

IMD

AGENCY MANUAL

IMD



Carima's DLP 3D Printer IMD is optimized for the dental industry providing a One-Stop Digital Workflow & One-Day Clinic. IMD is compatible with various dental resins and has excellent reproducibility.

**FAST
PRINTING**

24~25mins

Optimum production for dental treatment (Crown/Model) (Printing - Cleaning - Curing)

19-20mins

2mins

3mins

*Crown : 19mins/
Model : 20mins

**HIGH
PRECISION**

25µm

Layer thickness(25µm)
Printing precision(30µm)

**PIXEL SIZE
X/Y**

65µm

Ultra precision(X/Y)
(FHD Resolution, 1920x1080)

REPRODUCIBILITY

99%

Light uniformity
(Printing speed increased by minimizing light loss)



This manual provides instructions on how to use the "IMD." Understand how to use "IMD" through the manual and experience "IMD" easily and conveniently.

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INTRODUCTION

IMD Specification

IMD is optimized for printing highly precise models. This ultra-precise DLP printer is suitable for dental.



Printing Size(mm) [W x D x H]
124 x 70 x 140



Precision
65 μ m



Product Size (mm) [W x D x H]
391 x 405 x 589



Layer Thickness
25, 50, 100, 150 μ m



Weight
18.5 kg



Using Environment
18-26 (°C) / 64-79 (°F)
20% - 50% (humidity)



Light Source
365 / 385 / 405nm UV LED



Control Type
Embedded touch screen



Resolution
FHD 1920 x 1080



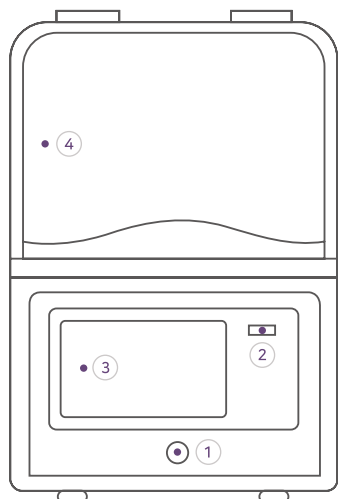
Power
DC 24V 5A with Adapter



Material
(Photopolymer) resin used in dental.

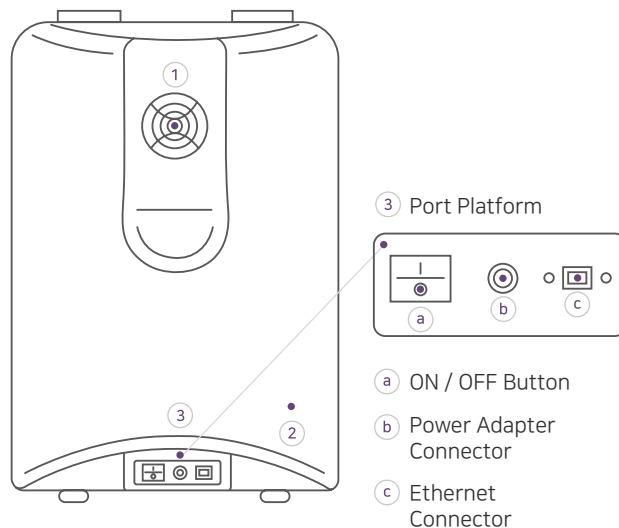
PRODUCT OVERVIEW

01 Front



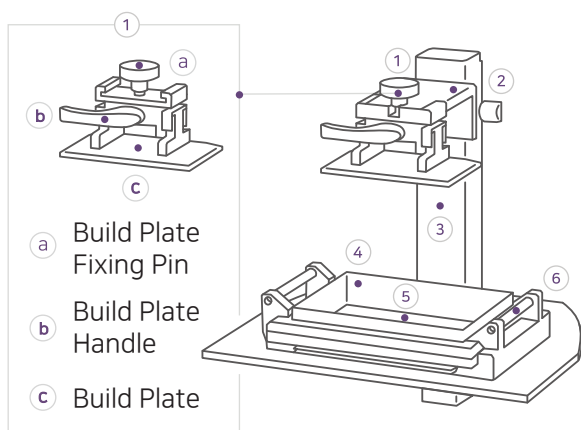
- ① LED Power Button
- ② USB Port
- ③ LCD Touch Screen
- ④ Print Room Cover

02 Back



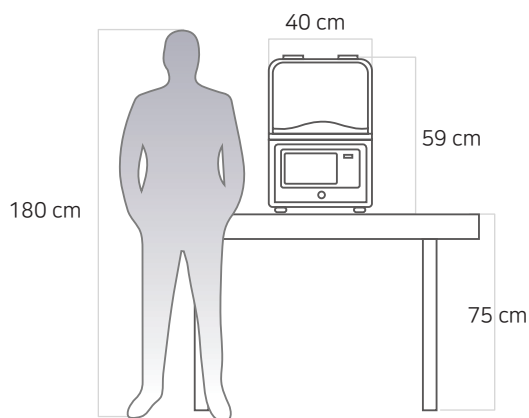
- ① Printer Cooler
- ② Product Information Label
- ③ Port Platform
 - a ON / OFF Button
 - b Power Adapter Connector
 - c Ethernet Connector

03 Internal Structure



- ① Build Plate Module
- ② Build Plate Fixing Base
- ③ Actuator
- ④ Resin Vat
- ⑤ FEP Film
- ⑥ Vat Retention Knob (located on both sides)

04 Size



* Build plate, vat, FEP film, etc. are accessories. To purchase additional accessories, please contact Carima.

SAFETY WARNINGS

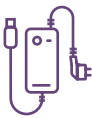
This information is intended to protect your safety and prevent property damage. Please be aware of the precautions before using, to prevent serious injuries and printer damage.



When printing, put the printer in a well-ventilated place because resin may smell.



Setting up a printer in a place with a lot of moisture or temperature changes can cause deformation and malfunction of the product.



If the printer power cable and USB cable are damaged due to being pulled or stepped on the rough surface, please note that sparking or voltage malfunction may occur. In addition, there is a risk of fire due to overheating when the power is turned off.



Do not turn the power switch off, located on the back of the printer, when the printer is on. A forced shut down shortens the life of the printer engine and can cause mechanical failure. Use the 'Power Off' or the 'Auto Shut Down' button to turn the printer off.



When moving the printer, be sure to completely shut down the printer, and then remove the vat and build plate so that the resin in the vat does not overflow or leak.



If metal fragments and other types of liquid leaks into the printer, it may cause mechanical malfunction. Also, operating the printer with wet hands may cause electric shock. Use protective equipment while using the printer.

*** Latex rubber gloves can also be used in place of the nitrile gloves provided.**



Do not use volatile objects near the printer as they may cause fire or explosion.



There are potential risks to the printer in terms of chemical composition and voltage. To prevent injury on children and pets, please install the printer in a safe place.



