Markin BOX

sketchbook!

Operation Manual

Ver. MB2

TOKYO CHOKOKU MARKING PRODUCTS CO.,LTD.

Tokyo, JAPAN

This is a translation of the original instruction and the original instruction is in Japanese

Introduction & Safety information

We would like to thank you for making a MarkinBOX marking machine your choice for meeting your marking and traceability needs.

MarkinBOX is NC-Controlled marking machine to make characters with dots of pins.

To help you use your MarkinBOX, this manual contains detailed information. Please read these instructions carefully and keep this document for future reference.

Information of the MarkinBOX

Copy of the marking plate

Warning definition

Hot	**Beware of high temperature**
	Prolonged continued use would heat up the solenoid. This will not affect the quality of marking. However, do not touch the area around the stylus pin or the solenoid with bare hands after continued use. In particular, refrain from using the system around small children. ***Continued use (non-stop for one hour or more) at marking force 10 (maximum power) and Speed 1 (slowest speed) sometimes causes the surface temperature to rise to approx. 120°**
Noise	**Beware of loud noise**
	Loud noise will occur when the Marking Force is set high or depending on material properties and the shape of the workpiece (especially thin and hollow ones such as pipes. Therefore, always wear an ear plug when operating the system.

Water Protection	**Using near water and in a humid area is prohibited**
	MarkinBOX series are IP20 classification
	To prevent fire, electric shock, and damage, do not use the system around water. Also, do not touch the system with wet hands.
Safety	**Beware of unwearing property gears**
	For your safety, wear an protection glass when operating the tool and wear PPE for hearing protection when operating the tool

WARNING   **General Power Tool Safety Warnings**

WARNING : Read all safety warnings and all instructions. Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury.

Save all warnings and instructions for future reference.

The term "power tool" in the warnings refer to your mains-operated (corded) power tool or battery-operated (cordless) power tool.

1) **Work area safety**
   a) **Keep work area clean and well lit.** Cluttered or dark areas invite accidents.
   b) **Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gasses or dust.** Power tools create sparks which may ignite the dust or fumes.
   c) **Keep children and bystanders away while operating a power tool.** Distractions can cause you to lose control.

   Note:
   Not expected to use or produce under potentially explosive atmosphere, as well as toxic, corrosive, flammable and explosive substances. Not expected to use under ATEX.

2) **Electrical safety**
   a) **Power tool plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with earthed (grounded) power tools.** Unmodified plugs and matching outlets will reduce risk of electric shock.
   b) **Avoid body contact with earthed or grounded surfaces, such as pipes, radiators, ranges and refrigerators.** There is an increased risk of electric shock if your body is earthed or grounded.
   c) **Do not expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock.

d) **Do not abuse the cord. Never use the cord for carrying, pulling or unplugging the power tool. Keep cord away from heat, oil, sharp edges or moving parts.** Damaged or entangled cords increase the risk of electric shock.

e) **When operating a power tool outdoors, use an extension cord suitable for outdoor use.** Use of a cord suitable for outdoor use reduce the risk of electric shock.

f) **If operating a power tool in a damp location is unavoidable, use a residual current device (RCD) protected supply.** Use of an RCD reduces the risk of electric shock.

Note : The term "residual current device (RCD)" may be replaced by the term "grounded fault circuit interrupter (GFCI)" or "earth leakage circuit breaker (ELCB)".

3) **Personal safety**

a) **Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use a power tool while you are tired or under the influence of drugs, alcohol or medication.** A moment of inattention while operating power tools may result in serious personal injury.

b) **Use personal protective equipment. Always wear eye protection.** Protective equipment such as dust mask, non-skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injury.

c) **Prevent unintentional starting. Ensure the switch is in the off-position before connecting to power source and/or battery pack, picking up or carrying the tool.** Carrying power tools with your finger on the switch or energizing power tools that have the switch on invites accidents.

d) **Remove any adjusting key or wrench before turning the power tool on.** A wrench or key left attached to a rotating part of the power tool may result in personal injury.

e) **Do not overreach. Keep proper footing and balance at all times.** This enables better control of the power tool in unexpected situations.

f) **Dress properly. Do not wear loose clothing or jewellery. Keep your hair, clothing and gloves away from moving parts.** Loose clothes, jewellery or long hair can be caught in moving parts.

g) **If devices are provided for the connections of dust extraction and collections facilities, ensure these are connected and properly used.** Use of dust collection can reduce dust-related hazards.

4) **Power tool use and care**

a) **Do not force the power tool. Use the correct power tool for your application.** The correct power tool will do the job better and safer at the rate for switch it was designed.

b) **Do not use the power tool if the switch does not turn it on and off.** Any power tool that cannot be controlled with the switch is dangerous and must be repaired.

c) **Disconnect the plug from the power source and/or the battery pack from the power tool before making any adjustments, changing accessories, or storing power tools.** Such preventive safety measures reduce the risk of starting the power tool accidentally.

d) **Store idle power tools out of the reach of children and do not allow persons unfamiliar with the power tool or these instructions to operate the power tool.** Power tools are dangerous in the

hands of untrained users.

e) **Maintain power tools. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the power tool's operation. If damaged, have the power tool repaired before use.** Many accidents are caused by poorly maintained power tools

f) **Keep cutting tools sharp and clean.** Properly maintained cutting tools with sharp cutting edges are less likely to bind and are easier to control.

g) **Use the power tool, accessories and tool bits etc. in accordance with these instructions, taking into account the working conditions and the work to be performed.** Use of the power tool for operations different from those intended could result in a hazardous situation.

5) **Service**

a) **Have your power tool serviced by a qualified repair person using only identical replacement parts.** This will ensure that the safety of the power tool is maintained.

⚠ WARNING **Read all safety warnings and all instructions.**

Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury.

Save all warnings and instructions for future reference.

⚠ **WARNING**

Contains precautions against actions that are prohibited at all times. Negligence could result in death or serious injury.

Using system for purposes other than marking is prohibited

The MarkinBOX Series is a marking machine. Using the machine for purposes other than marking may result in unexpected accidents and injury, which will not be covered by the warranty.
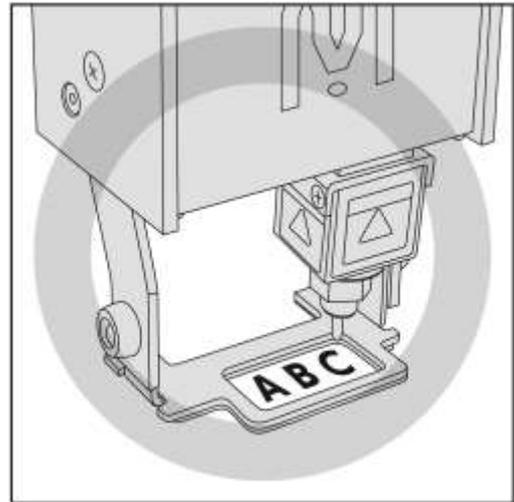
Handle power with care

When you connect the AC adapter to the controller, please follow the proper sequence by which it should be connected. Otherwise, static charge could be created in the DC output plug of the AC adapter, potentially resulting in electric shock or weak injury. Also, make sure the adapter's plug does not touch metal parts other than the controller's power connector.
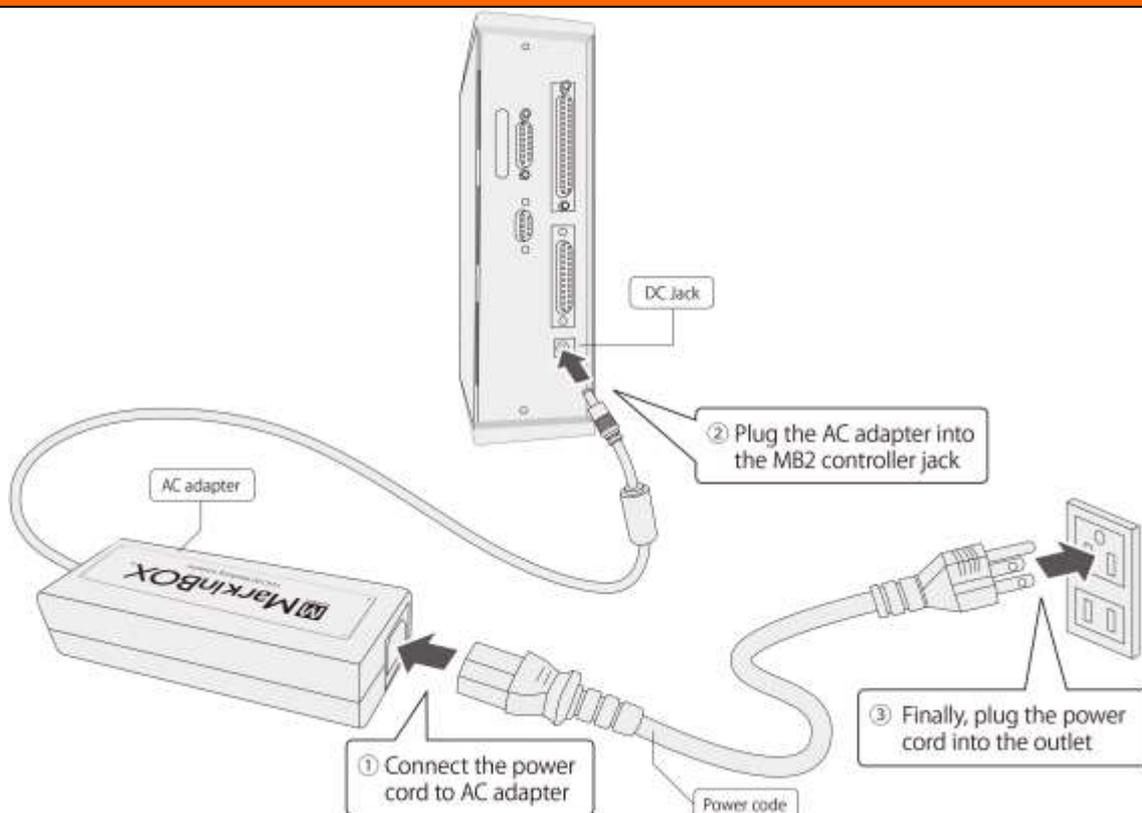
DC Jack

② Plug the AC adapter into the MB2 controller jack

AC adapter

① Connect the power cord to AC adapter

Power code

③ Finally, plug the power cord into the outlet

Beware of high temperature

Prolonged continued use would heat up the solenoid. This will not affect the quality of marking. However, do not touch the area around the stylus pin or the solenoid with bare hands after continued use. In particular, refrain from using the system around small children. ***Continued use (non-stop for one hour or more) at marking force 10 (maximum power) and Speed 1 (slowest speed) sometimes causes the surface temperature to rise to approx. 120°.**
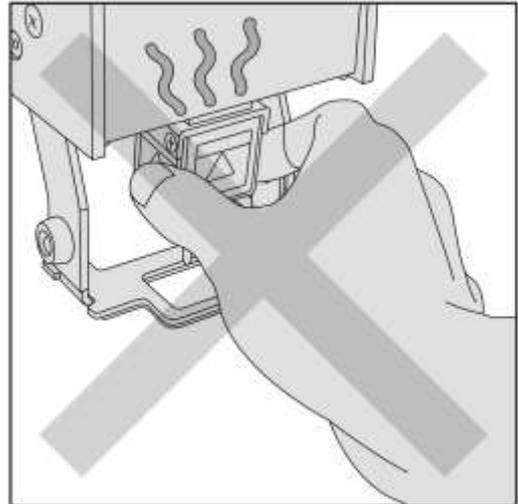
Take care not to injury finger

The distance between the stylus pin and the workpiece is approximately between **0.1mm and 5mm**. Be careful not to get your finger stuck between the pin and the workpiece. In particular, refrain from using the system around small children.
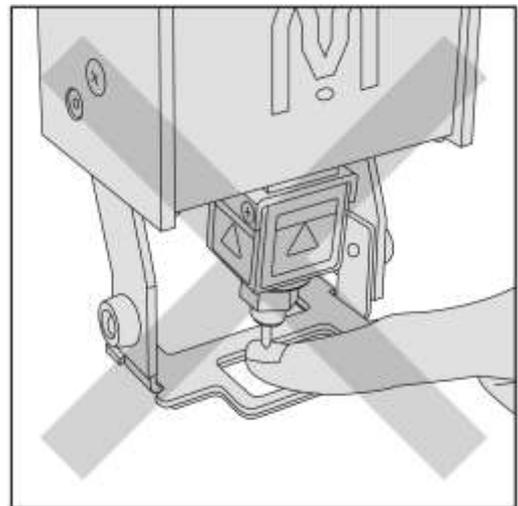
Beware of loud noise

Loud noise will occur when the Marking Force is set high or depending on material properties and the shape of the workpiece (especially thin and hollow ones such as pipes. Therefore, always wear an ear plug when operating the system.
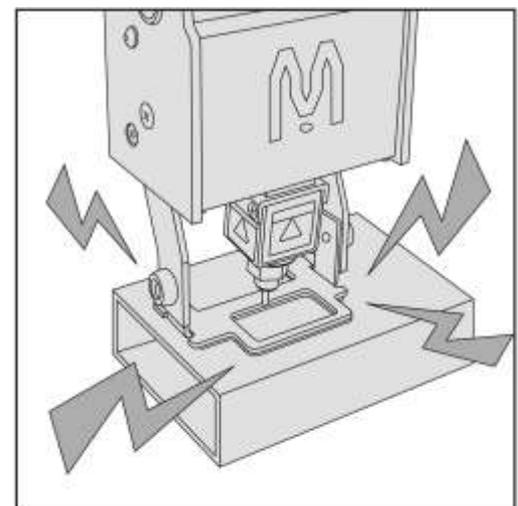
Using near water and in a humid area is prohibited

To prevent fire, electric shock, and damage, do not use the system around water. Also, do not touch the system with wet hands.
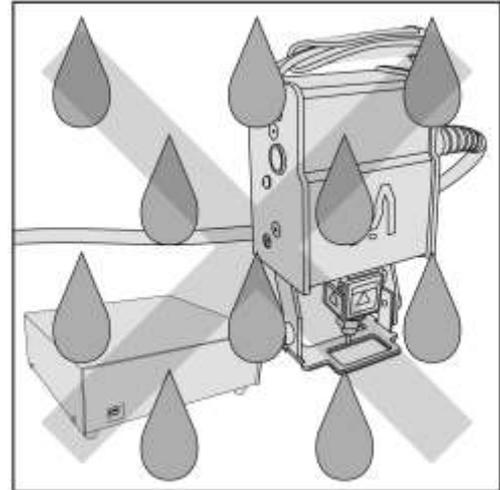
⚠ CAUTION

Contains precautions against actions that could result in injury and damage to the system if they are neglected.

Check for workpiece before marking

Do not conduct marking without a workpiece. Always set the workpiece so that the stylus pin touches the workpiece, including during the test run. Negligence could result in damage to the stylus pin.
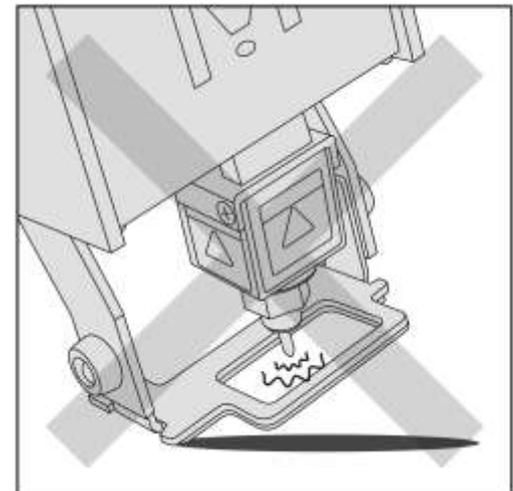
Beware of any obstructions

The marking machine will operate automatically upon applying power. Because the stylus pin will automatically reposition itself to the origin, do not put objects in the marking area that would obstruct the stylus pin from repositioning. Negligence could result in damage to the system.

Paragraph

1. Contents in MarkinBOX

➢ MB 3315S series
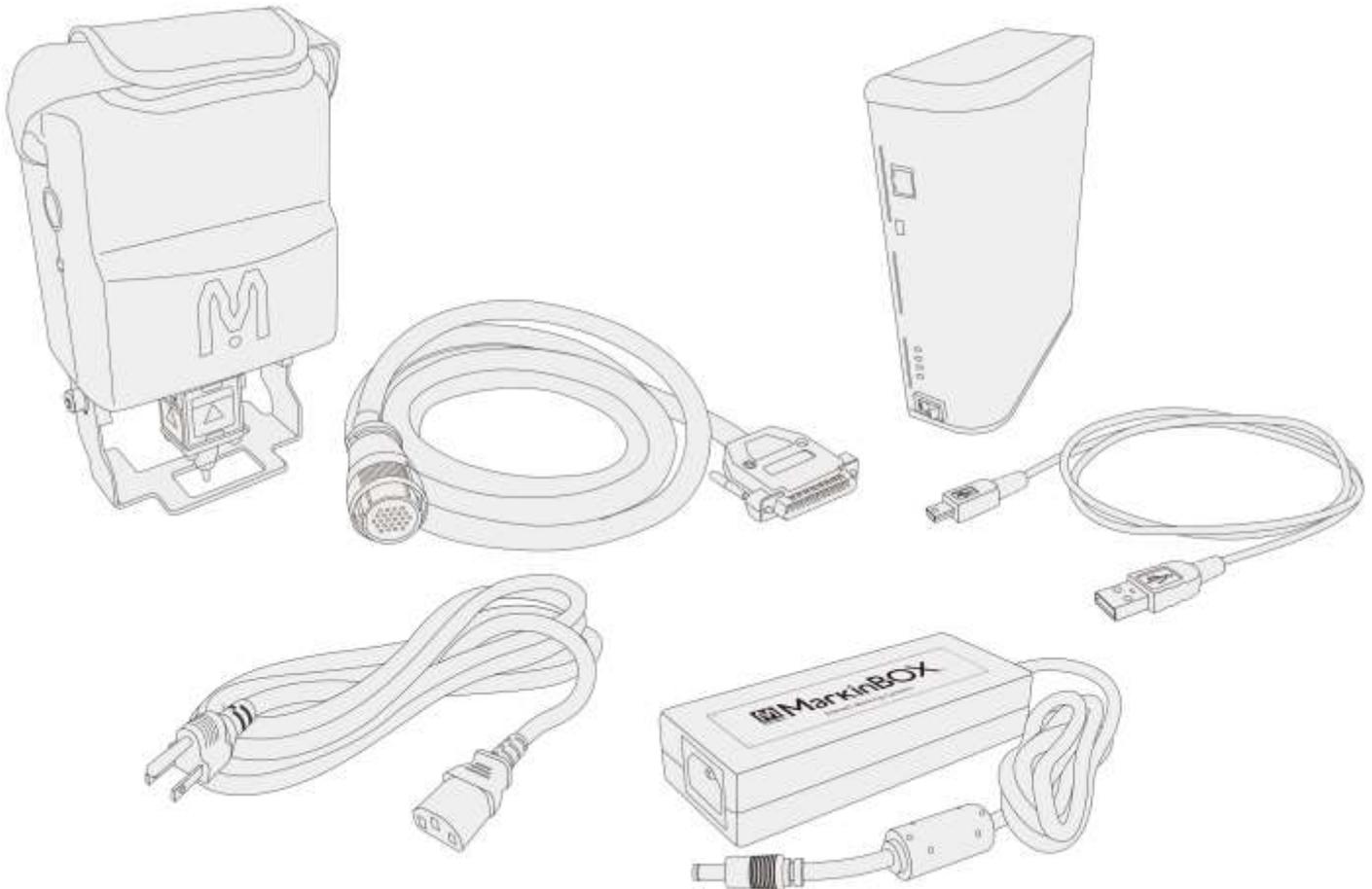
1. MarkinBOX 3315S······1pc
2. Head Cable······1pc
3. MB2 Controller ······1pc
4. AC Adapter (Including Power Cord, 100 to 240VAC 50/60Hz)······1set
5. USB Cable······1pc
6. Others as option

➢ <u>MB 8020S series</u>
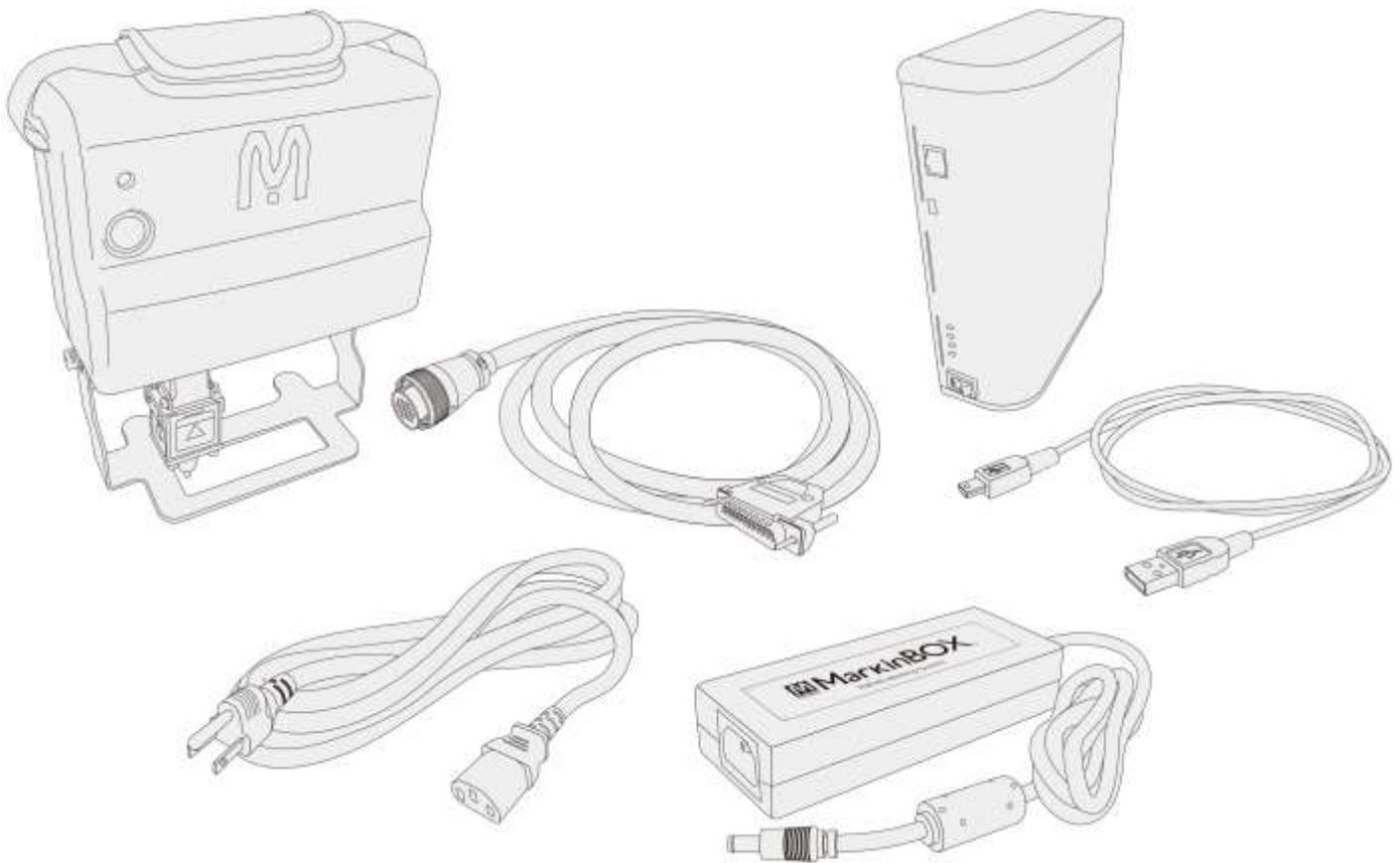
1. MarkinBOX 8020S……1set
2. Head Cable……1pc
3. MB2 Controller……1pc
4. USB Cable……1pc
5. AC Adapter (Including Power Cord, 100 to 240VAC 50/60Hz)……1set
6. Others as option

➢ MB 1010 series (proper use with original stand)

1. MarkinBOX 1010……1set
2. Head Cable……1pc
3. MB2 Controller……1pc
4. USB Cable……1pc
5. AC Adapter (Including Power Cord, 100 to 240VAC 50/60Hz)……1set
6. Others as option

2. Names of each part

➢ <u>MB3315S</u>

Start / Stop button

LED lamp

Cable connector

Mounting screws at four locations (4-M5)

Solenoid
*The area around the solenoid and the pin holder becomes very hot after continued use.

