

# UVCS V3.0 LED

Light-Curing Conveyor User Guide REV 1.0





YMAX UVCS V3.0 LED Conveyor System

# About Dymax

# UV/Visible light-curable adhesives. Systems for light curing, fluid dispensing, and fluid packaging.

Dymax manufactures industrial, light-curable, epoxy, and activator-cured adhesives. We also manufacture a complete line of manual fluid dispensing systems, automatic fluid dispensing systems, and light-curing systems. Light-curing systems include LED light sources, spot, flood, and conveyor systems designed for compatibility and high performance with Dymax adhesives.

Dymax adhesives and light-curing systems optimize the speed of automated assembly, allow for 100% in-line inspection, and increase throughput. System designs enable stand-alone configuration or integration into your existing assembly line.

Please note that most dispensing and curing system applications are unique. Dymax does not warrant the fitness of the product for the intended application. Any warranty applicable to the product, its application, and use is strictly limited to that contained in the Dymax standard Conditions of Sale. Dymax recommends that any intended application be evaluated and tested by the user to ensure that desired performance criteria are satisfied. Dymax is willing to assist users in their performance testing and evaluation by offering equipment trial rental and leasing programs to assist in such testing and evaluations. Data sheets are available for valve controllers or pressure pots upon request.

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# Introduction

This guide describes how to set up, use, and maintain the UVCS V3.0 LED system safely and efficiently. Before using this product, please be sure to read the instruction manual carefully and ensure it properly.

#### **Intended Audience**

This user guide is meant for experienced process engineers, technicians, and manufacturing personnel. If you are new to high-intensity LED light sources and do not understand the instructions, contact Dymax Application Engineering for answers to your questions before using the equipment.

## Where to Get Help

Dymax Customer Support and Application Engineering teams are available by phone and email in the United States, Monday through Friday, from 8:00 a.m. to 5:30 p.m. Eastern Standard Time, and in Germany, Monday through Friday, from 8:00 a.m. to 5:00 p.m. Central European Time. You can also email Dymax at info@dymax.com or Dymax Europe GmBH at info\_de@dymax.com. Contact information for additional Dymax locations can be found on the back cover of this user guide.

Additional resources are available to ensure a trouble-free experience with our products:

- Detailed product information on our website <u>www.dymax.com</u> & <u>www.dymax.de</u>
- Dymax adhesive product data sheets on our website
- Safety data sheets (SDS) provided with shipments of Dymax materials

# Safety

WARNING! If you use this UV light source without first reading and understanding the information in the UV Light Safety Guide, SAF001, injury can result from exposure to high-intensity light. To reduce the risk of injury, please read and ensure you understand the information in that guide before assembling and operating the Dymax UV LED light source.

This device falls under IEC 62471 Risk Group 3 for UVA and Blue Light emissions:

**WARNING!** UV emitted from this product. Avoid eye and skin exposure to unshielded products.

**WARNING!** Possibly hazardous optical radiation emitted from this product. Do not look at operating lamp. Eye injury may result.

# **Product Overview**

The UVCS V3.0 LED is a modernized conveyor platform designed to operate with Dymax's latest high-power LED flood emitters. It combines a new industrial design with the latest features in curing system technology, providing ease of use and the highest quality of life for operators.

Each facet of the design was curated to maximize and enhance operations. It improves monitoring and facilitates control of the curing process directly from the conveyor by incorporating speed control, automatic part sensing, and control of the installed emitters. Additionally, the UVCS V3.0 LED was carefully developed for easy integration into larger manufacturing systems and processes.

The UVCS V3.0 is ideally suited for a number of applications in the medical, consumer electronics, automotive, aerospace and defense, optical, and appliance industries. It is the ideal solution for LED curing in high throughput manufacturing processes.

# Unpacking

## Unpacking and Inspecting Your Shipment

Upon arrival, inspect all boxes for damage and notify the shipper of box damage immediately. Open each box and check for equipment damage. If parts are damaged, notify the shipper and submit a claim for the damaged parts. Contact Dymax so that new parts can be shipped to you immediately.

The parts below are included in every package/order. If parts are missing from your order, contact your local Dymax representative or Dymax Customer Support to resolve the problem.

**Note:** After inspecting the package, use a socket tool to remove the screws around and above the wooden package. The screws are reusable. It is necessary to install the Alarm Lamp on the conveyor according to the figure. If the exhaust pipe is to be installed, install it to the outlet of the exhaust fan according to the figure, and secure it with four screws.

## Parts Included

- UVCS V3.0 Conveyor (Base)
   PN: 88870 UVCS V3.0 BELT 220V
   PN: 88871 UVCS V3.0 BELT 110V
   PN: 88878 UVCS V3.0 EDGE 220V
   PN: 88879 UVCS V3.0 EDGE 110V
- Cradle (mounted in unit, included in sales PN)
   PN: 80021 FX1250 CRADLE, HA, UVCS V3.0
   PN: 80022 FX1250 CRADLE, VA, UVCS V3.0
- Power Cord

PN: 84301 AC CORD, CN PLUG, UVCS PN: 84302 AC CORD, NA PLUG, UVCS PN: 84303 AC CORD, EU PLUG, UVCS PN: 84304 AC CORD, UK PLUG, UVCS

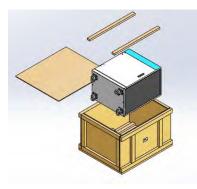
• Exhaust Pipe

PN: 82131 PIPE, EXHAUST PN: 83864 GB/T 818 M4×6

- UVCS V3.0 LED Conveyor System User Guide
   PN: 87072 USER MANUAL, UVCS V3.0
- UV GOGGLES PN: 84126 UV GOGGLES

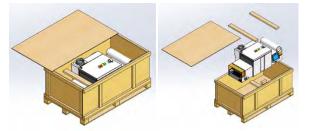
#### Figure 2.

Cabinet Accessory Packaging (PN: 80020); Sold Separately

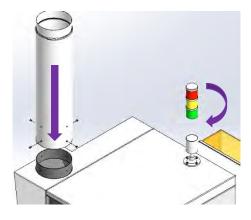


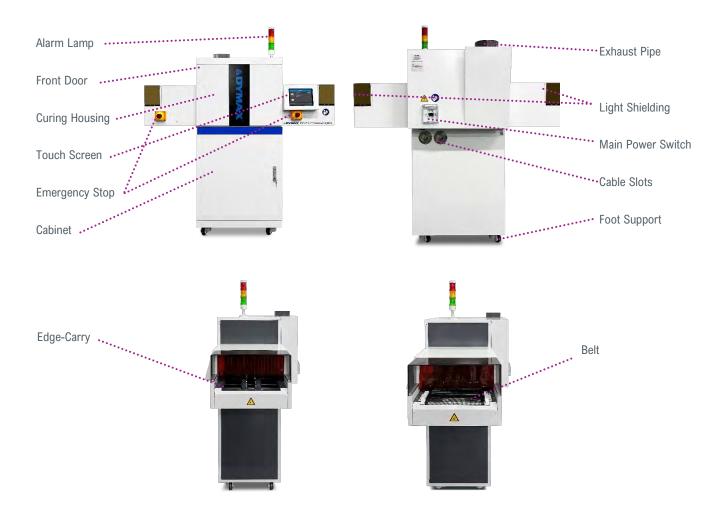
USER GUIDE | UVCS V3.0 LED

Figure 1. UVCS V3.0 LED Conveyor Packaging



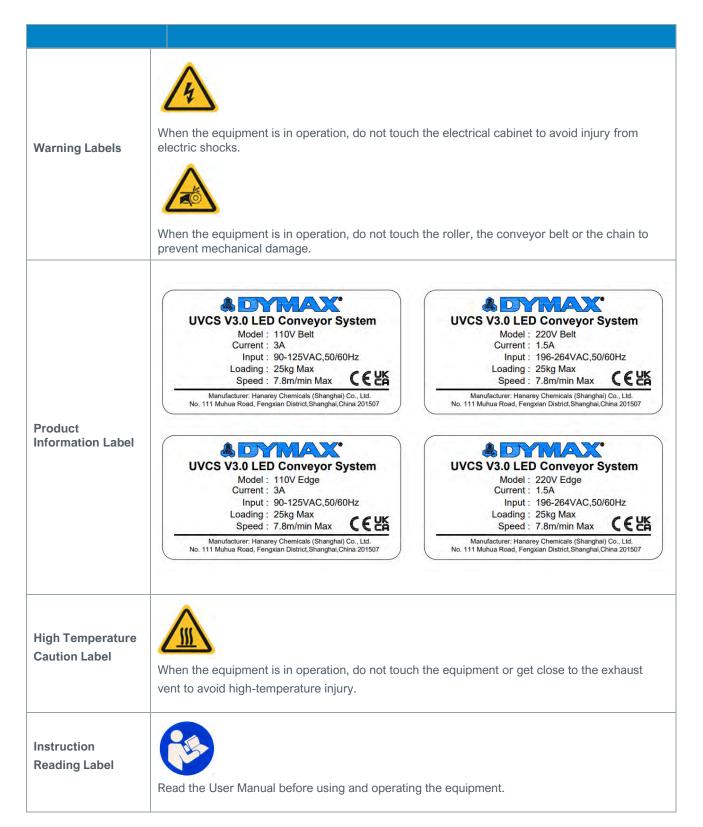
Install the Exhaust Pipe and the Alarm Lamp



