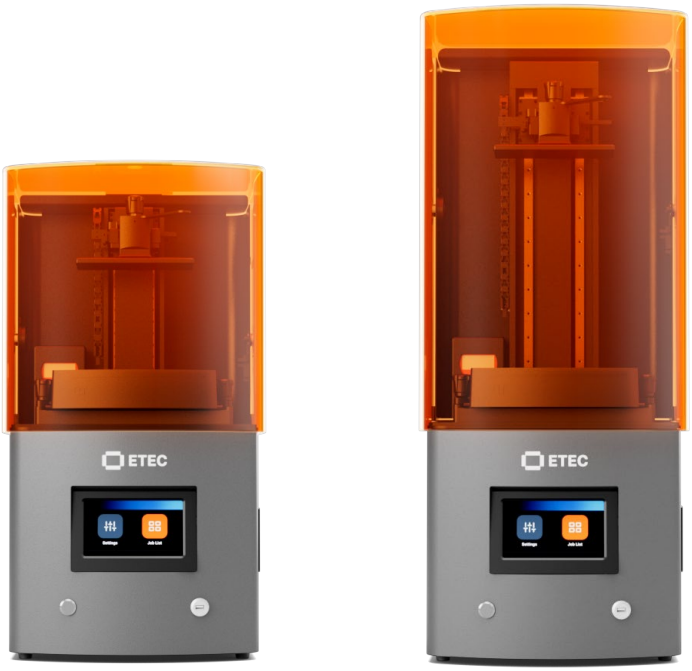
Operations Guide

Envision One cDLM® Series



ETEC

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Identification

Manufacturer

EnvisionTec GmbH
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Germany

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USA

Legal Notice

History of Changes

Date	Changes	Version
Feb-2019	• Document creation	1.0
Feb-2019	• Added Printer Update subsection	1.1
May-2019	• Added Hall sensors subsection • Added job status description in Job List Menu	1.2
May-2019	• Changed description of Job Settings Tab	1.3
Jun-2019	• Changed the Hood subsection • Updated figures • Changed Connect the Printer subsection • Updated Insert and Remove the Material tray subsection • Updated Attach and Detach the Build Platform subsection	2.0
Jul-2019	• Reorganized subsections in Software Presentation section • Added the Manual Debris Removal subsection • Added the Printer Settings subsection • Changed the Calibrate the Home Position subsection • Added the Usage Analytics subsection • Updated the Load a job from USB drive subsection • Updated Quick Start Guide annex	3.0
Oct-2019	• Added Network Requirements subsection • Changed the Calibrate the Home Position subsection • Added Software Recovery subsection • Added Download Log Report subsection	3.1
Nov-2019	• Changed Download Log Report subsection • Changed Troubleshooting annex • Changed Network Requirements subsection	3.2
Jan-2020	• Added Automatic Home Position Calibration subsection • Changed Mechanical Data subsection	4.0
Jun-2020	• Changed Job Settings section	4.1
Jul-2020	• Added Printing Statistics subsection • Updated Service and Maintenance section • Updated Troubleshooting annex • Updated the Start a Print section • Updated the Manual layout	4.2
Oct-2020	• Updated Automatic Home Position Calibration section • Updated Printing Statistics section	4.3

Date	Changes	Version
Oct-2020	• Updated figures • Updated screenshots • Added Connect the Oxygen Concentrator to the Printer section • Added Loading a Job from Envision One RP to Envision One section • Added Maintaining EnvisionTEC Materials section • Updated Adding the Material section • Updated Electrical requirements section • Updated Environmental conditions for Printers section • Updated Unpacking the Printer section • Updated Starter Kit section • Updated How to Use a Starter kit section • Updated Positioning the Printer section • Updated Build Platform section • Updated The Domeless Material Tray section • Updated Plug & Play section • Updated Connect the Oxygen Concentrator section • Updated Installing Envision One Build Platform • Updated Installing Envision One Domeless Material Tray section • Updated Set the Ethernet section • Updated Set the Wi-Fi section • Updated Software Update section • Updated Create Print Job in Envision One RP section • Updated Loading a Job from USB drive section • Updated Check the Envision One is Ready to Print section • Updated Start the Print section • Updated Remove the Build Platform from the Printer section • Updated Detaching Models from the Build Platform section • Updated Reset the Printer After a Print section • Updated Curing models section • Updated Cleaning the Build Platform section • Updated Cleaning the Domeless Material Tray section	4.4
Dec-2020	• Added Loading a Job via FTP section • Updated Mask Generation section • Updated Troubleshooting section	4.5
Jan-2021	• Updated Troubleshooting section • Updated Setting Up the Oxygen Concentrator section	4.6
Oct-2021	• Updated Setting Wi-Fi section • Updated Job Settings Tab section • Updated About Printer section • Updated Troubleshooting section • Updated Starting a Print section	4.7

Date	Changes	Version
Dec-2021	• Updated Manual Debris Removal section • Updated Calibration section • Updated Starting a Print section • Updated Software Update section • Updated Support section	5.0
July-2022	• Updated the document layout • Updated Technical Data section • Updated Generate Mask section • Added Map a Network Drive in Windows section • Added Create Shortcut section • Added Load Job via FTP section • Added end page	5.1

User Information

Note: This Operations Guide was created for version 11.0 of Envision One Control Software.

Purpose of Document

This instruction manual:

- Describes the operation and maintenance of the printer.
- Provides important information on safe and efficient handling of the printer.

Note: The operation of the Envision One RP Software is described in the Envision One RP Software Manual.

This document includes important notes and tolerances for calibration tasks. Pay attention to these notes when starting up the printer and during operation. Keep this guide close to the printer so the operator can always access it.

Target Group

This instruction manual is intended for:

- The customer (company operating the printer) whose responsible employees have been trained by the manufacturer or the distributor.
- Trained operators for operation.
- People with specialist technical training (mechanics/electrical engineering) for troubleshooting/fault elimination and maintenance.

Perspective in Instruction Manual

All the directions and locations in this instruction manual are presented from the working position of the operator.

Technical Data

Mechanical Data

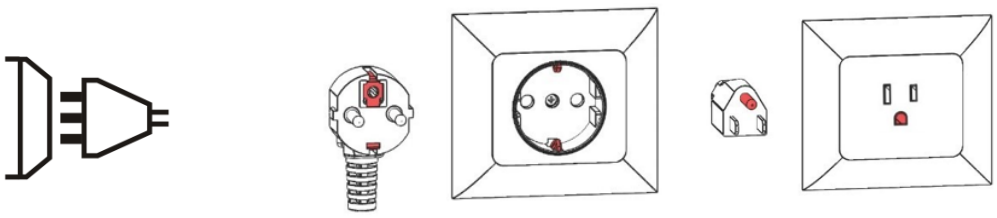
	Envision One cDLM	Envision One cDLM XL
Footprint	40.64 x 40.64 x 77.5 cm (16 x 16 x 30 in.)	40.64 x 40.64 x 111.76 cm (16 x 16 x 44 in.)
Weight	49.8 kg (110 lbs.)	52.1 kg (115 lbs.)
Build envelope	180 x 101 x 175 mm (7.09 x 3.98 x 6.9 in.)	180 x 101 x 330 mm (7.09 x 3.98 x 12.9 in.)
Projector Resolution	1920 x 1080	
Native XY Resolution	93 µm	
Enhanced XY Resolution	60 µm	
Warranty	1 year back to factory included	

Electrical Requirements

We strongly recommend you use an uninterrupted power supply to protect your printer. All electrical requirements must be met to ensure a stable setup:

1. Do not plug any additional equipment into the power circuit.
2. The Envision One cDLM requires 110/220 VAC 50/60 HZ 5A
3. The oxygen concentrator has the following requirements:
   - Power supply: 220V ± 22V, 50Hz ± 1Hz/110V ± 15V, 60Hz ± 1Hz.
   - Operation voltage (V/Hz): AC220/50 AC110/60.
4. Plug the printer and oxygen concentrator into separate surge protectors or separate battery backups.
5. The Envision One cDLM printer does not require a dedicated server. It can be connected wirelessly, hard-wired into the network, or directly connected to a computer.

WARNING	**Risk of electric shock:** connect printer to grounded outlet ground wire before using. Only use the grounding adapters of the plug & socket type targeted for the country of intended use of the printer.



Grounded plug | Type F grounded plug | Type B grounded plug

Figure 1: Grounded plugs

Network Requirements

- **139, 445 ports:** Use them to access the shared network folder (job, logs, update) on the printer. They are also used to upload jobs to the printer via network.
- **5900 port**: Use a VNC server for printer remote control, see Connect to the Printer via VNC Clients.
- **2504 port:** Use to connect the Envision One Control Software and Envision One RP.
- **22 (ssh)** and **443 (https)**: These are used for downloading the software update.

Intended Environmental Conditions

Storage Conditions for Materials

Store materials under the following conditions:

- at room temperature
- dry
- in closed bottles
- lightproof

If materials are filled in the material tray, the printer hood should always be closed. If you don't need the material tray for a longer time, pack the material tray and store it under the same conditions as mentioned above.

Note: For additional information on storage conditions for materials, see the corresponding **Material Best Practice Guide** or the **Instruction for Use** provided by the manufacturer or distributor.

Printer Delivery

Unbox Printer

Your Envision One cDLM printer arrives in a wooden crate with a series of accessories boxes. The crate and boxes are on top of a pallet. Use a forklift or pallet jacket to take them to the site. You can also remove the crate and accessories boxes from the pallet and use a dolly to move them.

- **Crate:** Envision One cDLM, USB drive
- **Optional Boxes:** Parts curing apparatus, Parts washing apparatus, and battery backup if purchased.

These tools are required to complete the unboxing process:

- Box cutter/scissors
- Flathead screwdriver
- Hi-Lo/dolly
- One helper

Before opening the box, make sure you see no visible damage or broken sensors. If these are present, please inform the office immediately.
Take the following steps to unbox the printer:

1. Carefully cut the plastic wrap.
2. Remove the boxes from the pallet.
3. Place the External Components box on a sturdy work surface.
4. Place the Oxygen Concentrator box on the floor nearby.
5. Remove the clips from the crate using a systematic approach. Use a flathead screwdriver to pry the metal crate fasteners from the corners.
6. To remove the L-brackets from the crate, slide the screwdriver under the end of the bracket with a break in the metal. Leverage the bracket up, one side at a time until the bracket comes free from the crate. Take the stack of brackets and set them off to the side. They will be used again to store the crate.
7. Disassemble the last removable side of the crate, remove the padding from the top and sides. Remove the printer from the crate with a helper and place the printer on a stable desktop.

Starter Kit

The starter kit includes useful tools for operating and cleaning the printer and the built parts.

- Allen key, 3 mm
- Cone-shaped paint filters
- Scraper
- Digital calipers
- Precision knife
- Rubber spatula
- Paint scraper
- USB drive
- Wi-Fi Antenna
- Crossover network cable, 5 mm

Allen key
Required for printer calibration and to assist with technical support cases. It is not required for day-to-day operation.

Crossover network cable, 5 mm, colored plug
This cable connects the printer to the operating computer, as needed. The cable inserts into the I/O panel behind the printer. The other end plugs into the operating computer.

Paint scraper
Use the scraper to remove printed models from the build platform. Use the paint scraper for detaching larger printed models, see **Detach Models from the Build Platform**. You can also use the scraper to remove material residues from the build platform.

USB drive
The USB is a back-up for transferring print information from the operating computer to the printer. Between 8 and 32 GB size is recommended.

Rubber Gloves
Use the supplied protective gloves while working with printing materials.

Precision knife
Use the precision knife to cut the supports off your models.

Printer Components

Functional Description

During the printing process, the model is built layer by layer. The mechanical system moves the build platform up so that the cured material sticks to the build platform or to the previous layer.

Before starting the printing process, certain calibrations are performed at the factory.

The material is then directly poured into the material tray. The job is transferred to the printer through Envision One RP® software or via USB drive. The print process starts.

After the build process has finished, the models are removed from the build platform with a scraper and treated according to the corresponding material's Best Practice Guide.

Construction of Printer

Figures below give an overview of the most important printer components and show their position on the printer.

Front View

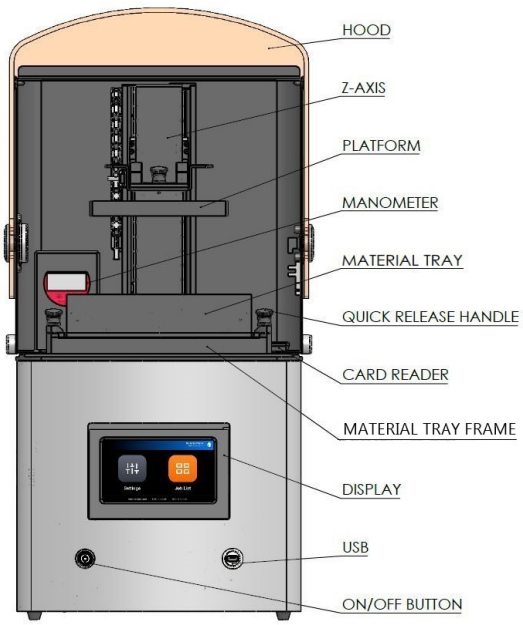


Figure 2: Front view of the printer

Back View

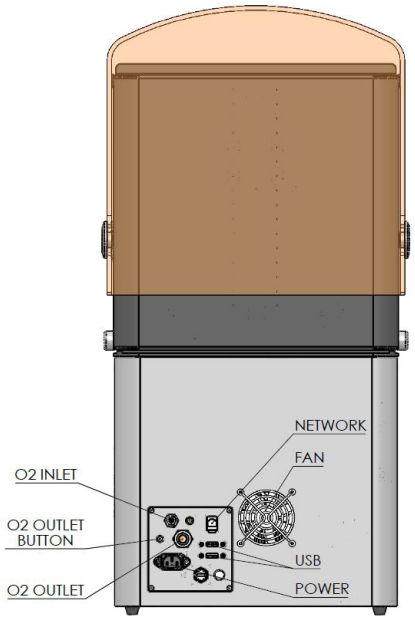


Figure 3: Back view of the printer

Hood

CAUTION	**Risk of injury.** The protection hood must always be closed, except when removing models from the printer. After the models are removed, close the hood on the printer.

The orange hood protects the printer and the operator. It protects:

- the operator against the movements of the build platform.
- the photopolymer in the material tray from ambient light.
- the printer components from dust and debris.

The hood of the printer has no locking mechanism. Open or close the hood manually by rotating it on its hinges. If the hood opens during the printing process, then the job pauses, and the error message appears.

RFID Tag Reader

CAUTION	**Risk of damage to the printer.** To avoid damage to the RFID tag reader, make sure the material tag is placed into the RFID tag reader as shown in the picture below.

