



X1 Product Manual

ENGLISH

Version 1.5 June 2021

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Revision History

Version	Date	Modification
V1.0	2021/1/22	Mass production release.
V1.1	2021/3/5	<ul style="list-style-type: none"> - Add 1.2.9 section cartridge insertion & Removal. - Update Controller and power specifications table -Add recommendation steps for power off controller and cartridge insertion/removal. - Added Figure 2.2-2 Logout and shutdown page. - Reviewed station delay concept Table 2.1-3. - Reviewed Pre-purge concept Table 2.4-3 - Modified Figure 3.5-1 and Variable input concept.
V1.2	2021/5/17	Modified table 6.1-2 <ul style="list-style-type: none"> - Pin 3 Encoder signal open wire is green color. - Pin 4 DC voltage open wire is red color.
V1.3	2021/5/20	<ul style="list-style-type: none"> - Updated Figure 2.1-2 Time Zone. - Added reference to production line section Table 2.1-2. - Added reference to print station section Table 2.1-2. - Modified Table 2.1-3 Station Delay description. - Added Figure 2.3-2 Message Delay. - Added Figure 2.4-6 Station Delay description and note. - Deleted note for Figure 2.4-5. - Added Figure 2.4-12 Repeat Print Initial Delay and notes for initial delay and period values. - Modified Table 2.4-3 initial delay and period description.
V1.4	2021/6/2	<ul style="list-style-type: none"> - Add power consumption detail to Figure 6.1-1. - Add Inrush Current in controller specification.
V1.5	2021/7/1	<ul style="list-style-type: none"> - Update power specification. - Update Table 2.4-3 pre-purge feature description. - Update new Anser Logo and official url address.

X1 HARDWARE

1.1 Overview

1.1.1 Controller Overview

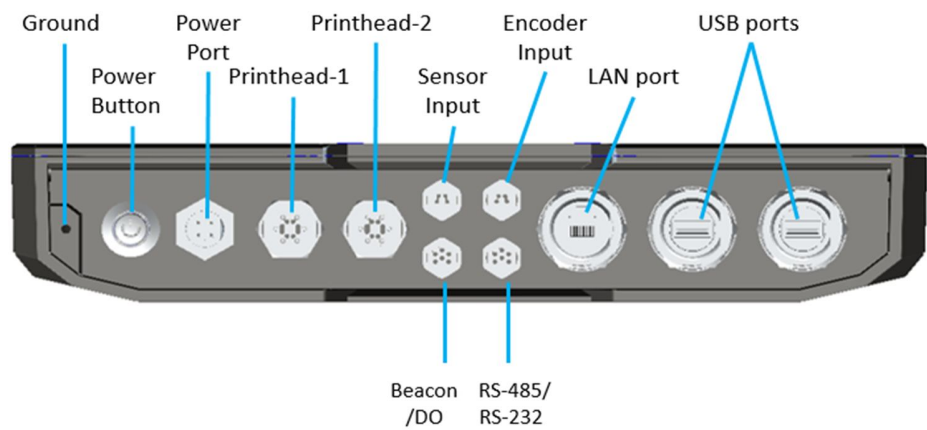


Figure 1.1-1

Ports	Description
Ground	Connection of ground cable.
Power Button	Power ON/OFF controller.
Power Port	Port for DC24V input.
Print Head-1	Port for connecting printhead-1 and controller.
Print Head-2	Port for connecting printhead-2 and controller.
Sensor Input	Port for connecting an external sensor to trigger printing.
Encoder Input	Port for connecting external encoder.
Beacon / DO	Port for connecting external warning light and getting output signal from the controller.
RS-485/RS-232	Port for serial communication with PLC, PC, and other devices.
LAN	RJ45 port for Ethernet communication.
USB ports	Two USB 2.0 ports for import/export messages, configuration, backup files, and firmware. Also available as a serial COM port.

Table 1.1-1

1.1.2 Printhead Overview

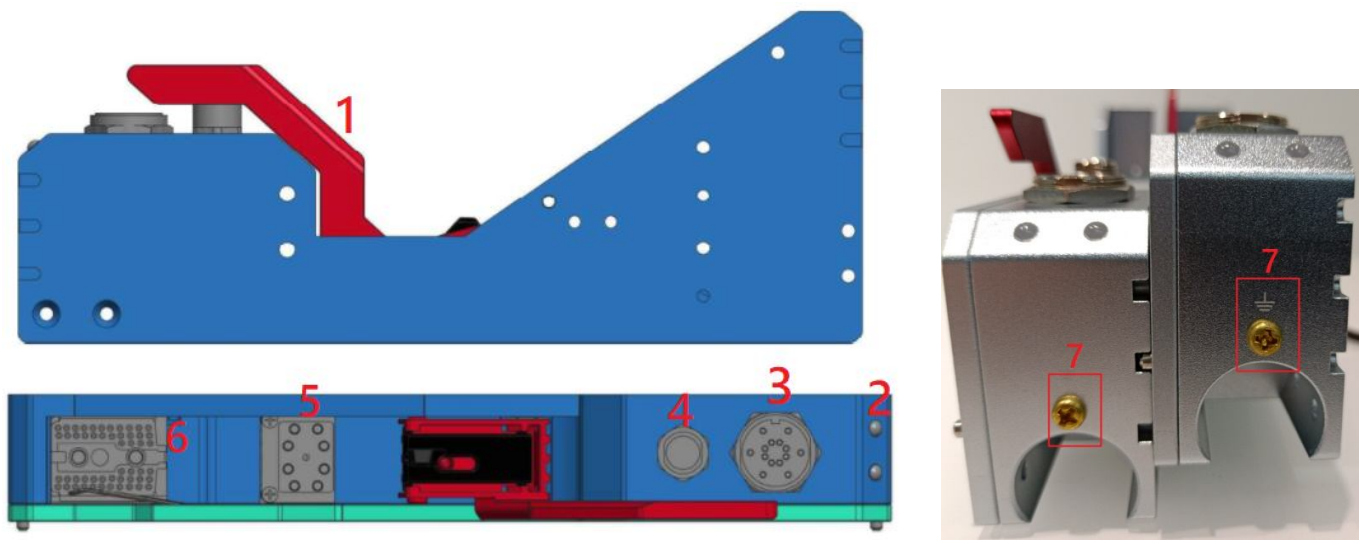


Figure 1.1-2

	Ports	Description
1	Cartridge Latch	For keeping cartridge in-placed.
2	LED Status	Printhead status LEDs.
3	Data Line	Port for connecting the data cable between printhead and controller.
4	Accessory Connector	Port for connecting the photocell sensor or encoder. When using Y-connector, both sensor and encoder can be used at the same time.
5	DISC Module	For reading the parameters stored in the cartridge chip.
6	Pen Board Driver Pins	Pins for driving the firing of the cartridge.
7	Ground	Use to ground the printhead (s)

Table 1.1-2

1.2 X1 Hardware Installation

1.2.1 Unpacking List Items

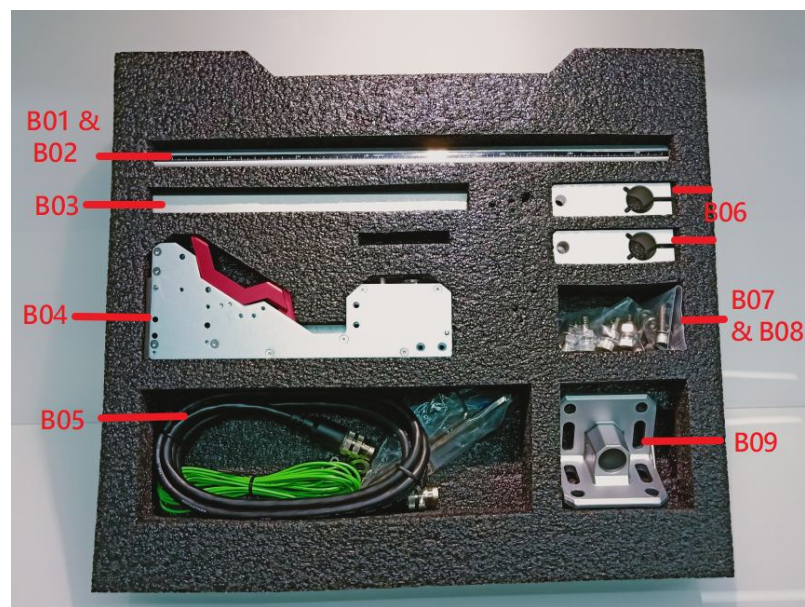
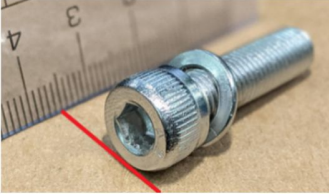

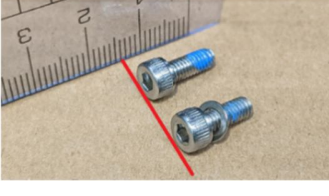
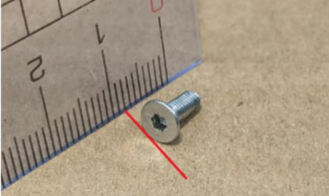
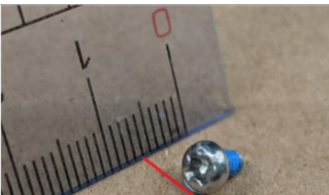
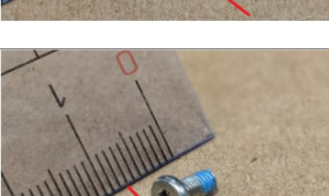


Figure 1.2-1



Figure 1.2-2

Item	Description	Illustration
C1 (M8XL28)	Use to lock the brackets (A or B) together with bracket connector B06.	
C2 (M8XL20)	Use to mount the bracket base A09 on the conveyor.	
C3(M4XL10)	<ul style="list-style-type: none"> - Use to mount A02 bar into the A09 base. - Use to mount the VESA on the back of controller. 	
C4 (M3XL8)	<ul style="list-style-type: none"> - Use to mount the B03 printhead bar into the back of the printhead (M3xL10). - Use to mount the front and middle sections when doing stitch and parallel printheads. 	
C5(M3XL4.5)	Use to mount the photocell holder.	
C6 (M3XL6)	Use to mount the printhead frames for single, stitch and parallel modes.	

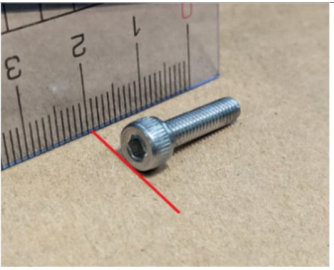
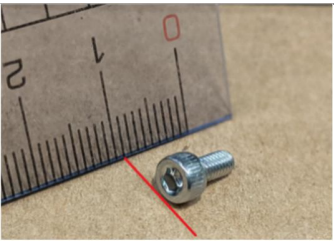
C7 (M4XL14)	Use to mount the anti-shock's rear side to the printhead.	
C8 (M3XL6)	Use to mount the anti-shocks's front side to the printhead.	

Table 1.2-1

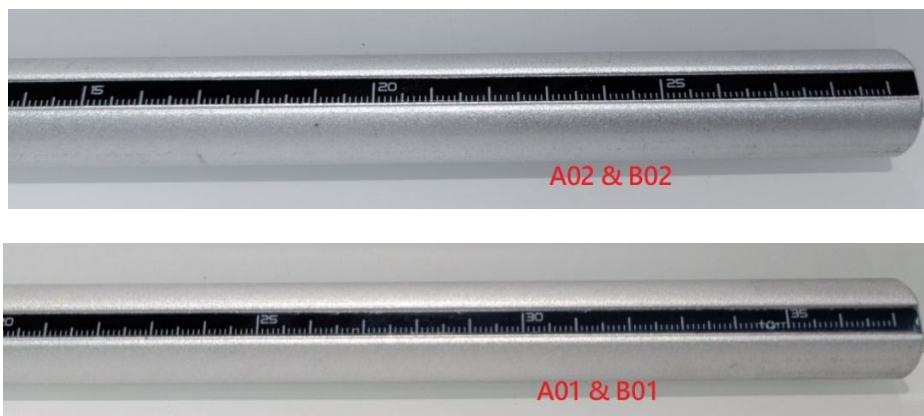


Figure 1.2-3

1.2.2 X1 Controller Bracket Installation

STEP1: Assemble the A02 bar into the A09 base by using two screw type C03 (**add washer**).



Figure 1.2-4

STEP2: Mount the base A09 on the conveyor using four C02 type of screw. To mount on the side, use the upper holes and the lower holes to mount on flat surface.

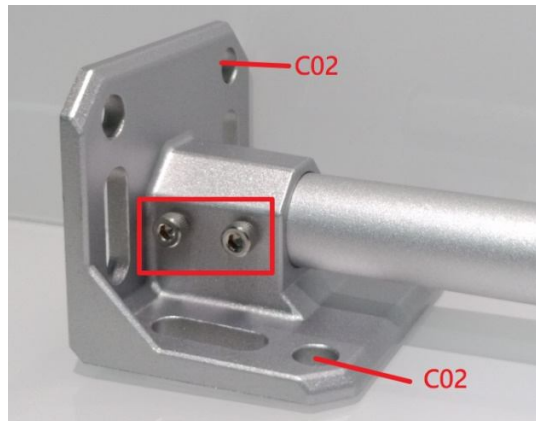


Figure 1.2-5

STEP3: Position the holder VESA A03 on the four screw holes found on the back of controller, and screw the four sides using the C03 screw type.

STEP4: Insert the A01 bar into the VESA base A03, and use two C03 to screw.

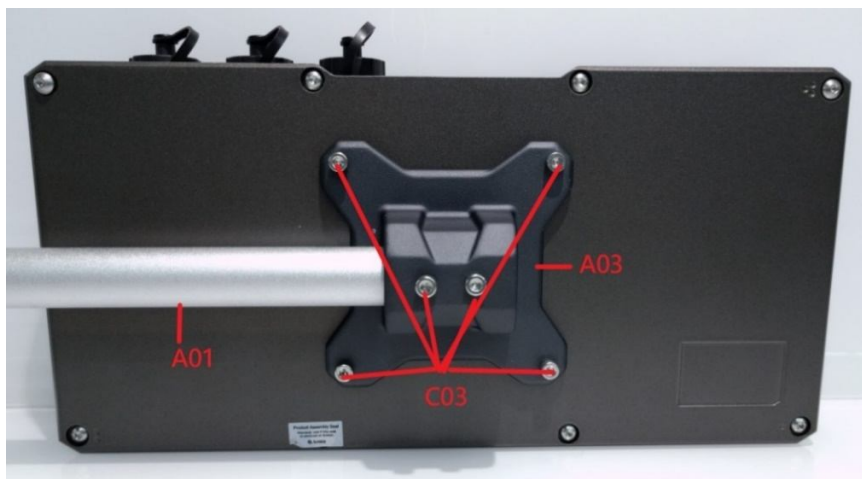


Figure 1.2-6

STEP5: Mount the controller on the main bracket base by using the A06 bracket connector. After finding the desired position for the controller, use two C01 screw type and screw tightly both sides of the connector.

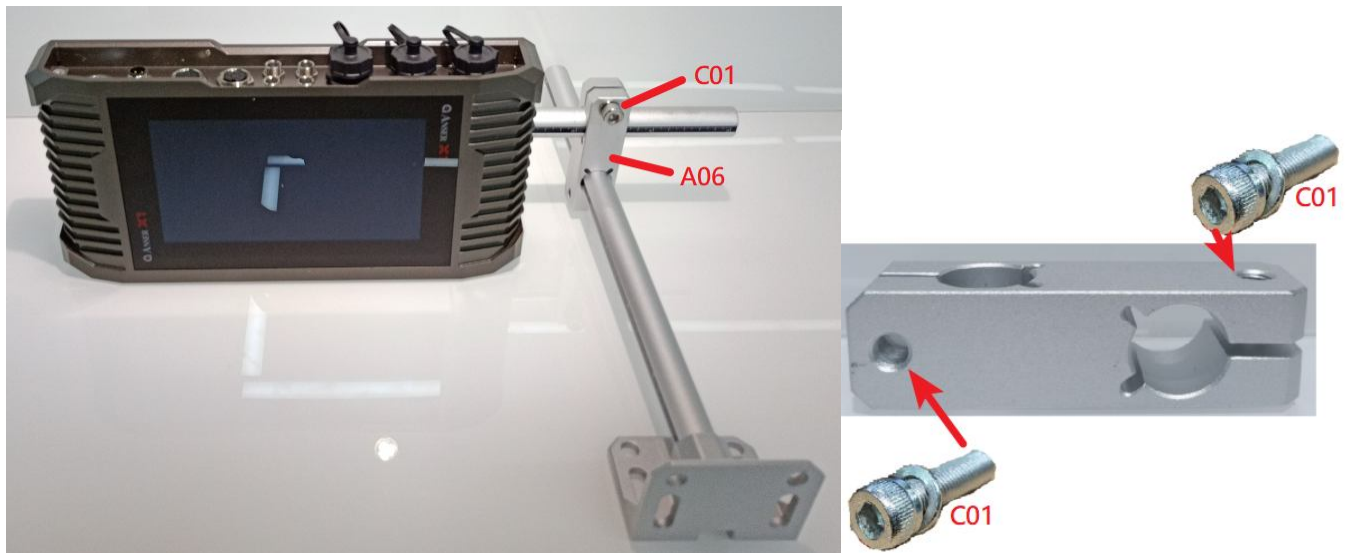


Figure 1.2-7

STEP6: Finally, connect the ground wire connector (**yellow/green wire 18 AWG**) to the chassis ground source located.

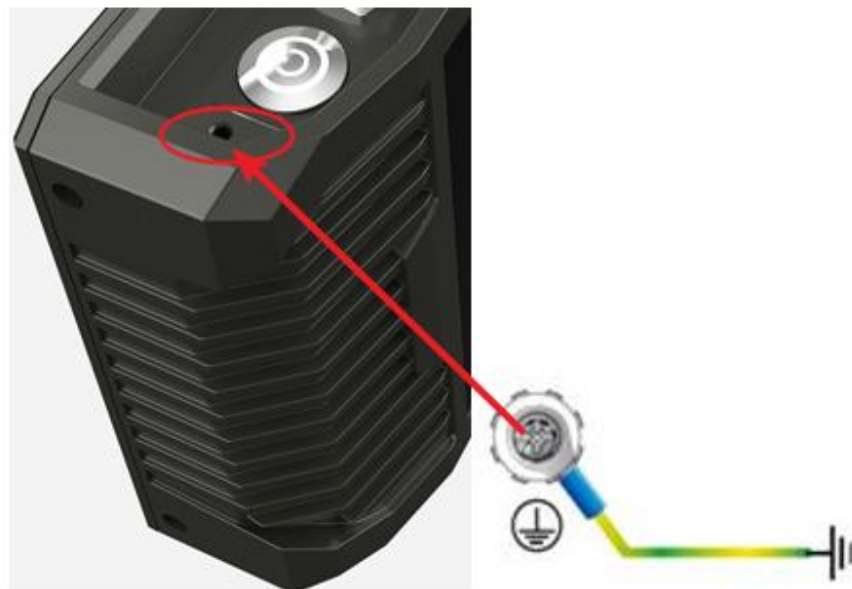


Figure 1.2-8



Perform soft shutdown of the system using the shutdown button found in log out page, and then press power button to completely power off controller.