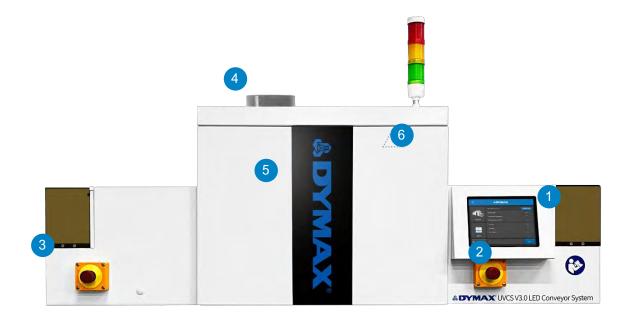


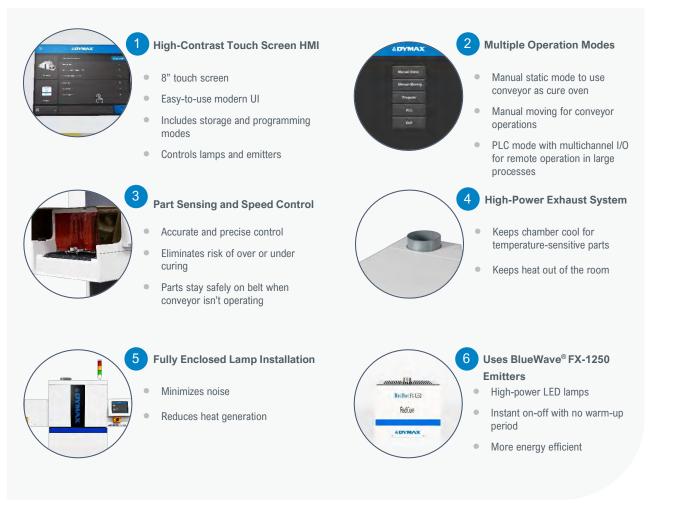
## **Conveyor Main Components**

- Touch Screen: 8" HMI touch screen
- Curing Housing: Includes adjustable lamp bracket and thermal exhaust system
- Front Door: Provides access to emitter cradle. Logo illuminates when emitter is on
- **Emergency Stops:** Press down any one of the Emergency Stop in case of emergency to power off the conveyor. Rotate clockwise to reset and power on
- Light Shielding: Removable shielding for UV-light
- Belt: UV-resistant belt; belt speed is adjustable from 0.4~7.8m/min
- Edge-Carry: Edge-width can be adjusted from 38mm (1.5 inches) to 255 mm (10 inches)
- Cabinet: Purchasable accessory used to mount conveyor and to store controller inside
- **Exhaust Pipe:** Exhausts thermal air from curing housing inside; diameter = 150 mm (6 inches)
- Alarm Lamp: A green light means the conveyor is working normally; a red light is accompanied by an alarm sound and indicates a conveyor breakdown; a yellow light means the conveyor is in waiting state.



# System Features & Benefits





# System Installation

## Assemble the Conveyor and Cabinet Together

- 1) Raise the foot supports by rotating them and placing the rollers on the ground for easy movement. (Figure 3.)
- Lift the conveyor onto the cabinet by inserting the 4 rubber bumpers into the holes on the top of cabinet. (Figure 4.)

Note: After assembly, complete the ground connection according to Figure 33.

- 3) When the conveyor is being moved or assembled, the position of the load on the equipment is shown in (Figure 6.).
- 4) Insert the communication/power/drive cord into cabinet thread holes. (Figure 5.)
- 5) Revise the height level by adjusting the bottom foot supports.

### Figure 3.

Raise the Foot Support



Figure 4.

Insert 4 Bumpers of the Conveyor into the Top of the Cabinet

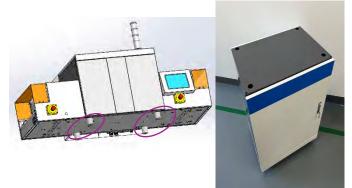


Figure 5. Cable Slots on Cabinet

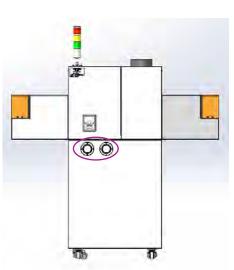
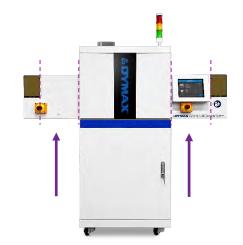


Figure 6. Load Position



# **Input Power**

The input power of the conveyor is shown in the following table. (Table 2)

| Table 2. |
|----------|
|          |

| Voltage Range | Max Current | Input Power Frequency |
|---------------|-------------|-----------------------|
| AC 90~125V    | 3A          | 50/60HZ               |
| AC 196~264V   | 1.5A        | 50/60HZ               |

**Note:** The curing units and the conveyor unit have separate electrical circuits. Before commissioning, make sure that your main connection is designed for the maximum power requirement of the conveyor. Connect all power cords directly and do not use external power strips. When using a conveyor with two curing systems, be sure to plug the second unit into a separately fused outlet to prevent circuit overload.

## **Belt Tracking Adjustment**

The conveyor is factory adjusted to provide proper tracking of the belt. If further adjustments are necessary:

### Figure 7.

White Rubber Hole Plug on the Sealing Plate



Figure 9. The Belt or Edge Positive Direction



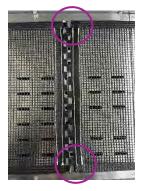
## Figure 8.

Tension Screws at the Input End Side



### Figure 10.

Remove or Coat the Quick Drying Glue at Both Ends of the Shaft of the Belt Joint



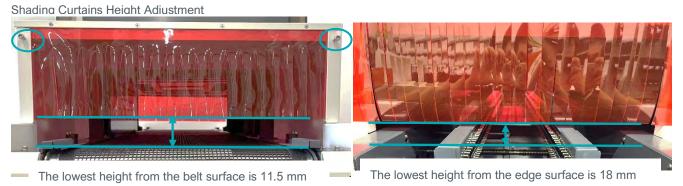
- 1) Remove the white rubber hole plug from the sealing plate on the left side of the conveyor. (Figure 7.)
- 2) There are two tension screws located at the input end of the conveyor. To adjust tracking, simply tighten the side to which the belt is tracking through the hole (Figure 8.)

**Note:** When changing the direction of rotation for the belt conveyor, the position of the belt must be adjusted to prevent the belt deviation. When the user faces the conveyor screen, the clockwise rotation of the belt or edge defaults to the positive direction. (Figure 8.) When the belt needs to be removed or installed, the quick drying glue at both ends of the shaft of the belt joint needs to be removed or coated. (Figure 10.)

# Shading Curtain Height Adjustment

The height of the shading curtains can be adjusted by loosening two screws as shown. (Figure 11.) The lowest height of the shading curtain from the belt surface is 11.5 mm and from the edge surface is 18mm. The shading curtains are designed to protect the operators from UV, so it is suggested to not remove the curtain, or raise it too high to block UV light.