The software utilizes the very latest RFID technology (Radio Frequency Identification) to track the material level in the material bottle. The tag reader prevents usage of the material that does not match the buildstyle or material tag.

Build Platform

The build platform is an assembly comprised of:

- A large, flat platform
- A handle
- A connection cavity

The flat area of the build platform is where cured material gets adhered during the printing process. The build platform is aluminum anodized. It is used for medical and technical applications.

Figure 4: Build platform

Domeless Material Tray

Note: Use a different material tray for different printing material to avoid contamination. Otherwise, clean the material tray thoroughly when switching printing materials.

The domeless material tray is an assembly with a closed circuit of oxygen airflow which minimizes separation forces during print and works with the upward movement of the build platform.

The domeless material tray consists of two metal frames with a piece of glass and a special film between them.

There is a space for oxygen delivery between the glass and the film. It ensures the continuous printing mode and prevents the excessive sticking of parts to the film.

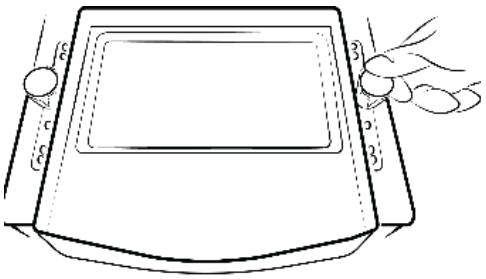


Figure 5: Domeless material tray

Z-axis

The build platform moves up and down along the Z-axis.

Oxygen Concentrator

The Oxygen Concentrator supplies the printer with the oxygen needed for the printing process.

It creates a flow of oxygen within inner tubes that comes towards the domeless material tray.

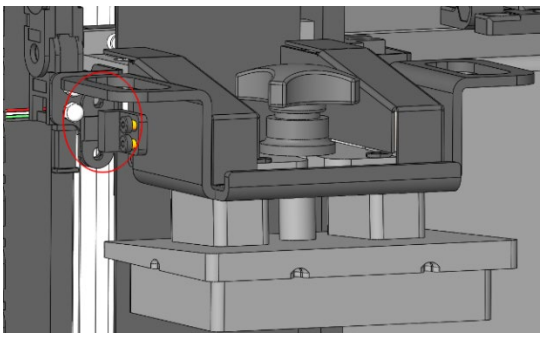
Figure 6: Oxygen concentrator

Hall Sensors

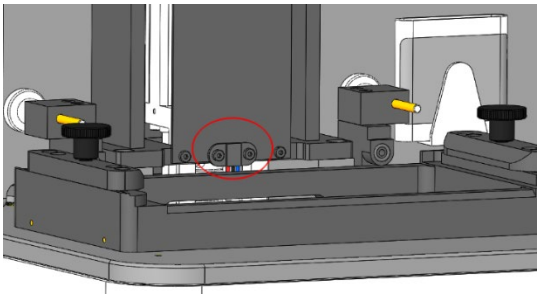
The information in this section is only for those printers that are equipped with hall sensors.

Hall sensors are used to detect the presence of the build platform and the material tray on the printer. There are two of them inside the printer:

- One for the build platform.



- One for the material tray.



Hardware Setup

Connect Printer

Plug & Play

Match all of the connections in the diagram below, except for the oxygen delivery tube that connects to the oxygen concentrator. This tube should not be installed until the concentrator is primed (30 minutes after turning on).

- The white antenna: Wi-Fi
- The blue cable: CAT 6 Ethernet cable
- Large black plug: Power

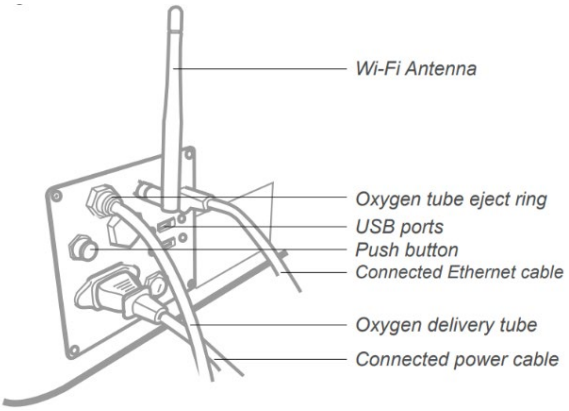


Figure 7: I/O ports

Note: There are two USB ports on the side of the printer. A USB drive with printer compliance and safety instructions is including in the original shipping box.
Desktop Health recommends saving a backup copy of the data on your USB drive in a separate place, such as cloud-based storage, external hard drive, a backup computer, etc.

Turn On Printer

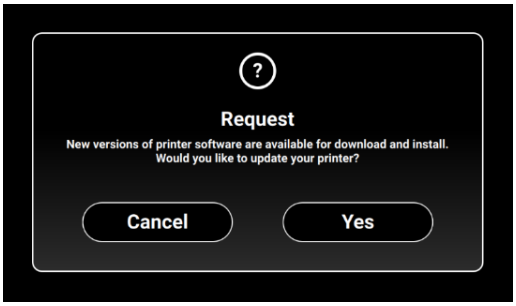
CAUTION	**Risk of injury from crushing caused by moving printer parts:** printer may only be operated by instructed and specially trained personnel. The printer may only be operated if the protecting devices are working properly.

To turn the printer on, select the power button on the front of the printer and hold it for two seconds.

→ The button illuminates and the screen switches on.
→ After a booting sequence, Control Software opens automatically.

CAUTION	**Risk of damage to the printer:** to prevent damage to the printer, do not touch the screen before the Envision One Control Software finishes booting.

When an update is available for the printer, the following message appears:



To update the printer, select **Yes**.
To discard the update message, select **Cancel**.

Connect Parts Washing Apparatus

The PWA 2000 is the recommended parts washing unit for the models printed with the Envision One cDLM printer. To set up the PWA 2000, see **PWA 2000 Setup**.

Connect Parts Curing Apparatus

The PCA 2000 is the recommended parts curing unit for models printed with the Envision One cDLM printer. To set up the PCA 2000, see **PCA 2000 Setup**.

Set Up Oxygen Concentrator

CAUTION	**Risk of damage to the printer: t**o prevent damage to the printer, do not add water to the oxygen concentrator.

The Oxygen Concentrator is delivered with the preset pressure. Twelve spare filters are shipped together with the concentrator. Store these in a safe place.
To set up the oxygen concentrator:

1. Place the oxygen concentrator on the floor near the printer and make sure there are at least 12 inches (30 cm) of space between the concentrator and any other object.
2. Plug the power cable into the concentrator.
3. Wait for around ten minutes for the automatic priming process.
   → An orange indicator turns off when the concentrator is ready to be plugged into the printer.

CAUTION	**Risk of damage to the printer:** priming must finish before plugging the oxygen concentrator into the printer.

Install Envision One Build Platform

To install the build platform:

1. Open the printer's hood.
2. Loosen the build platform knob on the top of the printer by a couple of turns.
3. Slide the build platform into the build platform housing at the top of the Z-axis tower.
4. Tighten the build platform torque knob down to secure the build platform in place. Listen for the click.

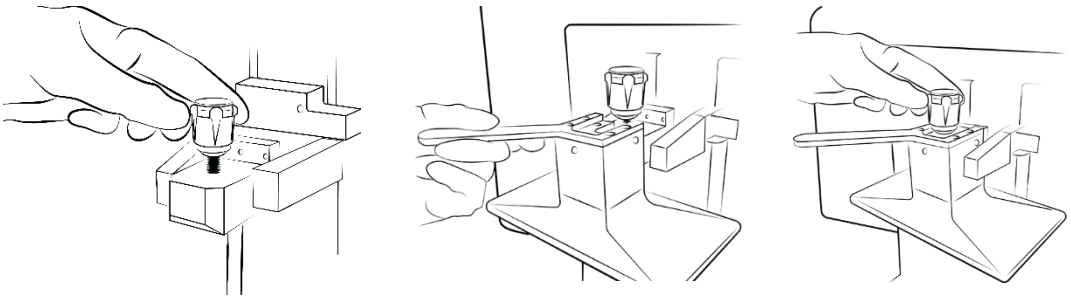


Figure 8: Build platform installation

CAUTION	**Risk of damage to the printer:** Make sure the build platform torque knob is secured before printing. Failure to do so will cause the build platform to be uneven and can cause build failures.

Install Domeless Material tray

To install the material tray:

1. Unlock the torque knobs on the right and left of the build area.
2. Slide the domeless material tray into the printer, vent holes first, until it is fully seated.
3. Lock the two clamping handles down.

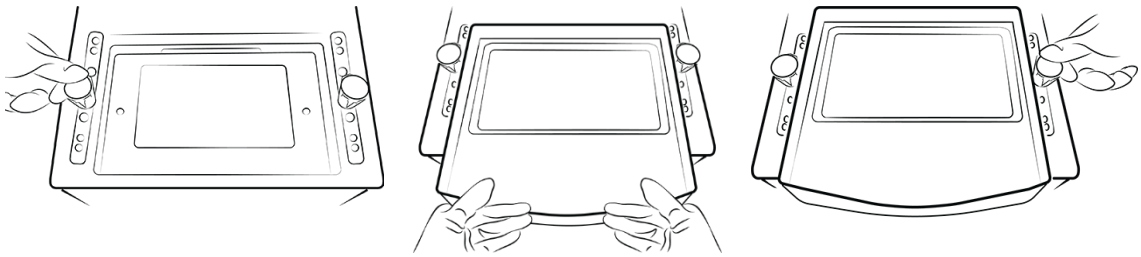


Figure 9: Material tray installation

CAUTION	**Risk of damage to the printer:** tightening the two torque knobs until they are snug is very important. If they are not locked properly, the material will splash inside the printer. Double-check if the torque knobs are tightened securely before starting a build process.

Add Material

Each ETEC printing material offers the Best Practices Guide, see **Material Best Practices Guide**. Be sure to properly prepare your specific material before each use. Always observe the relevant **Material Safety Data Sheets** supplied with the material bottle.

CAUTION	**Risk of injury:** Use the appropriate personal protective equipment.

NOTICE	Always remove the build platform before taking the material tray out of the printer! Failure to do so can result in material dripping down into the safety glass causing failed builds and ruined equipment.

NOTICE	Use a different material tray for each kind of material to avoid contamination. If not possible, clean the material tray carefully and thoroughly.

Note: Ensure the extraction is sufficient. Desktop Health recommends an air change of 25 m^3/h per m^2 effective surface of the laboratory per EN 16798-3 or 3.2 m^3/h per m^2 per US ANSI ASRAE 62. Check local requirements.

Step-by-step:

1. Open the printer's hood.
2. A material tag is attached to the material bottle. Remove the material tag and place it on the material tag reader.
3. Shake the material bottle well. Open the material bottle and pour the material slowly into the material tray to the material fill line.
4. Mix the material thoroughly with the supplied spatula. Close the hood to protect the material from ambient light.

Connect Oxygen Concentrator to Printer

Prerequisite:
The oxygen concentrator has been set up, following steps in **Set Up Oxygen Concentrator**.

CAUTION	**Risk of damage to the printer:** priming must finish before plugging the oxygen concentrator into the printer.

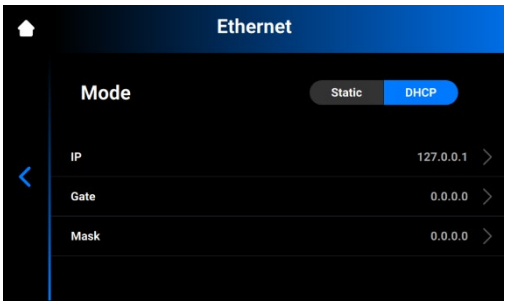
The oxygen delivery tube connects the front of the oxygen concentrator and the back of the Envision One cDLM printer. Firmly insert the open end of the tube into the plastic release ring at the back of the printer.

NOTICE	The concentrator must be turned on during the printer operation. It can be turned off only when the printer is not in use. When turning the concentrator back on, wait 30 minutes for the oxygen to prime.

Set Ethernet

The Envision One cDLM is compatible with both ethernet and Wi-Fi connections. To connect the printer to your network via an ethernet connection, complete the following steps:

1. Plug the Ethernet cable into the network connector located on the back of the printer.
2. Connect the Ethernet cable to your network.
3. On the printer screen, select **Settings > Ethernet**.



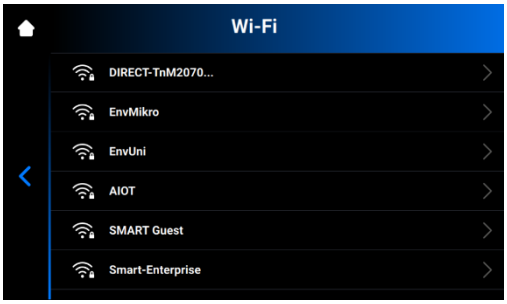
There are two types of Connection: static and dynamic. **Dynamic connection** or **DHCP** – assigns the printer a dynamic IP address. All the fields are greyed out.

4. To set the **Static** connection, complete the fields manually using the settings for your network.

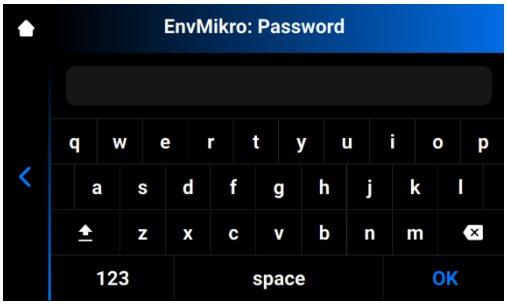
Set WI-FI

To set Wi-Fi on the printer:

1. Select **Settings > Wi-Fi** on the touch screen.
2. Select the required Wi-Fi name.



3. Select **Join**.
4. In the **Password** field, type a password for the selected Wi-Fi and confirm with **OK**.

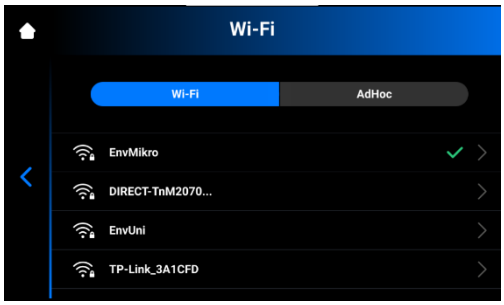


Note: The list of available Wi-Fi networks automatically refreshes each time you enter the Wi-Fi tab.

