Operations and Maintenance Guide

D4K

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Identification

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D4K Operations and Maintenance Guide: D4K-UG-00030-Rev03-EN, February 2023

Introduction

Note: This Operations and Maintenance Guide has been created for **version 6.0** of D4K Control Software.

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.

History of Changes

Date	Changes	Version
Jul-2019	Document creation	1.0
Oct-2020	• Images update: front page, About Printer tab • Updated Starter Kit section • Updated Positioning the Printer section	1.1
Oct- 2020	• Figure update Build platform section • Figure update Check the D4K Is Ready to Print section • Added Load a job from Envision One RP section • Added Maintaining the D4K Material section • Added Cleaning the Touch Screen section • Added Creasing the Z-slide section • Updated Power requirements section • Updated Environmental Conditions for Printers section • Updated Storage Conditions for Photopolymers section • Updated Starter Kit section • Updated Positioning the Printer section • Updated Plug & Play section • Updated Install the Build Platform section • Updated Software Update section • Updated Software Recovery section • Updated Fill in the Photopolymer section • Updated Create the Print Job in Envision One RP section	1.2

Date	Changes	Version
	• Updated Start the Print section • Updated Remove the Build Platform from the Printer section • Updated Remove Parts from the Build Platform section • Updated Cleaning the Build Platform section • Updated Cleaning the Material tray section	
February-2021	• Added Mask Generation section • Added Additional Information section • Updated About Printer section • Updated Starter Kit section • Updated Troubleshooting section	1.3
May-2021	• Updated Set the Wi-Fi section • Updated Move and Calibration Tab section • Updated Job Settings section • Updated Load a Job File section • Updated Start the Print section • Updated Annex: Troubleshooting section	1.4
Oct-2021	• Updated Move & Calibration Tab section • Updated About Printer Tab section • Updated Calibration section	1.5
Nov-2021	• Updated Home Position Calibration section	1.6
Dec -2021	• Updated Manual Debris Removal section • Updated Software Update section • Updated Support section • Updated screenshots	2.0
Feb-2023	• Updated document layout • Updated screenshots • Updated Starter Kit section • Updated Connect Parts Washing Apparatus section • Updated Connect Parts Curing Apparatus section • Updated Set AdHoc section • Added Set and Reset Password for VNC Client section • Added Customer Support section • Added Quick Calibration section	3.0

Technical Data

Mechanical Data

Build Envelope (L x W x H)	148 x 83 x 110 mm (5.8 x 3.3 x 4.3 in)
Footprint (L x W x H)	50 x 57 x 59 mm (19.7 x 22.4 x 23.2 in)
Native XY Resolution	50 µm
Patented Enhanced XY Resolution	25 µm
Z-layer Resolution	25–100 µm
Wavelength (LED)	385 nm
UI & Connectivity	Touch screen / Ethernet, USB Adapter: 100~240V AC, 1.5A, 50Hz/60Hz

Power Requirements

ETEC recommends you an uninterrupted power supply to protect your printer. All electrical requirements must be met to ensure the most stable setup:

- Do not plug any additional equipment into the power circuit.
- **D4K** – 19V DC / 4.73A.
- **With adapter** (included) – 100~240V AC, 1.5A, 50Hz/60Hz.

WARNING	**Risk of electric shock:** Connect the 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.

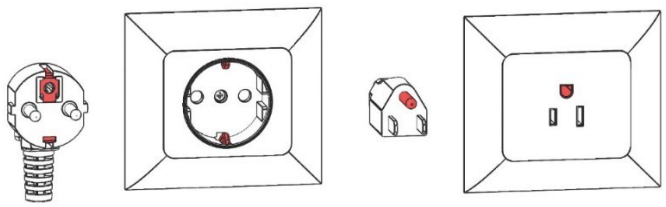


Figure 1: Grounded plug and outlet for Europe / Grounded plug and outlet for the US

Network Requirements

- **139, 445 ports:** Use to access the shared network folder (job, logs, update) on the printer. Also, they are used to upload jobs to the printer via network.
- **5900 port:** Use VNC server for printer remote control. See Connect to Printer via VNC Clients.
- **2504 port:** Use to connect between the D4K Control Software and Envision One RP.
- **22 (ssh) and 443 (https):** These are used for getting the software update.

Printer Delivery

Unpack Printer

The D4K arrives in cardboard packaging with a series of accessories boxes. The boxes will be on top of the pallet. Use a forklift or a pallet jack 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:** D4K, Starter Kit
- **Optional Boxes:** PCA 2000 or PCA 4000 (parts-curing apparatus), PWA 2000 (parts washing apparatus), and battery backup if purchased.

Before opening the box, make sure that no visible damage can be observed, or any sensors are broken. If these are present, please inform the office immediately.
If everything is in good condition, open the box and carefully lift out the printer, then place it feet down on the designated space.

Starter Kit

Note: Depending on the country of origin, the contents of the starter kit may vary.

The delivered starter kit includes:

- Build platform
- Spare material tray
- Ethernet cable
- Power supply cord with adaptor
- USB drive

Printer Components

This chapter explains the construction of the printer. Reading it when you are at the printer will help you get familiar with the printer and its functionality.

Functional Description

The D4K® printer builds 3D models by curing liquid photopolymers through a projector system. During the build process, the model is built layer by layer. A 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 build process, certain calibration functions need to be carried out, which are performed at the factory. The printing 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 build process can be started.
When the build process finishes, remove the models from the build platform using a scraper treated according to the corresponding Material Best Practice guide.

Printer Construction

Front View

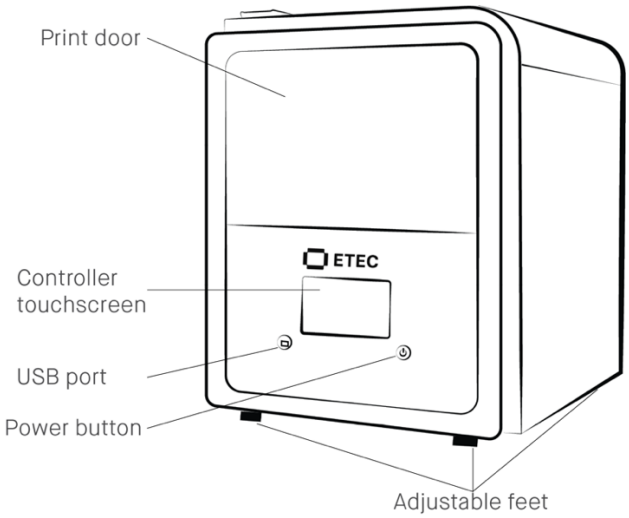


Figure 2: Front view of the printer

Print Area

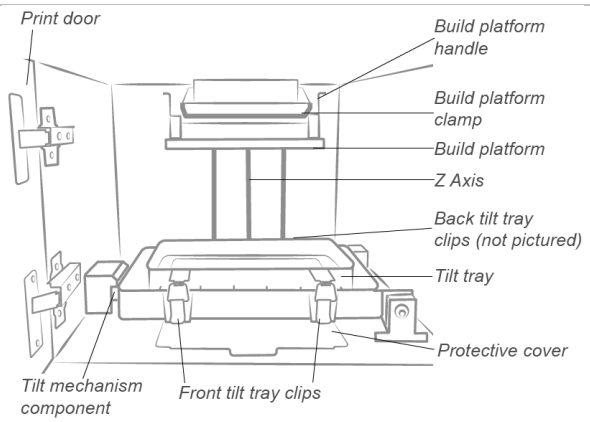


Figure 3: Print area

Main Printer Components

Material Tray

Also known as Tilting material tray, or Tilt tray. It comprises of two main parts - a film and a frame. Below the tilt tray assembly is a glass plate. The glass plate stays in position in the printer, below the tilt tray. Below the glass plate is the protective cover. The protective cover keeps the printer's internal components clean. The protective cover extends out in front of the tilt tray and is visible during normal operation. See Install Tilting Material Tray and Clean Material Tray.

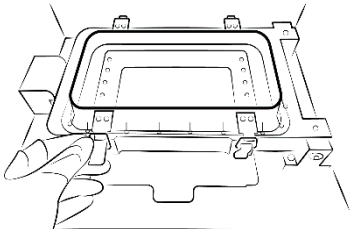


Figure 4: D4K Pro tilting material tray

Build Platform

Also known as Build Plate, Build tray, Printbed, it is the surface of the D4K printer on which the 3D printed part is formed. See Install Build Platform and Cleaning Build Platform.

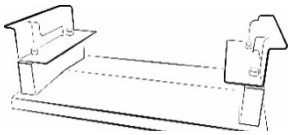


Figure 5: D4K Pro build platform

RFID Tag Reader

NOTICE	Ensure you put the material tag into the reader as shown in this section to avoid damage to the RFID tag and the tag reader.

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

Place the material tag (shipped with every material bottle) on the tag reader, where it is read and processed by the printer to ensure accuracy.

Hardware Setup

Connect Printer

Plug & Play

Connect the following as shown in the diagram below.

1. Connect the DC power supply to the printer.
2. Connect the DC power supply to the AC power cable.
3. Plug the power cable into a battery backup, surge protector, or its own outlet.
4. Connect the Ethernet cable to the printer, if applicable.

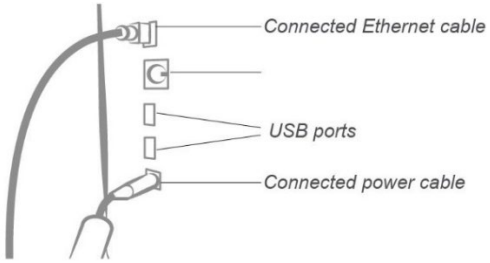


Figure 6: I/O panel

Note: There are two USB ports on the back of the printer. We recommend 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.

Turn Printer On

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

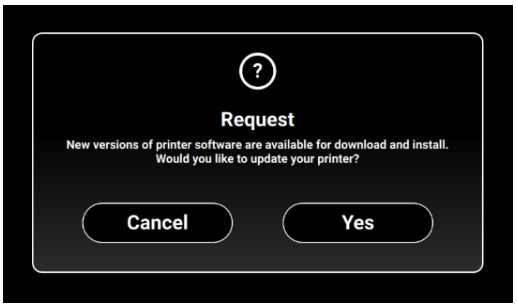
To turn the printer on, press the power button on the front of the printer and hold it for two seconds.

→ The button illuminates and the screen switches on.

→ After a booting sequence, controller software is opened automatically.