#### Figure 11.

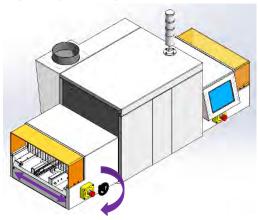


## Edge-Carry Width Adjustment

The width of the Edge-Carry conveyor can be adjusted from the front side through the handwheel. The adjustment range is from 38 mm to 255 mm, the width is reduced by clockwise rotation and is increased by counterclockwise rotation. (Figure 12.)

### Figure 12.

Edge-Carry Width Adjustment

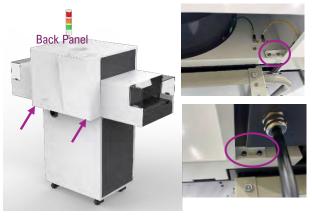


## Adding the Emitters and Controllers to the Conveyor

- Remove the back panel (Figure 13. Figure 15.) and the upper cover of the conveyor, (Figure 16.) install the support modules and the brace hook (Figure 17.). Adjust the emitter cradle height using the four locking handles (Figure 18.). The lowest height is 12 mm from the emitter cradle's bottom to the belt surface.
- 2) Put the four screws on the emitter holder into the four round holes on the cradle. The slotted side of the light frame should face the exhaust fan. (Figure 19.)
- Place the emitters on the cradle. (Figure 20.) The arrangements of the emitters are shown (Figure 21.) (Figure 22.). For 1x1, 1x2 horizontal, and 2x1 vertical configurations, it is advised to place the emitters on the side closest to the exhaust fan.
- 4) Complete wiring as required. (Figure 23. Figure 27.)
- 5) When adding the controllers to the cabinet, open the front door of the cabinet as shown (Figure 28.).

Note: When adjusting the curing height, the cradle and emitters should be removed from the bracket first.

### Figure 13. Loosen Four Screws Under the Back Panel



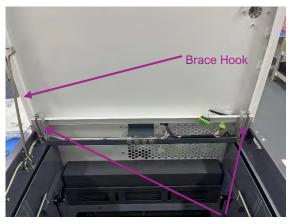
# **Figure 14.** Remove the Grounding Wire inside the Back Panel at the Position as Shown



Figure 15. Remove the Back Panel



Figure 17. Install the Support Modules and the Brace Hook



Support Modules

**Figure 16.** Open the Upper Cover



Figure 18. Four Locking Handles

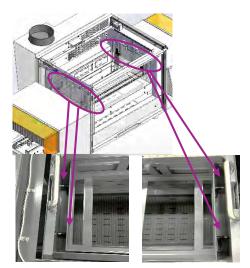
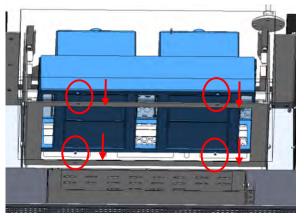


Figure 19. Four Screws on Lamp Holder



**Figure 20.** Place the Emitters on a Cradle

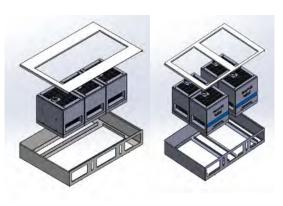
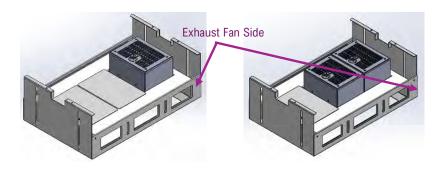
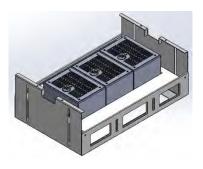


Figure 21. Horizontal Configuration PN:80021



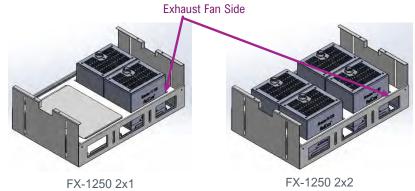


FX-1250 1 x1

FX-1250 1 x 2

FX-1250 1 x 3





## Figure 23.

Loosen the Screws, remove the Wire Pressing Plate



**Figure 25.** Install Connector on the Emitter Connection Port



#### Figure 24.

Cable Connector goes through the Wire Slot



Figure 26. Install the Wire Pressing Plate, and add the Screws

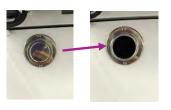


#### Figure 27.

Install Connector and Network Wire on the Controller Connection Port



Remove the lids of the Cable Slots



The Connector and the Network Wire go through the Cable Slots



Install Connector and Network Wire on the Controller Connection





## Figure 28.

Open the Front Door of the Cabinet

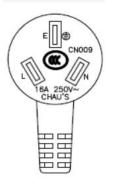


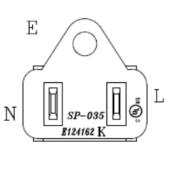
# Wiring and Connections

1) The conveyor will be provided with a region-specific 220VAC/110VAC power plug, as shown in Figure 29., Figure 30.,

Figure 31., Figure 32.

**Figure 29.** Power Cord with TYPE-I CN Plug Figure 30. Power Cord with TYPE-B NA Plug





**Figure 31.** Power Cord with TYPE-F EU Plug

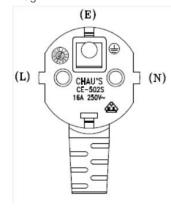
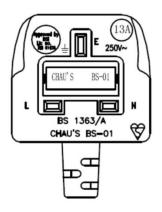


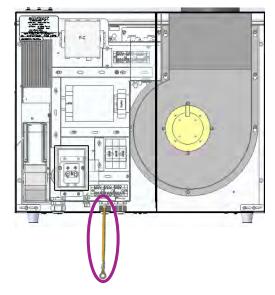
Figure 32. Power Cord with TYPE-G UK Plug



The conveyor may be grounded by using the reserve grounding wire. (Figure 33.)
 If the cabinet is in use, the grounding wire can be connected to the grounding column in the cabinet. (Figure 34.)

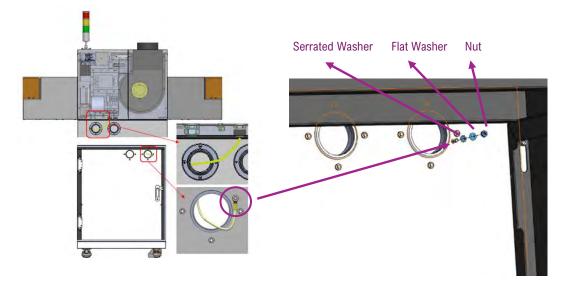
## Figure 33.

Grounding Wire



### Figure 34.

Grounding Wire Connected to the Cabinet with Serrated Washer, Flat Washer and Nut as Shown



 If you need to use the FX-1250 controller, please connect the network cable from the conveyor to the controller (Figure 35.) and plug the connection cable into the emitter: Roll the plug clockwise while inserting to plug the cable in. Roll the plug counterclockwise while removing to unplug the cable (Refer to BlueWave® FX-1250 user guide) (Figure 36.).

#### Figure 35. Network Cable



### Figure 36.

Plugging Connection Cable into Controller



#### Plugging Connection Cable into Emitter



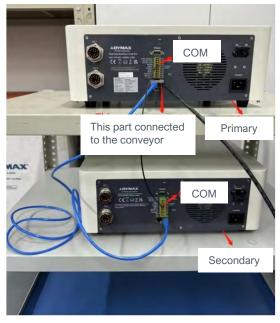
4) If using 2x FX-1250 controllers, please connect the network cable from the conveyor to the RJ45 socket interface on the right side of the primary controller (Figure 37.) and connect the primary controller to the secondary controller with the other network cable (Figure 37.), and connect the COM terminal of the PLC interface between the primary and secondary controllers (Figure 37.). And plug the connection cables into the emitters. (Refer to BlueWave® FX-1250 user guide).

Note: If your FX-1250 version is lower than V3.23.11, contact Dymax for software upgrades to ensure full functionality is achieved.