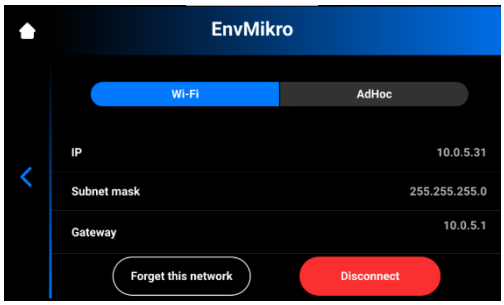
Connect to Another Wi-Fi Network

To join another Wi-Fi network, proceed with the following steps:

1. Enter the **Wi-Fi** tab by selecting **Settings > Wi-Fi**.
2. Select the network you want to disconnect from.



3. Select **Disconnect**.



4. Proceed with the steps outlined in Set Wi-Fi section.

Note: Select **Forget this network** to disable automatic connection to the current Wi-Fi network. It is possible to reconnect to this network again in the future. The system will ask for a password for protected Wi-Fi networks.

Connect to Printer via VNC Clients

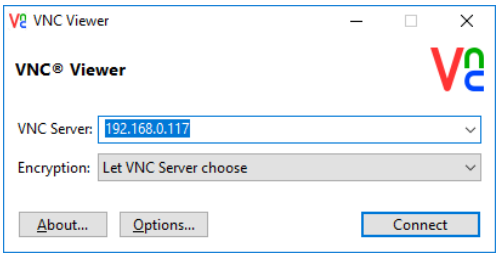
VNC Clients allows the printer operator to view printer status from a computer, remotely control the printer within reason, and provide remote access to the printer during a Technical Support Case.

NOTICE	Improper use of the remote printer control over local network using VNC software may lead to damage. Use the remote printer control with great attention. Do not use the remote printer control without an operator next to printer. The printer owner is responsible for any unsafe operation of the printer using the remote printer control.

Supported Clients for Windows

VNC Viewer

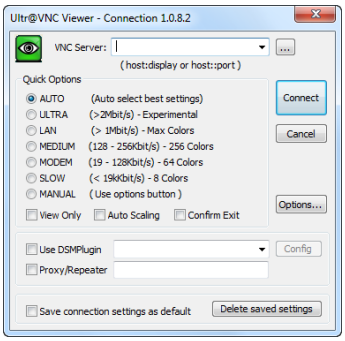
1. Download VNC Viewer and open the program.
2. Type the IP address into the **VNC Server** box.



3. Select **Connect**.
   → The control screen appears.

UltraVNC Viewer

1. Download UltraVNC Viewer and open the program.
2. Type the IP address into the **VNC Server** box.



3. Select **Connect**.
   → The control screen appears.

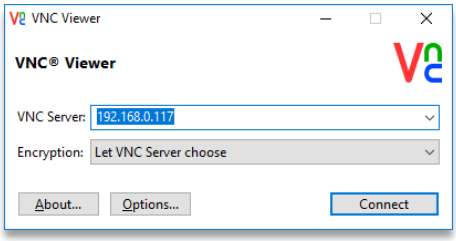
Supported Clients for Linux

VNC-Viewer

Step-by-step:

1. Download VNC Viewer and open the program.

2. Type the IP address into the VNC Server box.

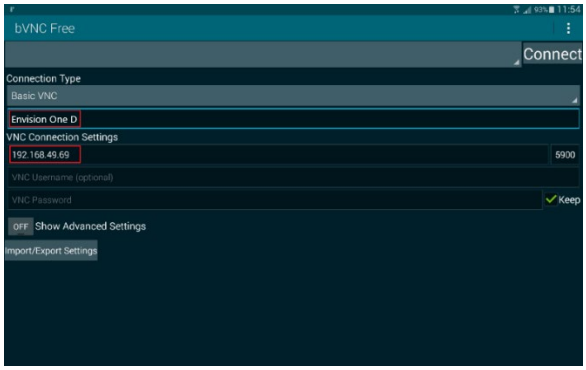


3. Select Connect.

Supported Clients for Android

bVNC Free

1. Type the connection name and the IP address into the boxes marked below.



2. Select **Connect**.
   → The control screen appears.
   → Proceed working on the printer.

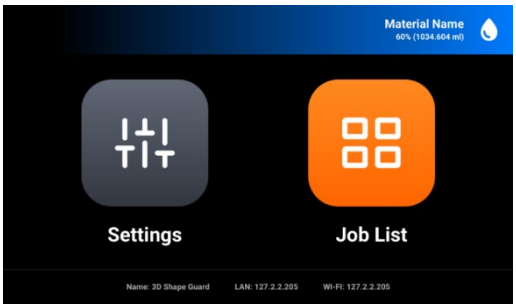
Supported Clients for iOS

VNC Viewer

Type the IP address and the connection name into the **Address** and **Name** boxes.
→ The control screen appears.
→ Proceed working on the printer.

Software Presentation

Envision One Control Software

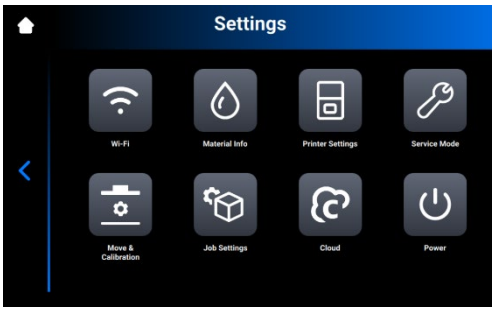


In the **Control Software**, there are two main menus: **Settings** Menu and **Job List** Menu.

Settings Menu

The **Settings** menu:

- allows you to change settings of the printer build parameter or the printer itself.
- gives further information about the printer or the LAN connection.
- allows the user to switch the printer off electronically.



To exit the **Settings** menu, select the icon on the left part of the screen.

To enter the main screen, select the icon on top-left corner of the screen.

Wi-Fi

The Wi-Fi tab lets you set the Wi-Fi connection on the printer.

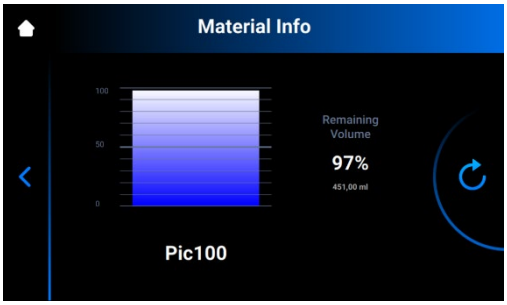
Select **Settings > Wi-Fi** to open the tab, see section Set Wi-Fi.

Material Info

The **Material Info** tab provides information about:

- the type of material used on the printer.
- the amount of the material left on the material tag.

Select **Settings > Information > Material Info** to open the tab.



Select to update the data from the RFID tag reader.

To change the material tag, proceed as follows:

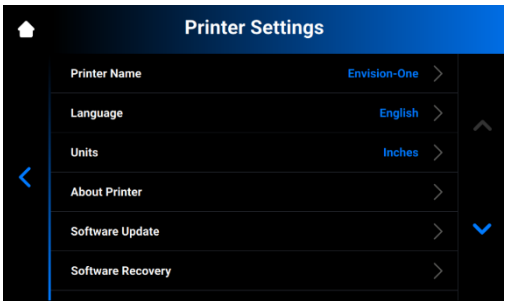
1. Remove the material tag from the tag reader.
2. Put the new material tag on the tag reader.
3. Select the icon.
   → The material information will be updated based on your new material tag.

Printer Settings

The **Printer Settings** tab:

- provides information about the printer.
- allows you to change the printer's name, select units of measurement, and update the software.

To open the tab, select **Settings > Printer Settings**.



Printer Name

This option lets you change the name of a printer.

1. Select **Settings > Printer Settings > Printer Name**.

2. Enter the required name of the printer into the corresponding field using the keyboard on the screen.

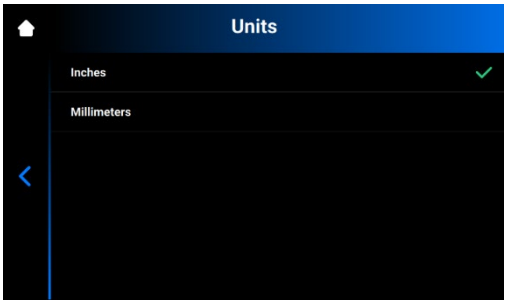
> **Note:** Printer name may contain:
> • Letters from A to Z.
> • Digits from 0 to 9.
> • A hyphen (-).
> It may not:
> • Include spaces.
> • Include special characters.
> • Begin with a number or a hyphen.

3. Select **OK**.
   → The printer's name is changed.

Units

The **Units** tab lets you select the units of measurement for the motion parameters.

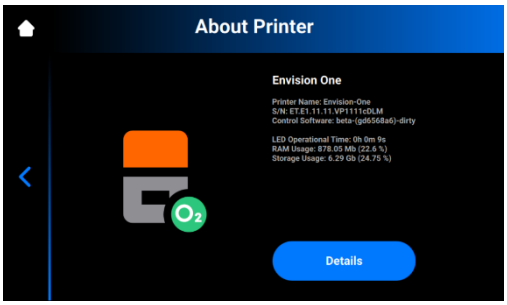
1. Select **Settings > Printer Settings > Units**.



2. Select **Inches** or **Millimeters** by selecting on the corresponding field.
   → The units of measurement are changed.

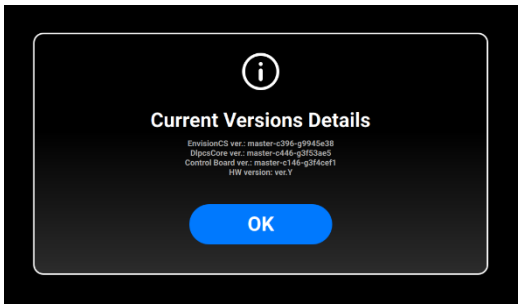
About Printer

To view information about the printer, select **Settings > Printer Settings > About Printer**.



- **Printer Name:** name of the printer.
- **S/N:** printer serial number.
- **Control Software:** version of control software set on the printer.
- **LED Operational Time:** time of LED operation.
- **RAM Usage:** volume of the occupied memory (as percentage of the total volume).
- **Storage Usage:** volume of the occupied storage (as percentage of the total storage).

For more detailed information on the printer, select **Details**.

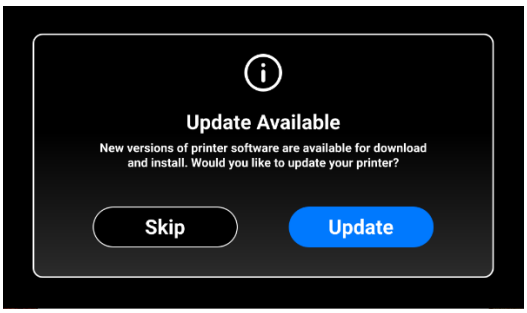


- **EnvisionCS ver.:** Version of the control software on the printer.
- **DlpcsCore ver.:** Version of the DLPCS Core.
- **Control Board ver.:** Version of control board.
- **HW version:** Version of firmware set on the printer.

To return to **About Printer** tab, select **OK**.

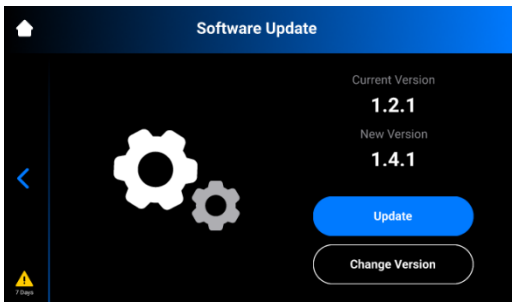
Software Update

Select **Settings > Printer Settings > Software Update** on the printer screen to check the software version installed on the printer.
If the latest version of software is installed on the printer, the **ChangeLog** button displays. Select it to view detailed information about the current version.
If a new version of software is available, the **Update** button displays.



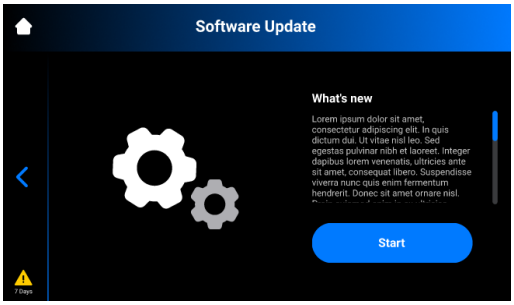
To update the software:

1. Select **Update**.

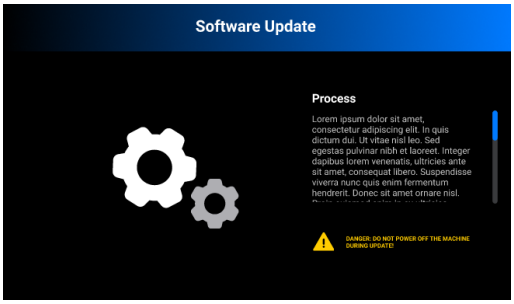


CAUTION	**Risk of damage to the printer: d**o not turn the printer off during update.

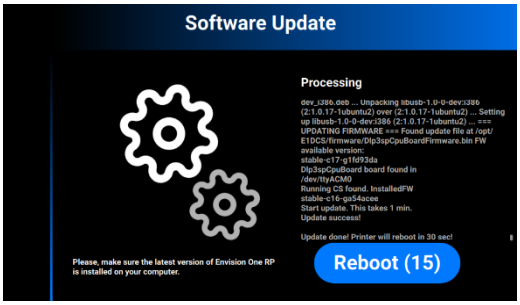
2. Select **Start**.



→ The update process starts.



→ The following screen appears.

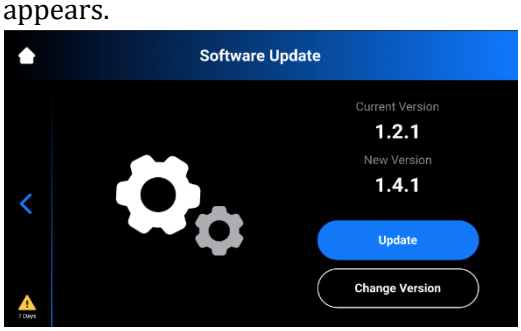


3. To reboot the printer manually, select **Reboot**. If not, it will start rebooting automatically in 30 seconds.

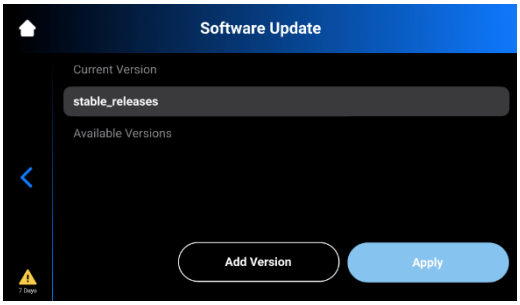
There is also an option for users to get a custom version of the Control Software that contains special features. Once that custom Control Software version is ready, users will receive an encrypted version number and would be able to install that custom update on the printer.