➢ <u>MB8020S</u>

LED lamp

Start / Stop button

Cable connector

Solenoid
*The area around the solenoid and the pin holder becomes very hot after continued use.

Mounting screws at four locations (4-M5)

➢ MB 1010 series (proper use with original stand)

Adjust handle

LED lamp

Start / Stop button

Solenoid
*The area around the solenoid
and the pin holder becomes
very hot after continued use.

Hold lever

Cable connector

➢ MB2 Controller

Wifi Receiver

Option
Rotary Device Connector
D-Sub 15 pins Female

RS232C Connector
D-Sub 9 pins Female

LAN Port   USB Connector   LED Lamp   Power Switch

Power Jack   Marking Head Connector   DJ/O Connector
                  D-Sub 25 pins Female   D-Sub 37 pins Female

➢ Overall configuration image

  *Image would be different depend on the machines.
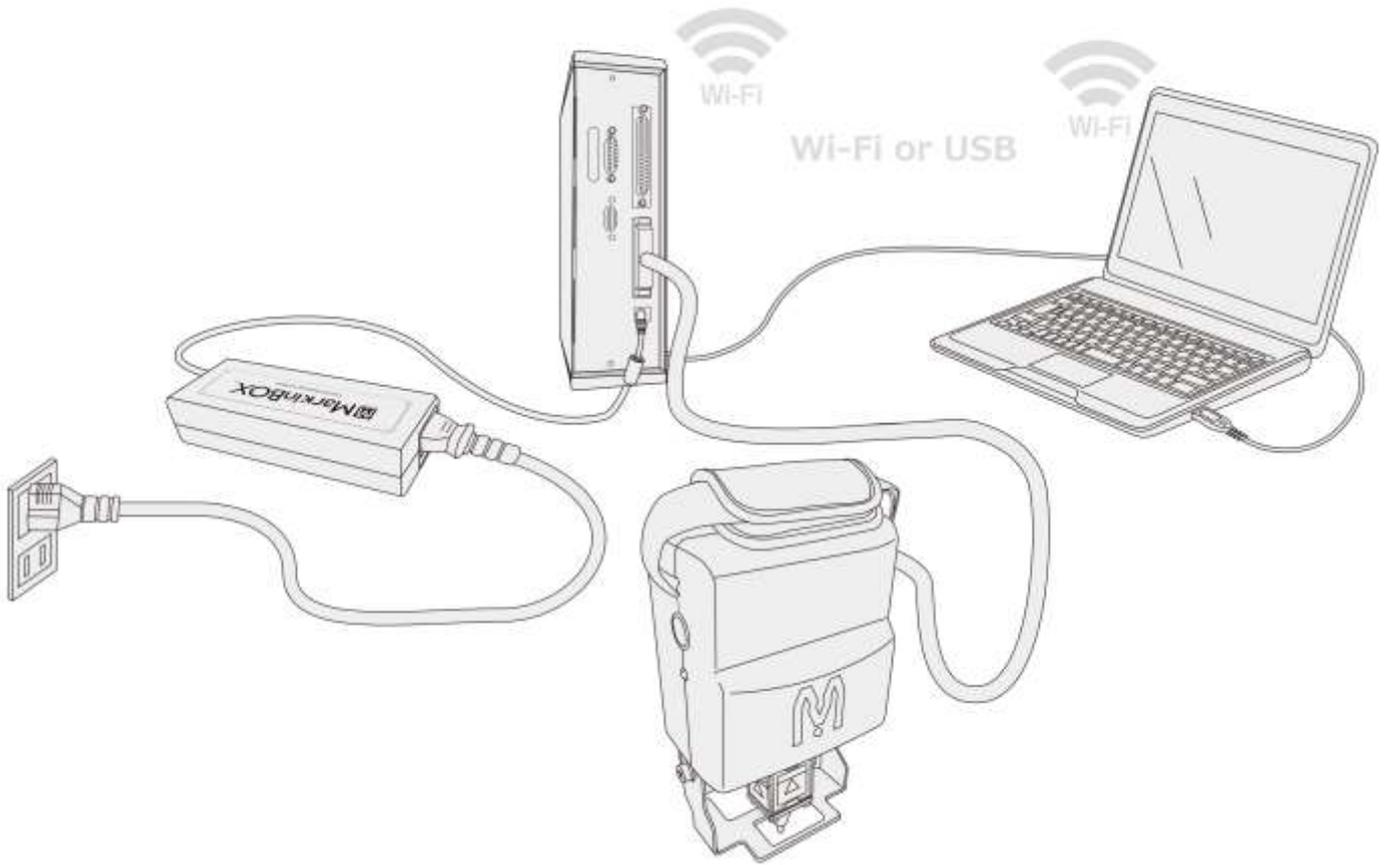
➢ Rotary Device connection images (Option)

  * Image would be different depend on the machines.
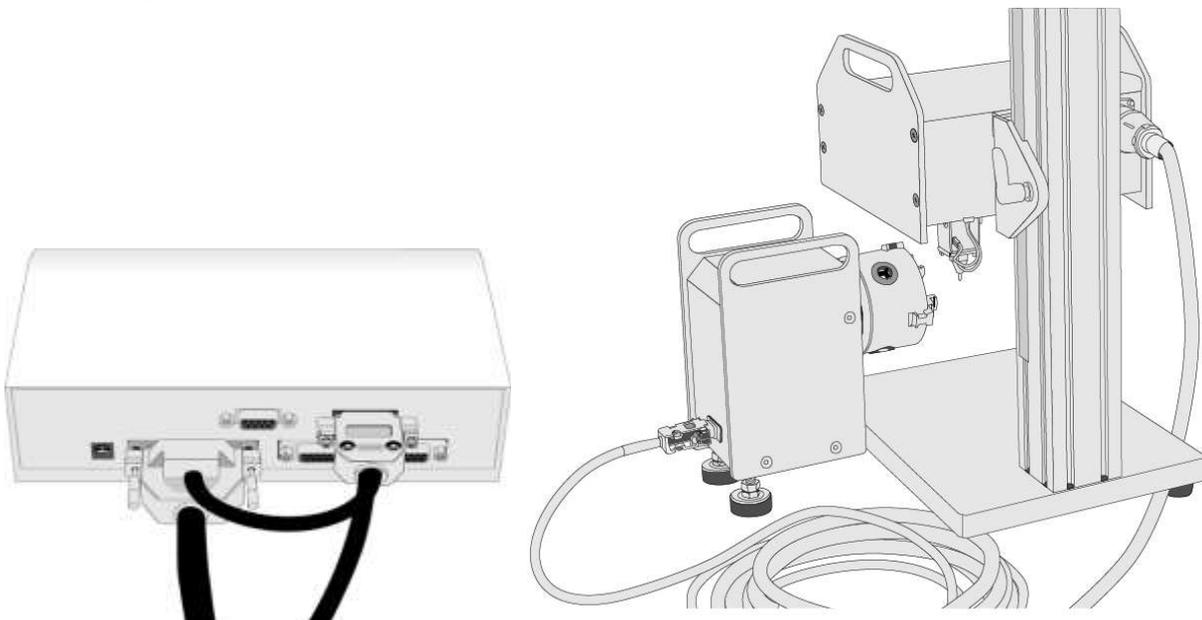
3. Using the marking machine

3-1. Distance between the stylus pin and the workpiece

The distance between the stylus pin and the workpiece will vary according to the material properties of the workpiece and the marking force. Use the following chart as a guideline.

Note: Always do a trial marking run and use the settings (marking force and distance) that matches the workpiece.

Standard Solenoid		Distance between parts and pin (mm)											
		～	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
Force	1	◎	○	×	×	×	×	×	×	×	×	×	×	×
	2	◎	○	○	△	△	×	×	×	×	×	×	×	×
	3	○	○	○	◎	◎	◎	○	○	○	○	△	△	△
	4	○	○	○	○	◎	◎	◎	◎	◎	○	○	○	○
	5	○	○	○	○	○	○	◎	◎	◎	◎	◎	○	○
	6	○	○	○	○	○	○	◎	◎	◎	◎	◎	○	○
	7	○	○	○	○	○	○	◎	◎	◎	◎	◎	○	○
	8	○	○	○	○	○	○	◎	◎	◎	◎	◎	○	○
	9	○	○	○	○	○	○	◎	◎	◎	◎	◎	○	○
	10	○	○	○	○	○	○	◎	◎	◎	◎	◎	○	○

BSD		Distance between parts and pin (mm)										
		0.5	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
Force	1	△	△	△	○	○	◎	◎	◎	◎	○	○
	2	△	△	△	○	○	◎	◎	◎	◎	○	○
	3	△	△	△	○	○	◎	◎	◎	◎	○	○
	4	△	△	△	○	○	◎	◎	◎	◎	○	○
	5	△	△	△	○	○	◎	◎	◎	◎	○	○
	6	△	△	△	○	○	◎	◎	◎	◎	○	○
	7	△	△	△	○	○	◎	◎	◎	◎	○	○
	8	△	△	△	○	○	◎	◎	◎	◎	○	○
	9	△	△	△	○	○	◎	◎	◎	◎	○	○
	10	△	△	△	○	○	◎	◎	◎	◎	○	○

*◎:recommended, ○:acceptable, △:acceptable but not recommend, ×: can not mark
*The above numbers will vary according to the material properties of the parts.

3-2. Start button on marking machine

Start marking	Push the start button once after sending marking data.
Pause	Push the start button once during marking.
Restart	Push the start button once during pause.
Cancel	Holding down the start button 3 seconds during pause, pin will be back to original position.

3-3. LED lamp

A LED lamp is installed on the back of the marking machine and the controller. Refer to the following chart to monitor the machines.

Marking head	
Status	LED
Standing by	Green lit
Marking	Green blinking
Returning to the home	Red blinking (8020)
	None (3315,1010)

MB2 Controller	
Status Top	LED
Power ON	Green lit
Returning to the home	Blue blinking (0.5sec.)
Marking	Blue blinking (0.25sec.)
X axis error	Red blinking (0.25sec.)
Y axis error	Orange blinking (0.25sec.)
Z axis error	Orange / Red blinking simultaneously
Other error	Orange / Red blinking alternately

3-4. Calendar and Shift Settings

Location	How to setup
Shape Icons	Click or or + and dragging to create a filed
Properties	Click

1. Shift Marking

   Divide each 24 hour period into a maximum of 5 shifts. The shift code that has been set (a single alphanumeric character) will be marked when the designated time period is reached.

2. Calendar Marking

   Dates are marked using single alphanumeric character for the year, month and day.
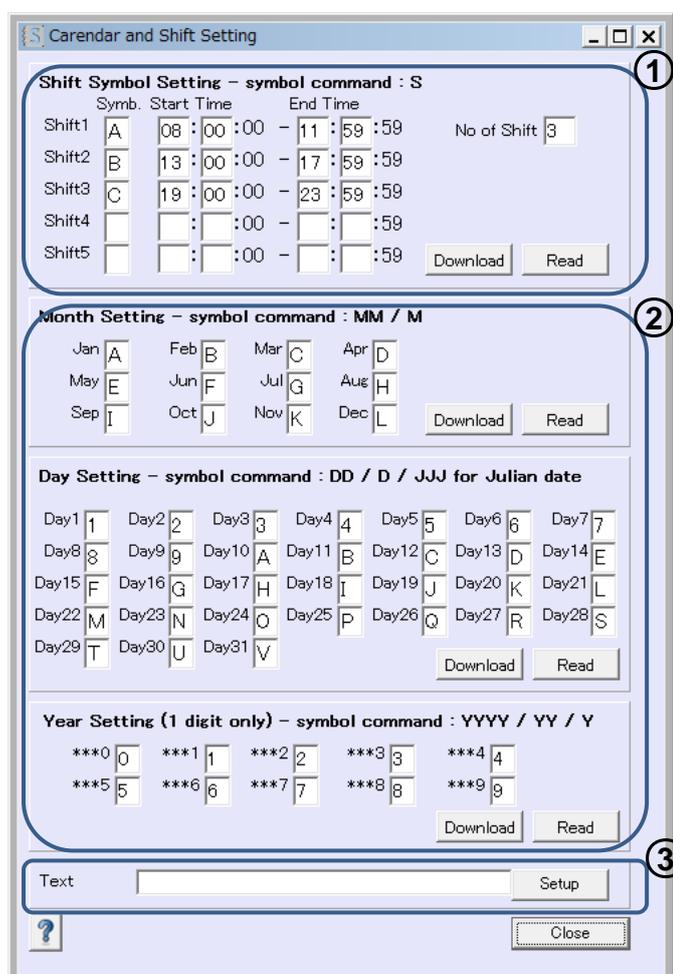
① Shift Marking

Symbol → Input the shift code (a single alphanumeric character.

Start time → Input the time the shift commences.

End time → Input the time the shift finishes.

Number of shift → Input the number of shifts.

After inputting the data click the Download button to send the data to the controller. If you want to display the current controller data click the Read button

② Calendar Marking

Input the single alphanumeric character for the month, day and year you want to mark, and click the Download button to send the data to the controller. If you want to display the current controller data click the Read button

③ Symbol Input

After sending the data, input the symbol using the symbol chart below for reference, and click the Setup button to finalize the input.

Symbol Chart	
Shift Symbol -> S	Julian dates → JJJ (Example: 030)
Month 2 characters → MM (Examples: 01, 12)	→ jjj (without using zeros, example: 30)
Month 1 character → M (Setting is required, Example: 1)	Julian weeks → WW (Example: 05)
Day 2 characters → DD (Examples: 01, 31)	→ ww (without using zeros, example: 5)
Day 1 character → D (Setting is required, Example: 1)	Hour 2 characters → hh (Example: 19)
Year 4 characters → YYYY (Example: 2013)	Minutes 2 characters → mm (Example: 25)
Year 2 characters → YY (Example: 13)	Seconds 2 characters → ss (Example: 30)
Year 1character → Y (Setting is required, Example: 3)	

--- Instructions ---

1. After inputting the data, click the Download button to send the data to the controller.
2. Input the symbol in the symbol field using the chart for reference, and click the Setup button to finalize the input.
3. Click the Read button to display the data in the controller.
4. Return to the main screen, check the displayed text, and start marking.

3-5. Serial Settings

Location	How to setup
Shape Icons	Click ⟨A⟩ or ⟨ABC⟩ or ⟨QR⟩ + ⟨0001⟩ and dragging to create a filed
Property	Click ⟨0001⟩

You can set 4 types of serial numbers in the controller, from No. 1 – No. 4.
Click the tab of the number you want to set and input the settings.

Format	[with 0] Choose this if you want to write the number with appended zeros, like this : 0001.
	[Non 0(R)] Choose this to leave off of the zeros when marking, like this ____1. The numbers will be right justified.
	[Non 0(L)] Choose this to leave off of the zeros when marking, like this 1. The numbers will be left justified.
Reset	Select the timing for resetting to the minimum value.
	[Max] Choose this to reset when the maximum value set is reached.
	[Year] Choose this to reset when the year changes.
	[Month] Choose this to reset when the month changes.
	[Day] Choose this to reset when the day changes.
	[Time] Choose this to reset when the time changes. Also input the [Reset time].
	[Stop] Choose this to stop when the maximum value set is reached A message is pop-up by using PC mode and alarm is ON by using MB mode.
Max Value	Set the maximum value for incrementing. This can be set up to a maximum of 99999999 (8 digits). Even if you don't intend to use the reset function, input numbers here to set the number of digits for the serial number.
Min Value	Set the start value for incrementing.

Present Value	Shows the current value for the serial number. This is particularly useful when sending files to the controller for marking.
Repetition (1-10)	Set the number of times to repeat the same serial number, like this 0001, 0001, 0001, 0002, 0002, 0002. This can be set from 1 to 10 times.

--- Instructions ---

1. Click the relevant tab and make the settings for each item.
2. Click Download to send the data to the controller.
3. Select the number you want to mark from the serial number settings pull-down menu, and click the Confirm button.
4. Return to the main screen, check the text, and commence marking.

When modifying data, repeat steps 1 to 4.

3-6. Logo and Font Settings

Location	How to setup
Shape Icons	Click ![A] or ![ABC] + ![M] and dragging to create a filed
Property	Click ![M]

Create fonts and logos beforehand in the logo edition screen and font edition screen and then register them.

Display example:

01 -> Logo number

[F041] -> ASCII code

--- Instructions ---

1. Choose either the character or logo list to read in from the top right of the screen.
2. Make sure that the Capture checkbox in the lower left of the screen is checked.
3. Click the logo or font to use for marking by clicking directly on it.
4. The selected logo (@L[No.]) or font will display in the box next to the "Uptake" check box. Click the Confirm button to confirm the selection.
5. Return to the main screen, check the displayed text and start marking.

3-7. Arc 3 Points Setting

Right click on the ARC text in the preview

Arcs can easily be set visually.

	X [mm]	Y [mm]
Start Point	3.10	6.20
Middle Point	10.59	4.79
End Point	18.20	4.54
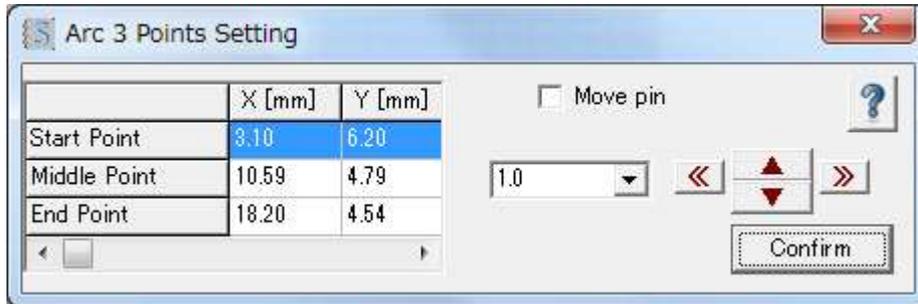
Initial point	Point 1 below.
Median point	Point 2 below.
Final point	Point 3 below.
Move pin	When this is checked the pin will move so you can make the settings while checking with the job piece.
Arrow keys	Pressing the keys moves the designated point to the left or right or up and down. The pitch of the movement can be selected from the pull- down menu to the left.

--- Instructions ---

1. The initial point 1, median point 2 and final point 3 can be dragged onto the arc where marking is desired by using the mouse.
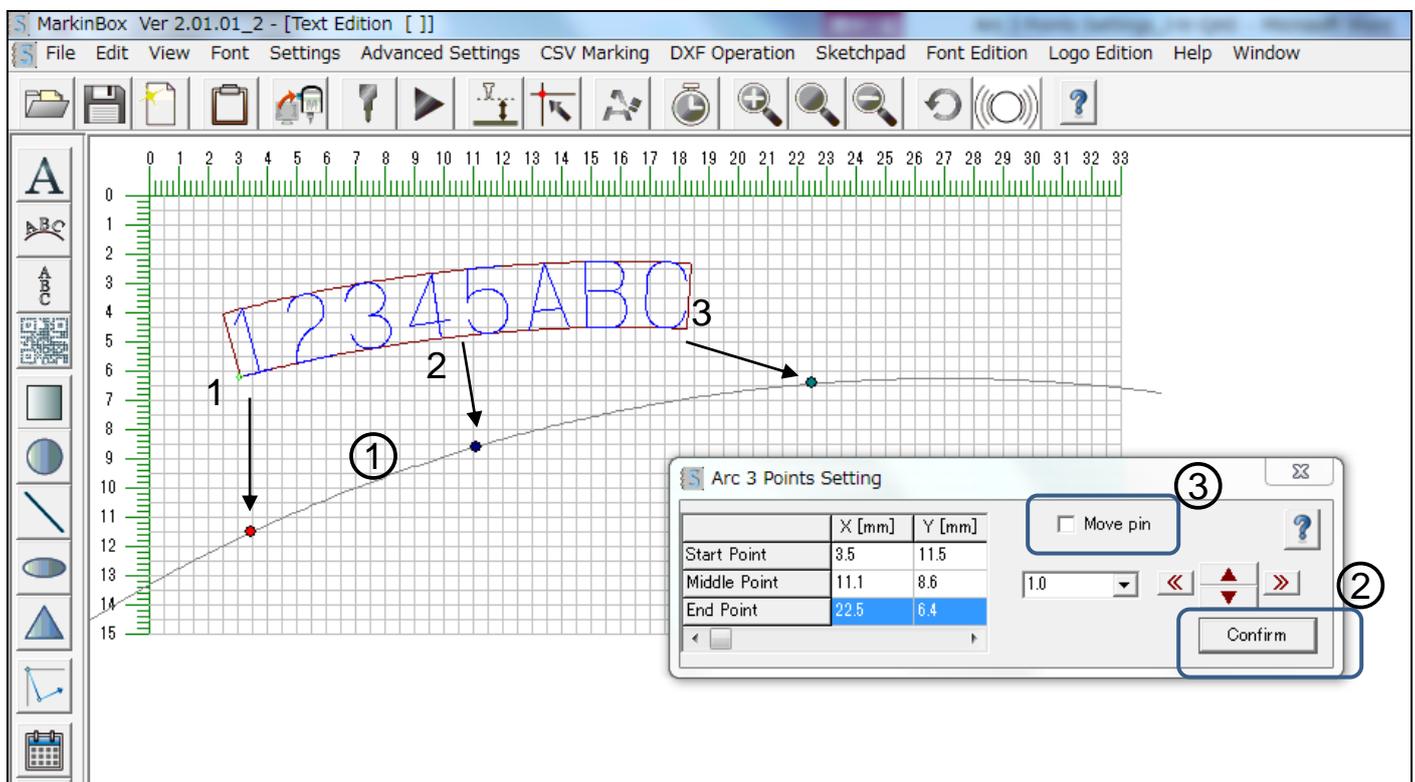
2. Clicking the Confirm button sets the marking positions.