NOTICE	Do not try to touch or open anything on the screen before the Controller Software has finished booting. This can cause damage to the files on the printer.

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



- To update the printer, press **Update**.
- To discard the update message, press **Cancel**.

Connect Parts Washing Apparatus

The PWA 2000 is the recommended parts washing apparatus for the D4K printer. To set up the PWA 2000 Unit, see ETEC Knowledge Base.

Connect Parts Curing Apparatus

The PCA 2000 and PCA 4000 are the recommended parts curing apparatus for the D4K printer. To set up the PCA 2000 Unit, see ETEC Knowledge Base.

Install Build Platform

To attach the build platform:

1. Open the protection door.
2. Slide the build platform onto the receptor held on the Z slide.
3. Tighten down the build platform clamp to secure the build platform.
4. Check that the build platform is secured in position.

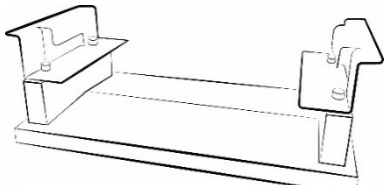


Figure 7: D4K Pro build platform

NOTICE	Make sure the build platform is tightened down securely before building. Failure to do so will cause the build platform to be uneven and can cause build failures.

Install Tilting Material Tray

To insert the material tray:

1. Open the printer door.
2. Release the front and back tilt tray clips.
3. Note the tilt tray is labeled “front”: this label must be towards you when the tilt tray is in the printer.
4. Note the glass plate, ensure all corners are completely flat and in position.
5. Lower the tilt tray into position and secure with all four clips.

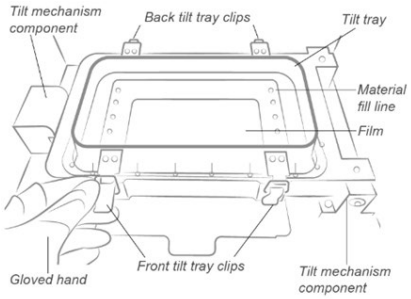


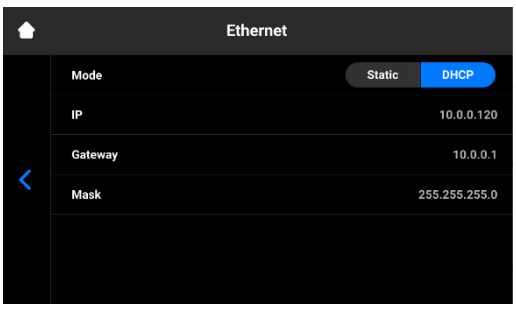
Figure 8: Material tray inside

NOTICE	Fastening the material tray clips is very important. If they are not fastened properly, the material will splash inside the printer.

Set Ethernet

The D4K printer is compatible with both ethernet and Wi-Fi connection types. To connect the printer to your network via ethernet connection:

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. Press **Settings > Network Settings > Ethernet**.



There are two types of connection:

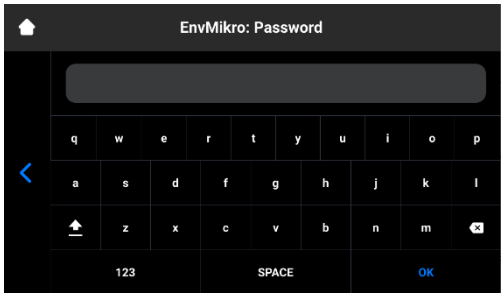
- **Dynamic connection** or **DHCP**: Printer gets the dynamic IP address. All the fields are greyed out.
- **Static connection**: Fill all the fields manually using the settings for your network.

Set WI-FI

To set Wi-Fi on the printer:

1. Access the **WI-FI** tab by selecting **Settings** > **Network Settings** > **Wi-Fi**.
2. Select the required **Wi-Fi** name on the list.

3. Press **Join**.
4. In the **Password** field, type a password for the selected Wi-Fi.



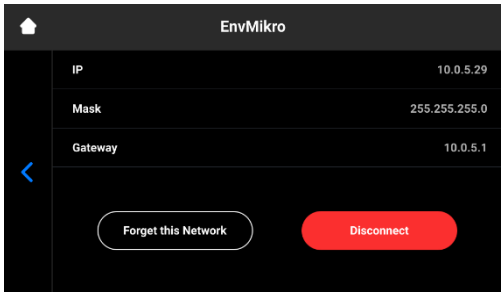
5. Press **OK**.

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

Connect to Another Wi-Fi Network

To join another Wi-Fi network:

1. Enter the **Wi-Fi** tab by pressing **Settings** > **Network Settings** > **Wi-Fi** on the touchscreen.
2. Select the network you want to disconnect from by pressing on it.



3. Return to the list of the Wi-Fi networks and select the preferred network.
4. Press the selected network to connect. Enter the password if required.

Note: Press **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.

Set AdHoc

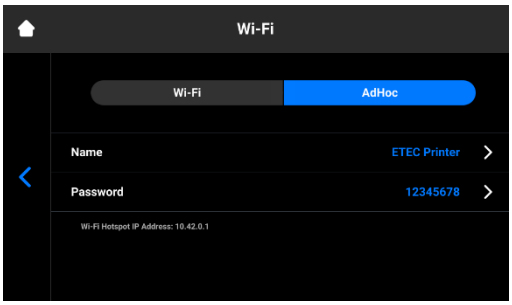
AdHoc is a type of on-demand device-to-device network. In ad hoc mode, you can set up a wireless connection directly to another computer or printer without having to connect to a Wi-Fi access point or router. It allows you to load the jobs to a printer that has no Internet connection.

Tune Up AdHoc

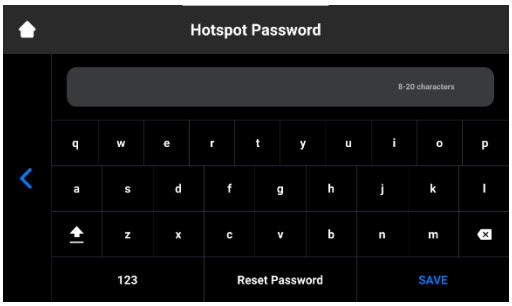
Note: Once Ad Hoc is chosen, Wi-Fi is disabled on the printer.

To set Ad Hoc on the printer:

1. Go to **Settings > Network Settings > Wi-Fi > AdHoc**.
   → The following screen appears.



2. To set a password for the AdHoc, press **Password**. The **Name** field, which is the printer's name, is set automatically.
   → The following window appears.



3. Enter the password into the **Hotspot Password** field.

Note: Your password must contain at least 8 characters and no spaces.

4. Press **SAVE**.

Connect to AdHoc

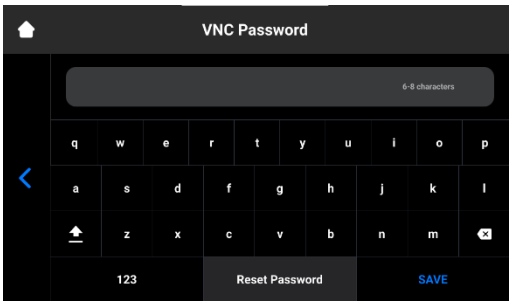
To connect to the Ad Hoc network:

1. Open the network settings on your computer or another device.
2. Find the hotspot name that matches the printer's name and select it.
3. Type the password from the **AdHoc** tab on the printer into the **Password** field.
4. Press **Save**.
   → The wireless connection to the printer is successfully established.

Set and Reset Password for VNC client

To set password:

1. Go to **Settings > Printer Settings > VNC Password**.
   → The following screen appears.



2. Set the password according to the requirements in the **Password** field.
3. Press **SAVE**.
4. Restart the printer to apply new settings.

To reset a set password:

1. Go to **Settings > Printer Settings > VNC Password**.
2. Press **Reset Password**.
3. Enter new password in the **Password** field.
4. Press **SAVE**.
5. Restart the printer to apply new settings.

Enter this password in the VNC client when establishing connection with the printer.

Connect to Printer via VNC Clients

VNC Clients allow 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.

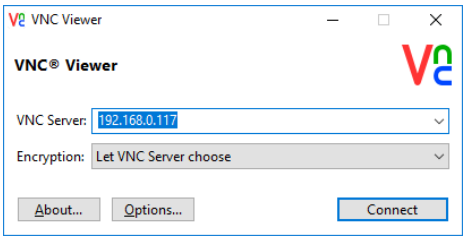
NOTICE	Improper use of the remote printer control over local network using VNC software may lead to damage or injuries. Use the remote printer control with great attention. Do not use the remote printer control without an operator being next to printer. The printer owner is responsible for any unsafe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

Supported Clients for Windows

VNC Viewer

Step-by-step:

1. Download the VNC Viewer and open it.
2. Type the IP address in the VNC Server box.

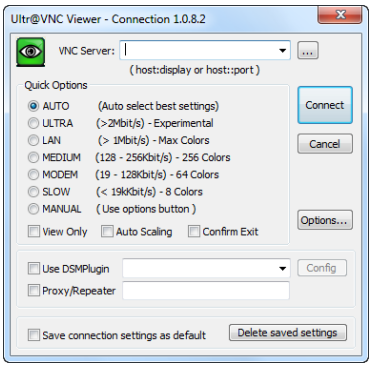


3. Press **Connect**.

UltraVNC Viewer

Step-by-step:

1. Start the UltraVNC Viewer.
2. Type the IP address into the **VNC Server** field.



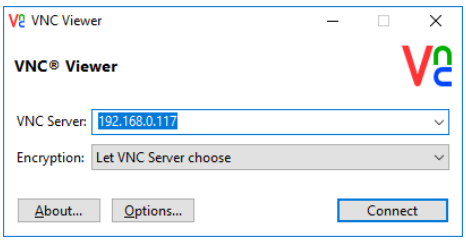
3. Press **Connect**.

Supported Clients for Linux

VNC-Viewer

Step-by-step

1. Download the VNC Viewer and open it.
2. Type IP address in the VNC Server field.



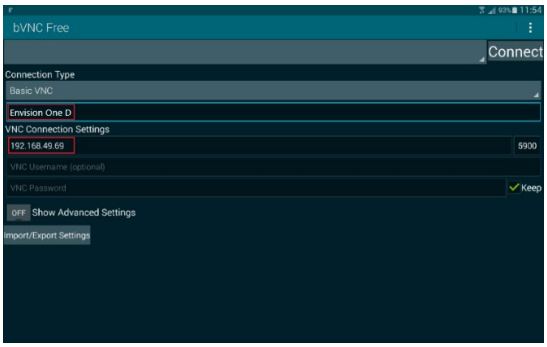
3. Press **Connect**.