To install the custom version update:

1. Select **Settings > Printer Settings > Software Update** on your printer.
   → The following screen appears.

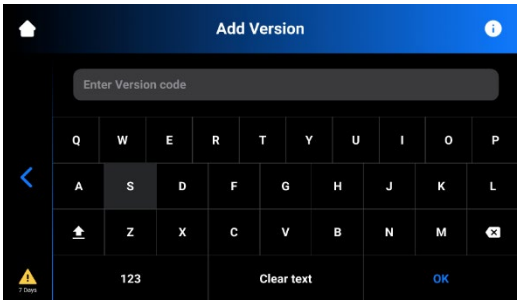


2. Select **Change Version**.
   → The following screen appears.

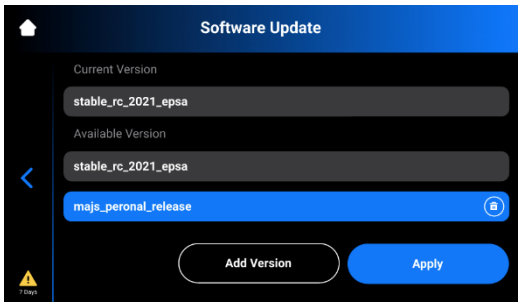


Note: If no custom update is available, the Apply button will be grayed out.

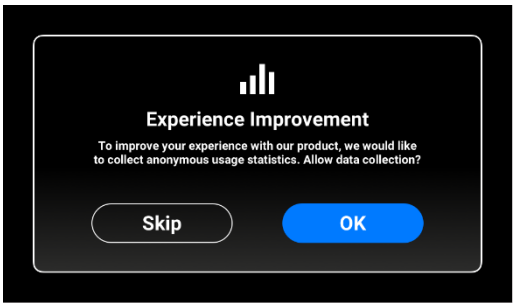
3. Select **Add Version**.
   → The following screen appears.



4. Type in the encrypted version number.
   → The system adds the version to the list.

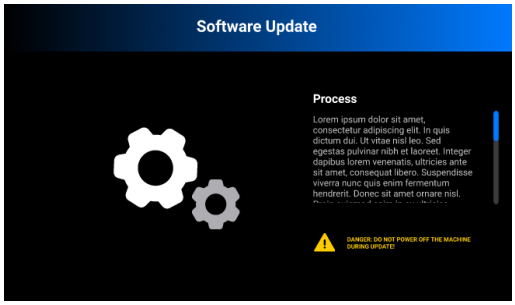


5. Select the needed version from the list and select **Apply**.
   → The system saves the previously installed Control Software version.
6. Select **Start**.
   → The **Experience Improvement** message appears.

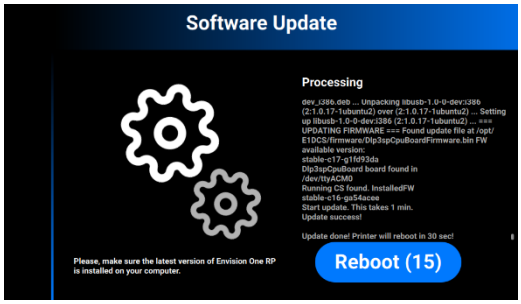


7. Select **OK** to allow data collection or **Skip** to skip this step.

→ The update process starts.



→ The following screen appears.



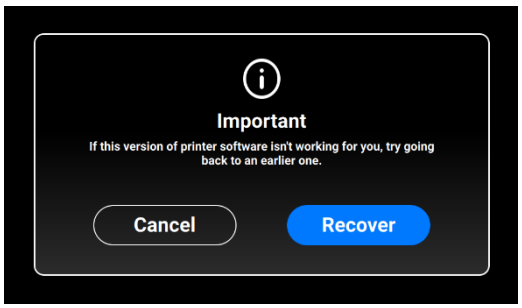
8. To reboot the printer manually, select **Reboot**. If not, it will start rebooting automatically in 30 seconds.

Software Recovery

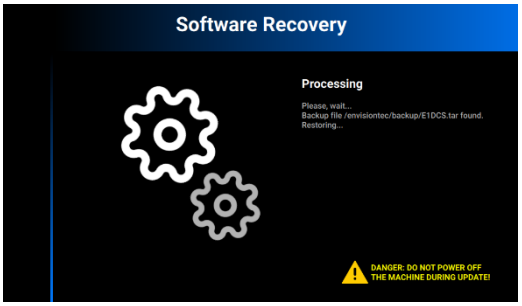
The **Software Recovery** tab lets you recover the previous version of software.

1. Select **Settings > Printer Settings > Software Recovery** to open the tab.
   → The following screen appears.

2. Select **Recover** to get back to the previous version of Control Software.
   → The following message appears.



3. Select **Recover** to confirm the software recovery.
   → The process of software recovery starts.

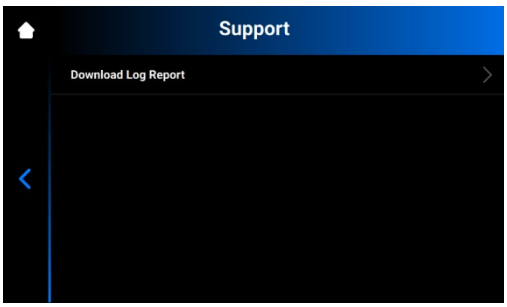


→ The following message appears.

4. To reboot the printer manually, select **Reboot**. If not, it will start rebooting automatically in 30 seconds.

Support

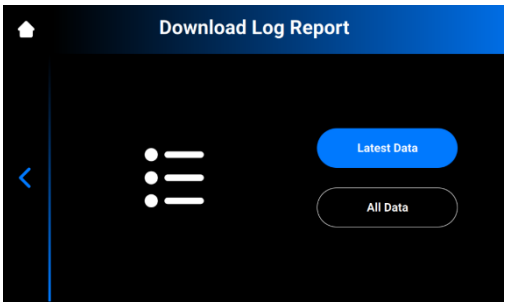
The **Support** tab contains options that would be useful for contacting the ET Support Team in case of any printer-related issues.



Download Log Report

To download the log report with printer information to the USB-drive:

1. Connect the USB drive to the printer.
2. On the home screen of the printer, select **Settings > Support > Download Log Report** to open the tab.

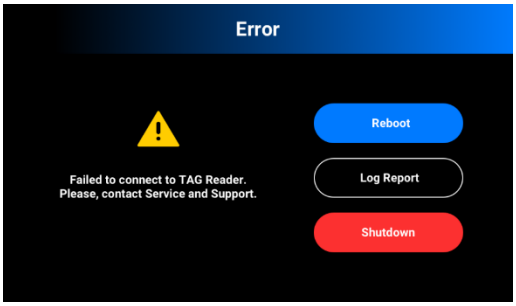


3. Select **Latest Data** to download the latest printer information; or **All Data** to download the report containing all information received during printer operation.

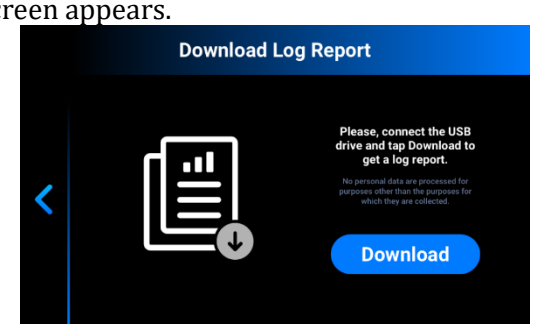
To send the log report to Service and Support, proceed as follows:

1. Open the USB drive folder.
2. Find the file with the similar name: snapshot_2019-09-26T14-01.zip.
3. Send it to your personal Service and Support manager.

In case a hardware issue is detected, the following error message appears:



1. Select **Log Report**.
   → The following screen appears.



2. Make sure the USB drive is connected to the printer.
3. Select **Download**.

   → The report downloads to the USB drive.

To send the log report to Service & Support, proceed with steps shown above.

Printing Statistics

This tab provides the printer usage data for the last 7 days, last 30 days, and all operations data.

Select **Settings > Printer Settings > Printing Statistics**.

→ The following screen appears.

The following information is shown:

- **Job evaluation data:** quality of finished jobs (successful, partially successful, and failed).
- **Materials usage:** name and volume of each material in use.
- **Job quantity:** quantity of completed, aborted, and failed jobs.
- **Average print duration:** average job duration (hours).
- **Damaged material trays:** number of material trays marked as damaged.

Usage Analytics

Collecting and sending statistics automatically helps ETEC improve our products.

1. Select **Settings > Printer Settings > Usage Analytics**.
2. Check the **Usage Analytics** checkbox to consent to collection and usage of customer data.

Service Mode

The **Service Mode** tab can be accessed by **technicians and distributors only**.

Ethernet

This tab lets you set the network on the printer.

Select **Settings > Ethernet** to open the tab, see Set Ethernet.

Move & Calibration

The **Move & Calibration** tab is used for moving the build platform and calibration of Home position.

Move

This tab lets you move the build platform along the Z-axis.

1. Select **Settings > Move & Calibration > Move** to open the tab.

2. Select the **Up** and **Down** arrows to move the platform up and down correspondingly.

- **Zero position**: the highest position of the build platform along the Z-axis.
- **Home position**: start position of the build platform for printing.
- **Safe position**: safe position of the build platform between Zero position and Home position.

- **Dry position:** the lowest position of the build platform along the Z-axis. It is used for calibration of the platform while the material tray is empty of material.

Home Calibration

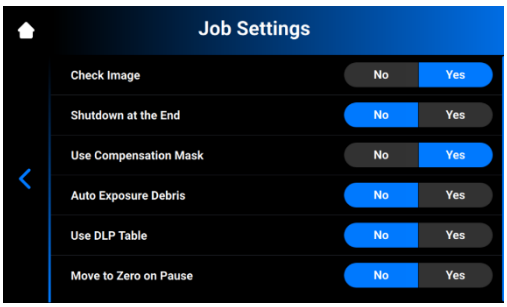
Select **Settings > Move & Calibration > Home Calibration** to open the tab, see Calibrate Home Position.

Mask Generation

Select **Settings > Move & Calibration > Mask Generation** to open the tab, see Generate Mask.

Job Settings

This tab allows the user to check or change the printer settings.
Go to **Settings > Job settings** to open the tab.



The following settings are available:

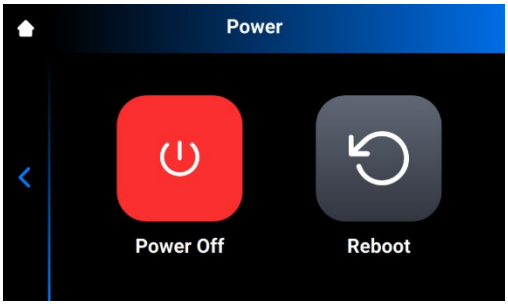
- **Check Image:** Function of image verification.
  - **Yes.** All layers of the job are checked before starting the job.
  - **No.** The layers are not checked before starting the job.
- **Shutdown at the End:** Shutdown of the printer when the job is finished.
  - **Yes.** Printer turns off automatically after completion of the job.
  - **No.** Printer does not turn off after completion of the job.
- **Use Compensation Mask:** Function of mask application.
  - **Yes.** Mask is applied to the projected image.
  - **No.** Mask is not applied to the projected image.
- **Auto Exposure Debris:** Function of automatic exposure of the material tray to make cleaning the material tray easier.
  - **Yes.** Material tray is automatically exposed after the job has failed.
  - **No.** Material tray is not exposed automatically when the job has failed. In this case, you can manually perform the material tray exposure after the completion of the print process.
- **Use DLP Table:** Function of DLP table application.
  - **Yes.** DLP table is used.
  - **No.** DLP table is not used.

- **Move to Zero on Pause:** Function of build platform movement when the job is paused.
  - **Yes.** Build platform moves to Zero position.
  - **No.** Build platform stays at current layer of the job.

Power

This tab lets you turn off the printer of or reboot it when needed.

1. Select **Settings > Power** to open the tab.



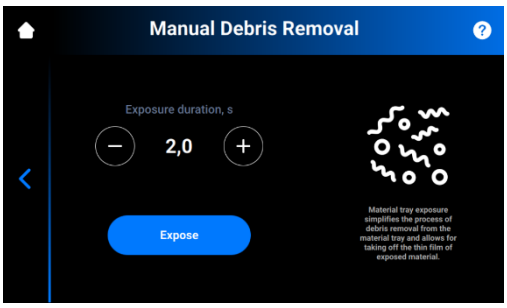
2. Select:

- **Power Off** to turn off the printer.
- **Reboot** to reboot the printer.

Manual Debris Removal

This tab helps simplify the process of cleaning the material tray.
To remove debris from the material tray:

1. Select **Settings > Manual Debris Removal** to open the tab.

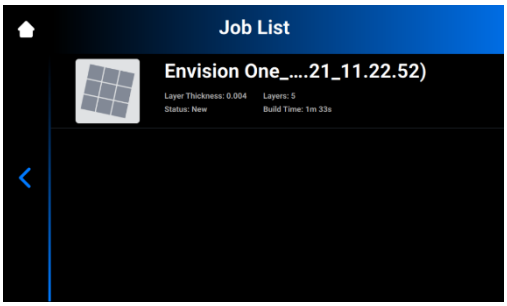


Note: To learn more about this feature, select the ? icon in the upper-right corner of the screen. Scan the QR-code with your mobile phone or tablet to visit the corresponding page in the online knowledge base.

2. Set the required exposure time using the + and – icons.
3. Select **Expose**.
   → The entire material tray area is exposed.
4. Remove debris from the material tray by lifting the thin film of exposed material.

Job List Menu

Select **Job List** to open the tab.



Scroll through the list to view different jobs. There is the following information on job statistics:

- **Layer thickness:** Thickness of one layer in μm.
- **Layers:** Number of layers for the job.
- **Print time:** Estimated time of the print job completion. This calculation is approximate and is updated dynamically after each exposure.
- **Status:** State of the job at a current time. It can be:
  - **New:** Job has not been printed yet.
  - **Complete:** Job has been printed successfully.
  - **Failed:** Job has corrupted or failed due to material mismatch.
  - **Aborted:** Job has been aborted manually or cancelled due to mechanical issues.
  - **Invalid:** A problem was detected when transferring the job file from Envision One RP® to Envision One Control Software

Envision One RP®

All files to be printed must pass through Envision One RP model processing software before transferring to Envision One printer. Once the models are loaded, automatically fixed, oriented, and supported in Envision One RP, they may be transferred to the printer as a folder containing a series of images and files. This information is used by the printer to build three-dimensional models.

With each printer we send a USB drive containing the following program and data:

- Envision One RP® Software
- Buildstyles for the printer (.bsx)

Find information on how to install and operate Envision One RP® in the Envision One RP® User Guide provided with your printer.

Calibration

The printer is completely calibrated and tested during fabrication. However, the calibration needs to be carried out to guarantee the uniformly accurate build results if:

1. The printed models are not adhering to the build platform, especially in one corner or half of the build platform.
2. The current material tray is replaced with a new material tray.

Calibrate Home Position and Adjust Parallelism

Automatic Home Position Calibration

Note: The latest material trays contain a serial number indicated on the front of the material tray.

