SMART-70X

(Laser Engraver)

User Manual

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In order to make a warranty claim you must contact an IDP Reseller. You will be responsible for packaging the printer for shipment and the costs of shipping and insurance of the printer from the point of use of the printer to the IDP Reseller. The IDP Reseller will bear the costs of shipping and insuring the printer from the repair location to the address from which the printer was shipped.

Before returning any equipment for in-warranty or out-of warranty repair, contact an IDP Reseller or an IDP Service Center for a Return Materials Authorization (RMA) number. Repack the equipment in the original packing material and mark the RMA number clearly on the outside of the box. For more information about RMA or IDP warranty statements, refer to the Warranty booklet on the quick install guide.

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1. Basic Information

1.1. SMART-70X Overview

SMART-70X is a device to engrave a card on both sides by laser. SMART-70X is used independently or with other modules of SMART-70 series.

Picture 1 (a) shows a combination of SMART-70I(Input Hopper) and SMART-70X(Laser Engraver) for encoding and laser engraving. Picture 1 (b) shows a combination of SMART-70I(Input Hopper), SMART-70P(Printer) and SMART-70X(Laser Engraver) for printing, encoding and laser engraving.

(a) SMART-70IX   (b) SMART-70IPX

Picture 1. Example of combination for SMART-70X

Key features of SMAR-70X are as follows.

☑ Enable a fast and stable engraving with a high quality laser source.

☑ Enable CLI (Changeable Laser Image) engraving.

☑ The Camera inside the module for monitoring and Image Processing is installed by default.

☑ Enable to encode a magnetic stripe, contact/contactless smart card as options.

☑ The error card drawer to collect encoding failed cards is installed by default.

☑ The physical key is installed to prevent touching a card.

☑ Enable to use it with SMART-70 Laminator and Output hopper.

1.2. SMART-70X Features

1) External features (Front)

①	**Control Panel LCD** The status of engraver is displayed. It can be operated by buttons.
②	**Window for monitoring** It shows operation by eye.
③	**Indicator LED** It shows the simple status of module. (Blue: Ready, Green: Operating, Red: Error)
④	**Physical lock** To lock engraver
⑤	**Door handle** To open a door
⑥	**Card Gate** Card gate is to eject cards

2) External features (Rear)

① **Air Inlet**
The hole which air is inhaled
② **Air Outlet**
The hole which air is exhaled
③ **Power Switch**
Turn On/Off
④ **Power Plug**
110-240V~ 50-60Hz Power plug
⑤,⑦ **Communication Port**
To communicate between SMART-70 modules
⑥ **USB Device port**
This port is connected to the PC

3) Internal features

①	**Laser safety switch**
	When a door is opened, it blocks a power of laser for safety.
②	**Camera**
	It can check a graving
③	**Flipper**
	It flip a card for engraving on both surfaces
④	**Card movement module**
	It moves a card. The encoder options are installed.
⑤	**Door Open Sensor**
	It can sense opening a door.
⑥	**Error card drawer**
	It keeps error cards.

1.3. Caution

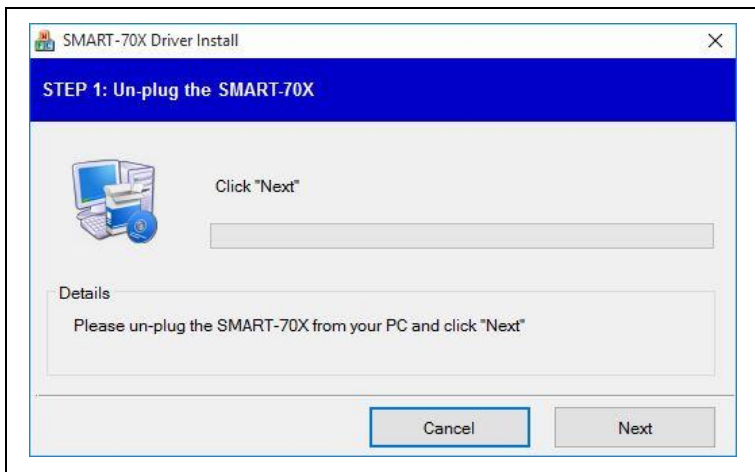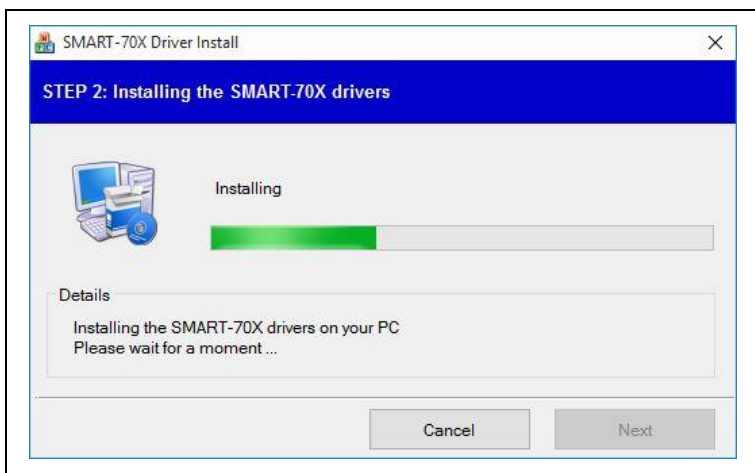|	
🚫	Use a power of AC 100~240V, 5~60Hz electric outlet. Otherwise, the device may have a fault or cause fire.
🚫	Do not strike or apply strong vibration to the device. Otherwise, the device may have a fault or cause fire.
🚫	Do not use the device in a dusty place, or in a place with high temperature. Otherwise, the device may have a fault or cause fire.
🚫	Do not expose the device to rain or water. If the device gets wet, contact an authorized dealer or service center.
🚫	Do not push any objects into the air vents or openings of your equipment. Otherwise, the device may have a fault or cause fire.
🚫	Do not connect or disconnect any cable while the device is ON. Otherwise, the device may have a fault or cause fire.
🚫	Do not push a laser safety switch while the door is opened. Otherwise, the device cause burns or vision problem.
🚫	Do not disassemble or modify the device. Otherwise, the device may have a fault or cause electric shock.
⚠️	Leave 20.4 cm (8 in) minimum of clearance on all vented sides of the device to permit the airflow required for proper ventilation. Restricting airflow can damage the device or cause fire.
⚠️	Irritating or poisonous gas may be produced depending on a material of a card. Ventilate the room well or install a ventilator.
⚠️	If device does not operate normally - in particular, if there are any unusual sounds or smoke coming from it – turn off it immediately and contact an authorized dealer or service center.
⚠️	Before moving, disconnect the power cord and all external connections