Supported Clients for Android

bVNC Free

Step-by-step

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



2. Press **Connect**.

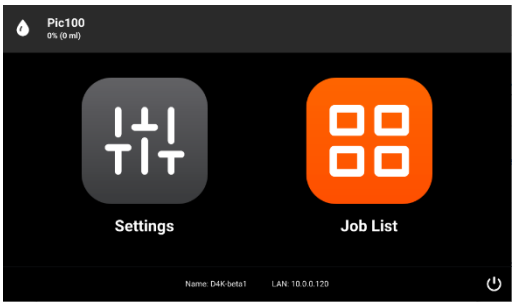
Supported Clients for iOS

VNC Viewer

Put the IP address and the connection name into the highlighted boxes.

Software Presentation

D4K Control Software



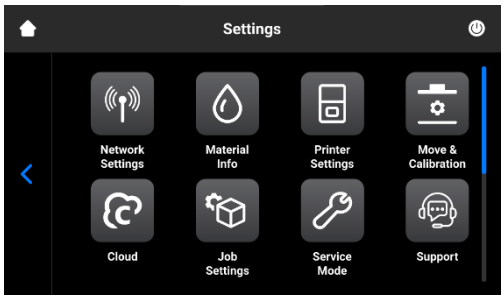
In **D4K Control Software**, there are two main menus:

- **Settings** menu
- **Job List** menu

Settings Menu

The **Settings** menu:

- Lets you change settings of the printer build parameter or the printer itself.
- Gives further information about the printer or the LAN connection,
- Provides a possibility to switch the printer off electronically.



To exit the **Settings** menu, press the < icon on the left part of the screen.
To enter the main screen, press the **Home** icon on top-left corner of the screen.

Wi-Fi Tab

The Wi-Fi tab allows you to set the Wi-Fi connection on the printer.
Go to **Settings** > **Network Settings** > **Wi-Fi**.

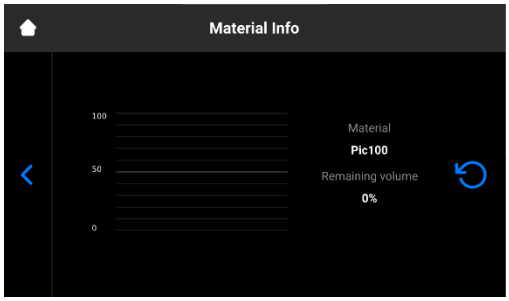
See Set Wi-Fi.

Material Info Tab

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

- Type of material used on the printer.
- Amount of the material left on the material tag.

Go to **Settings** > **Material Info** to open the tab



Press the icon to update the data from the RFID Tag Reader.
To change the material tag:

1. Remove the material tag from the tag reader.
2. Put the new material tag on the tag reader.
3. Press the icon.

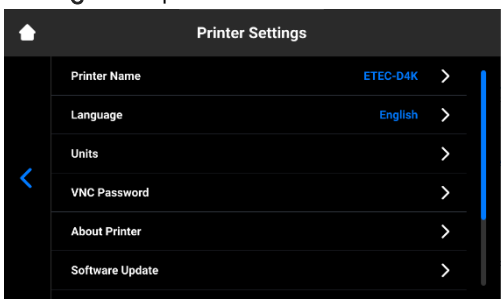
   → The material information will be updated based on your new material tag.

Printer Settings Tab

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 version.

Go to **Settings** > **Printer Settings** to open the tab.



Printer Name

This option allows you to change the name of a printer.

1. Go to **Settings** > **Printer Settings** > **Printer Name**.

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

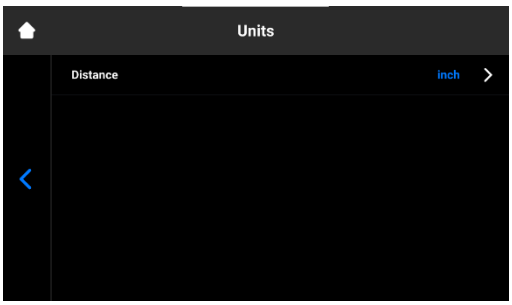
Note: Printer name can contain letter from a to z, digits from 0 to 9, a hyphen (-). Printer name cannot contain spaces, special characters, or start with a number of hyphen.

3. Press **OK**.

Units

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

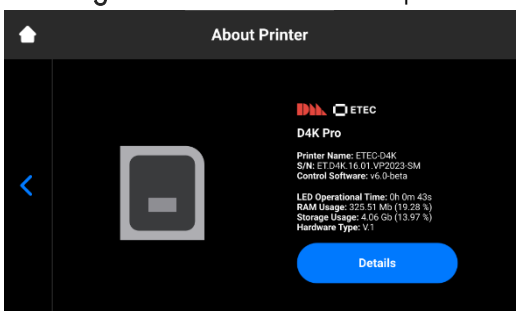
1. Select **Settings** > **Printer Settings** > **Units**.



2. In the **Distance** section, select **Inches** or **Millimeters**.
   → The units of measurement are changed.

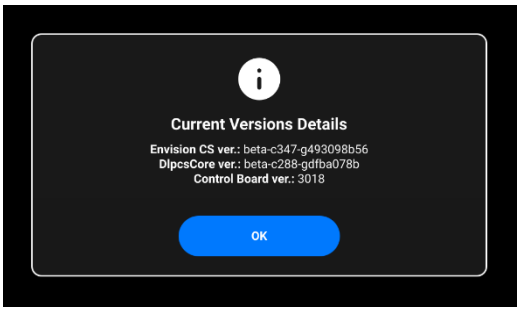
About Printer

This tab provides information about the printer.
Select **Settings** > **Printer Settings** > **About Printer** to open the tab.



- **Printer Name:** Name of printer.
- **S/N:** Printer's serial number.
- **Control Software:** Control software version on printer.
- **LED Operational Time:** LED operation time.
- **RAM Usage:** Amount of occupied memory.
- **Storage Usage:** Amount of occupied storage space.
- **Hardware Type:** The hardware type specified during initial configuration of the printer.

For detailed information about the printer, press **Details**.



- **D4KCS ver.:** Control software version on the printer.
- **DlpcsCore ver.:** Version of DLPCS Core.
- **Control Board ver.:** Version of control board.
- **HW version:** Firmware version on the printer.

To return to the **About Printer** tab, press **OK**.

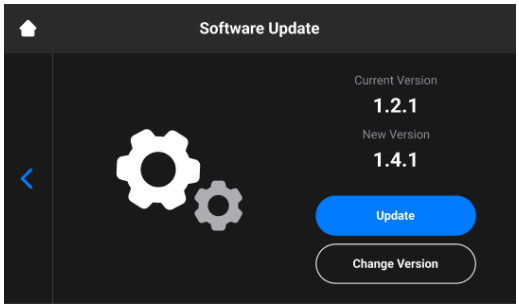
Software Update

To update the printer, go to the **Software Update** tab to see information about the current version of software and the latest version of software, if one is available.

Go to **Settings > Printer Settings > Software Update** to open the tab.

If the latest version is installed, the **ChangeLog** button displays. Press it to view detailed information about the current version.

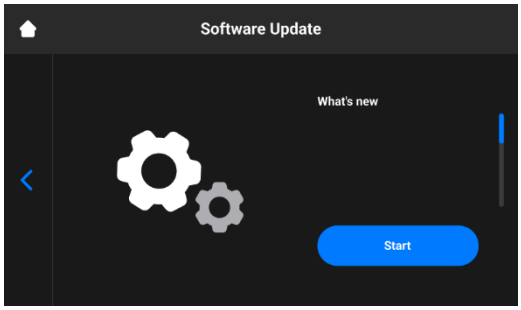
If a new version of software is available, the **Update** button displays.



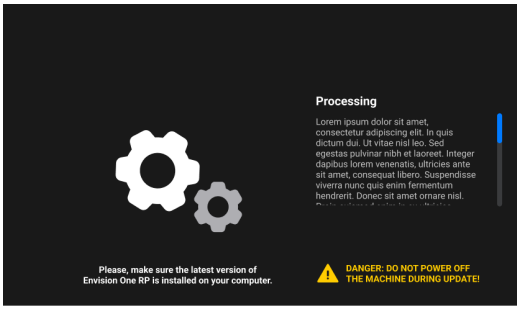
CAUTION	**Risk of damage to the printer.** Do not turn the printer off during update.

To update the Software version:

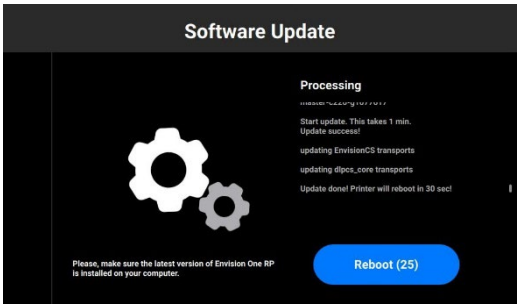
1. Press **Update**.
   → The following screen appears. It shows information about the changes in the new software versions.



2. Press **Start**.
   → The **Experience Improvement** message appears asking if you allow the data collection to improve the experience with our product.
3. Press **OK** to allow data collection or **Skip** to skip this step.
   → The process of printer updating starts.



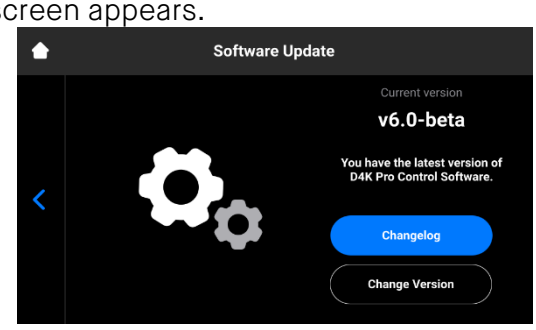
→ After successful printer update, the following screen appears.



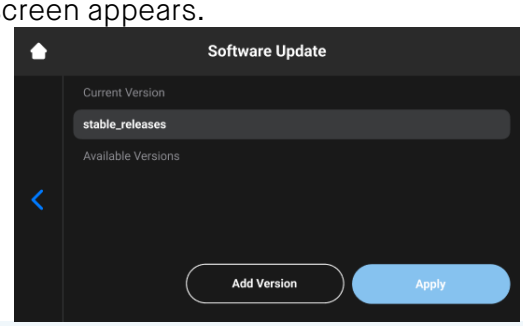
4. To apply changes, reboot the printer. It will reboot automatically in 30 seconds. To reboot the printer manually, press **Reboot**.