Note: Recalibrate the Home position of the build platform after each change of the material tray.

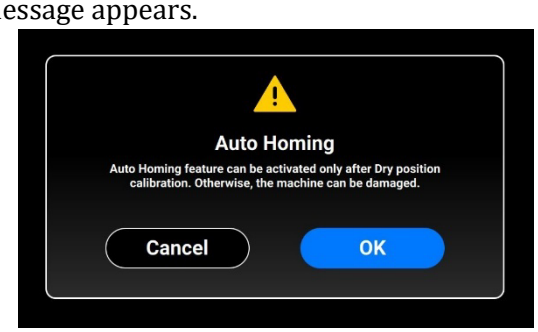
Note: The Automatic Home Position Calibration or Auto Homing is only possible if the printer is equipped with Load cells, therefore enabling the Dry position calibration.

Prerequisites:

- The Load Cells have been calibrated.

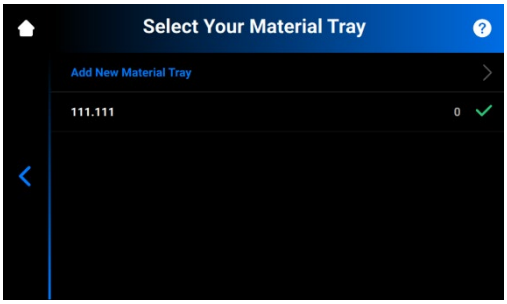
Step-by-step

1. Select **Settings > Move & Calibration > Home Calibration > Auto Homing**.
   → The following message appears.



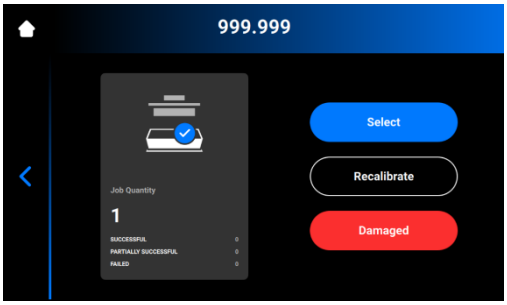
2. Select **OK**.
   → Dry position calibration starts.

→ The following screen appears with a list of material trays. The material trays on the list have been calibrated and the calibration data is saved. The numbers on the right of the material tray name show the number of prints done for each material tray.



Note: To learn more about the material tray maintenance, click the **?** icon in the upper-right corner of the screen. Scan the QR-code to visit the corresponding page in the online knowledge base.

If you have already calibrated the platform position with this material tray, select this material tray's name or serial number on the list.

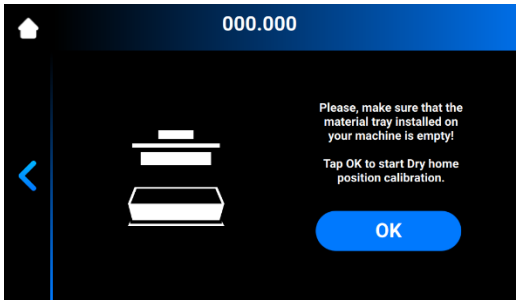


- Press **Select** to select this material tray and proceed working with the printer.
- Select **Damaged** to mark the material tray as damaged and remove it from the list.

Note: To check the number of material trays marked as damaged, go to the **Printing Statistics** menu.

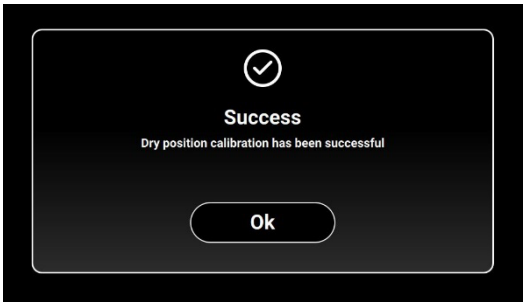
To recalibrate the existing material tray:

1. Select **Recalibrate**.
2. Select **OK**.
   → The following screen appears.



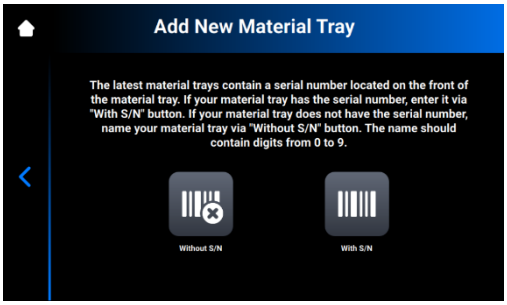
Note: Make sure your material tray does not contain material in it. Material residue in the material tray causes false reading to the sensors during the calibration.

3. Select **OK**.
   → The platform starts moving to its Dry position.
   → Once the platform finds its Dry position, it starts moving to Zero position.
   → Dry position calibration has been saved.
   → The following screen appears.



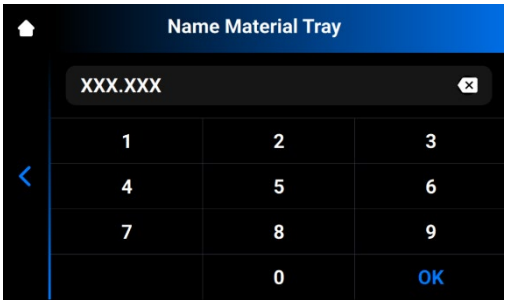
To add a new material tray to the list:

1. Select **Settings > Move & Calibration > Home Calibration > Auto Homing > Add New Material Tray**.
   → The following screen appears.



2. Select **With S/N** if your material tray has a serial number or **without S/N** if your material does not have a serial number.
3. Type the material tray's serial number.
   - If your material tray has a serial number, find it on the front of your material.

- If your material tray does not have a serial number, name it. The material tray name must contain 7 digits.



4. Select **OK**.

Note: Make sure your material tray does not contain material in it. Material residue in the material tray causes false reading to the sensors during the calibration.

5. Select **OK**.
   → The platform starts moving to its Dry position.
   → Once the platform finds its Dry position, it starts moving to Zero position.
   → Dry position calibration has been saved.

Manual Home Position Calibration

NOTICE	To prevent material dripping down into or onto the printer, always remove the platform before taking the material tray out of the printer.

Required equipment:

- Digital calipers
- Scraper
- Material
- RFID material tag
- 3 mm Allen wrench
- Post-processing materials
- Home Position Calibration Cubes.stl file

To check, modify, or fine-tune the printer's parallelism and home position, a Home Position Calibration Cubes.stl file is printed. The printer must be powered on for the duration of the parallelism calibration, and the home position calibration.

Note: Parallelism is achieved when the platform and material tray are aligned with each other. Home position is the lowest point of the build platform along Z-axis, it is the start position of the build platform for printing.

Step-by-step:

1. Download the **Home Position Calibration Cubes.stl** file to the computer where the Envision One RP software is installed.
2. Open the Envision One RP software and select a buildstyle. See the Envision One RP® User Guide provided with the printer for details.
3. Import the .stl file into the Envision One RP software.

> **Note: Home Position Calibration Cubes.stl** file contains nine blocks, where each block is five millimeters high. This file is located on the USB drive that is shipped with every Envision One cDLM printer. The file is also available for download by contacting ETEC support or an authorized distributor.

4. Print the Home Position Calibration Cubes.stl file. See **Start Job** for details.
5. Once the print has completed, check whether there are nine cubes on the platform.
6. If any of the cubes are missing, select and remove any cured particles from the bottom of the material tray.

Post processing:

7. Gently remove the calibration blocks from the build platform using the scraper that came in the starter kit.
8. Clean the models, see **Post-Process**.
9. Take a close look at each printed block. There is a small number printed on each cube.

Figure 10: Measuring calibration cube with the caliper

Measure

10. Measure the height of each cube and write down the values.
    a) If all the blocks are within +/- 100 microns, the printer is paralleled, and no further actions need to be taken at this time.
    b) If all the blocks are within 4.90 and 5.10 mm (for the disposable tray – within 4.8 mm and 4.95 mm), the printer's home position is correct, and no further actions need to be taken.
11. If the Home position is correct and the printer is not paralleled, move on to Step 12. If the printer is paralleled and the home position is not correct, proceed to Step 16.

Adjusting parallelism:

12. Reference your values in Step 10 to determine which side needs adjustment. Find the two extremes. One corner is most likely the highest and the opposite is the lowest. Adjust the higher number to make it lower.

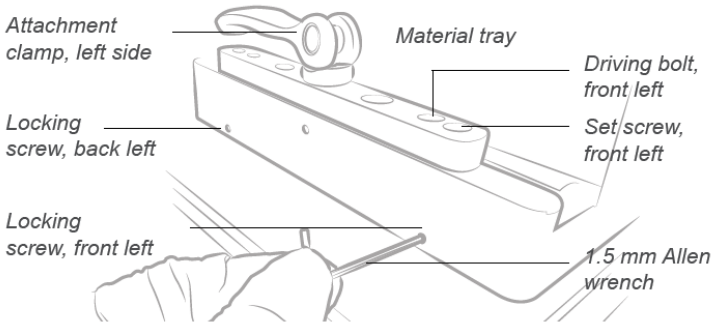


Figure 11: Location of material tray bolts and screws

To increase the height measurement:

- Turn the outer screws or Set Screws counterclockwise (e. g. ¼ turn= 100 microns).
- Turn the inner screws or Driving Bolts clockwise (e. g. ¼ turn = 100 microns).

To decrease the height measurement:

- Turn the inner screws or Driving Bolts counterclockwise (e. g. ¼ turn= 100 microns).
- Turn the outer screws or Set Screws clockwise (e. g. ¼ turn = 100 microns).

13. Find the difference between the two extremes and divide the number in half. This is the adjustment amount.

Example:
Block 1 is 4.9mm and Block 9 is 4.7 mm
The difference between the between Block 1 and Block 9 is 2mm (200 microns).
The result 200 microns is divided by 2 is equal to 1mm (100 microns).
The adjustments is ¼ turn.

14. Apply adjustments cautiously and precisely using the 3 mm Allen wrench.
15. Print the Home Position Calibration Cubes.stl file again and measure the cubes. Adjust the parallelism again as needed.

Adjusting Home position:

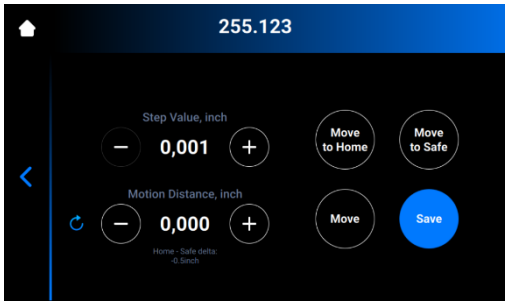
16. Remove the build platform from the printer and place it aside on a clean work surface. See **Remove Build Platform from Printer**.
17. Select **Settings > Move & Calibration > Home Calibration > Manual Homing**.

→ The list of material trays appears. The material trays on the list have been calibrated and the calibration data is saved. The numbers show the number of prints done for each material tray.

- If you have already calibrated the platform position with this material tray, proceed to the next step.
- If you want to add a new material tray, proceed with the instructions specified in the Add New Material Tray section before the next step.

18. Find the serial number or name of your material tray in the list and select it.
    → The warning message appears asking if you are sure you want to recalibrate the existing material tray. Select **OK**.

    → The following screen appears.



19. Select **Move to Home**.
    → The build platform holder moves down the Z-axis to the current home position.
20. Set the value of a step by selecting the **-** and **+** icons of **Step Value**. This is the increment used for the **Motion Distance**. The Step Value increments can be set to 0.01, 0.10, 1.00, and 10.00.
21. Set motion distance of the platform by selecting the **-** and **+** icons of **Motion Distance**. This is the total distance the platform moves.

> **Note:** The positive values move the platform up. The negative values move the platform down. Selecting the ↻ icon resets the motion distance value to zero.

22. Reference the values in Step 10 to determine the new home position. The adjustment should be made based on the average height of the calibration blocks.
    a) If the average height measurement is below 4.90 mm (for the disposable tray – 4.80 mm), move the platform up by selecting **Move** the required number of steps.
    b) If the average height measurement is above 5.10 mm (for the disposable tray – 4.95 mm) move the platform down by selecting **Move** the required number of steps.

23. Set the motion distance to the required adjustment. Select **Move** to make the adjustment. Select **Save**.
    → The build platform holder starts moving up to the top of the Z-axis.
    → The new home position is set.

Generate Mask

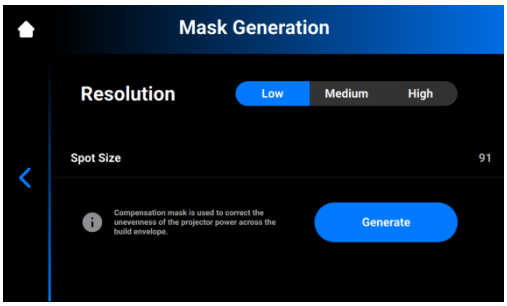
Compensation mask corrects possible unevenness of the projector power across the build envelope.

Required equipment:

- USB light sensor
- UV protection glasses

Step-by-step:

1. Insert the empty and clean material tray in the material tray holder.
2. Connect your USB Light Sensor to the printer via USB cable.
3. Select **Settings > Move & Calibration > Mask Generation**.
   → The following message appears.



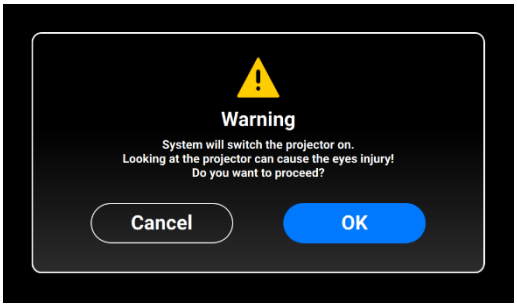
4. Select a resolution (Low, Medium, or High) in the **Resolution** field.

Note: Resolution defines the number of required measurements. The higher the resolution, the more measurements are needed.

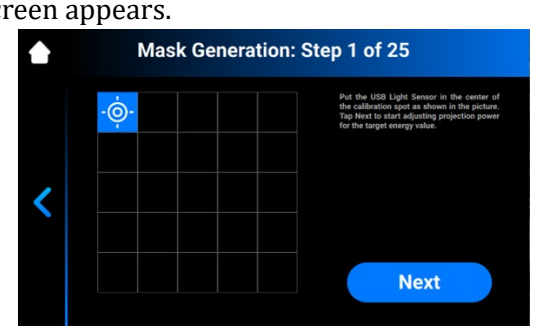
Note: The spot size is set automatically based on the printer type and build envelope size.

5. Select **Generate**.

→ The following screen appears.



6. Make sure you have the UV protection glasses on and select **OK** to proceed.
   → The following screen appears.



Note: Each box on the screen shown above corresponds to a spot of projected light onto the empty material tray. Select the required box to measure and adjust, if needed, its projection power or select **Next** to move to the next box.