3. Checking the "Move pin" item will cause the pin to move, so it can be checked visually with the job piece.
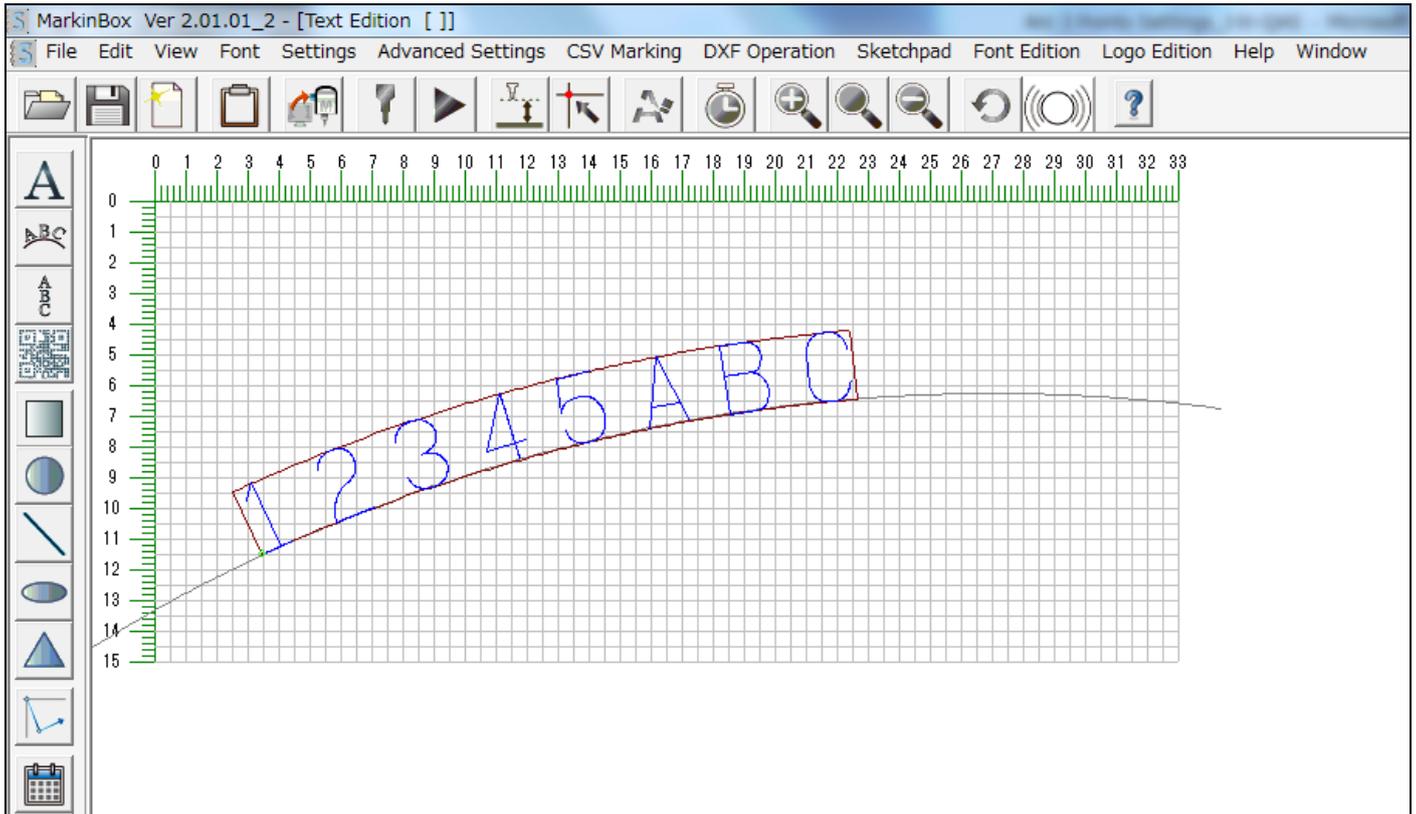
3-8. Template Layer

Menu → View → Layer → Template Layer

You can make groundwork by using template layer, it helps positioning where you want to mark in.

①

② Marking window:
It is shown the different window depend on chosen marking machine.
It is moveable to anyplace within the preview screen.
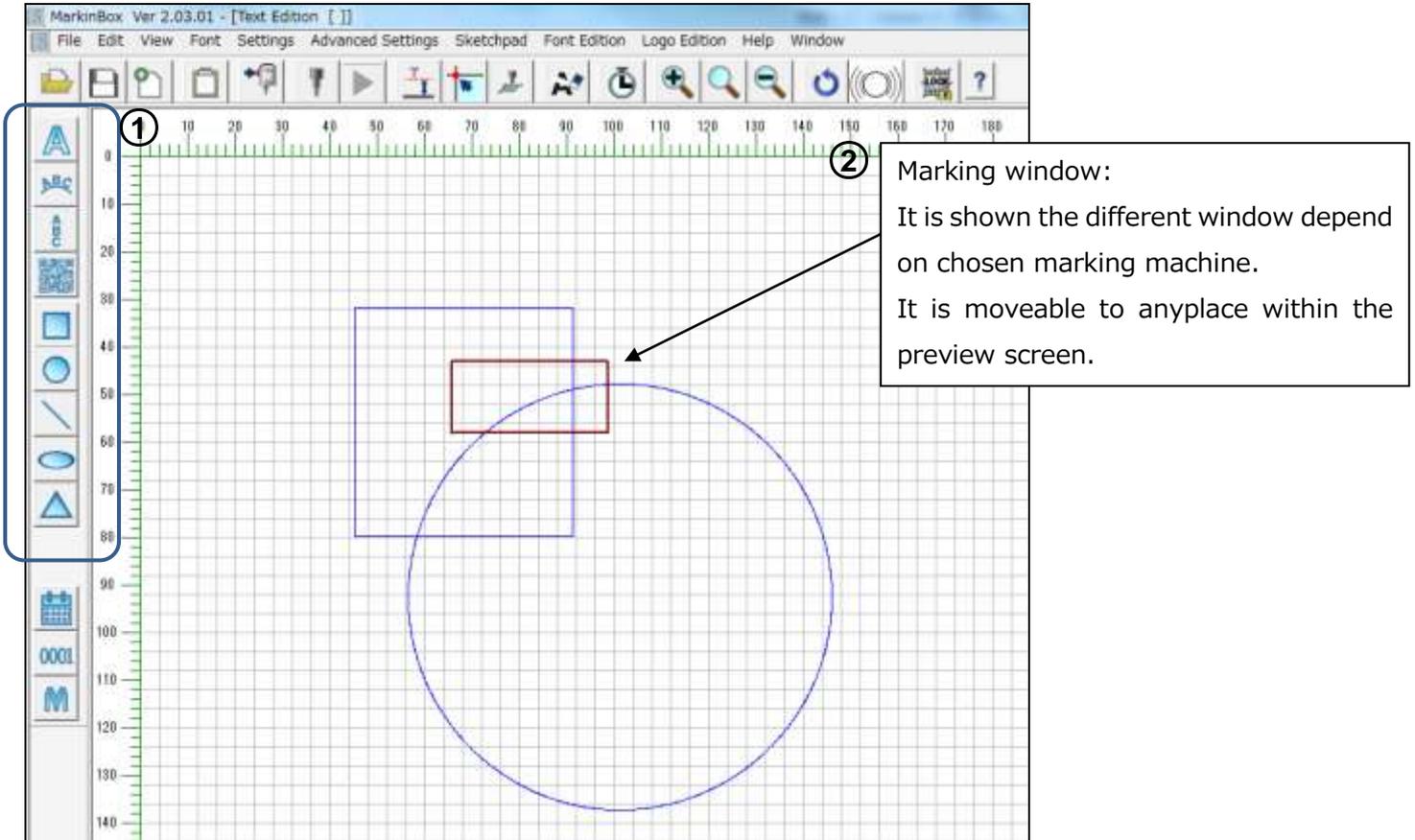
---Instructions---

1. Create the template on the template layer by clicking shape icons in the editing icons
2. Move to the marking window to where you want to mark

3. Return to the text layer and click ◢ icon in the shapes icons, you can get the bellow screen.

③
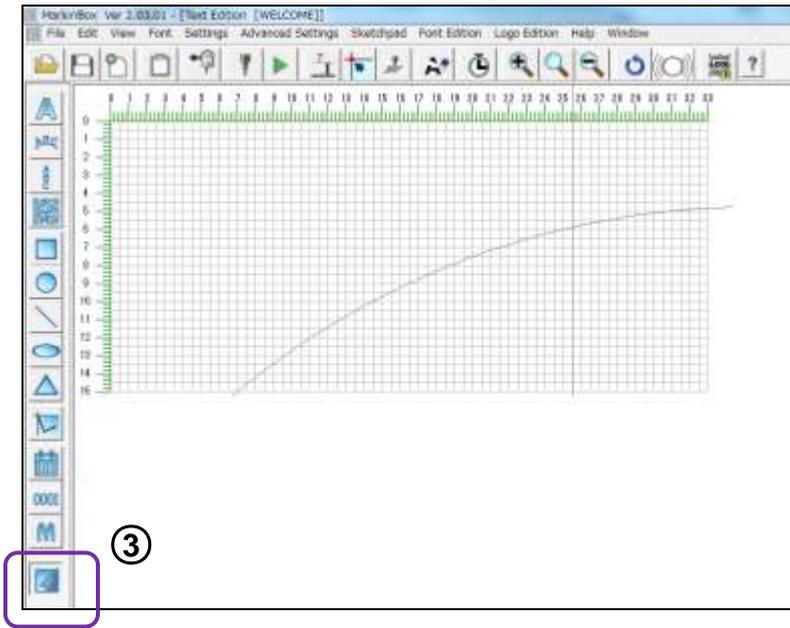
3-8-1. BMP Layer

Menu → View → Layer → Template Layer → Advanced Settings → BMP layer

The base layer (BMP or JPEG data) is displayed, and the field position can be set. This is hepful for position setting and positioning marking for nameplates etc.
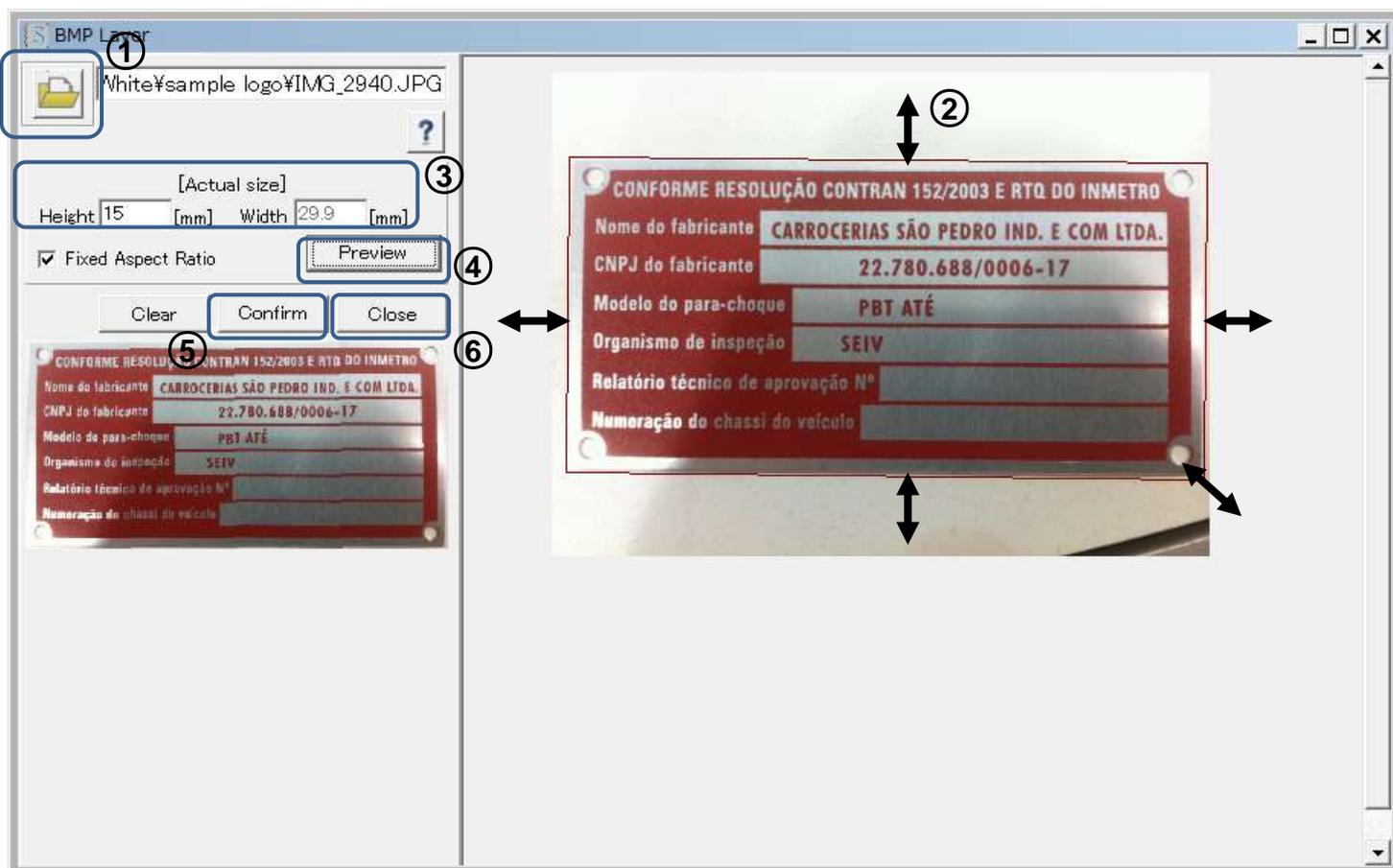
---Instructions---

1. Click the 🗁 icon to open the BMP data or JPEG data.

2. After importing the data, trim the data on the screen using click and drag. Adjust the frame horizontally and vertically, as well as the lower right (angle), and carry out trimming in accordance with the size of the data.

3. After trimming, input the actual dimensions of the data. (If the aspect ratio is fixed just input the height dimension.)

4. Click the Preview button. The trimmed data is displayed on the lower left.

5. After checking the preview data, click the Confirm button, and save the data (*bml) in the location of your choice.

6. Click the Close button to close the window.

7. From the template layer screen, click 🖐 in the shapes icon to create a field within the preview   area

and import the previously saved bml data. After importing, align the bml data with the marking window and set its position. ***Be sure to align the base position of the pin with that of the preview screen when marking.**

⑦
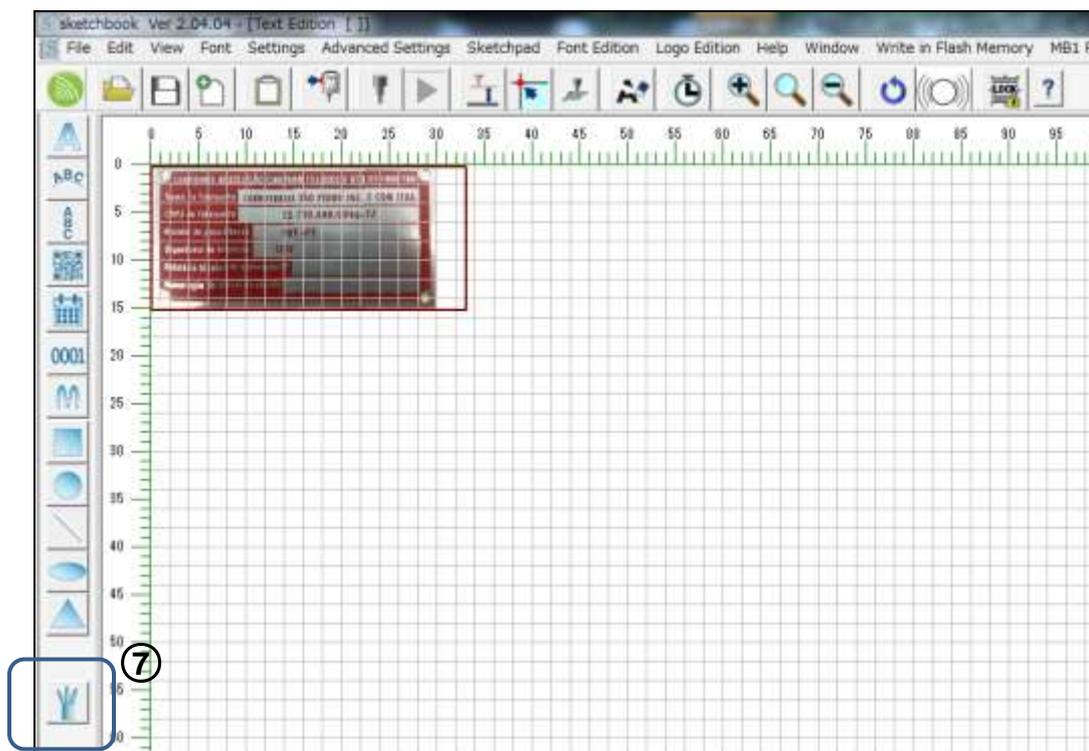
8. Return to Menu → View → Text Layer, and click within the shapes icon the bml data will be displayed in the base layer, so create the fields on top of the base layer graphic.

⑧
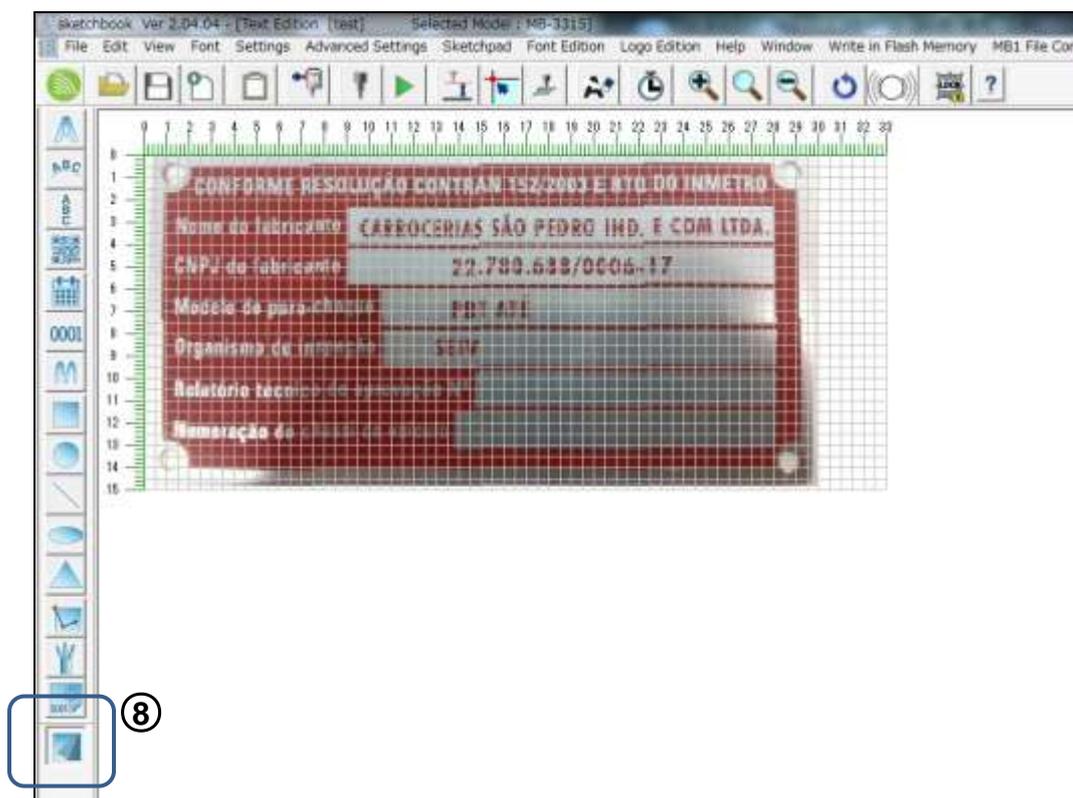
3-9. MB Font Settings

Menu → Font → MB Font

At shipment the font is set to TC font, a MarkinBOX original font. MarkinBOX allows you to register fonts and logos that you have created yourself. When registering a new font be sure to send the font file to the controller. The font displayed on the computer screen and the font actually used for marking (the font set in the controller) need to be the same. If different fonts are set the font that is used for marking will not be same as the one displayed on the computer screen.
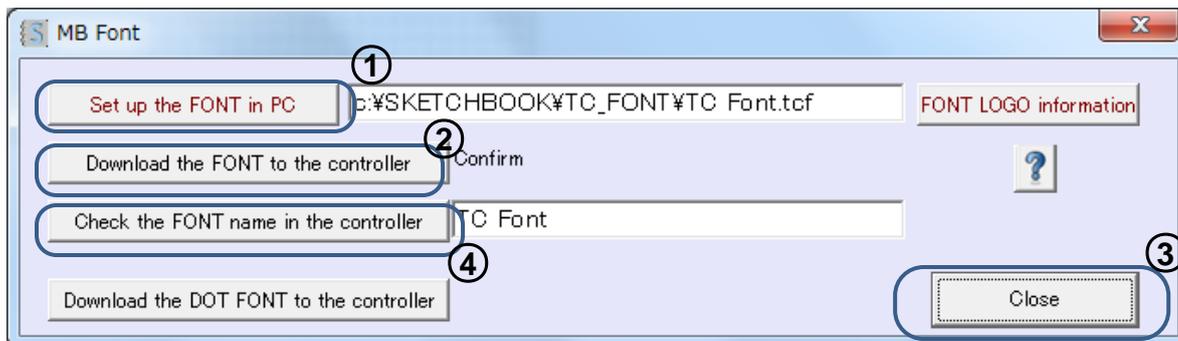
| Set up the FONT in PC	The font displayed on the computer screen. Click the button, navigate to the folder where the fonts are stored, and select the font file.
FONT LOGO information	Clicking this allows you to see the contents of the font. Use this to check the font.
Download the FONT to the controller	Sends the font selected above to the controller. Click the button to send the font.
Check the FONT name in the controller	You can use this to check the font currently set in the controller. The name of the font set in the controller will display.
Download the DOT FONT to the controller	Sends a 5x7 dot font to the controller after modifying or newly registering it.

---Instructions---
1. Click the Set up the FONT in PC button and select the font to use for marking.
2. Click the Download the FONT to the controller button to send the selected font to the controller. A message will display while the font is being saved.
3. When the transmission completed message is displayed, click the Close button and close the font setting screen.
4. **Turn off the controller and then turn it on again.** Connection to the controller will be cut off, so choose "Settings" → "Communication" from the menu and ensure that the controller is reconnected.
5. To check the font name registered in the controller, go back to the font setting screen and click the Check the FONT name in the controller button.

Be sure to perform the settings above when registering a new font or logo, or modifying a font file.

3-10. PC Font Settings

Menu → Font → PC Font

You can set Windows fonts, **but only when the marking device is connected to the computer.**
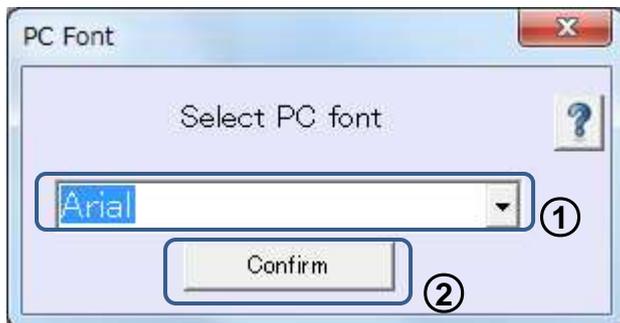
--- Instructions ---

1. Choose the Windows font to set from the pull-down menu.
2. Confirm the selection by clicking the Confirm button.
3. Choose the "PC font" in the property screen of each field will display the set font.
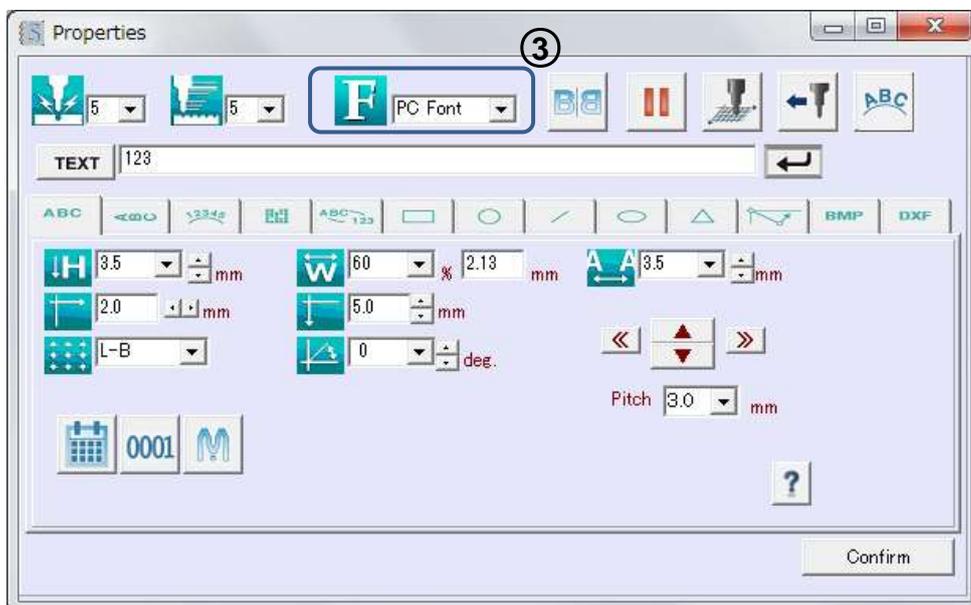
*Some fonts cannot be set. (Not displayed in the preview).