To install the custom update of the Software version:

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

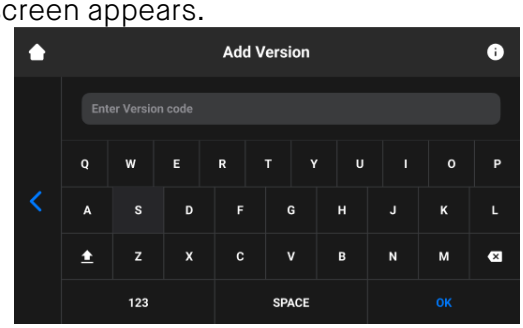


2. Press **Change Version**.
   → The following screen appears.

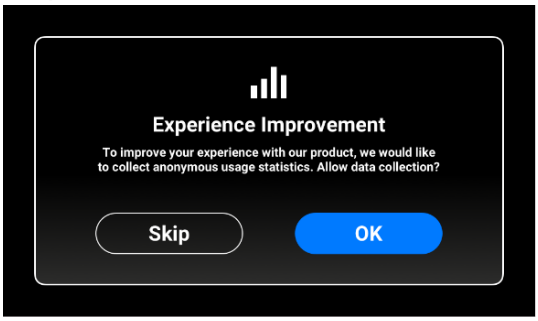


Note: If no custom updates are installed yet, the **Apply** button will be grayed out.

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



4. Type in the encrypted version number and confirm with **OK**.
   → The system adds the version to the list.
5. Select the needed version from the list. Press **Apply**.
   → The system saves the previously installed Control Software version.
6. Press **Start**.
   → The **Experience Improvement** message appears.



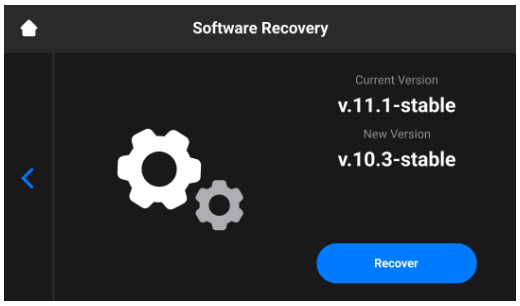
7. Press **OK** to allow data collection or **Skip** to skip this step.
   → The process of printer updating starts.
8. To apply changes, reboot the printer. It will reboot automatically in 30 seconds. To reboot the printer manually, press **Reboot**.

Software Recovery

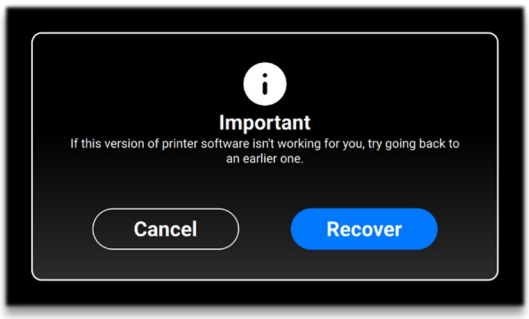
The **Software Recovery** tab allows you to recover the previous version of Control Software.

1. Select **Settings** > **Printer Settings** > **Software Recovery** to open the tab.

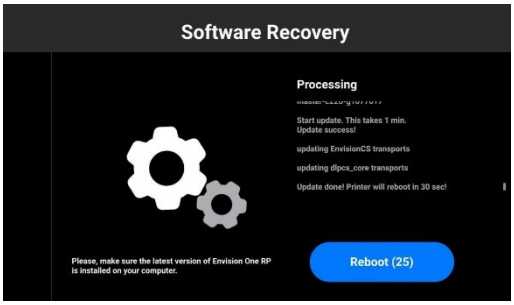
→ The following screen appears.



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



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



   → After successful software recovery, the screen with the Reboot button appears.
4. To apply changes, reboot the printer. It will reboot automatically in 30 seconds. To reboot the printer manually, press **Reboot**.

Usage Analytics

Collecting statistics and sending it automatically helpa **ETEC** improve its products.

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

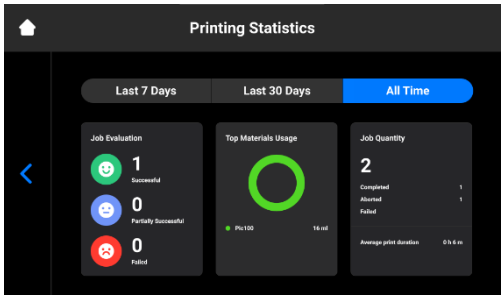
Support

The **Support** tab provides various options that help to get in touch with the ET Support Team for resolving any printer-related issues, see Customer Support for details.

Printing Statistics

This tab provides the printer usage data for the last 7 days, last 30 days or all the time your printer has operated.

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 duration of the job in hours.

Move & Calibration Tab

Use the **Move & Calibration** tab to move the build platform and calibrate the Home position.

Home Calibration

Go to **Settings** > **Move & Calibration** > **Home Calibration** to open the tab, see Calibration.

Move

This tab lets you move the build platform along the Z-axis.
Select **Settings** > **Move & Calibration** > **Move** to open the tab.

Press the **Up** and **Down** arrow icons to move the platform up and down correspondingly.

- **Zero position** is the highest position of the build platform along the Z-axis.
- **Home position** is the start position of the build platform for printing.

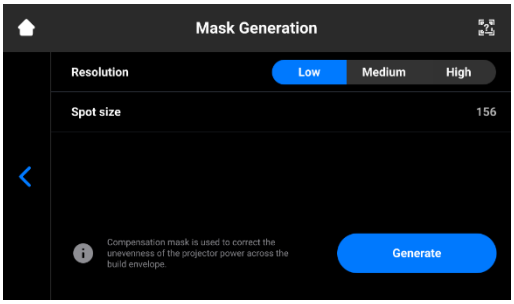
- **Safe position** is the safe position of the build platform between Zero position and Home position for Calibrate the Home Position.

Mask Generation

Note: The USB Light Sensor is under development.

Step-by-step:

1. Insert the empty material tray to the material tray holder.
2. On the main screen, select **Settings** > **Move & Calibration** > **Mask Generation**.
   → The following message appears.

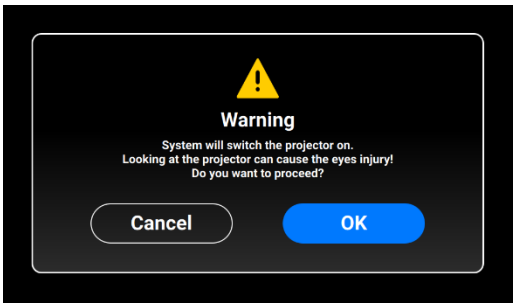


3. Select a resolution (Low, Medium, or High) in the **Resolution** field.

Note: Resolution defines the number of measurements that need to be done. 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.

4. Press **Generate**.
   → The following screen appears.



5. Make sure you have the UV protection glasses on and press **OK** to proceed.
6. Connect your USB Light Sensor to the printer via USB cable.

Note: Each box on the screen shown above corresponds to the spot of light that is projected onto the calibration plate. Select the required box to adjust its projection power or press **Next** to move to the next box

7. Place the USB light sensor in the center of the projected light spot and press **Next** to start adjustment of projection power.
   → The **Next** button becomes **Pause** button.
   → The projection power is being adjusted.
   → The red **Pause** button becomes active, allowing to pause the adjustment of the current box.
8. Repeat step 7 for each of the remaining boxes.
9. To save the newly generated mask and proceed working with the printer, press Apply on the confirmation screen that appears.

   → The newly generated mask has been saved.

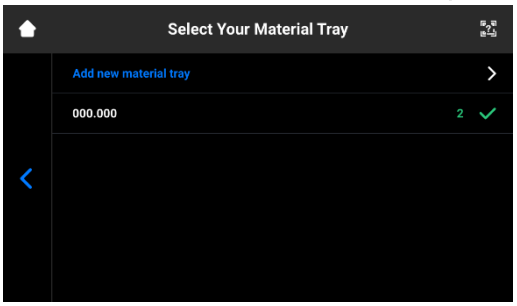
Material Tray

This tab shows the list of material trays and provides a possibility to add a new one.

NOTICE	Make sure your material tray does not contain material in it. Material residue in the material tray during the calibration will give a false reading to the sensors.

To add new material tray to the list:

1. Go to **Settings > Move & Calibration > Material Tray > Add New Material Tray**.



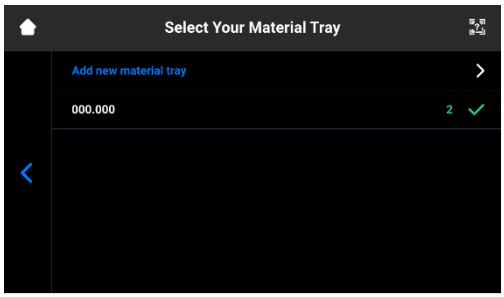
2. Name your material tray and enter the name to the field on the screen that appears. **The name must contain the digits from 0 to 9 only.**

3. Press **OK**.
   → The material tray name appears on the list.

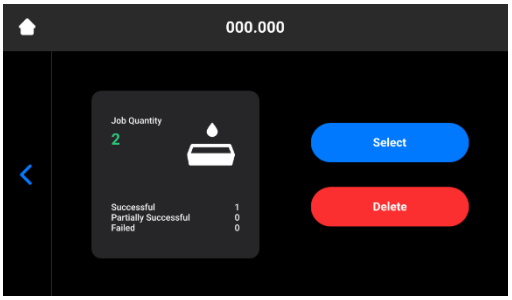
To delete the material tray from the list:

1. Go to **Settings > Move & Calibration > Material Tray**.

2. Select the material tray name on the list.

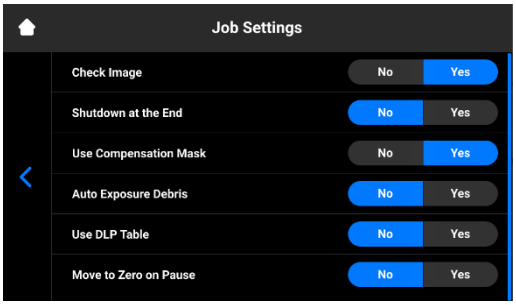


3. Press **Delete**.



Job Settings Tab

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



The following settings are available:

- **Check Image:** Image verification.
  - When set to **Yes**, all layers of the job are checked before starting the job.
  - When set to **No**, the layers are not checked before starting the job.
- **Shutdown at the End:** Shutdown the printer when the job is complete.
  - When set to **Yes**, the printer turns off automatically after completion of the job.
  - When set to **No**, the printer does not turn off after completion of the job.
- **Use Compensation Mask:** Mask application.
  - When set to **Yes**, the mask is applied to the projected image.
  - When set to **No**, the mask is not applied to the projected image.
- **Auto Exposure Debris:** Automatic exposure of material tray to make the material cleaning easier.
  - When set to **Yes**, the material tray is automatically exposed after the job has failed.