## Figure 37.

#### Figure 38.

Network Cable from the Primary to the Secondary Controller



| ID for Multidevic | ce Set: (Range: 0 -10) |  |
|-------------------|------------------------|--|
|                   |                        |  |
| 0                 |                        |  |

| 0    | Default. Single device        |
|------|-------------------------------|
| 1    | Primary-Conveyor              |
| 2-10 | Secondary in multidevice net. |

| <                               |         | & DYM        | AX           | 14-11<br>2021/1/13 |
|---------------------------------|---------|--------------|--------------|--------------------|
| Brightness                      | 80      |              | Time         | Setting Date       |
| Language                        | English | •            | ID.          | 2                  |
| Emitter 1 : Re                  | diQure  | LED On Time  | :0,1h        | RESET              |
| Emitter 2 Re                    | diCure  | LED On Time  | :0.1h        | RESET              |
| .CD Version:<br>Firmware Versio |         |              | -            |                    |
|                                 |         | SYSTEM RESET | CHANGE PASSW | ARE SYSTEM LOG     |

# Turn On

Turn on the main switch of the equipment to supply power for the conveyor. The following (Figure 39.) shows the main switch of the conveyor.

### Figure 39.

Power Supply Switch



**Note:** The cover of the power switch is made of plastic. Pay attention to protect it during use or transportation to prevent damage.

# **Emergency Stop**

In case of an emergency requiring an immediate shutdown, press one of the emergency stop buttons while the conveyor is in operation. This action will halt the motor and the exhaust fan of the conveyor and emitters, while simultaneously activating the alarm. The operator needs to check the alarm logs of the conveyor and emitter and take corresponding measurements. The following Figure 40. shows the emergency stop buttons.

## Figure 40.

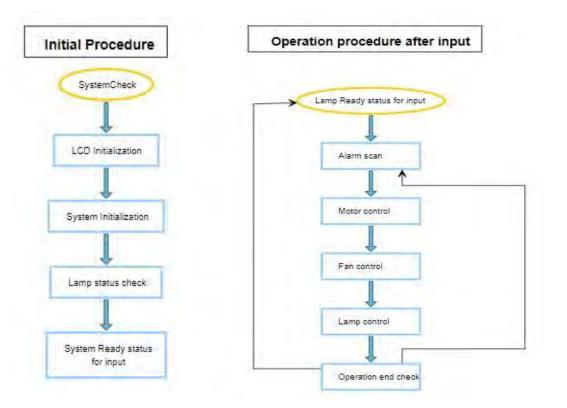
**Emergency Stop Buttons** 



Note: When any alarm occurs in the conveyor system, the emergency stop button must be pressed first.

# Operation

# System Flow Chart



# Start Up

- Verify all connectors are firmly plugged into the rear panel of the controller and emitter.
- On the rear panel of the controller, move the power switch to the ON position (up direction).
- The start-up window (Figure 41.) will appear for several seconds as the system initializes.
- 4) After starting up, the main window appears.
- 5) **WARNING!** Emitters must be installed correctly before powering up. If no emitter is installed, the controller is not operable. Power off the controller and install at least one emitter.
- 6) The system is now ready to have emitter parameters set.
- 7) Firmware version: check in the HMI system LCD version: check in the HMI system

Figure 41. Start-Up Window



# System Settings

Press the system setting button on the Main Window. A password input window (Figure 42.) will appear. The password must be entered to enter the System Settings window.

Press the bar beside the lock on the password input window to activate the keyboard. (Figure 43) The default password is set to "1234". Press CONFIRM to proceed to the next window.

#### Figure 42.



## Figure 43.

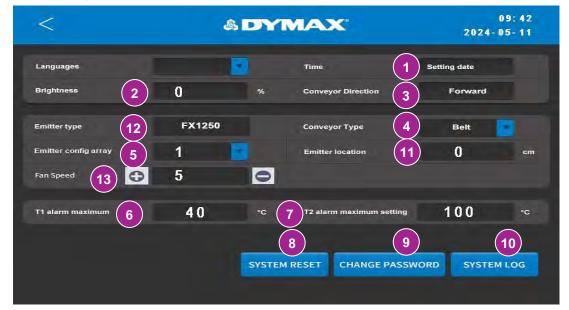
Keypad for Password Window



Once the password is entered, the System Settings window (Figure 44.) appears.

### Figure 44.

System Settings Window



#### Table 3.

System Settings Window Functions

| Number | Name                         | ICON                 | Description  |
|--------|------------------------------|----------------------|--|
| 1      | Calendar and RTC             | Setting date         | Set calendar and RTC time                            |
| 2      | Brightness                   | Brightness           | Set the LCD brightness                               |
| 3      | Conveyor Direction           | Conveyor Direction   | Set the direction of belt movement                   |
| 4      | Conveyor type                | Conveyor Type        | Select the belt type or chain type of the conveyor   |
| 5      | Emitter config array         | Emitter config array | Select the emitter array type                        |
| 6      | T1 alarm maximum temperature | TI alarm maximum     | Displays the value for the maximum temperature of T1 |

| 7  | T2 alarm maximum temperature Setting | T2 alarm maximum setting | Set the value for the maximum temperature of T2 $(100 - 150 \text{ °C})$ |
|----|--------------------------------------|--------------------------|--|
| 8  | System reset Button                  | SYSTEM RESET             | Reset the important data in the system                                   |
| 9  | Change password Button               | CHANGE PASSWORD          | Reset the password of the system   |
| 10 | System log                           | SYSTEM LOG               | Look up the alarm log  |
| 11 | Emitter location                     | Emiliar location         | Add the distance from the LED array center in conveyor direction         |
| 12 | Emitter type                         | Emitter type             | Display the Lamp type  |
| 13 | Exhaust Fan Speed                    | Fan Speed                | Set fan speed level from 1 to 5  |

#### Recommended Fan Speed

| T2 (°C) Alarm Setting      | Emitter Configuration |              |           |           |          |
|----------------------------|-----------------------|--------------|-----------|-----------|----------|
|                            | 1x1                   | 2x1          | 1x2       | 1x3       | 2x2      |
| 40 °C                      | 3                     | 4            | 4         | NA        | NA       |
| 50 °C                      | 2                     | 3            | 3         | 4         | NA       |
| 60 °C                      | 2                     | 3            | 3         | 4         | 4        |
| 70 °C                      | 2                     | 3            | 3         | 4         | 4        |
| 80 °C                      | 2                     | 3            | 3         | 4         | 4        |
| 90 °C                      | 2                     | 3            | 3         | 4         | 4        |
| 100 °C                     | 2                     | 3            | 3         | 4         | 4        |
| 110 °C                     | 2                     | 3            | 3         | 4         | 4        |
| 120 °C                     | 2                     | 3            | 3         | 4         | 4        |
| 130 °C                     | 2                     | 3            | 3         | 4         | 4        |
| 140 °C                     | 2                     | 3            | 3         | 4         | 4        |
| 150 °C                     | 2                     | 3            | 3         | 4         | 4        |
| Noise Level                | 3: 65 dba             | 4: 75 dba    | 4: 74 dba | 4: 73 dba | 4: 73dba |
|                            |                       | Test Conditi | on        |           |          |
| 1. Fan Speed: (1-5)        |                       |              |           |           |          |
| 2. Emitter Height: 25 mm   |                       |              |           |           |          |
| 3. Emitter Intensity: 100% |                       |              |           |           |          |
| 4. Ambient Temperatu       | ıre: 25 °C ± 2        |              |           |           |          |
| 5. Emitter: 365 nm * 4     |                       |              |           |           |          |
|                            |                       | D.           |           |           |          |

6. UVCS V3.0 Belt Speed: 7.8 m/min (Forward)

**Note:** When setting the fan speed, adjust the fan speed based on the actual environment temperature, working distance and intensity setting.

## **Brightness**

### Figure 45.

Brightness Adjustment Bar



- 1) On the system settings window, press on the brightness button.
- 2) Move the bar left to right to adjust the brightness of the screen. The number above the bar displays the brightness value.
- 3) Press the back arrow in the left top corner to exit.

# **Clock and Calendar Settings**

- On the System Settings window, press the Time button. (Figure 44., #1)
- 2) There are 5 values in the Time window
- Y: Year
- M: Month
- D: Day
- H: Hour
- M: Minute
- 1) Press the upper blue line of the middle-row number to increase the value by 1 unit.
- 2) Press the lower blue line of the middle-row number to decrease the value by 1 unit.
- 3) After the time is set, press the CONFIRM button to set time.
- 4) Or press the CANCEL button to exit.