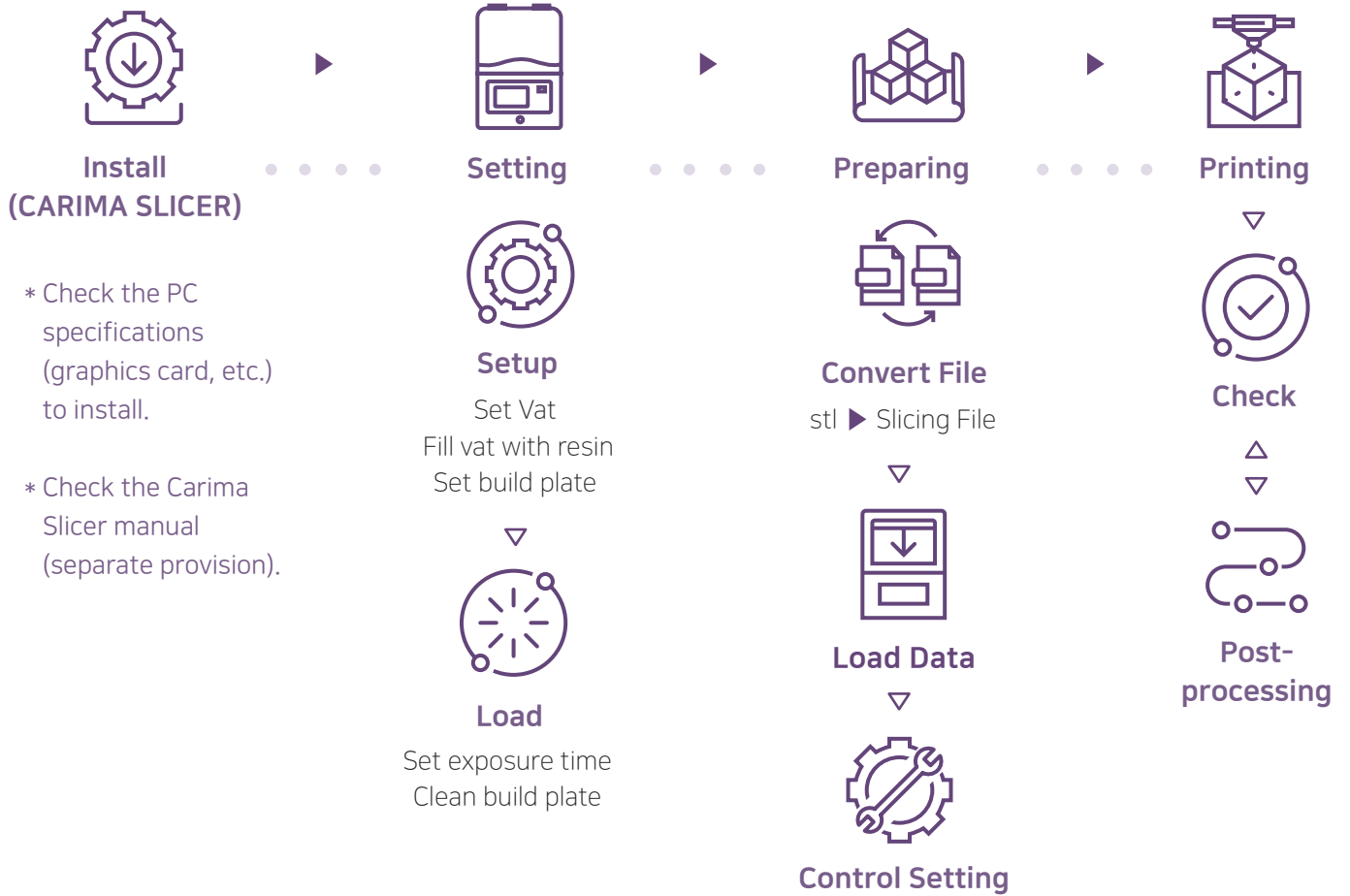
The warranty benefits of the printer will be forfeited if disassembled or modified artificially. Carima will not be held liable for the loss caused by this.



For inquiries regarding "After Sale Service" and product warranty, please contact Carima.

PROCESS OVERVIEW

For output, the following procedure is required.



IMD Compatible Resin

IMD is compatible with all of Carima's general and functional resin.

*** We can only guarantee the print's outcome when Carima product is used.**







General

Generally used for printing for prototype or life-size modeling.



Nontoxic CMYK / Clear

Biocompatible CMYK/W resin, being non-volatile and nontoxic, allows users to combine colors. The resin is compatible with Carima's eco-friendly detergent (RD-229), allowing it to be washed with water.

 White	 Yellow	 Magenta	 Cyan	 Black	 Clear
Code CUKL22W	Code CUKL22Y	Code CUKL22M	Code CUKL22C	Code CUKL22K	Code CUKL22CL

Dental

Highly accurate and transparent resin used in dental industry.



Model

Gray

Code
CUKH17G



C&B

Natural Tooth Shade A1

Code
CDV020A1

Natural Tooth Shade A2

Code
CDV020A2

Natural Tooth Shade A3

Code
CDV020A3



SG

Clear

Code
CDV030C



Cast

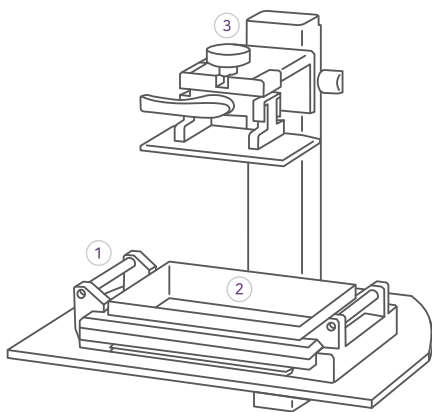
Red

Code
CDV040R

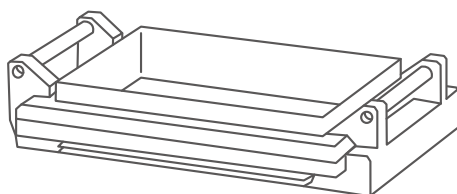
Preparation and Setup

PRINTING PREPARATION

To start printing, you must first prepare the materials. Materials include resin vat, resin, and build plate.



- ① Align the detached vat and fasten it to the vat retention knob.
- ② Pour the resin into the resin vat.
- ③ Fasten the plate to the build plate fixing base and to the module with the fixing fin.



- **Scratching the FEP film with sharp scrapers or cutters will tear and contaminate the engine room due to leakage of resin.**

* Build plate, vat, FEP film, etc. are accessories.
To purchase additional accessories, contact Carima.

Information on the use of resin

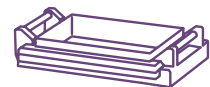


Use protective equipment when using resin. Pour resin before printing and on inevitable occasions, press the 'Pause' button and wait for a complete stop before slowly pouring the resin into the vat. Adding the resin during output can cause bubbles and adversely affect the print.



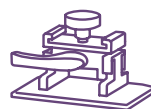
Information on the use of resin vat

The FEP film may tear or loosen during output. In this case, replace it with a new one to prevent resin leakage. It may get scratched due to user carelessness or by hardened outputs. Be aware, for it may occur in short-term use.



Information on maintaining the build plate

Clean the build plate by scraping it off with a scraper or by wiping with alcohol. Thoroughly wipe the resin off before using a different resin.



Information on optical engine

The lifespan of the optical engine lamp is 20,000 hours. When it exceeds 20,000 hours, the brightness of the lamp may decrease. Once it exceeds its usage time, improve the quality of the output by replacing it with a new lamp.