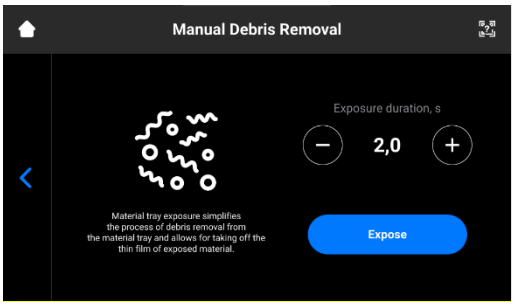
- When set to **No**, the material tray is not exposed automatically when the job has failed. In this case, you can manually perform the material tray exposure after the completion of the build process.

- **Use DLP Table:** DLP table application function.
  - When set to **Yes**, the DLP table is used.
  - When set to **No**, the DLP table is not used.
- **Move to Zero on Pause:** Moves the platform to zero position when the print job is paused.
  - When set to **Yes**, the platform moves to zero position.
  - When set to **No**, the platform remains in its current position.

Manual Debris Removal

This tab allows you to simplify the process of cleaning the material tray.
To remove debris from the material tray:

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



2. Set the required exposure time using the **+** and **–** icons.
3. Press **Expose**.
   → The entire material tray area has been exposed.
4. Remove debris from the material tray by simply taking off the thin film of exposed material.
5. Proceed with the steps indicated in Filter Material if needed.
   → The following message appears.

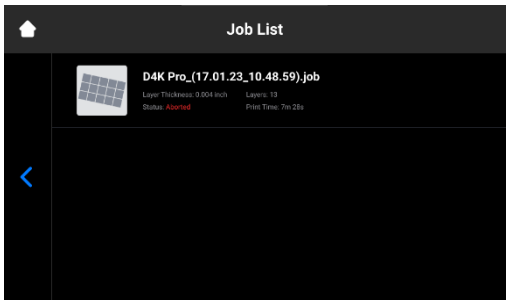
6. Make sure the USB-drive is connected to the printer and press **OK**.
   → The report downloads to the USB drive.

Service Mode Tab

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

Job List Menu

Press **Job List** on the main screen of the Control Software 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 when the job will be finished. This calculation is approximate and is updated dynamically after each exposure.
- **Status**: State of the job at a current time.
  - **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 (projector/board does not respond, etc.).
  - **Invalid:** A problem is detected when transferring the job file from Envision One RP® to D4K Control Software.

Envision One RP®

All files to be printed must pass through Envision One RP model processing software before transferring to the 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.
A USB drive is included with every printer. It contains:

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

For information on how to install and operate the Envision One RP®, see Envision One RP® User Guide.

Calibration

The printer is calibrated and tested during fabrication. However, you must also calibrate the printer to guarantee uniform and accurate build results when:

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

Adjust Parallelism

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 or onto the printer causing failed builds and damaged equipment.

Equipment:

- Digital calipers
- Scraper
- Material
- RFID material tag
- 1,5 mm Allen wrench
- 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.

1. Download the **Home Position Calibration Cubes.stl** file to the computer where the Envision One RP software is installed.

Note: The **Home Position Calibration Cubes.stl** is a file made of nine blocks. Each block is five millimeters high. This file is located on the USB-drive that is shipped with every printer.

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 **Home Position Calibration Cubes.stl** file into the Envision One RP software.
4. Print the **Home Position Calibration Cubes.stl** file. See Start Print.
5. Once the print has completed, check if there are nine cubes on the build platform.

6. If any of the cubes is missing, press the **Manual Debris Removal** icon and remove any cured particles that settled to the bottom of the material tray.

Post-Process

1. Gently remove the calibration blocks from the build platform using the scraper that came in the starter kit.
2. Clean the models.
3. Take a close look at each printed block. There is a small number printed on each cube.

Note: Do not cure the printed cubes.

4. Take a close look at each printed calibration cube. The calibration cubes are labeled with numbers 1 through 9.

Figure 9. Calipers measuring calibration Cube 3.

Measure

Measure the height of each cube and write down the values.

- If all the blocks are within +/- 100 microns, then the printer is paralleled, and no further action is required.
- If all the blocks are within 4.85 and 5.05 mm, then the printer's Home position is correct, and no further action is required.

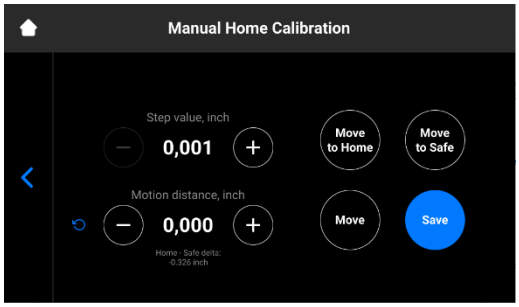
If the Home position is correct and the printer is not paralleled, then submit a tech support ticket for assistance.

If the printer is paralleled and the Home position is not correct, see Adjust Home Position.

Adjust Home Position

Note: Do not adjust Home position until the printer is parallel.

1. Remove the build platform from the printer and place it aside on a clean work surface.
2. Select **Settings** > **Move & Calibration** > **Home Calibration**.
   → The following screen appears.



3. Set the value of a step by pressing 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.
4. Set a motion distance of the platform by pressing the **–** and **+** icons of **Motion Distance**. This is the total distance the platform moves.

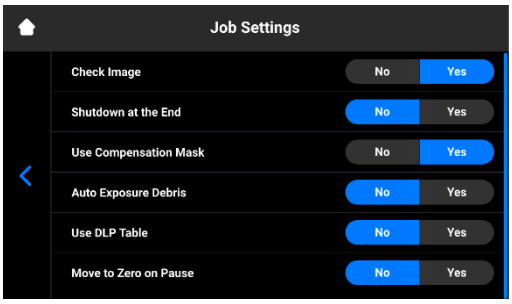
Note: The positive values move the build platform up, the negative values move the build platform down. Pressing the ↻ icon resets the motion distance value to zero.

5. 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.
   - If the average height measurement is below 4.85 mm, move the platform up pressing **Move** the required number of steps.
   - If the average height measurement is above 4.95 mm move the platform down pressing **Move** the required number of steps.
6. Press **Save**.
   → The build platform holder starts moving up to the top of the Z-axis.
   → The new Home position is set.

Use Compensation Mask

The Compensation Mask is set in the factory.
To enable the Compensation Mask on your printer:

1. Select **Settings** > **Job Settings** on the screen of the Control Software.



2. Make sure the **Yes** checkbox is enabled in the **Use Compensation Mask** field.

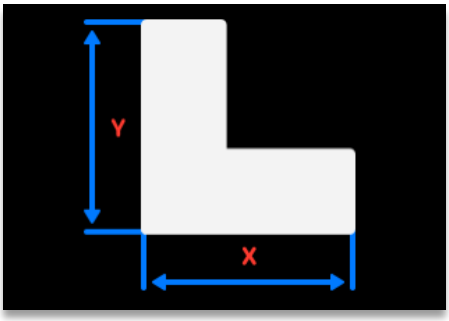
Quick Calibration

Go to **Settings** > **Move & Calibration** > **Quick Calibration** to open the tab.

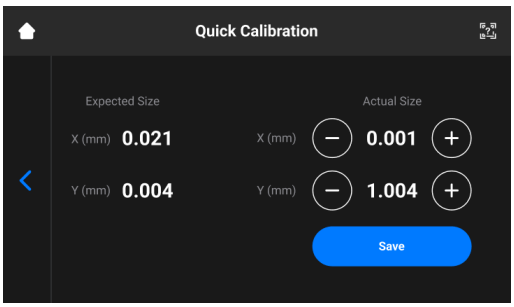
Note: This feature is still under development and will be available very soon.

The printer calibration allows you to set up compensation coefficients to tune the accuracy of your printer.

1. Print the L-shaped job.
2. After the L-shaped job is printed, clean it well and post-cure the model as required for the used material.
3. Measure the printed model as shown below using a caliper.



4. Go to **Settings** > **Move and Calibration** > **Quick Calibration**.



5. Enter the obtained X and Y values to the appropriate fields.
6. Press **Save** to confirm.

Start Print

CAUTION	**Risk of injury from crushing caused by automatically moving printer parts:** The printer may only be operated by instructed and specially trained personnel. Make sure that all persons are clear of the danger zone. The printer may only be operated if the protecting devices are working properly.

CAUTION	**Risk of injury.** Do not use other materials than the materials delivered by ETEC®. Observe the relevant Material Safety Data Sheets for the materials. Use the appropriate personal protective equipment.

Note: The execution of job preparatory activities, including date and performing operator, shall be documented for reasons of traceability.

Check Z-axis

Make sure the printer has its Z-axis slide activated:

1. Select **Settings** > **Move & Calibration** > **Move** on the main screen.
2. Press 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, the reason could be that it has already reached its highest point.

Create Print Job in Envision One RP

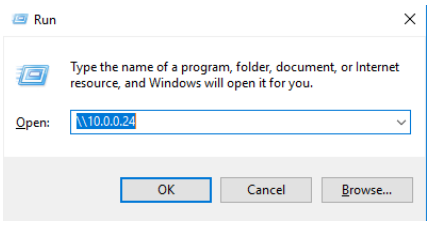
To create the job in Envision One RP:

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.

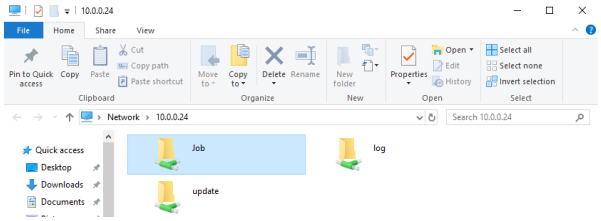
Load Job File

To load a job to the printer:

1. Type in **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.



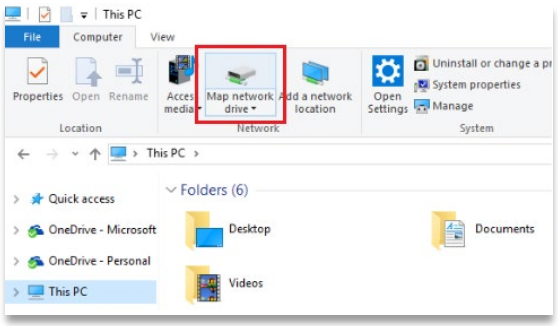
3. Open the **Job** folder.
4. Put the job files to the folder.
   → All the files from Job folder are now shown in the **Job List** tab.