2. SMART0-70X Installation

2.1. Driver Installation

SMART-70X contains the laser controller, card movement controller and web cam. The related device driver should be installed in the PC. SMART-70X provides a one-time installation program for easy driver installation of all components. Please install them as following the below steps.

1) Run LaserInstall.exe

	Please run the 'LaserInstall.exe' in the 'SMART-70X₩Drivers₩' **without connection of SMART-70X.** STEP 1: Click "Next" button.

2) Start Installation of drivers

	STEP 2: Click "Next" button.

3) Confirm a "Windows Security"

	Click "Install" button when "Windows Security" windows is displayed.

4) Complete drivers

	STEP 3: Installation is completed. Click "Close" button.

2.2. Stand-alone installation

Please connect a SMART-70I input hopper and SMART-70X as a below pictures for laser engraving only.

5) Connection between SMART-70X and SMART-70I

	After install a binder below a SMART-70X, connect a SMART-70I on the binder.

6) Arrangement of modules

	Attach a stacker on the right side of the SMART-70X and arrange modules.

7) Connection of cables

Connect power cables, red communication cable and USB cable as a left picture.

① Connect a 100~240V, 50~60Hz AC power to SMART-70X, a 24V DC adapter to SMART-70I.

② Connect the red communication cables to each module.

③ Connect each USB cable to SMART-70X, and connect the opposite end to the PC.

8) Power on

Turn on the power in order of the below steps.

① Turn on SMART-70X.

② Turn on SMART-70I.

9) Completion of installation

All modules are installed normally if the colors of status LED are blue.

2.3. Installation with the SMART-70P

Please connect a SMART-70I input hopper, SMART-70P printer and SMART-70X as a below pictures for printing and laser engraving.

1) Connection between SMART-70X and SMART-70P

	After install a binder below a SMART-70X, connect a SMART-70P on the binder.

2) Connection between SMART-70P and SMART-70I

	After install a binder below a SMART-70P, connect a SMART-70I on the binder.

3) Arrangement of modules

Attach a stacker on the right side of the SMART-70X and arrange modules.

4) Connection of cables
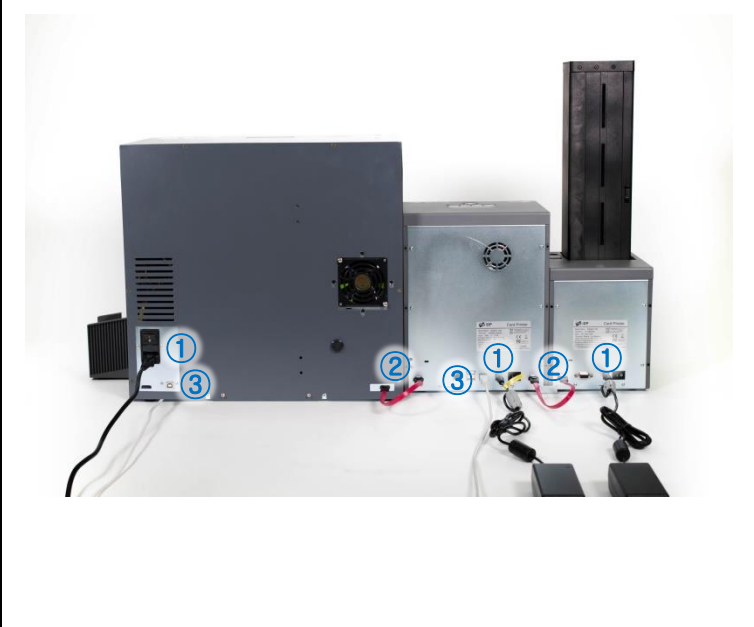
Connect power cables, red communication cables and USB cables as a left picture.

① Connect a 100~240V, 50~60Hz AC power to SMART-70X, a 24V DC adapter to SMART-70P/I.