1.2.3 Single Printhead

HALF-INCH PRINthead FRAME

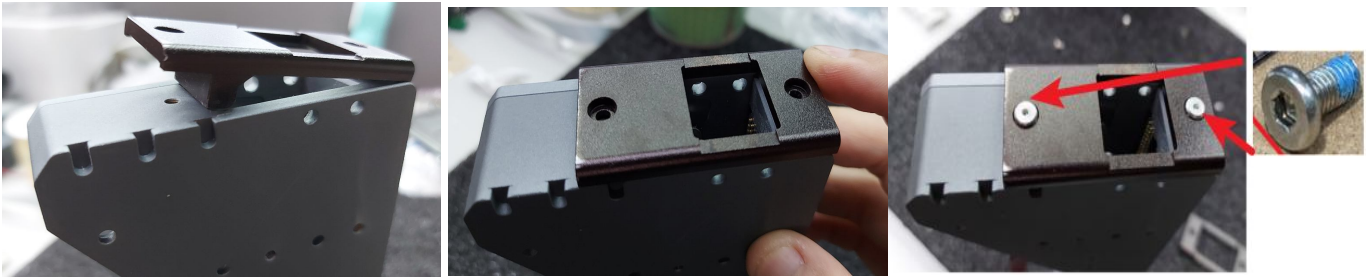


Figure 1.2-9

ONE-INCH PRINthead FRAME



Figure 1.2-10

1.2.4 Mounting Stitch Printheads

HALF-INCH STICH PRINtheads

STEP1: Mount the front and rear pins of one printhead in the second groove, as illustrated in below images.

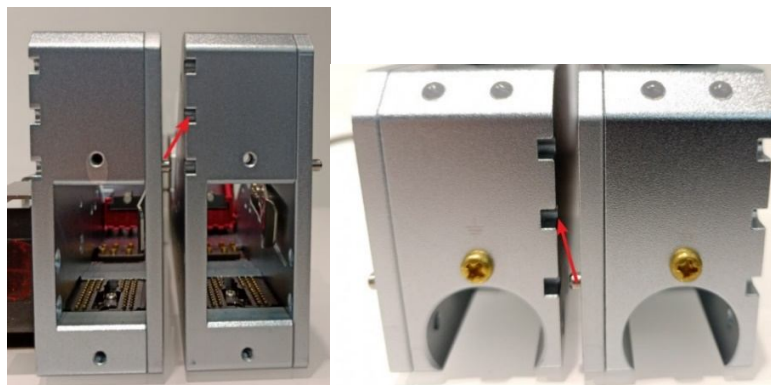


Figure 1.2-11

STEP2: Use one C4 type of screw to lock the front section of both printheads as illustrated below.

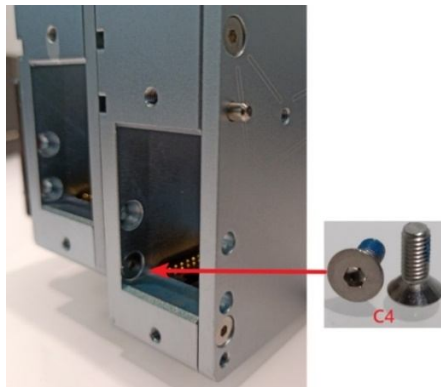


Figure 1.2-12

STEP3: Use two C4 type of screws to lock the middle section of the printheads as illustrated below.

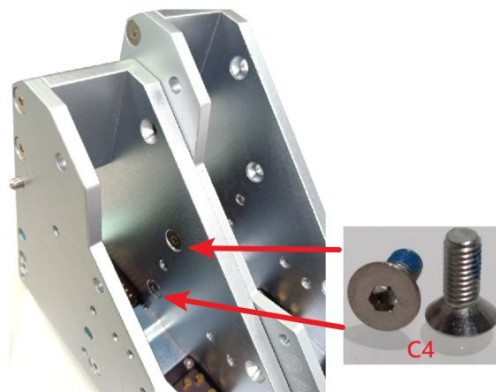


Figure 1.2-13

STEP4: Mount the half-inch stitch front plate as illustrated below, and use three C6 type of screw to lock it.

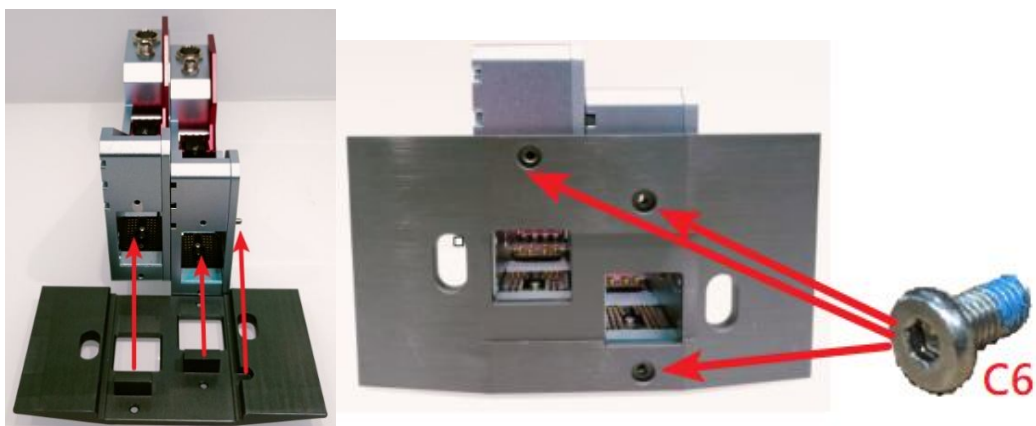


Figure 1.2-14

ONE-INCH STITCH PRINTHEADS

STEP1: Mount the front and rear pins of one printhead in the first groove, as illustrated in below images.

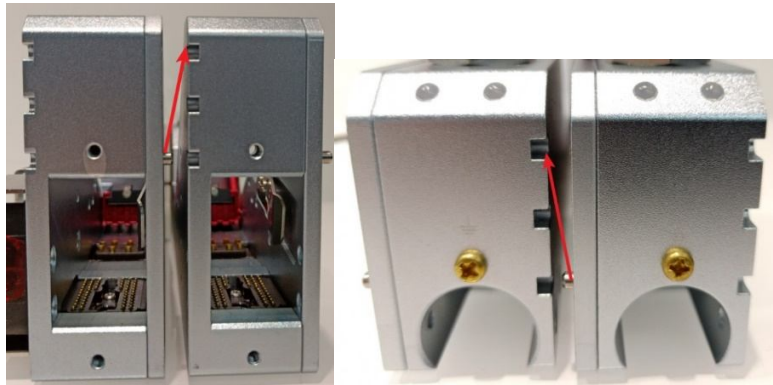


Figure 1.2-15

STEP2: Use one C4 type of screw to lock the front section of both printheads as illustrated below.

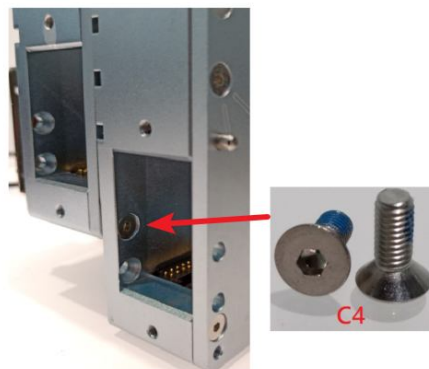


Figure 1.2-16

STEP3: Use one C4 type of screw to lock the printheads as illustrated below.

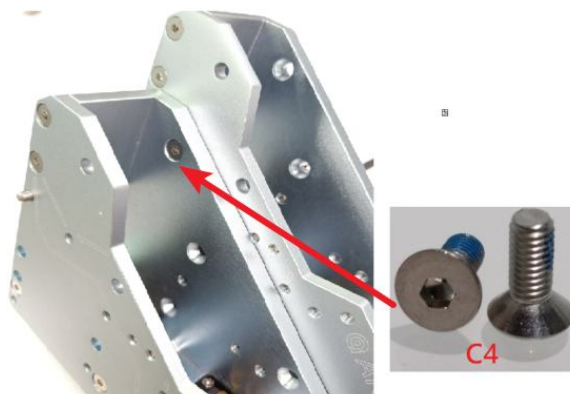


Figure 1.2-17

STEP4: Mount the one-inch stitch front plate as illustrated below, and use three C6 type of screw to lock it.

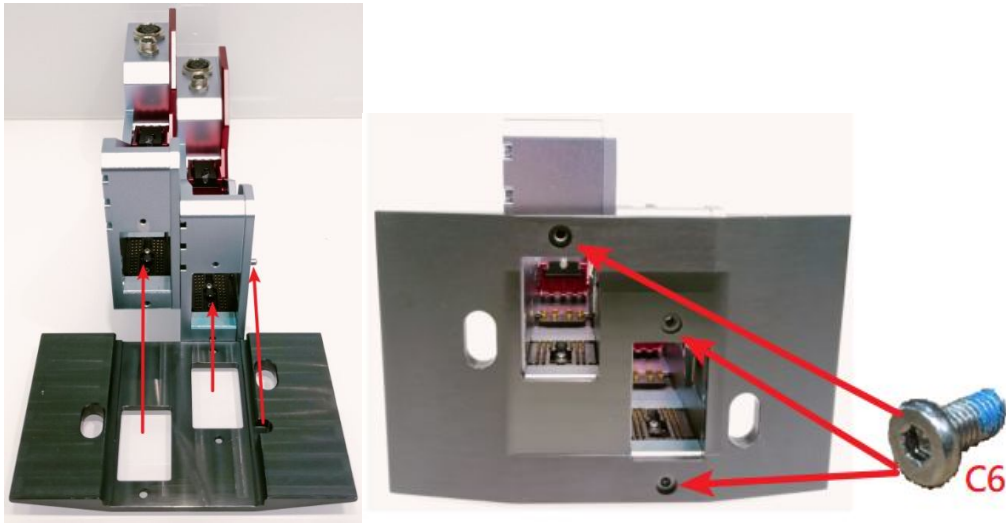


Figure 1.2-18

1.2.5 Mounting Parallel Printheads

STEP1: Mount the front and back pins of one printhead in the third groove, as illustrated in below images.



Figure 1.2-19

STEP2: Use one C4 type of screw to lock the middle section of both printheads as illustrated below.

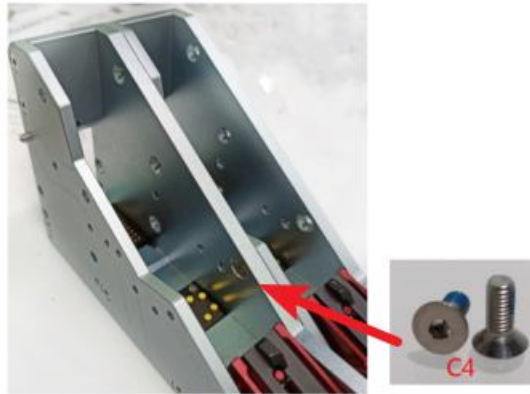


Figure 1.2-20

STEP3: Mount the parallel front plate as illustrated below, and use three C6 type of screw to lock it.

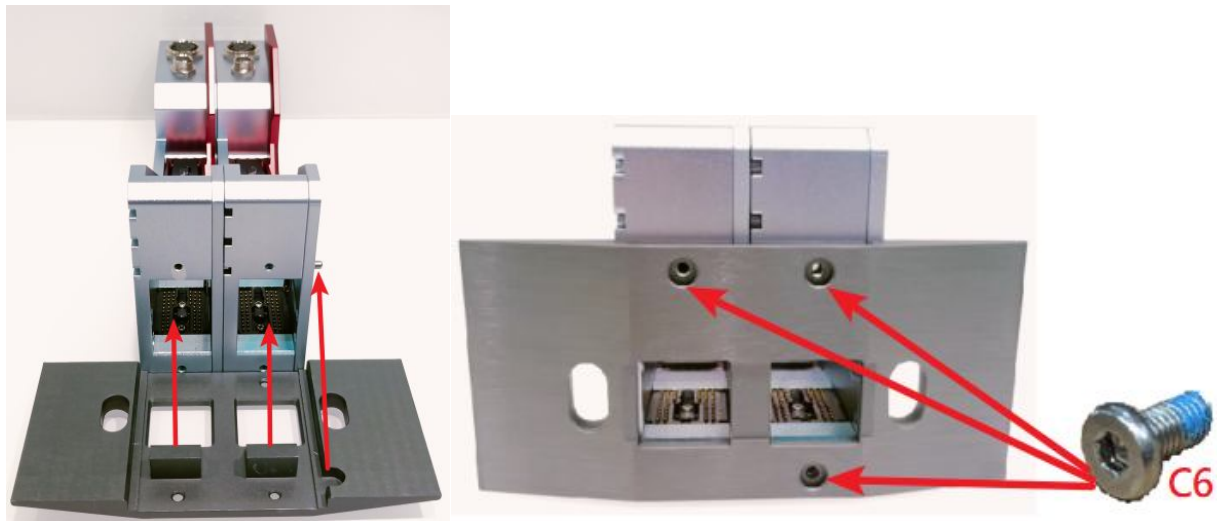


Figure 1.2-21

Note: Follow same steps to install one-inch parallel printhead plate.

1.2.6 Mounting Printhead Sensor

STEP1: Place the sensor inside the holder, and use two C05 type of screw to lock it as illustrated below.

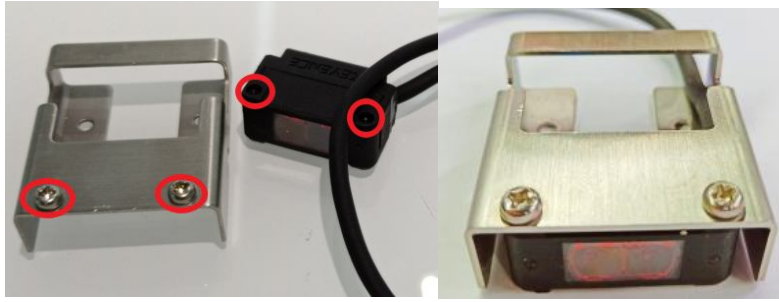


Figure 1.2-22

STEP2: Mount the sensor holder on either side of the printhead by using two C05 type of screws.

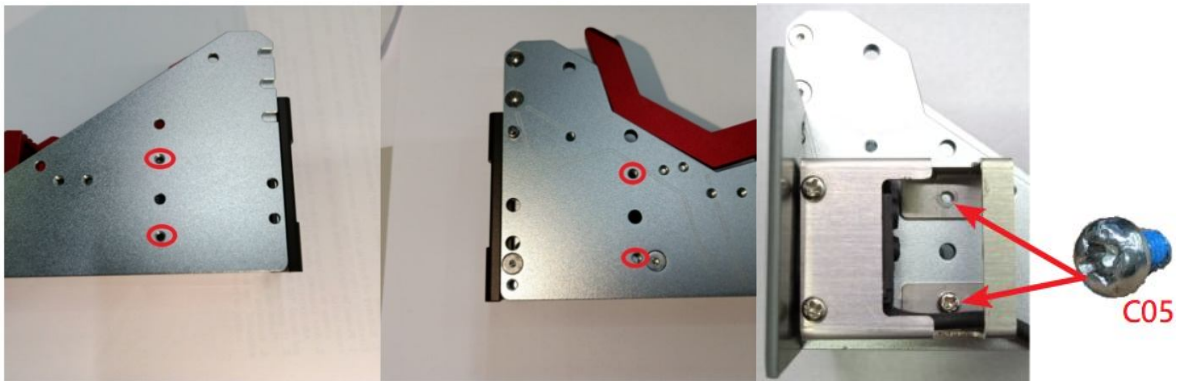


Figure 1.2-23

STEP3: Plug the sensor M4 male connector to either the printhead or controller M4 female connector.



Figure 1.2-24

Note: Use the extension cable to connect photocell to the controller.

1.2.7 Mounting the Anti-Shock Mechanism

PRINthead LEFT SIDE INSTALLATION

STEP1: Place the anti-shock front and rear holes in relation with the printhead holes as marked in the below image.

STEP2: At the front of the anti-shock, use one C8 type of screw and insert it into the upper hole.

STEP3: At the back of the anti-shock, use one C7 type of screw to lock it.

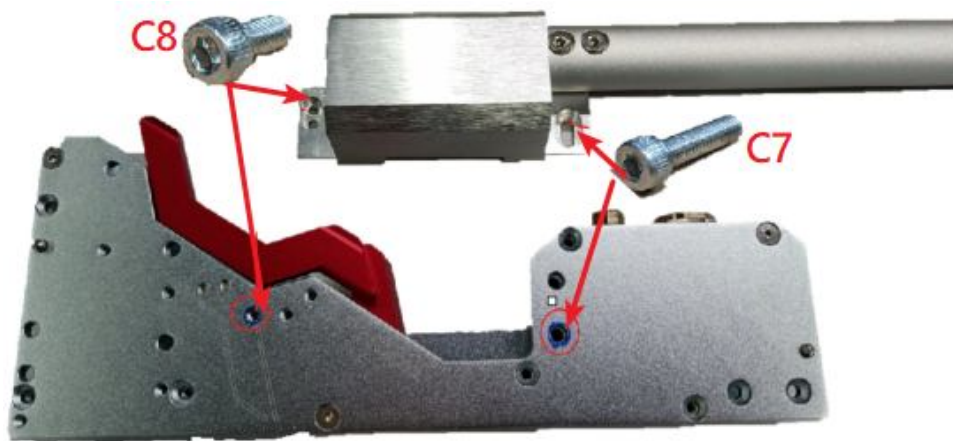


Figure 1.2-25

PRINthead RIGHT SIDE INSTALLATION

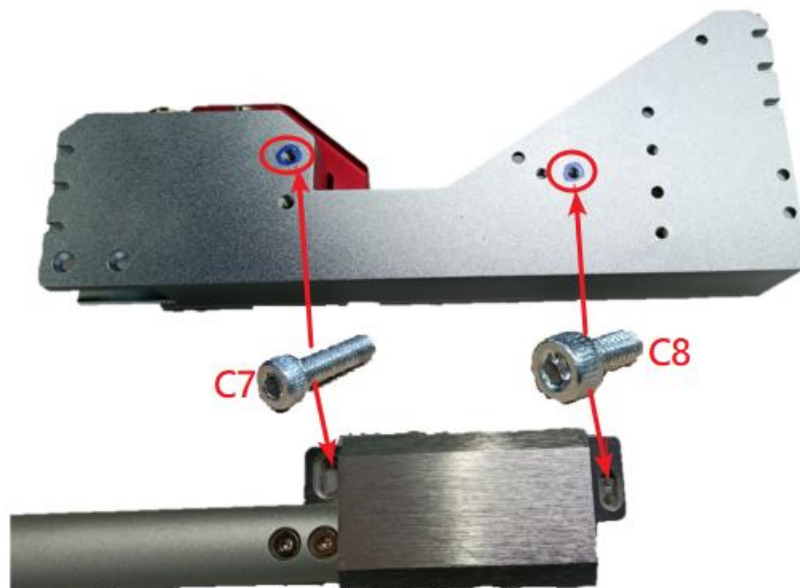


Figure 1.2-26

1.2.8 Printhead Bracket Installation

STEP1: Assemble the B02 bar into the B09 base by using two screw type C03 (add washer).



Figure 1.2-27

STEP2: Mount the base B09 on the conveyor using four C02 type of screw. To mount on the side, use the upper holes and the lower holes to mount on flat surface.

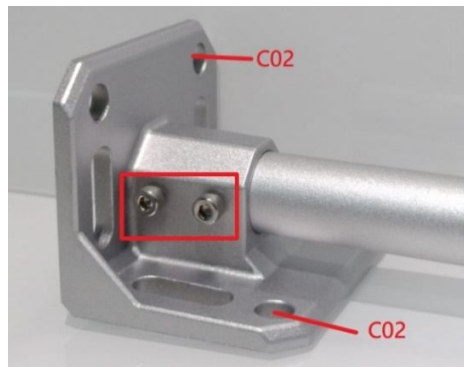


Figure 1.2-28

STEP3: Insert the B03 bar into the back of the printhead B04, and use four C04 (M3xL10) type to screw the bar and printhead together.

