Smart-Jet DL200

THERMAL INKJET CODER

USER MANUAL

Contents

SAFETY INFORMATION

- STOP PRINTING BEFORE INSERTING OR REMOVING THE CARTRIDGE.

- TURN OFF PRINTER BEFORE PLUGGED / UN-PLUGGED ANY CABLE (PRINT HEAD CABLE / ENCODER CABLE / SENSOR CABLE / IO CABLE).

- BE CAREFUL OF USING OTHER EXTERNAL DEVICES SUCH AS: ENCODER / SENSOR / POWER SUPPLY.

- DO NOT TRY TO USE OTHER CARTRIDGES THAT IS NOT SUPPLIED FROM YOUR SUPPLIER.

- AVOID USING WITH HIGH VOLTAGE, STRONG IMPACT TO PRINTER.

- STORE THE PRINTER IN A DUST-FREE ENVIRONMENT.

- BE CAREFUL OF UPDATING FIRMWARE AND SOFTWARE.

- WORKING TEMPERATURE: 5-50ºC.

- USE GLOVE TO AVOID THE SHARP FROM MOUNTING BRACKET.

- RECOMMEND USE MASK AND GLASSES TO AVOID THE INK FLY IN AIR.

- WARNING: THIS EQUIPMENT IS COMPLIANT WITH CLASS A OF CISPR 32 / EN 55032. IN A RESIDENTIAL ENVIRONMENT THIS EQUIPMENT MAY CAUSE RADIO INTERFERENCE.

EMERGENCY CASE

IN SOME SPECIAL CASE LIKE: APPEAR SMOKE ON PRINTER, PRINT OUT CONTINUOUSLY WITHOUT CONTROL, FIRE, EXPLOSIVE SOUND, ETC.

PLEASE REMOVE THE POWER SUPPLY IMMEDIATELY!

ENVIRONMENT PROTECTION

DON'T THROW PRINTER / INK CARTRIDGE TO RECYCLE BIN

PRODUCT WARRANTY

LIMITED WARRANTY. THE HOUSING AND CIRCUIT BOARD FOR EACH PRINTER IS WARRANTED TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF TWELVE (12) MONTHS FROM THE BILL OF LADING DATE. THIS LIMITED WARRANTY DOES NOT APPLY TO SPARE PARTS, AUTHORIZED INKS, OR CARTRIDGES, OR TO HOUSINGS AND CIRCUIT BOARDS THAT EXPERIENCE PROBLEMS RESULTING FROM MISUSE, TAMPERING OR IMPROPER STORAGE.

WARRANTY VOID IF

- ANY NON-ORIGINAL PARTS AND UNAPPROVED OEM INKS ARE USED.

- THE PRODUCT HAS BEEN ALTERED OR MODIFIED WITHOUT APPROVAL FROM US.

- THERE IS DAMAGE ON THE PRINT HEAD AS A RESULT OF IMPROPER INSTALLATION.

- DAMAGE OCCURS FROM AN ACCIDENT, SUCH AS BUT NOT LIMITED TO, BEING DROPPED, BEING SPRAYED WITH WATER OR OTHER LIQUIDS, CAUSED BY A NATURAL DISASTER, CAUSED BY STOCKING OR SHIPPING CONDITIONS.

- UNAPPROVED, WRONG OR UNSTABLE POWER SUPPLY IS USED.

ABOUT MACHINE

Thank you for purchasing the **Smart-Jet DL200 Thermal Inkjet Coder**, a product of **MSSC LLC.** This printer is designed for **packaging printing**, **POD printing applications** powered by HP Thermal Inkjet Technology.

Machine boasts to be able to run **Standalone**, **print variable data and variable 2D barcodes**, Wi-Fi connection via mobile devices for control and real time update print status. Each option provides a full set of applications.

Machine produces crisp text, logos, variable data and barcodes on porous and non-porous media by automatically recognizes aqueous and solvent inks and applies the appropriate printing parameters.

The complete system includes one machine, power supply with On/Off switch, mounting brackets.

TECHNICAL SPECIFICATIONS

Machine details

| No.	Description	Specifications
1	Model	**Smart-Jet DL200**
2	Display	PC's Monitoring, Mobile
3	Dimensions (LxWxH)	214 x 76 x 101.5 mm / 8.42 x 2.99 x 3.99 in
4	Weight	930g
5	Power supply	AC 100V – 240V, 50/60Hz. Output 24VDC 2.5A
6	Maximum power consumption	48W
7	Maximum printing resolution	600x600dpi
8	Print speed	70m/min@300x300dpi
9	Optical density	5 levels
10	Operation selection	**Wi-Fi, LAN Internet (Cat 6 or higher)**
11	Message memory	**4GB for Storage**
12	Ink solution	Aqueous and Solvent
13	Menu language	**Multiple / selectable**
14	Printable characters	**Windows true fonts**
15	No. of lines	Unlimited per Template
16	Character height	Maximum 25.4mm/1"
17	Printability	Alphanumeric, logos, date/time, expiry date, Julian date, shift code, variable data and **variable 2Dbarcodes, POD (Print Online Data)**
18	Operating temperature	$5^0C – 50^0C$
19	External connections	External sensor, encoder, alarm kit, etc…

Mobile Application

Control machine via Mobile application

MACHINE OVERVIEW

- **[1]** Led **Sen status**.
- **[2]** Led **Alarm** status.
- **[3]** Led **Stop** status.
- **[4]** Led **Run** status.
- **[5]** Led **Ink** status
- **[6]** USB connector. Use for **USB Wi-Fi module**.
- **[7]** RJ45 LAN connector. Use for **Print Online Data or Remote control**.
- **[8]** HDMI port (Not use)
- **[9]** Start/Stop button. **Start/Stop printer or use for reset default**.
- **[10]** Power supply connector.
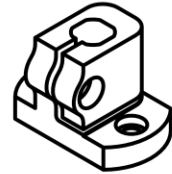- **[11]** I/O port. Connect to **Encoder, External sensor, Alarm beacon**.
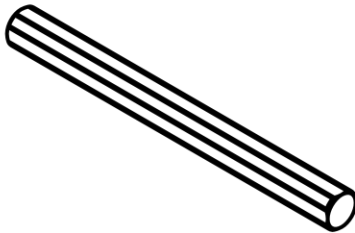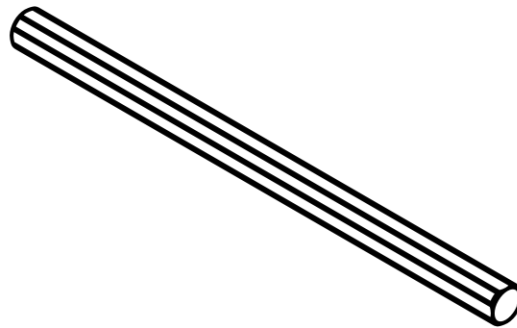
INSTALLATION PROCEDURES
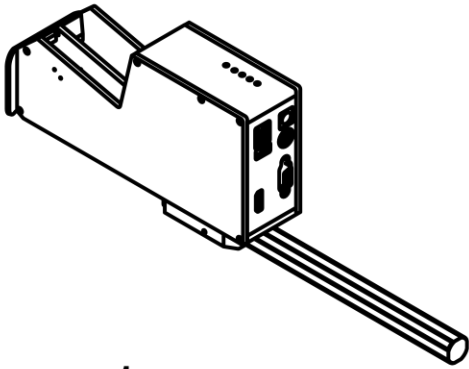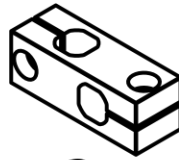
| No	Item	Quantity
[1]	Machine	1
[2]	Clamps	3
[3]	Base clamp	1
[4]	Round bar short	1
[5]	Round bar long	3
[6]	Screws M8x20	8

MOUNTING BRACKETS

Please setup machine with minimum distance that you could. Closer distance for better printing quality. We are recommend from 1-3 mm.