7. Place the USB light sensor in the center of the light spot that is projected and select **Next** to start adjustment of projection power.
   → The **Next** button transforms into the **Pause** button.
   → The projection power is adjusted.
8. Repeat step 7 for each of the remaining boxes.
   → The confirmation screen appears.
9. Select **Apply** to save the newly generated mask and proceed working with the printer.
   → The newly generated mask has been saved.

Use the Grey Mask

The Grey Mask is the compensation mask for the Envision One cDLM printer. It is set in the factory. To enable the Grey Mask on your printer:

1. Go to **Settings > Job Settings**.
2. Make sure the **Yes** option is selected in the **Use Compensation Mask** field.

Start Print

CAUTION	**Risk of injury from crushing caused by moving printer parts:** Printer may only be operated by instructed and specially trained personnel. The printer may only be operated if the protecting devices are working properly.

CAUTION	**Risk of injury:** Do not use materials other than the materials branded or manufactured or qualified for use by Desktop Health®. Observe the relevant Material Safety Data Sheets for the materials. Use the appropriate personal protective equipment.

Check Z-axis

Ensure the printer has its Z-axis slide activated:

1. Select **Settings > Move & Calibration > Move** on the main screen.
2. Select the **Up** and **Down** arrow icons and make sure the building platform moves along the Z-axis. If the build platform does not move up, it is already at its highest point, see Move.

Create Print Job in Envision One RP

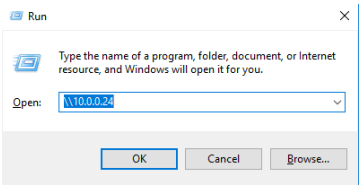
To create the job in Envision One RP:

1. Open Envision One RP Software.
2. Select the printer, material, and layer thickness.
3. Add a model.
4. Orient a model and add supports as needed or use the **Hyper Print** feature.
5. Save the build job to a USB or transfer directly to the printer.

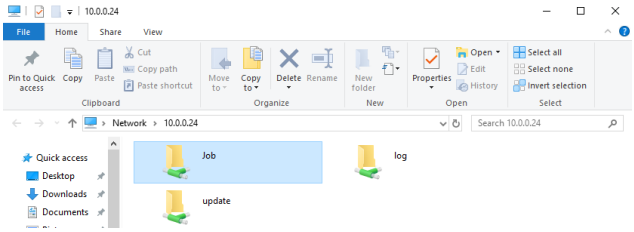
Load Job File

To load a job to the printer:

1. Enter **Run** into the Windows search field or use **<Windows> + <R>** hotkey on your computer keyboard.
   → The **Run** window opens.



2. Enter the IP address of the printer, e. g.: \\10.0.0.24.
   → The Windows file explorer opens, showing the folders on the printer.



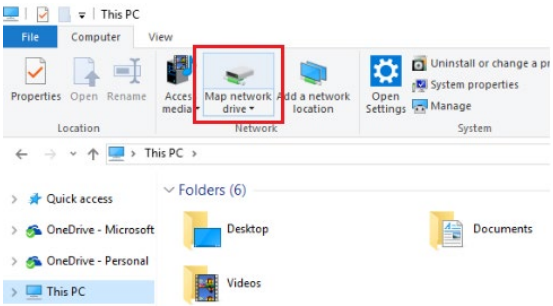
3. Open the **Job** folder.
4. Put the job files to the folder.
   → All the files from Job folder are now shown in the **Job List** tab.

Map Network Drive in Windows

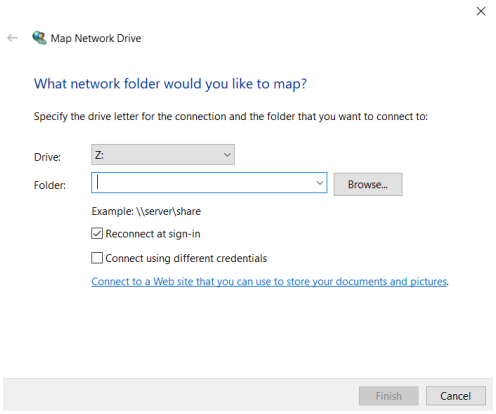
Map a network drive to access the Jobs folder from File Explorer in Windows without having to search for it or type its network address each time.

Windows 10

1. Open File Explorer from the taskbar or the **Start** menu, or select the **Windows logo key + E**.
2. Select **This PC** from the left pane.
3. On the **Computer** tab, select **Map network drive**.



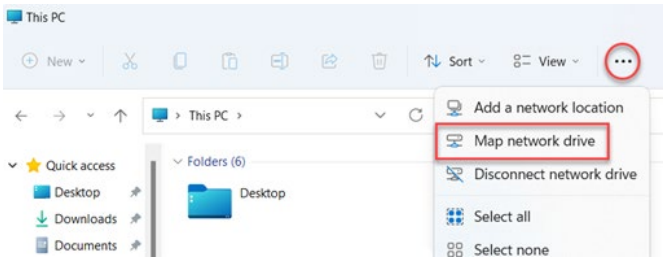
→ The following screen appears.



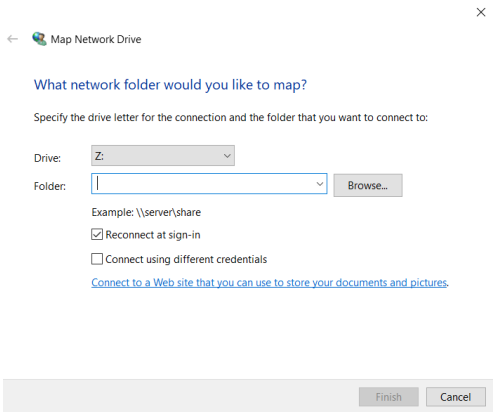
4. In the **Drive** drop-down list, select a drive letter (you can select any available letter).
5. In the **Folder** field, type the path of the folder or computer, or select **Browse** to find the folder or computer. To connect each time you sign in to your PC, check the **Reconnect at sign-in** checkbox.
6. Select **Finish**.

Windows 11

1. Open File Explorer from the taskbar or the **Start** menu, or select the **Windows logo key + E**.
2. Select **This PC** from the left pane.
3. On the File Explorer ribbon, select **More > Map network drive**.



→ The following screen appears.



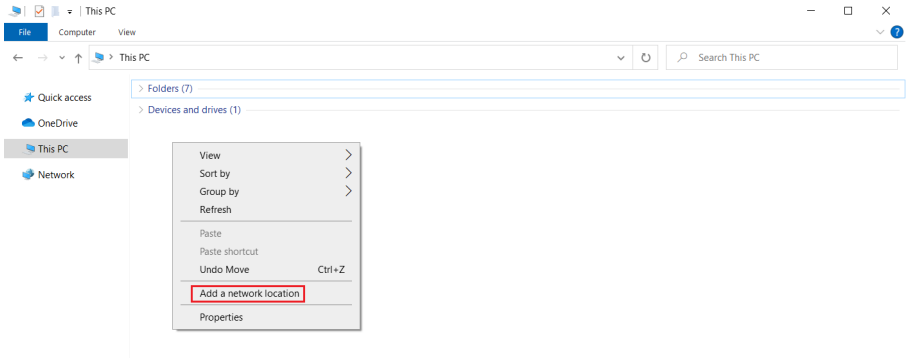
4. In the **Drive** drop-down list, select a drive letter (you can select any available letter).

5. In the **Folder** field, type the path of the folder or computer, or select **Browse** to find the folder or computer. To connect each time you sign in to your PC, check the **Reconnect at sign-in** checkbox.
6. Select **Finish**.

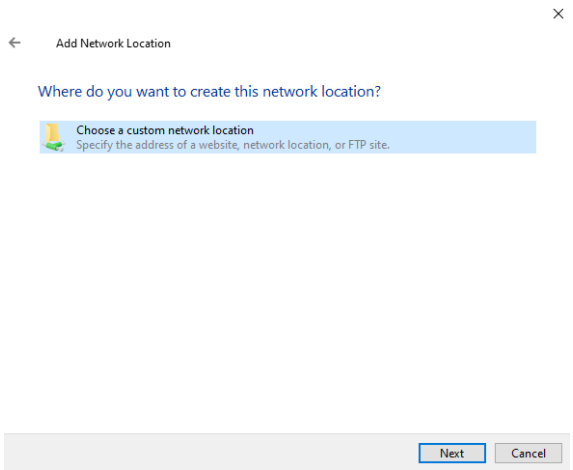
Create Shortcut

To create a shortcut to a network place in Windows allowing you to access FTP and Windows file shares, proceed as follows:

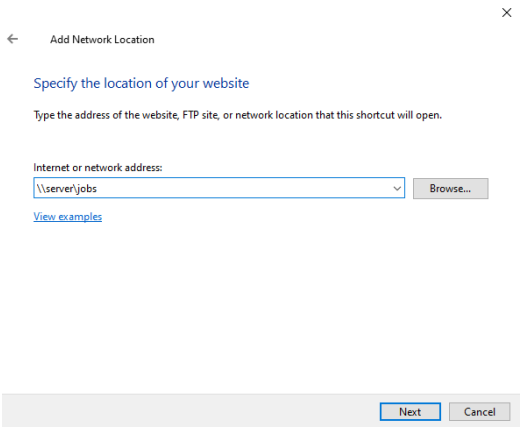
1. Open the Start menu, then search and select **This PC**.
2. Right-click on any empty space and select **Add Network Location**.



3. Select **Next** on the **Add Network Location Wizard** that opens.
4. Select **Choose a custom network location** and select **Next**.



5. Type in the address, FTP site, or network location, then select **Next**.

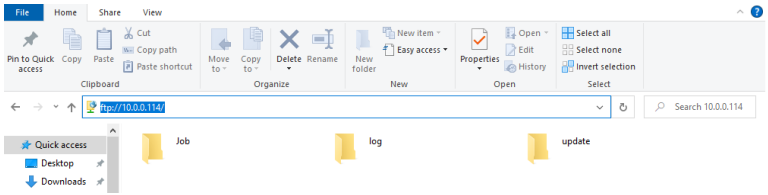


6. In the screen that appears, type a name for the network and select **Next**.
7. Select **Finish** on the **Add Network Location Wizard** screen.
   → The location is now listed under **Network Locations** tab in **This PC**.

Load Job via FTP

To load a job to the printer:

1. Enter the IP address of the printer, e. g.: ftp://10.0.0.114.
   → The Windows file explorer opens, showing the folders on the printer.



2. Open the **Job** folder.
3. Put the job files to the folder.
   → All the files from Job folder are now shown in the **Job List** tab.

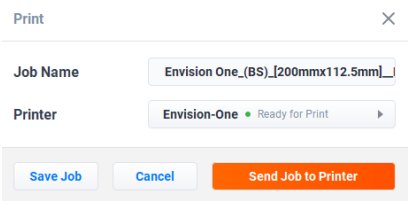
Load Job from Envision One RP

1. Open Envision One RP.

   Requirements: At least one opened and selected 3D model.

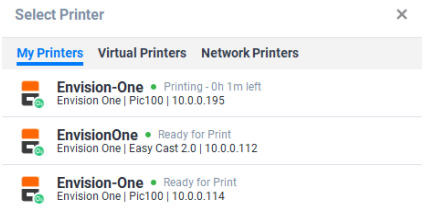
2. Select the **Print** button in the **Print Menu**.

   → The following window appears:



3. Select the **Printer** field.

→ The following window appears:



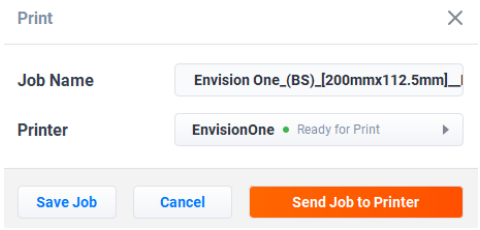
4. Select a printer to send your job to and click on it.
   → The job is sent to the selected printer.

Note: Printers in the network can have the following statuses: Ready for Print, Printing, Offline. You cannot send a job file to the printer that is offline.

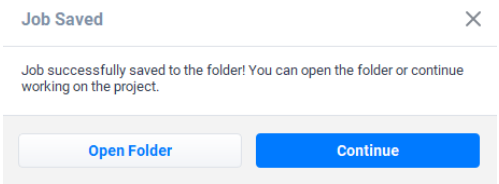
Load Job from USB Drive

To save a Job to USB drive:

1. Connect the USB drive to the PC with the installed Envision One RP.
2. Open the Envision One RP.
3. Create the job you want to save.
4. Select the job you want to save.
5. Select **Print**.
   → The following window appears.



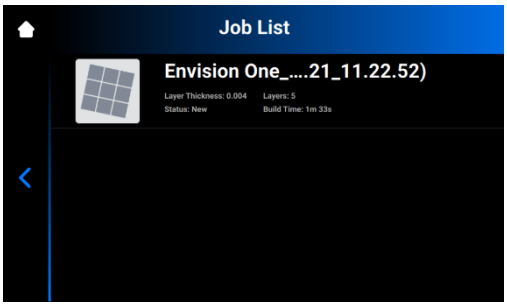
6. Select **Save job**.
   → The folder selection dialog box appears.
7. Open the USB drive folder you want to save a job to and click **Select Folder**.
   → The job folder with all required data is saved to the selected USB drive.
   → The following window appears.



8. Select either:
   - **Continue** to exit the dialog box; or
   - **Open Folder** to open the Job folder.

To load a job directly from the USB drive:

1. Upload the required job to the USB drive as shown above.
2. Insert the USB drive with the uploaded job into the corresponding plug of the printer.
   → The job is automatically added to the **Job List** of the Envision One cDLM printer.



Note:
The icon indicates that USB drive is connected to the printer.
The icon in the Job list indicates that the job was added via USB drive.

Verify Printer Is Ready to Print

Note: The pressure gauge must read between 0.05 and .080 PSI when ready to start to print.