USING THE LCD PANEL

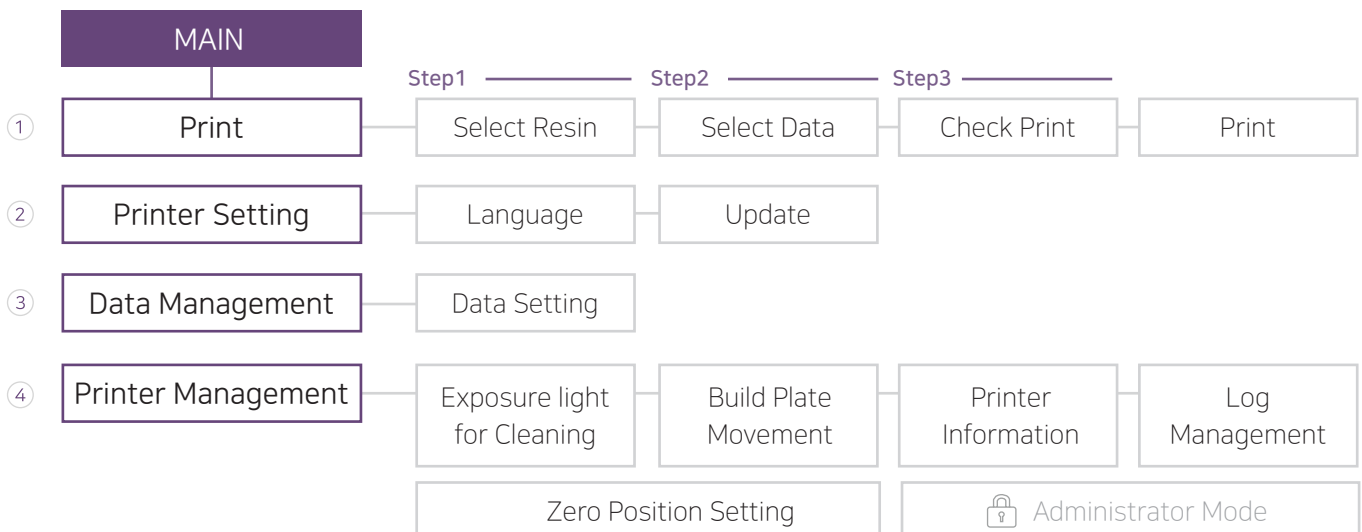
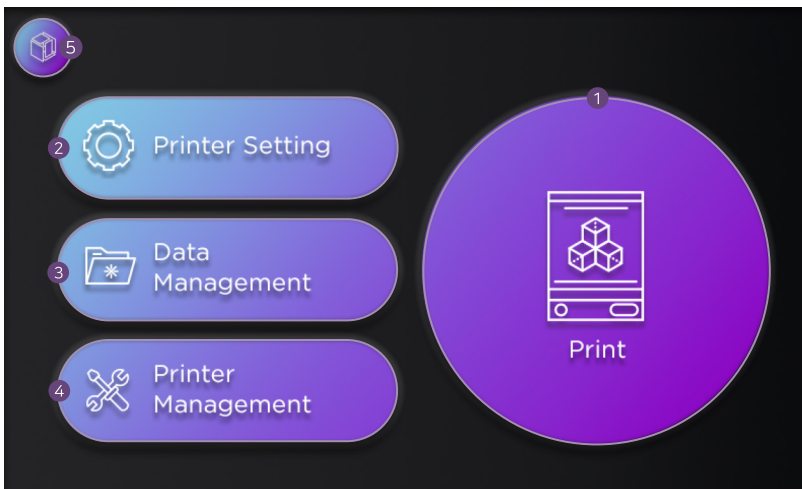
Use the LCD panel to set most of the settings.

◦ INITIAL SCREEN



When the printer is turned on, the loading screen appears. Make your ideas come true with Carima's 3D printer!

◦ 메인 화면



01 PRINT

Step1

Select Resin

Select the resin to be printed.
After selecting the resin, press the arrow to move to the next step.



Step2

Select Data

Select the data to be printed and proceed to the next step.



Step3

Check Print

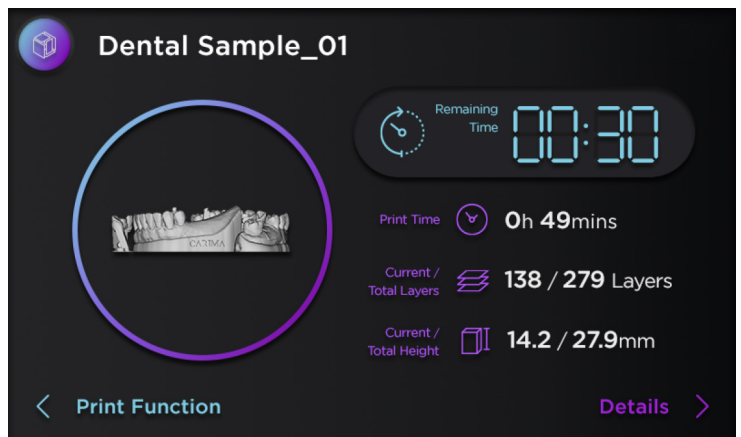
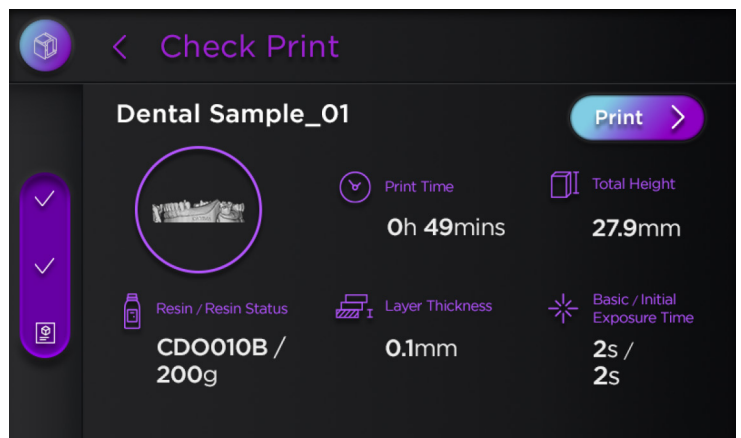
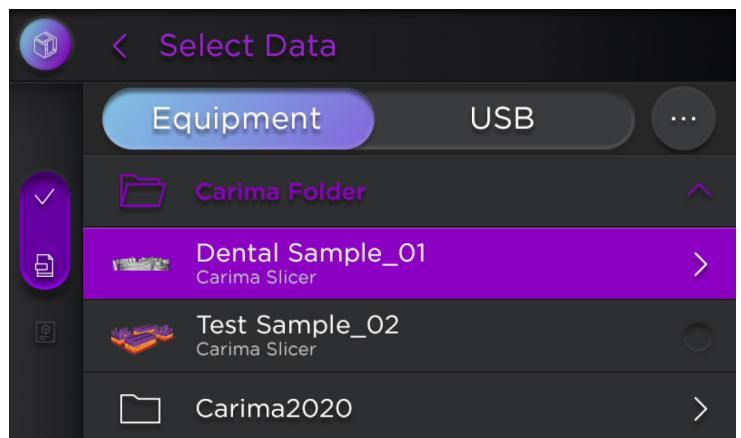
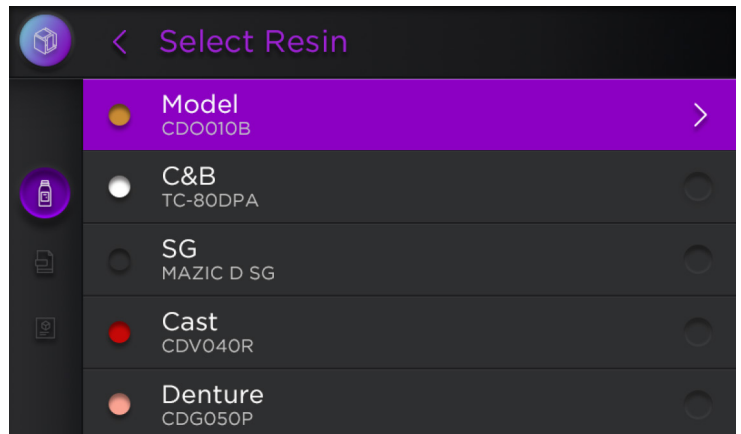
Check the printing conditions such as the data and the resin to be printed, and press the print button to start printing.



Print

This is a screen showing the printing progress. You can see the current printing progress.