Step 1
Select direction to mount machine on the conveyor or production line.
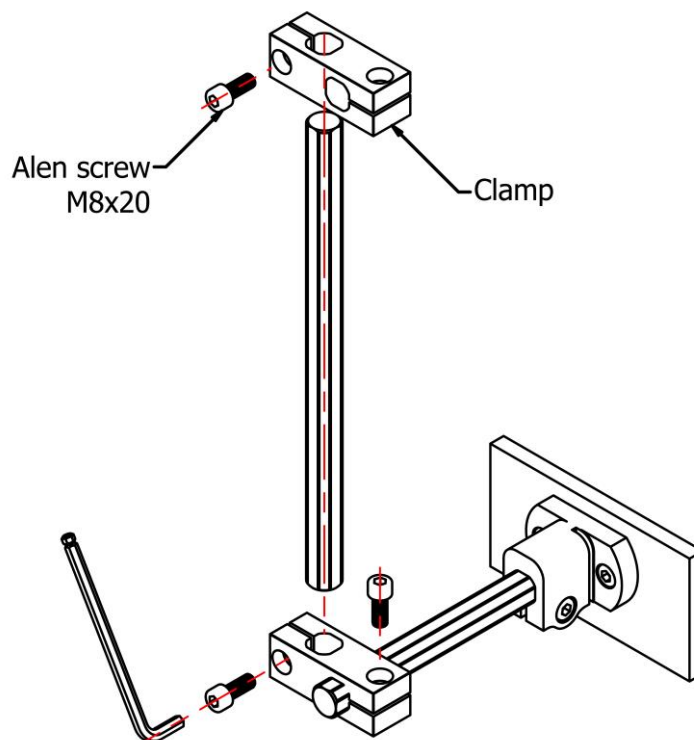
Step 2
Installing the base clamp to the side of the conveyor or production line.
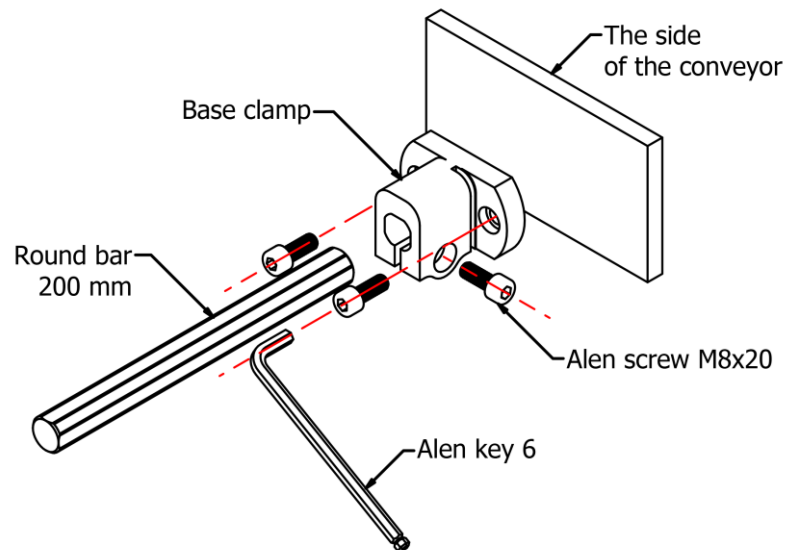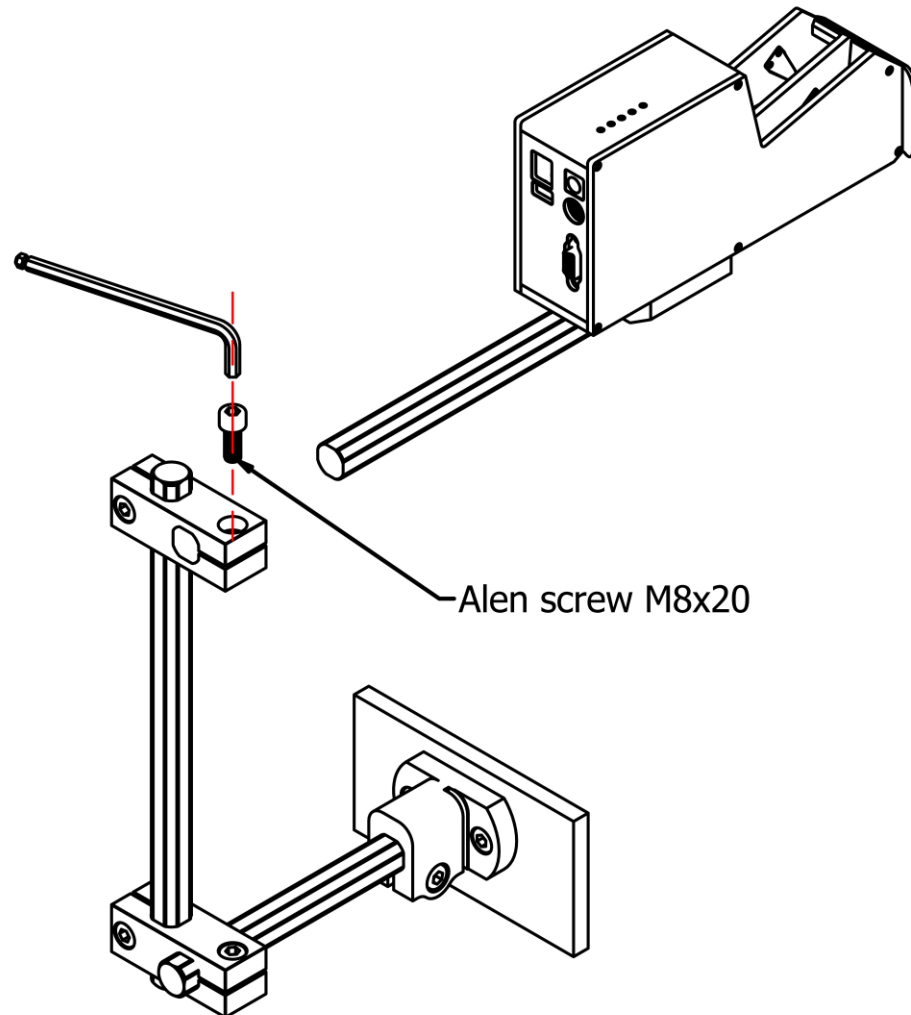

Step 3
Installing the clamps to the round bar.

Select the suitable bar length for each case.

Horizontal setup

This setup will be used to print on carton box, bottle, tray, pipe, etc…
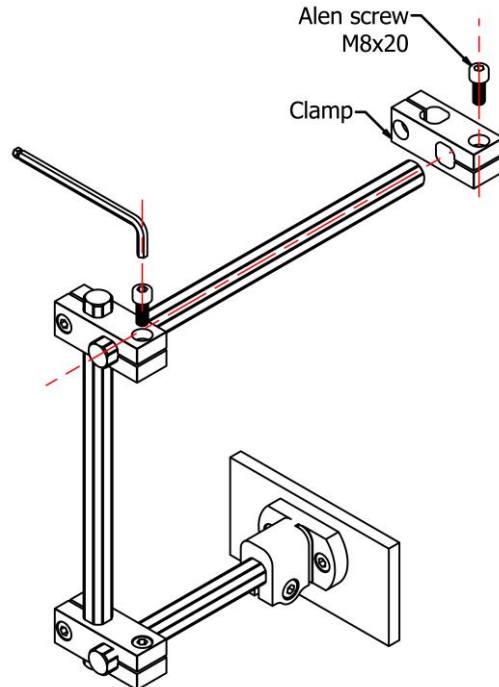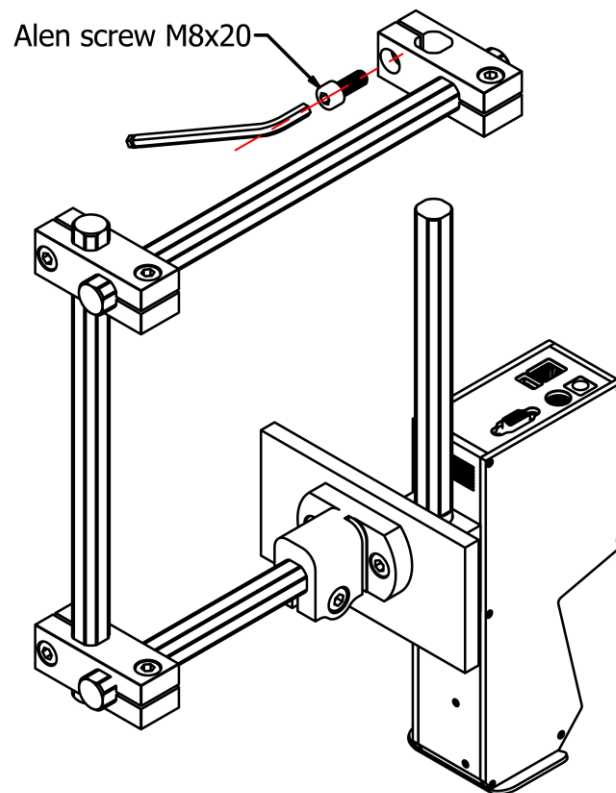
Alen screw M8x20

Vertical setup

This setup will be used to print on paper, film, and other flat substrates.

NOTES: With default machine, we don't support this setup. You need buy more accessories (round bar and clamps).

Step a: Add more clamp to bracket.

Step b: Add one more vertical round bar.

GETTING STARTED

Install the machine on your conveyor according to the installation instructions. See the Quick Start Guide for more information.

- Set print direction and appropriate throw distance to obtain best print quality (1-3 mm).

- Insert ink cartridge.

- Plug the power cord into an appropriate power source to start up the machine.

- The printer need PE (Protective earthing conductor) connection before use.

EXTERNAL DEVICES CONNECTIONS

NOTES:

- *Machine is able to operate with External Sensor, Encoder, Alarm at a time. Consult your supplier for further supports on the settings and connections.*

- *To connect machine with External Sensor, Encoder, Alarm, etc…, additional connector DB15 (male) will be required.*

EXTERNAL SENSOR

Machine supports NPN, PNP and Push-pull sensor types.

- Connect sensor using power supply on machine **24VDC**.

- Connect sensor to machine using external power supply. Below demonstration is for external power supply of **5VDC**.

NPN type Sensor
Active: 0V
Deactive: Free
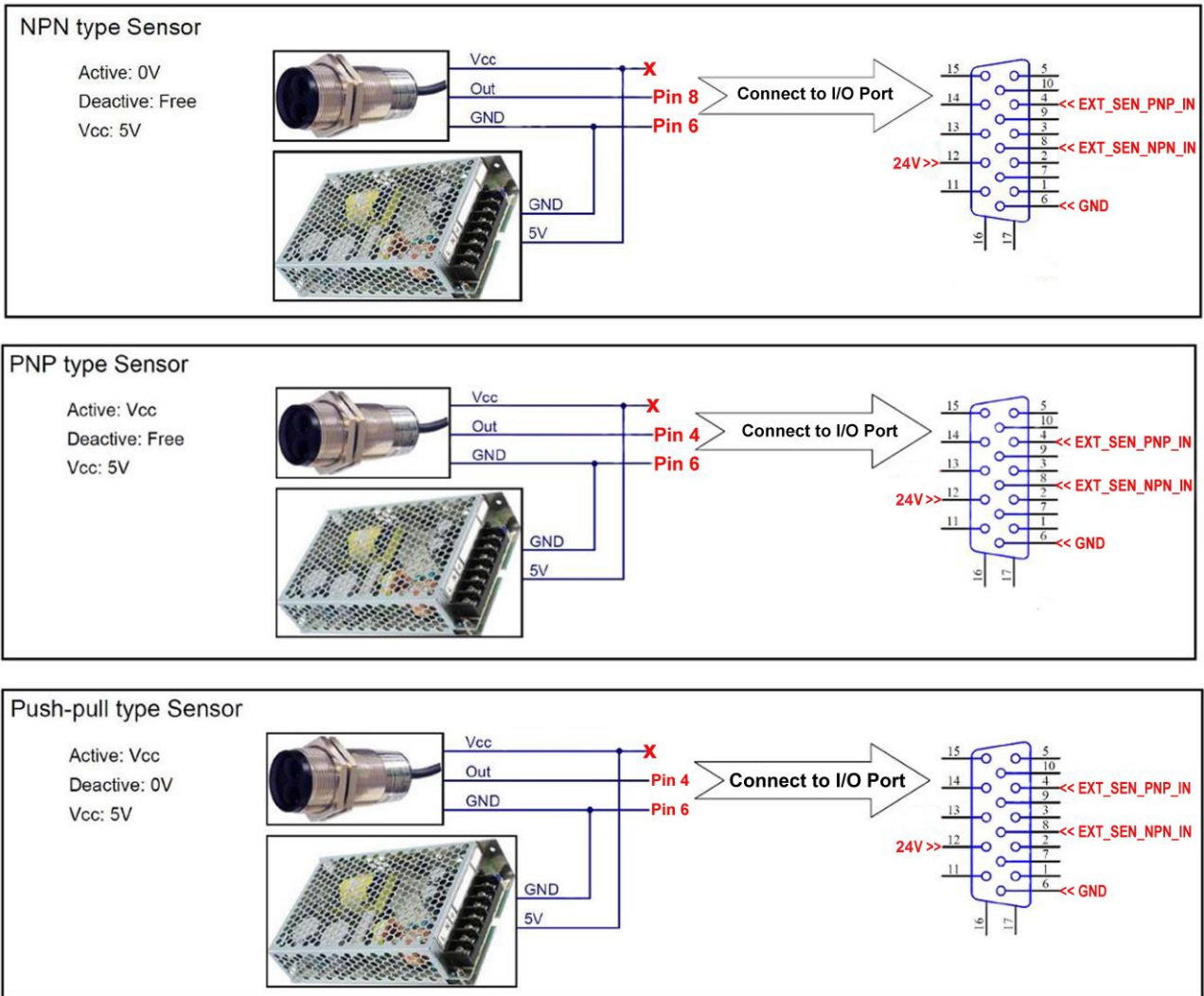Vcc: 5V