Map Network Drive on Windows

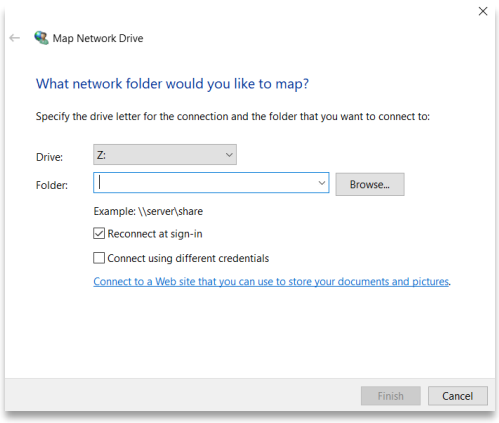
Map a network drive to access the Jobs folder from File Explorer in Windows without having to search for it or type its network address each time.

Windows 10

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



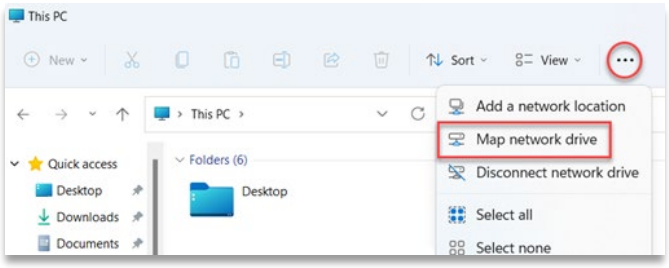
→ The following screen appears.



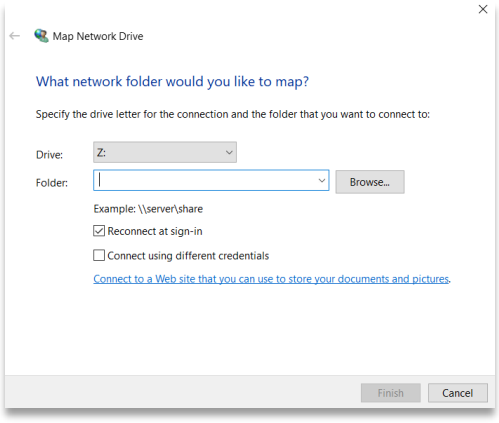
4. In the **Drive** drop-down list, select a drive letter (you can select any available letter).
5. In the **Folder** field, type the path of the folder or computer, or select **Browse** to find the folder or computer. To connect each time you sign in to your PC, check the **Reconnect at sign-in** checkbox.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

Windows 11

1. Open File Explorer from the taskbar or the **Start** menu, or press 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.



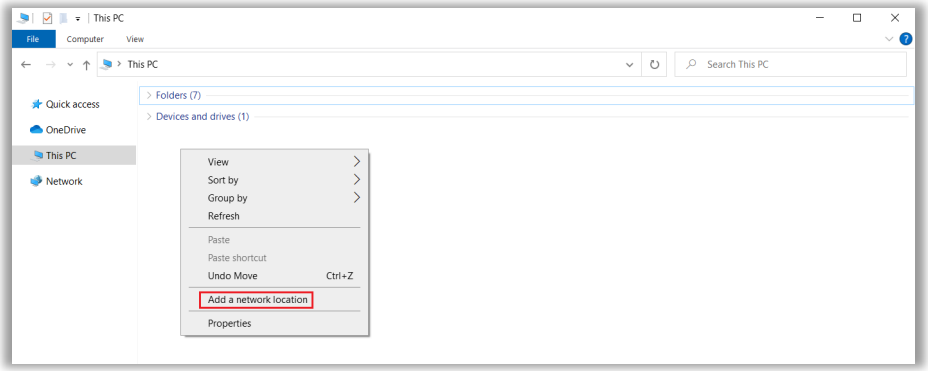
4. In the **Drive** drop-down list, select a drive letter (you can select any available letter).

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 have to sign into your PC and check the **Reconnect at sign-in** checkbox.
6. Select **Finish**.

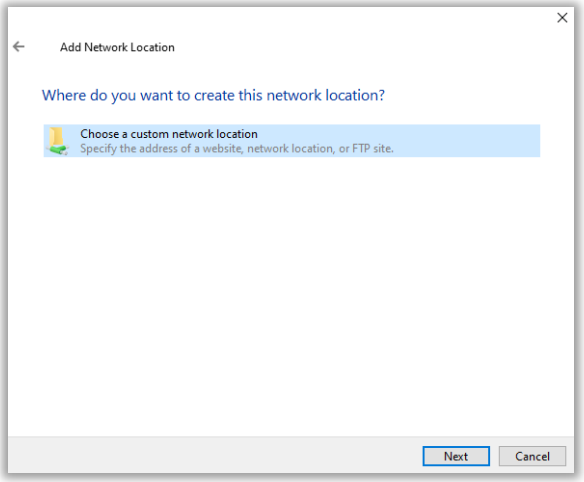
Create a Shortcut

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

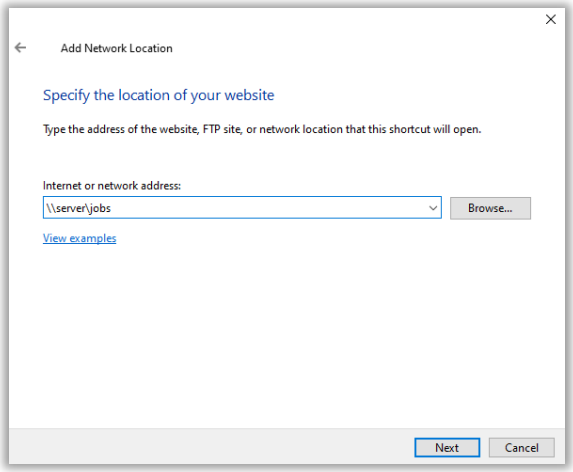
1. Open the **Start** menu, then search and press **This PC**.
2. Right-click on any empty space and select **Add Network Location**.



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



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

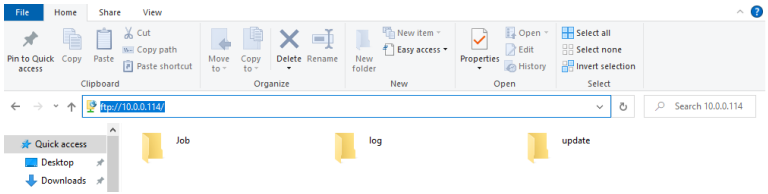


6. In the screen that appears, type a name for the network and select **Next**.
7. Press **Finish** on the **Add Network Location Wizard** screen.
   → The location is now listed under **Network Locations** tab in **This PC**.

Load a 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.



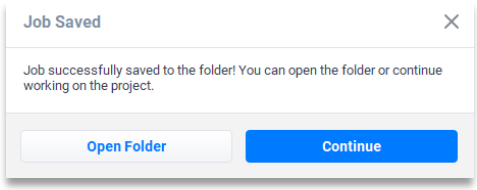
2. Open the **Job** folder.
3. Put the job files to the folder.
   → All the files from Job folder are now shown in the **Job List** tab.

Load Job from 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. Press **Print**.
6. Press **Save job**.
7. Open the USB-drive folder you want to save a job to and press **Select Folder**.
   → The job folder with all the required data is saved to the selected USB-drive.

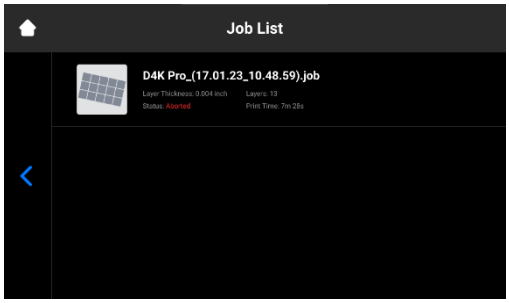
→ The following window appears.



8. Press either:
   → **Continue** to exit the **Save job** dialog box; or
   → **Open Folder** to open the Job folder.

To load a job directly from the USB drive:

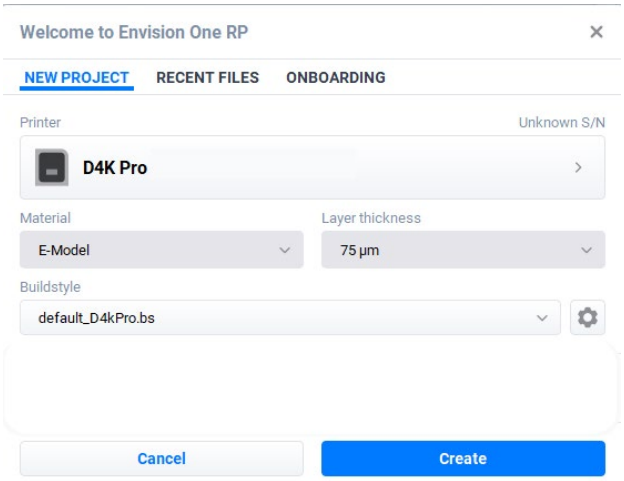
1. Upload the required job to the USB drive as described above.
2. Insert the USB drive with the uploaded job into the corresponding plug of the printer.
   → The job is automatically added to the **Job List**.



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.

Load Job from Envision One RP

1. Open the **Envision One RP**. At least one open and selected 3D model.
2. Press the **Print** button in the **Print Menu**.
   → The following window appears:



3. Press the **Printer** field.
4. Select a printer to send your job to.
5. Press **Send Job to Printer**.

Note: The Printers in the network can have the following statuses: **Ready for Print, Printing, Offline.**
You cannot send a job file to a printer with the **Offline** status.

Verify D4K Is Ready to Print

Before beginning a print, always check the following:

1. The printer door is closed.
2. The flat surface of the build platform is clean and free of all cured material, and the build platform clamp is secured in position.
3. The material tray is secured in position and the material tray clamping handles are tight and the material tray clips are fastened.
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.