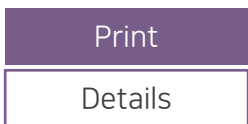
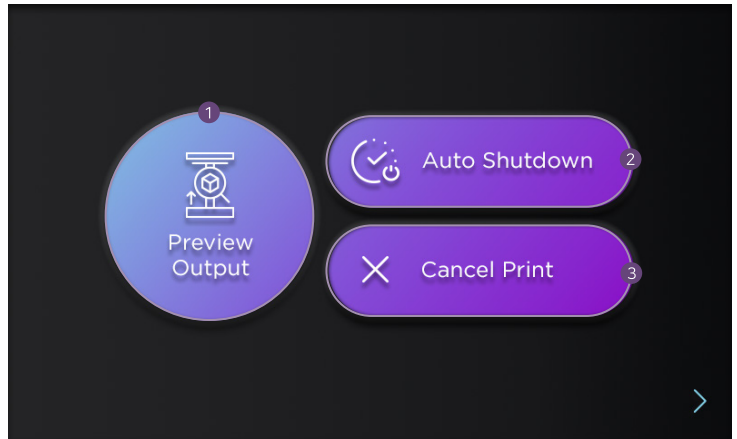
*** When the remaining time is less than 10 minutes, it is displayed in yellow, and when printing is finished, it is displayed in red.**



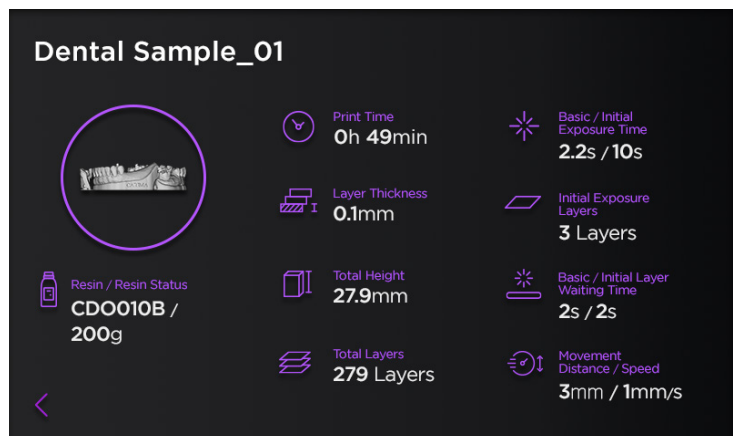


This is the print function screen during printing.

- ① **Preview Output :**
You can pause printing and raise the build plate up to check the printing status.
- ② **Auto Shutdown :**
Automatically shuts down the printer after printing is complete.
- ③ **Cancel Print :**
Cancel printing.

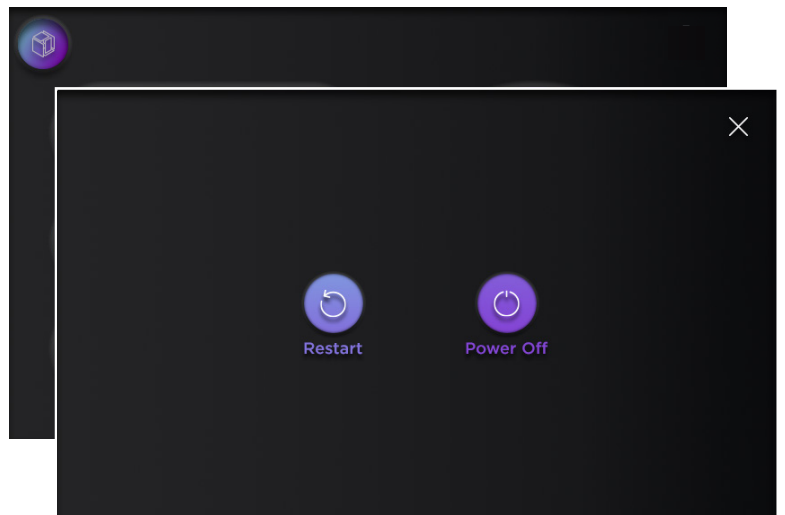


This is the detailed information screen during printing.



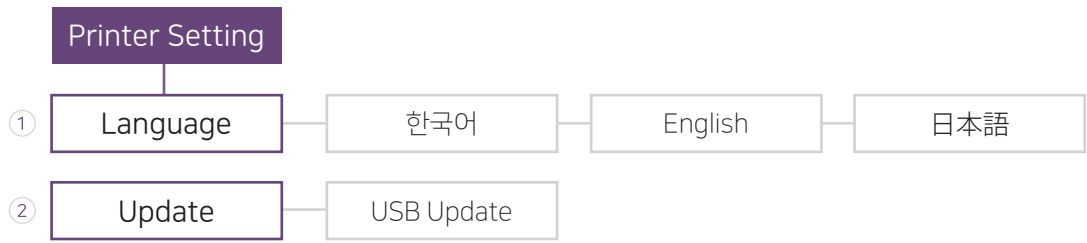
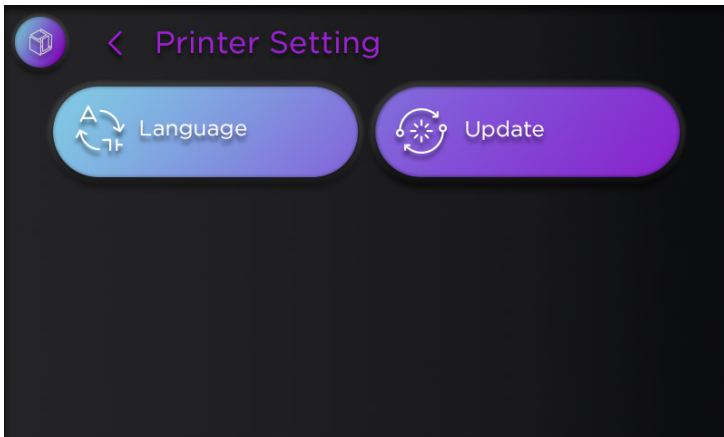
◦ **Power Off**

If you press the Main Home button on the main screen, the exit pop-up page appears. You can select the Restart or Power Off.



02 Printer Setting

Setting language and update.



- ① **Language :**
Change the language setting. The changed language is applied when the system restarts.

- ② **Update :**
Update the software version.

03 Data Management

You can delete and export data from the data management page.

① **Equipment / USB :**
Choose a storage space.

② **Sort :**
Select the data array method.
There are three ways to array the data.
(Times, Name and File Size)