PNP type Sensor
Active: Vcc
Deactive: Free
Vcc: 5V

Push-pull type Sensor
Active: Vcc
Deactive: 0V
Vcc: 5V

ENCODER
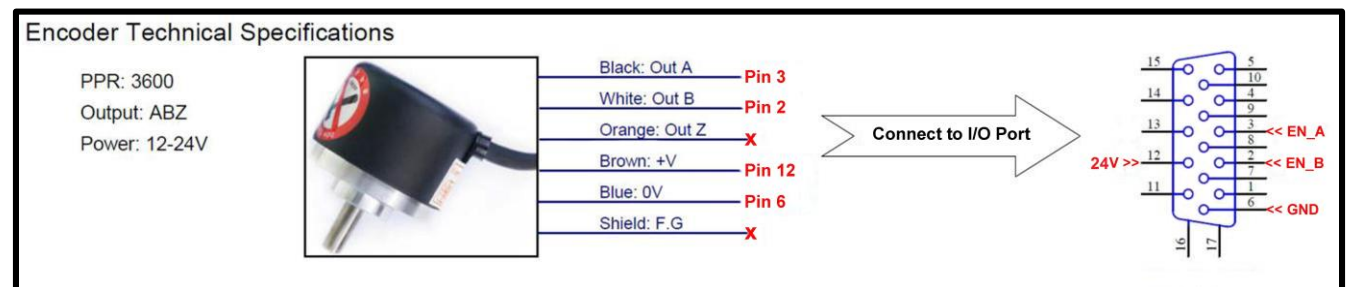
An encoder is recommended to ensure the best print quality regardless the inconsistent speed of conveyor.

Encoder Technical Specifications
PPR: 3600
Output: ABZ
Power: 12-24V

To calculate wheel diameter (**D**) depend on resolution (**R**) is:
    D = R/(π x 600) (inches).

Example: Encoder has R = 3600 (PPR),
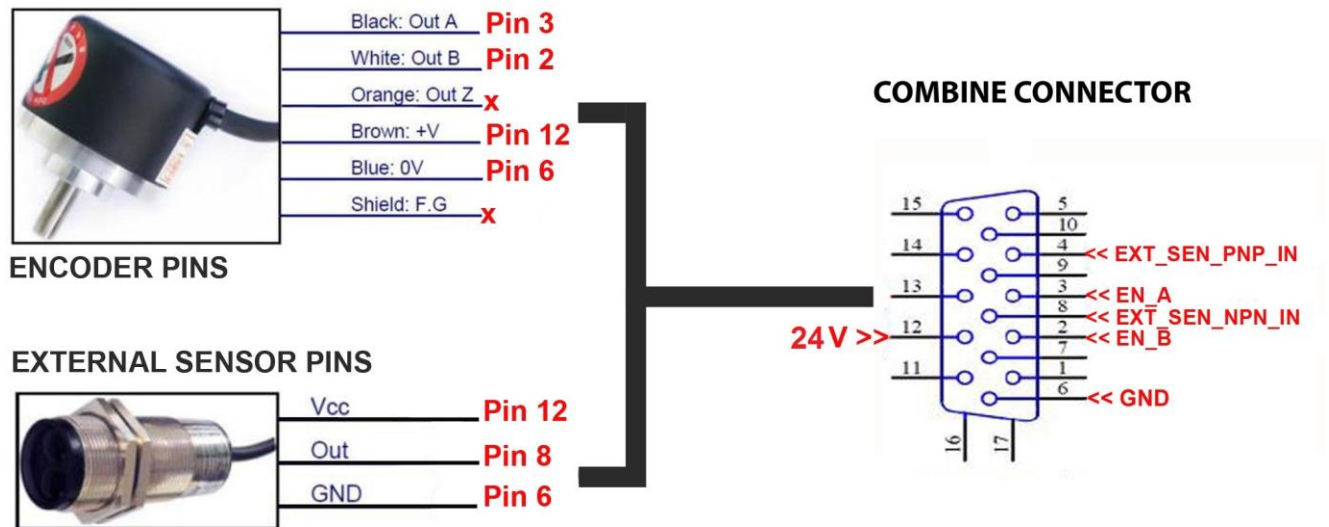   ⇨ **D** = 1.90985 inches ~ 48.5 mm.

COMBINE EXTERNAL SENSOR AND ENCODER

In some case you need to use external sensor and encoder to get perfect printing quality. But the machine have one extended port only. Please do as following instruction to take external sensor and encoder work together with machine.

See picture for this situation.

ENCODER

EXTERNAL SENSOR

Connect to I/O port

See this picture for connection pins.

Black: Out A	**Pin 3**	
White: Out B	**Pin 2**	
Orange: Out Z	**x**	
Brown: +V	**Pin 12**	
Blue: 0V	**Pin 6**	
Shield: F.G	**x**	

ENCODER PINS

COMBINE CONNECTOR

EXTERNAL SENSOR PINS

Vcc	**Pin 12**
Out	**Pin 8**
GND	**Pin 6**

<< EXT_SEN_PNP_IN
<< EN_A
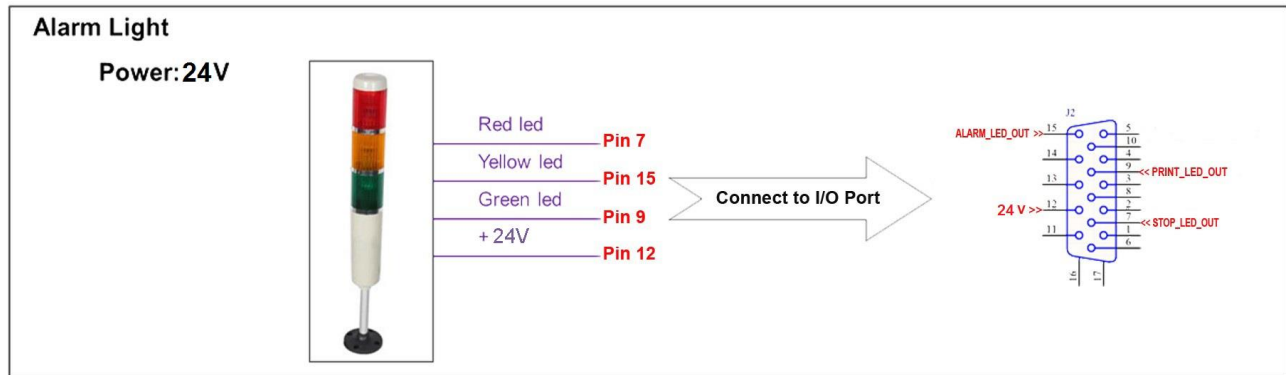<< EXT_SEN_NPN_IN
<< EN_B
<< GND

24V >>

NOTES:

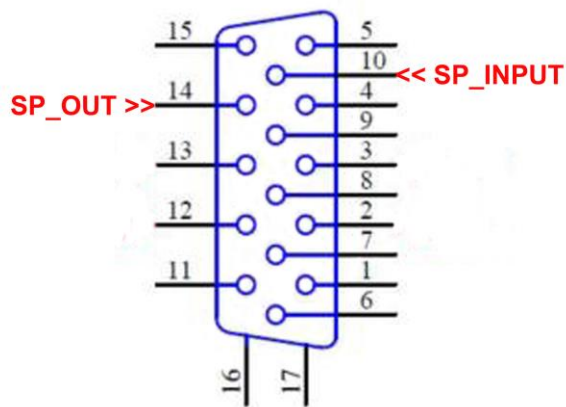*PIN12 (24V) use for both of Encoder and External sensor.*

ALARM

Allow users to monitor operation of Machine from distance via the light signals from the Alarm.

INPUT AND OUTPUT

Input: To trigger some functions (reset counter …). Accept NPN or dry contact.

Output: NPN signal. Active when some even occur (each print …).

QUICK STARTUP

REQUIRED COMPONENTS

| No.	Basic Components	With Smartphone	With PC Web browser	Optional
1	Machine	✓	✓	
2	Power supply	✓	✓	
3	Mounting brackets	✓	✓	
4	USB Wi-Fi Module	✓	✓	
5	Ink cartridge	✓	✓	
6	Smartphone Android or iOS	✓		
7	PC desktop/laptop		✓	
8	PC connection Cable		✓	
9	Encoder			✓
10	Alarm Beacon			✓
11	External Sensor			✓

Setup machine

See Installation Procedures and Getting Started.

NOTES: The machine will function with Water based ink and Solvent based ink series from us only. Trying to use unapproved cartridges may damage the machine and void the warranty.