② Connect the red communication cables to each module.

③ Connect each USB cable to SMART-70X and SMART-70P, and connect the opposite end to the PC.

5) Power on

Turn on the power in order of the below steps.

③ Turn on SMART-70X.
④ Turn on SMART-70P.
⑤ Turn on SMART-70I.

6) Change Mode of SMART-70P

Change mode of SMART-70P to 'Slave'.

① Click Menu(▤) button and find "System Config." Menu.
② Click Select (↵) button, then the 'Combination' is displayed.
③ Click Arrow (➡) button and find "Operation Mode".
④ Click Select (↵) button to change a Mode.
⑤ Click Arrow (➡) button to change a Mode to "SLAVE".
⑥ Click Select (↵) button to apply Mode to "SLAVE", and the SMART-70P is rebooted automatically.
⑦ "Printer Ready" is displayed on LCD panel if the "SLAVE" Mode is applied.
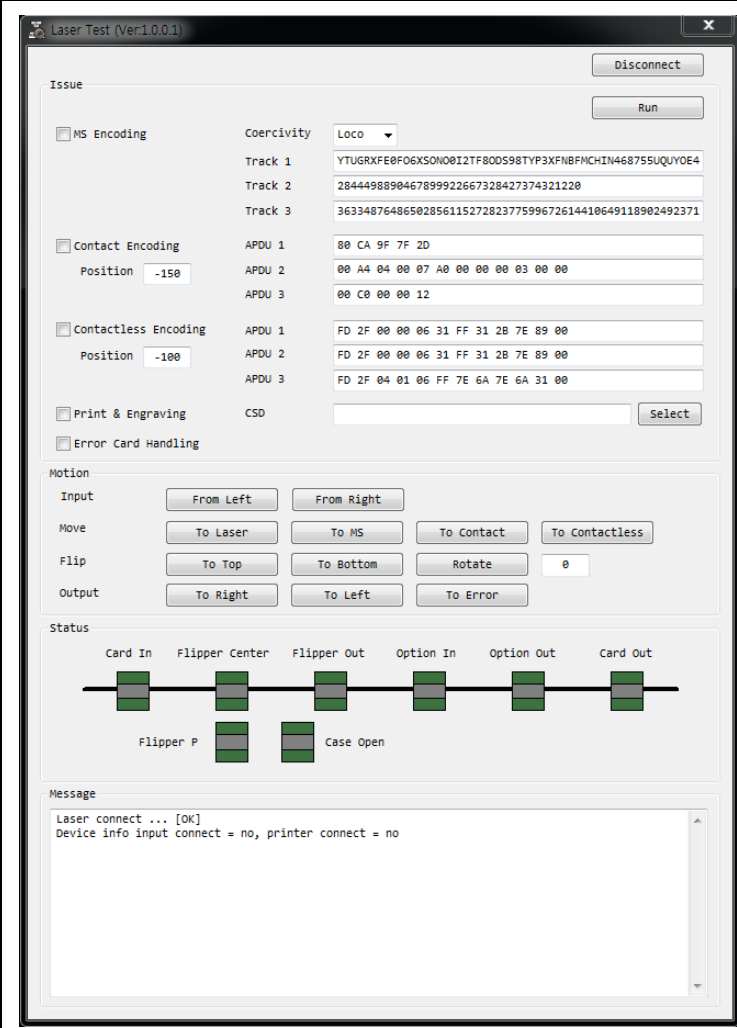
7) Completion of installation

	All modules are installed normally if the colors of status LED are blue.

3. Engraving a card

3.1. LaserTest

LaserTest is a testing utility for SMART-70X.

Please run LaserTest in the '₩SMART-70X₩Utilities₩' folder.

1) The left window is displayed when running LaserTest.
2) Check a "Printing & Engraving" item and click the 'Select' button to select a "sample_single.csd".
3) Click "Run".
4) The card is inserted automatically when the input hopper is connected. If the SMART-70X uses a stand-alone mode, the user input a card manually.

Please read the "4.4 LaserTest" for reference.

Please use the SmartID for editing a CSD file or creating a new CSD file. Please refer to the 'SmartID user manual'.

3.2. SmartID

SmartID is a card printing program for SMART series printers. Please run the SmartID after the installation of SmartID in the Installation CD.