*Some fonts will not fit in the field frame.

***The fonts cannot be used for marking by saving in a file and then disconnecting the device from the computer.**

3-11. Barcode Settings

Menu → Advanced Settings → Barcode

Data can be scanned in from a barcode reader connected to the PC, then sent to the controller and used for marking. Marking is done after linking the scanned data to a field created beforehand. Up to 8 fields can be incorporated into one file.

--- Instructions ---

Create the marking field in the main screen in advance. (Create the field with the same content and number of characters that will actually be imported.)

If you want to mark by MB mode, click [icon] icon.
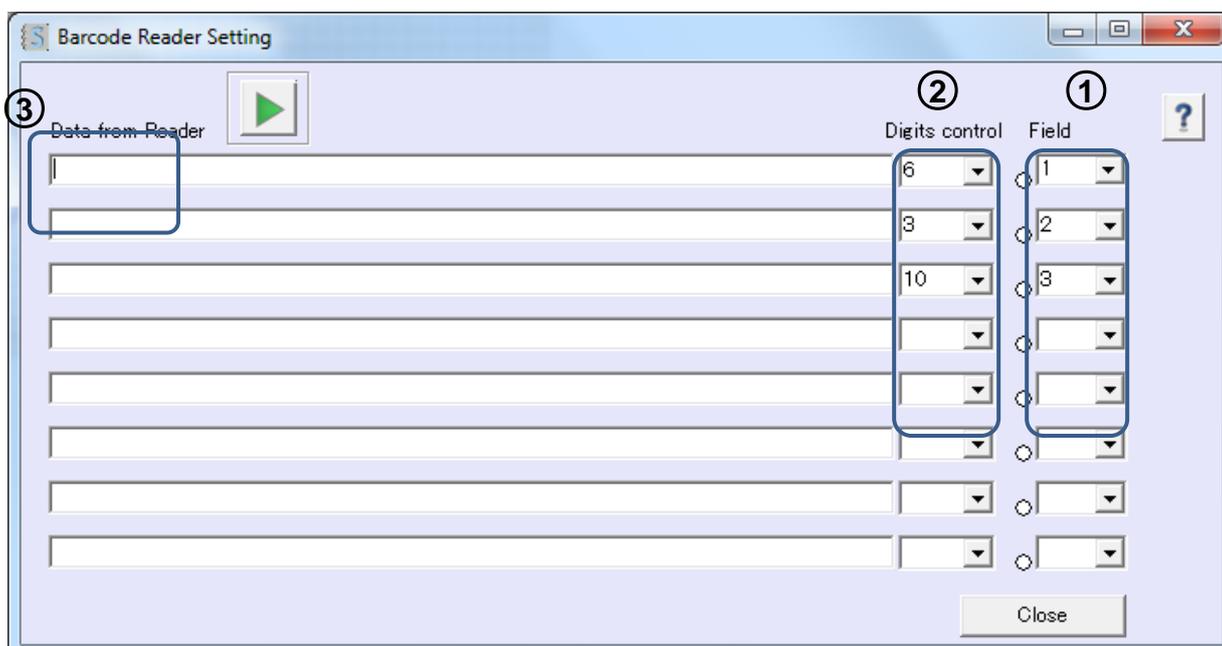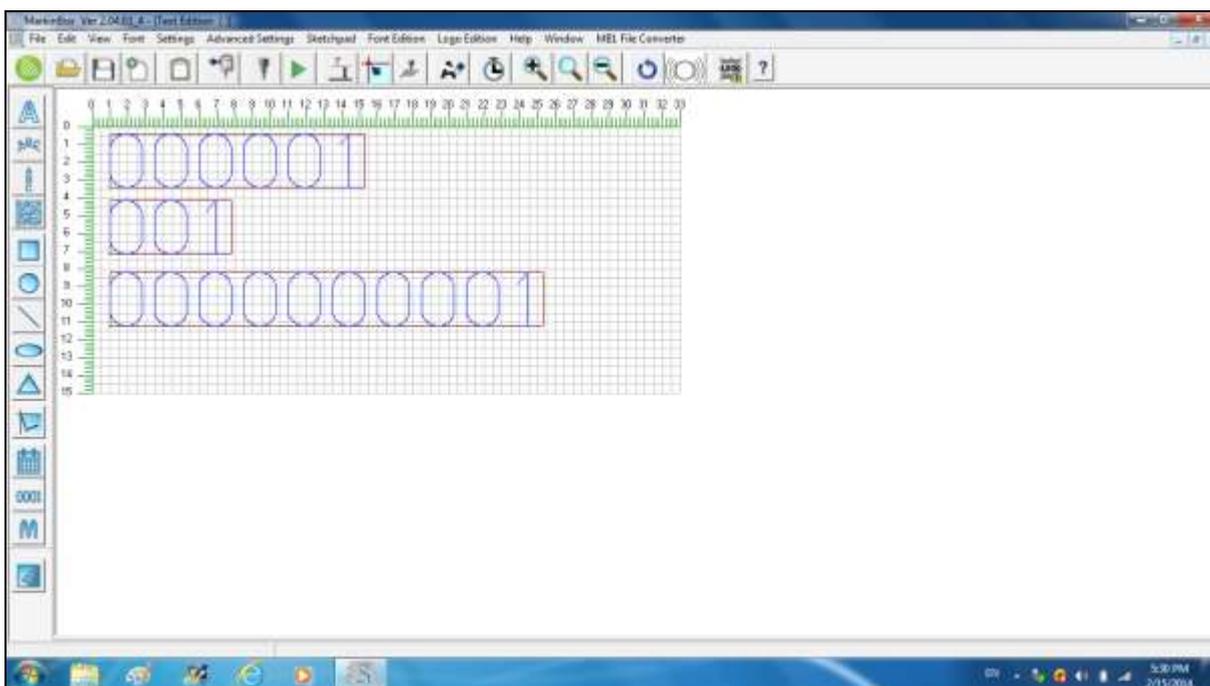
1. Select the field to which the scanned data will be sent (link field) from the pull-down menu. (The numbers of the fields created in the main screen will be displayed.)

2. Select the digits for protection unexpected marking (setup "None" if don't need protection)

3. Place the cursor in the "Data from reader" text box.

4. Scan the data for marking with the barcode reader that is connected to the PC. If multiple settings for scanned text are to be made, move the cursor up and down using the ENTER key on the keyboard
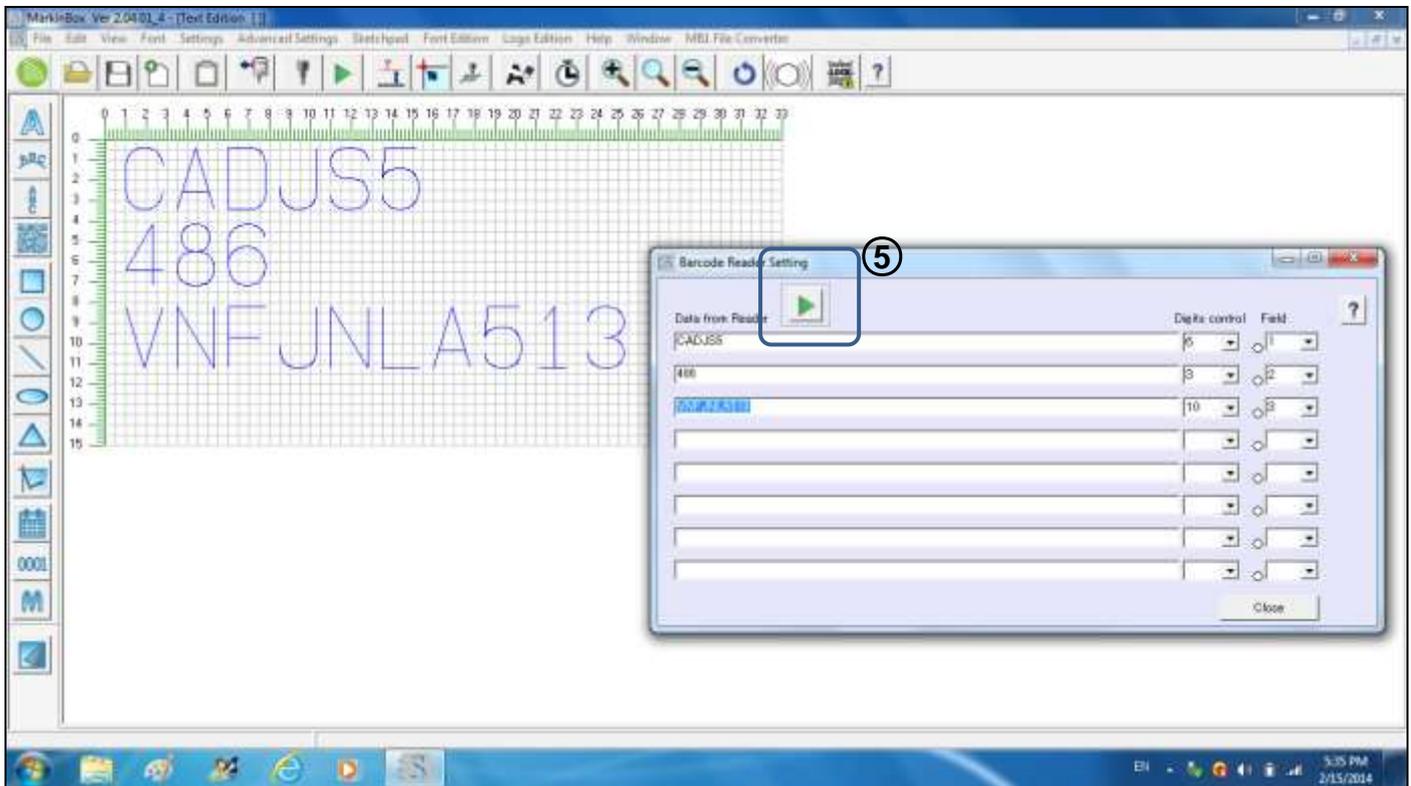
5. After the text appears in the "Data from reader" text box, start marking ▶ using the selected marking mode.

3-12. CSV Marking Settings

Menu → Advanced Settings → CSV marking

You can import csv data for marking.

--- Instructions —-

1. Create the csv data

   Example using Excel (Save the file in csv (comma delimited) format).

2. Create the marking data in the main screen beforehand (number of imported csv data columns = number of fields created). The example below shows 3 fields being created to import the csv data (3 columns) shown in the previous screen.
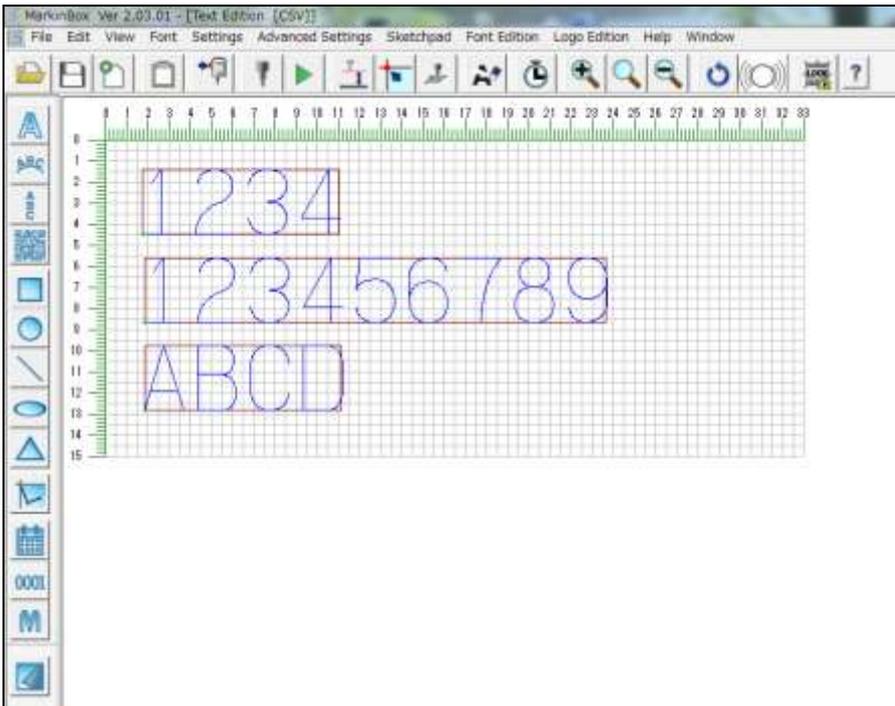
3. Import the csv data

Click the "File" button and import the csv file.
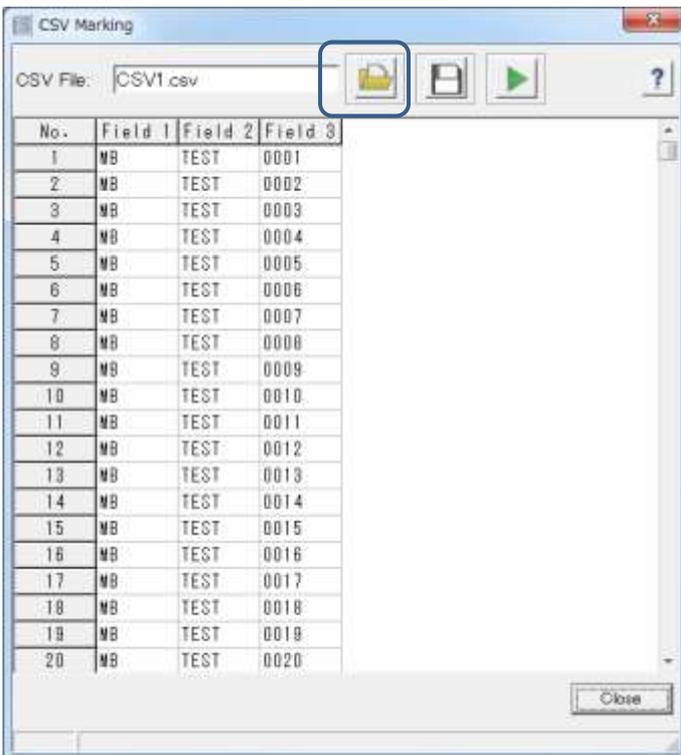
4. Start marking

To mark in PC mode, click start icon .

When marking is completed, the data for that field will be highlighted in yellow as shown below.
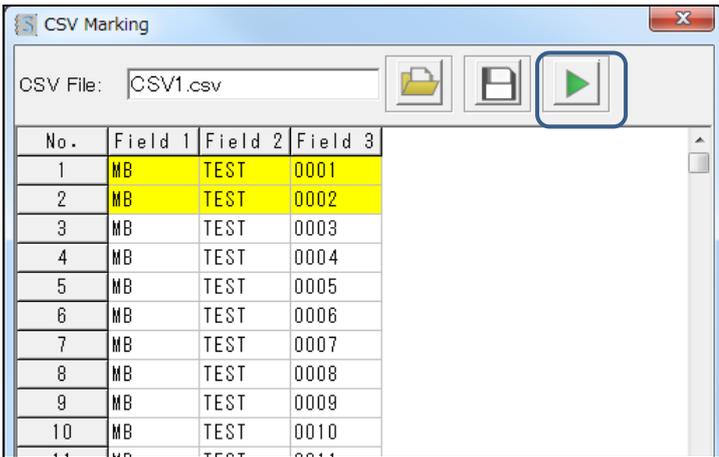
To mark in MB mode, click the MB mode icon to turn on MB mode and click start icon .

Before start marking, click OK button on the bellow message.
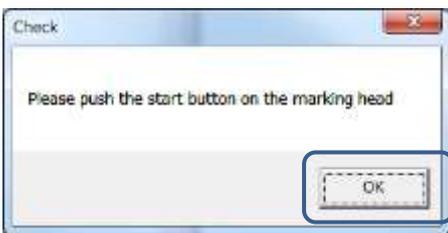
5. Items can be edited by right-clicking on them.

For editing data, by right-clicking on the numbers.

The marking order can be changed by dragging and dropping.
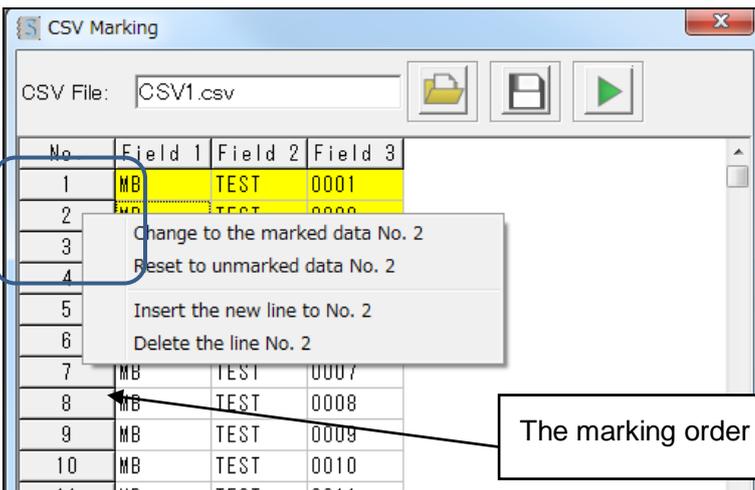
For editing text, by right-clicking on the fields.
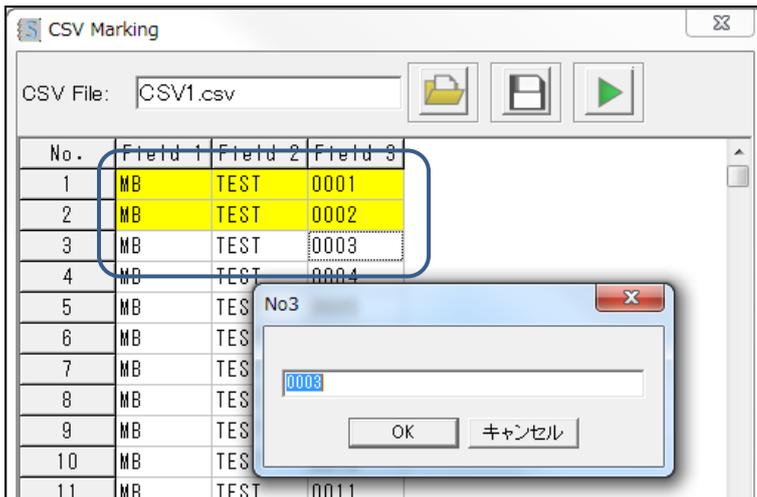
6. To save data for marking not completed click on .

7. Click the Close button to stop marking.

   Or when marking in MB mode, press the Stop button then click the Close button to stop marking.

3-13. DXF Marking

Menu → Advanced Settings → DXF Converter

You can convert DXF data into marking data for MarkinBOX(*fdx) and use it for marking.

* Work with Line, Circle, Oval Multi angles only, unsupported Spline and Characters.

* Work by PC and MB mode only, unsupported file marking.

* Only one DXF data is able to capture in the preview, unable to capture multi DXF data.
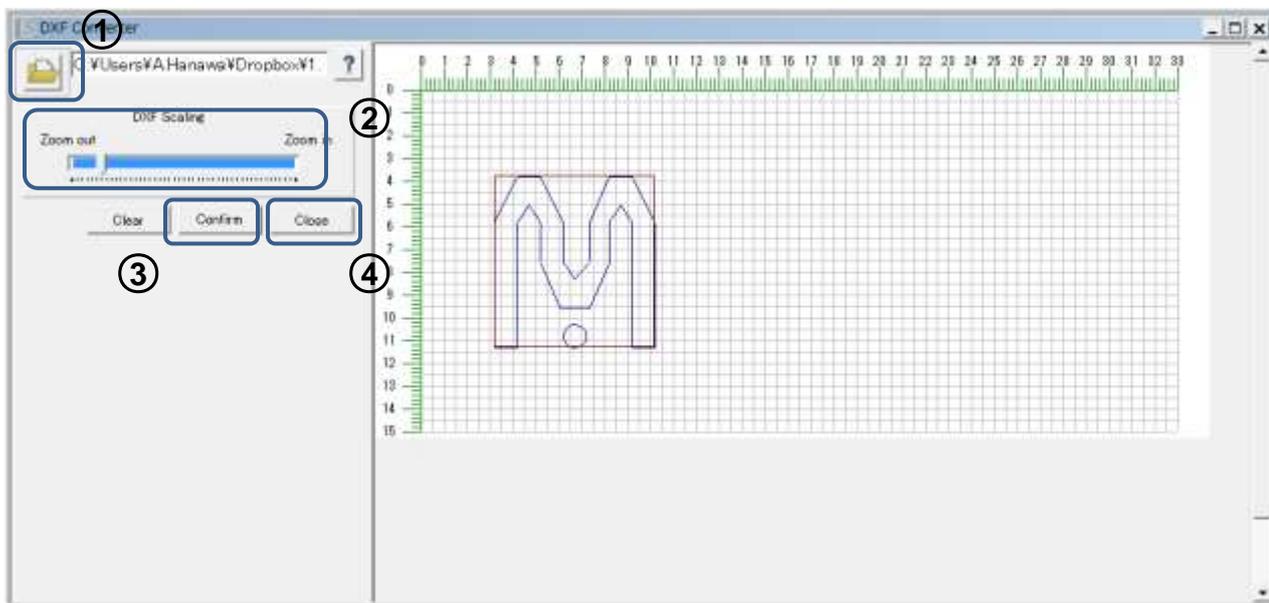
--- Instructions —-

1. Click "DXF data" [icon] to import the data.

2. Adjust the imported data by using the DXF scaling bar.

3. Click confirm button to input the file name and save the converted data (*fdx data).

4. Click Close button.

5. Click [icon] icon in the preview and capture the saved fdx data by creating a field.

You can also adjust the details in the properties

⑤
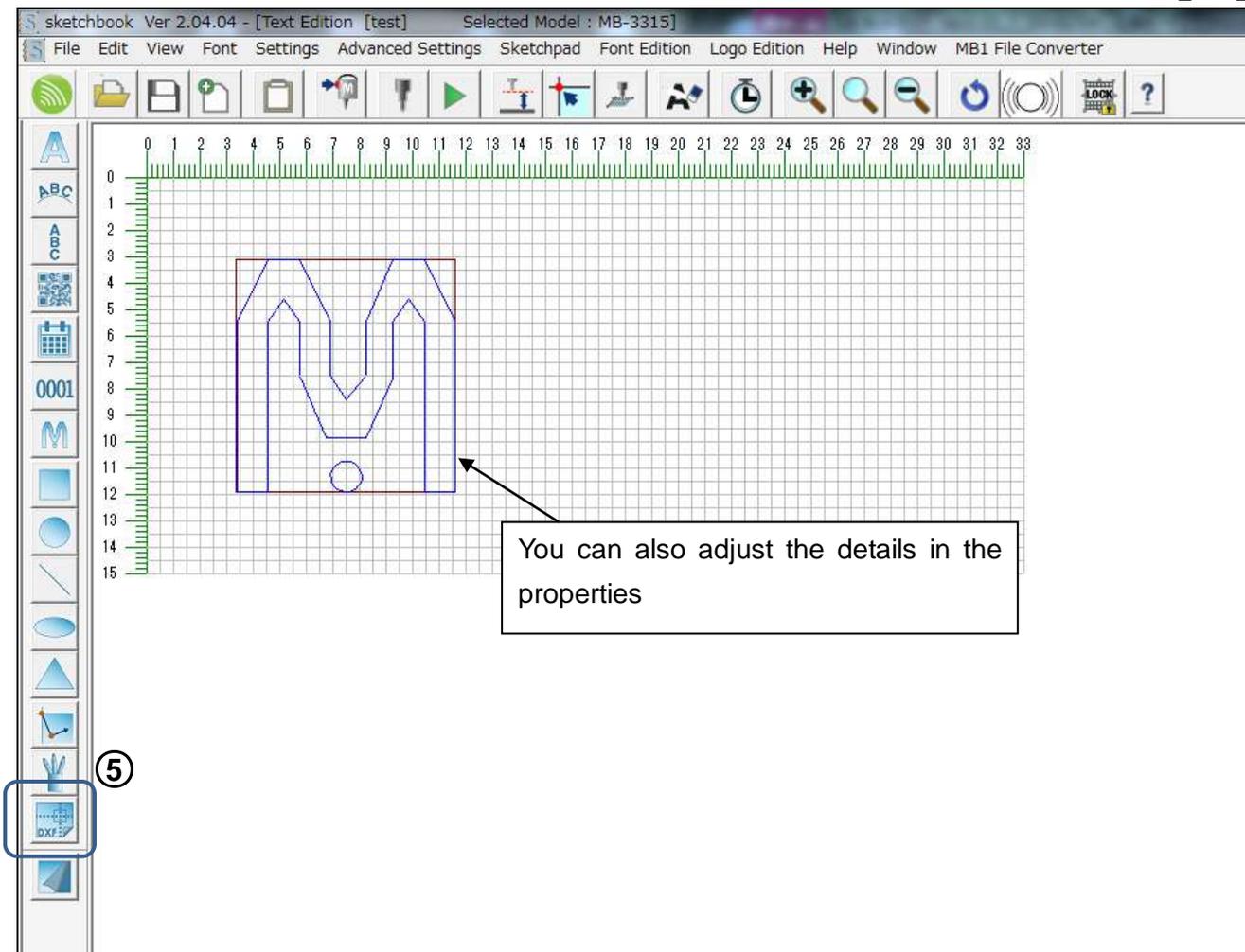
6. Click start icon ▶ to mark in PC mode.