**Note:** Once powered off, the calendar can only be saved for 1 week.

## Input the Password

- Press the bar beside the lock to enter the password.
- Press the CONFIRM button to check. If it is correct, the window proceeds to the next window.
- 3) Press the CANCEL button to exit
- 4) Default password is: 1234

## Changing the Password

- Press the Change Password button on the System Settings window (Figure 44., #9) to enter the Change Password window.
- 2) Press New Password to input the new password. (Figure 47.)
- Press Confirm Password and input the new password again. The two input passwords must be identical.
- 4) Press the CONFIRM button to save the password.
- 5) Press the back arrow in the left top corner to exit.

## System Reset

Press the System Reset button on the System Settings window to:

- Reset the password to the default setting: 1234
- Reset the program names and values to the default settings

### Figure 46.

Clock and Time Input Pad

| 4.0 | 4.4  | 30    | 0      | 0  |
|-----|------|-------|--------|----|
| 19  | 11   |       | 0      | _0 |
| 20  | 12   | 31    | 1      | _1 |
| 21  | 1    | 1     | 2      | 2  |
| Y   | м    | D     | H      | М  |
|     | CANC | EL CI | ONFIRM |    |

# Figure 47.

Change Password Window

|         | åDYMAX'        |
|---------|----------------|
| 187/175 | Input Pass!    |
|         | CANCEL CONFIRM |
|         |                |



# Main Window Settings

In the main window, the operator can:

- 1) Select the conveyor mode.
- 2) Set all emitters' power and cure time.
- 3) Start or stop the conveyor.

## Figure 48.

Main Window

| Ø <b>1</b>    | & DYMAX                        | 2                   |
|---------------|--------------------------------|---------------------|
| 4             | Implementation Parameters      | 3 Parameter Setting |
|               | Conveyor Speed                 | 5 7.0 m/min         |
|               | Curing Chamber Temperature(T1) | 6 23 <sub>°C</sub>  |
| Conveyor      | Belt Surface Temperature(T2)   | 7 24 ·c             |
|               | UV Intensity                   | 8 15 %              |
| and a         | Irradiation Time               | 9 s                 |
|               | VisiCure VisiCure              | 1 VisiCure VisiCure |
| Emitter       | 4.4h 0.4h                      | 1. 2h 1. 2h         |
| Manual Moving | PROCIA                         | M1 15 RUN           |

# Table 4.Main Window Functions

| Number | Name                          | ICON                           | Description   |
|--------|-------------------------------|--------------------------------|---|
| 1      | System Setting                | •                              | Press to enter the system setting window to<br>set the system parameters (clock, calendar,<br>password, brightness, emitter type, emitter<br>location, etc)   |
| 2      | Dymax Logo                    | & DYMAX"                       |   |
| 3      | Parameter Setting             | Parameter Setting.             | <ul> <li>In moving mode, this window can be used to set speed, intensity, cure time, delay time</li> <li>In static mode, intensity, and cure time can be set. The cure time must be larger than 0 in this mode.</li> </ul>  |
|        |                               |                                | In program mode, a slot can be selected for storage and applying programs.  |
| 4      | Conveyor Type                 |                                | Displays the conveyor type icon.  |
| 5      | Conveyor Speed                | Conveyor Speed                 | The wheel speed is measured in meters per minute  |
| 6      | Curing Chamber<br>Temperature | Curing Chamber Temperature(T1) | Displays the curing chamber temperature   |
| 7      | Belt Surface<br>Temperature   | Belt Surface Temperature(T2)   | Displays the surface temperature at the belt  |
| 8      | UV Intensity                  | UV Intensity                   | Displays the intensity of the UV emitter  |
| 9      | Irradiation Time              |                                | Displays the time the emitters will be on in<br>Static mode   |
| 10     | Emitter Type Icon             |                                | Displays the emitter type   |
| 11     | Emitter Type                  | VisiCure                       | Wavelength of connected emitter:<br>PrimeCure (365 nm)<br>VisiCure (385 nm)<br>RediCure (405 nm)  |
| 12     | Emitter Run Hours             | 4.4h                           | Displays the running hours of the emitter   |
| 13     | Mode                          | Manual Moving                  | <ul> <li>Allows selection from three modes:</li> <li>Manual Moving: the belt runs<br/>continuously</li> <li>Static mode: the belt runs in steps of<br/>fixed length</li> <li>Program mode: store and apply<br/>different parameters</li> <li>PLC: enter PLC mode</li> </ul> |
| 14     | Program Name                  | PROGRAM                        | Displays the applied program slot name  |
| 15     | Start/Stop Button             | RUN STOP                       | <ul> <li>Press Run button to start the conveyor</li> <li>Press Stop button to stop the conveyor</li> </ul>  |

*Note:* (For Table 4 Line 14), When starting or stopping the conveyor, you need to hold down the RUN or Stop button for 3 seconds. Before starting the conveyor each time, users need to re-select and confirm the mode.

## Select Conveyor Mode

- Press the Mode button on the main window (Figure 48., #13) to enter the mode selection list.
- 2) Enter the admin password to verify.
- 3) Select a mode on the list to activate that mode (Figure 49.). An animation (below) will appear, then the mode will change.
- 4) Press the button at the end of the list to exit the list.

## Set Moving Mode Parameters

- Access the Mode Selection list from the main window (Figure 48., #13) and set the conveyor mode to Manual Moving (Figure 49.)
- 2) Enter the parameter setting window. (Figure 50.)
- Press the Speed bar to set the belt wheel speed in m/min. (0.4 – 7.8)
- Press the Intensity bar to set the UV power (10%-100%) of all the emitters.
- 5) Press the Wake Interval bar to set the cure time (0-9999 minutes) of the emitters. Enter the desired value using the pad and press enter. The new value will display in the bar.

Lamp Timeout – After the duration? set in this bar, the conveyor shuts down all emitters if there was no trigger during that time.

- Press the APPLY button to update the parameters on this page to the current main window setting and save the setting.
- 7) If no changes are needed, press the back arrow in the left top corner to exit the parameter setting window.

**Note:** In moving mode, the curing emitters work continuously, and the curing time does not need to be set.

**Note:** Place a container at the end of the belt for collecting.

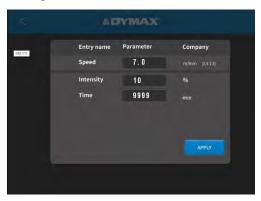
## Figure 49.

Mode Selection List



#### Figure 50.

Moving Mode, Parameters Window



# Set Static Mode Parameters

- Access the Mode Selection list from the main window (Figure 48., #13) and set the conveyor mode to Manual static (Figure 49.)
- 2) Enter the parameter setting window. (Figure 51.)
- 3) Press the Intensity bar to set the UV power (10%-100%) of all the emitters.
- Press the Irradiation Time bar to set the cure time of the emitters. Enter the desired value using the pad and press enter. (0-9999 seconds). The new value will display in the bar.
- Set a value greater than 0s to run the emitter automatically for that duration. (0s is not permitted in this mode)

Cure times can be set in intervals of 1 sec.

5) Press the APPLY button to update the parameters on this page to the current main window setting.

**Note:** In static mode, the next item may be loaded to the belt after the DYMAX LOGO turns on.

**Note:** High ambient temperatures can affect the operation of the FX emitters when operating at high intensities. To avoid high temperature alarms and shutdowns, the following maximum intensity settings are recommended based on the ambient temperature and emitter arrangement:

| Ambient     |      | Emitter | r Arrang | gement |      |
|-------------|------|---------|----------|--------|------|
| Temperature | 1    | 1x2     | 1x3      | 2x1    | 2x2  |
| 25°C        | 100% | 100%    | 100%     | 100%   | 100% |
| 32°C        | 100% | 100%    | 90%      | 100%   | 80%  |
| 40°C        | 80%  | 80%     | 70%      | 80%    | 60%  |

**Note:** If operating at higher ambient temperatures, please refer to the intensity parameters in the table above. Set and test the intensity to meet the usage requirements.

## Setting the Emitter Location

- 1) On the main window (Figure 48.) press the system setting button to enter the system setting window.
- 2) In the system setting window, press the bar beside the emitter config array to select a LED array type (Figure 53.).

In static mode, the conveyor can send the parts to a location defined by this setting. Its value is defined by the distance from the input sensor to the end side of the emitter The value is default according to emitter array in the chamber. The user can adjust the value according to their array.