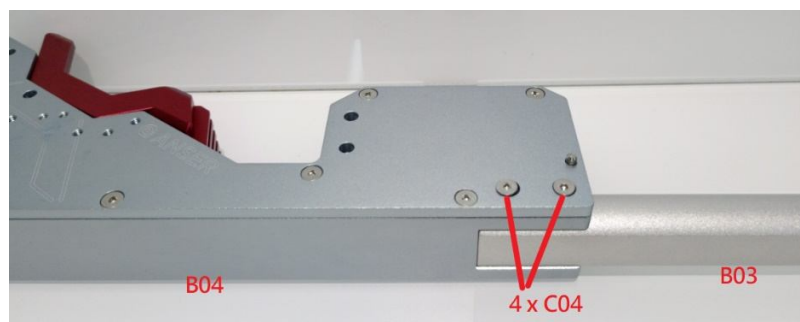


Figure 1.2-29

STEP3: Mount the printhead on the main base using two bracket connectors and the B01 bar. After finding the desired position for the printhead, use two C01 long screws for each connector and screw tightly both sides of the connector.

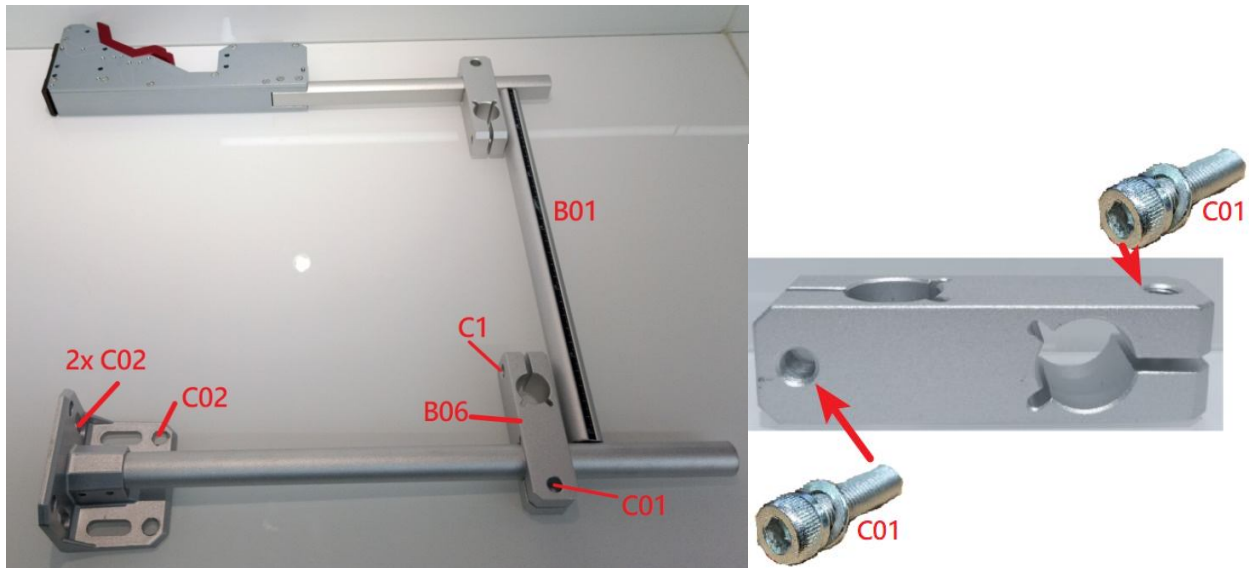


Figure 1.2-30

STEP4: Connect the ground wire connector (yellow/green wire 18 AWG) to the chassis ground source located at the back of printhead.

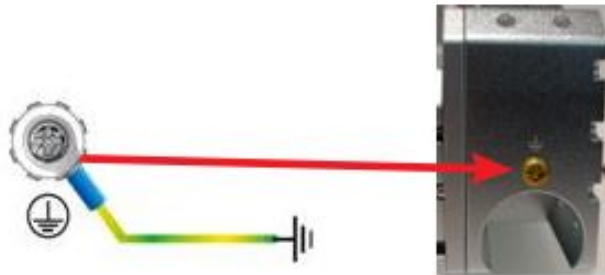
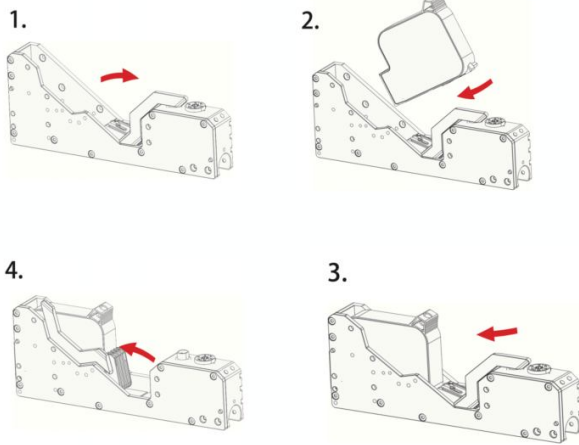


Figure 1.2-31

⚠ Power off the controller before removing or plugging any of printhead cables.

1.2.9 Cartridge Insertion & Removal

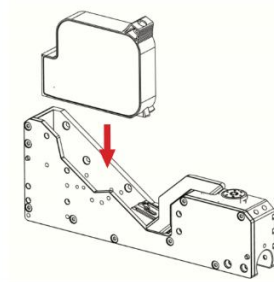
INSERTING THE CARTRIDGE



1. Open the printhead latch
2. Insert the cartridge at 45 angle careful not to scratch the nozzles with the pen board pins.
3. Gently push the cartridge into position.
4. Close the printhead latch.

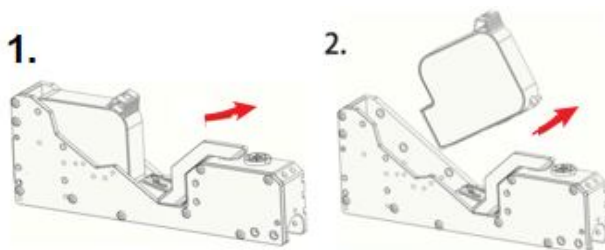


Insert the cartridge after system has completed boot up (login page).



Do not insert the cartridge vertically.

REMOVING THE CARTRIDGE



1. Open the printhead latch
2. Position the cartridge at 45 angle and pull it out.



Stop printing before removing the cartridge.

X1 USER INTERFACE

This chapter contains the description of the X1 user interface.

2.1 Getting started with X1 User Interface

The following information is described:

- Initial Setup
- Getting to know the homepage
- Getting to know the message editor
- Getting to know the device settings
- Getting to know the settings page

2.1.1 X1 wizard setup

Upon powering up X1 for the first time, the system will prompt a login page (Figure 2.1.1) where the user can set up an admin account. The user can also import the settings directly from another X1 controller using the USB.

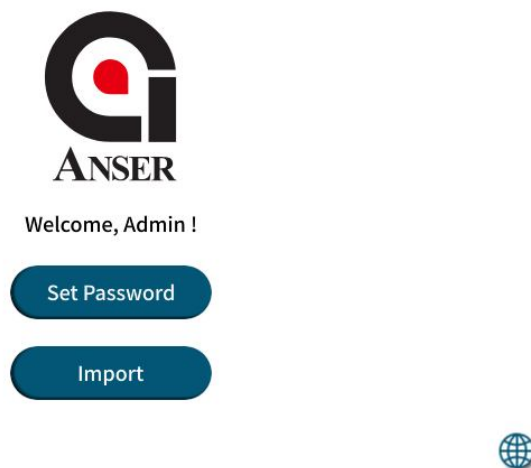


Figure 2.1-1

After creating an Admin account, the X1 wizard will guide the user on configuring the system date time and the necessary settings to start with X1, as seen in the following images

System Time

Year

Month

Date

2021

5

20

Hour

Minute

Second

16

50

16

Time zone Africa/Abidjan

24 Hour Format

PM

System Unit

mm

← Back

→ Next

Figure 2.1-2

1

2

3

Skip All

Production Line Settings

Name your Production Line and set the production line speed for the encoder.

Name

Production Line

Encoder

Production Line Speed

9.29

meters/min

Output DPI

300

← Back

→ Next

Figure 2.1-3

Options	Description
Production Line	Where one or multiple print stations can be installed for printing on different products. Please refer to section 2.4-1
Name	Name for production Line.
Encoder	Switch button on when working with encoder.
Production Line Speed	Input speed value when conveyor moving with constant speed.
Output DPI	Adjust the size and density of the printing message.

Table 2.1-1

After setting up a production line, the next step is to assign a print station which can compose of one or two printheads.

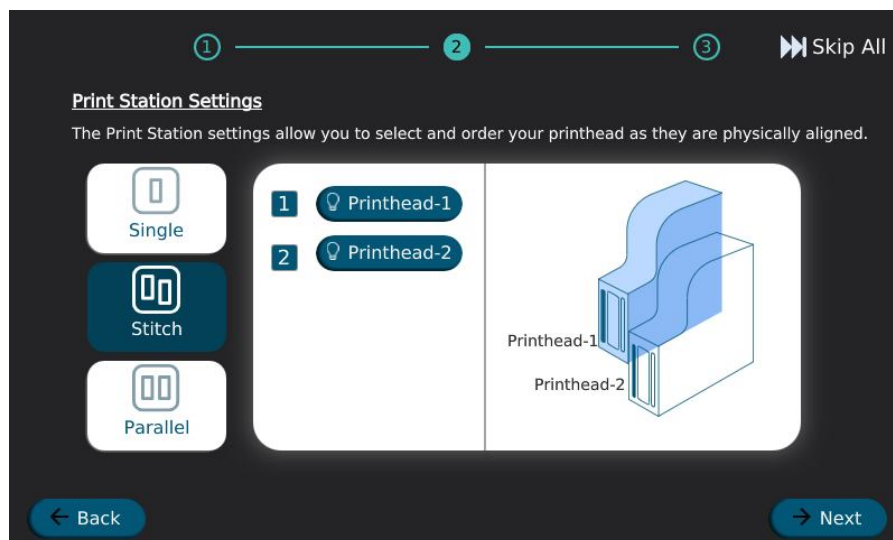


Figure 2.1-4

Options	Description
Print Station	Refers to a single or union of two printheads installed in a production line. Please refer to section 2.4-2
Single	Print station containing one single ½" or 1" printhead.
Stitch	A print station composed of two ½" or two 1" printheads stitch together to achieve a higher print message.
Parallel	A print station is composed of two ½" printheads installed in parallel to each other for non-stop printing.

Table 2.1-2

The last step in the wizard initial setup is to configure the settings related to the print station.

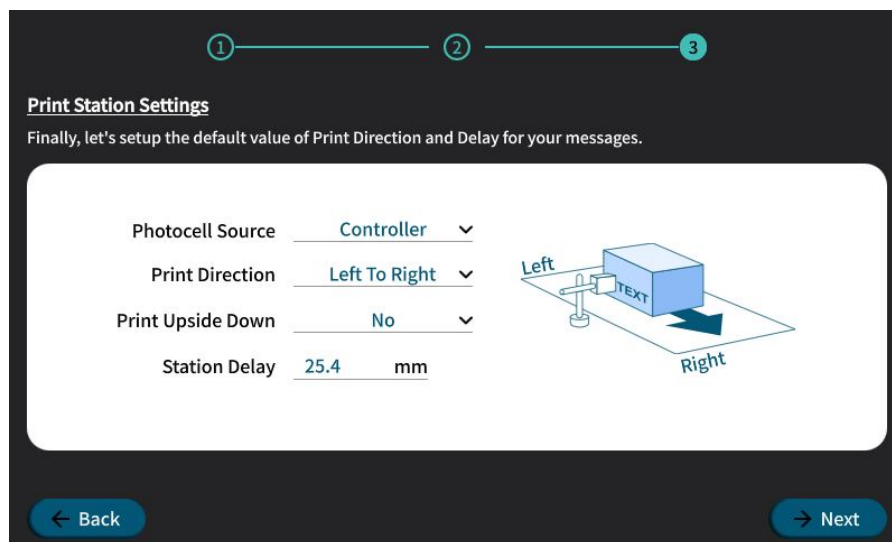


Figure 2.1-5

Options	Description
Photocell Source	Set the sensor signal coming from the controller or printhead .
Print Direction	Set according to the moving direction of the object when passing in front of the print station.
Print Upside Down	All messages are printed using upside down orientation
Station Delay	The distance (mm or inch) from the sensor trigger to the location on the product where the print starts. Please refer to Figure 2.4-6 .

Table 2.1-3

Save the initial setup and confirm whether you want to proceed to the message editor or homepage (**Figure 2.2-1**).

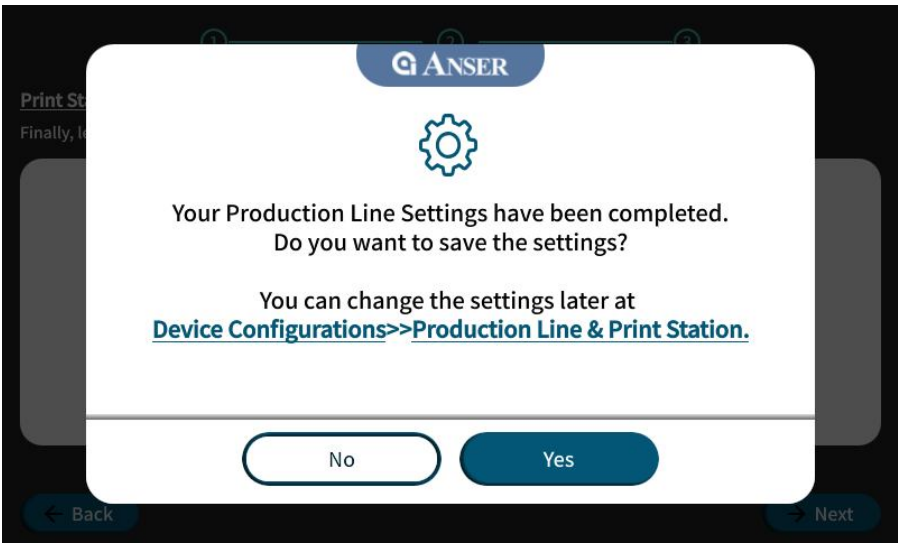


Figure 2.1-6

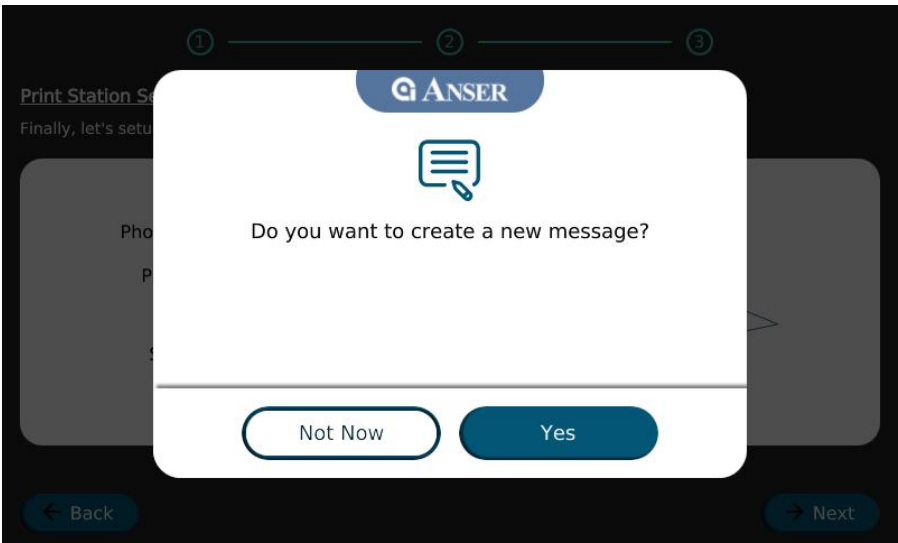


Figure 2.1-7

2.2 Getting to know the homepage

The X1 system homepage provides essential information about the status of the production line, print station, and printheads, where the user can quickly know what is happening through all the components.



Figure 2.2-1

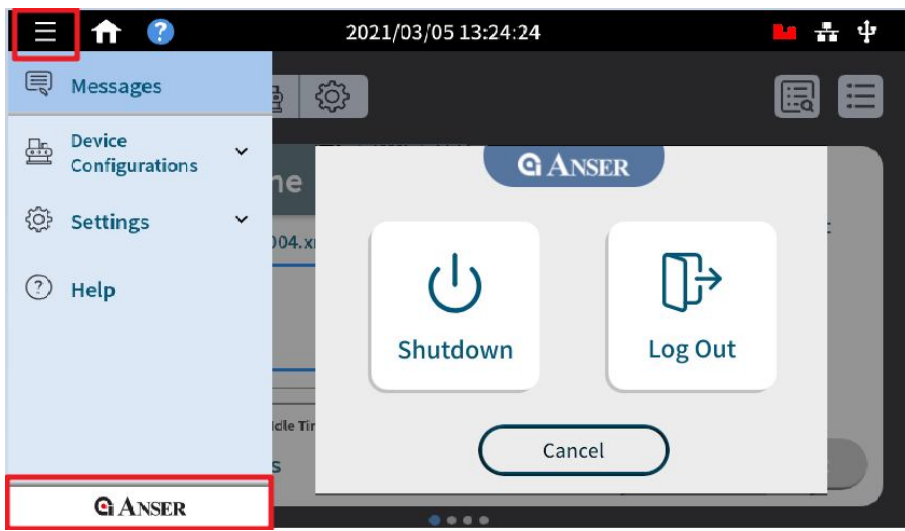


Figure 2.2-2

No.	Options
1	<p>Home Button: Return to the main page as shown in <i>Figure 2.2-1</i>.</p> <p>Menu Tree Button: Access to system main menus.</p> <ul style="list-style-type: none"> - Log out: Log out from current user account, and back to login page. - Shutdown: Perform a soft shutdown of the system before pressing power off button in hardware controller. <i>See figure 2.2-2</i>
2	<p>Status Bar: Provides information about the status of Ethernet, WIFI, USB, and cartridge alarm. Pressing the icon to open the setup page for Ethernet, WIFI, and USB interfaces respectively.</p>
3	<p>Start/Stop All production Line button</p> <p>Message List: Opens the select message list page where a new message can be set to print mode.</p> <p>Create New Message Button: Opens X1 on-board message editor.</p> <p>Device Configurations Button: Quick access button opens the <i>Device Configuration</i> menu.</p> <p>Settings Button: Quick access button opens the <i>Settings</i> menu.</p>
4	<p>Printing Display Information Button: Access the information display page to select the type of printer and cartridge information to be displayed on the main page.</p> <p>List View Button: Displays production line information in list mode useful when working with more than one production line.</p>
5	<p>Production Line Settings Button: press to access the current production line settings page.</p>
6	<p>Print station Mode (single, stitch, or parallel): Press to access the print station settings page.</p> <p>Quick Edit Button: Permits quick parameter adjustment while the printer is in printing mode.</p> <p>Ink Cartridge Information: Provides information on the status of the cartridges such as ink level and the number of prints. How this information is displayed can be defined on the information display page.</p>

	Printing Start Button
7	Printing Message: Display the message assigned to the print station. Also, allows performing changes to the current message.
8	Information Display Area: Display printing statistical information as well as performance information. By default, 3 items are displayed, and accessing the information display page, additional information can be selected. Also, by pressing this area, more information can be obtained.

Table 2.2-1

2.3 Getting to know the message editor

X1 offers the possibility to create and edit messages directly in the controller. The X1 editor offers to the user the tools necessary to make message editing a more straightforward process.