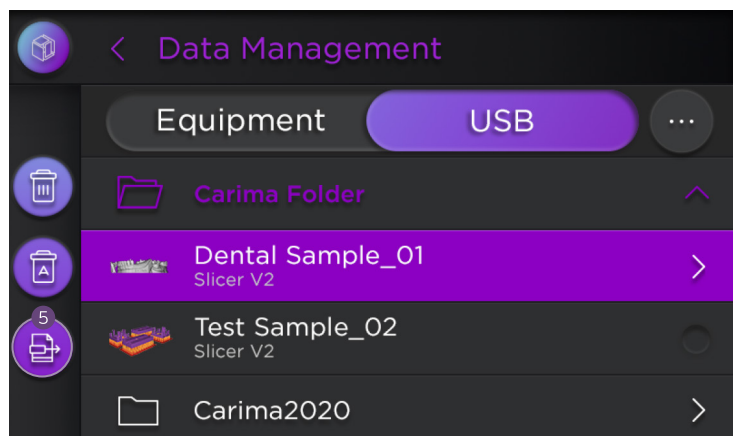
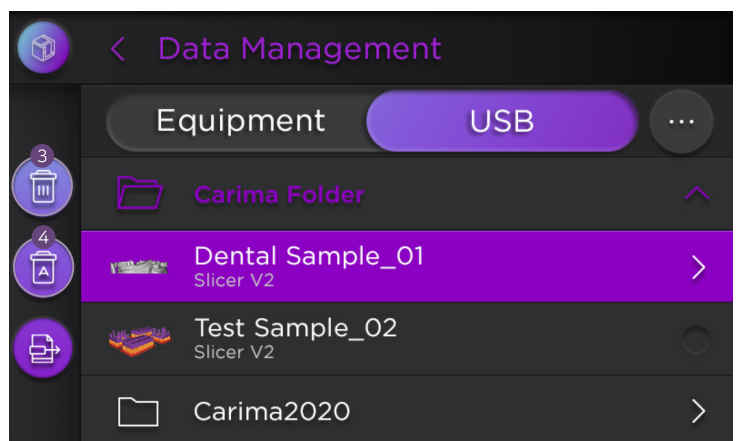
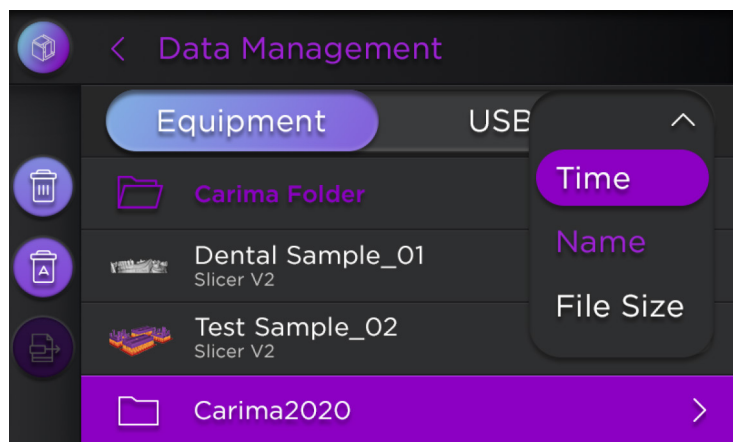
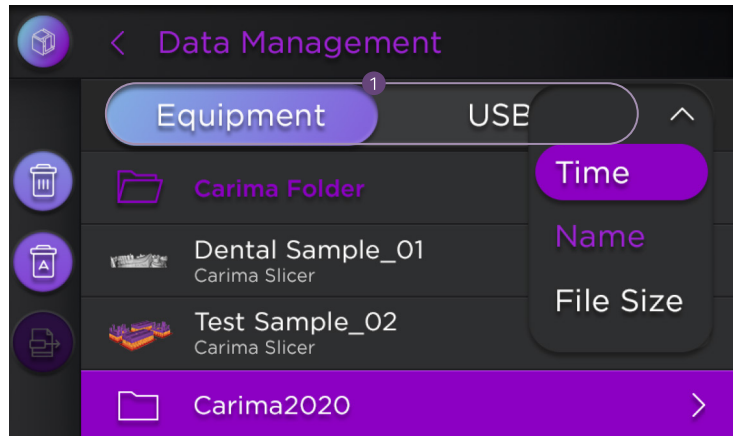
◦ **Delete Data**

③ **Delete :**
Select data and press the delete button to delete data.

④ **Delete All :**
Delete all data.

◦ **Export Data**

⑤ **Export**
You can export files from USB to Equipment. After selecting the data, click the Export button to complete the export.

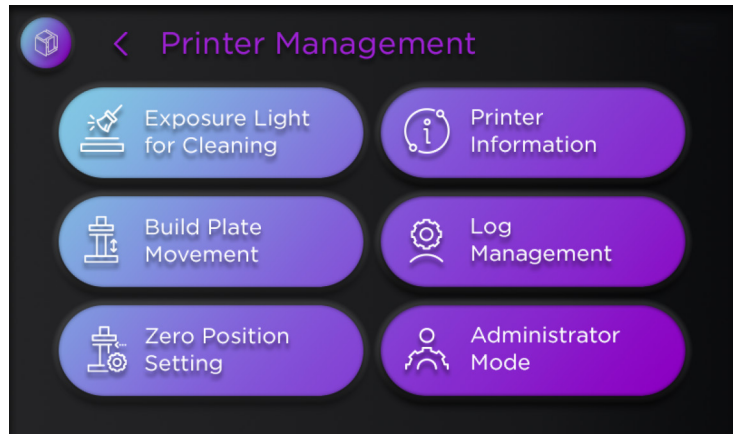


04 Printer Management

Make settings related to printer management such as Exposure Light for Cleaning, Build Plate Movement, Printer Information, Log Management, Zero Position Setting and Administrator mode.

◦ Administrator Mode

Used only by Carima technicians during "After Sale Service." This service is not available for users. For Customer Service, contact Carima. (82-2-3663-8877)



◦ Exposure Light for Cleaning

This function is used to clean to remove any debris or residue left on the sheet. Operate while the resin remains in the vat, and remove the cured layer when cleaning is complete.

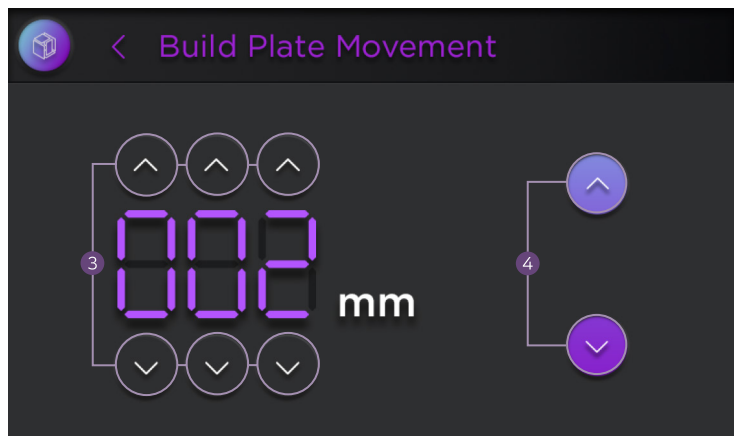
- ① Up and down adjustment button: Adjusts the time of Exposure Light for Cleaning.
- ② Exposure Light for Cleaning button: Cures the printing surface at the set time.



◦ Build Plate Movement

Move the build plate.

- ③ Up and down adjustment button : Adjusts the distance to move the build plate.
- ④ Up and down movement button : The build plate moves up and down by the set distance.



◦ Printer Information

Check information about product name, build size, resolution, storage space, IP address, and software version.

◦ Log Management

Check log information.

04 Printer Management

⚠ Zero Position Setting ⚠

This function requires attention.
Before setting the zero position, please refer to the user manual or contact Carima.

*** There is a risk of damage to the glass of the printer when setting the zero position, and the manufacturer is not responsible for this accident.**

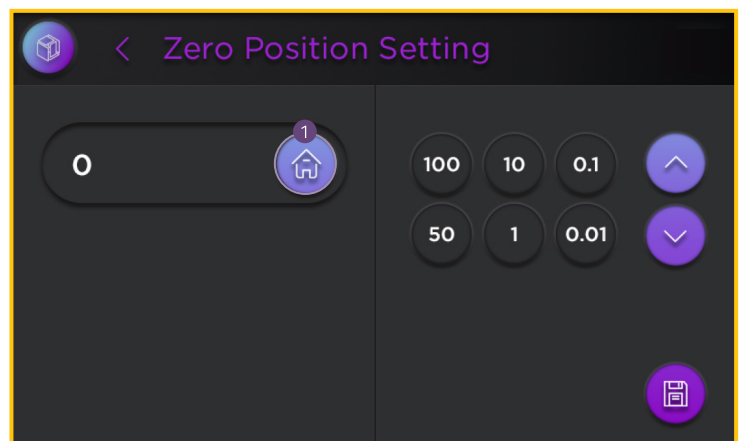


Step1

Zero Position Initialization

Initialize the build plate before setting the zero position.

- ① Home(Initial position) :
Initialize the zero setting value.
The build plate moves to the 0 position.