Start Print

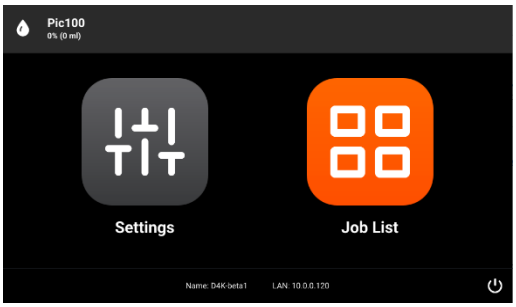
NOTICE	Make sure the build platform is clean and the material tray is in place and has material in it before starting a print to prevent failed builds and damage to the equipment.

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

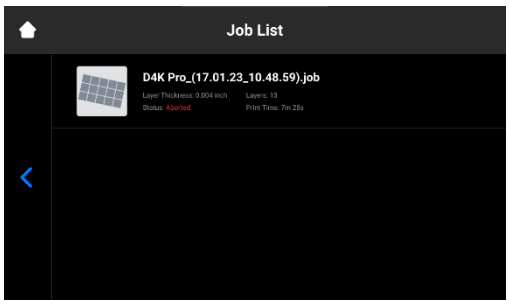
Note: To pause a job, use the **Pause Job** button. All other methods will likely result in a failed build. Proceed with attention.

To start a job:

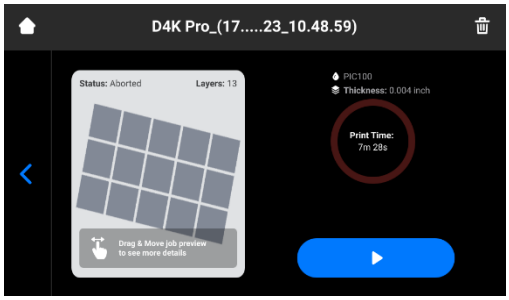
1. On the Home screen, select **Job List**.



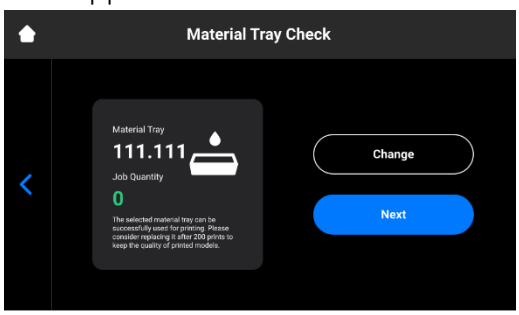
2. Select the job to print.



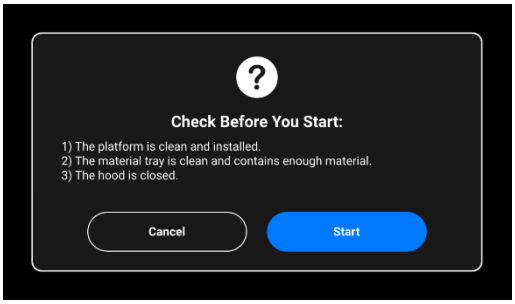
→ The following screen appears.



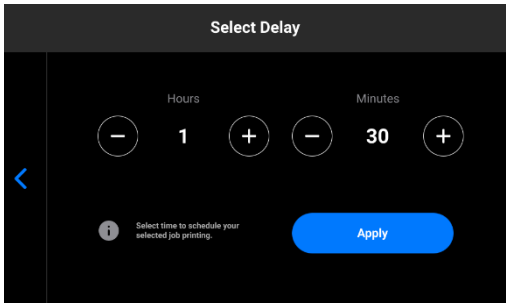
3. Press the **Play** button to start printing.
→ The following screen appears.



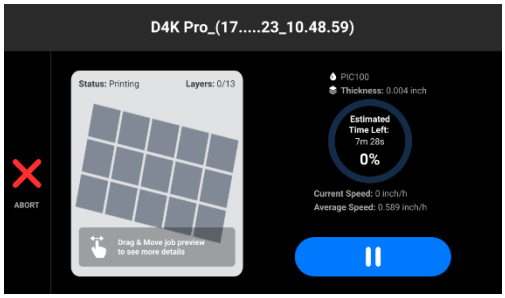
4. Press **Next** to proceed with the current material tray. Press **Change** to select another material tray.
→ The following confirmation window appears.



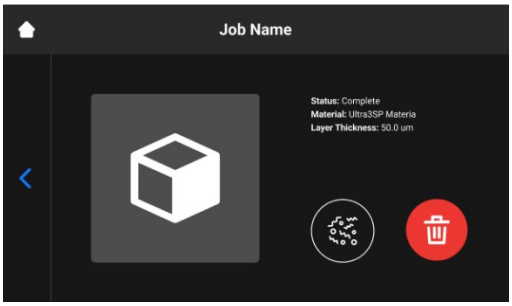
5. Check the requested parameters and press **Start**.
6. To start the print job right away, wait several seconds.
7. To delay the start of the job, press **Start Later**.
   → The following window appears.



8. Set the required delay time using the **+ (plus)** and **- (minus)** icons in the **Hours** and **Minutes** fields and press Apply.
   → The print job starts. When the print job starts, the following window appears.



9. Once the job has been printed successfully, the following window appears.



If for some reason you want to remove the job from the material tray, press the left icon and proceed by following a step-by-step for debris removal specified in Abort Job.

Stop Job

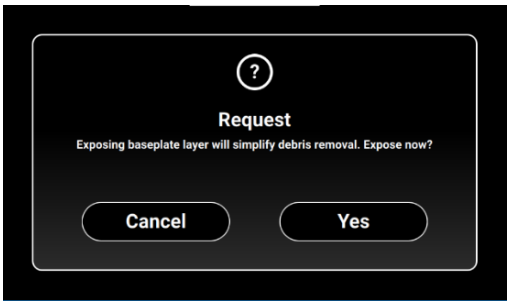
To stop or abort the print, the following options are available:

- Abort Job
- Delete Job

Abort Job

The job can be aborted by pressing the ✕ icon in the job printing window.

1. Press **Yes** in the confirmation window that appears.
   → The job has been aborted.
   → The following window appears.



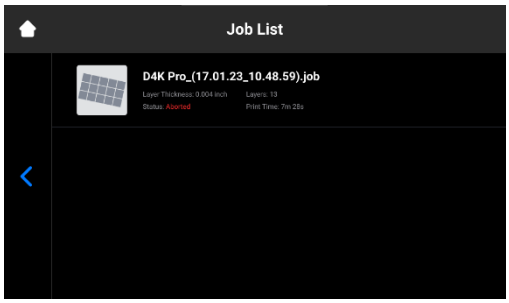
- Press **Cancel** if there is no need to simplify the process of cleaning the material tray.
- Press **Yes** to simplify the process of debris removal from the material tray.
  → The job has stopped.
  → The entire material tray area has been exposed.

2. Now, you can remove debris from the material tray by simply taking off the thin film of exposed material and following the procedure for Filter Material.

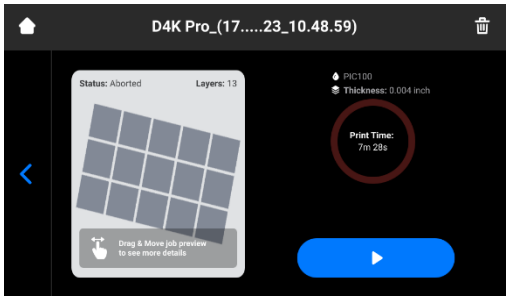
Delete Job

To delete the job from the Job list:

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



2. Select the job you want to delete from the list of jobs by pressing it.
   → The following screen appears.



3. Press the **Waste Bin** icon on the top right corner to delete a job file.
   → The confirmation window appears.
4. Press **Delete** to confirm a job file removal.

Post-Process

Post-Cleaning Supplies and Post-Curing Equipment

Recommended list of cleaning supplies:

- Spray bottle (optional).
- Parts washing unit, or two plastic containers with lid for holding the isopropyl alcohol.
- Isopropyl alcohol (99%) for cleaning extra material off of cured models.
- Soft artist or make-up brush.
- Precision knife/surgical blade or small nail scissors for removing supports from models.
- Air compressor for removing excess material and alcohol from the model surface.
- Paper towels.
- Post curing unit.

Remove Build Platform from Printer

When a print job is successfully completed, the build platform will rise to the top of the Z-axis tower. The build platform with the printed part is ready to remove. Have a paper towel ready to catch potential drips of uncured material.
To remove the build platform from the printer:

1. Open the printer's door.
2. Place one hand on the build platform handle.
3. Grasp the build platform clamp with the other hand and lift to release.
4. 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.
5. Pull the build platform towards yourself until it comes free from the printer.

Remove Parts from 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 photopolymers. Be careful not to spill any chemicals.

Once the job is complete, the built part will hang off the build platform.
To remove the part, proceed as follows:

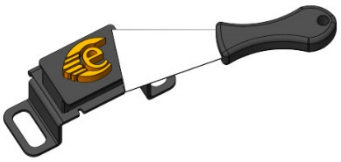


Figure 10: Separation of a model from the build platform

1. Place the build platform on its side in the processing zone. Watch the material so it doesn't leak into the build platform clamp screw cavity.
2. Use the scraper from the Starter Kit to gently detach models from the build platform. Angle your tool roughly 30 degrees from the platform and move the blade while applying a light amount of pressure.
3. If the model doesn't separate easily, move to a different area, working your way around the model until it safely dislodges from the build platform.
4. Place each model on a paper towel to catch the excess material as it drips.

Note: The models appear to be glossy because uncured material covers the surface.

Note: If the model doesn't begin to separate easily, move to a different area, working your way around the model until it safely dislodges from the build platform.

Reset Printer after Print

1. Once the models have been removed, use the glass scraper to remove any remnants of the printed job 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 clamping handle.
4. Close the printer door.

Clean Printed Models

The PWA 2000 Parts Washing Apparatus is the recommended washing unit for the D4K. For information on how to clean a printed model with PWA 2000, see PWA 2000.

For information on cleaning of the parts, consult the Material Safety Data Sheet or Instruction of Use provided by your manufacturer or distributor.

Post-Cure Printed Models

The PCA 2000 Parts Curing Apparatus and PCA 4000 Parts Curing Apparatus are the recommended curing units for the D4K printer. For information on how to cure a printed

model with PCA 2000, see PCA 2000. For information on how to cure a printed model with PCA 4000, see PCA 4000.

Finish Post-Processing of Printed Models

Finishing is the final step in post-processing of the printed models. With finishing, remove 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 from 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.** **Risk of 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.** **Residual risks 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. Adhering to regular maintenance is crucial for efficient use of the printer.