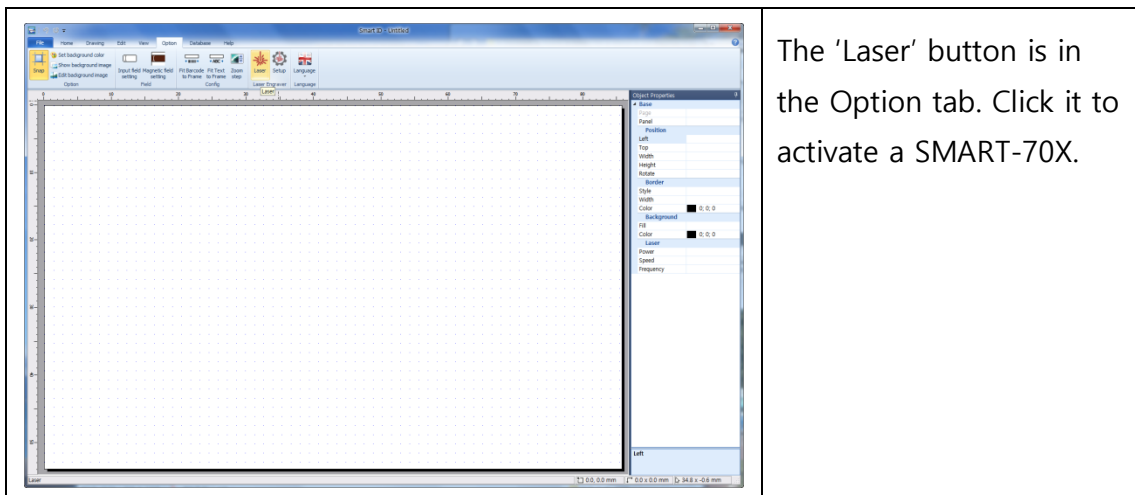- Please refer to the 'SmartID user manual' for further information.
- SmartID uses the encoders in the printer only.
- Please use the LaserTest Utility if the encoder is used in the laser module.
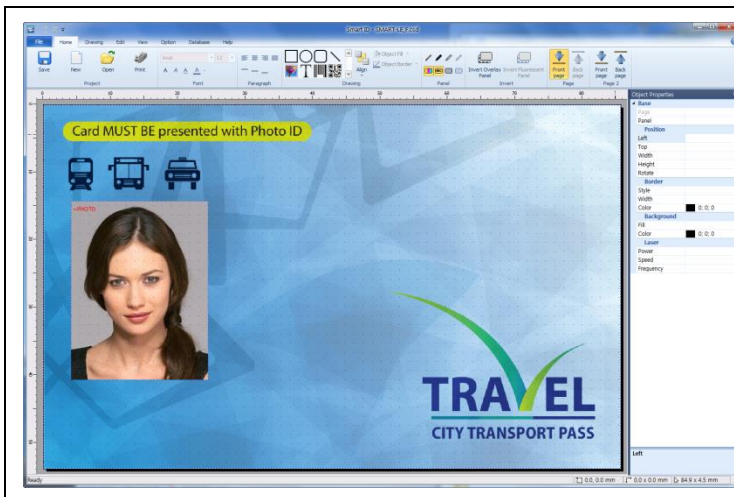
1) Run SmartID
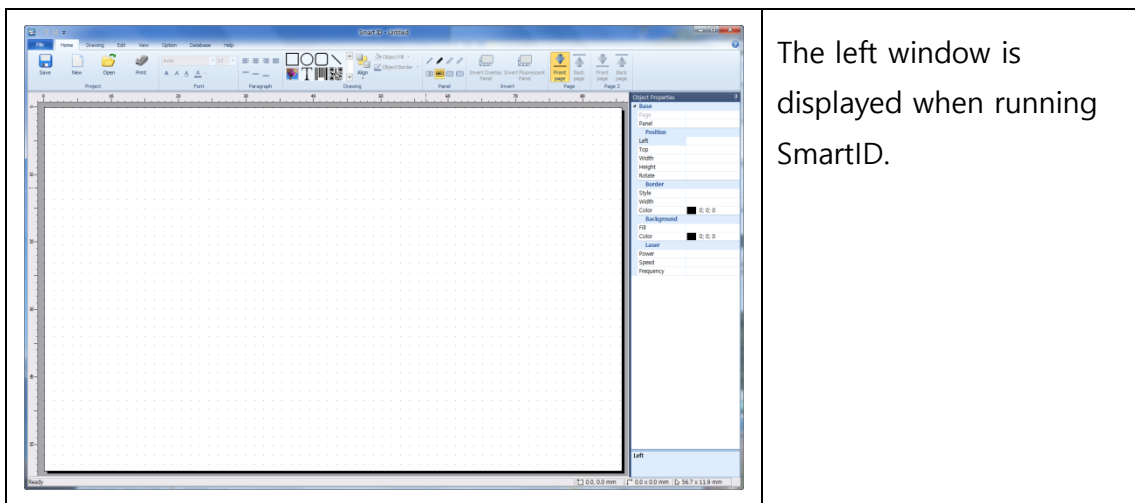
	The left window is displayed when running SmartID.

2) Activation of laser function

	The 'Laser' button is in the Option tab. Click it to activate a SMART-70X.

3) Design a card

Design a card after clicking "Front page" of 'Page'.
You can open a "sample_single.csd" in the Utilities folder, too.

4) Design engraved objects
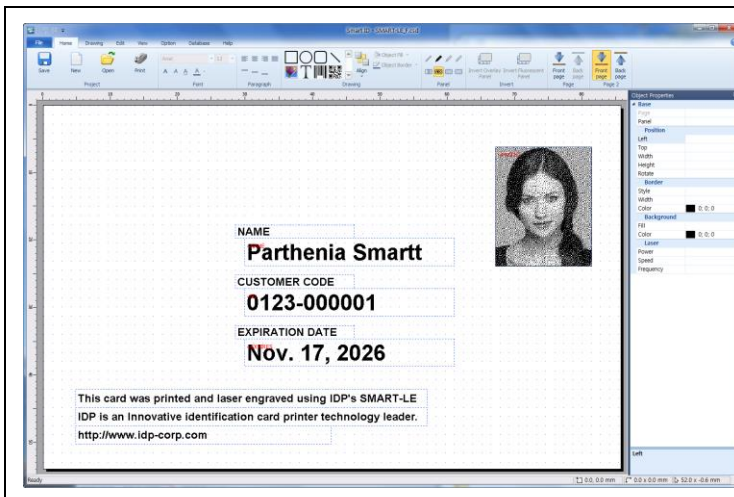

Design engraved objects after clicking "Front page" of 'Page 2'.
You can open a "sample_single.csd" in the Utilities folder, too.