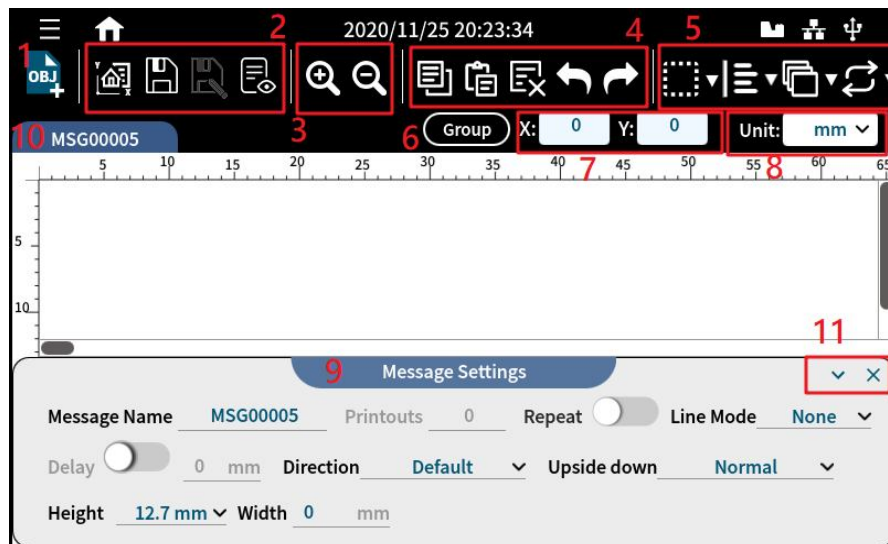


Figure 2.3-1

No.	Options
1	Add Object Button: Opens object management page where users can find different types of objects to include into printing.
2	Reset Position Button: When the canvas position is too far to the right-hand side, press this button to go back to the initial position.

	<p>Save Button: Once finish editing the message, press Save to store the message.</p> <p>Save As Button: When editing the existing message, if wish to keep the original message, press this button to save it with a different name.</p> <p>Print Preview: Display a preview of the message.</p>
3	Zoom: Permits zoom in and out objects within the editor.
4	Clipboard Buttons: Permits the user to copy, paste, and delete objects in the editor, as well as undo actions.
5	<p>Alignment Buttons:</p> <ul style="list-style-type: none"> • Select, unselect all, and multiple select objects. • Align objects in different positions. • Send a selected object to the back or bottom and bring an object to the front or top. <p>Orientation Buttons: This allows the user to set the orientation of objects.</p>
6	Group: Print objects within one message by assigning them to any of two groups, which later the group can be assigned to one print station. If using color ink cartridges, select the color of the cartridge used to print the group.
7	Object Positioning: Display the position of the selected object on the editor.
8	Canvas Measurement Units: This allows the user to change the measurement units of the canvas to millimeters, inches, or pixel.
9	Message Settings: Display settings related to the message being edit.
10	Access Message Settings Button: Press this button to access and display the configuration parameters of the current message.
11	Toggle Button: Press this button to toggle down/up or hide the message settings window.

Table 2.3-1

MESSAGE SETTINGS

Options	Description
Message Name	Default system message or custom input by the user
Printouts	Set a maximum number of prints for the message. The value zero means no limit.
Repeat	Enable repeat print settings for the message. Repeat print settings can be found in printhead settings.
Line Mode	Add editing guidelines to message editor. Useful when creating a message containing content spread in multiple lines.
Delay	The distance (mm or inch) from the sensor to the printhead cartridge nozzle. Each individual message can have its own delay value. Please refer to Figure 2.3-2 . When enabled will overwrite Print Station Delay .
Direction	Message printing direction, as a default, follows print station Print Direction .
Upside Down	Default: Follows the print station setting Normal: Overwrites the print station print upside down setting. Upside Down: Print the message upside down orientation.
Height	Message height based on the printhead height.
Width	Display the width of the current message considering the object furthest to the right side.

Table 2.3-2

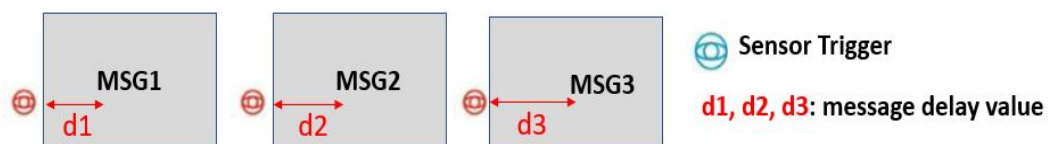


Figure 2.3-2

2.4 Getting to know the device configuration page

The device configuration menu is where users can find settings related to the production line, print stations, printheads, and external devices. If initially no setup has been done, then the user can access this page to set up both the controller and printheads. Additionally, settings for serial communication capable devices can be found on the **External Devices** page.

2.4.1 Production Line Page

It displays an overview of the production line and allows the user to create, edit, and remove production lines and print stations.

One production line setup can support up to two print stations in single mode, and only one print station in stitch or parallel mode. Same printheads can exist within multiple production lines set up, but two production lines can't use the same printhead simultaneously.

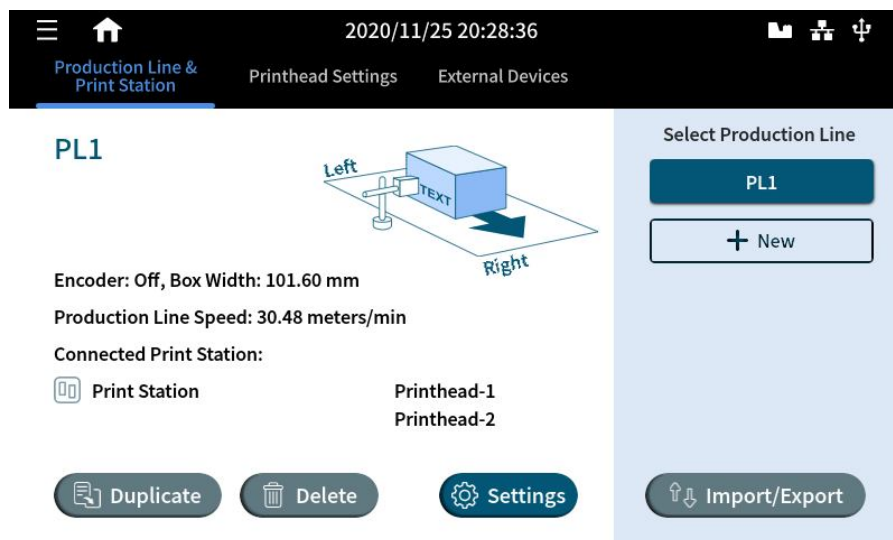


Figure 2.4-1

The production line & Print station page allows user to perform the following:

- Create a production line
- Access production line settings
- Delete or duplicate a production line
- Import or export production line

The **Production Line & Print station** settings page display parameters related to the production line on the left side of the panel and the option to add **Print Station** on the right side, as shown in *Figure 2.4-2*.

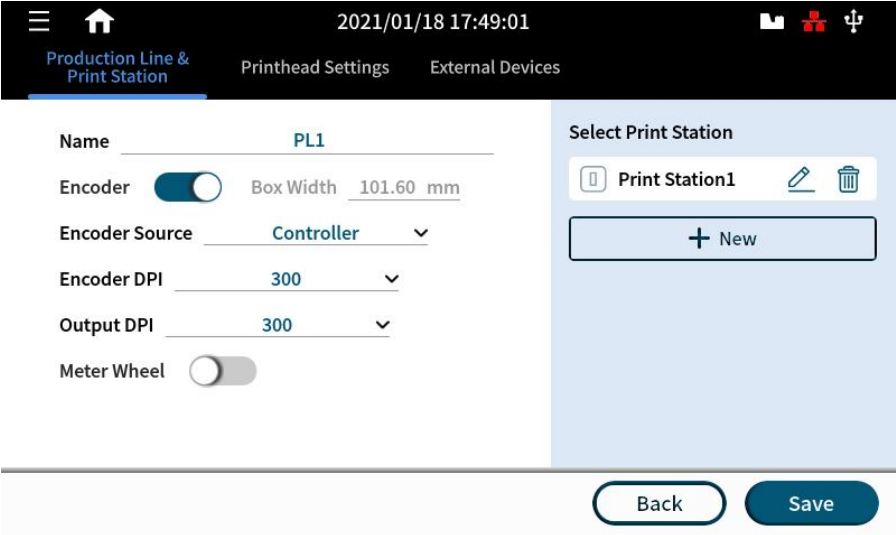


Figure 2.4-2

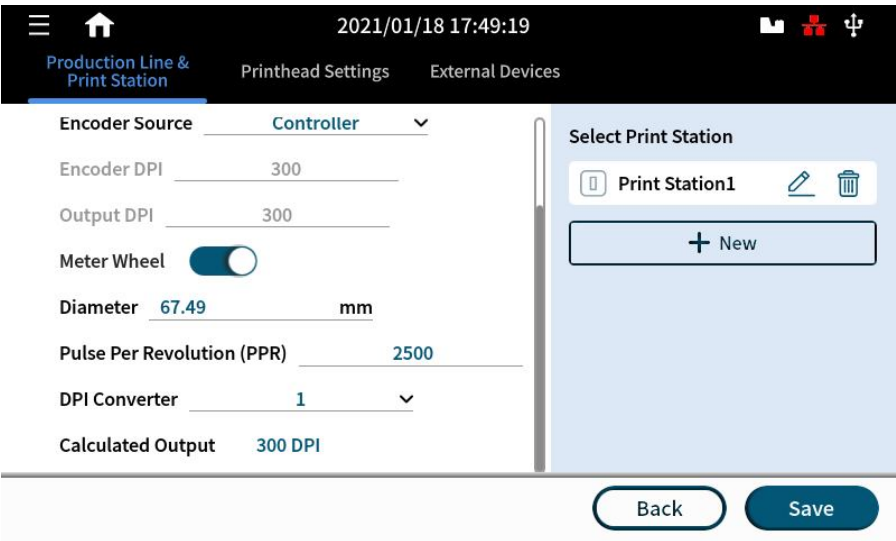


Figure 2.4-3

Options	Description
Encoder Source	Encoder is connected to controller or printhead. If encoder option is switched off, i.e., not connecting encoder, printer will generate the signal with a constant speed by itself. <i>Refer to chapter 3.1.</i>
Encoder DPI	Resolution (DPI) of the encoder.
Output DPI	Actual printout DPI. User can divide encoder DPI into the smaller value.
Meter Wheel	Enable the option to use your own encoder. User can manually input the diameter and PPR.
DPI Converter	Divide encoder DPI by 1 to 8.
Calculated Output	Show actual printout DPI calculated by diameter, PPR and DPI converter. $DPI = \frac{PPR * 25.4}{D * \pi * converter}$

Table 2.4-1

2.4.2 Print Station

Adding a new print station automatically displays the print station page where the user can assign different print station modes (Single, Stitch, and Parallel). Swipe up to find settings related to the photocell sensor, print direction, and print delay.

2.4.2.1 Single Print Station Mode

Some applications require to print content on two sides of a product that it is running on one production line.

X1 supports up to two single printheads which means the user has the flexibility to set up two single head print stations within the same production line setup.

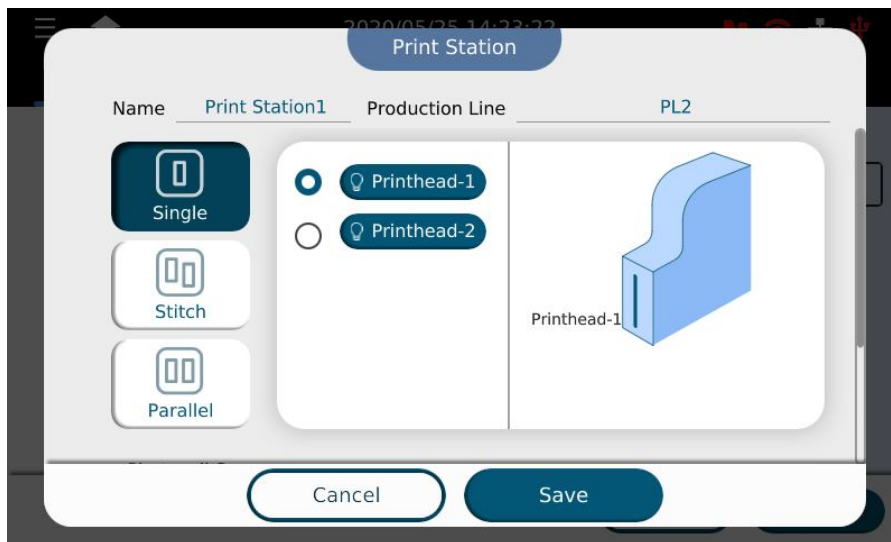


Figure 2.4-4



Figure 2.4-5

STATION DELAY

User must measure the distance from the sensor trigger point to the location on the product where to start the print, and the measurement should include the separation from sensor installation to the cartridge nozzle.

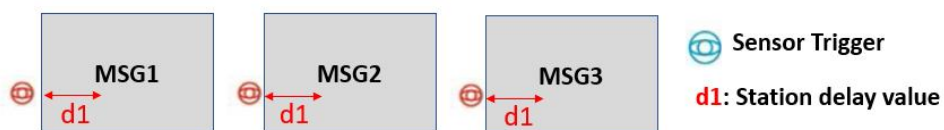


Figure 2.4-6

Note: The same delay value applies to all the printing messages.

2.4.2.2 *Stitch Print Station Mode*

The stitch mode printing station allows combining two half or one-inch print heads, thus achieving prints with a height of up to two inches. A production line can only have one print station in stitch mode since in this mode both heads are occupied.

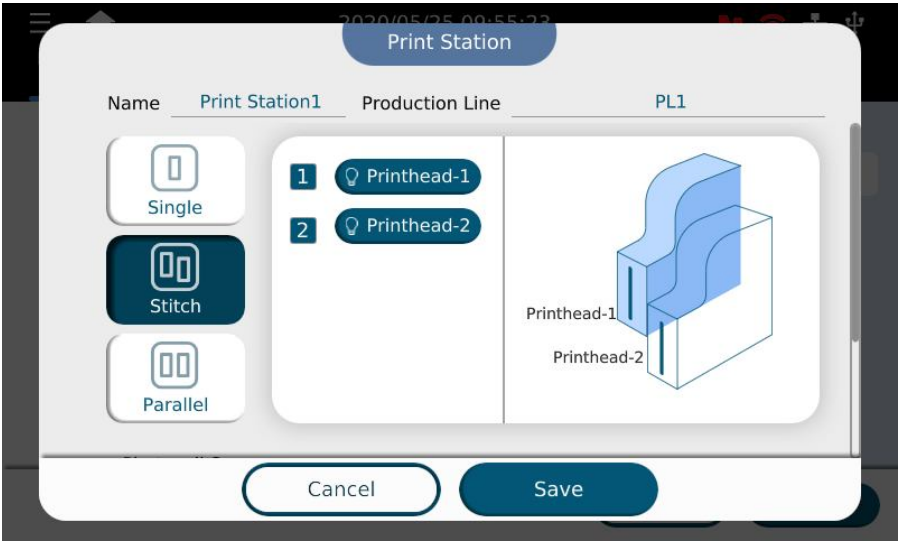


Figure 2.4-7

2.4.2.3 *Parallel Print Station Mode*

X1 parallel print station mode gives the user a production without downtime. Two cartridges printing alternatively based on different ratios configured by the user. Software monitor cartridge level and automatically switch to the second cartridge allowing the operator to replace the empty cartridge without needing to stop the production.

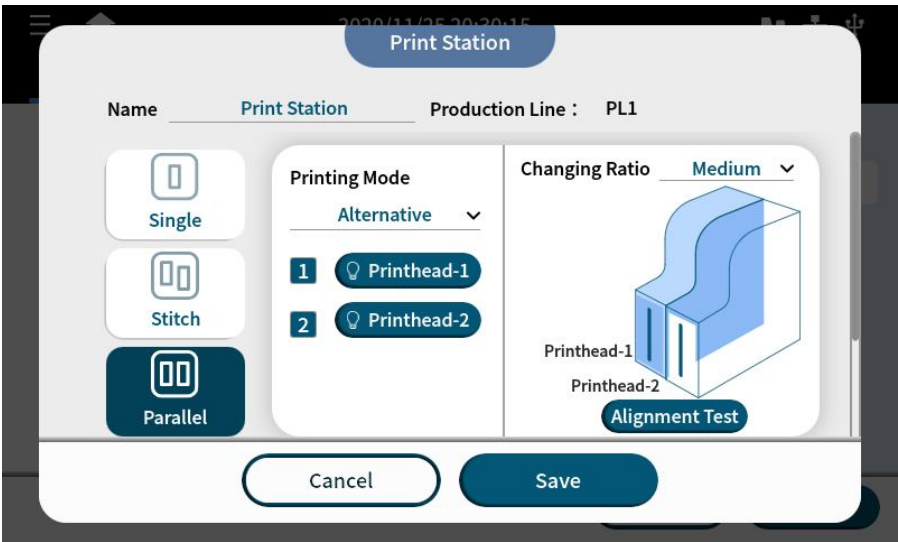


Figure 2.4-8

Ratio	PH1:PH2
High	1:12
Medium	1:6
Low	1:3

Table 2.4-2

Additionally, a parallel print station allows setting Dual Color mode. In this mode, two ink color cartridges can be used to achieve the effect of printing one message with two different colors. In the message editor, parts of the message are organized in groups each representing one color cartridge.

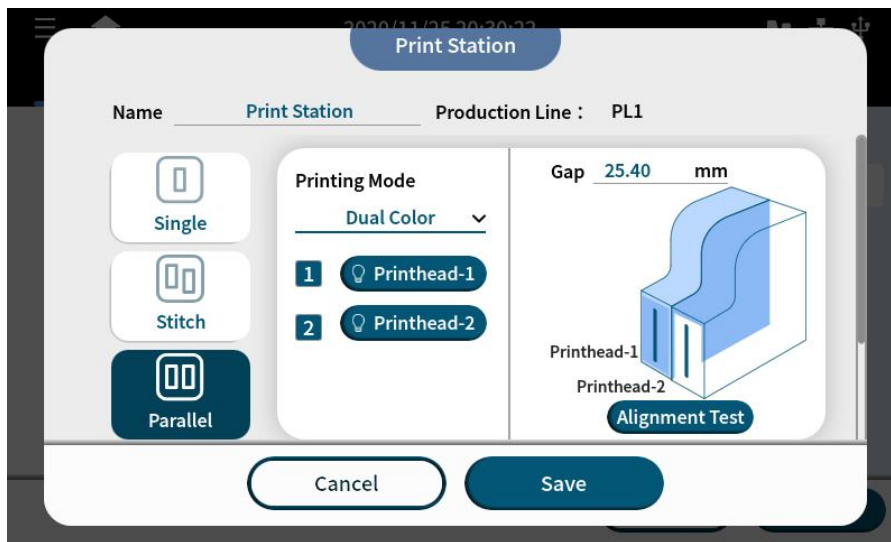


Figure 2.4-9

2.4.3 Printhead Settings

After one print station is created, users can configure parameters related to the printheads bind to the print station.

On the right side of the settings page, listed all the printhead setup related to existing print stations, and on the left side, an overview of the parameters related to the selected print station. Pressing the **settings** button (Figure 2.4-9) opens the printhead settings page, as shown in Figure 2.4-10.