Step2

Zero Position Setting

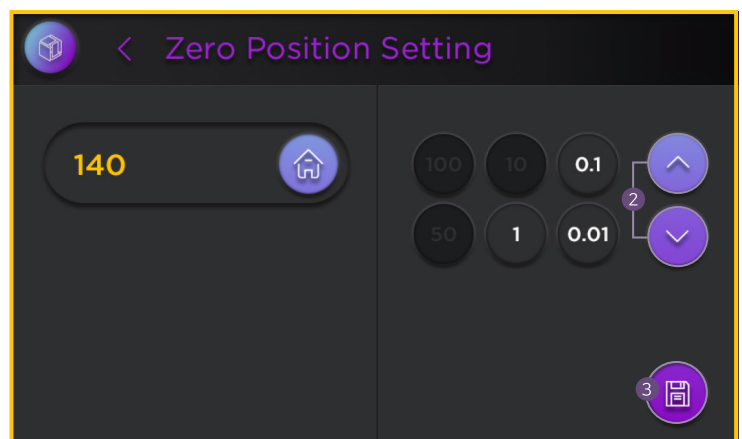
Set the zero position.
It can be set from 0 to 145.
After setting, click the Save button to save.

*** If set to 140 or higher, there is a risk of damage to the glass of the printer.**

- ② Up and down adjustment button :
The printing plate is moved up and down by the set value.

*** When set to 140 or higher, the 100, 50, and 10 buttons are disabled.**

- ③ Save :
The set value is saved as the build plate's zero position (output start position).



Printer Management

Administrator Mode



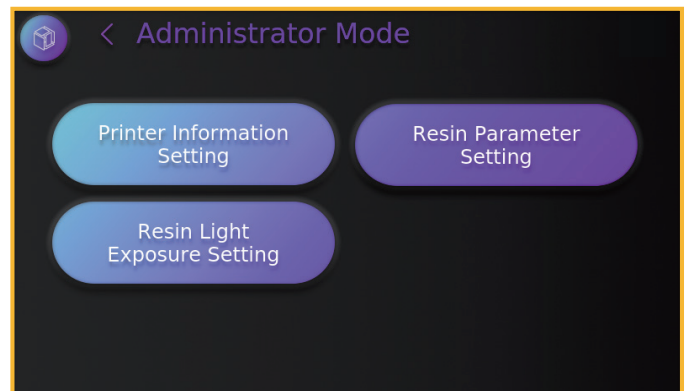
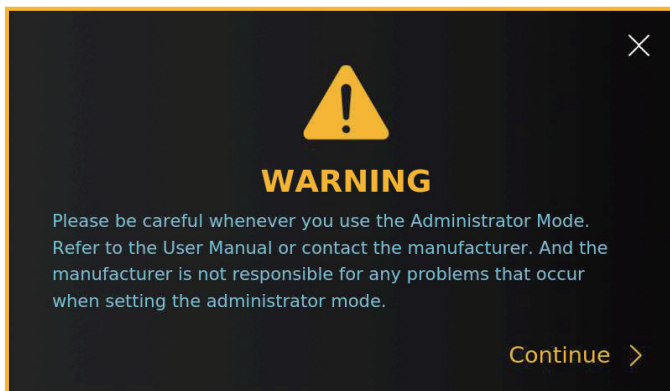
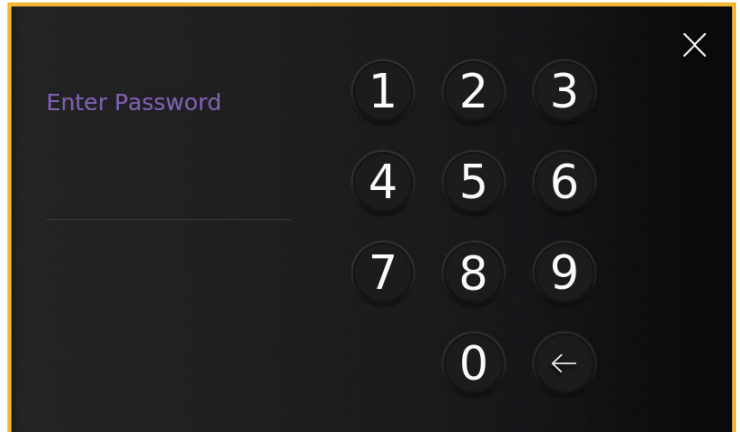
Please be careful whenever you use the Administrator Mode.

Refer to the AGENCY Manual or contact Carima Co., Ltd..

Carima Co., Ltd. is not responsible for any problems that occur when setting the administrator mode.

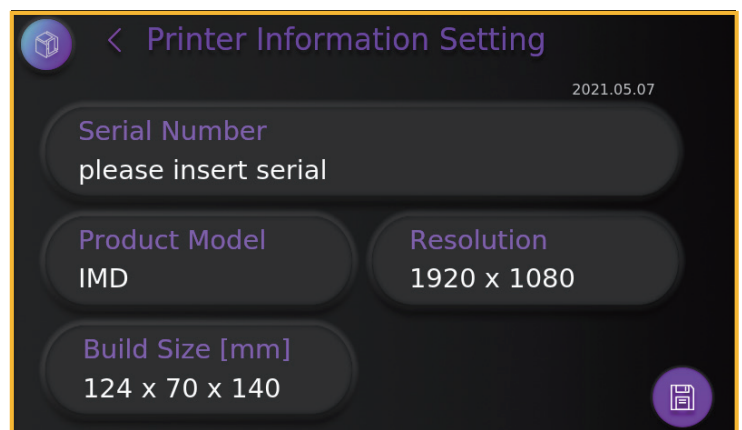
◦ Enter Password

Enter password to enter the Administrator Mode (**028877**)



◦ Printer Information Setting

Check or change the Printer's name, Resolution, Serial number, and Build size.



Printer Management

Resin Parameter Setting

Step1

Select Resin

Select the resin to set parameters.
You can delete, reset and add resins on the current page.

① Delete

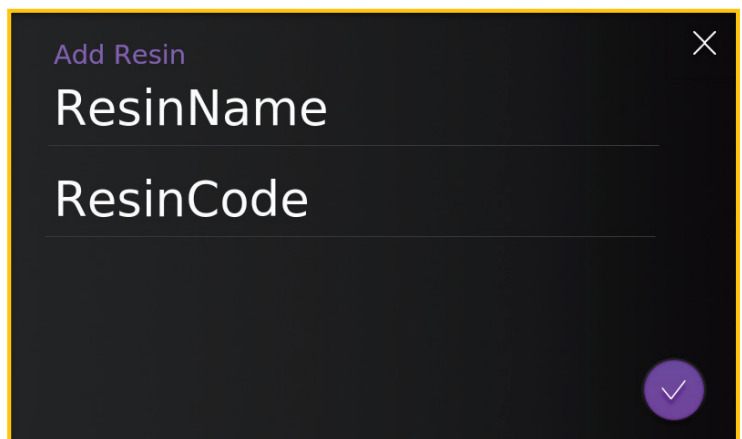
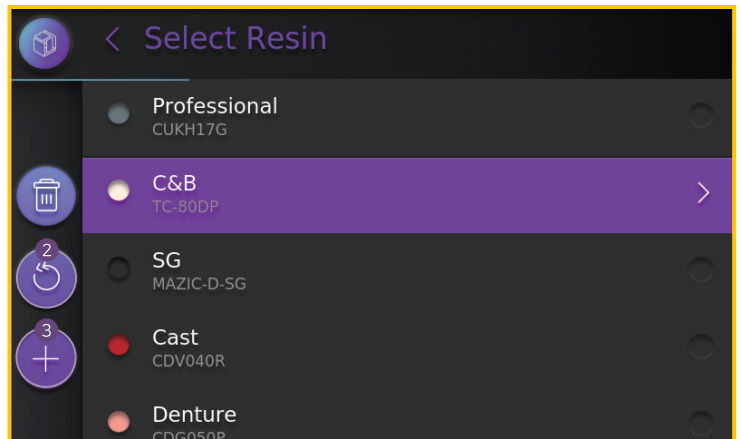
Select the resin, and click 'Delete' button to delete.

② Reset

Reset the resin list.