7. Click the MB mode icon to mark in MB mode and push the start button on the marking head.

3-14. BMP marking

Menu → Advanced Settings → BMP Converter

It can done by converting bitmap data (BMP) into marking data (*mbp) for MarkinBOX.

Not only BMP marking but also outline making can be set.

* Only one BMP data can be imported into the preview screen. Two or more BMP data cannot be imported.

* Only applicable for PC mode marking and MB mode marking, and is not applicable for file marking.
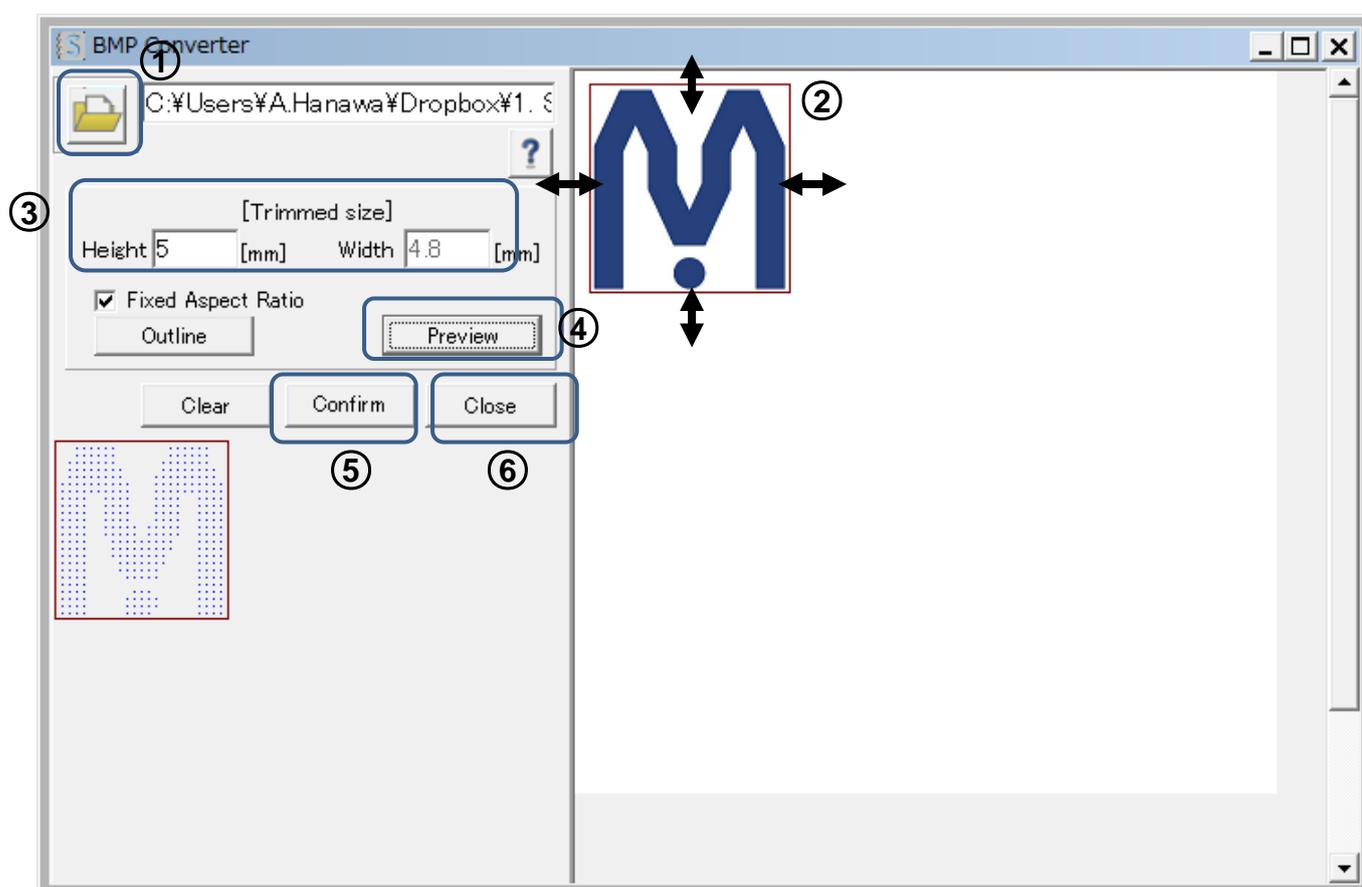
--- Instructions —-

1. Click [folder icon] to import the BMP data.

2. After importing the data, trim the data on the screen using click and drag. Adjust the frame horizontally and vertically, as well as the lower right (angle), and carry out trimming to fit the data.

3. After trimming, input the trimming dimensions.

4. Click the Preview button. (If the aspect ratio is fixed just input the height dimension.)
   If required, click the Outline button to turn it on.

5. The trimmed data is displayed on the lower left. After checking it, click the Confirm button, and save the data (*mbp) in the location of your choice.

6. Then click the Close button to close the window.

7. On the preview screen, click ![icon] in the shapes icon to create a field, and import the saved mpb data. The "BMP dot pitch" and the "Border Level" when importing color BMP data, can be adjusted on the Property screen.
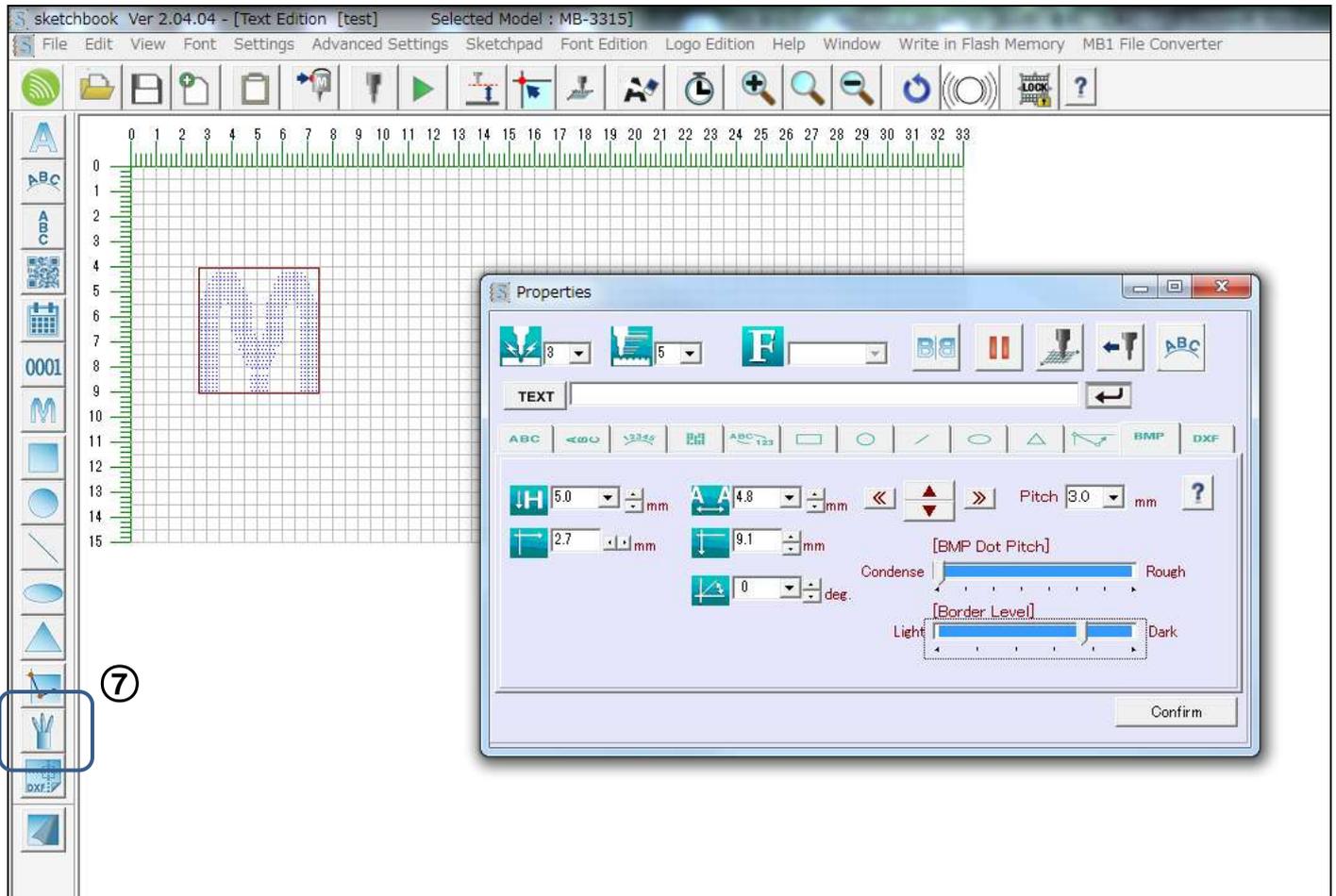
3-15. Jog Operation

Location	How to setup
Tool Icons or Properties	Click

Enable to move the pin free within marking area by using the arrow keys.

It is also useful to setup XY coordinate visually and setup starting position with Rotary Device.
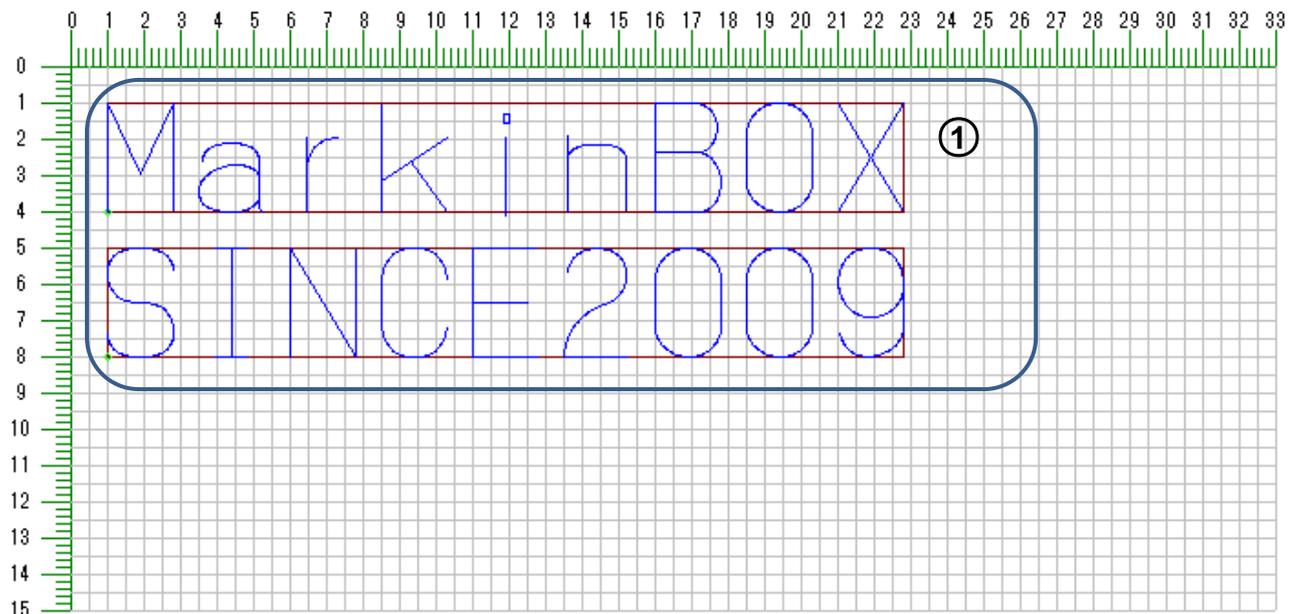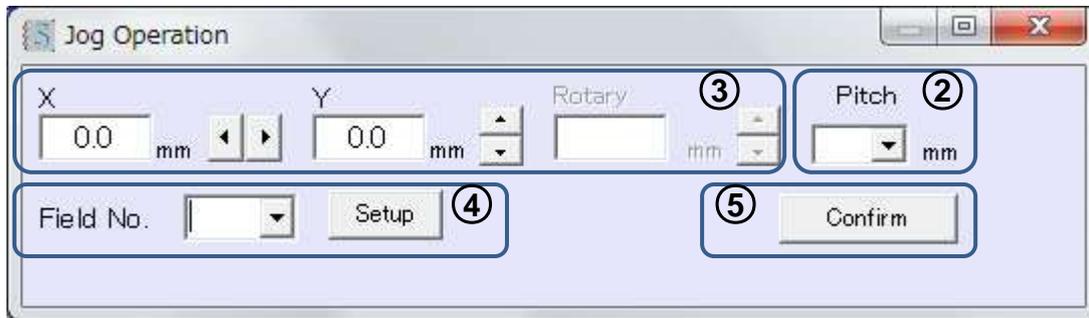
--- Instructions ---

1. Make the fields on the preview in advance.
2. Choose a pitch from the pull-down menu.
3. Setup the XY coordinate by using the arrow keys. Pin also moves at same timing.
4. Choose the field want to setup from the pull-down menu and click Setup button.
5. Click Confirm button
6. For setup multi fields, repeat steps 3 and 4.

4. More settings

4-1. Password Settings

Menu → Settings → Password

Using passwords, you can set levels for administrators and operators and manage files.

Administrator level	Can use all of the functions of the sketchbook software.
Operator level	Can only import files saved on the computer and save them, carry out marking and zooming, and perform communication and font settings. *See below if it is wished to assign the right to modify properties.
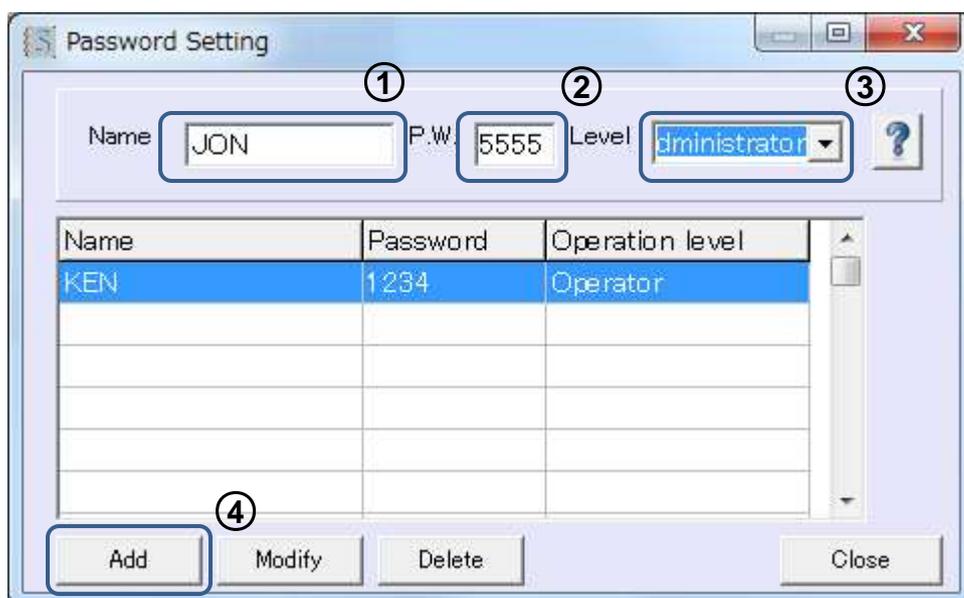
--- Instructions ---

1. Name → Input the person's name.
2. P.W. → Input a password made up of four numbers.
3. Operation level → Choose administrator or operator from the pull-down menu.
4. Click the Add button to register the information.
5. Log in using the registered password when the program is next started up.

*To modify the information select the name from the list, input the new information and then click the Modify button.

*To delete, select the name from the list and click the Delete button.

***To allow the operator level to change properties:**

Log in as an administrator and choose "Menu" → "Settings" → "Basic Parameters". Place a check in the "Select activated function in operator mode" - "Enable the field modification" check box, and click the Download button. For details see "Basic Parameter Settings".

4-2. Basic Parameter Settings

Menu → Settings → Basic Parameters

You can check the controller's basic parameters and set the method of operation. Also if necessary you can save and retrieve parameter files that are stored within the controller.

*Marking parameters cannot be modified.
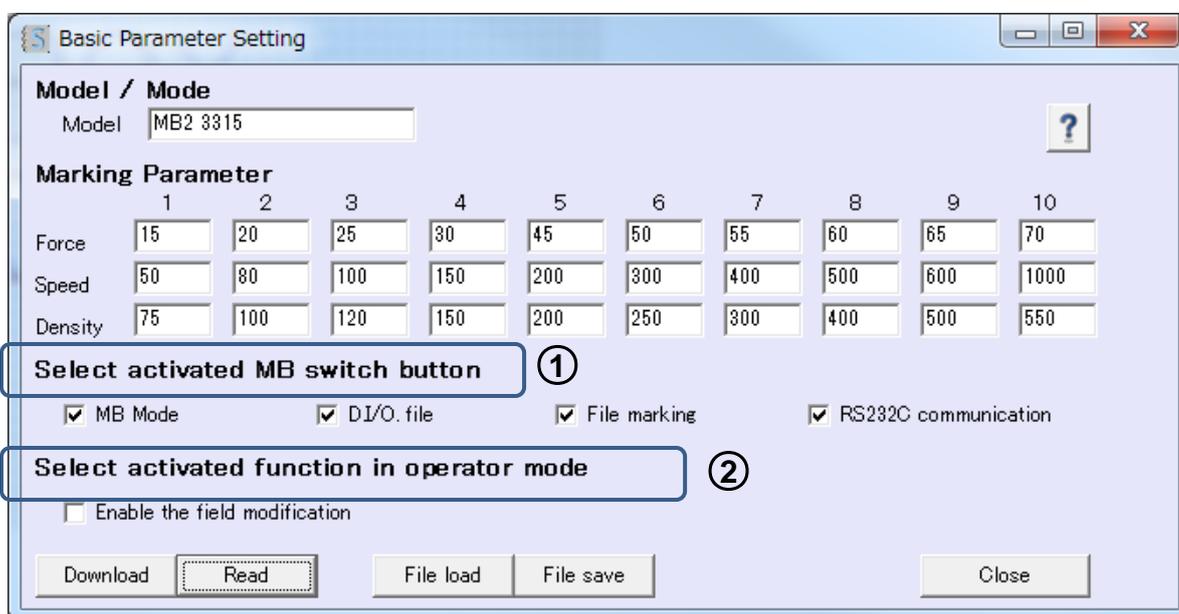
① Select activated MB switch button --- You can control when the switch button are active.	
MB Mode	The buttons will be active when you press the button to start up in MB mode (marking using the marking head's switches).
D.I/O	After selecting the file with the D.I/O, the buttons will be active when you want to carry out marking with the marking head's switch button.
File marking	Select the file to be used for marking with the "MB button setup file No." button from file marking. The buttons will be active when you want to carry out marking with the marking head's switch button.
R232C communication	After sending the data via RS232C communication the buttons will be active when you want to carry out marking with the marking head's switch button.

② Select activated function on the operator mode --- You can choose the permissions applied to the operator mode.	
Enable the field modification	Allows correction and modification of field properties when checked.

Retrieval and saving of parameter files

File load	Click when you want to retrieve a parameter file.
File save	Click when you want to save a parameter file.

--- Instructions ---

1. Read in the current settings using the Read button.

2. After checking the required items, click the Download button to set the controller.

4-3. PLC / IP Settings

Menu → Advanced Settings → PLC / IP settings

You can setup RS232C and LAN communication specifications.
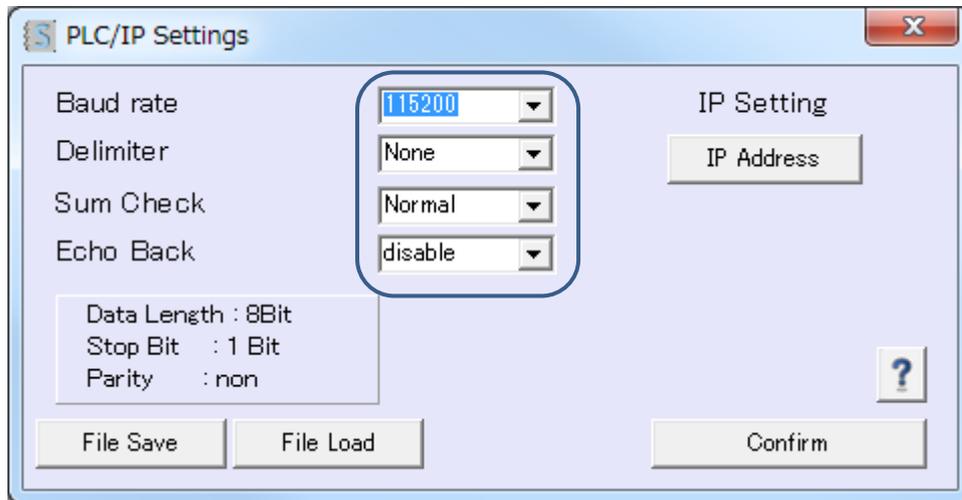
Baud rate	Choose the RS232C baud rate from the pull-down menu.
Delimiter	Choose None, CR, LF, or CR/LF from the pull-down menu.
Sum Check	Choose Normal, Minus Values, no use from the pull-down menu.
Echo Back	Enable to select the echo back program between PLC. MB2 controller is able to respond the command back to PLC. Choose enable or disable from the pull-down menu.

--- Instructions ---

1. Choose the required items and click the Confirm button.
2. To save the current settings as a file on the computer, click the File Save button.
3. To import a saved file click the File Load button.