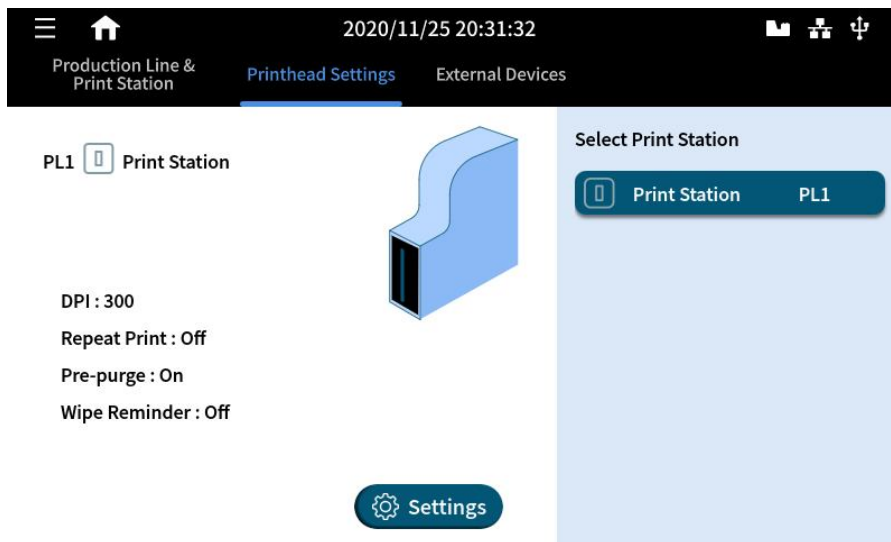


Figure 2.4-10

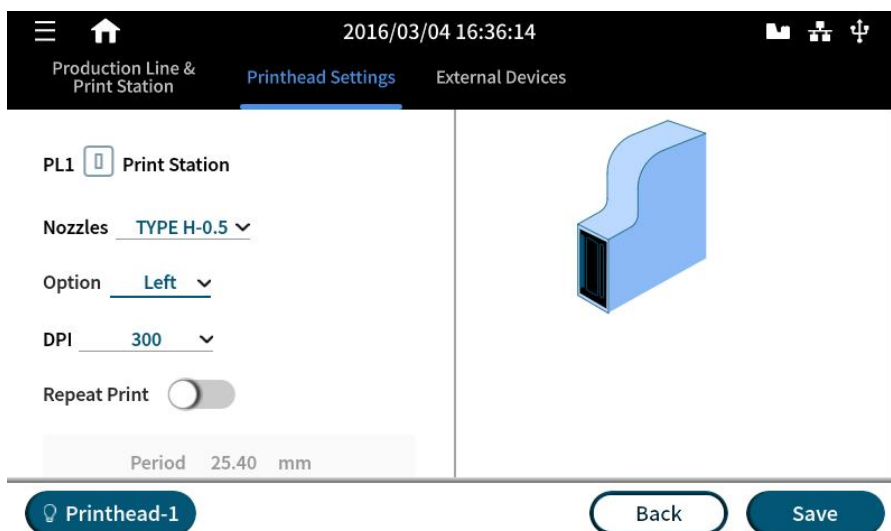


Figure 2.4-11

Options	Description
Nozzles	The type of cartridge print engine. Switch between options to change printhead type. Refer to chapter 3.3
Option	<ul style="list-style-type: none"> - Select left or right nozzle row - One-inch printhead only one row available. - All options alternate between rows while printing.
DPI	Vertical resolution. 600 DPI, print HD mode while the horizontal DPI matches the connected encoder.
Repeat Print	<p>Allows the user to configure the printhead to print in continuous mode</p> <p>Trigger: Enable to trigger by a photocell sensor or disable to trigger while the encoder is rotating.</p> <p>Initial Delay: Set a delay value to the beginning of the first print in the repetitions after sensor is triggered. Please refer to Figure 2.4-12</p> <p>Period: Message length plus the gap between each repetition.</p> <p>Infinite: Switch on to enable infinite repetitions.</p> <p>Count: When infinite switch off, set a finite number of repetitions.</p>
Stitching Alignment	Allows the user to perform vertical and horizontal alignment adjustments when using Stitch mode.
Pre-purge	<p>Firing ink drops to avoid nozzles dry out from the result of cartridge short-decap, when printing in dry environments.</p> <p>Auto: automatically determine parameters for the ink cartridge inserted.</p> <p>Custom: manually set the time and level parameters to purge the nozzles</p> <ul style="list-style-type: none"> - Interval: the time in seconds to start a purge cycle. - Level: Refer to the frequency of pre-purge cycle. The higher the level, the shorter time for each purge cycle.

Table 2.4-3

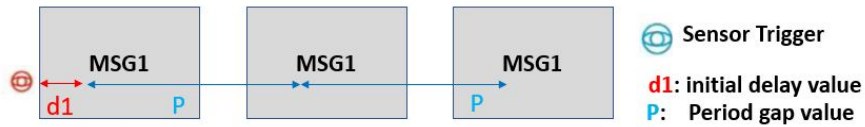


Figure 2.4-12

Note1: Initial Delay has top priority over message and print station delays.

Note2: Period value must be greater than the printing content total width.

2.5 Getting to know the Settings page

Access through the main menu or the quick access **System** button found on the home page (see Figure 2.5-1), leads to the settings menu.

2.5.1 System Settings

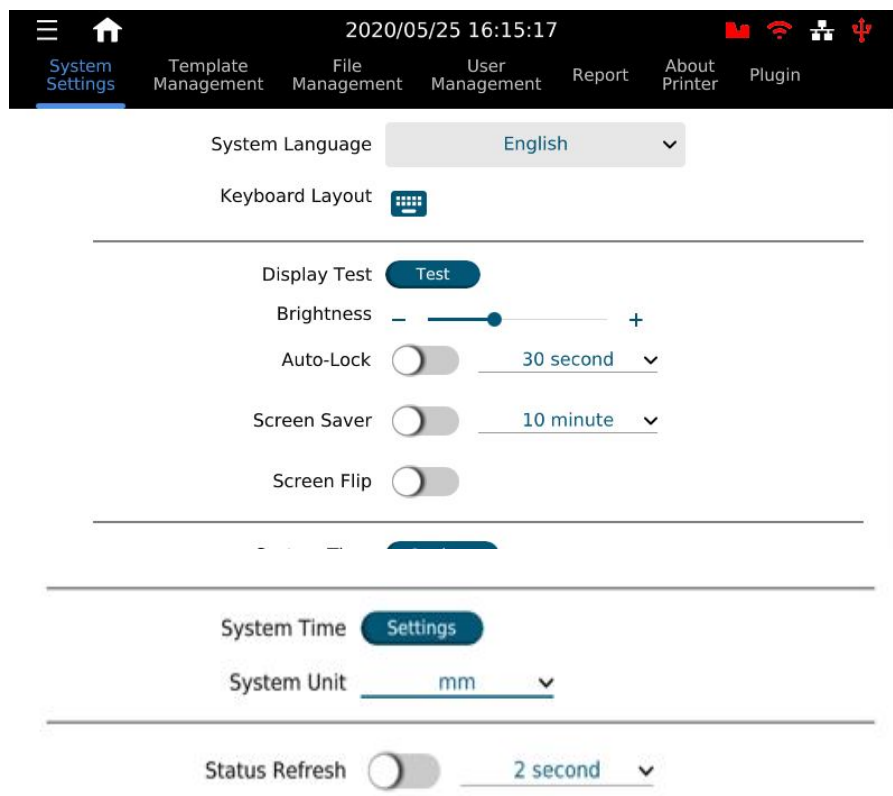


Figure 2.5-1

Options	Description
System Language & Keyboard Layout	Allows the user to change system language and add multiple languages to the keyboard.
Screen Settings	Permits the user to configure the following: Display Test: Perform a test on the LCD panel. Brightness: Adjust the brightness of the screen Auto-Lock: Log the user out of the system. Note: requires input password to log in again. Screen Saver: blanks the screen when the controller has been idle for a specified time. Screen Flip: Permits to rotate the screen 180 degrees when the controller is installed up-side-down. Touchscreen Sensitivity: Turn down to prevent accidental touch in dusty environment.
System	System Time: Allows to set system time settings. System Unit: Measurement unit.
Status Refresh	The time interval to update the information display data on the home page.

Table 2.5-1

2.5.2 Template Management

Navigate to System > Template Management (*Figure 2.5-2*) from the menu tree.

Templates are a good way to facilitate message content creation for the user. One or multiple templates for a specific object can be defined and used throughout all the messages.

When a template is imported into a message, a copy is created of that template. Even if the template were deleted, it won't affect the copy contained within the messages.

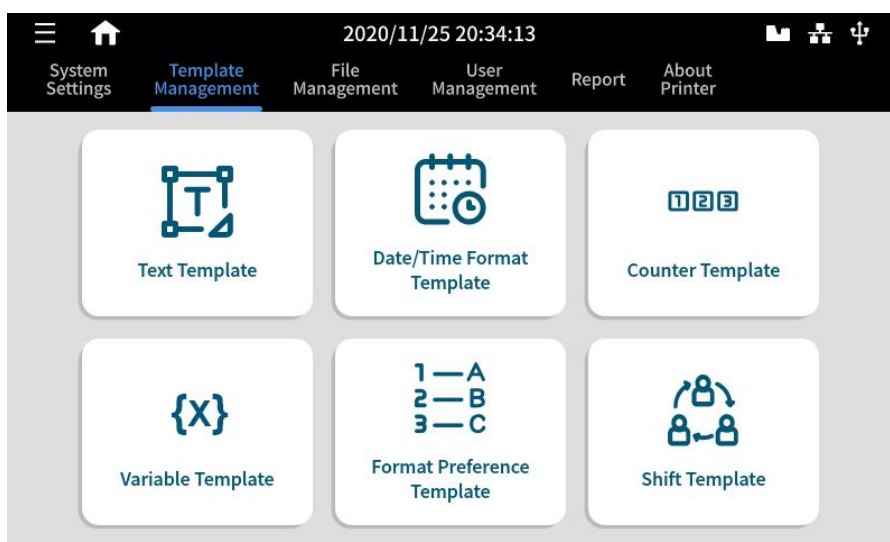


Figure 2.5-2

Options	Description
Text Template	Allows the user to create text objects that contained pre-fixed content.
Date/Time Format Template	Allows the user to create custom template formats for date and time objects.
Counter Template	Allows the user to create templates for counter objects.
Variable Template	Allows the users to create a table of variable objects containing pre-defined content. Can be used to store data sent by external devices.
Format Preference Template	Customize the name of the months used in production and expiry date objects.
Shift Template	Allows the user to create a table of work shifts for different operators and hour periods.

Table 2.5-2

2.5.3 File Management

Navigate to System > File Management (*Figure 2.5-3*) from the menu tree.

The file management page is a file center where users can manage all different types of files used throughout the systems. Here, users can import and export one or more files. The import and export process done using USB.



Figure 2.5-3

2.5.4 User Management

Navigate to system > User Management (**Figure 2.5-4**) from the menu tree.

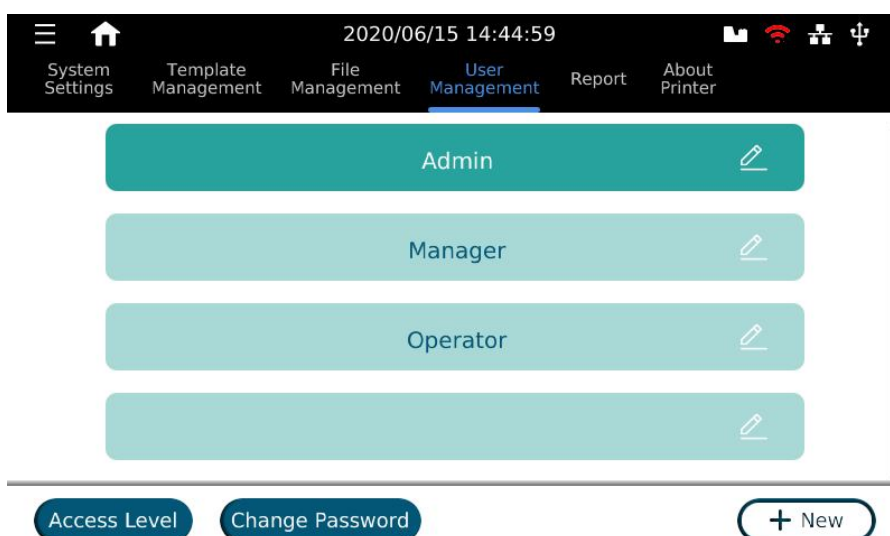


Figure 2.5-4

The X1 system provides three default accounts (Admin, Manager, and Operator), each with their respective access levels (*Table 2.5-3*). Admin can edit options for each account, delete existing accounts, and add new ones.

The user management page allows creating 13 additional user accounts. Each user can have different access levels for message creation, print jobs settings, and system configurations.

Access Level	Admin	Manager	Operator
Start/Stop/Select Message	✓	✓	✓
Create Message	✓	✓	
Delete Message	✓	✓	
Message Settings	✓	✓	
Edit Message	✓	✓	
Production Line & Print Station	✓	✓	
Printhead Settings	✓	✓	
External Devices	✓	✓	
Quick Edit	✓	✓	
Information Display	✓	✓	✓
System Settings	✓	✓	
Template Management	✓	✓	
File Management	✓	✓	
User Management	✓		
Report	✓	✓	✓
Restore/Backup/Reset	✓	✓	
About Printer	✓	✓	✓
Import/Export/ Printer Settings	✓	✓	

Table 2.5-3

Note: The default password for Admin is **Admin**, Manager is **Manager** and Operator is **0000**.

2.5.5 About Printer

Navigate to System > About Printer (*Figure 2.5-5*) from the menu tree.

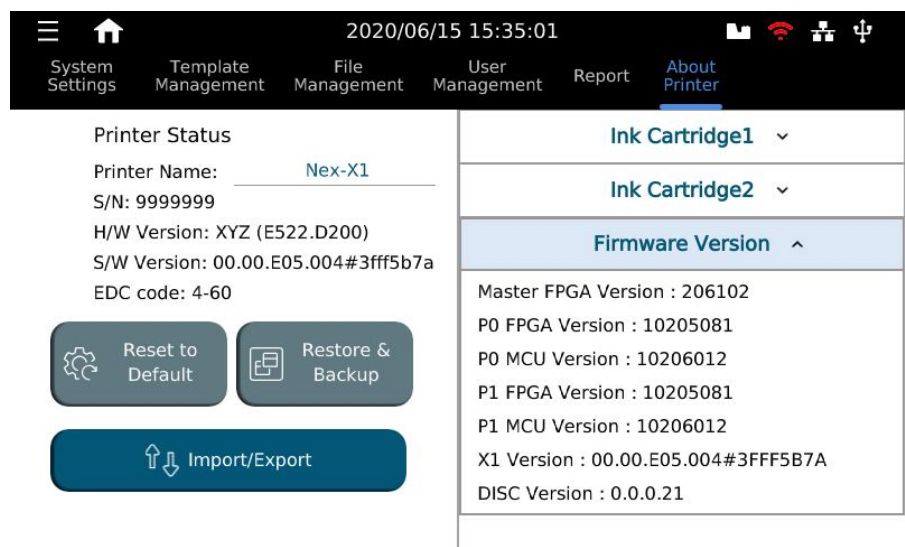


Figure 2.5-5

The **About Printer** page provides information about the controller software and hardware version — also, information about the printheads and ink cartridges (also seen by pressing cartridge icon).

Options to reset the system to factory default, restore the system from a backup and options to import and export can all be found in this page.

X1 Printing Setup

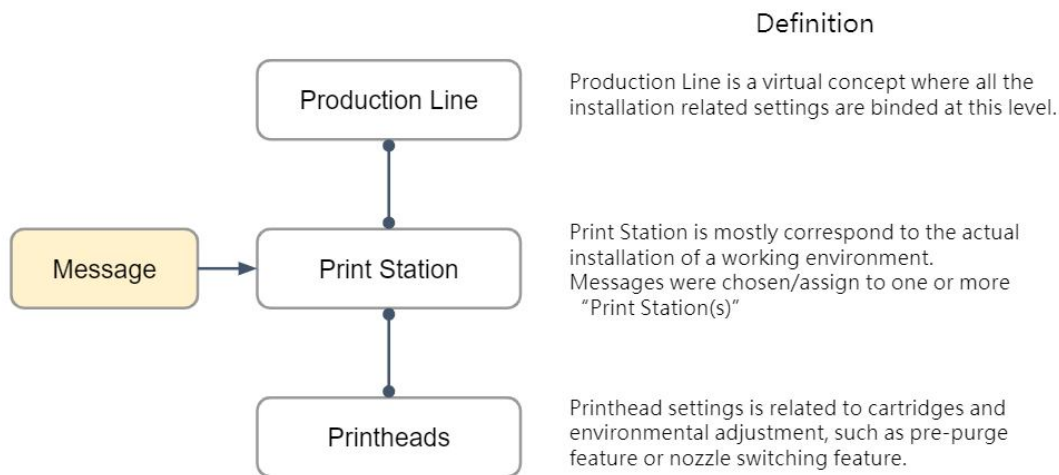






Figure 2.5-1

3.1 Production Line Setup

Production Line settings are the top layer of the X1 function structure (Figure 2.5-1), and they encapsulate print stations and messages. It is required for having a production line created before setting up print stations and selecting messages. Users can access directly from the home page by pressing the quick access button .

Users has the option to create a production line either by pressing the  button or import one from the other controller's Backup settings.


Creating a production line

- a. Press the  button
- b. Press the  button to access production line configuration parameters
- c. Name the production line
- d. Production Line speed settings
 - i. **With encoder:** enable encoder and specify whether connected to controller or printhead.
 - ii. **No encoder:** Input conveyor speed or use test option to detect current object speed by using a photocell sensor and width of the object.
- e. Select encoder DPI value according to encoder or input wheel pulse and diameter to calculate
- f. Press the Save button before proceeding to print station setup.

3.2 Print Station Setup

Print stations can contain one or two printheads combined in different modes according to their physical setup.

While in the production line settings page,

- a. Press  to add a print station
- b. Select print station mode (single, stitch, or parallel), add a name or use the default name
- c. Move down by swiping up to select settings related to photocell sensor source, print direction, print upside down, and station delay settings.
- d. Press Save.


Repeat the same steps when an additional single print station is needed. Once ready, press SAVE and proceed to printhead settings.

Note: In Stitch mode, the photocell sensor source should be set to the controller.

3.3 Printhead Settings

In the printhead, settings to define the type of cartridge to use in the station, vertical resolution, and options for repeat print. Likewise, pre-purge options can be configured to keep the nozzles moist when working in hot and dry environments.

Access printhead Settings overview page,

- a. Select the print station to configure the printhead settings
- b. Press the  button to access the selected printhead settings page
- c. Set resolution, repeat settings and pre-purge
- d. Press the Save button to save printhead settings.

Note: When using a half-inch printhead, select one of the nozzle rows or both for nozzle switching

3.3.1 Stitching Alignment

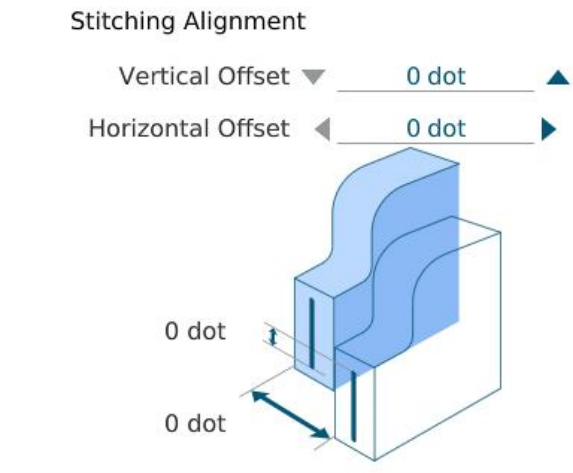


Figure 3.3-1

When working with print stations in stitch mode, a full-height message is printed by dividing the content into two parts and assigning them to each of the printheads forming the stitch print station. It is during the initial setup that there could be issues with a message not being properly aligned.

To align the printheads and print a complete message, the operator can perform physical adjustments to printhead installation, as well as, changing the stitch alignment settings directly in the X1 software.