- **Note:** When the conveyor is in a constant temperature environment of 35 degrees, the default alarm temperature of T1 is 40 degrees. If you have special needs, change the number of emitters or change the ambient temperature or add protection.
- The user can add some distance from the LED array center in the conveyor direction by inputting values in Emitter Location.

## Figure 51.

Static Mode, Parameters Window



### Figure 52. Emitter Config. Array



### Figure 53.



#### Figure 54.



## Speed of Static Mode

- 1) The speed is programed for accurate positioning.
- 2) It is fixed and cannot be changed by the user.

# **Program Settings**

To save the set values in the main window, enter program mode by pressing the Mode Selection list on the main window, then select the Program. It is required to enter the user password correctly before entering the window.

### Figure 55.

Program Window

|                                   | & DY      | MAX             |                                     |
|-----------------------------------|-----------|-----------------|-------------------------------------|
| Progra                            | m Program | Program         | Program                             |
| Progra                            | m Program | Program         | Program                             |
| Progra                            | m Program | Program         | Program                             |
| Progra                            | m Program | Program         | Program                             |
|                                   |           |                 | Apply                               |
| Progran<br>Intensit<br>Irradiatio |           | m1 Open<br>Spee | ating Mode: Moving<br>d: <b>7.0</b> |

There are 16 slots for selection. Their default names are Program # (1-16). Only one slot can be selected at a time.

The operation steps are:

- 1) Press on a program slot. The program slot is marked by a blue check when selected. The parameters stored in that program slot are displayed in the bottom area.
- 2) Press the bar beside the Program Name in the bottom area to rename the slot.
- 3) Press the bar beside the Operating Mode to set the mode. Moving | Static.
- 4) Press the bar beside the Intensity to input the intensity.
- 5) Press the bar beside the Speed to input the belt wheel speed.
- 6) Press the bar beside the Irradiation Time to input the cure time.
- 7) Press the Apply button to save and update the program parameters to the main window.
- 8) Press the back arrow in the top left corner to exit the program window.

# System Log

#### **Checking the Alarm History Log**

To check the alarm history log, press the Alarm Log window. The error window will appear. (Figure 56.)

**Note**: The alarm records are only updated. They can't be deleted. The lines show the date and time of the alarm, and the code to describe the reason for the alarm.

The controller can save a maximum of 100 records. When over 100 alarms have been recorded, the next number is overlaid by the new alarm.

Press the arrow to move the page number up and down.

Press a number to go to the specified page.

Press the Back arrow to return to the main window.

### When the Controller Receives an Alarm

When the controller receives an alarm, the controller is forced to enter the Alarm Popup window. Press Turn Off the Alarm (Figure 57.) to enter the Alarm Active window. In this window, you can stop the alarm by pressing the red bell icon at the bottom of the window (Figure 58.).

After the alarm code is checked, shut down the machine to restart.

In the System Setting window, press the system log button to check the history.

When an alarm occurs, the emitters are stopped, and the controller beeps.

Press the Reset button to turn off the beep and disable the alarm.

# **WARNING!** Power off before checking the controller and emitters.

Every alarm message has the time of occurrence, alarm code and alarm message.

**Note:** When pressing the emergency stop button, if rerun the conveyor, turn off the power switch, and then turn on the power switch.

#### **Figure 56.** Alarm Log Window

| <  | Log Details  | 10: 07<br>2024- 05- 11 |
|--|--|------------------------|
| alarm code<br>alarm code<br>alarm code<br>alarm code<br>alarm code<br>alarm code<br>alarm code<br>alarm code<br>alarm code | e message<br>e message<br>e message<br>e message<br>e message<br>e message<br>e message<br>e message |                        |
|  | < 1 2 3 4 5 6 7 >  | \$                     |

## Figure 57.

### Alarm Popup Window



#### Figure 58. Alarm Active Window

|       |      |         | Log Det | tails |   | 10:<br>2024- 05- |
|-------|------|---------|---------|-------|---|------------------|
| alarm | code | message |         |       |   |                  |
| alarm | code | message |         |       |   |                  |
| alarm | code | message |         |       |   |                  |
| alarm | code | message |         |       |   |                  |
| alarm | code | message |         |       |   |                  |
|       |      | message |         |       |   |                  |
| alarm | code | message |         |       |   |                  |
|       |      | message |         |       |   |                  |
| alarm | code | message | 3       |       |   |                  |
|       |      | 1 2     | 34      | 5 6   | 7 |                  |

## Table 5.

Alarm Codes and Description

| Alarm<br>Code | ALARM message   | Cause  |
|---------------|-----------------|--|
| 0x0001        | EMERGENCY STOP! | The emergency button is pushed in.                 |
| 0x0002        | CHAM TEMP HIGH! | T1 or T2 is over the maximum temperature.          |
| 0x0003        | DOOR OPEN!      | The conveyor door is open.                         |
| 0x0004        | MOTOR ERROR!    | Motor is reporting an error.                       |
| 0x0005        | MOTOR CONNECT!  | Motor communication is not connected.              |
| 0x0007        | FX1250 ERROR!   | FX1250 device has errors or communication problems |
| 0x0008        | FAN ERROR!      | Exhaust fan is not working.                        |

If the LCD is disconnected, the alarm will turn red and produce a buzzing sound. An icon (Figure 59.) indicating the error will appear on the HMI.

#### Figure 59.



Should the Emergency Stop button be activated or in case of a sudden emergency, strictly follow these steps:

- 1. Turn off the power supplies for the emitters and shut down the conveyor's power.
- 2. Release the emergency stop button.
- 3. Analyze and troubleshoot any potential issue.

## Troubleshooting

Table 6.

| Alarm Code | ALARM message   | Suggestion   |
|------------|-----------------|--|
| 0x0001     | EMERGENCY STOP! | Check the emergency button.  |
| 0x0002     | CHAM TEMP HIGH! | <ol> <li>Check fan status.</li> <li>Check sensor connection.</li> <li>Check the fan of LED emitter.</li> <li>Check the environment temperature.</li> </ol>   |
| 0x0003     | DOOR OPEN!      | Check the cover of the conveyor.   |
| 0x0004     | MOTOR ERROR!    | <ol> <li>The motor is experiencing an internal error.</li> <li>First, verify if the belt is running smoothly.</li> <li>Check if the load on the conveyor is excessive, as this could lead to overburdening.</li> </ol>   |
| 0x0005     | MOTOR CONNECT!  | Check the motor connect wire.  |
| 0x0007     | FX1250 ERROR!   | <ol> <li>The FX-1250 has errors or communication problems.</li> <li>Make sure the FX-1250 operates properly<br/>independent of the conveyor system.</li> <li>Verify the integrity of the cables being used, and<br/>ensure they are properly connected.</li> <li>Set correct ID (2 or 3).</li> <li>Correct wire connection.</li> </ol> |
| 0x0008     | FAN ERROR!      | Check fan status.  |

# PLC Mode

There are 2 working modes:

**Default:** This is the default mode and is operable by the touch screen. Parameters can be stored in the program slots and called for operation.

**PLC:** The system can be controlled by PLC. This mode is triggered by selecting the "PLC" mode in the mode list (see Select Conveyor Mode). Please follow the wiring guide in "PLC UV Control".

## **PLC UV Control**

PLC switching may be driven by manual switch, relay, or optical coupler.

To use the PLC mode, first, set the parameter setting in manual moving mode or static mode, then select the PLC MODE (See Figure 60.) in the mode list to enter the PLC window.

#### Figure 60.

PLC Mode Window



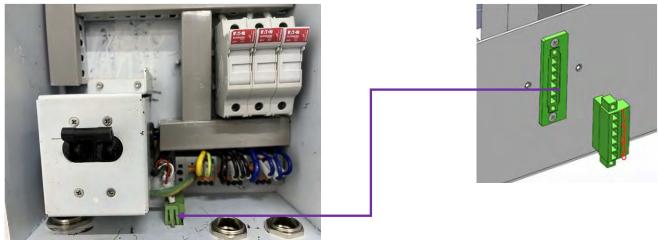
You can click the back arrow to exit the PLC mode. Before exiting, a password window will appear prompting you to enter the admin password.

