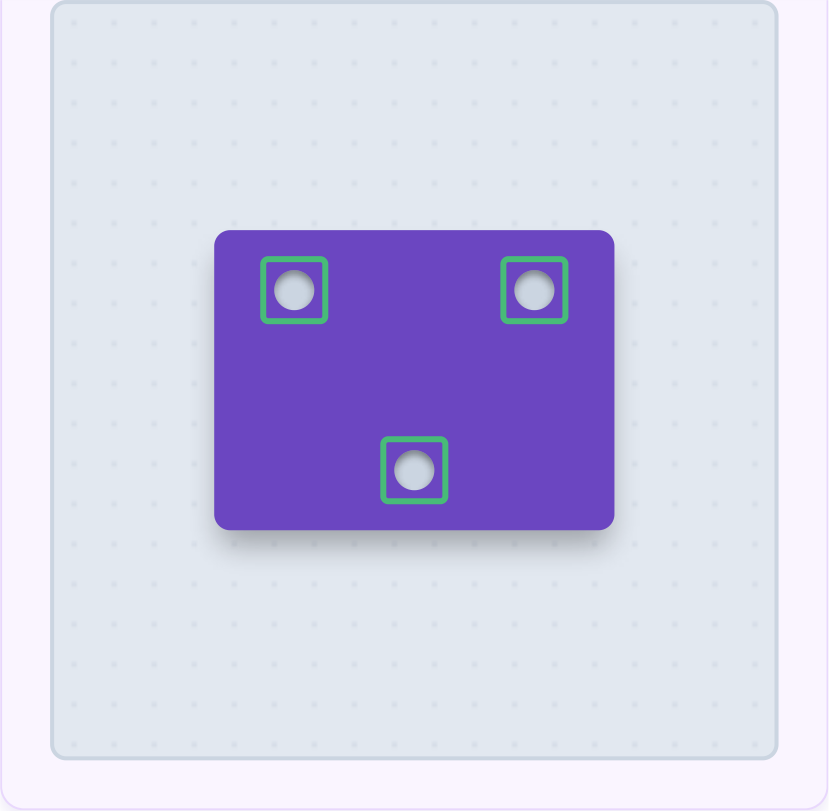
1. Capture a template image of a good part
2. Place 2-3 small template regions on features that never change (strong edges, corners, holes)
3. Place them as far apart as possible on the part

4. Clean up noisy edges with the Ignore tool
5. Save, then test with Live Preview. Move the part around and verify the alignment tracks it

> ⚠ **The #1 alignment mistake**
>
> Never anchor the aligner to defects, labels, stickers, or anything that can move independently of the part. Only align to permanent, rigid features (machined edges, drilled holes, PCB outlines). If you align to a barcode sticker and someone places it crooked, the camera shifts all your inspection boxes to the wrong position.

Try it yourself: Use the simulator below to see what happens when a part shifts on the conveyor. Toggle the aligner off, then move the sliders to watch the inspection boxes lose tracking.





Read Alignment Explained for the full walkthrough. This is the most important page in this documentation.

Step 3: Inspection Regions (ROIs)

Full guide: Inspection Regions

Now draw the areas where the AI will actually inspect. These are your Regions of Interest (ROIs).

The critical rule: Keep ROIs as small as possible. This is the second biggest source of customer issues. Read Why ROI Size Matters to understand why.

The short version:

1. Create an Inspection Type (e.g., "Screws") with your expected classes (e.g., "present", "absent")

2. Draw rectangular ROIs on each location you want to inspect
3. Make them just big enough to contain the feature, no bigger
4. Name them descriptively (e.g., "Screw_Top_Left")

Step 4: Train Your AI Model

Full guide: Training Your AI

Label a few images and train your first model.

The short version:

1. Start with **3-5 images per class.** Don't over-collect
2. **Double-check every label** before training (one mislabel can ruin your model)
3. Train in **Development Mode** first (~30 seconds) to check the signal
4. Test with Live Preview. Try to break it
5. Add targeted data where it fails, retrain
6. When development mode works well, switch to **Production Mode** (5-10 minutes)

Step 5: Output Rules (IO Block)

Full guide: Setting Up Outputs

Define what happens when the AI makes its decision.

Basic Mode: Set rules for pass/fail. The simplest setup: all ROIs must pass for a global pass. That single binary result gets sent to your PLC, HMI, or output.

Advanced Mode (Node-RED): For anything beyond simple pass/fail: custom dashboards, time-series logic, data routing to MES systems, barcode scanner integration (external reader required), and more. Use tools.overview.ai to generate Node-RED flows from plain English descriptions.

Step 6: Deploy and verify

1. Activate your recipe

2. Set your trigger mode (manual, hardware sensor, PLC, or interval)
3. Run test parts through the system
4. Verify the pass/fail output matches your expectations
5. Check edge cases, the parts that are hardest to classify

Congratulations! You now have a running AI inspection.

Recipe checklist

Before moving on, confirm:

- [ ] New recipe created and named
- [ ] Image settings configured: sharp, well-lit, consistent
- [ ] Alignment set up and tracking reliably
- [ ] Inspection regions drawn: small, well-positioned, named
- [ ] AI model trained and tested in development mode
- [ ] Output rules configured: pass/fail matches expectations
- [ ] Recipe activated and deployed with correct trigger mode

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What's next?

- **Improving Your Model:** How to keep your AI getting better over time

- **Troubleshooting & FAQ:** Common issues and quick fixes
- **Classifier vs. Segmenter:** Detailed guide on when to use which