- Section Operational Maintenance describes the operational maintenance procedures.
- Section Auxiliary Materials and Consumables gives an overview of all auxiliary materials and consumables.

Customer Service

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ETEC

EnvisionTEC US LLC

Dearborn, Michigan, U.S.

833-384-3577

Customer Support

This section provides various options that help to get in touch with the ET Support Team for resolving any printer-related issues.

Download Log Report

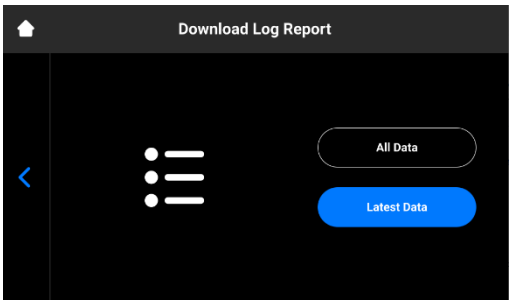
The **Download Log Report** feature allows you to download the log report with all the printer information to the USB drive.

Prerequisite:

- USB drive is connected to the printer.

Step-by-step:

1. Select **Settings > Printer Settings > Download Log Report** to open the tab.
   → The following screen appears.



2. Press **Latest Data** to download the latest information of the printer; or **All Data** to download the report containing all information received during printer operation.
   → The confirmation screen appears.
3. Make sure the USB drive is connected to the printer and press **OK**.
   → The report has been downloaded successfully to the USB drive.

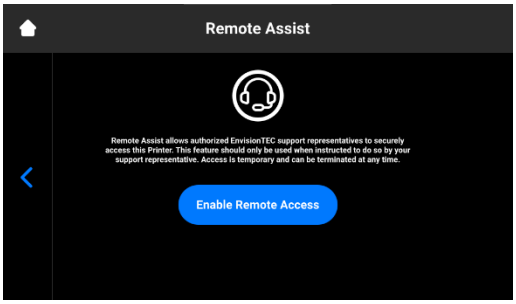
To send the log report to Service and Support:

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

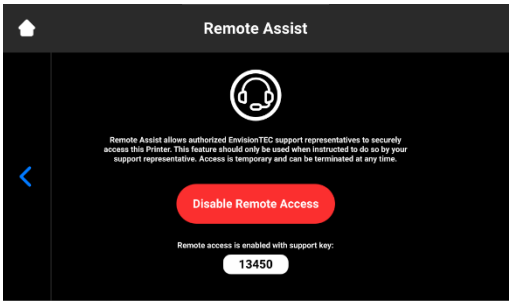
Remote Assist

This feature allows you to grant remote access to the support representative.

1. On the home screen, go to **Settings > Support > Remote Assist > Enable Remote Access**.



→ The following screen appears

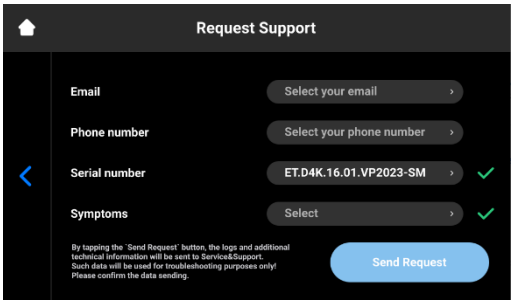


2. Provide the 5-digit support key to your support representative.
   → The remote session starts.
3. To terminate the remote session, press **Disable Remote Access**.

Request Support

This feature allows you to open the support case from the printer.

1. Go to **Settings** > **Support** > **Request support**.



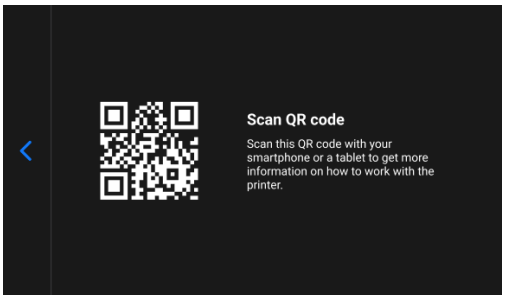
2. Press the **Email** field to select the existing email address. Otherwise, press **Add new email** to type a new email address and press the back button to save the changes and return to **Request support** menu.
3. Press the **Phone number** field to type your phone number in.
4. Type the printer serial number in the **Serial Number** field.
5. Press **Symptoms**, select the issue(s) by checking the corresponding box.
6. If the issue is not in the list, press **Other**, type the issue using a keyboard, and confirm with **OK**.

7. Press the back button to save the changes and return to **Request support** menu.
   → Once all fields are filled, they are marked with green checkmarks.
8. Press **Send Request**.
   → Your request is submitted. The next available technician will assist you.

Knowledge Base

This feature provides you access to the online database of materials for the D4K printer.

1. Go to **Settings > Support > Knowledge Base.**
   → The following screen appears.



2. Scan the QR code with your smartphone or another mobile device or follow this link to access D4K Knowledge Base.

Operational Maintenance

WARNING	**Risk of electric shock:** Disconnect power before servicing the printer.

Note: Carry out the maintenance tasks according to the table below and the intervals specified therein.

Note: Document the maintenance activities, including date and performing operator.

The operational maintenance helps ensuring 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 material tray	Print-by-Print
Cleaning the printer casing	Print-by-Print
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 (see Check the Safety Equipment).
Greasing the Z-axis slide	Annually

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.

To keep your printer in optimal printing condition, the build platform should remain as clean as possible between print jobs. The build platform should be cleaned when:

- It becomes sticky.
- There is cured material around the build platform clamping handle.
- When changing the material type.

Step-by-step

1. Clean the surface of the build platform using a clean paper towel.
2. Check every surface for material, buildup, or stickiness.
3. Clean the excessive buildup using a small amount of 99% IPA on a clean paper towel or Q-tip.

Clean Material Tray

NOTICE	Always remove the platform before taking the material tray out of the printer. Failure to do so can result in material dripping on the projector causing failed builds and ruined 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.
The material tray is a consumable with an approximate lifespan of up to 250 prints. Order a new material tray before the current tray expires or becomes damaged. The expired material tray can be disposed of.

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

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. Once spilled, the material cures to the casing and it is difficult to remove it.
Step-by-step

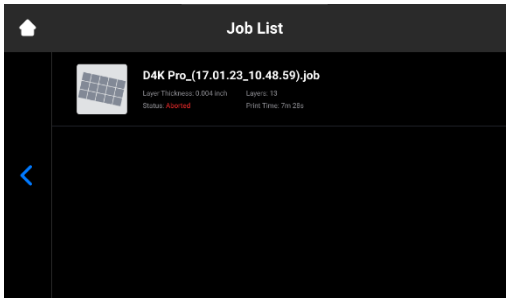
1. Wipe the spilled material as soon as it touches the printer before it cures.
2. Remove most of the spill with a dry paper towel first, then lightly spray a second paper towel with IPA and wipe away any residue.

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

Clean Hard Drive Space

Time needed: approximately five minutes.
Maintenance frequency: Weekly.
Overview
The printer has an internal PC that can store 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 may show error messages or respond slowly to touch screen commands.
Step-by-step

1. Turn on the printer.
2. On the D4K touch screen, press **Job List**.



3. Select the print job folder name.
4. Press 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.
If 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.

If using plastic washing containers:

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

Clean Dust

Time needed: Approximately five minutes.
Maintenance frequency: Weekly.
Overview
Dust may accumulate on, near, or inside of the printer. 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 isn't any 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:

- The printer is running slowly.
- The printer was recently updated.
- The printer has not been powered down in a week.

Maintain Materials

Time needed: Approximately five minutes to mix material, depending on the material, and other fifteen minutes to empty and clean the material tray.

Maintenance frequency: After each print.

Note: See the corresponding Material Safety Data Sheets for the printing material for details.

To maintain 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. To do this:
   - 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 material tray.
   - Mix the material until it's a completely uniform color.
3. Check the material for solids or debris. If found, filter the material. To do this:
   - 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.
   - 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.

Clean Touch Screen

Time needed: Approximately five minutes.
Maintenance frequency: Monthly.
Overview
Sticky spots on the touch screen can make it difficult to press buttons or navigate the interface effectively.
Step-by-step

1. Spray the lens cleaner onto a clean paper towel.
2. Gently wipe the surface of the touch screen.

NOTICE	Always stand away from the printer when spraying to avoid contaminating the material and material tray.

Grease Z-slide

Time needed: Approximately one hour.
Maintenance frequency: Annually.
Overview

Inside the Z-axis tower is a long-threaded metal rail called the Z-slide. This rail is attached to a motor and moves inside the printer. The Z-slide needs to be greased annually using white lithium grease. This keeps the Z-slide free of dust and debris and allows it to operate smoothly.

Step-by-step

1. Add a small amount of lithium grease to the tip of a clean Q-Tip.
2. Apply the grease by moving the Q-Tip starting near the top of the screw, moving down slowly.

Filter Material

Filter the material after each failed build. Use a paint strainer and run your material through it. The paper paint strainers are the most suitable, as they can be discarded after each use.

Do not use a paint strainer that requires cleaning, as cleaning solutions can contaminate and ruin material.

Figure 11: Paint strainer

Annex: Troubleshooting

NOTICE	For each task, the safety warnings contained in this instruction manual must be observed. In case of any problem not listed in this troubleshooting chapter, contact your customer support. Do not try to fix the problem without consulting the customer support first as it will void your warranty.

Problem	Remedy
My Z slide isn't moving when I press the relevant buttons in the Control Software.	1. Close the D4K software and 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 persists, 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, it may be time to order new ones. 4. If this is not the case and you still cannot get a good job after straining or using fresh material, you may have 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.
Sporadic blurring on part.	It is caused by contaminated material from alcohol or some other chemical. 1. Pour the old material in separate container. Do not pour it back into new or unused material container. 2. Clean out the material tray completely with dry soft paper towels only, don't 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 post 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 support 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.
Build 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: 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: Tilt parameters are incorrect. They can be changed in Envision One RP.	Tilting parameters are not within the limit set in the buildstyle. 1. Regenerate the job in Envision One RP. If it does not help, contact Service & Support.
Error 101	This can be caused by the wrong material usage. Contact Service & Support and provide the information on the material used.
Error message: Job is too high.	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: Your printer is running out of memory.	It means that your printer does not have enough free space to load the job file. When this error appears: 1. Check the memory usage in the About Printer menu. 2. Go to the Job List from the main screen of the D4K Control Software and delete a few jobs there to free up some space.

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