③ Add Resin

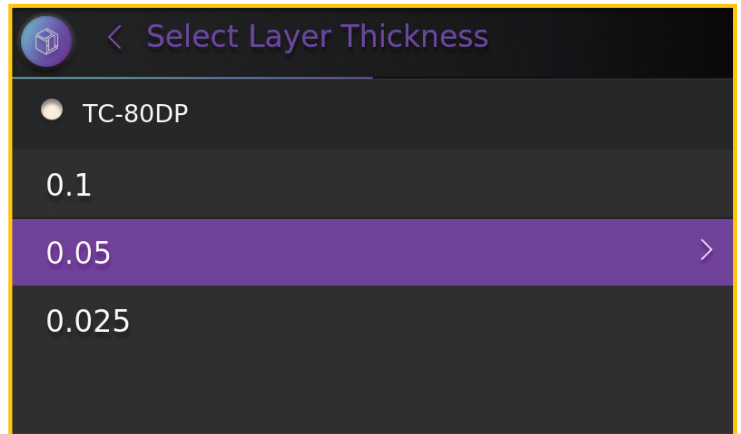
Add the resin.



Step2

Select Layer Thickness

Select the layer thickness to move to the next step.



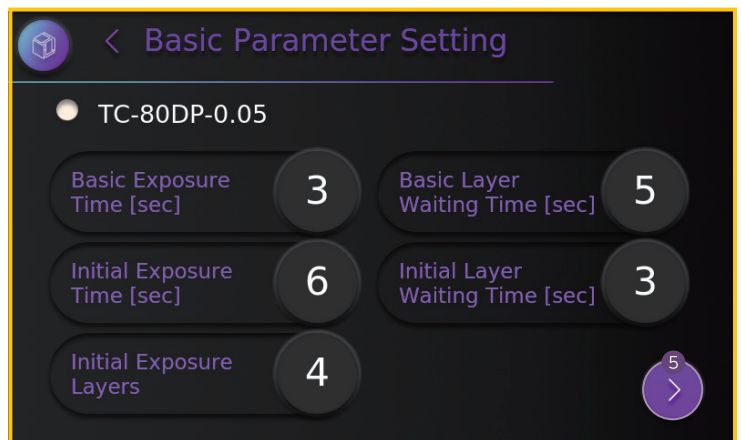
Step3

Basic Parameter Setting

Check the selected resin and layer thickness, and set basic parameters.

When the setting is complete, click the 'Next' button to move to the next page.

⑤ NEXT



Step3

Build Plate Parameter Setting

Set the Build-plate parameters. After setting, click the 'Confirm' button to complete the resin parameter setting. After then, move to Step1 (Select Resin) page to change other resin parameter setting.

⑥ Confirm



Printer Management

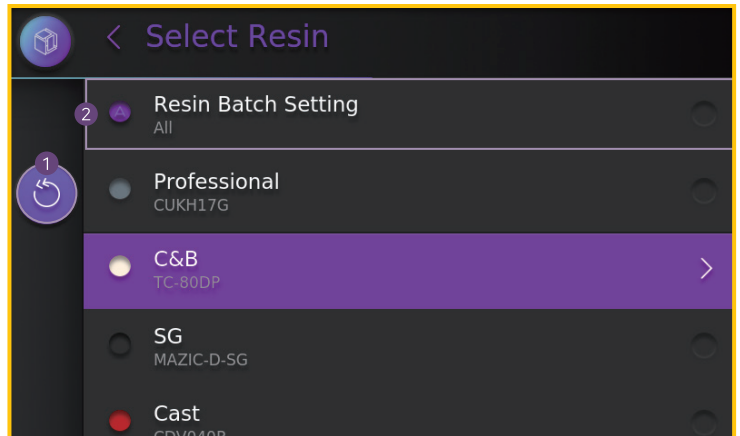
Resin Light Exposure Setting

Step1

Select Resin

Select the resin to change the light exposure setting.

- ① **Reset :**
Reset the light exposure settings of all resins.
- ② **Resin Batch Setting :**
Apply the same amount of light exposure to all resins.

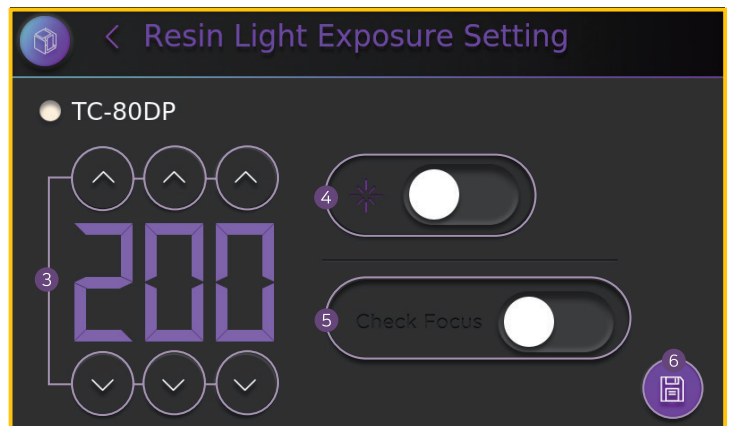


Step2

Light Exposure Setting

Select the amount of light.
Click the 'Confirm' button to complete after setting.

- ③ **Up/Down button :**
Set the amount of light exposure.
- ④ **Light Uniformity Calibration Image :**
You can check whether the light is irradi-ated evenly or not.
- ⑤ **Focusing Image :**
You can check whether the light source is in focus or not.
- ⑥ **Confirm**



Finishing Prints

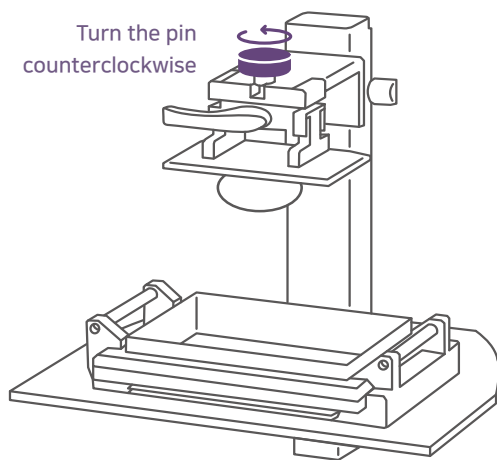
- Once the print is completed, remove the output from the build plate.
Wear nitrile gloves when removing the output.

Demounting

When the output is complete, remove the output from the build plate.

01

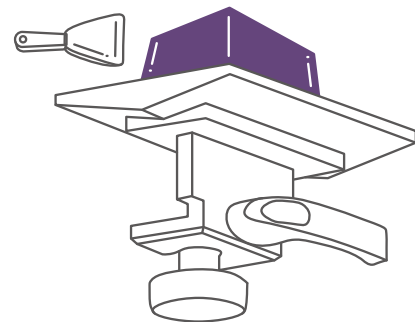
Separation



Once the print is completed, the plate moves up. Rotate the build plate fixing pin counterclockwise to remove the build plate.

02

Demounting



Remove the build plate upside down, to prevent the remaining resin from falling. To prevent damages, carefully use the scraper provided to remove the output.

*** Be careful when using the cutter and scraper.**

POST-PROCESSING

After removing the output, post-processing such as washing, drying, removing the supporters and curing has to take place. Wear nitrile gloves and remove the prints.

01

Washing

- The resin remains when the output is completed. The remaining resin can be cleaned with alcohol(IPA, 95% or higher). The higher the alcohol concentration, better the wash.
- * Washing can be done through soaking the outprint in alcohol or by using a sprayer with alcohol. Be aware, for the output should not be in alcohol for more than an hour.**
- For detailed wash, use thin brush to remove resins.
- Use eco-friendly detergent or water when using Carima's Nontoxic resin(CMYK/W).
- * Use protective equipment when using toxic alcohol(IPA).**

02

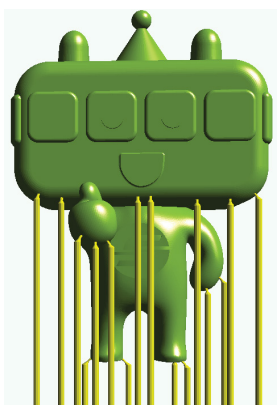
Drying

After cleaning with alcohol, dry the output with an air compressor or let it dry naturally.