5) Engrave a card

The preview window is displayed when clicking "Print" button. The above preview is for printing, and the below preview is for engraving. To print and engrave, click "Print" button in the preview window.

4. Utilities

4.1. LaserConfig

SMART-70X is optimized for the best engraving in the factory. However, the user can configure the power, speed, position and other values for laser engraving.
Please run the LaserConfig in the '₩SMART-70X₩Utilities₩' folder for adjusting a configuration of SMART-70X.

The left window is displayed after connecting a SMART-70X when running LaserConfig.

- The power of SMART-70X should be connected and turned on before running LaserConfig.

- The SmartID or other laser utility program should be closed before running LaserConfig.

- The 'Connection failed to SMART-70X' pop-up window is displayed if LaserConfig can't connect the SMART-70X.

1) Information

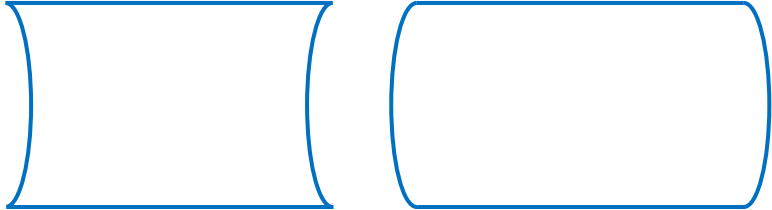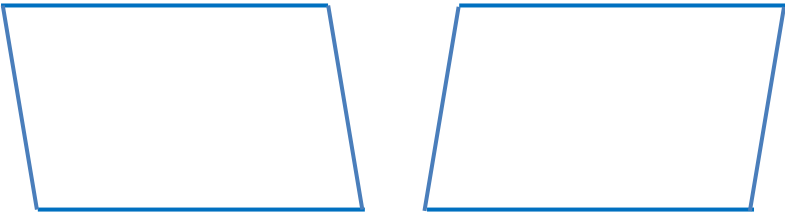| Serial Number	Show a serial number of SMART-70X.
Setup Version	Show a version of configuration for SMART-70X

2) Power

DPI	Select the resolution of laser engraving between 600 dpi / and 1200 dpi.
Power Level	Set the power level of laser. Range : 1~25 • If value is larger, the power level is bigger and engrave darker. • The below value as 'Text', 'Line','Image' is changed automatically if the power level is changed.
Text	Set the power and speed when the text or barcode is engraved. • Range of Power is 0~100, it is percentage of the maximum value. • Range of Speed is 0~1600, the speed of movement of laser.
Line	Set the power and speed when the line or figure is engraved. • Range of Power is 0~100, it is percentage of the maximum value. • Range of Speed is 0~1600, the speed of movement of laser.
Image	Set the power and speed when the portrait or logo is engraved. Image is expressed by gray level, the minimum and maximum value of power is set. • Range of Power is 0~100, it is percentage of the maximum value. • Range of Speed is 0~1600, the speed of movement of laser.

3) Position

Field Size	Set the maximum size for laser engraving. • Range of Field Size is 120~150, the unit is mm. • The size of output is changed if Field Size is changed.
Angle	Set the rotation value for laser engraving. • Range of Angle is 0~360, the unit is degree. • The output is rotated as a value of Angle.
Offset X	Set position to the right and left properly. • Range of Offset X is -10~10, the unit is mm. • The position of output is changed by left or right depending on this value.
Offset Y	Set position to the up and down properly. • Range of Offset X is -10~10, the unit is mm. • The position of output is changed by up or down depending on this value.

4) Galvo

Negate	Engrave after reflection of image across a defined axis.
Scale	Set the scale of image for each axis. • Range of Scale is 0~100, unit is percentage (%).
Ellipse	Calibrate image result in shape of ellipse. • Range of Ellipse is 0.875~1.125. • The image is deformed depending on a value of Ellipse as below.
Parallelogram	Calibrate image result in shape of parallelogram. • Range of Parallelogram is 0.875~1.125. • The image is deformed depending on a value of Parallelogram as below.

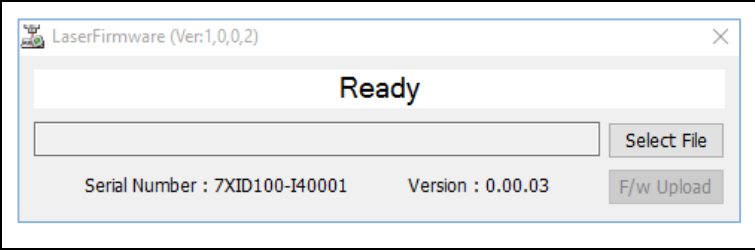|	
Trapezoid	Calibrate image result in shape of trapezoid. • Range of Trapezoid is 0.875~1.125. • The image is deformed depending on a value of Trapezoid as below.