# PLC Output and Input

The green interface terminal is the input and output ports of internal and external signals.

#### Figure 61.

PLC Connector



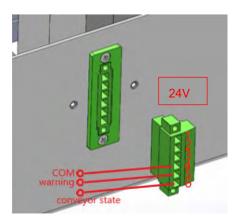
There are two status outputs. They are driven by an optical coupler. These outputs work in any mode and can be used as status inputs for PLC or any status display/monitor purpose.

- WARNING Output low to indicate the unit is normally working.
- Conveyor State Output low to indicate the UV LEDs are ON.

The example application of these signals is shown below.

#### Figure 62.

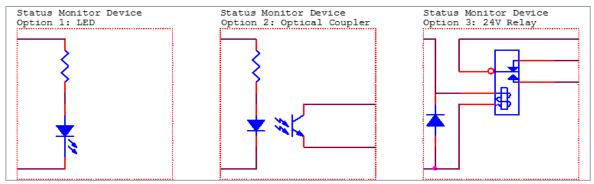
Status Outputs Connection to Customer's Monitor Device



PLC IO channel is a 24V source available for use to drive PLC logic but must be current limited using pull-down resistors to protect the device when directly attached to the I/O channels through the PLC connector. The max support current is 50 mA.

## Figure 63.

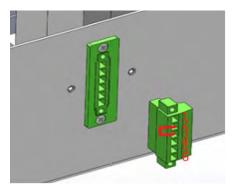
Examples of Customer Configurations for Monitoring Outputs



PLC input connection shows the conveyor start in the following figure.

#### Figure 64.

PLC Input Connection



#### Table 7.

The green terminal interface shown in Figure 62. is defined as follows:

| Signal Name            | Pin # | Description   |   |
|------------------------|-------|---|---|
| INPUTS                 |       |   |   |
| Input Reserve          | 1     | Do Not Use  | Input Reserve   |
| CONVEYOR<br>START/STOP | 2     | Protective interface:<br>0V- On;<br>24V/Open-Shut OFF.      | Can be used as a start/stop.<br>0V can be used for normal operation.  |
| COM                    | 3     | Common  | Common  |
| OUTPUTS                |       |   |   |
| WARNING                | 5     | System fault indication:<br>24V- fault;<br>Open- Working    | Relay output:<br>24V: the system is in failure, the output is<br>on, and with an alarm.<br>Open: the system is working. |
| CONVEYOR STATE         | 6     | Working status indicator:<br>Open-Working;<br>24V-Shut OFF. | The signal is open, the system is running.<br>The signal is 24V, the system will be in an<br>inactive state.            |
| СОМ                    | 4     | Common  | Common  |

# Maintenance

# **Routine Maintenance**

| NO | Module             | Item                  | Requirement   | Example | Cycle   |
|----|--------------------|-----------------------|---|---------|---------|
| 1  |                    | Belt                  | Check for wear; replace belt if worn out                            |         | Weekly  |
| 2  | Driving            | Roller                | Check for wear; replace rollers if worn out                         |         | Monthly |
| 3  | Section            | Edge                  | Add lubricant   |         | Monthly |
| 4  |                    | Sprocket<br>wheel     | Add lubricant   |         | Monthly |
| 5  |                    | Exhaust fan           | Dust off  |         | Monthly |
| 6  |                    | Exhaust fan<br>box    | Dust off  |         | Monthly |
| 7  | Cooling<br>Section | Windshield<br>glass   | Dust off  |         | Monthly |
| 8  |                    | Temperature<br>sensor | Check for correct operation; replace damaged or aged wiring harness |         | Monthly |

# Spare Parts & Accessories

# Accessories

| Item   | Part Number |
|--|-------------|
| CRADLE HORIZONTAL CONFIGURATION FOR 1x1 1x2 1x3              | 80021       |
| CRADLE VERTICAL CONFIGURATION FOR 1x2 2x2                    | 80022       |
| CABINET, CONVEYOR SYSTEM                                     | 80020       |
| PROTETCTIVE GOGGLES-GRAY (STANDARD MODEL INCLUDED WITH UNIT) | 84126       |
| INTERCONNECT CABLE, 2M TYPE L & L                            | 84025       |
| INTERCONNECT CABLE, 2M TYPE I & L                            | 84026       |
| INTERCONNECT CABLE, 5M TYPE L & L                            | 84027       |
| INTERCONNECT CABLE, 5M TYPE I & L                            | 84028       |
| ACCU-CAL 160 LED, COMPLETE                                   | 41585       |
| BLUEWAVE FX 1250 EMITTER REDICURE (365NM)                    | 88801       |
| BLUEWAVE FX 1250 EMITTER PRIMECURE (385NM)                   | 88802       |
| BLUEWAVE FX 1250 EMITTER VISICURE (405NM)                    | 88803       |
| BLUEWAVE FX 1250 CONTROLLER 1CH (CHINA CORD)                 | 88805       |
| BLUEWAVE FX 1250 CONTROLLER 2CH (CHINA CORD)                 | 88804       |
| BLUEWAVE FX 1250 CONTROLLER 1CH (NORTH AMERICA CORD)         | 88846       |
| BLUEWAVE FX 1250 CONTROLLER 2CH (NORTH AMERICA CORD)         | 88847       |
| BLUEWAVE FX 1250 CONTROLLER 1CH (NO CORD)                    | 88850       |
| BLUEWAVE FX 1250 CONTROLLER 2CH (NO CORD)                    | 88851       |
| NETWORK WIRE,5M  | 84458       |

# Components & Spare Parts

| Item   | Part Number |
|--|-------------|
| BELT, W300*L2875, UVCS V3.0  | 83105       |
| SHIELD   | 81216       |
| DRIVE PULLEY   | 83100       |
| IDLE PULLEY  | 83101       |
| BELT CURTAIN   | 83113       |
| RUBBER BUMPER  | 83108       |
| TRI-COLOUR LIGHT   | 84132       |
| DRIVE MOTOR  | 84172       |
| REDUCTION GEARS  | 84173       |
| MOTORIZED IMPELLER, 230VAC   | 84128       |
| MOTORIZED IMPELLER,115VAC  | 84171       |
| UVCS V3.0 BELT 110V NA (TYPE B POWER CORD) WITH HORIZONTAL CRADLE      | 88880       |
| UVCS V3.0 BELT 110V NA (TYPE B POWER CORD) WITH VERTICAL CRADLE        | 88881       |
| UVCS V3.0 EDGE 110V NA (TYPE B POWER CORD) WITH HORIZONTAL CRADLE      | 88882       |
| UVCS V3.0 EDGE 110V NA (TYPE B POWER CORD) WITH VERTICAL CRADLE        | 88883       |
| UVCS V3.0 BELT 220V CN (TYPE I POWER CORD) WITH HORIZONTAL CRADLE      | 88884       |
| UVCS V3.0 BELT 220V CN (TYPE I POWER CORD) WITH VERTICAL CRADLE        | 88885       |
| UVCS V3.0 EDGE 220V CN (TYPE I POWER CORD) WITH HORIZONTAL CRADLE      | 88886       |
| UVCS V3.0 EDGE 220V CN (TYPE I POWER CORD) WITH VERTICAL CRADLE        | 88887       |
| UVCS V3.0 BELT 220V EU (TYPE F POWER CORD) WITH HORIZONTAL CRADLE      | 88888       |
| UVCS V3.0 BELT 220V EU (TYPE F POWER CORD) WITH VERTICAL CRADLE        | 88889       |
| UVCS V3.0 EDGE 220V EU (TYPE F POWER CORD) WITH HORIZONTAL CRADLE      | 88890       |
| UVCS V3.0 EDGE 220V EU (TYPE F POWER CORD) WITH VERTICAL CRADLE        | 88891       |
| UVCS V3.0 BELT 220V UK/ASIA (TYPE G POWER CORD) WITH HORIZONTAL CRADLE | 88896       |
| UVCS V3.0 BELT 220V UK/ASIA (TYPE G POWER CORD) WITH VERTICAL CRADLE   | 88897       |
| UVCS V3.0 EDGE 220V UK/ASIA (TYPE G POWER CORD) WITH HORIZONTAL CRADLE | 88898       |
| UVCS V3.0 EDGE 220V UK/ASIA (TYPE G POWER CORD) WITH VERTICAL CRADLE   | 88899       |