- a. Perform an initial test print to confirm stitch alignment status.
- b. If there is a separation between the content, first do physical adjustments to the printhead installation, and perform another test print.
- c. If no improvements are observed, access to printhead settings then adjust the vertical or horizontal offset from the stitching alignment setup page.

3.3.2 Repeat Print Settings

Repeat print settings are applicable for applications where it is required to print the same content repeatedly a finite number of times or to continue printing while encoder motion is detected.

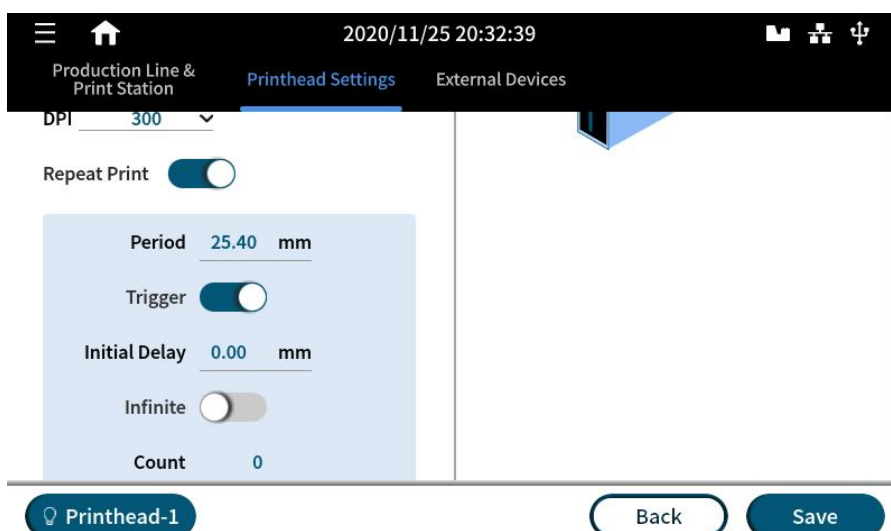


Figure 3.3-2

For example, printing ten times, 10mm after triggering the photocell sensor, and leave a gap of 20 mm between each repetition:

Parameter	Value
Trigger	ON
Initial Delay	10 mm
Period	20 mm
Infinite	OFF
Count	10


Table 3.3-1

3.3.3 Pre-Purge Settings



Enable pre-purge when printing after a certain time, the print quality starts to deteriorate working in a hot and dry environment. In such an environment, the cartridge nozzles tend to dry out much faster than in normal environment conditions.

Pre-purge releases drop of ink from time to time keeping nozzles moist when cartridge idle (in printing mode but no printing). The user can define the time cycle to purge the nozzles as well as the level (amount of ink drops) used per each purge. Please **Table 2.4-3**.

3.4 Creating a Print Message

Access message editor either by pressing the  button on the home page or from the menu “Message > Create”


To create a message containing a text object

- a. Set a name for the message, height, and other related settings if needed
- b. Press the  button to access the message object list
- c. Select Text object from the list, and select the template entries to edit
- d. Press the content field to bring up the keyboard, and press Enter after input the text content
- e. Select the font, size, and format of the object. If needed, apply stretching, spacing, and resolution settings to the Text object
- f. Press the  icon or the message name tab on the editor to bring back the message settings, and press the SAVE button to save and go back to the home page.

Note: Printhead 1 is always the printhead at the bottom when using stitch printheads

3.5 Quick Edit

It is possible to make adjustments to printing related settings while a print station is in operation.

Press the button  on the home page to access the Quick Edit settings page.

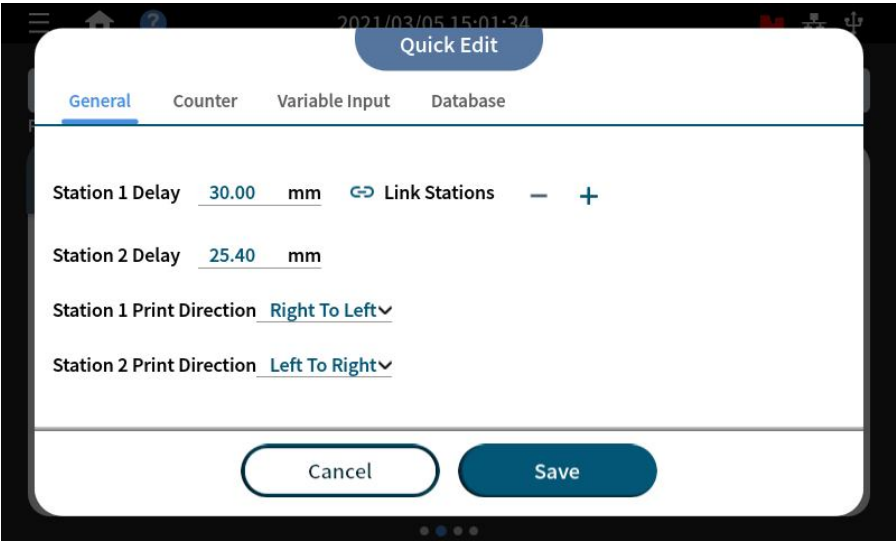





Figure 3.5-1

A. General

▶ Station Delay:

- when having two print stations (single) within the same production line, use the  button to enable link station delay. Both station delay can be adjusted simultaneously.
- The delay is applied in the next print.

▶ Print Direction: Change the print station print direction setting. Setting is applied after two prints.

B. Counter: All the options found in this tab are applied after two prints.

- ▶ **Message Counter:** Reset to zero information display count and total count parameters
- ▶ **Object Counter:** Reset the start value for the counter objects within a message.

C. Variable Input: Update one or multiple variable objects contained within the printing message. Useful when user is only allowed to change part of the message content. Use together with access level to achieve this purpose.

D. Database: After an excel (.csv) is imported, select from which row to start printing. Setting is applied after two prints.

X1 Operation

4.1 Usage of the variable (string) Object

X1 printer system enables users to set their own variables, such as Company name, addresses, URL, product number, etc. For application required to quickly replace specific content of the message without modifying the whole message layout, Variable is the right object to be used. Variable objects can also become the content source to a Barcode object, please see the below figure to understand the structure.

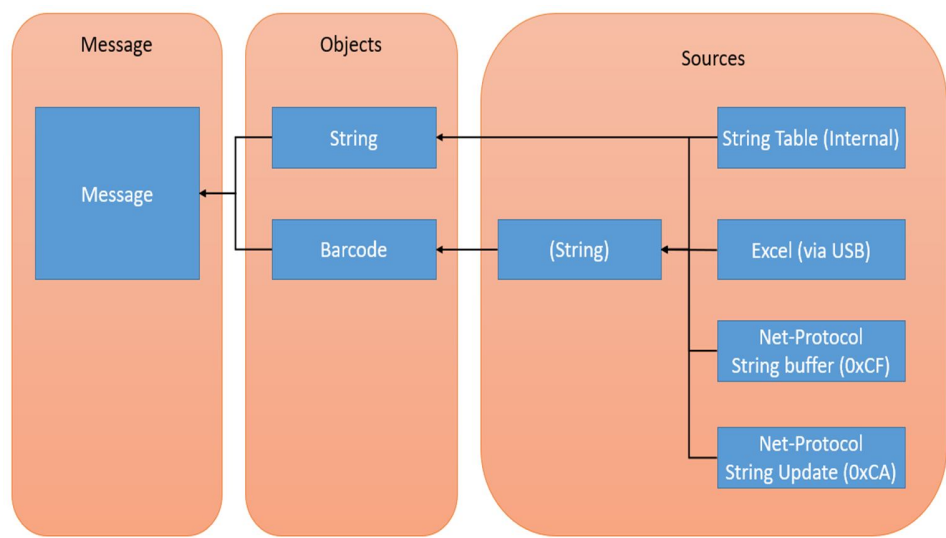


Figure 4.1-1

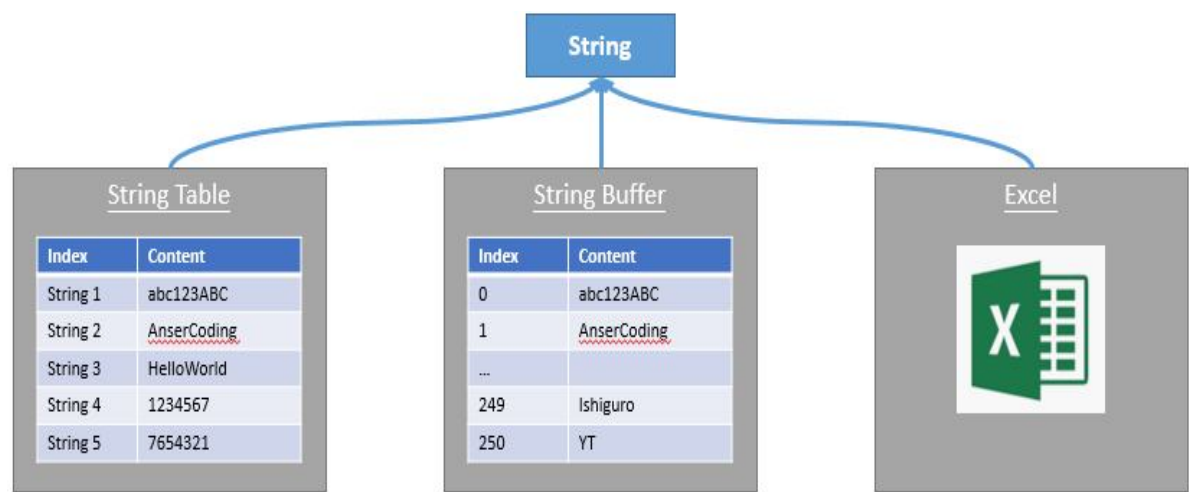


Figure 4.1-2

Methods to edit: 1. PC software (Message Pro X) 2. Controller UI 3. Net Protocol over Ethernet (0xCA) 4. USB Variable source setup as "Default"	Methods to edit: 1. Net Protocol over Ethernet (0xCF, 0xCB, 0xCC) Variable source setup as "External"	Methods to edit: 1. PC software (Message Pro X) String source setup as "Database"
--------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------

Table 4.1-1

4.1.1 Internal Variable Table

There is a total of 100 variables that can be defined and kept in an X1 controller. Each of the Variables can hold up to 100 alphabets (100 bytes). Message editor is full Unicode support in UTF-8 format.

4.1.2 Excel or Database

Variable objects are able to take imported .csv file extensions as a source. When a print job starts, the user has the option to preview and choose which entry or row he/she would like to start.

4.1.3 Data Update Using Communication Protocol (0xCA)

The CA command updates the internal Variable table. The data updated by the CA command can be printed as many times as the customer want before the next CA command were received.

4.1.4 Data Stream Using Communication Protocol (0xCF)

Unlike the CA command, the CF command uses a string First in First Out (FIFO) buffer. Therefore, the string data by CF command can only be printed once and will be removed from the buffer after print complete.

The size limitation of a single variable is also 100 bytes long, and the size of the buffer is 250.

4.1.5 Data from USB

Save to the internal table option will make the data written to the variable table and can be printed as many times as the user wants before the next overwrite.

Support to connect devices such as USB barcode scanners. Using the USB settings, user can manage the data coming from this USB COM port. For a set of stream data, set the position and the length of the data needed for printing.

Navigate to "Device Configurations > External Devices > USB"

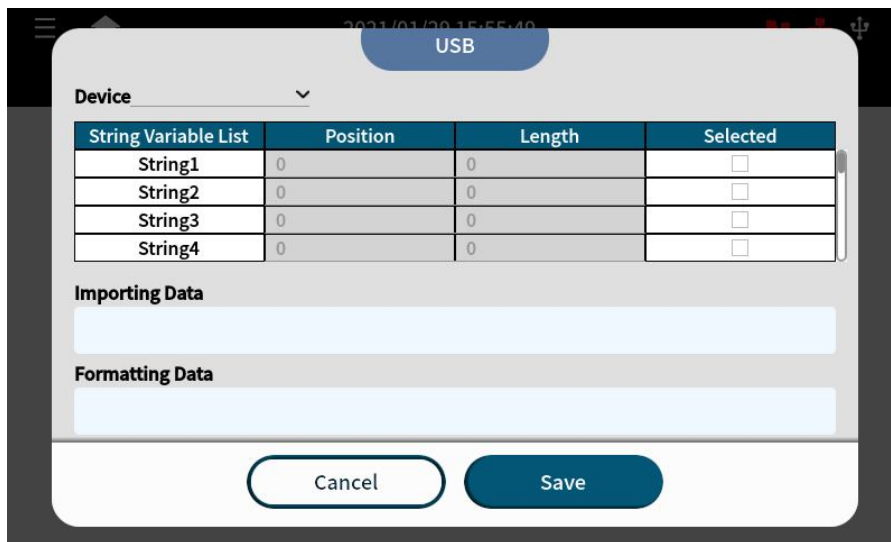


Figure 4.1-3

4.2 Format Preference

Navigate to “Settings > Template Management > Format Preference Template”

Create custom inputs for each month of the year. Refer to *Table 4.2-1*

Customized Month

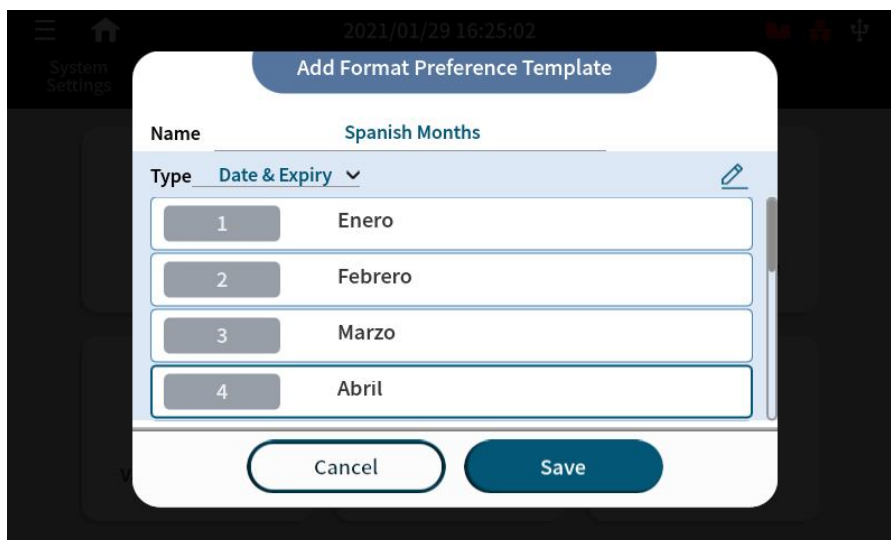


Figure 4.2-1

	Letters	Arabic	Spanish
January	AA	كانون . .	Enero
February	BB	شباط	Febrero
March	CC	آذار	Marzo
April	DD	نيسان	Abril
May	EE	أيار	Mayo
June	FF	حزيران	Junio
July	GG	تموز	Julio
August	HH	آب	Agosto
September	II	أيلول	Septiembre
October	JJ	٢ ين الأول	Octubre
November	KK	٣ ين . .	Noviembre
December	LL	كانون الأول	Diciembre

Table 4.2-1

4.3 Export & Import Data

There are two ways to export and import data from the X1 system, it can be done either from the "**About Printer**" menu or from the "**File Management**" menu.

About Printer

- Insert the memory into the USB port
 - Press the "Import / Export" button
 - Choose the action to import or export and select the USB.
 - Exporting creates a backup copy of all the information contained in the controller.
-
- **Note:** when exporting, the system creates a main directory as "Backup_xxxxxxx" containing folders for all the types of files found in the system.

File management

File Management can export and import one or multiple types of files such as messages, images, fonts, etc.

To Export,

Select the files to export from the file manager, press the "Export" button, and select the USB directory to export.

Note: when exporting, files are exported to the directory "File_Management_xxxxxxx".

To import,

1. You will need a system file directory that can be generated through the “Export” operation mentioned previously. After exporting, put one or multiple files under the corresponding subfolder, e.g., excel, font, logo...
2. Insert the USB into the USB port, click “Import” then access the directory of the USB where the files to import are located. **Backup_xxxx or File_Management_xxxx.**

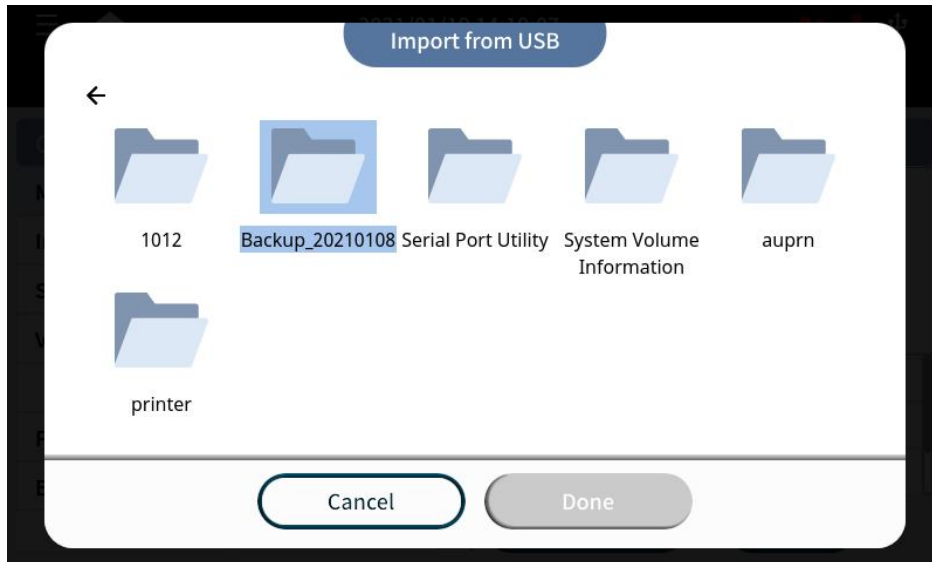


Figure 4.3-1

3. Dig into the file folder and press Done, the directory tree will show up.

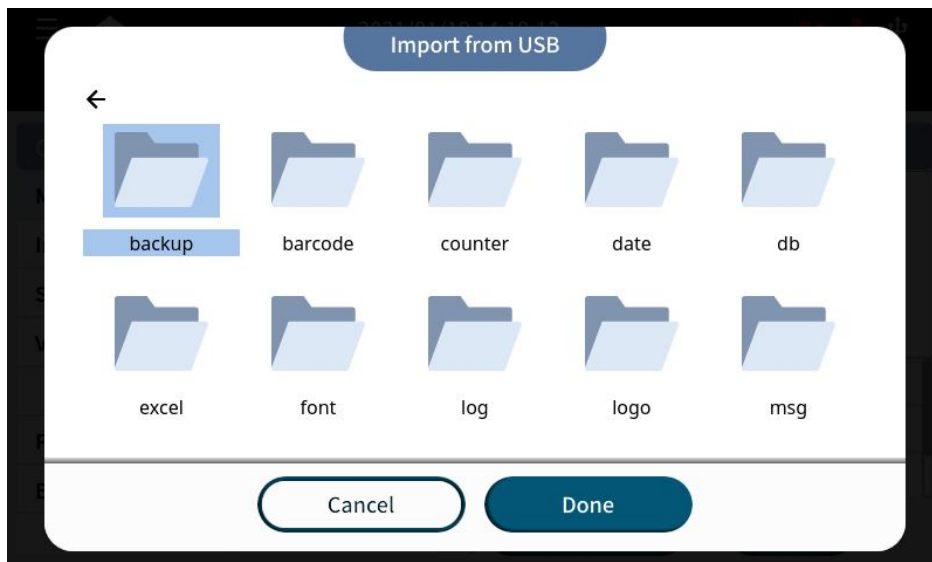


Figure 4.3-2

4. Select the files you want to import and press Done.

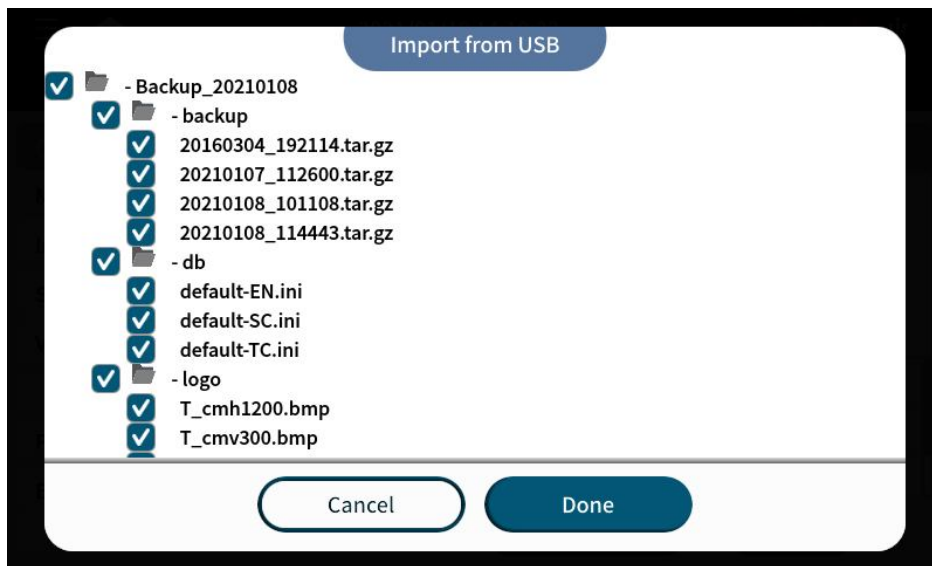




Figure 4.3-3

4.4 File & System Backup

To back up all system information on X1. Be sure to insert a FAT32 formatted USB before starting the backup.