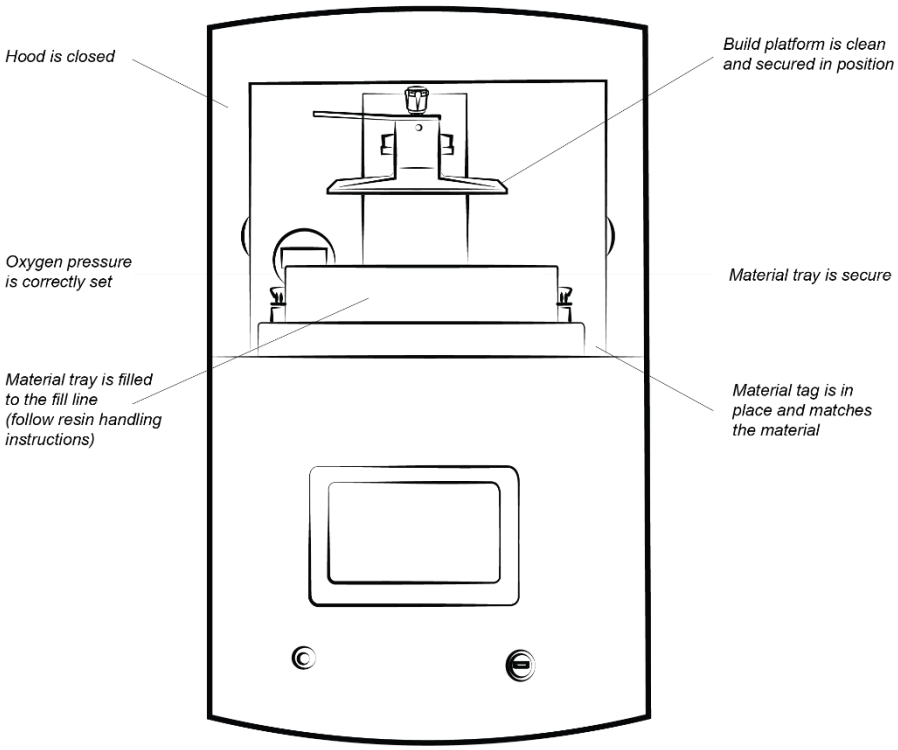


Figure 12: Printer readiness verification

Before the print starts, always check the following things:

1. The hood is closed.
2. The flat surface of the build platform is clean and free of all cured material, and the build platform torque knob is secured in position.
3. The material tray is secured in position and the material tray torque knobs are tight.
4. The material tray is filled to the fill line, and all material handling instructions are followed for the specific material used (mixing, temperature, etc.)
5. The material tag is on the material tag reader, and the tag matches the material in the tray and in the buildstyle.
6. The oxygen concentrator is supplying pressure.

Start Print

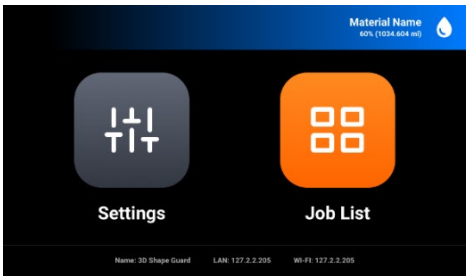
NOTICE	Make sure the build platform is clean and the material tray is in place and has material in it before starting a print. Failure to do so will result in failed builds and damage to the equipment.

Note: Before starting a print, the software checks whether the buildstyle in the job matches the material tag on the printer. If they do not match, the job does not start.

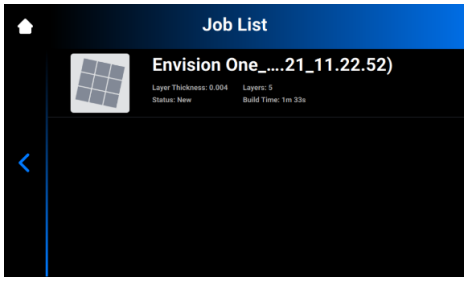
Note: To pause a job, select the **Pause Job** button. All other methods will likely result in failed build.

To start a job:

1. From the **Home** screen, select **Job List**.



2. Select the job folder from the Job List.

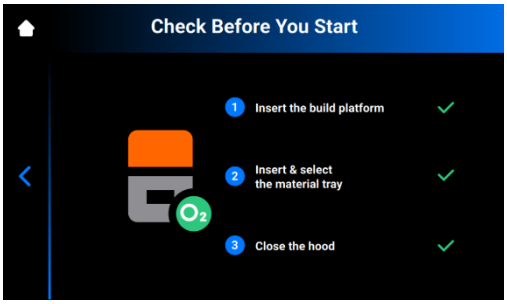


3. Select the **Play** button to start a job.

→ The following screen appears.

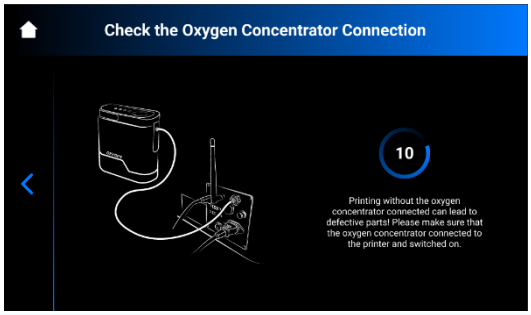
→ The following window appears.

→ The system checks if the printer is ready to start a print.



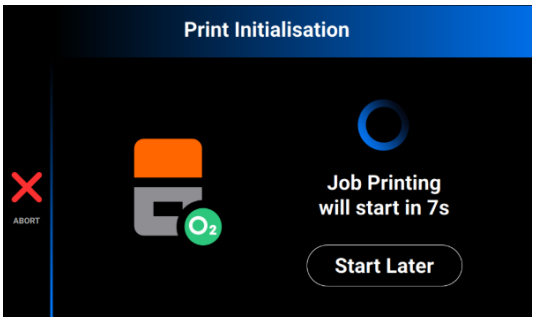
→ After the printer's shutdown, or if the printer was idle for more than 8 hours, the system checks whether the oxygen concentrator is connected.

→ The following window appears.



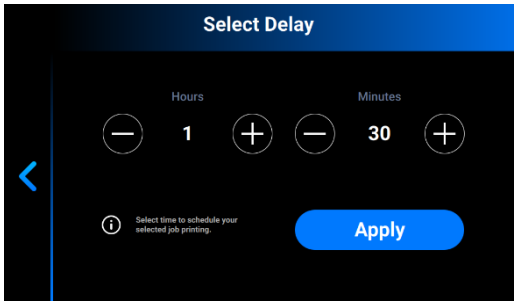
Note: To learn more about how to check and adjust the oxygen pressure, click **?** in the upper-right corner of the screen. Scan the QR-code to visit the corresponding page in the online knowledge base.

4. To start the job now, wait until the job starts.
   To delay your job print, select **Start Later**.

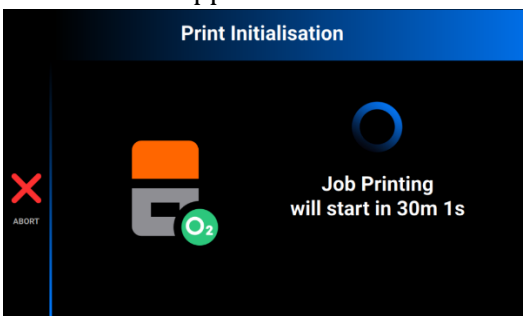


Note: The minimum delay time is 15 minutes. The maximum delay time is 999 hours and 45 minutes.

→ The following window appears.



5. Set the required delay time using the **+** and **-** icons in the **Hours** and **Minutes** fields and select **Apply**.
   → The print initialization window appears.



6. Wait until the job starts.
   → The build platform homes.
   → The job starts.

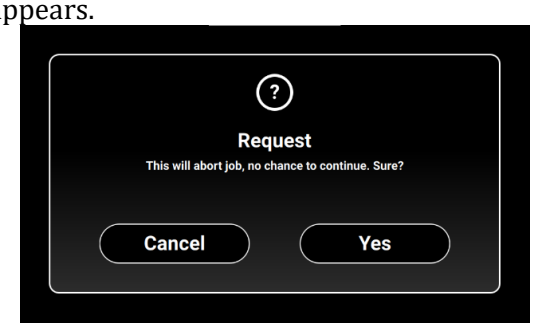
Stop Job

To stop or abort the print, the following options are available:

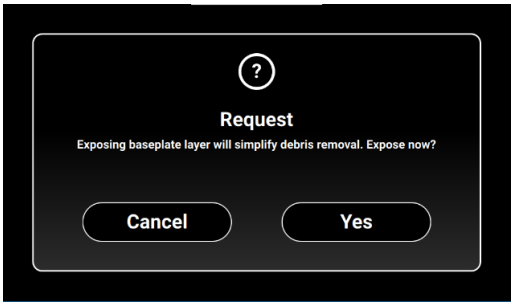
- Abort Job
- Delete Job

Abort Job

The job can be aborted by selecting the ✕ icon in the job printing window.
→ The following window appears.



1. In the confirmation window, select **Yes**.
   → The job has been aborted.
   → The following window appears.



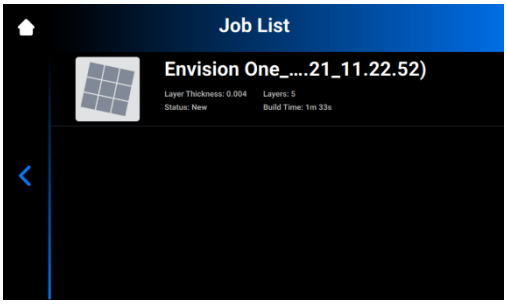
- If there is no need to simplify the process of cleaning the material tray, select **Cancel**.
- To simplify the process of debris removal from the material tray, select **Yes**.
  → The job stops.
  → The whole material tray area is exposed.

2. Remove debris from the material tray by simply taking off the thin film of exposed material.

Delete Job

To delete the job from the Job List:

1. Select **Job List** on the main screen.



2. Select the job you want to delete from the list.
   → The following screen appears.

3. Select the **Waste Bin** icon to delete a job file.
   → confirmation window appears.
4. Select **Delete** to confirm a job file removal.

Post-Process

Post-Cleaning Supplies and Post-Curing Equipment

Recommended list of cleaning supplies:

- Spray bottle (optional).
- Plastic containers with lid for holding the isopropyl alcohol.
- Isopropyl alcohol (99%) for cleaning uncured material on the surface of printed models.
- Soft artist or make-up brush.
- X-Acto knife/surgical blade or small nail snips for removing supports from models.
- Air comselector for removing isopropyl alcohol and uncured material from the surface of printed model.
- Paper towels.
- Post curing unit.

Remove Build Platform from Printer

When a print job is successfully completed, the build platform rises to the top of the Z-axis tower. The build platform with the printed models is ready to remove. Have a paper towel ready to catch potential drops of uncured material.

To remove the build platform with printed models:

1. Open the printer's hood.
2. Place one hand on the build platform handle. Lift the build platform clamp with the other hand.
3. Lightly cradle the bottom of the build platform with the paper towel. This will help to prevent dripping while removing the build platform from the printer.

Detach Models from the Build Platform

CAUTION	**Risk of injury:** As handling chemicals puts you at risk of coming into contact with corrosive chemicals, being burnt, inhaling poisonous vapors, etc., always put on suitable protective clothing (gloves, protective goggles, etc.) before working with construction substances. Take utmost care to avoid getting any chemicals in your eyes or breathing the chemical vapors in. Always wash your hands thoroughly afterwards with soap and water only. Don't use Isopropyl alcohol to wash your hands if you come in contact with materials. Take care not to spill any chemicals.

Once the job is complete, the built part hangs off the build platform.

To remove the printed part:

1. Place the build platform on its side in the processing zone as shown in the diagram below. Control the material does not leak into the build platform cavity. Ensure the magnet stays clean.
2. Hold the build platform handle with one hand to steady the platform.
3. Use the scraper from the Starter Kit to gently detach models from the build platform. Tilt your tool roughly by 30 degrees from the platform and move the blade while applying a light amount of pressure.
4. Place each model on a paper towel to catch the excess material as it drips.

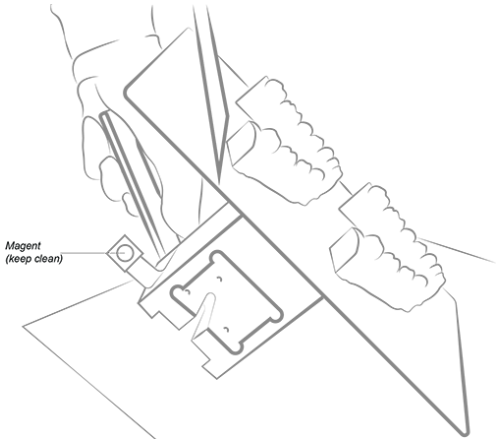


Figure 13: Detaching printed models from build platform

Note: The models appear to be glossy as uncured material is covering the surface.

Note: Close the printer's hood after removing the build platform.

Reset Printer After Printing

1. Once the models have been removed, use the scraper to remove any remnants of the cured material from the surface of the build platform.
2. Wipe the entire platform dry using a paper towel. The previous print job shouldn't be visible on the platform.
3. Install the build platform on the printer and tighten the build platform torque knob.
4. Close the hood.
   → The Envision One can now begin printing the next loaded print job.

Clean Printed Models

The PWA 2000 Parts Washing Apparatus is the recommended washing unit for the models printed with the Envision One. To get the information on how to clean a printed model with PWA 2000, see **Hardware Operations PWA 2000**.

Contact your distributor for further details on parts washing units for the Envision One printer. Clean the printed models following the instructions for your washing unit.

Post-Cure Printed Models

The PCA 2000 Parts Curing Apparatus is the recommended curing unit for the models printed with Envision One. To cure the models using the PCA 2000, see **Hardware Operations PCA 2000**.

Finish Post-Processing of Printed Models

Finishing is the final step in post-processing of the printed models. With finishing, grind all traces of supports and polish models as needed, depending on the final part application.

1. Grind support bumps using a fine burr and rotary tool, or manually using sandpaper.
2. Remove dust particles by quickly spraying the model(s) with 99% IPA in a spray bottle, and dry immediately with compressed air.

Service and Maintenance

CAUTION	**Risk of injury:** crushing caused by automatically moving printer parts. Body parts may be crushed by movements of the build platform. The printer may only be operated if the protecting devices are working properly.

CAUTION	Risk of injury from slipping, stumbling or falling of persons through loose cables, objects or liquids on the floor. Keep the printer area clean and dry. Make sure that no loose cables or objects are lying on the floor of the printer area. Place all printer cables carefully to prevent trip hazard. After repairing the printer, place cables back carefully to prevent trip hazard. Remove tools and other objects from the printer. Inform the personnel of residual risks.

CAUTION	Risk of injury caused by the ergonomics of the printer. Maintain a healthy posture. Instruct the personnel accordingly.

The following sections contain information on service and maintenance of the printer. Regular maintenance according to the maintenance plan is an essential precondition for efficient use of the printer.

- Section **Customer Service** describes the ways to get the technical support in case you face any issues with the printer.
- Section **Operational Maintenance** describes the operational maintenance and how to carry out the maintenance tasks.

Customer Service

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Operational Maintenance

Note: Maintenance activities, including date and performing operator, should be documented due to traceability.

The operational maintenance helps ensure a smooth and efficient production process. The operating personnel can carry out these tasks after being trained accordingly.