- * The air compressor is not sold in Carima.
- * Take caution while using the air compressor, for it may damage the output.

03

Removing supporters



◀ Character "Ttota"
Source : Seoul Metro



Remove the supporter by hand from the plate after post-processing.

If cured without removing the supporters, use the nipper to remove it.

04

Polishing

If parts of supporters remain on the output after removing it off, you may use sandpaper to smoothen the surface.

05

Curing

- * Do not look directly into the UV when using the UV curing. Wear glasses or goggles to protect your eyes.

Be aware, for excessive curing affects the output.

- * The type of curing machine and time may affect the curing process.

Curing frequently and multiple times will reduce the transformation of output than curing long period of time at one session.

CARIMA CURING MACHINE CL300pro



Lamp

UV LED 300W
(Adjust Steps 1 - 20)
Recommend to use step 12-15



Product Size (mm)

External	Internal
283	Ø150
X	X
283	110
X	(Full base 125x110)
337	



Cooling System

Air Cooling



Power

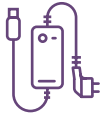
AC110-220V 50 / 60Hz, 5A

Maintenance

- To use the printer for a long time, be informed on maintenance and FAQs.

Maintaining the Printer

To use the printer for a long time, it is important to keep the printer in a good condition.



- If the printer is not in use for a long period of time, unplug it and store it in a shady area.



- If the resin leaks into the printer, wipe it with alcohol.



- **If the engine lens is damaged, it can adversely affect the print quality. Contact Carima for technical help.**

Maintaining Other Accessories

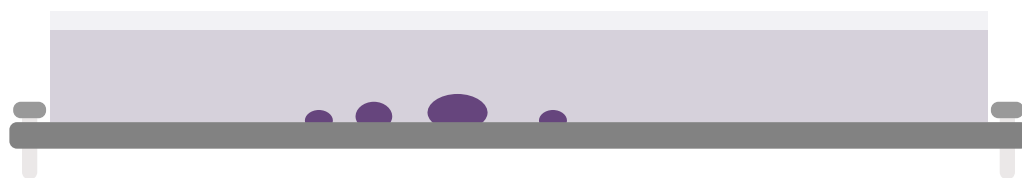
Basic printer accessories include resin vat and resin.

01 Managing the Resin Vat

To remove the leftover resin and/or to use other resin type, completely remove the resin from the vat with the provided syringe. Then wipe the vat with alcohol.

We recommend using individual vats for each type of resin. Due to material properties, the resins are hard to remove completely. If different types of resin mix together, the print quality may be affected.

If residue remains on the resin vat



- Wear nitrile gloves and remove the residue by hands.
When using the scraper to remove the residue, be careful to not damage the FEP film.
(We do not recommend using the scraper directly on the FEP film.)
- Use the 'Exposure light for cleaning' function (Preference>Printer Setting / Manual page 10) to remove residue.

02 Maintaining the Resin

- Resins are vulnerable to sunlight and other lights. Store it in a shady place to use the printer for a long time.
- Do not mix different types of resin.

*** Be aware of resin getting into your eyes for the resin is composed of chemical.**

- To store the leftover resin, take the the resin-filled vat out from the printer and use the resin bottle or light-blocking item such as foil to store in it.

*** The resin has chemical odor which may affect your respiratory. Always use goggle or sunglasses, mask and gloves for protection.**

*** Do not mix different types of resin when storing the resin back into the bottle.**

03 Disposing of Resin

Types of General Waste

Household chemicals such as used soaps, detergents, etc.

Solid wastes that have been printed

Chemical-free tissue and paper

- Disposal of Waste

If you have a purification device, dispose in it, otherwise, it should be entrusted to the waste disposal company.

- Disposal of Output

If it corresponds to general waste, it is treated as general waste without being entrusted to the waste disposal company.

- **⚠ Disposal of Hazardous Waste ⚠**

Must be entrusted to waste disposal company.

04 IMD Tool Set

IMD Tool Set will be available when IMD is purchased. These set of tools will be useful when using the printer.

Contact Carima for additional purchase of IMD Tool Set.



Power Adapter



Power cord (220/110V)



VAT



Funnel



Silicone scraper



Scraper



Brush



Nipper



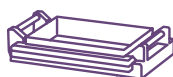
Gap gauge



Hex wrench



USB



Tray



Syringe



Nitrile gloves

***Components and tools may be changed or replaced by other items.**

FAQ Most asked questions while using Carima's printer.

Q. **The engine won't turn on.**

A. Turn off the power and then turn down the switch located at the back. Wait for at least 1-3 minutes and then turn it on again. If the power does not turn on, contact Carima.

Q. **How much resin do I need?**

A. Pour as much resin as necessary every time you use the printer. Filling the vat with 1/3 of resin will be sufficient.

Q. **The printer is not printing.**

A. Check if the engine light is on and set the exposure time again. If it doesn't print, contact Carima.

Q. **How long can I store the resin?**

A. After opening the resin, the warranty period is up to 6 months. Keep the resin away from light exposure, as it can cure when exposed to it.

Q. **If the output falls while printing, what do I do?**

A. Stop the operation and turn off the engine, take out the vat and filter out the residue. Take caution when taking it out, for the resin on the build plate may fall on the engine.

Q. **The slicing file I've uploaded has a different resolution.**

A. If the resolution of the device is not correct, it will not print. Be sure to check the resolution and build size of the device in 'configuration' before slicing.

Q. **How do I clean the vat?**

A. Check for residue in the vat. To remove the leftover residue, filter out the resin in the vat separately through the funnel and the sieve net. Lightly wipe the resin inside the vat with tissue paper and alcohol. Make sure that the resin and alcohol do not get into the vat's gap.

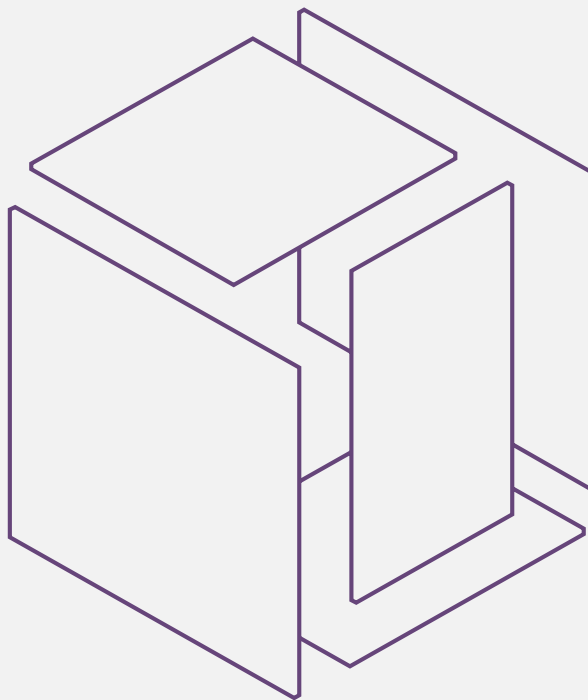
*** You can also use the 'Exposure light for cleaning' to remove residue.**

Q. **How do I manage the printer when it is not in use?**

A. The resin vat of an unused printer should be emptied and cleaned with alcohol. Unplug the printer and store it in a shady area, away from rain, wind and sunlight.

Q. **What is the difference between "crv" and "stl" files?**

A. The crv file is the default file by carima slicer. Supporter and models are recognized separately and stored so that they can be modified at any time when the supporter work is completed and saved. In the case of the stl file, supporters are saved as one mass with the model and cannot be modified after saving.



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Products and other inquiries

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