Login machine by Wi-Fi hotspot using USB Wi-Fi module.

- Insert the **USB Wi-Fi module to USB connector port**.
- Insert the Power supply.
- Power on the machine. The boot time to complete about 40 seconds.
- The Beep sound and Alarm beacon to confirm boot completed.
- By default for USB connector port is Wi-Fi Hotspot:
    - SSID: **DL200_XX**
    - Password: **dlioj@200 (Please change the password hotspot for security)**
- **Connect the Smartphone or PC to Wi-Fi hotspot**.
- **Login the machine by default username and password**:
    - **IP default**: **192.168.100.10**
    - Username: **Admin**   (password: **dl@admin**)
    - Username: **Operator**   (password: **dl@operator**)
    - Username: **Viewer**   (password: **dl@viewer**)
- **Please change the Admin's password for security**. Admin can add more user.

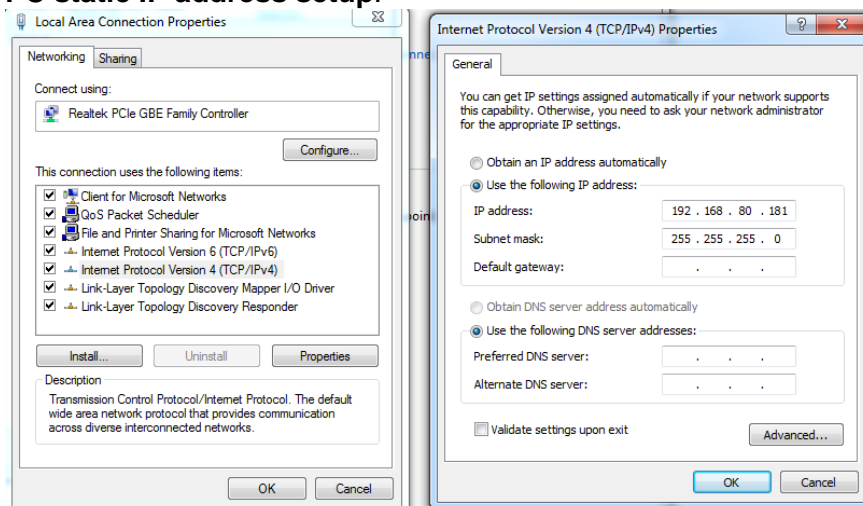**By PC Web Browser using Wi-Fi hotspot (Chrome, Firefox, Opera, Safari).**
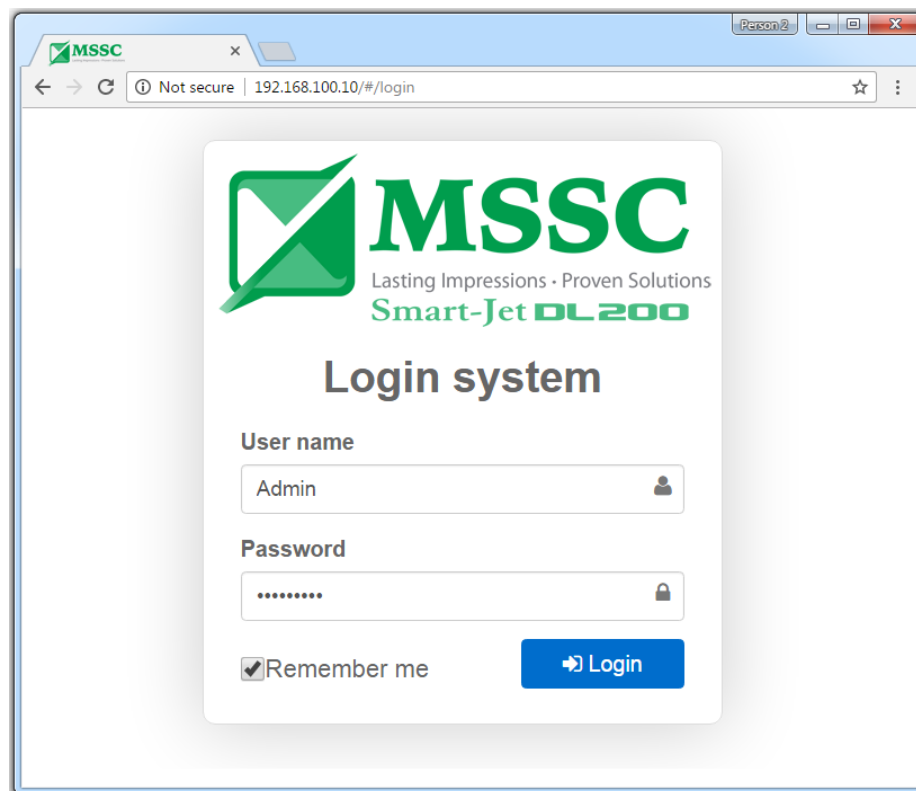
**By Smartphone using the Android Application or iOS Application.**
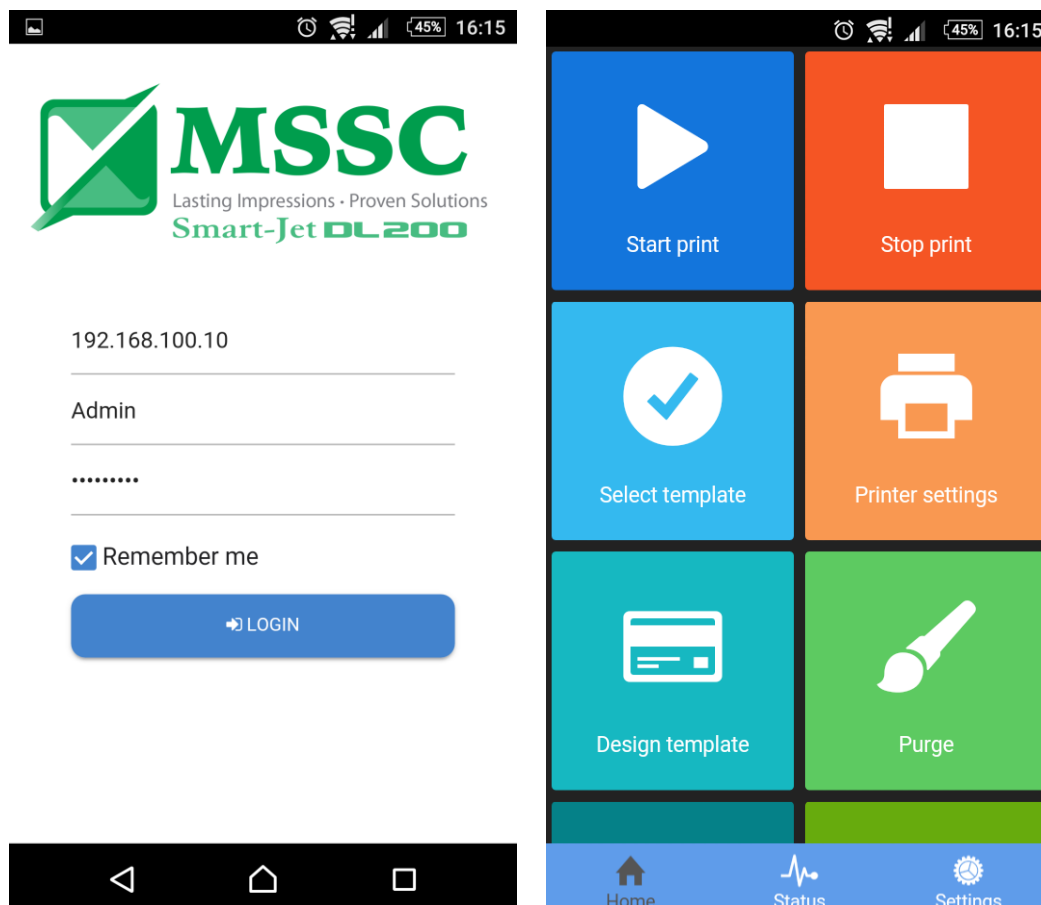
Login machine by PC Web browser using RJ45 LAN connector.

- **PC static IP address setup**.