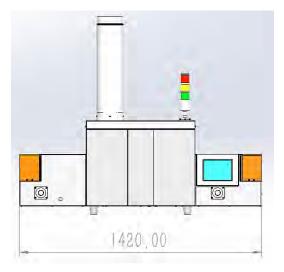
# **Product Specifications**

## Table 8.

Product Specifications and Electrical Requirements

| Property                | Specification  |
|-------------------------|--|
| Model                   | UVCS V3.0  |
| Size                    | Conveyor: 1420 x 715 x 826 mm<br>Cabinet: 640 x 512 x 820 mm |
| Weight                  | Conveyor: 90 kg<br>Cabinet: 40 kg                            |
| Maximum Parts Height    | 152 mm   |
| Belt/Edge Speed         | 0.4 ~ 7.8 m/min  |
| Belt Width              | 300 mm   |
| Edge-Carry Width        | 38 ~ 255 mm  |
| Lamp Height Adjustment  | 12 ~ 152 mm  |
| Operation Temp/Humidity | -10 ~ 40 °C, Non-condensing                                  |
| Storage Temp/Humidity   | -20~ 50 °C, Non-condensing                                   |
| Power Input             | North America: AC 90 ~ 125 V, 50/60 HZ, 3 A                  |
|                         | China & Europe: AC 196~264 V, 50/60 HZ, 1.5 A                |
| Maximum Load Capacity   | 25 kg  |
| Ingress Protection      | IP 33  |

**Conveyor Dimension** 



### **Cabinet Dimension**







# **Declaration of Conformity**

#### Figure 65.

Declaration of Conformity - CE



## EU Declaration of Conformity

Original

Manufacture: Hanarey Chemicals (Shanghai) Co., Ltd. No.111 Muhua Road, Fengxian District, Shanghai, China 201507

Authorised person to compile the technical file:

Dymax Europe GmbH Christian Gruber Kasteler Strasse 45, Building G 359,65203 Wiesbaden Germany

Product description: Model name(s):

UVCS V3.0 LED Conveyor System UVCS V3.0 LED Belt 220V UVCS V3.0 LED Edge 220V UVCS V3.0 LED Belt 110V UVCS V3.0 LED Edge 110V

This product complies with the following relevant Union Harmonization Legislation:

Machinery Directive(2006/42/EC)

Electromagnetic Compatibility Directive(2014/30/EU)

EN ISO 12100:2010 EN 60204-1:2018 EN 619:2022 EN IEC 61000-6-2:2019 EN IEC 61000-6-4:2019

Applicable Harmonized Standards:

RoHS Directive 2011/65/ EU (incl.(EU) 2015/863)

EN IEC 63000:2018

#### Declaration:

This declaration of conformity is issued under the sole responsibility of the manufacturer. Signed for and on behalf of Hanarey Chemicals (Shanghai) Co.,Ltd

Shanghai CE N.

Authorized Signatory: Kyle Zhu Senior Manager, Equipment Development Hanarey Chemicals (Shanghai) Co., Ltd.



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**B DYMAX** 

## UK Declaration of Conformity

Original

Manufacture: Hanarey Chemicals (Shanghai) Co., Ltd. No.111 Muhua Road, Fengxian District, Shanghai, China 201507

Authorised person to compile the technical file:

Product description: Model name(s): UVCS V3.0 LED Conveyor System UVCS V3.0 LED Belt 220V UVCS V3.0 LED Edge 220V UVCS V3.0 LED Belt 110V UVCS V3.0 LED Belt 110V

This product complies with the following relevant UK Legislation: Applicable UK legislation: Supply of Machinery (Safety) Regulations 2008

Electromagnetic Compatibility Regulations 2016

Applicable Harmonized Standards: EN ISO 12100:2010 EN 60204-1:2018 EN 619:2022 EN IEC 61000-6-2:2019 EN IEC 61000-6-4:2019 EN IEC 63000:2018

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

#### Declaration:

This declaration of conformity is issued under the sole responsibility of the manufacturer. Signed for and on behalf of Hanarey Chemicals (Shanghai) Co.,Ltd

Shang hai Date





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# Validation

Tests should be conducted prior to production to determine the time and light intensity required to fully cure your resin. The following approaches may be used to validate the curing process.

# Set Exposure Time, Determine Intensity

Users can specify a cure time and, through empirical testing, determine the intensity required to achieve a full cure. As with any manufacturing process, it is advisable to incorporate a safety factor.

# Set Intensity, Determine Exposure Time

Users can specify light intensity and, through empirical testing, determine the exposure time required to achieve a full cure. As with any manufacturing process, it is advisable to incorporate a safety factor.

**NOTE**: Dymax recommends low intensities at first to preserve LED life.

Contact the Dymax Application Engineering Team for additional process support.

## Control

Process validation confirms a minimum acceptable intensity. Users can then choose to operate at full intensity (using the excess intensity as an additional safety factor) or adjust the output to a specific intensity level. To ensure consistent and repeatable process results, intensity levels should be monitored with a radiometer. This enables users to identify light intensity changes and take corrective action (either adjusting the light intensity or performing maintenance).

# Warranty

From date of purchase, Dymax Corporation offers a one-year warranty against defects in material and workmanship on all system components with proof of purchase and purchase date. Unauthorized repair, modification, or improper use of equipment may void your warranty benefits. The use of aftermarket replacement parts not supplied or approved by Dymax Corporation, will void any effective warranties and may result in damage to the equipment.

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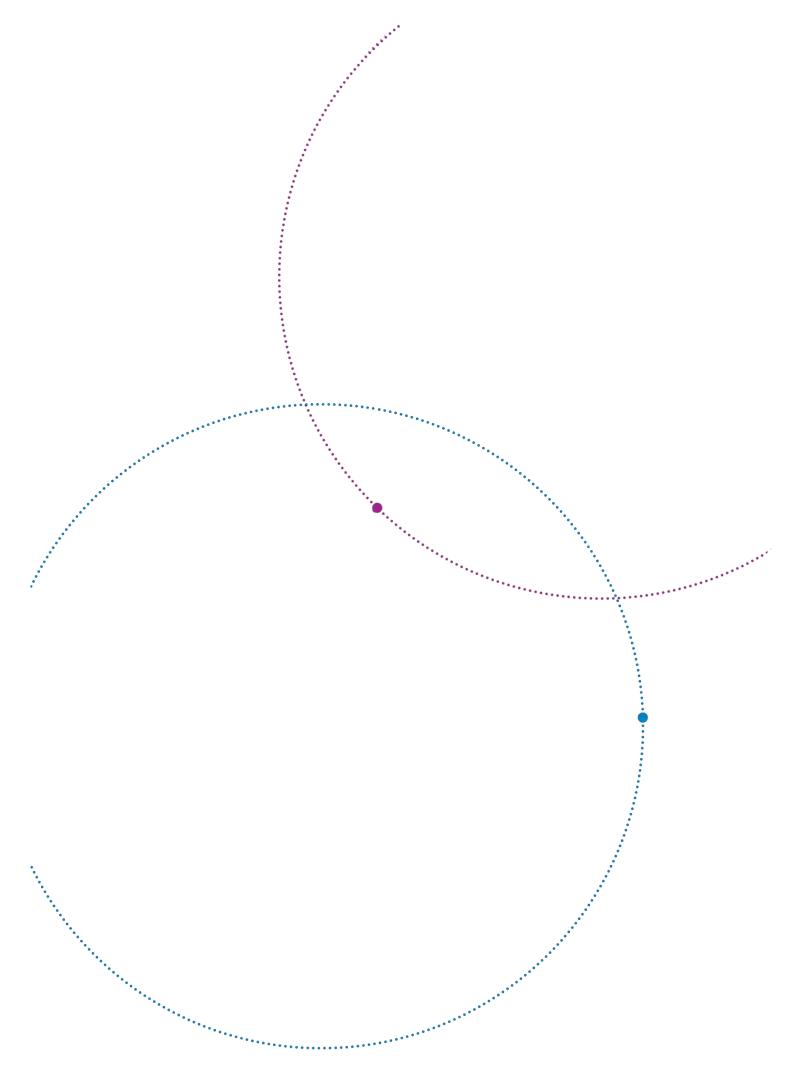
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### Manufacturer

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