4-4. Ethernet IP Settings

Menu → Advanced Settings → PLC / IP Settings → IP Address

You can change the IP address of the MB2 controller to connect network. (Setup the IP address via USB initially.) You can also manage multiple MB2 controllers from one PC using their IDs, by registering additional MB IDs.
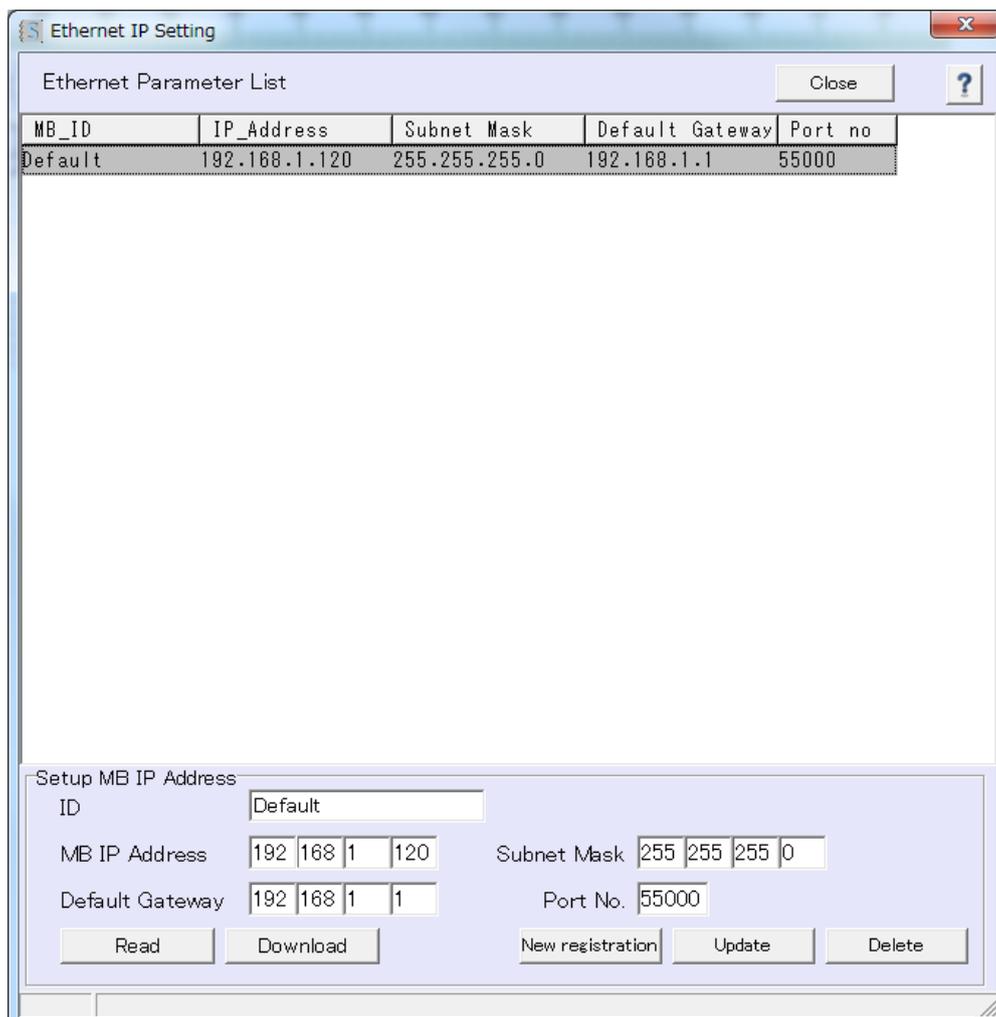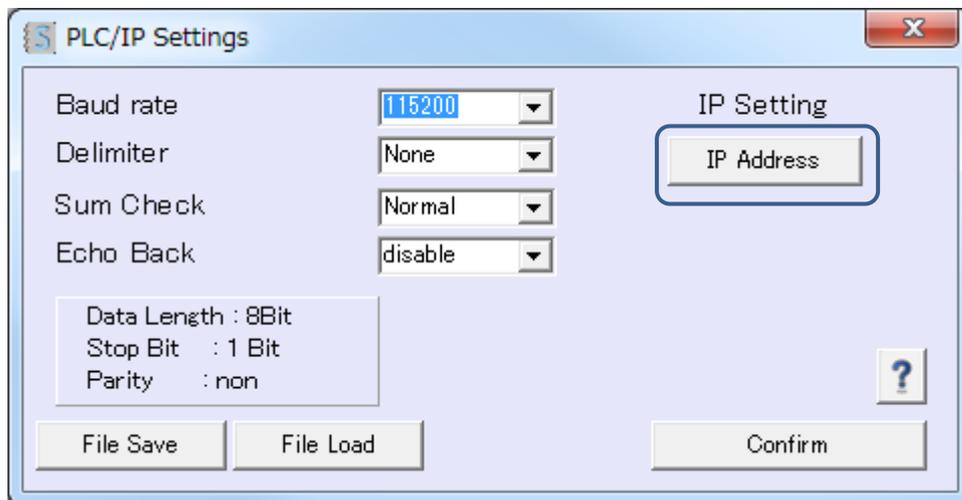
Read	Reads in the MB controller settings.
Download	Writes the settings to the MB2 controller.
New registration	Registers the newly input parameters.
Update	Modifies the registered parameters.
Delete	Deletes the registered parameters

--- Instructions ---

1. To make a new registration input all the MB IP address information, starting from the MB ID, and click the New registration button.

2. To modify registered parameters, select the parameter from the list by clicking on it, input the new data in the items to modify, and click the Update button.

3. To delete a registered parameter, select the parameter from the list by clicking on it, and click the Delete button.

4. Return to the communications settings screen by clicking the Close button and go to
   "Menu" → "Settings" → "Communication" and choose the MB ID to connect to from the LAN settings pull-down menu, select LAN and click the Connect button.
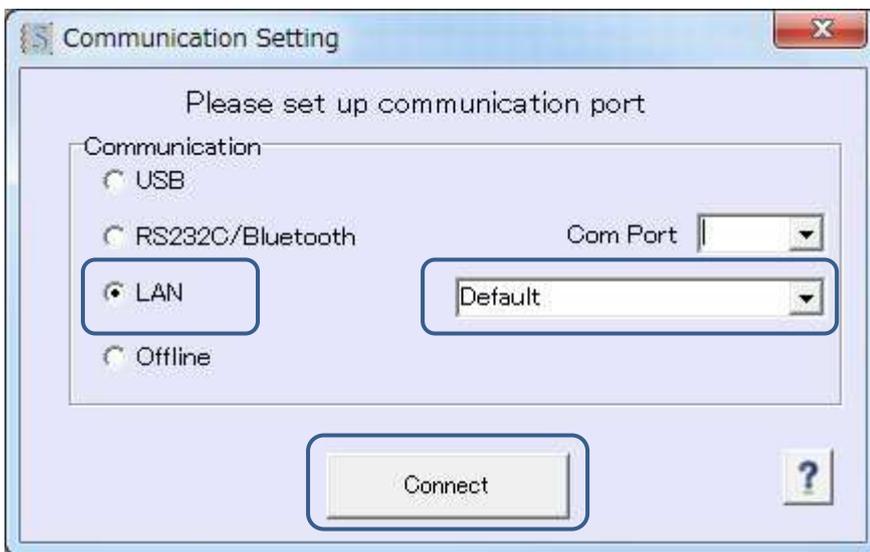
5. File Marking Settings

Menu → Advanced Settings → File Marking

You can send files containing the data created in the main screen to the controller, and also save them.

1. You can save up to 255 files in the controller.
2. File selection and marking can be carried out via the D.I/O connecter.
3. If set as an "MB button setup file" marking, the data will remain even if the power is off, and marking can continue to be performed in MB mode (marking using the switch buttons on the marking head).
4. Using batch processing, multiple files stored in the controller can be received, and multiple files can also be sent to the controller.
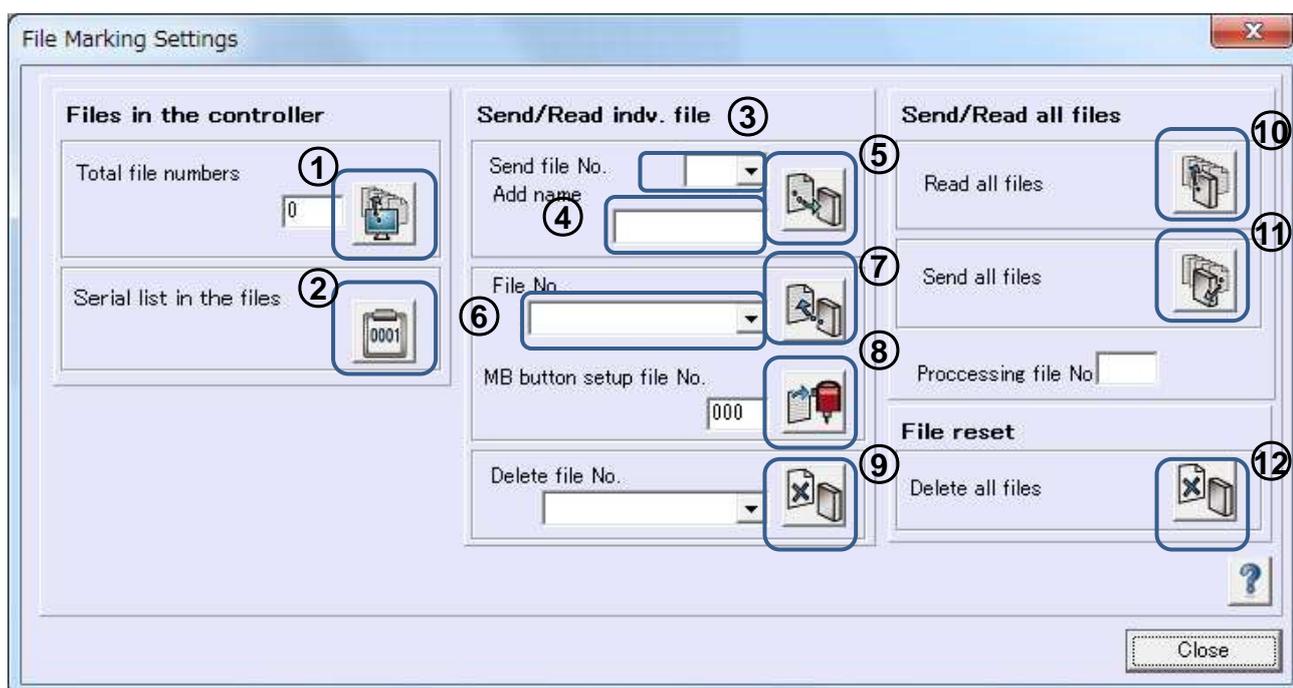
Files in the controller	
Total file numbers	① Shows the number of files saved in the controller. Click ![icon] .
Serial list in the files	② Shows the serial number of the file. Click ![icon] .

Send / Read indv. File	
Send file No. Add name	Sends the prepared data to the controller. ③ Select the number of the file from the pull-down menu. ④ File names of up to 8 single byte characters can be added.

	⑤ When the settings are completed click ![icon] to send the data to the controller.
File No.	Retrieves a file from the controller. ⑥ Select the number from the pull-down menu. ⑦ click ![icon].
MB button setup file No.	Sets the file retrieved in the previous item to use with MB mode marking. ⑧ Choose the number of the file to retrieve and click ![icon]. After setting the file, you can continue to carry out the marking operation being performed even if marking is cancelled or the power is off, because the data has been saved.
Delete file No.	⑨ Deletes a file. Click ![icon] after selecting the file from the pull-down menu.

Send / Read all files	
Read all files	⑩ Retrieves all the files saved in the controller. Click ![icon] and select the folder in which to save the files.
Send all files	⑪ Sends all the files saved on the PC to the controller. Click ![icon] and select the files to send. You can select multiple files by pressing the Ctrl key.

File reset	
Delete all files	⑫ Deletes all the files saved in the controller. Used to reset the controller's memory. Click ![icon] and delete all the files to reset the memory. This action cannot be undone so use it with caution.

6. Font & Logo Editing

Menu → Font Edition or Logo Edition

~Basics~

Place an original and trace over it. A single stroke comprises one group. For example, for the letter "A" each screenshot below represents one group. At least two groups are necessary to make the letter "A."

<Group No.1>   <Group No.2>

First

Starting point   Endpoint

Starting point   Second endpoint
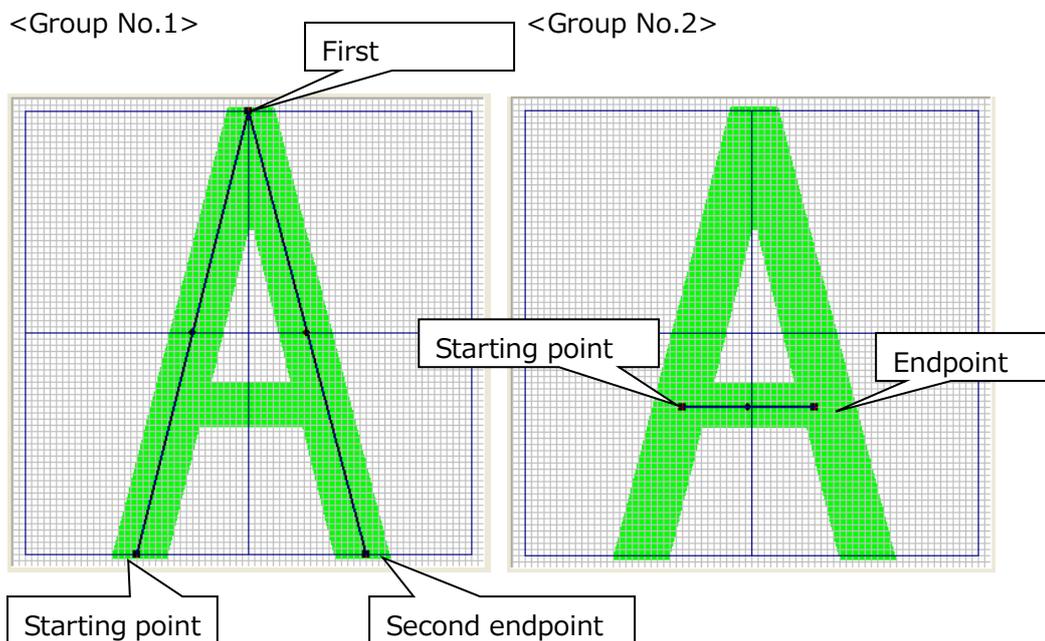
Like the above Group No.1, lines are drawn in one stroke. (Group No.1 comprises two diagonal lines that taper and meet at the end to form an inverted V.)

Once the starting point and the endpoint are determined, the midpoint will be automatically determined. Moving the midpoint, a curve is automatically draw in the shape of an "R."

Second midpoint

Second endpoint

First
endpoint   Third midpoint

First
midpoint   Third endpoint

Starting point
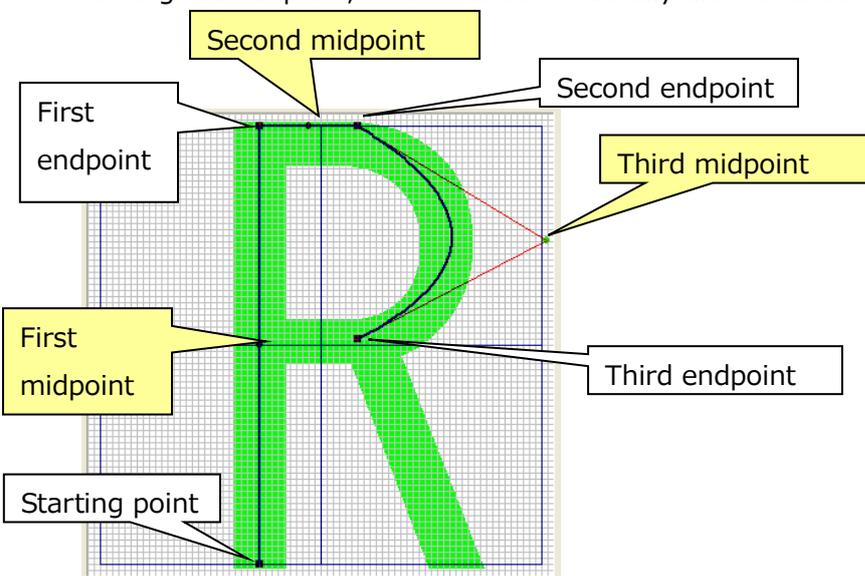
You can edit and delete these lines. Lines can also be added into a group. Make additions according to the original being traced.
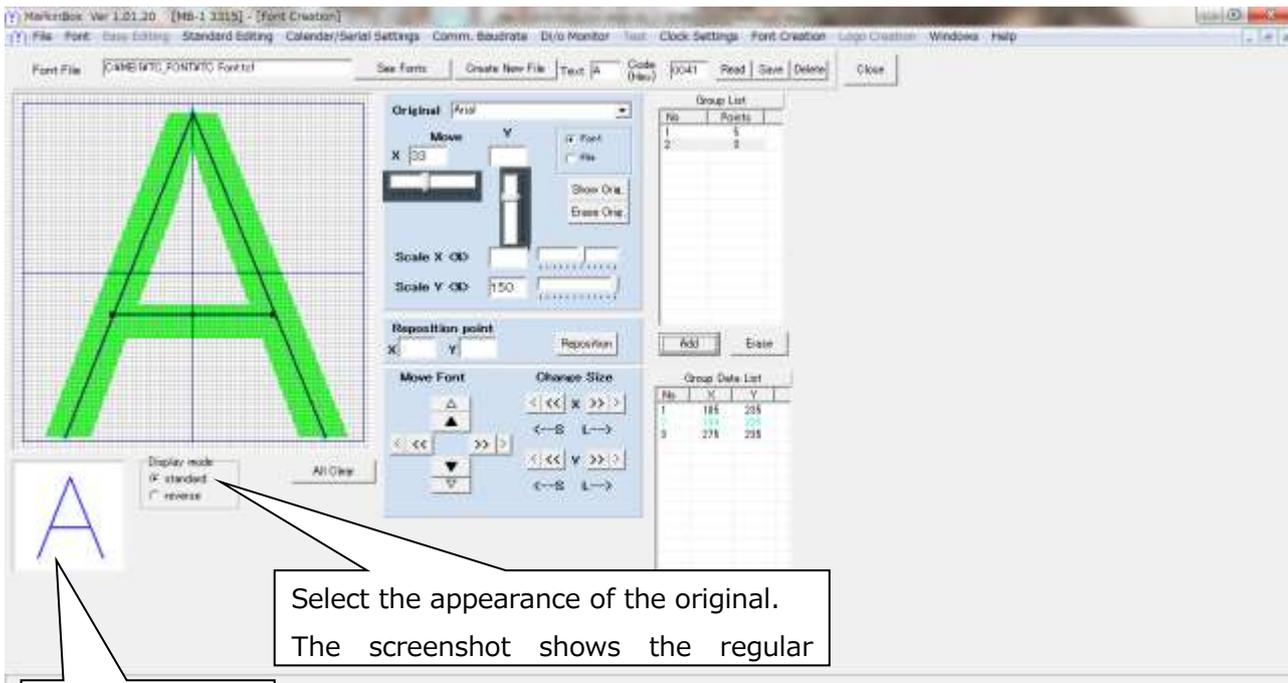
Select the appearance of the original.
The screenshot shows the regular

Preview window

Font File   C:¥MB1¥TC_FONT¥TC Font.tcf   See Fonts   Create New File

Font currently selected

Text A   Code (Hex) 0041   Read Save Delete

To make as a new file, click this button.
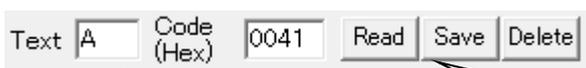
Enter the character to register. An ASCII code will show in the right field.
In Logo case, 31 logos (01 to 31) can be registered in a file.

Read Opens a saved font. If font is not registered, an error message appears.
Save Saves the font newly created.

Delete Deletes a saved font. Open the font before deleting.

Repositioning the original (up, down, left, right).
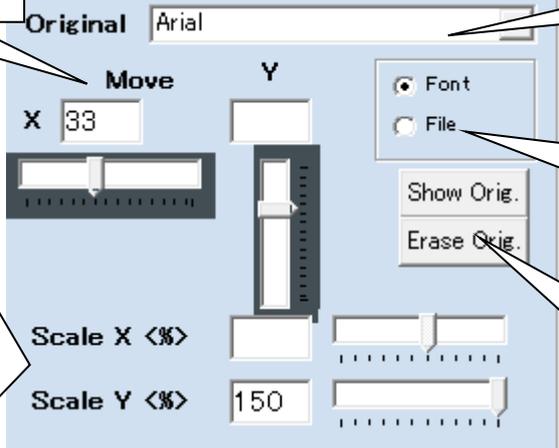
Selecting the font of the original.

Zooms in and out by percent. If the original is a font, it can be zoomed only in the Y direction. If the original is a file, it can be zoomed in both X and Y directions.

Original Arial

Move   Y
X 33

Font
File

Show Orig.
Erase Orig.

Selecting the type of the original.
Font: Regular
File: BMP, JPG

Scale X <%>

Scale Y <%> 150

Showing and clearing original.

- 52 -

Click the Add button in the group list and select Group No.1. Click on the original to select the starting point. Then, click the first endpoint. Click at other points as necessary until you are finished with the tracing.

Group List

No	Points
	5
	3

Click on the first endpoint.

Adding a group.

Deleting a group by selecting the group number.

Add   Erase

Click on the starting point.
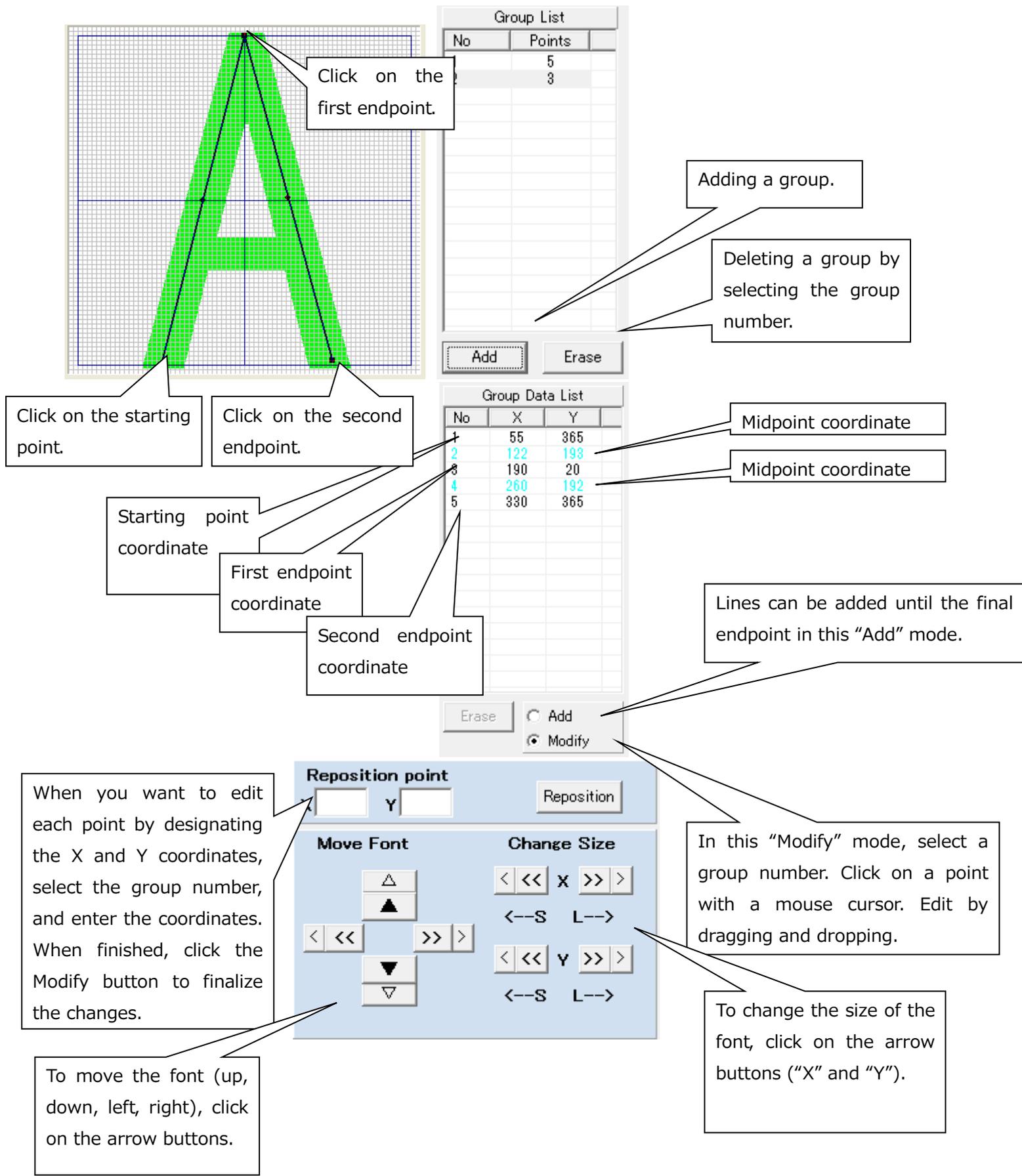
Click on the second endpoint.