- Insert the Power supply.
- **Connect PC RJ45 gate to RJ45 LAN connector by cable**.
- Power on the machine. The boot time to complete about 40 seconds.
- **Login the machine by default username and password**:
    - IP default: **192.168.80.180**
    - User name: **Admin**   (password: **dl@admin**)
    - User name: **Operator**   (password: **dl@operator**)
    - User name: **Viewer**   (password: **dl@viewer**)
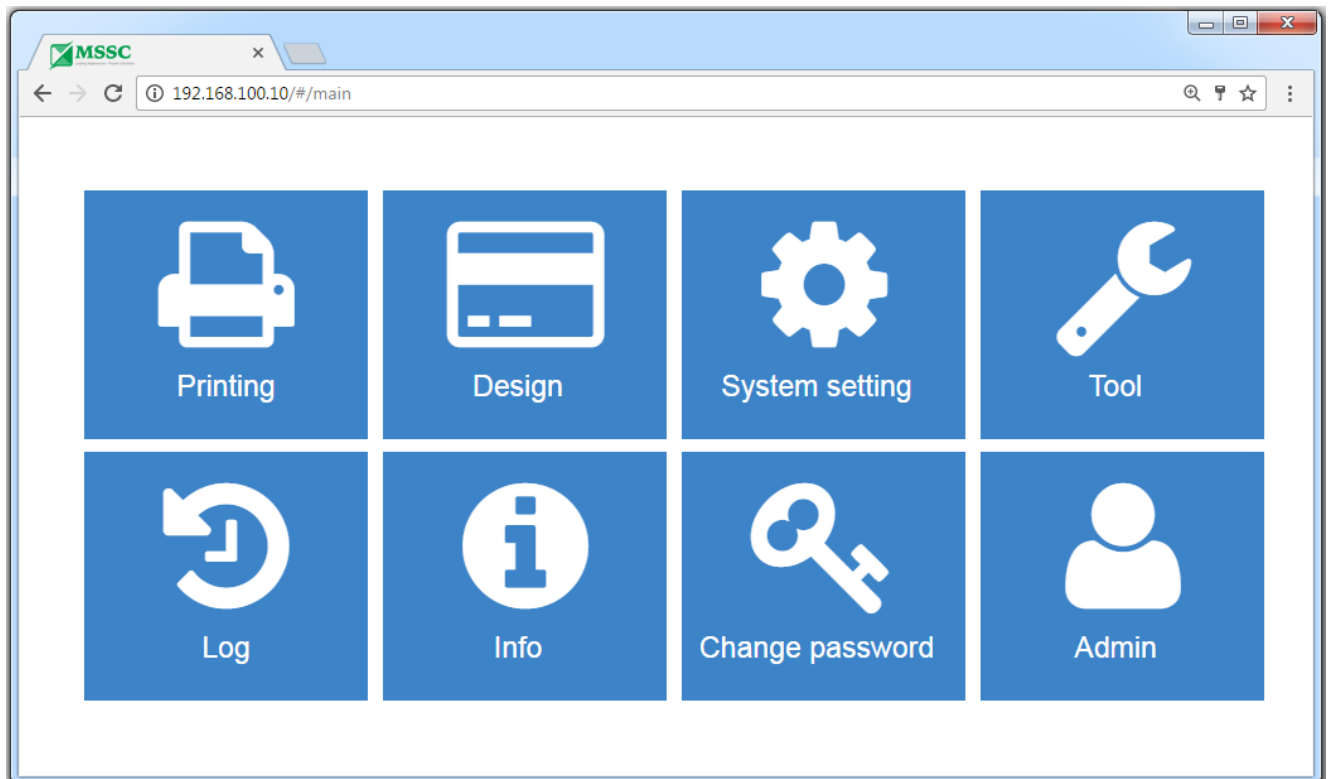- **Please change the Admin's password for security**. Admin can add more user.
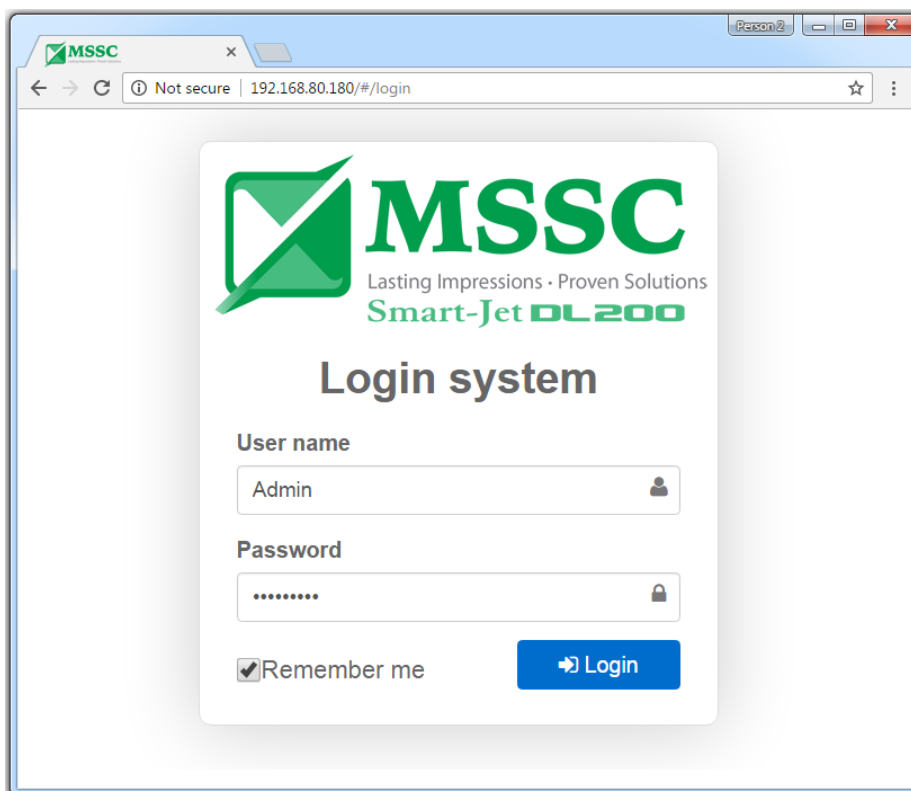
Design print template by PC Web browser

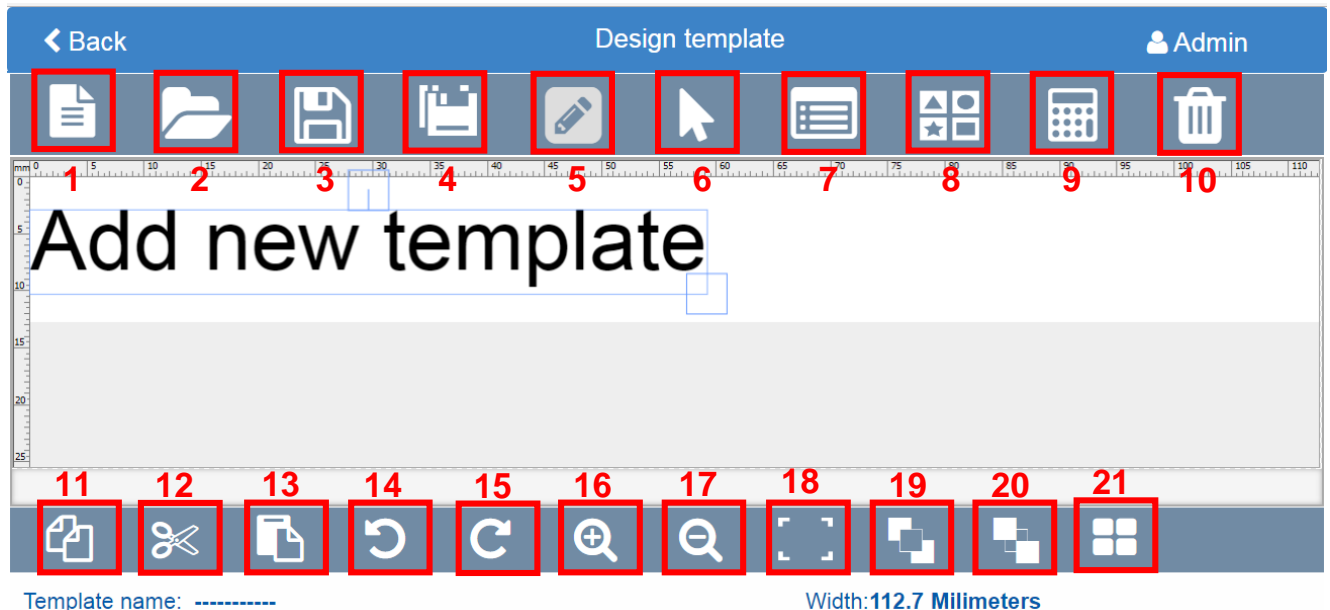## Login by Web browser
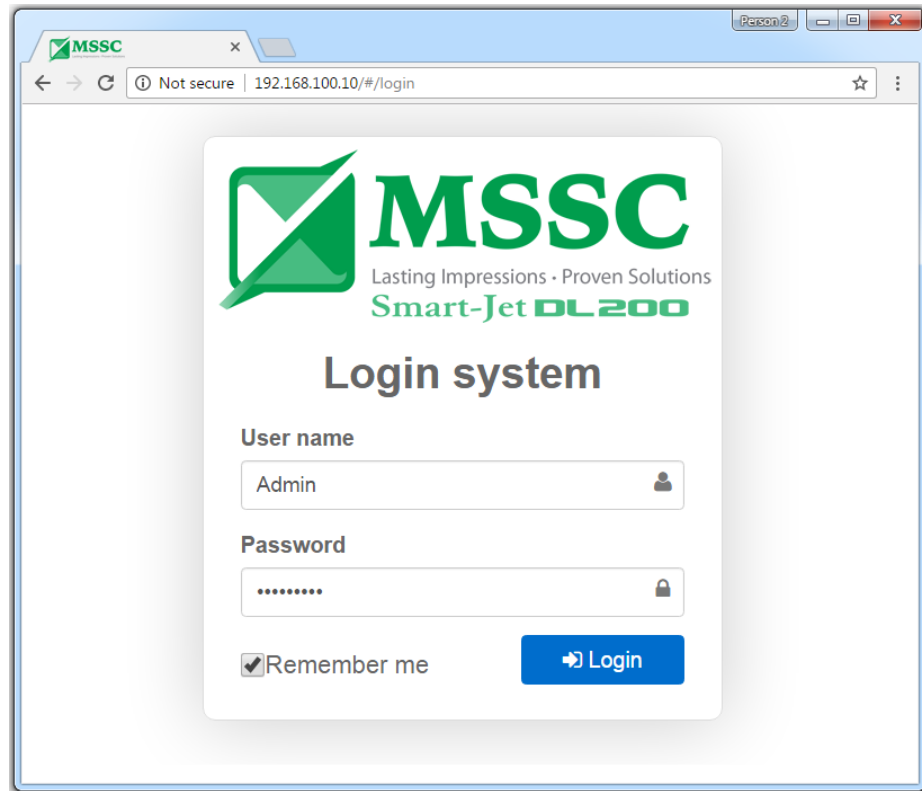
Main interface

- **Printing:** Print control
- **Design:** Design template
- **System setting:** Set stitchX, stitchY, parameter encoder, auto jet, date time…
- **Tool:**
  - **Configuration:** Hotspot connection, Local area connection, Wireless network connection
  - **Update:** Update firmware, update software
  - **User:** Manager user
  - **Language:** Support English, Chines, Russian, German, Italia, Portuguese, Vietnamese
- **Log:** Save event log of user
- **Info:** Introduce information of Smart-Jet DL200
- **Change password:** Change password of user

Add new template

Template name: -----------   Width:**112.7 Milimeters**

- [1]: Create template
- [2]: Open template
- [3]: Save template
- [4]: Save as template
- [5]: Edit template
- [6]: Select object
- [7]: Select all object
- [8]: Drawing template
- [9]: Cost ink
- [10]: Delete object

- [11]: Copy
- [12]: Cut
- [13]: Paste
- [14]: Undo
- [15]: Redo
- [16]: Zoom in
- [17]: Zoom out
- [18]: Fit to size
- [19]: Send to back
- [20]: Bring to front
- [21]: Properties (Only appear together with object)

**Create template**

Examples:

- **Name:** Name for new template.
- **Width:** 100mm. Max 1500mm.
- **Print head:** All print head, print head 1, print head 2.
- **Unit:** Millimeters, centimeter, pixels, inches.
- **Resolution:** 300x300dpi (300x150dpi, 300x600dpi, 600x150dpi, 600x300dpi, 600x600dpi).
- **Direction:** Left to right (left to right reverse, right to left, right to left reverse).
- **Channel:** ODD or EVEN.
- **Density:** 1 to 5 drops.
- **Encoder:** External encoder or internal encoder.
- **Speed:** Only use for internal encoder mode
- **Fix length: Only use for Continuous print mode**.
- **Print mode:** External sensor, continuous with external sensor, internal sensor, continuous with internal sensor, continuous without sensor.
- **Delay before:** Distance from external sensor to print head setup. Example 50mm.
- **Delay after:** Delay after print finished. Example 0mm.
- **Repeat:** Numbers repeat for template with one signal sensor. Example set 1 (**repeat one time**): Sensor signal → print 1, print 1. → Sensor signal → print 2, print 2. → …

Click Save for Apply design template

After Save. Can change the parameters by click Edit template button. Example Width template 112,7mm
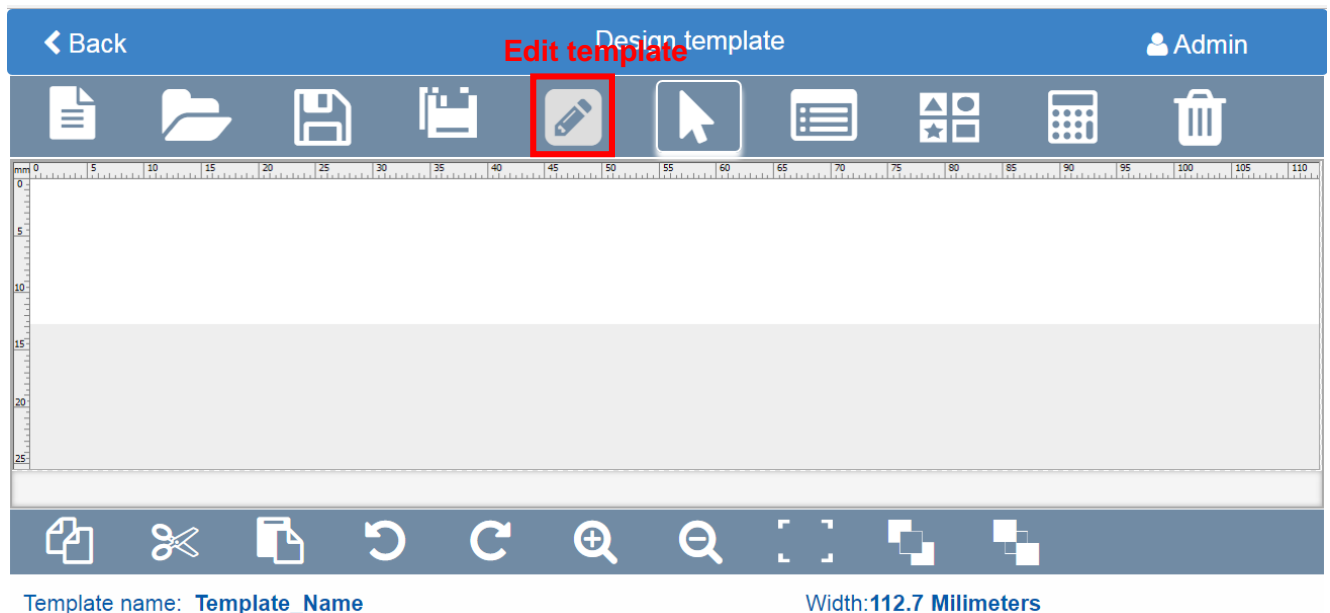
Design Template
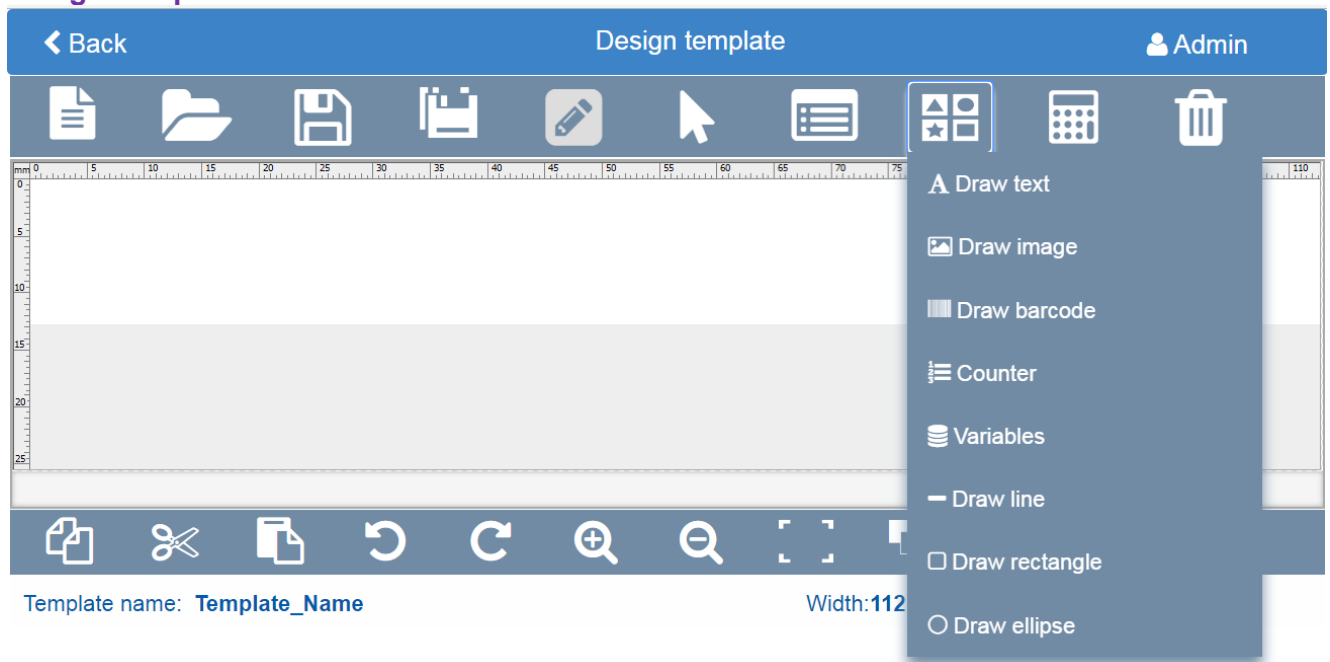
Draw Barcode

Properties:

- **Data type**: Number or alphanumeric
- **Step**: Set **1** (A-00001-B increase A-000002-B), set **2** (A-00001-B increase A-000003-B).
- **Repeat**: Barcode repeat time. Set **1** (A-**000001**-B, A-**000001**-B increase A-**000002**-B, A-**000002**-B).
- **Value**: Start value.
- **Min length**: Number length. Set **6** (000001).
- **Quantity**: Barcode quantity.
- **Prefix**: Prefix characters.
- **Suffix**: Suffix characters.
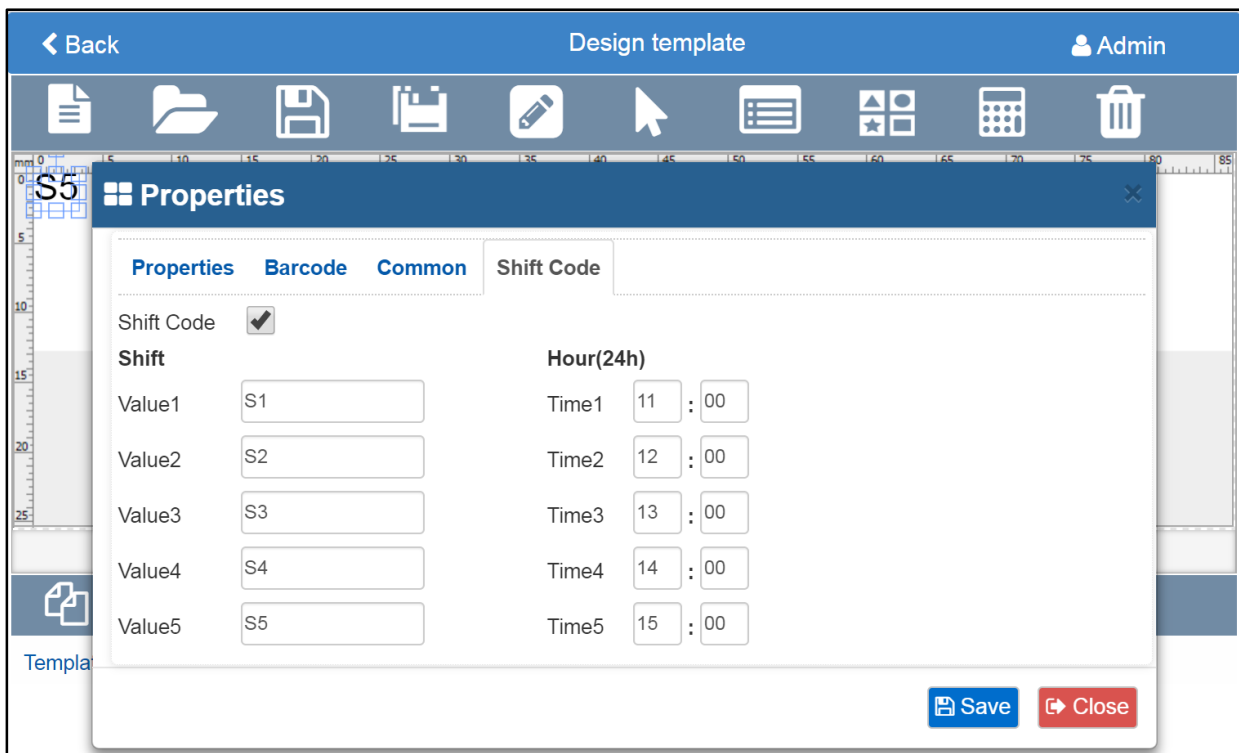- **Order print**: Increase or decrease.