5) Load / Save

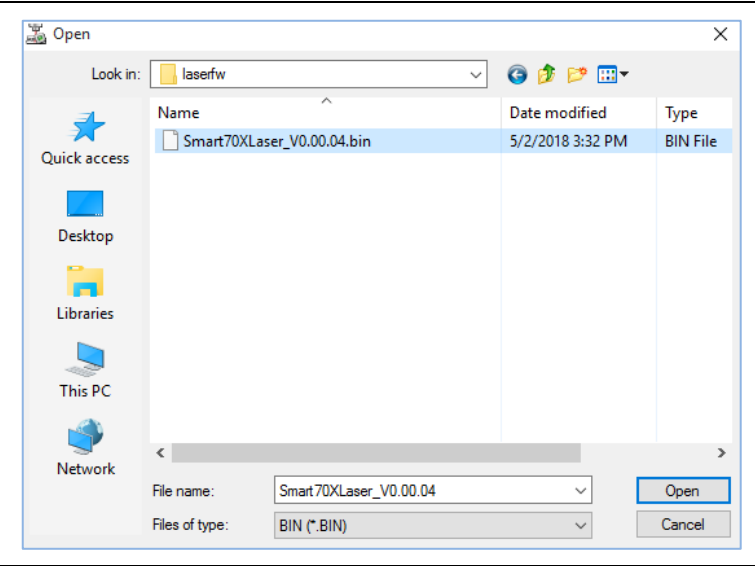|	
Load Default	Load factory configuration values in the memory of SMART-70X. To apply it, click a 'Store' button.
Reload	Show the configuration values in SMART-70X.
Store	Save current values to SMART-70X.
Close	Exit a LaserConfig utility.

4.2. LaserFirmware

For updating a firmware of SMART-70X, run the LaserFirmware in the '₩SMART-70X₩Utilities₩' folder.
The SMART-70X should be installed and power is turned on before running a LaserFirmware utility. And, SmartID or other Laser utilities should be closed before running a LaserFirmware.

1) Run LaserFirmware

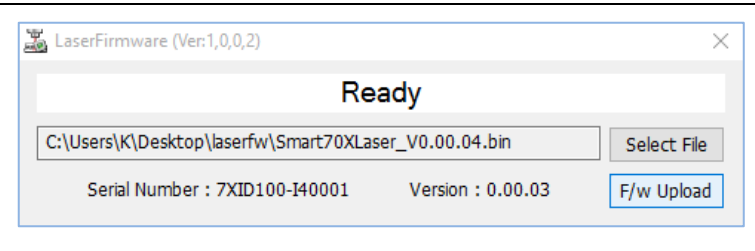|	
	The left window is displayed when running 'Laser Firmware' utility after connecting a SMART-70X.

2) Select a firmware file

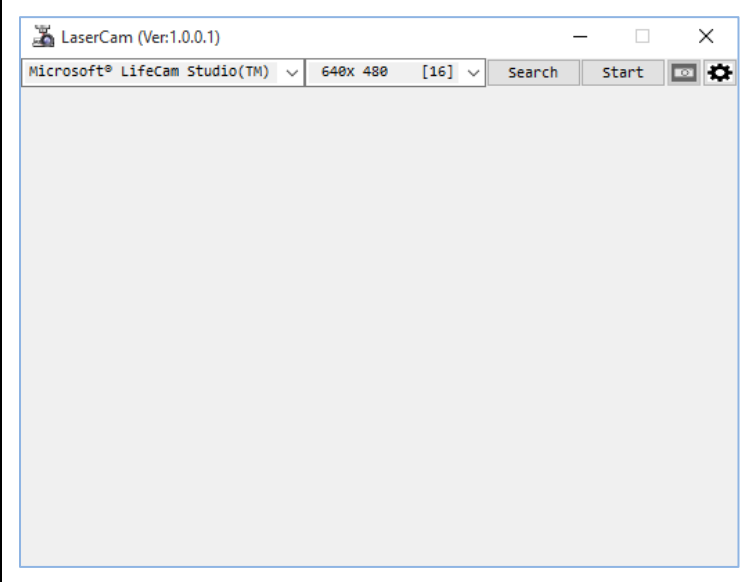|	
	Click a "Select File" button and select a 'Smart70XLaser_VX.XX.XX.bin'.

3) Upload a firmware

	Click "F/W Upload" button to update a firmware.