Access "About Printer > Restore & Backup" by pressing the quick access button  on the home page, then going to the "About Printer" menu. Also, the user can access directly from the drop-down main menus located in the upper left corner.

Press the "Restore & Backup" button to enter the list of available backup copies. To back up the system, press the  button and to restore from existing copy, press the "Restore" button.

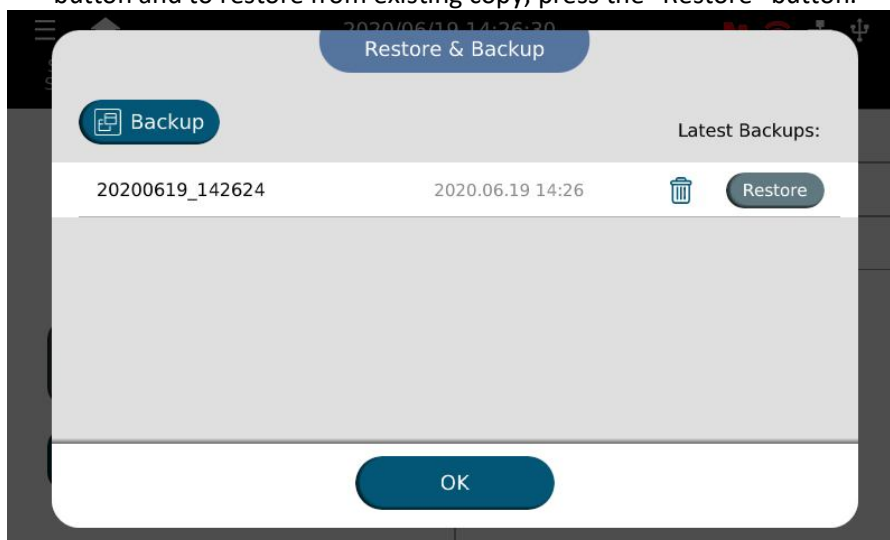


Figure 4.4-1

Troubleshooting

5.1 Fault Messages and Warnings

INK CARTRIDGE FAULTS

Fault	Description
No Cartridge	Normally happens when no cartridge is detected in the printhead. Additionally, could happen when chip failure or printhead latch abnormal.
Ink Type Not Support	The ink type is not supported in the current software version or printer model.
Ink Capacity Not Support	Ink cartridge volume is not supported in the current software version or printer model.
Ink Color Not Support	The ink color is not supported in the current software version.
Ink Empty	Ink cartridge empty, change a new cartridge.
Ink Low	The ink level reaches 5% or the custom trigger value.
EDC Not Match	Either the country code, area code or both codes don't match controller EDC.

Table 5.1-1

5.2 Status Definition

UI ICON STATUS









Device	Connected	Error	Error Event
Wi-Fi			Click icon shows Error message Dialog, Click See more Open Wi-Fi Setting Page
Ethernet			Click icon show Error message Dialog, Click See more Open Ethernet Setting Page.
Cartridge			Click icon show Error message Dialog, Click Open Ink Error String & Error Code.
USB			Click icon show Error message.

Table 5.2-1

UI AND WARNING LIGHT

PL Status	UI Display	Light	Buzzer	Trigger Condition	Exit Status condition
Idle	Gray	Off	Off	No printing / Stop Printing	Start Printing
Printing	Green	Green	Off	Start Printing	Stop Printing Error Ink Low or Empty
Ink Low	Yellow	Yellow & Green	Beep 3s	1. Reach threshold 2. Start with a low ink cartridge 3. Insert the low ink cartridge	Insert cartridge ink level over the threshold
Ink Empty	Red	Yellow & Red		Printed all available ink dots	Insert the cartridge with enough ink to print
Error	Red	Red		DISC related: 1. Can't read DISC 2. EDC error 3. Can't recognized DISC 4. No legal DISC 5. Ink type no supported 6. Cartridge latch no close 7. Printhead disconnected 8. Wiping reminder time up	When the trigger condition is released

Table 5.2-2

PRINTHEADS LED STATUS

Fault	White LED	Red LED	Notes
Cartridge Inserted	ON	OFF	Stand by
Printing Mode	Flashing	OFF	
Cartridge Removal	OFF	ON	Cartridge no inserted or no detected
Cartridge error/Ink Empty	ON	ON	
Ink Low	ON	Flashing	
No Power	OFF	OFF	
Discovery Mode	Flashing	Flashing	Alternately flash 0.2s ON > 0.2s OFF > 0.2s ON → 1s OFF then repeat 10 times

Table 5.2-3

Technical Specifications

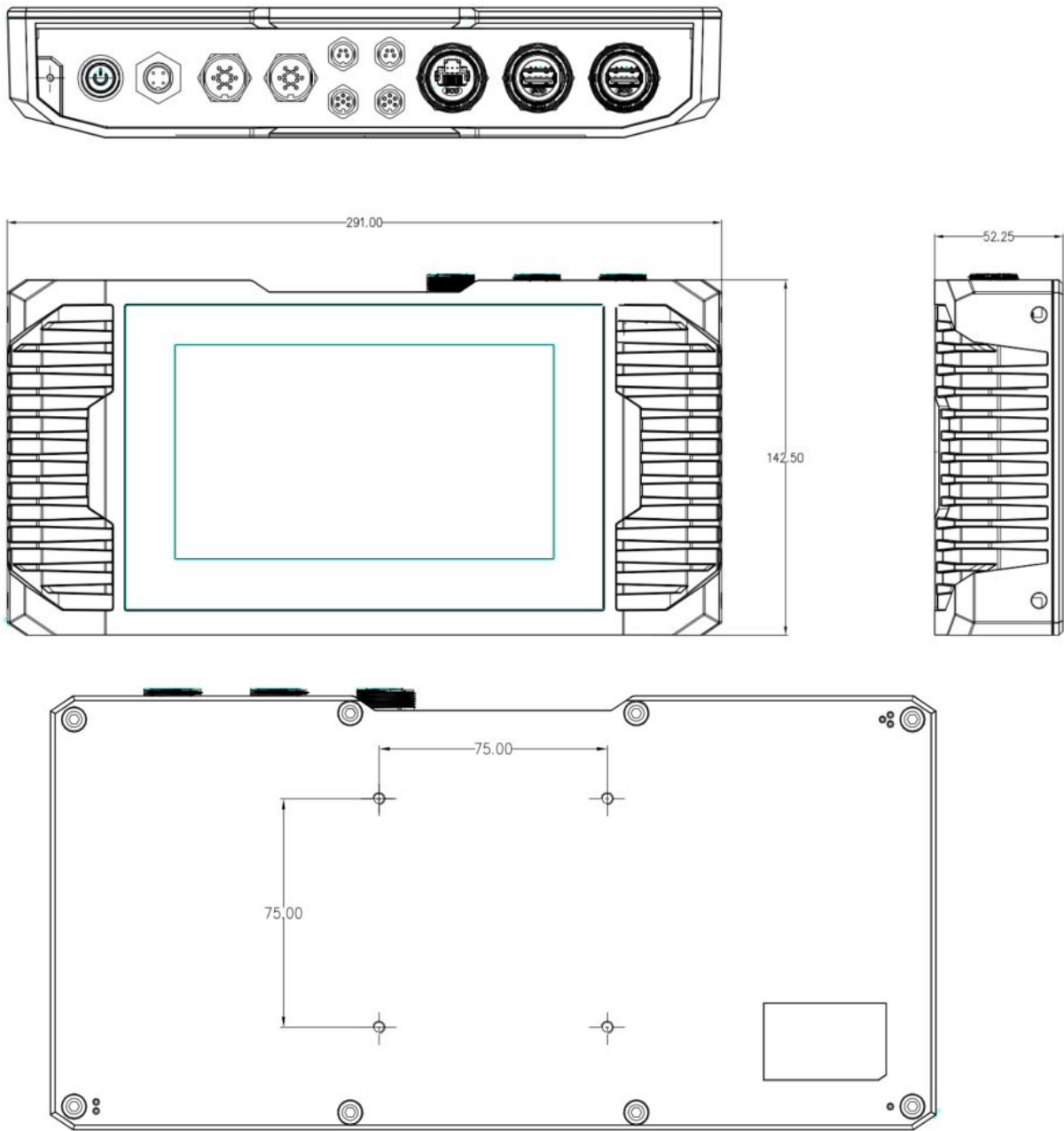
6.1 X1 Hardware Specifications

6.1.1 X1 Controller

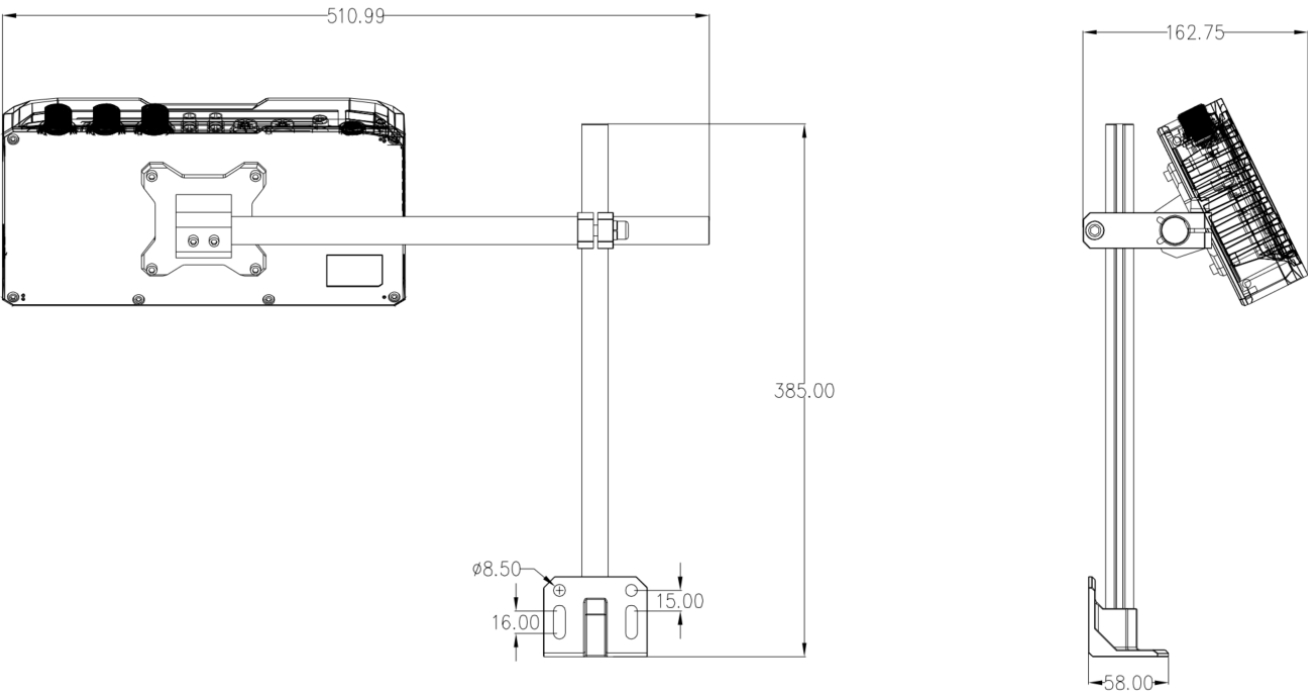
CONTROLLER SPECIFICATIONS

Items	Description
Max. Number of Printheads	2
Display	7" Color LCD Capacitive Touchscreen (800x480 px)/ (Compatible with most medical & industrial gloves)
Printing Functions	<ol style="list-style-type: none">1. Static Data: Text, Image2. Dynamic Data: Variables, Shift, Counter, Production Date, Expiration Date, Barcodes
Font Type	Support True Type Fonts
Control Language	English, Spanish, German, French, Italian, Traditional Chinese, Simplified Chinese, Japanese, Korean, Russian, Portuguese, Turkish, Hungarian, Slovak, Czech, Swedish, Romanian, Serbian, Bulgarian, Polish
1D & 2D Barcodes	EAN8, EAN13, EAN14, EAN128, UPCA, UPCE, CODE39, CODE128, ITF14 (SCC-14), NVE18 (SSCC-18), INTER25, CODABAR, PDF417, DATAMATRIX, QRCODE, GS1 (DATAMATRIX, DATABAR EXP, DATABAR, QRCODE), D'MATRIX 8x32, DUN14, Aztec Code
I/O Ports	<ol style="list-style-type: none">3. USB 2.0 port x 24. RS-485 & RS-232 port x 15. RJ-45 port x 16. Digital I/O port (1 IN & 4 OUT pins)7. Encoder port x 18. Sensor port x 1
Communication Protocols	TCP IP/UDP, Modbus TCP, and ANSER RS485 protocols
Dimensions & Weight	291 x 142 x 52mm / 2.12 Kg
Operating Conditions	Temperature 0~40 C, 0%~90% RH, Non-condensing
IP Rating	IP66

CONTROLLER DIMENSIONS

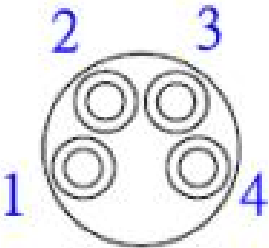


BRACKETS & CONTROLLER



6.1.2 Controller ports Pin Descriptions

ENCODER & PHOTOCELL M8 4 PINS



PIN	Function	Open wire Cable	Spec
1	GND	Black	
2	Sensor signal	White	V _{IH} : 23V ~ 24V V _{IL} : 0V ~ 12V
3	Encoder signal	Green	V _{IH} : 23V ~ 24V V _{IL} : 0V ~ 12V
4	DC 24V encoder/sensor	Red	Min : 20 V , Max : 24 V, 120mA

Table 6.1-2

I/O PORT M8 6 PINS



PIN	Function	Color	Specification
1	Reserved	Black	
2	Red LED signal Output	Brown	VOH : : 20V ~ 24V VOL : 0V ~ 0.3V, 80mA
3	GND	Red	
4	Yellow LED Signal Output	Orange	VOH : : 20V ~ 24V VOL : 0V ~ 0.3V, 80mA
5	Buzzer Signal Output	Yellow	VOH : : 20V ~ 24V VOL : 0V ~ 0.3V, 80mA
6	Green LED Signal Output	Green	VOH : : 20V ~ 24V VOL : 0V ~ 0.3V, 80mA

Table 6.1-3

COM PORT M8 8 PINS



PIN	Function	Open Wire cable	Specification
1	RS232 Tx	Black	Min : -6 V , Max : 6 V
2	RS232 Rx	Blue	
3	DOUT	Green	VOH : : 20V ~ 24V VOL : 0V ~ 0.3V, 80mA
4	RS485 -	Yellow	
5	RS485 +	Orange	
6	24V	Red	Min : 20 V , Max : 24 V, 120mA
7	GND	Brown	VOH : 20V ~ 24V
8	DIN	Purple	VIH : 23V ~ 24V VIL : 0V ~ 12V