Task	Maintenance Interval
Cleaning the build platform	Print-by-Print
Cleaning the printer casing	Print-by-Print
Cleaning the material tray	Weekly
Cleaning the hard drive space	Weekly
Cleaning the PWA 2000 or Washing Containers	Weekly
Cleaning dust	Weekly
Power Cycling	Weekly
Cleaning the touch screen	Monthly
Checking the safety equipment	Daily and every time the printer is put into operation and every time the printer has been repaired

Clean Build Platform

NOTICE	Use 99% IPA away from the material tray and thoroughly wipe all IPA completely from the build platform before installing it back onto the printer.

Time needed: Approximately two minutes
Maintenance frequency: After each print
Overview:
The build platform should remain as clean as possible between print jobs in order to keep your printer in optimal printing condition. The build platform should be cleaned when:

- build platform becomes sticky
- material cured around the build platform torque knobs
- when changing the material type

Step-by-step:

1. Clean the connection cavity at the top of the build platform using a Q-tip with 99% IPA.
2. If too much material has cured in the clamp screw threading, replace the build platform.
3. Clean the surface of the build platform using a clean paper towel.

4. Check every surface for material, buildup, or stickiness.
5. Clean the excessive buildup using a small amount of 99% IPA on a clean paper towel or Q-tip.
6. Hard spots of cured material can be carefully scraped off using the paint scraper.

Clean Domeless Material Tray

CAUTION	**Risk of injury:** Always wear nitrile gloves when handling the items that come into contact with uncured resin.

NOTICE	Always remove the platform before taking the material tray out of the printer! Failure to do so can result in material dripping down into or onto the printer causing failed builds and damaged equipment.

NOTICE	Always clean the material tray each time you need to change the material for printing parts on the printer.

NOTICE	Do not pour material from your material tray into the bottle it came from! This can potentially contaminate the whole bottle of material and ruin it.

NOTICE	Never use chemicals inside the material tray. This will contaminate and ruin any material you put into the material tray.

Time needed: Approximately five minutes

Maintenance frequency: Weekly

Overview

The material tray's approximate lifespan is around 1000 hours of print time or 3 months of use. Order a new material tray before the current tray expires or becomes damaged.
The **Film Assembly** is located inside the material chamber and is comprised of a film, a glass panel, and a metal frame.

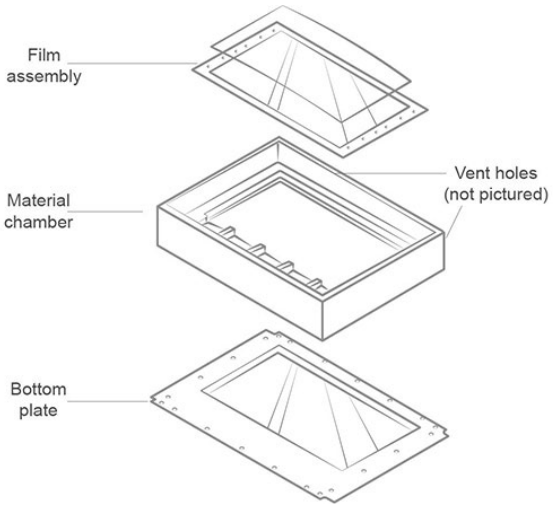


Figure 14: Material tray construction

Step-by-step:

1. Check the film at the bottom of the material tray whenever the material is removed.
2. Look for pinholes, punctures, ripples, and other signs of stress. A slightly cloudy film is normal and will not affect the print quality.
3. Use the **Manual Debris Removal** feature to remove cured material from the surface of the film assembly at the end of a print, or access it using the following sequence – **Home > Settings > Manual Debris Removal**.
4. Once the exposure time is set on the **Manual Debris Removal** page, select **Expose**. The projector will expose the full printing area to light for the set exposure duration. Use the rubber spatula from the Starter Kit to gently remove the cured material from the surface of the film assembly.

The **Material Chamber** is the vessel to hold the material in the printer during operation. It consists of two sections: the upper chamber and the lower chamber.

1. Use a clean dry paper towel to clean the material chamber. Using chemicals or alcohol to clean anything that comes in contact with material causes contamination, resulting in printing issues.
2. When switching to a new type of material, carefully clean corners with the paper towel or a Q-Tip to prevent contamination. Reinstall the material tray on the printer as soon as possible after cleaning. Leaving the material tray exposed to light can cause small particles of material to cure. This can prematurely age the material tray and contaminate new material when the tray is used again.

The **Bottom Plate** is under the material chamber and consists of a glass panel and a metal frame.

1. Check the glass on the bottom of the tray for smears or fingerprints, which can affect print quality.
2. Wipe the glass on the bottom of the material tray with an ammonia-free glass cleaner when needed.

Note: If the glass cracks or is badly stretched, then the material tray will need to be replaced.

The **Vent Holes** are located on blocks at the back of the domeless material tray. When the material tray is installed, these vent hole blocks lineup with two corresponding holes on the printer. When the printer is powered on, the oxygen flows to and from the material tray via the vent holes. The vent holes must remain clean in order to form a seal.

Use a dry paper towel to clean the vent hole blocks.

Note: If the printing material leaks into the oxygen system via the vent holes, then the material tray needs to be replaced and the printer's internal oxygen tubing system needs to be checked for any damage.

Clean Printer Casing

Time needed: Approximately two minutes
Maintenance frequency: After each print
Overview:
The printer's metal casing protects the internal components from damage. To avoid spilling material on the casing, always hold a paper towel under the build platform and the material tray while installing or removing them. Once spilled, the material cures to the casing and it is difficult to remove it.
Step-by-step:

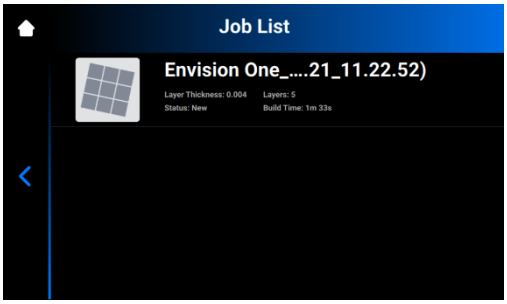
1. Wipe the spilled material as soon as it touches the printer before it cures.
2. Remove spilled material with a dry paper towel first, and then lightly spray a second paper towel with IPA and wipe away any residue.

Note: If rubbed with too much pressure or for too long, the casing may become discolored.

Clean Hard Drive Space

Time needed: Approximately 5 (five) minutes
Maintenance frequency: Weekly
Overview:
The Envision One cDLM printer has an internal PC that stores a limited amount of data. It is a good practice to remove print job folders from the printer to free up space. When most of the hard drive space has been used, the printer shows error messages or responds slowly to touch screen commands.
Step-by-step:

1. Power the printer on.
2. On the Envision One touch screen, select **Job List**.



3. Select the print job folder name.
4. Select the **Waste Bin** icon.
   → The unwanted print job folder is now erased from the printer.
5. Repeat these steps until all unwanted print job folders have been removed.

Clean PWA 2000 / Washing Containers

Time needed: Approximately fifteen minutes
Maintenance frequency: Weekly
Overview:
The PWA 2000 needs to be emptied when the bottom of the container is no longer visible. The 99% IPA will collect particles of uncured material over time. If using plastic washing containers instead of the PWA 2000, the dirty bath will need to be emptied when the bottom of the container is no longer visible.
Step-by-step:
Check your local protocol for safe handling of 99% IPA.
When using the PWA-2000:

1. Remove the washing compartment from the PWA 2000.
2. Pour the IPA from the pour spout into an IPA recycling container.
3. Wipe down the interior of the washing compartment with a clean paper towel.

When using plastic washing containers:

1. Remove the used IPA from the dirty bath.
2. Wipe the container clean using a paper towel.

Clean Dust

Time needed: Approximately five minutes
Maintenance frequency: Weekly
Overview
Dust may accumulate everywhere near the Envision One cDLM printer and inside it. Dust can build up on fans and vent holes. High levels of dust accumulation can cause the printer to overheat.

Note: To protect the internal hardware, the printer automatically shuts down if it reaches the maximum internal temperature of 49 C/120 F.

Step-by-step:

1. Look around the vent holes on the left and right sides of the printer's casing for signs of buildup.
2. Listen to the fan for inconsistency, stress, or obstructions when the printer is powered on.
3. To remove dust, power down the printer, disconnect the power cable, and then wipe the vents and fan with a microfiber cloth.
4. After the printer has been cleaned, look down through the safety glass under the material tray to make sure that there is no dust or debris on the lens.

Power Cycle

Time needed: Approximately five minutes
Maintenance frequency: Weekly
Overview:
It is recommended to power cycle the printer under any of the following conditions:

- Printer is running slowly.
- Printer was recently updated.
- Printer was not turned off in a week.

Clean Oxygen Concentrator Filter

Time needed: Approximately five minutes
Maintenance frequency: Every two weeks, replace every six months.
Overview:
The oxygen concentrator has a filter on its base. This filter should be cleaned every two weeks and replaced every six months. Twelve replacement filters arrive together with the oxygen concentrator.

NOTICE	Do not start this process while the Envision One cDLM is printing.

Step-by-step:

1. In between print jobs, turn off the oxygen concentrator using the power button on the top of the concentrator.
2. Turn the concentrator on and locate the filter cap as shown below.

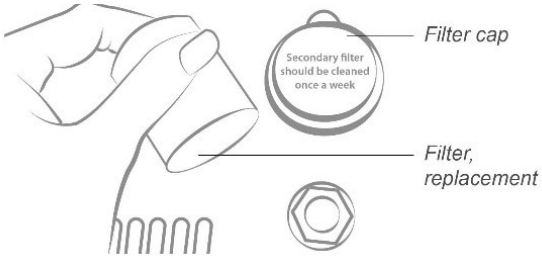


Figure 15: Replacement of concentrator filter

3. Remove the cap from the concentrator. Then remove the filter.
4. Take the filter to the post-processing zone and spray compressed air to remove dust and debris.
5. Insert the filter back into the base of the concentrator, return the cap, and situate the oxygen concentrator back on its base.
6. When ready, turn the oxygen concentrator on.
7. Allow the system to prime for 30 minutes before starting the next print.

Note: Every 6 months, the filter must be removed and replaced with a new filter. If needed, the cavity can be cleaned with a clean dry paper towel or microfiber cloth.

Maintain Materials

Time needed: Approximately five minutes to mix material, depending on the material + 15 minutes to empty and clean the material tray.
Maintenance frequency: After each print
To maintain ETEC Materials:

1. Protect material in the material tray from ambient light by keeping the hood closed.
2. Mix the material in the material tray before each print using the rubber spatula from the Starter Kit.
   - Lightly skim the spatula back and forth across the surface of the material in the tray.
   - Mix carefully to avoid puncturing or tearing the film at the bottom of the domeless material tray.
   - Mix the material until it's a completely uniform color.
3. Check the material for solids or debris. Filter the printing material if needed.
   - Remove the material tray from the printer.
   - Set the funnel and cone-shaped paint filter on top of a separate opaque storage bottle.
   - Pour the material out by tipping a front corner of the tray, away from the vent holes.
   - Use the rubber spatula to assist in guiding the material into the filter.
   - When finished, dispose of the filter and clean the funnel with a dry paper towel.

Note: For details on handling printing materials, see the corresponding Material Safety Data Sheet.

Annex 1: Troubleshooting

Problem	Remedy
My Z-slide is not moving when I select the relevant buttons in the Control Software.	1. Unplug both the power supply and the USB from the back of the printer. 2. Wait for 10 seconds and reconnect. 3. If the problem remains, call technical support.
The built model fell off the build platform or nothing substantial was built.	1. Filter your material using a paint strainer to ensure there is no debris left from the failed job in it. 2. Wipe out and check your material tray to ensure it is still in good condition. 3. If your material tray or material is over 6 months, order the new ones. 4. If this is not the case and you still cannot get a good print job result after straining or using fresh material, there might be an issue with your LED or the homing position of the build platform. Call technical support.
Time out Reached message appears on the screen.	The projector cannot be initialized. In this case, restart the printer by shutting it down and then powering it on again.
Error 4252	This can be caused by the wrong material usage. Contact Service & Support and provide the information on the material used.
Sporadic blurring on part.	It is caused by contaminated material from alcohol or any other chemical. 1. Pour the old material in separate container. Do not pour it back into a new or unused material container. 2. Clean out the material tray completely with dry soft paper towels only. Do not use any chemicals. 3. Clean the corners of the material tray with dry Q tips. 4. Replace with new material and rebuild parts. To avoid future contamination: • Do not place any chemical near material tray or resin. • Do not clean the part near the material tray, and do not clean the build platform with any chemicals but only dry paper towels.
Partial build failure	This could be several things or a combination of the following: • Damaged, scratches, hole or worn material tray will cause a build failure. • Weak supports. A weak or improperly placed supports will cause a part feature not to build. Add additional supports to the failed area. • Boolean operation is not correct, errors in file. A small feature is not completely attached to the main body of the part. In Magics or your CAD program check to ensure there is no gap, all small features are completely attached and the part is a one single entity.

Printed parts falling off the build platform	• Damaged, scratches, hole or worn material tray will cause this build failure. • Dirty optics. Clean the glass between the material tray and projector. • Call customer service.
Tag reader/DLP board/projector connection lost	When the connection error appears: 1. Reboot the printer. 2. Contact Service & Support. 3. Send the log report to Service & Support.
Error message: Invalid Auto Homing parameter	Auto Homing parameter has the invalid value in Buildstyle. Contact Service & Support.
Error message: Job is too high. Please regenerate job in Envision One RP.	The job is too high for the printer`s Z-axis. Regenerate the number of layers and/or layer depth of the job in Envision One RP.
Error message: Control software is expired and the system cannot be updated.	It means that your Envision One RP license is expired. Contact Service & Support to extend the Envision One RP license.
Error message: Material usage report cannot be sent…	This can be an Internet connection issue. Check your Internet connection or contact Service & Support.
Error message: Material report wasn`t sent…	This can be an Internet connection issue. Check your Internet connection or contact Service & Support.
Error message: Compensation mask was not applied…	The compensation mask was not generated. Please contact Service & Support.
Error message: Your printer is running out of memory…	This error message appears when there is not enough system memory for the printer to operate or start a print job. Delete unnecessary jobs from the printer and check the memory usage in the **About Printer** menu.
Error message: Case A: failed to move home.	This can happen during the Auto homing procedure. An obstacle during the motion along the Z-axis was detected. Remove the obstacle (part debris stuck to the build platform, floating debris in material, etc.) and repeat the Auto homing procedure. If this does not help, contact Service & Support.
Error message: Case B: failed to move home.	This can happen during the Auto homing procedure. Load cells overload was detected. Contact Service & Support.
Error message: Case C: failed to move home.	This can happen during the Auto homing procedure. Small auto homing offset correction was detected or small debris in the material tray. Contact Service & Support.
Error message: Case D: failed to move home.	This can happen during the Auto homing procedure. Build platform reaction was not detected. Contact Service & Support.

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