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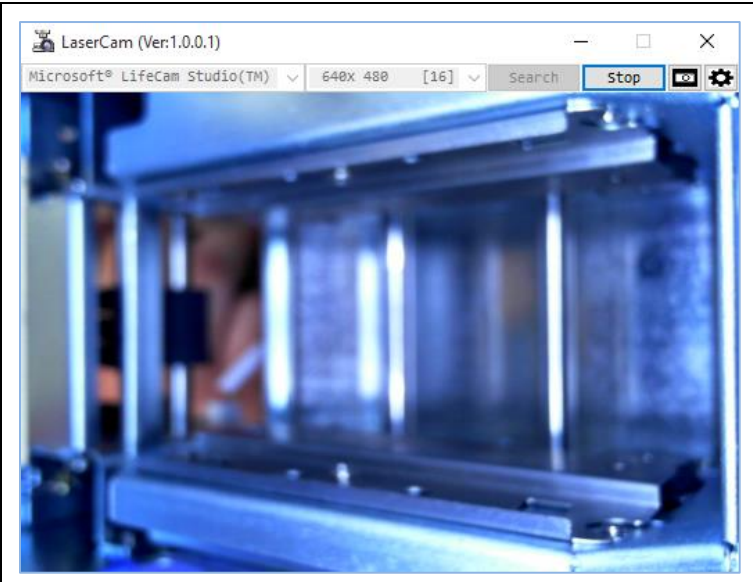
4.3. LaserCam

The camera is installed by default in the SMART-70X and the status of engraving on real time. Run 'LaserCam' in the '₩SMART-70X₩Utilities₩' folder.
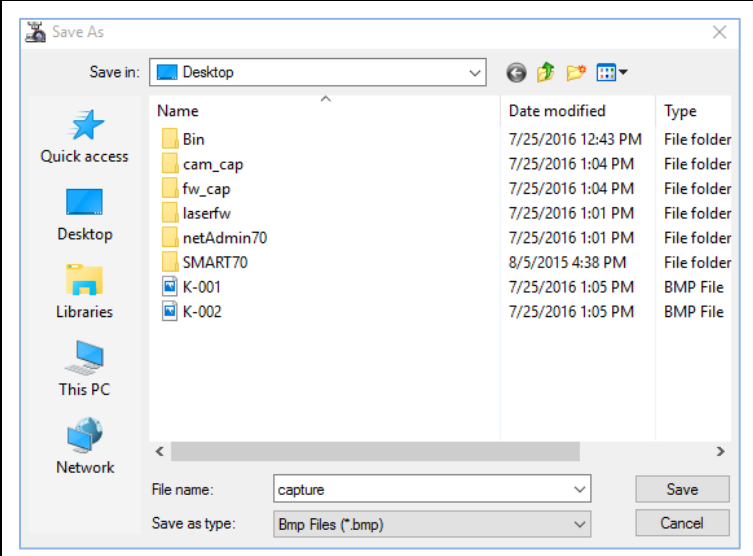
1) Run LaserCam

	The left window is displayed when running 'Laser Firmware' after connecting SMART-70X. • It works if 'Microsoft LifeCam Studio' is shown in the first list box. • Click 'Search' button after checking a connection status of SMART-70X if the camera is not on the list.
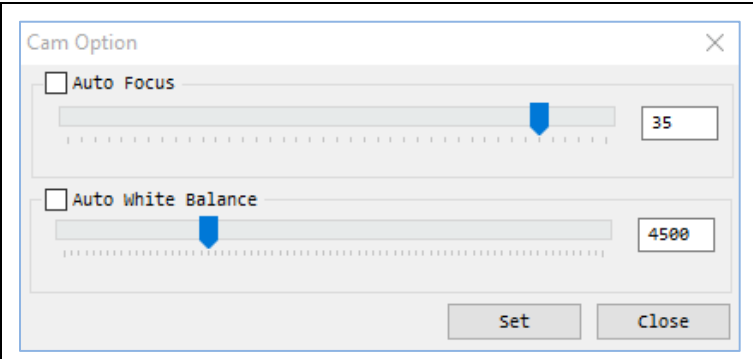
2) Start LaserCam

	The inside of SMART-70X is shown when clicking "Start" button. • The image can be saved by the resolution 640x480. • The size of image is changed by dragging an edge of window with mouse.

3) Save an image of LaserCam

To save an image in the window, click a Camera icon in the LaserCam.

4) Configuration of LaserCam

To adjust a focus and white balance, click Gear icon in the LaserCam.

Focus	Set the focus of camera by Focus. • When "Auto Focus" is checked, it sets automatically. • Adjust a slider to show the image of printed card clear when it set manually.
White Balance	Set the white balance of camera by White Balance. • When "Auto White Balance" is checked, it sets automatically. • Adjust a slider to show the image of printed card a feeling of color as user wants when it set manually.

4.4. LaserTest

LaserTest is a sample program for encoding, printing and engraving by SMART-70X. The basic functions of SMART-70X can be tested by LaserTest. Users can use SmartID or the customized program by SDK.