Group Data List

No	X	Y
1	55	365
2	122	193
3	190	20
4	260	192
5	330	365

Midpoint coordinate

Midpoint coordinate

Starting point coordinate

First endpoint coordinate

Second endpoint coordinate

Lines can be added until the final endpoint in this "Add" mode.

Erase   ○ Add
          ● Modify

In this "Modify" mode, select a group number. Click on a point with a mouse cursor. Edit by dragging and dropping.

When you want to edit each point by designating the X and Y coordinates, select the group number, and enter the coordinates. When finished, click the Modify button to finalize the changes.

Reposition point

X [   ] Y [   ]   Reposition

Move Font   **Change Size**

△   < ‹‹ X ›› >
▲
                     ‹--S   L--›
‹ ‹‹   ›› ›
▼   < ‹‹ Y ›› >
▽
                     ‹--S   L--›

To change the size of the font, click on the arrow buttons ("X" and "Y").

To move the font (up, down, left, right), click on the arrow buttons.

When finished, click on the Save button to save as a designated file on the PC.

Important : The font must be sent to the controller to enable marking. Refer to "MB Font Setting" and always send the font to the controller.

Creating and registering the fonts or logos in the new font file

1. Click the Create New File button and create a file for storing
2. Enter a new file name and click save button
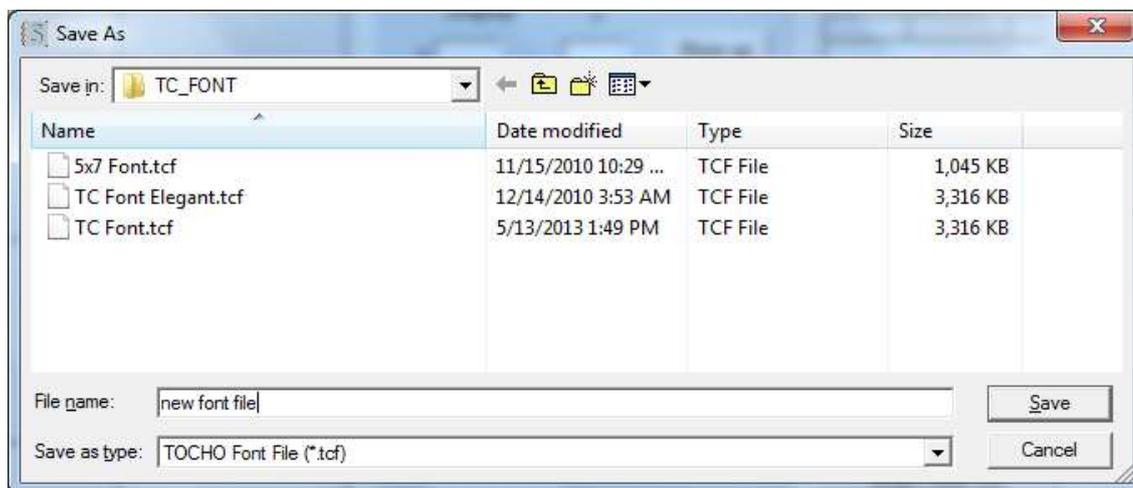
3. Enter the font you would like to edit or register in the "Text" field.

4. When drawing is complete, click the Save button to register.

Important : The font must be sent to the controller to enable marking. Refer to "MB Font Setting" and always send the font to the controller.
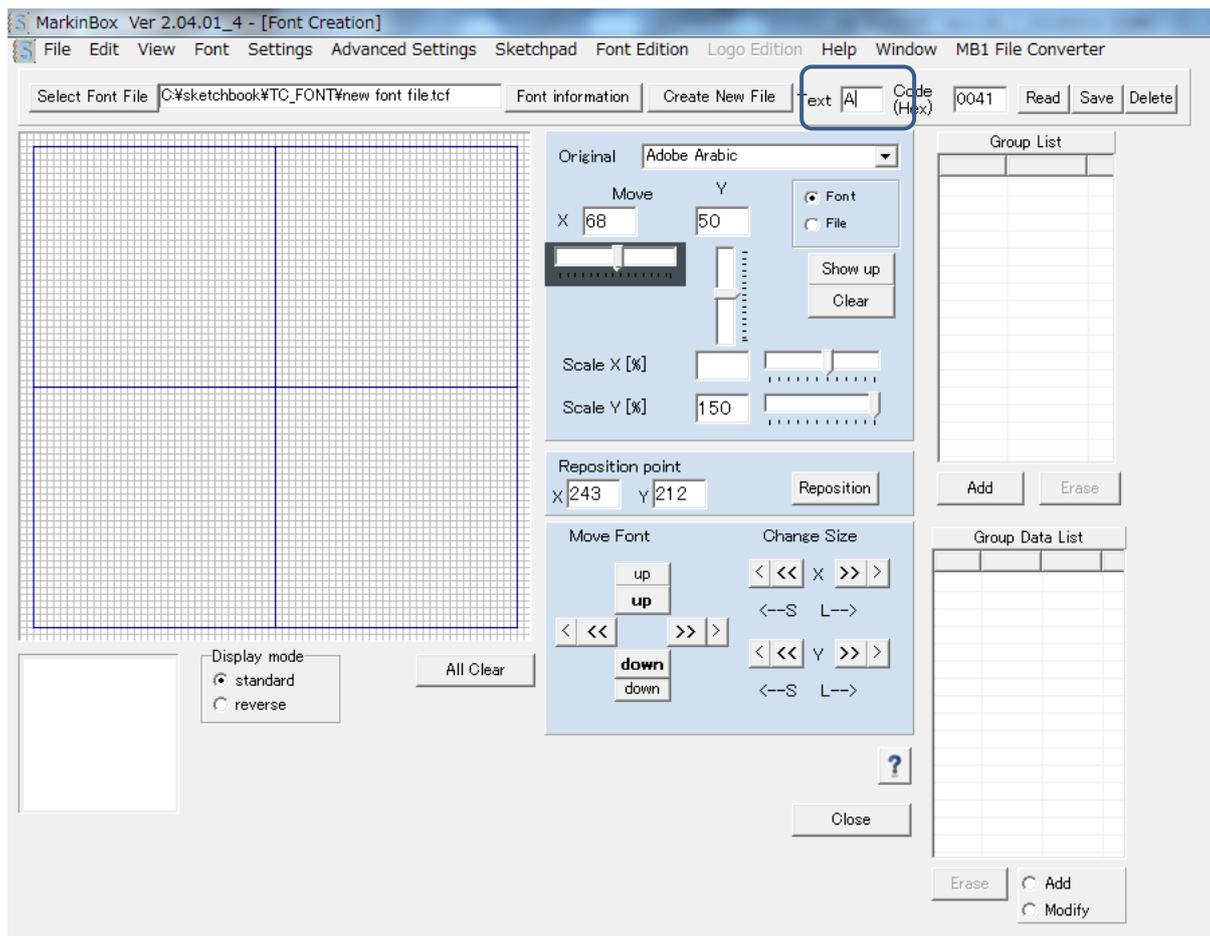
7. Marking Data Log

Menu → File → Log

The log only displays data from the **PC mode** marking result.

*Data cannot be read in from the controller.
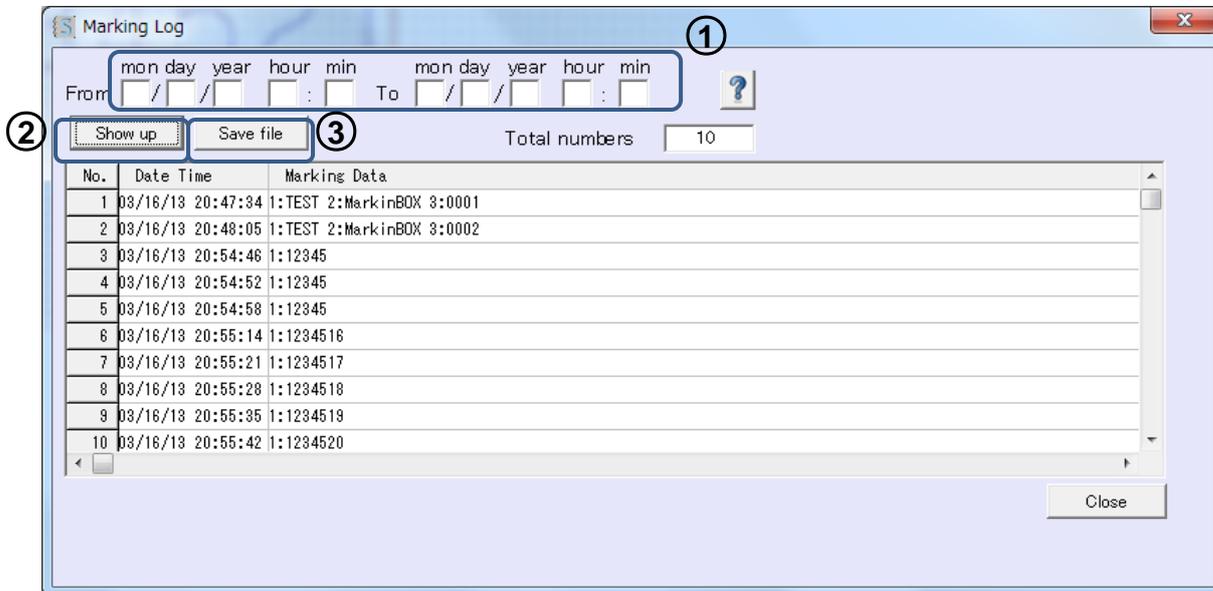
--- Instructions ---

1. Input the dates for the period you want to import data for in "From" and "To". (If nothing is input here all the data will be displayed.)

2. Click the Show up button to display the data. (Up to 1,000 data items can be displayed.)
   If required you can click the Save file button to save the data in a csv file.

8. Rotary Device Settings (Optional)

Menu → Advanced Settings → Rotary Device

Make default settings for the rotary and cylinder job piece.

Rotary Device Direction	① Sets the installation orientation of the rotary.
	No use rotary → Choose if the rotary is not fitted during normal marking. Vertical set → Choose when the rotary is fitted vertically. (See below) Horizontal fitting → Choose when the rotary is fitted horizontally. (See below)
Chuck Type	② Select Chuck Type Standard Chuck or Large Chuck
Workpiece Diameter	③ Input the diameter of the cylinder part piece. Values from 10 – 200 mm can be entered.
Initial Position	④ Set the marking pin to the center of the cylinder.
	When the rotary is fitted vertically → X axis goes to the center of the cylinder by using the arrow keys. . When the rotary is fitted horizontally → Y axis goes to the center of the cylinder by using the arrow keys.

--- Instructions —-

*Carry out the following settings after setting up the rotary and the marking device head.

1. Select the installation orientation in the rotary settings.
2. Select the Chuck Type
3. Set the cylinder workpiece in the chuck.
4. Input the cylinder workpiece diameter.
5. Use the arrow keys to set the cylinder work piece diametric center. (You can also choose the movement

pitch from the pull-down menu.)

6. Click the Download button to send the data to the controller.

7. Click the Confirm button and go to the main screen. Pin returns to the home position.

8. In the main screen, onput the marking data and start marking.

9. To read in the data for the current settings click the Read button.

The below image is available for all models. **Please set up all connection after off power.**

Connection Images
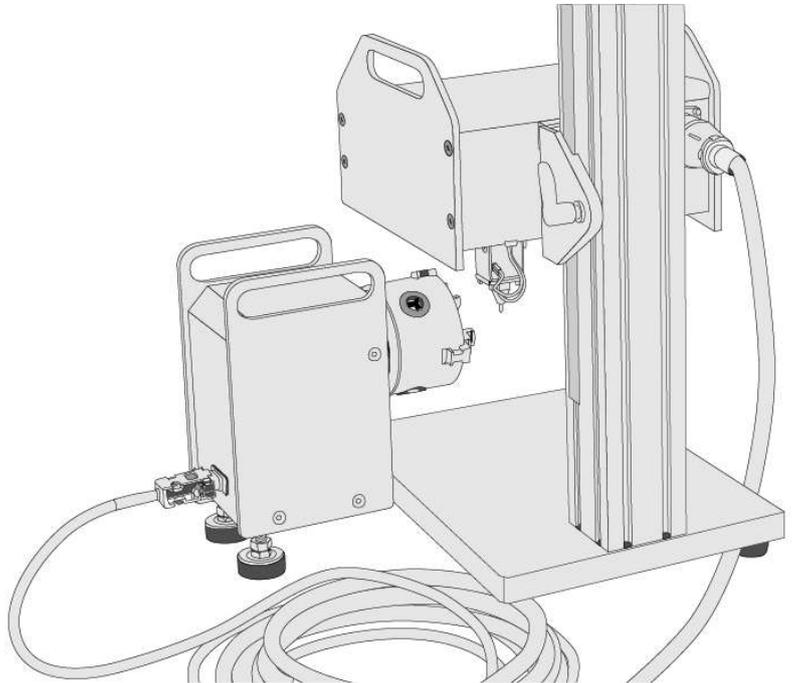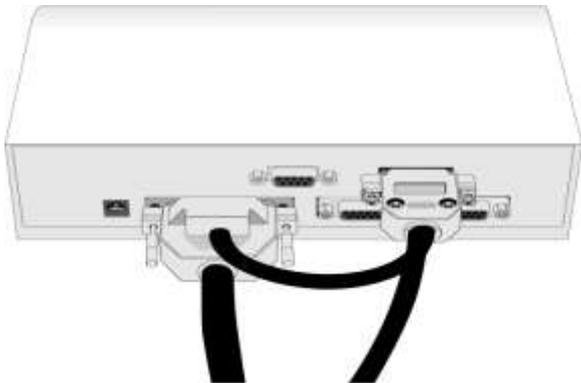
| Rotary fitted vertically	Rotary fitted horizontally
When the rotary is fitted vertically the angle of TEXT is set to 180 deg. or 0 deg.	When the rotary is fitted horizontally the angle of TEXT is set to 90 deg. or -90 deg.
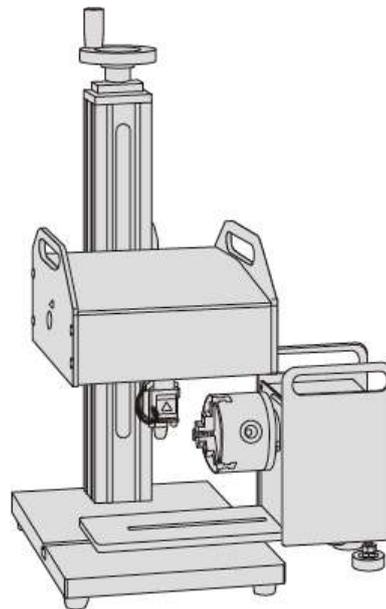
9. Convert the file from MB1 to MB2

Menu → MB1 File Converter

You can convert the file which was made by MB1 software for sketchbook and MB2 controller.

MB1 PC File → sketchbook	
Covert MB1 PC file	① Convert to sketchbook file which was saved in the PC by MB1 software (*prg). After converting, new file name becomes as XXX_CNVMB2.ppg. Click [icon] and select the MB1 PC file. Shift key + Files → All selection / Ctrl key + Files → Multiple selection

MB1 Controller File → MB2 Controller File *Enable operation when connected MB1 controller	
Number of files in MB1	② Total saved file numbers in MB1 controller
Select a file	③ Read a saved file in the MB1 controller and show up in the preview screen. Select a file from the pull-down menu and click [icon].
Read all files	④ Read all saved files in the MB1 controller and convert all to as MB2 file. Click [icon] and make a holder for saving.
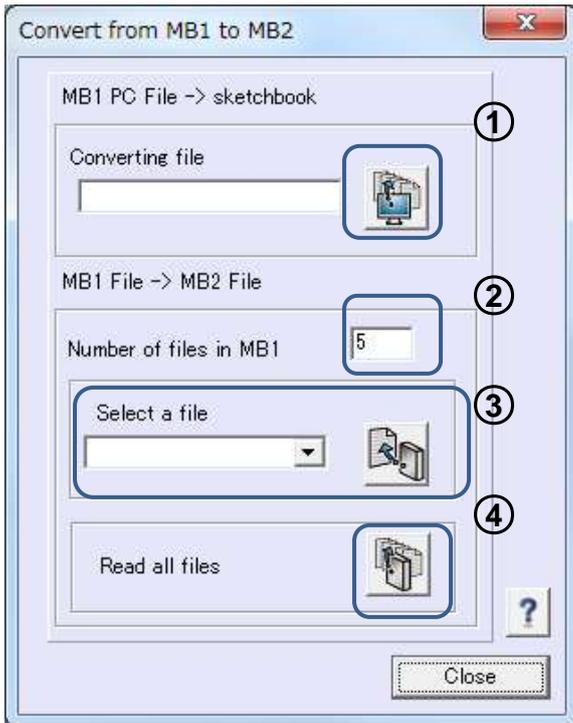
10. How to Check the Software Version

Menu → Help → Version

To check the version of the software and the controller ROM, choose [Version] from [Help] in the toolbar.

sketchbook software version

Controller ROM version
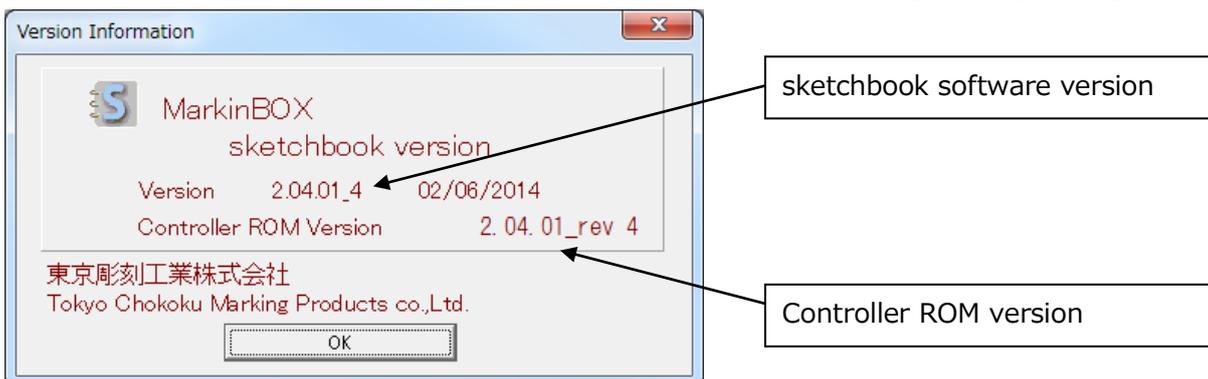
11. Uninstalling the Software

Follow the steps outlined below to uninstall sketchbook from your computer.

(1) Exit sketchbook.

(2) Select the "sketchbook" folder from "Computer" → "C Drive", right click and choose "Delete".

(3) Uninstall is completed.

12. Appendix

A-1. D.I/O Diagram for MB-2

After serial number 140702-00420 of the MB2 controller, please refer to the draw on this page.

Before serial number 140702-00420, please refer to the draw on the next page.

(From S/N : 140702-MB2-00420)

MB2 D.I.O. Connector (D. I/O) Diagram

D-Sub37pin (Female)

D-Sub37Pin (Male)
Connector : DDK 17JE-23370-02-D1(Male)
Hood : DDK MDA-37H-M2.6

I.O. cable (Option)
< Note > Please carry out insulated processing of
the end (CN14-1~CN14-37)of the cable
which is not used.

CN14 Pin Diagram

Pin No.19   ▽ Pin No.1

Pin No.37   O Pin No.20

⟨ Controller ⟩

Photo Coupler
DC24V,7mA

(PIN No.)

37 Pin (Female)   37 Pin (Male) (Option)

CN14-20	(DI 04)	SW1	(Start)
CN14-21	(DI 05)	SW2	(Alarm reset)
CN14-22	(DI 06)	SW3	(Return to origin)
CN14-23	(DI 07)	SW4	(Stop)
CN14-24	(DI 08)	SW5	(File No.1)
CN14-25	(DI 09)	SW6	(File No.2)
CN14-26	(DI 10)	SW7	(File No.4)
CN14-27	(DI 11)	SW8	(File No.8)
CN14-28	(DI 12)	SW9	(File No.16)
CN14-29	(DI 13)	SW10	(File No.32)
CN14-30	(DI 14)	SW11	(File No.64)
CN14-31	(DI 15)	SW12	(File No.128)

< Note >
For file marking CN14-24
to CN14-31 have to be ON
before start marking by
CN14-20.

(Attention)
(Output is
P-com or N-com
avalable)

DC power polarity can
also use (+) or (-).

External electric
power DC24V 0.3A

(Option)

(COM)
CN14-34
CN14-35

< Note >
Output current,
use in less than 70mA.

Solid Relay
DC24V,70mA

CN14-1	(DO 00)	(Relay) AL1	(Alarm)
CN14-2	(DO 01)	RE1	(Ready)
CN14-3	(DO 02)	MK1	(Marking)
CN14-4	(DO 03)	RO1	(During origin return)

(Attention)
(Output is
P-com or N-com
avalable)

DC power polarity can
also use (+) or (-).

External electric
power DC24V 0.3A

CN14-11
CN14-12
CN14-13
CN14-14

(Option)

(Attention)
CN14-5,6,7,8,9,10,15,16,17,18,19,32,33,36,37
is open.

The draw on this page design for before serial number 140702-00420.

MB2 D.I.O. Connector (D. I/O) Diagram

D-Sub37pin (Female)

D-Sub37Pin (Male)
Connector : DDK 17JE-23370-02-D1(Male)
Hood : DDK MDA-37H-M2.6

I.O. cable (Option)
< Note > Please carry out insulated processing of
the end (CN14-1~CN14-37)of the cable
which is not used.

CN14 Pin Diagram

Pin No.19   ▽ Pin No.1
Pin No.37   ○ Pin No.20

< Controller >

Photo Coupler
DC24V,7mA

(PIN No.)   37 Pin (Female)   37 Pin (Male) (Option)

CN14-20	(DI 04)	SW1 (Start)
CN14-21	(DI 05)	SW2 (Alarm reset)
CN14-22	(DI 06)	SW3 (Return to origin)
CN14-23	(DI 07)	SW4 (Stop)
CN14-24	(DI 08)	SW5 (File No.1)
CN14-25	(DI 09)	SW6 (File No.2)
CN14-26	(DI 10)	SW7 (File No.4)
CN14-27	(DI 11)	SW8 (File No.8)
CN14-28	(DI 12)	SW9 (File No.16)
CN14-29	(DI 13)	SW10 (File No.32)
CN14-30	(DI 14)	SW11 (File No.64)
CN14-31	(DI 15)	SW12 (File No.128)

< Note >
For file marking CN14-24
to CN14-31 have to be ON
before start marking by
CN14-20.