Barcode:

- **Barcode:** Barcode type (QR, GS1 data matrix, Code39, PDF417,…).
- **TextY offset:** Distance from barcode line to numbers.
- **Show text:** Visible or invisible the numbers.

Common:

- **Font family:** Windows true fonts.
- **Font style:** Use for text or numbers (Bold, italicized, underlined).
- **Font size:** Number's size.
- **Text align:** Center, left, right.
- **Width:** Adjust the barcode width with default barcode size.
- **Height:** Adjust the barcode height with default barcode size.
- **Coordinates X:** X position.
- **Coordinates Y:** Y position.
- **Angle:** Adjust the barcode angle from 0 to 360 degree.

Draw Text

Properties:

- **Value:** Add value to print (Text, number, special character,…)
- **Line height:** Distance between two line (1 → 10 value)

Properties: Divides one day into multiple work shifts and prints a different code for each work shift

- **Shift Code:** Check to select print Shift code.
- **Shift value:** Add value Shift code to print
- **Hour (24h):** The start / End time of shift value print (hour/minute units). Up to 5 shift code value

Draw Images
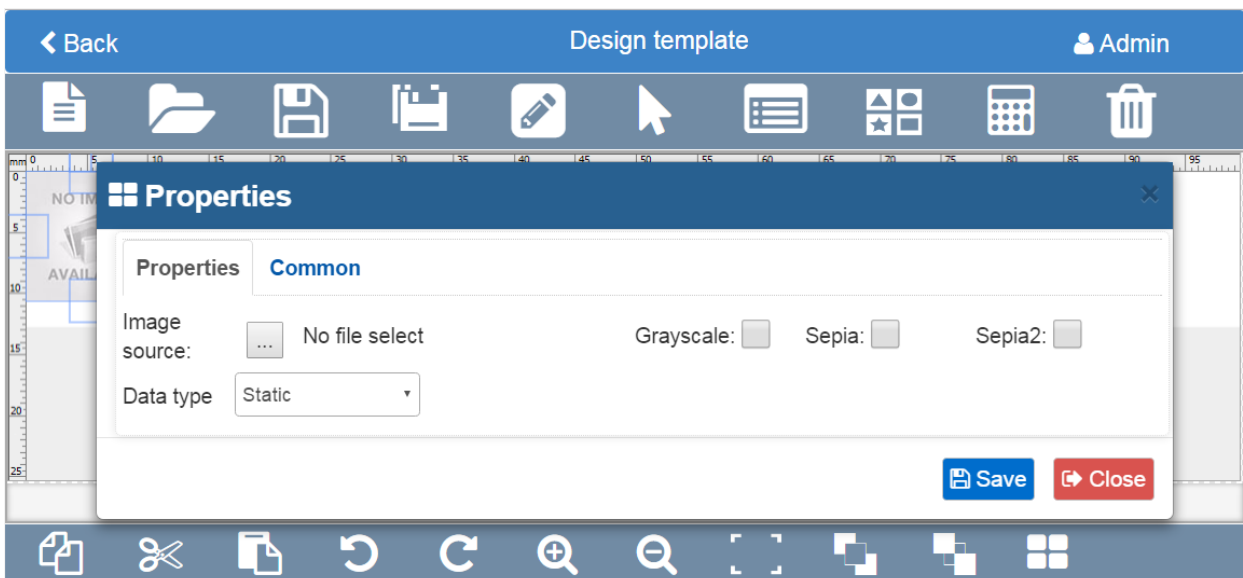
Properties:
- **Image source:** Source of image
- **Data type:** Print mode (Static, Image folder, Data field)
- **Grayscale, Sepia, Sepia:** Effects of image

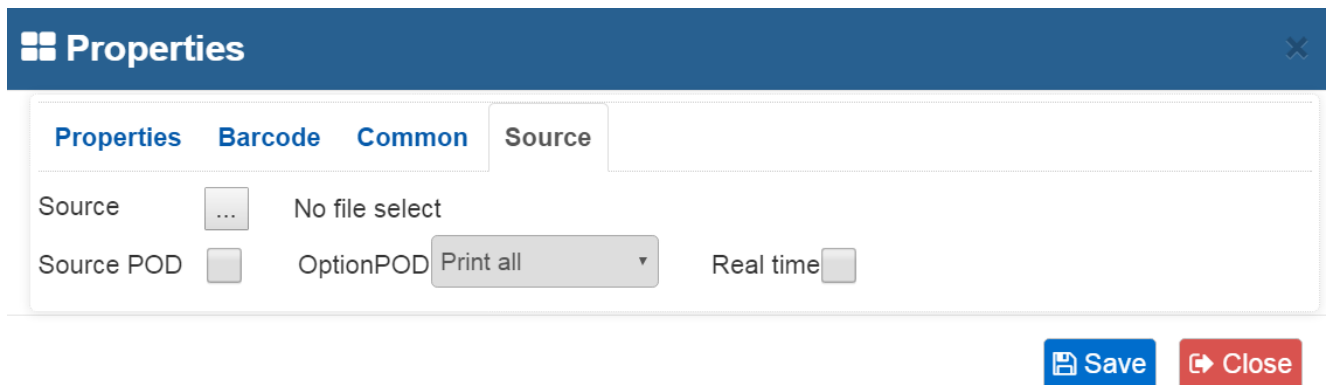**Draw Counter**

Properties:

- **Data type:** Number or Alphanumeric
- **Step:** Set **1** (A-000001-B increase A-000002-B), set **2** (A-000001-B increase A-000003-B).
- **Repeat**: Counter repeat time. 1: (A-000001-B, A-000001-B → A-000002-B, A-000002-B,…).
- **Value**: Start value.
- **Min length**: Number length. Set **6** (000001).
- **Quantity**: Counter quantity.
- **Prefix**: Prefix characters.
- **Suffix**: Suffix characters.
- **Order print**: Increase or decrease.

Draw Variable

Properties:

- **Start point:** Starting page number print
- **End point:** Ending page number print (0: Unlimited)
- **Date format:** Format date time
- **Value:** Add value of date time or text
- **Step value:** Step of page print (Only user for print database)
- **Add date:** Added to the current date
- **Source:** Type value (Text, Date time, object of database)
- **Destination:** Object of source be selected
- **[1]:** Moving objects back and forth between Source and Destination.
- **[2]:** Moving an object up and down in Destination
- **[3]:** Add or remove objects Field name (Only use for POD)

Source:

- **Source:** Path to file database
- **Source POD:** Tick if print POD (Print online data)
- **Option POD:** Print all, Print last, Print continuous last
- **Real time:** Tick if print real time

Click Save
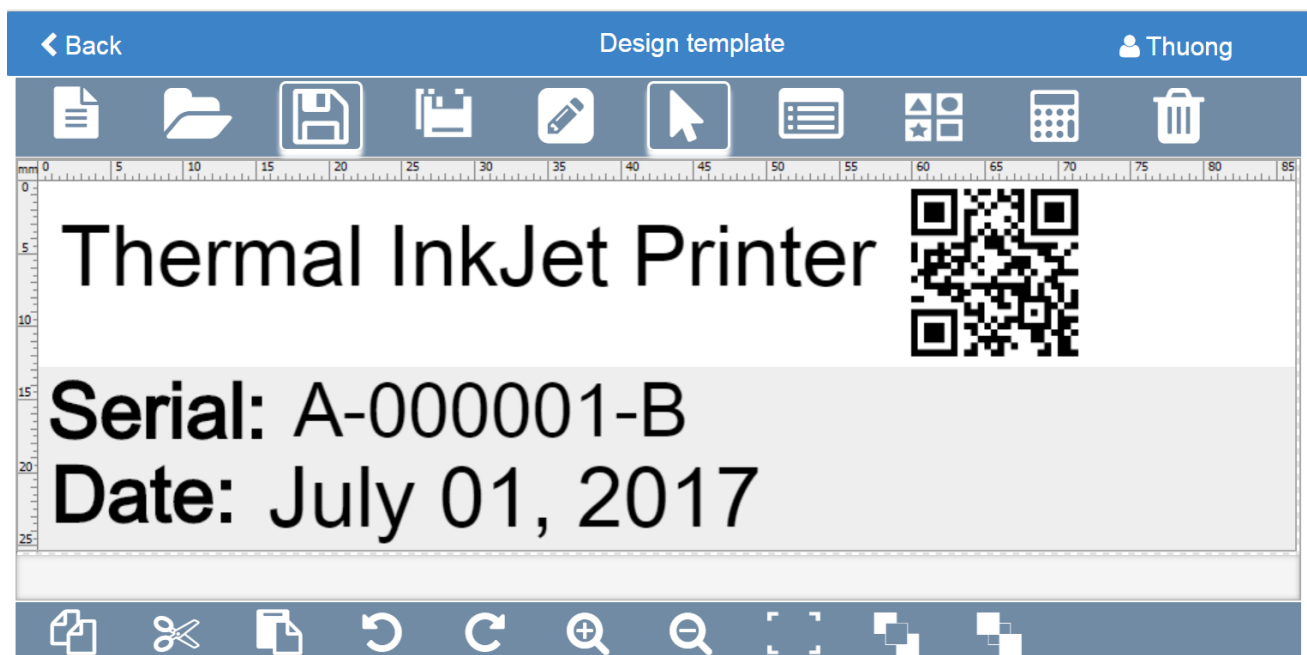
Calculate ink cost

- **Density / Resolution:** Select your target parameter.
- **Cartridge (ml):** Set the ink volume (with cartridge or bulk ink. Maximum you can input is 800ml).
- **Page:** Set number of printed page that you need.
- **Cost:** Add cost in your currency (depend on language such as: USD, VND, SGD, EUR, CND…) for each cartridge.
- **Ink type:** Select what kind of ink you are using now. **Solvent-base** or **Water-base ink.**

System setting

- **Auto jet**

  - **Auto jet:** Tick auto jet to automatic clean print head during print template
  - **Time jet (seconds):** The time between each jet (Example = 4: 4 second will automatically jet once)
  - **Column jet:** The number of column will be jet for each time

- **Import/export**

  - **Import:** Get the template from the control device to your printer
  - **Export:** Export the template from the printer to the control device

Printer control by Web browser

Printer Control Main Screen

- [1] Open template
- [2] Edit template
- [3] Zoom in
- [4] Zoom out
- [5] Fit to size
- [6] Purge
- [7] Start print
- [8] Stop print
- [9] Print setting

Printing information

Current page	0	Speed	1 m/min	Printhead 1		Water ink: 39.90 ml
Total page	Unlimited	Density	1	Printhead 2		Water ink: 39.90 ml
Print status	Off	Channel	Odd	User		Admin
Resolution	H300 X W150	Encoder	Internal encoder	Print mode		Internal sensor

APPENDIX

INK CARTRIDGES MAINTERNANCE

Print head cleaning

As Machine is working, if the print quality is degraded, please check on the ink level in the cartridge:

- If the cartridge is out of ink, change the new cartridge.
- If the cartridge isn't out of ink, the degraded print quality may be caused by the ink-spray, dust, or paper fiber being collected and built up on the surface of the nozzles plate. To maintain the print quality of the cartridge follow these wiping and purging tips.