Please run 'LaserTest' in the '\SMART-70X\Utilities\' folder.
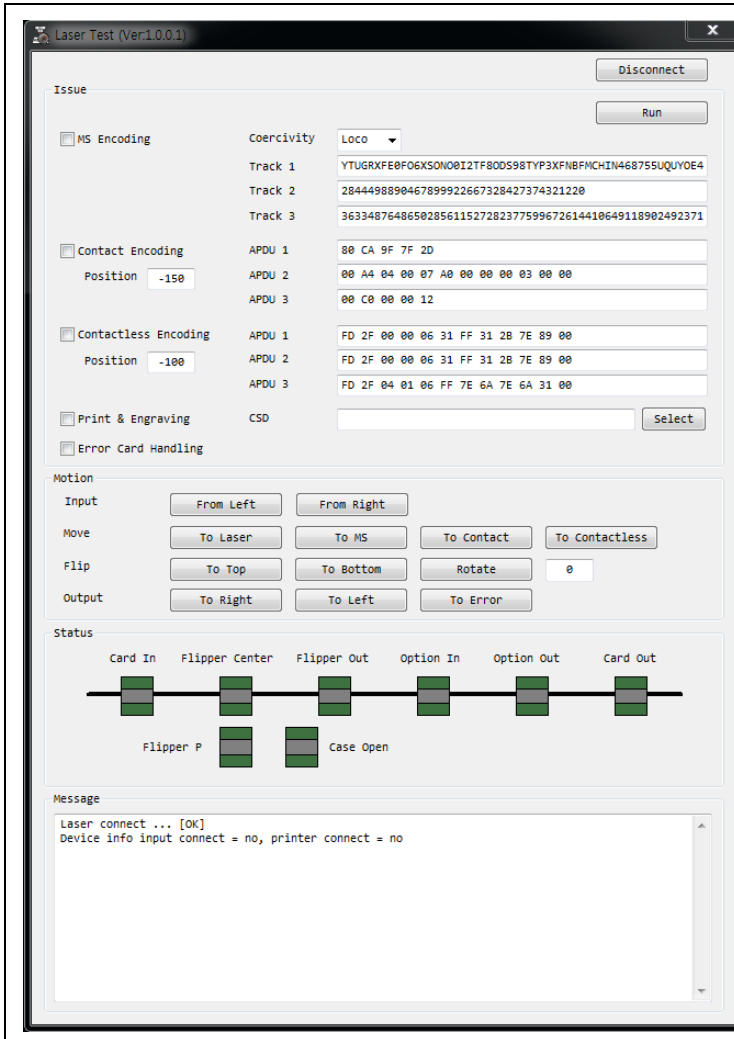
	The left window is displayed when running 'LaserTest' after connectina SMART-70X. • The power of SMART-70X should be connected and turned on before running LaserTest. • The SmartID or other laser utility program should be closed before running LaserTest. • The 'Connection failed to SMART-70X' pop-up window is displayed if LaserConfig can't connect the SMART-70X.

Connect / Disconnect	Connect/Disconnect button can connect/disconnect the SMART-70X. • SMART-70X is disconnected if the 'Disconnect' button is clicked on 'Connect' status. • SMART-70X is connected if the 'Connect' button is clicked on 'Disconnect' status.

Issue	Issue makes encoding, printing and engraving automatically. • Check the operation as you want, enter the data and click 'Run' button. • For encoding, the proper encoder options should be installed in the SMART-70X. • For MS encoding, check a proper coercivity of encoded card, enter the data to encode. • For Contact/Contactless smart card encoding, enter the APDU which a card can recognize. • Position of contact/contactless smart card should be adjusted to the encoding position. • For Printing and Engraving, select a CSD file to design in SmartID. • When checking 'Error card handling', the error card is moved to 'Error card drawer' when encoding is failed.
Motion	Motion makes doing each operation of SMART-70X step by step. • Input: input a card from left / right. • Move: move a card to the indicated position. • Flip: flip a card or rotate a card by the indicated angle. • Output: Eject a card to left / right.
Status	Status shows a status of sensors in SMART-70X.
Message	Message shows a operation of SMART-70X on real time.

5. Specification

Model		SMART-70X
Laser Engraving	Laser Type	6W Air-Cooled DPSS Laser, ND:YAG
	Resolution	1200dpi
	Scanning	Raster & Vector Scanning
	Engraving Mode	Single or Dual-sided Laser Engraving
	Speed	103 cards/hour (Single-sided Laser engraving only)
	CLI (Changeable Laser Image)	Yes
	Warranty	20,000 hours
Card	Card Feeding	Automatic, Manual
	Card Size	ISO CR80 (54mm x 86mm / 2.12" x 3.38")
	Card Thickness	0.76mm (30mil)
	Card Type	Laserable PVC, PC (Polycorbonate) Card
Capacity	Input Hopper	Max. 500 Cards (Optional : SMART-70 Input Hopper)
	Output Hopper	Max. 500 Cards (Optional : SMART-70 Output Hopper)
	Error Card Bin	Max. 20 Cards
System	Display	LCD & LED
	Control Panel	4 Buttons
	Vision Camera	Laser Engraving Monitoring
	Supported Platforms	Microsoft Windows 7/ 8/ 10
	Communication	USB
	Power Supply	100-240V~50/60Hz 2.5A
	Temp. / Humidity	10~30℃ / 20~80%
Security	Physical Lock	Laser System, Error Card Bin
Options	Magnetic	ISO 7811 (Track I, II, III Read/ Write, HiCo/ LoCo)
	Contact	ISO 7816 (ID-1)
	Contactless	MIFARE, ISO 14443 (Type A/ B), ISO 15693, DESFIRE, iCLASS
	Air Cleaning	Gas & Vapor Protection - Organic Vapor/Acid Gas/Ammonia/Methylamine/Formaldehyde
Dimensions	Millimeter (WxLxH)	450 x 230 x 425
	Inch (WxLxH)	17.7 x 9.1 x 16.7
Weight	Kg / Lbs	Approx. 25kg / 55 lbs
Laser Safety		IEC-60825-1 CLASS 1 Standard

Specifications and availability may change without notice.