Table 6.1-4

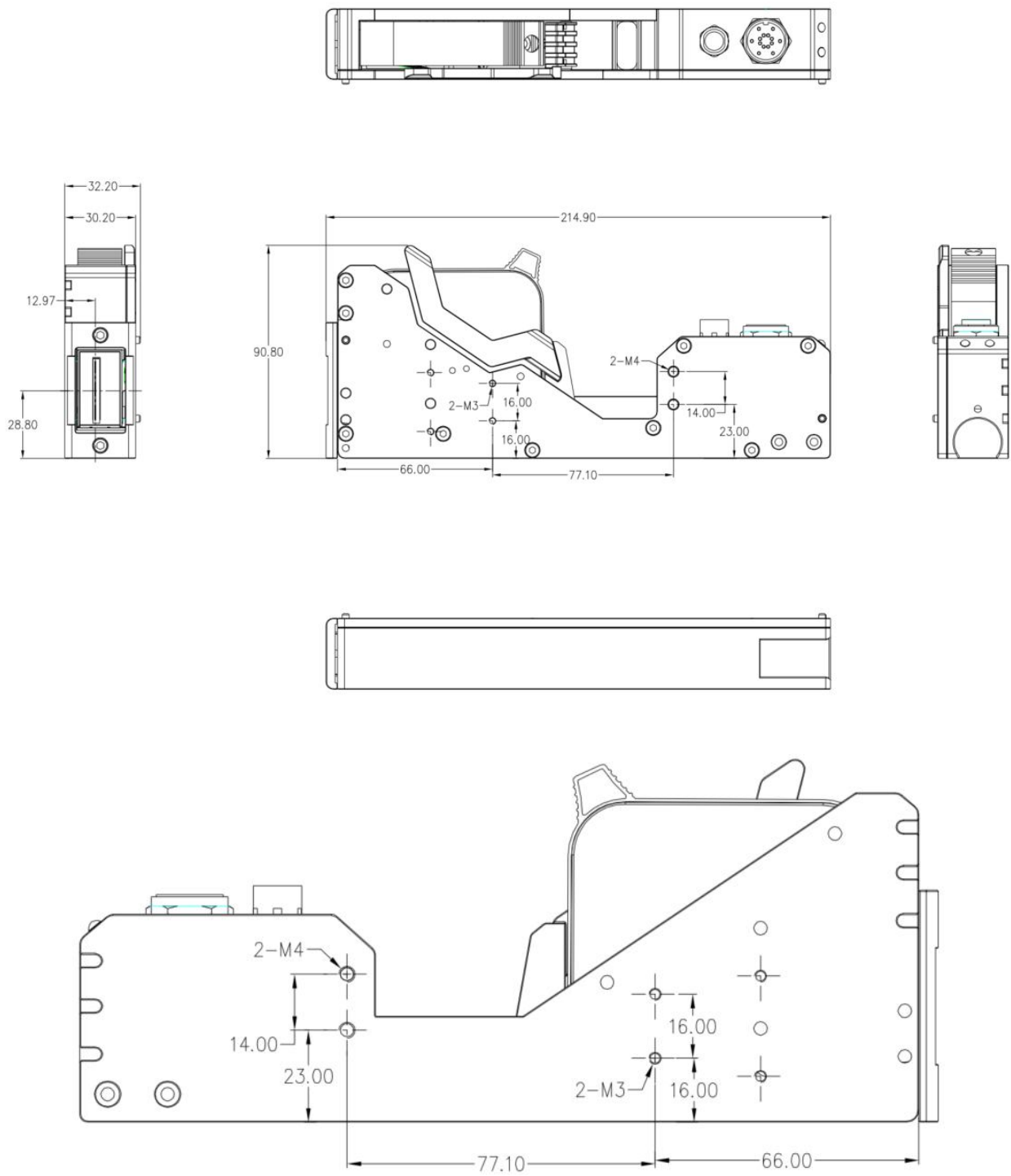
6.1.3 X1 Printheads

PRINthead SPECIFICATIONS

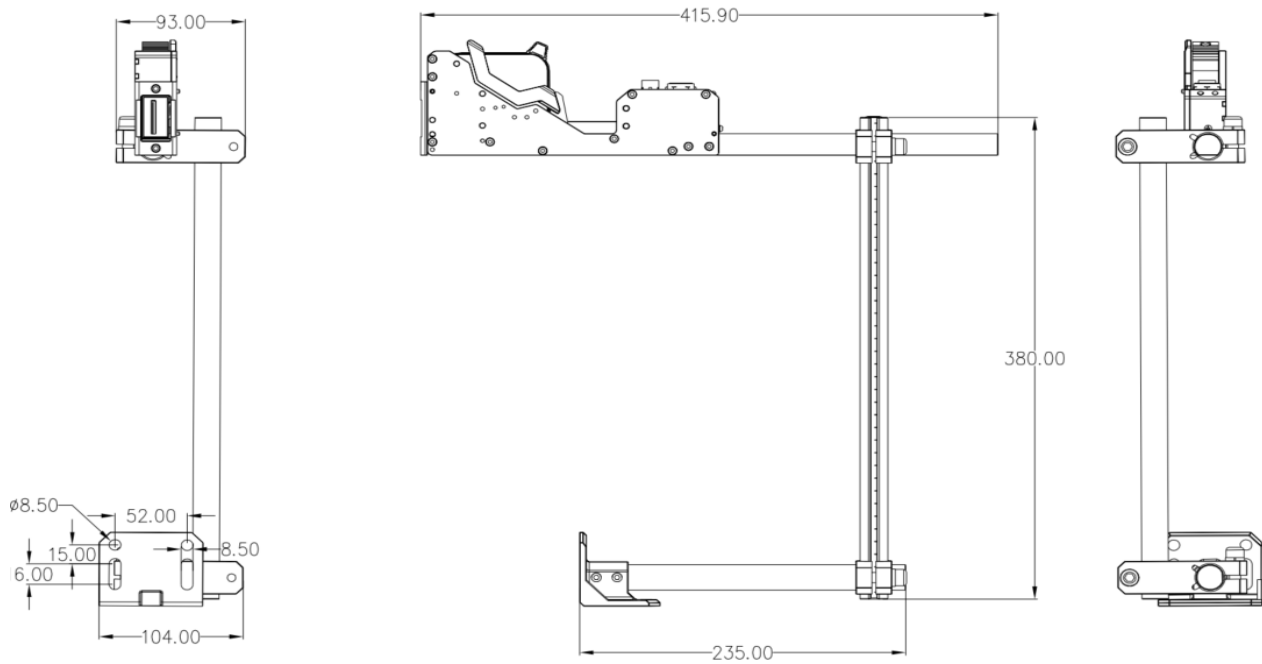
Items	Description
Printing Technology	High Resolution Thermal Ink Jet
Printhead Type	Type H-0.5 & Type H-1.0
Print Height	Type H-0.5: Single Print Head: 12.7mm Stitch Print Head: 12.7mm x 2 @ 24.75mm Type H-1.0: Single Print Head: 25.4mm (1.0 inch) Stitch Print Head: 12.7mm x 2 @ 48.7mm
Printing Resolution	600 x 600 DPI
Printing Speed	30m/min @ 600 dpi 300m/min @ 60 dpi
Print Distance	Type H-0.5 & Type H-1.0: 6mm
Message Length	2000 mm
Printhead Cables	Standard: 2M, Optional: 5M, 10M or 15M
Dimensions & Weight	82 (H) x 30 (W) x 210 (L) mm / 0.46kg
Port	Controller: M16 14-pole female socket Sensor: M8 4-pole female socket"

Table 6.1-5

PRINTHEAD DIMENSIONS



PRINTHEAD & BRACKETS



6.2 External Accessories Specifications

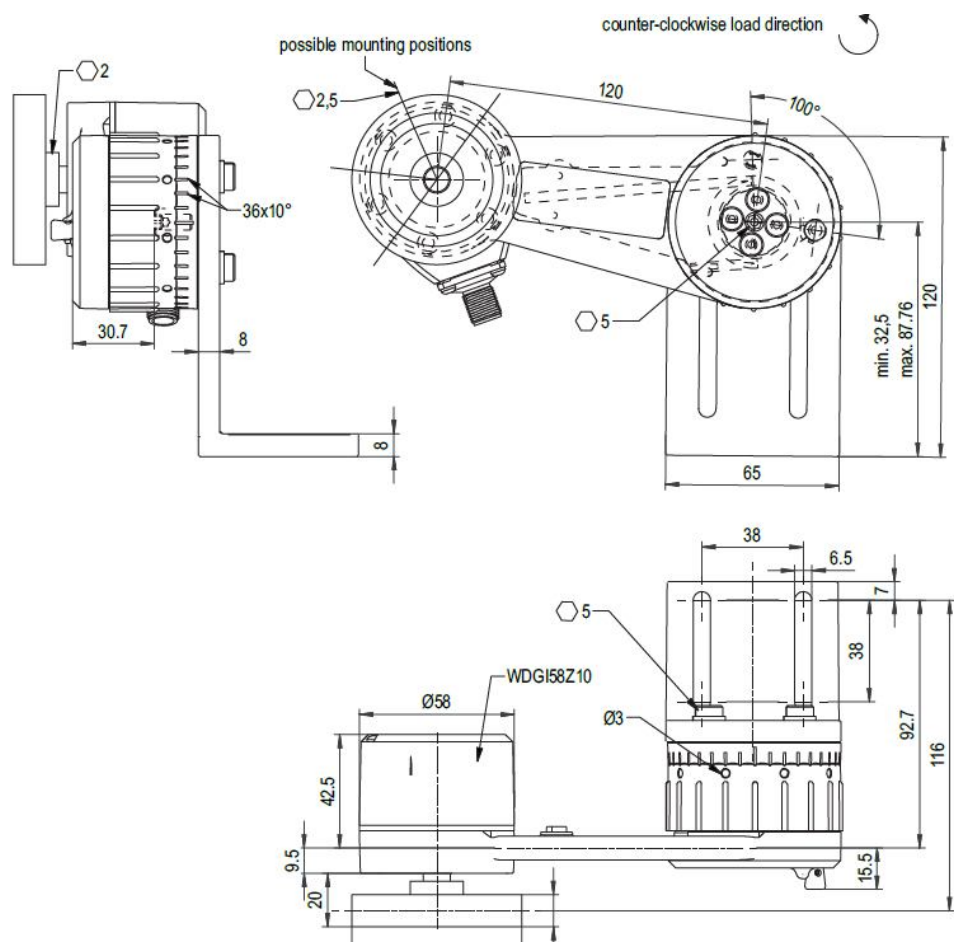
6.2.1 Encoder

ENCODER SPECIFICATIONS

Items	Description
Resolution	0.02 mm / pulse
Pulses per revolution	10000 PPR
Measuring wheel	200 mm Circumference
Power supply	10 – 30 VDC, max 100 mA
Open Circuit	HTL
Load	Max 40 mA / channel
Weight	Approx. 1100 g
Protection Rating	IP67
Operating Temperature	-10 °C up to +50 °C

Table 6.2-1

ENCODER DIMENSIONS



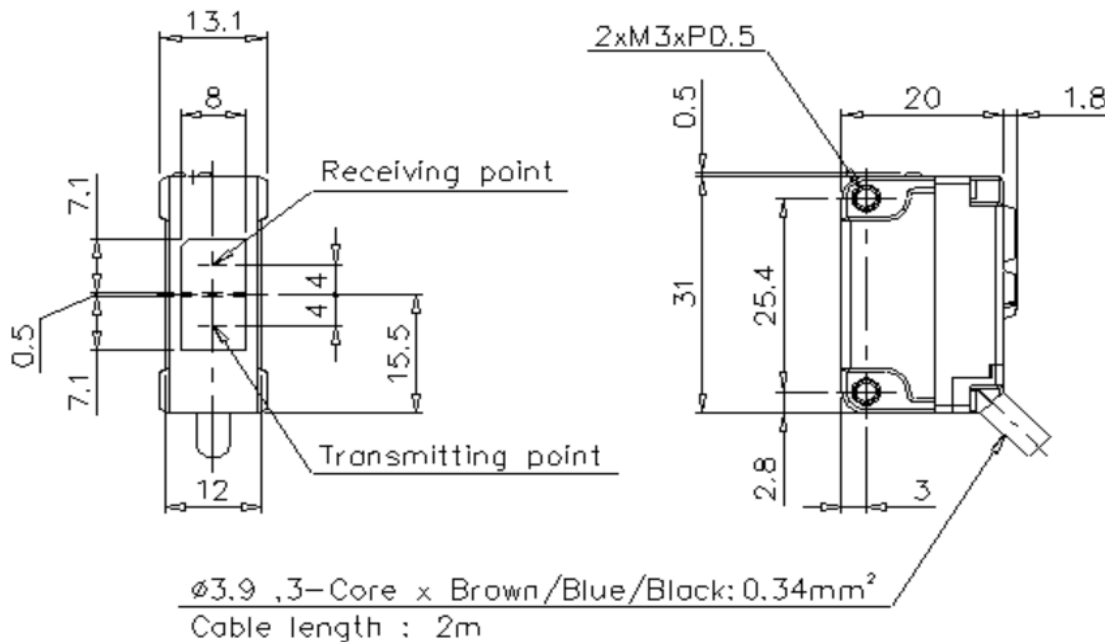
6.2.2 Photocell Sensor

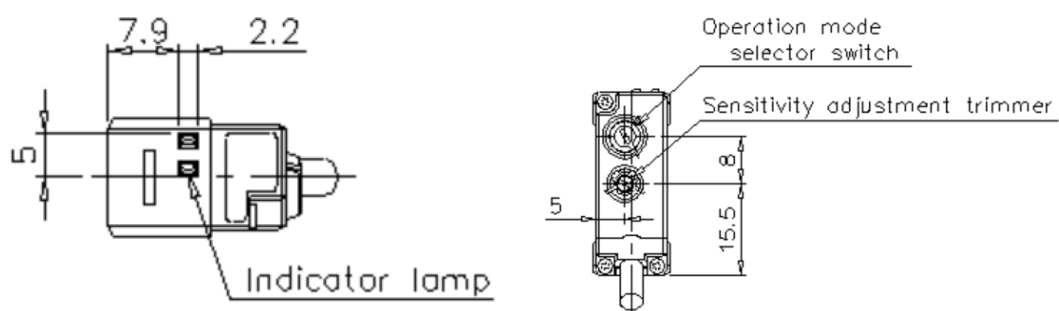
PHOTOCELL SPECIFICATIONS

Items	Description
Type	Diffuse Reflective Short-Range
Output	NPN
Cable Connection	Cable (2m)
Detecting Distance	300 mm (When detecting 10 x10cm white paper)
Response Time	500 μ s
Operation Mode	LIGHT-ON/DARK-ON (switch-selectable)
Control Output	Open Collector Output, 30V max, 100mA max, Residual V: 1V max
Power Voltage & Current Consumption	10 to 30 VDC, 34mA or less
Enclosure Rating	IEC: IP67/NEMA: 4A, 6, 12/DIN:IP69K
Temperature & Humidity	-20 to +55 $^{\circ}$ C -4 to 131 $^{\circ}$ F (No freezing), 35 to 85 % RH (No condensation)

Table 6.2-2

PHOTOCELL DIMENSIONS





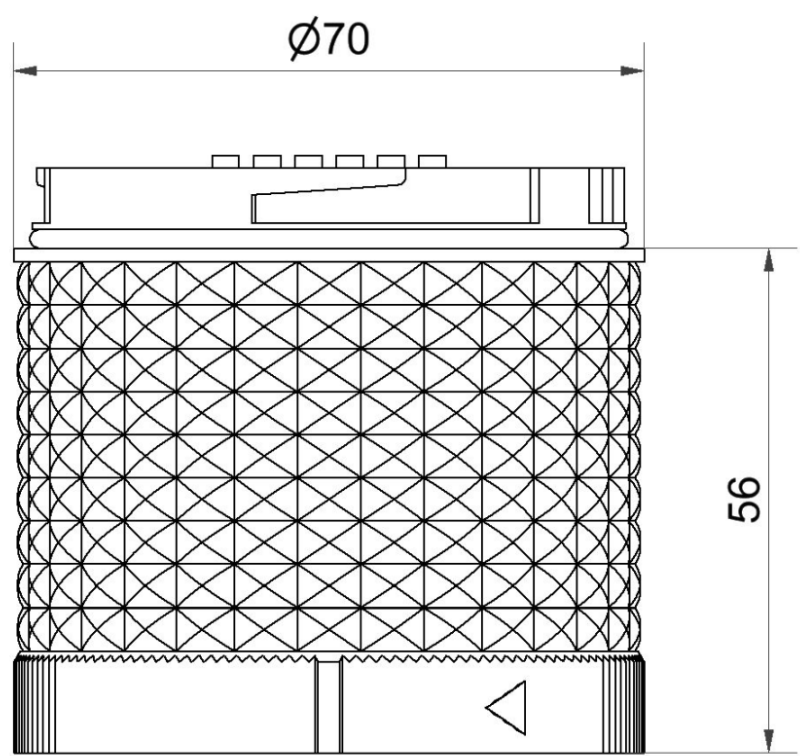
6.2.3 Alarm Beacon

ALARM BEACON SPECIFICATIONS

Items	Description
Height & Diameter	65mm x 70mm
Protection Category	IP65
Operating Temperature	-30°C ~ +50°C
Product Weight	1 g (one level)
Operating Voltage	24V DC
Operational & inrush current	40mA & 250mA
Light Source	LED

Table 6.2-3

ALARM BEACON DIMENSIONS



Appendix

MAINTENANCE

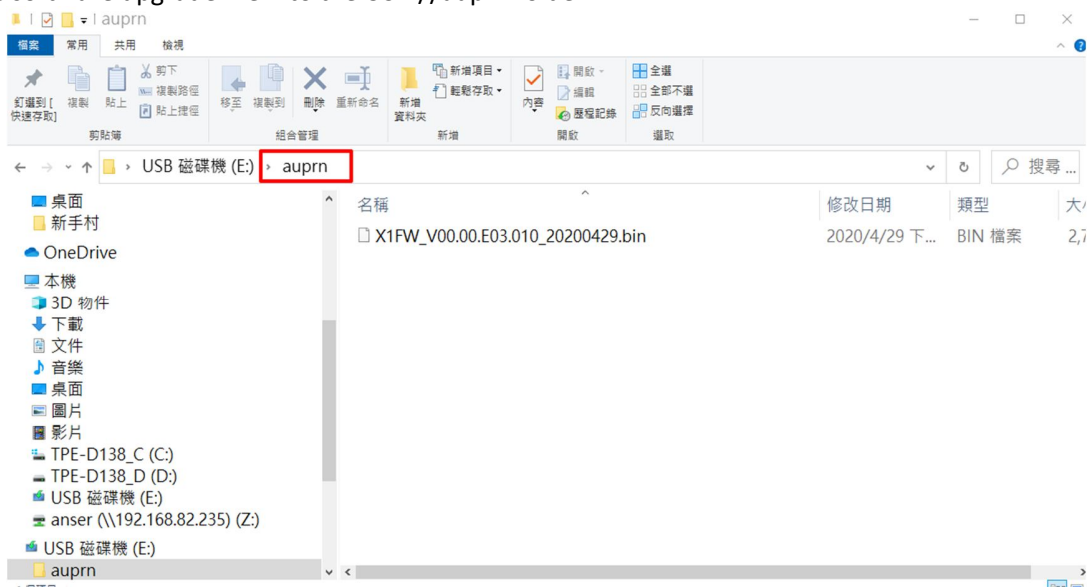
Printhead

- Before powering up, make sure all the components are connected.
- Remove the cartridge, shutdown system from UI shutdown button, and then press the power switch in the controller prior to disconnecting any of the printheads.

UPGRADE CONTROLLER FIRMWARE

X1 software can be upgraded by USB

1. Before starting, please make sure that the USB is format as FAT32
2. Create a new folder within the USB and name it as “auprn”
3. Copy the software upgrade file into the USB://auprn folder

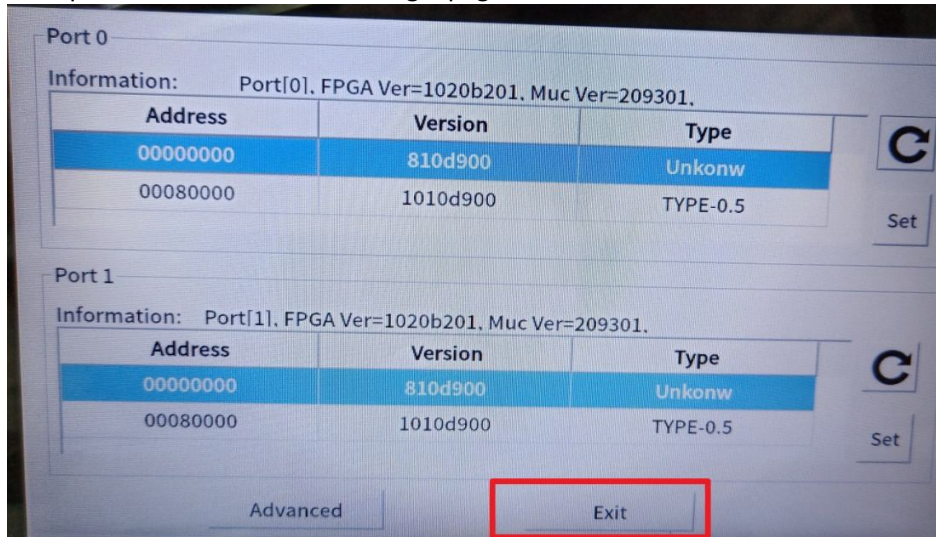


4. Insert the USB in one of the USB port and wait for the upgrade confirmation window to show up
5. Press the upgrade button to initiate the upgrade process
6. X1 will reboot automatically once the upgrade process is completed.

Note: Access the “About Printer” page to confirm both printer and printhead firmware versions are updated.

PRINTHEAD UPGRADE

1. Copy the file into the **auprn** directory, make sure only this file is in this directory
2. Insert the USB in controller, and wait to confirm prompt window
3. Wait for the process to be completed, might take several minutes. When done, please press “Exit” and then “Yes” to exit the printhead update mode. It will back to login page.



Access about printer > firmware version, P0 & P1 FPGA should show

Printer Information

S/N: 179777

H/W Version: X1-V100

S/W Version: 00.00.E08.032#b7ee1d2d

Build Date: 2021-01-20

EDC code: 3-886

Reset to Default

Restore & Backup

Import/Export

Ink Cartridge1

Ink Cartridge2

Firmware Version

Master FPGA Version : 211081

P0 FPGA Version : 10211081

P0 MCU Version : 00209301

P1 FPGA Version : 10211081

P1 MCU Version : 00209301

X1 Version : 00.00.E08.032#B7EE1D2D

DISC Version : 0.0.0.45



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