Wiping

**[1]**: Materials needed: a lint-free, soft cloth, and de-ionized water.

[2]: Moisten the cloth with de-ionized water. Tap water also works but de-ionized water is recommended since the tap water contains impurities that can damage the print head.

[3]: Wipe slowly across the long-axis with the cartridge facing down as shown.

[4]: There are two lines of ink on the moistened cloth after wiping.
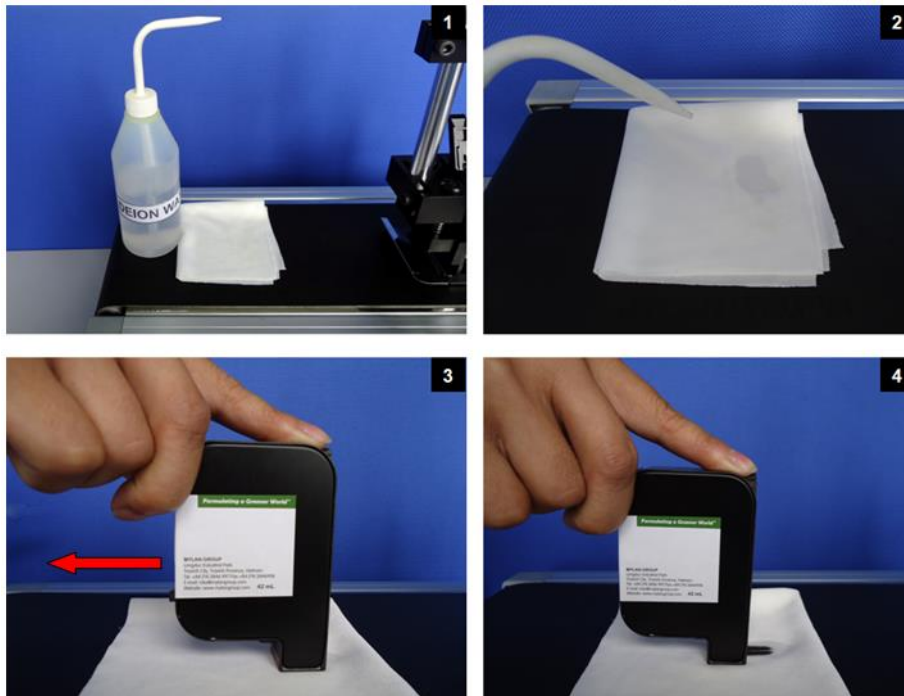
Important notes

- To avoid scratching the orifice plate, do not apply excessive force or use a dry or abrasive cloth.
- To avoid clogging the nozzles, make certain that the lint free cloth and de-ionized water used do not have a high percentage of suspended particles.
- Do not shake the cartridge as ink pressure will damage the nozzles.


Purging

[1]: If the cartridge sits inactive and uncapped for a period of time, the ink may dry and form a viscous plug at the nozzles. The dried ink plug can cause misdirected drops and eventually block the nozzles. White streaks may be visible in the printed text or graphic. To fix this problem, purge the ink plug out of the nozzles. Printing alone may be inefficient in removing ink plugs from the nozzles.

[2]: Then wipe the cartridge with a moist, lint-free cloth to remove the excess ink on the surface of nozzle plate.

[3]: After that print a few lines of text or graphics at high resolution to utilize more nozzles and push more ink out.

[4]: Finally, check the printed image. If the print quality can't be recovered, repeat this procedure several times. If it still doesn't work, change the print cartridge.

The cartridge before [1] and after [2] cleaning:
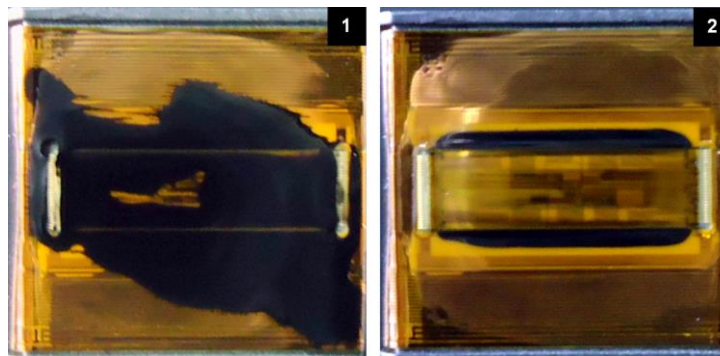
INK CARTRIDGE STORAGE PROCEDURE

For short term storing (less than one day)

- Leave the cartridge in the machine, capped. Capping cartridge is always recommended to prevent the nozzles from drying out or becoming clogged due to ink's solvent evaporation or dusting.
- Wipe and/or purge the cartridge next time it is used until good print quality is achieved.

For long term storing (more than one day)

- Remove the cartridge from the machine
- Remember that all inkjet print cartridges produce a small amount of ink residue that may build up on the cartridge nozzles during printing. We need to wipe the cartridge to remove these ink residues from the nozzles plate.
- Tightly cape the print cartridge by sealing tape.
- Leave the cartridge uncapped and place it in an airtight container with moist, dust- free cloth or sponge to prevent cartridge's nozzles from drying out or becoming clogged. Close the container tightly.
- Wipe and/ or purge the print cartridge next time it is used until getting the good print quality is achieved.

System disposal

- Keep the print head connected to the ink reservoir when disposing of system.
- Place the entire system in a plastic bag to avoid ink leakage.

Important handling cautions

- The cartridge has to be stored in a nozzle-up position.
- Never squeeze the ink reservoir as this will push ink out of the print head.
- To avoid getting air in the print head, never shake, drop or hit the print head.
- To avoid getting air in the print head, never hold the print head more than 10 inches above the ink reservoir when removing the system for storage.
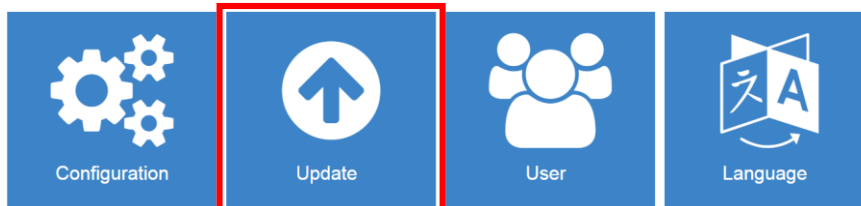- To avoid ink leakage, never hold the print head below the reservoir.

UPDATE FIRMWARE AND SOFTWARE

***NOTES*:**

- *Be sure there is no power failure while firmware is being updated.*
- *All data and settings will be lost while updating new firmware.*
- *Cartridge should be removed from the machine to avoid failure.*

Update firmware

- **Step 1:** Select "**Update**" function from tool menu.

- **Step 2:** Select "**Update Firmware**" from Combo Box.

- **Step 3:** Press "**Select file**" Button to select the new firmware update (*.hex).

- **Step 4:** Press "**Update**" Button after file load completed.

- **Step 5:** Press "**OK**" after the update completed.
- **Step 6:** Press "Reboot" button to complete update

Update Software

- **Step 1:** Select "**Update Software**" from Combo box.

- **Step 2:** Do the same "Step 3", "Step 4".
- **Step 3:** Press "**OK**" after the update completed.
- **Step 4:** Press "**Reboot**" Button for complete Update Software.

Machine default

Set your machine to factory defaults:

- The Printer at **"Stop Status"**.
- **Press and hold** **"Start/Stop"** button in **10 seconds until have Beep Sound**.
- **Release** **"Start/Stop"** button.

NOTES:

This step must be execute to make sure all new function on machine work well and no more error happened.

TROUBLESHOOTING

Error ID	Reason	Solution
Hardware		
Display "Cartridge connect fail"	The connection between the boards on cartridge and machine is not fully fitted or the boards on cartridge is dirty.	Remove the cartridge, clear the boards on cartridge and insert into the machine again. If still display "cartridge connect fail", restart the machine and check again.
Not print	The internal, external sensor is dirty by ink and dusty. External encoder is not connected with machine (External encoder mode).	Clear internal and external sensor. Check connection between encoder and machine.
Firmware		
Distance , delay before, delay after, fix length, template 's length are not correct	Setting encoder's parameters is not correct.	Change "**Pull / Revolusion (PPR)**" and "**Diameter of the Roller**". Goto **HOME -> System setting** to correct.
Update firmware is not successful	Have error when check data update.	Update firmware again.
Software		
Can't find the Wi-Fi hotspot of machine	The machine was configured to operate in Wi-Fi internet mode. Not plug USB Wi-Fi or USB Wi-Fi is not tight.	Check USB Wi-Fi and plug again to machine and restart the machine. If still can't find Wi-Fi hotspot, hold the button about 10 seconds to reset default then restart the machine.
Can't connect to machine by web browser or mobile application	The connection of device and machine is dropped.	Check the connection between device and machine.
Machine is printing but not update status.	The connection of device and machine is dropped	Check the connection between device and machine.
Not allow print when enough two cartridge.	Two cartridge have different ink type.	Change two cartridges have same ink type.
Can't connect to machine after configure the network.	Configure network for machine is not correct.	Hold the button about 10 seconds to reset default setting of the machine and then restart.