< Note >
Output current,
use in less than 70mA.

CN14-34   +24V   External electric power DC24V 0.3A   GND
CN14-35   (Option)

Solid Relay
DC24V,70mA

		(Relay)
CN14-1	(DO 00)	(AL1) (Alarm)
CN14-2	(DO 01)	(RE1) (Ready)
CN14-3	(DO 02)	(MK1) (Marking)
CN14-4	(DO 03)	(RO1) (During origin return)

(Attention)
(Output is
P-com or N-com
avalable)

(COM)   CN14-11
CN14-12
CN14-13
CN14-14

DC power polarity can
also use (+) or (-).
External electric power DC24V 0.3A
(Option)

(Attention)
CN14-5,6,7,8,9,10,15,16,17,18,19,32,33,36,37
is open.

Wiring Drawing For D-Sub 9 pin Connector (RS232C)

D-Sub 9pin Connector (Female) — To MB Connector

Connected wires in the connector.

Pin No.	Signal Name	Content
1		
2	TXD	Transmit Data
3	RXD	Receive Data
4	DSR	Data Set Ready
5	GND	Ground
6	DTR	Data Terminal Ready
7	CTS	Clear to Send
8	RTS	Request to Send
9		

D-Sub 9pin Connector (Male) — To PC

Pin No.	Signal Name	Content
1		
2	RXD	Receive Data
3	TXD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request to Send
8	CTS	Clear to Send
9		

D-Sub 9pin Connector (Female)

No.5   No.1

No.9   (CN4)   No.6

To D-Sub 9pin Connector of PC

Cable   (Option)

D-Sub 9pin Connector (Male)

PC (Option)

POWER   RS232C

HEAD CABLE   DIJO

DC24V
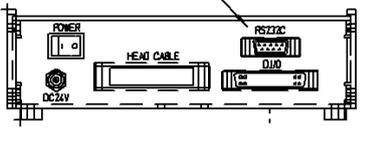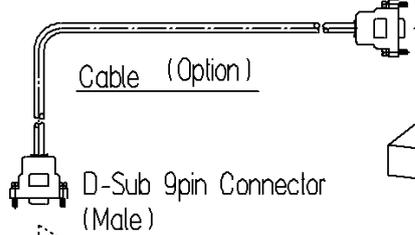
Back Panel on the MB-1 Controller

RS232C   ROTARY D.

DC24V   HEAD CABLE   DIJO
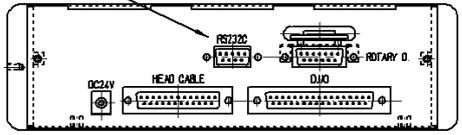
Back Panel on the MB-2 Controller

A-2. RS232C Serial Communication

Refer to the following protocol for serial communication specifications.

Serial communication	RS232C（IEE232）
Baud rate	115200 bits/sec
Bit length	8 bit
Parity	Non
Stop Bit	1 bit
No software flow control by Xon/Xoff, etc.	
Transmission data format Commands from PLC are received by MarkinBox Controller PLC Command packet ⟶ MarkinBox Controller ⟵ ACK packet	
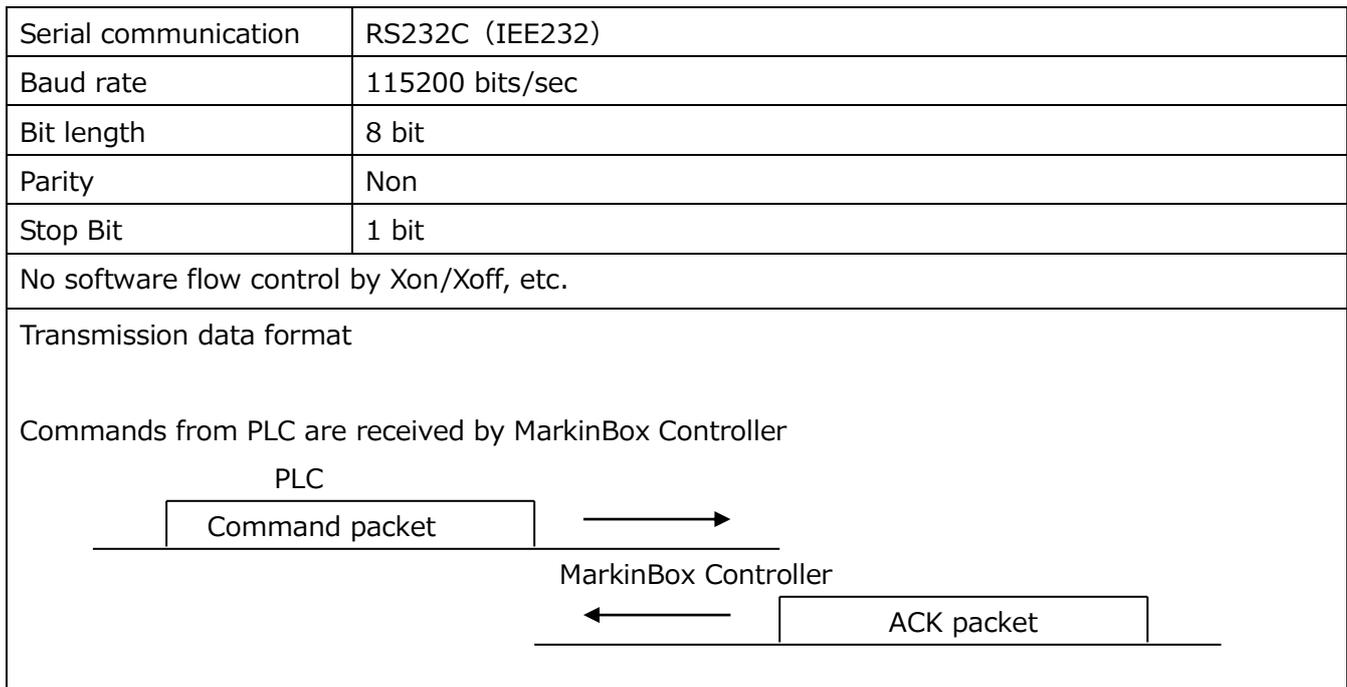
*Figures not satisfying the required digits can be expressed as "0" or "_" (space). However, since the commands are text-based, spaces cannot be used, such as the "0" in "01".

*Using check sum is always recommended, but if you would like, it is possible to make a communication WITHOUT check sum.

Go to "**Menu**" ➔ "**Advanced Settings**" ➔ "**PLC / IP Settings**", and show the follow window. Please select "no use" on the Check Sum section, and click the Comfirm button to download to the controller.
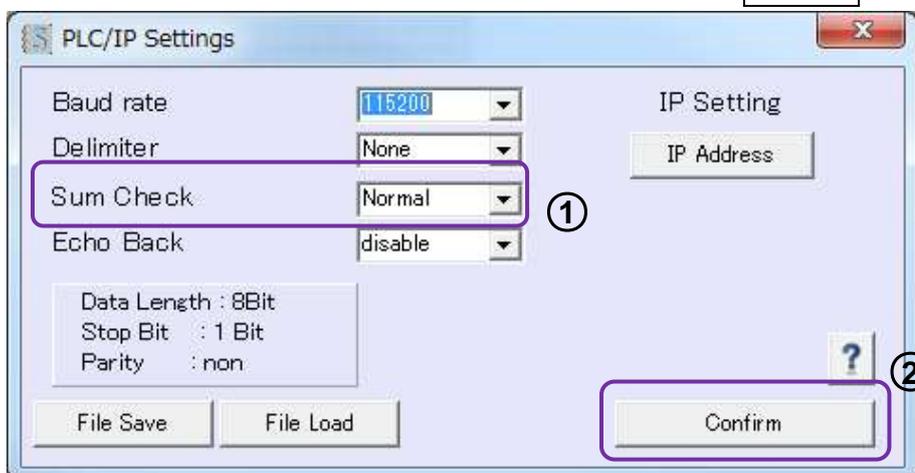
A-2-1. Standard Communication

Packet format

2 bytes	2 bytes	2 bytes	3 bytes	(0-999) bytes	1byte	2 bytes
Starting code	Packet no.	Command	Data length	Data	Ending code	Check sum

*Need from the Stating code(@STX) to the ending code(ETX) only, if you selected no use check sum.

Starting code (2 bytes)	Packet starts @stx fixed				40h 02h (fixed)
Packet no. (2 bytes)	Two characters showing synchronization between the transmission and receiving packets. The two characters arbitrarily controlled by the transmitter. The receiving packet will always contain the same number as the transmitting packet.				Example: 30h 30h
Command (2 bytes)	Commands are fixed at two characters.				
	01	Send marking data to MarkinBOX	PLC → MarkinBOX		30h 31h
	02	Receiving packet: Command 01	MarkinBOX → PLC		30h 32h
	03	Execution command to MarkinBOX	PLC → MarkinBOX		30h 33h
	04	Receiving packet: Command 03	MarkinBOX → PLC		30h 34h
	05	Status request to MarkinBOX	PLC → MarkinBOX		30h 35h
	06	Receiving packet: Command 05	MarkinBOX → PLC		30h 36h
	07	Send move XY data to MarkinBOX	PLC → MarkinBOX		30h 37h
	08	Receiving packet : Command 08	MarkinBOX → PLC		30h 38h
	09	Send text data to MarkinBOX	PLC → MarkinBOX		30h 39h
	10	Receiving packet : Command 09	MarkinBox → PLC		31h 30h
	11	Execution command to MarkinBOX	PLC → MarkinBOX		31h 31h
	12	Receiving packet : Command 11	MarkinBOX → PLC		31h 32h
Data length (3 bytes)	Length of the data (number of bytes). Send the number of bytes (before ETX) of the next packet's data.				Example: 30h 33h 39h
Data (0-999 bytes)	Maximum data is 999, expressed in 999 characters. The data will differ according to the command. Please refer to below.				Refer to below
Ending code (1 byte)	etx fixed.				03h
Check sum (2 bytes)	Hexadecimal form in two characters expressing the lower 8-bit figure derived from the sum encompassing from "Packet no." to "Data" above. *@STX and ETX are not included. If you choose "no use checksum", do not need addition.				

The receiving time is 500 ms maximum. Retry will be controlled by the transmitter.

Data specifications according to command

1. Command 01: Send marking data (PLC to MarkinBOX)

[Header data] and [field data]

The header data comprises "Force," "speed," and "number of fields," which are common to all fields.

Header (total bytes: 8)		ASCII examples
nn +0,1 (2 bytes)	Force 01-10	30h 35h (at marking force 5)
nn +2,3 (2 bytes)	Speed 01-10	30h 35h (at marking speed 5)
n +4 (1 byte)	Serial setting *It's an option, please send "0" usually. 0 (no use serial marking)	30h (when no use serial marking)
n +5 (1 byte)	Home position 0 (Back to home after marking) 1(Pause after marking)	30h (when back to home position after marking as standard)
nn +6,7 (2 bytes)	Number of fields sent 01 -11	30h 31h (when number of fields is 1)

Field data are individual data including marking text.

Field (text data; maximum 79 bytes)		ASCII examples
nn +0,1 (2 bytes)	Field no. 01-21	30h 31h (when field no. is 1)
n +2 (1 byte)	Data format 0 : fixed characters, 3 : logo, 4 : vertical on Y axis, 5 : vertical on X axis, 6 : outer arc, 7 : inner arc	30h (when using fixed characters)
n +3 (1 byte)	Marking direction 0 : Standard direction, 2 : Reverse direction	30h (standard direction)
nn.n +4,5,6,7 (4 bytes)	Character height mm	30h 33h 2Eh 30h (at 03.0mm)
nnn +8,9,10 (3 bytes)	Character width percentage %	30h 36h 30h (at 060%)
nnnn +11,12,13,14 (4 bytes)	Angle Degree	2Dh 30h 34h 35h (at -045 deg)
nn.n +15,16,17,18 (4 bytes)	Character pitch mm	30h 32h 2Eh 35h (at 02.5mm)
nn.n +19,20,21,22 (4 bytes)	Starting position X mm	30h 31h 2Eh 30h (at 01.0mm)
nn.n +23,24,25,26 (4 bytes)	Starting position Y mm	30h 33h 2Eh 30h (at 03.0mm)
nn +27,28 (2 bytes)	Number of characters (bytes) Maximum: 50 bytes	30h 35h (at 5 bytes)
data +29-78 (Maximum:50 bytes)	Marking data Maximum: 50 characters *When logo marking, logo numbers will be transmitted registered in the controller. @L[..] should be added in the front and back like 01 ~ 31.	41h 42h 43h 44h 45h (when: ABCDE) 40h 4Ch 5Bh 30h 31h 5Dh (when logo no. is 1)
nnn + (3 bytes)	Radius of Arc Not necessary input except ARC: mm	30h 31h 30h (when:010mm)

Field (2D data; maximum: 79 bytes)		ASCII examples
nn　+0,1 (1 byte)	Field No.21 Fixed for 2D code	32h 31h (Fixed)
n　+2 (1 byte)	Data format 8 : fixed characters	38h (fixed characters)
n　+3 (1 byte)	Barcode types 1:QR; 2:Date matrix	31h (when QR code)
nn　+4,5 (2 bytes)	Force 01-10	30h 33h (at marking force 3)
nn　+6,7 (2 bytes)	Barcode marking speed 01-10	30h 32h (at marking speed 2)
nn　+8,9 (2 bytes)	Dimensions: Data matrix only (QR:00) (10,12,14,16,18,20,22,24,26,32,36,40)	32h 30h (at 20)
n　+10 (1 byte)	0 Fixed	30h (Fixed)
nnnn +11,12,13,14 (4 bytes)	Angle deg	30h 30h 30h 30h (at 0000 deg)
nn.n　+15,16,17,18 (4 bytes)	Matrix size mm	30h 35h 2Eh 30h (at 05.0mm)
nn.n　+19,20,21,22 (4 bytes)	Starting position X mm	30h 30h 2Eh 31h (at 00.1mm)
nn.n　+23,24,25,26 (4 bytes)	Starting position Y mm	30h 35h 2Eh 35h (at 05.5mm)
nn　+27,28 (2 bytes)	Number of characters (bytes) Maximum: 50 bytes	30h 35h (at 5 bytes)
data　+29-78 (Maximum:50 bytes)	Data Maximum: 50 characters	41h 42h 43h 44h 45h (when: ABCDE)

2. Command 02, 04, 10, 12 receiving packet (MarkinBOX to PLC)

Receiving packet : ACK		ASCII example
n +0 (1 byte)	ACK	06h

Receiving example : 40h 02h 31h 31h 30h 32h 20h 20h 31h 06h 03h SS

@STX Packet no. Command no. Data length ACK ETX Check sum SS

*Need from the Stating code(@STX) to the ending code(ETX) only, if you selected no use check sum.

Receiving packet : NACK ASCII example		ASCII example
n +0 (1 byte)	NACK	15h

Receiving example : 40h 02h 31h 31h 30h 32h 20h 20h 33h 15h N..N 03h SS

@STX Packet no. Command no. Data length NACK ETX Check sum SS

*Need from the Stating code(@STX) to the ending code(ETX) only, if you selected no use check sum.

In case of NACK, the following N..N will be included after 15h.

*In response to general commands:

01 : Bad command, 02 : Abnormal data size, 03 : Error in etx position

4ssSS : Check sum error (ss: correct check sum; SS: received check sum)

*In response to start of marking:

32 : Alarming, 33 : In operation and cannot execute, 34 : No marking data

*In response to stop command:

35 : Not in operation, or halting

*In response to return to origin command:

36 : Returning to origin

*In response to move XY position command:

51 : Alarming, 52 : In operation, 54 : Abnormal motion speed parameter

*In response to file relations command:

81 : Abnormal file no., 82 : Abnormal field no., 83 : Abnormal text size

*In response to file marking command:

61 : No existing file, 62 : Abnormal file reading

*Others:

30 : Abnormal data format, 31 : Bad command number

3. Command 03: Execution command to MarkinBOX(PLC to MarkinBOX controller)

Execution command		ASCII example
n +0 (1 byte)	1: Start marking 2: Pause 3: Stop 4: Alarm reset 5: Return to origin	31h (when marking started)

Command example : 40h 02h 32h 32h 30h 33h 30h 30h 31h 31h 03h SS

@STX   Packet no.   Command no.03   Data length   Start marking   ETX   Check sum SS

*Need from the Stating code(@STX) to the ending code(ETX) only, if you selected no use check sum.

4. Command 05: Status request to MarkinBOX (PLC to MarkinBOX controller)

Status request		ASCII example
0 bytes	No data	None

Request example : 40h 02h 33h 33h 30h 35h 30h 30h 30h 03h SS

@STX   Packet no.   Command no.05   Data length   ETX   Check sum SS

*Need from the Stating code(@STX) to the ending code(ETX) only, if you selected no use check sum.

5. Command 06: Response to status request (MarkinBOX to PLC)

Receiving status request		ASCII example
nn +0,1 (2 bytes)	'99':Alarming ' 0':Standby ' 1':Marking ' 2':Halting ' 3':Returning to origin ' 5':Operating : Other	30h 31h (Marking)

Response example : 40h 02h 33h 33h 30h 36h 20h 20h 32h 20h 33h 03h SS

@STX   Packet no.   Command no.   Data length   Returning to origin   ETX   Check sum SS

*Need from the Stating code(@STX) to the ending code(ETX) only, if you selected no use check sum.

6. Command 07: Move XY position to MarkinBOX (PLC to MarkinBOX controller)

Move XY position		ASCII example
nn +0,1, (2 bytes)	Motion speed 01-10 (general setting 00)	30h 30h (general setting)
nn.n +2,3,4,5 (4 bytes)	X coordinate X mm	30h 35h 2Eh 30h (at 05.0mm)
nn,n +6,7,8,9 (4 bytes)	Y coordinate Y mm	31h 30h 2Eh 30h (at 10.0mm)

Command example : 40h 02h 34h 34h 30h 37h 30h 31h 30h 30h 30h 30h 35h 2Eh 30h 31h 30h 2Eh 30h

@STX   Packet no.   Command no.   Data length   Motion speed   X coordinate   Y coordinate

03h ETX

ETX   Check sum SS

*Need from the Stating code(@STX) to the ending code(ETX) only, if you selected no use check sum.

<Transmission example : it is no using check sum >

40h 02h 30h 31h 30h 31h 30h 37h 36h 30h 35h 30h 35h 30h 30h 30h 32h 30h 31h

@STX   Packet no.   Command 01   Data length 76   Force 5   Speed 5   No Serial   Home position   Number of fields 2   Field No.1

30h 30h 30h 33h 2Eh 30h 30h 36h 30h 30h 30h 30h 30h 30h 32h 2Eh 35h 30h 30h

Format 0   standard 0   Character height 3mm   Character width percentage 60%   Angle 0deg   Character pitch 2.5mm   X axis

2Eh 31h 30h 33h 2Eh 35h 30h 35h 41h 42h 43h 44h 45h 30h 32h 30h 30h 30h 33h 2Eh 30h

0.1mm   Y axis 3.5mm   Number of characters 5 bytes   Marking data ABCDE   Field No.2   Format 0   standard 0   Character height

3mm

30h 36h 30h 30h 30h 30h 30h 30h 32h 2Eh 35h 30h 30h 2Eh 31h 30h 37h 2Eh 30h

Character width percentage 60%   Angle 0deg   Character pitch 2.5mm   X axis 0.1mm   Y axis 7mm

30h 35h 30h 30h 30h 30h 31h 03h

Number of characters 5 bytes   Marking data 00001   ETX

*Need from the Stating code(@STX) to the ending code(ETX) only, if you selected no use check sum.

A-2-2. Simple Communication

Simple communication can be transferred only marking data using combination with file marking. There is two ways to operate marking.

【1】 Communication is only marking data and start marking through communication as well.
【2】 Communication is only marking data and selection a file and start marking is performed by D.I/O.
　　*It is also possible to mark with start button on marking machine after selecting the file on PC software.

【Above 1 and 2 common setup】
1. Create a text field in the PC software, and save the file as n (No.001 ~ 255). Please refer to the "5. File Marking Settings", due to save the file.
2. Communicate with the following protocol

Starting code (2 bytes)	Packet starts @stx fixed		40h 02h (fixed)
Packet no. (2 bytes)	Two characters showing synchronization between the transmission and receiving packets. The two characters arbitrarily controlled by the transmitter. The receiving packet will always contain the same number as the transmitting packet.		Example: 30h 30h
Command (2 bytes)	Commands are fixed 09. *Receiving packet is 10 from MarkinBOX.		30h 39h (fixed)
Data length (3 bytes)	Length of the data (number of bytes). Send the number of bytes (before ETX) of the next packet's data.		Example: 30h 33h 39h
Data	nnn (3 bytes)	File no. (001 ~ 255) Send the file No. saved at the above 1.	Example: 30h 30h 31h
	nn (2 bytes)	Field no. (01 ~ 21) Send the field No. want to change in the file	Example: 30h 31h
	nn (2 bytes)	Number of characters (01 ~ 50) Number of characters of text to be sent	Example: 30h 33h
	data (Max 50 bytes)	Marking text Maximum: 50 characters	Example : 31h 32h 33h
Ending code (1 byte)	etx fixed.		03h
Check sum (2 bytes)	Hexadecimal form in two characters expressing the lower 8-bit figure derived from the sum encompassing from "Packet no." to "Data" above. *@STX and ETX are not included. If you choose "no use checksum", do not need addition.		

<Transmission example : it is no using check sum >

40h 02h 30h 30h 30h 39h 30h 31h 30h 30h 30h 31h 30h 31h 30h 33h 31h 32h 33h 03h

@STX　Packet no.　Command 09　Data length 10　File no. 001　Field no. 01　Number of characters 3　Text 123　　ETX

【3-1.】 In case of the start marking through communication

Starting code (2 bytes)	Packet starts @stx fixed	40h 02h (fixed)
Packet no. (2 bytes)	Two characters showing synchronization between the transmission and receiving packets. The two characters arbitrarily controlled by the transmitter. The receiving packet will always contain the same number as the transmitting packet.	Example: 30h 30h
Command (2 bytes)	Commands are fixed 11. *Receiving packet is 12 from MarkinBOX.	31h 31h (fixed)
Data length (3 bytes)	Length of the data (number of bytes). 003 is fixed.	30h 30h 33h (fixed)
Execution command (3 bytes)	Send an executed file no. from 001 to 255. It is same as saved file no. the above 1.	Example: 30h 30h 31h
Ending code (1 byte)	etx fixed.	03h
Check sum (2 bytes)	Hexadecimal form in two characters expressing the lower 8-bit figure derived from the sum encompassing from "Packet no." to "Data" above. *@STX and ETX are not included. If you choose "no use checksum", do not need addition.	

<Transmission example : it is no using check sum >

40h 02h 30h 30h 31h 31h 30h 30h 33h 30h 30h 31h 03h

@STX　　Packet no.　Command 11　Data length 003　File no. 001　　ETX

【3-2.】 In case of the select the saved file by D.I/O.

How to connect the D.I/O, please refer to "A-1. D.I/O Diagram".

*It is also possible to select the file in the PC software.

Start marking by D.I/O.

*It is also possible to start marking from the switch button on the marking head. Please refer to the "4-2. Basic Parameter Settings".

A-2-3. Echo Back function

Communication MB2 and PLC via RS232C serial is selectable the echo back function, which means MB2 enable to respond the command back to PLC. When MB2 receives @stx command, MB2 sends the echo command back.

Enable to setup in the "PLC / IP settings" **"Menu" → "Advanced Settings" → "PLC / IP settings"**.
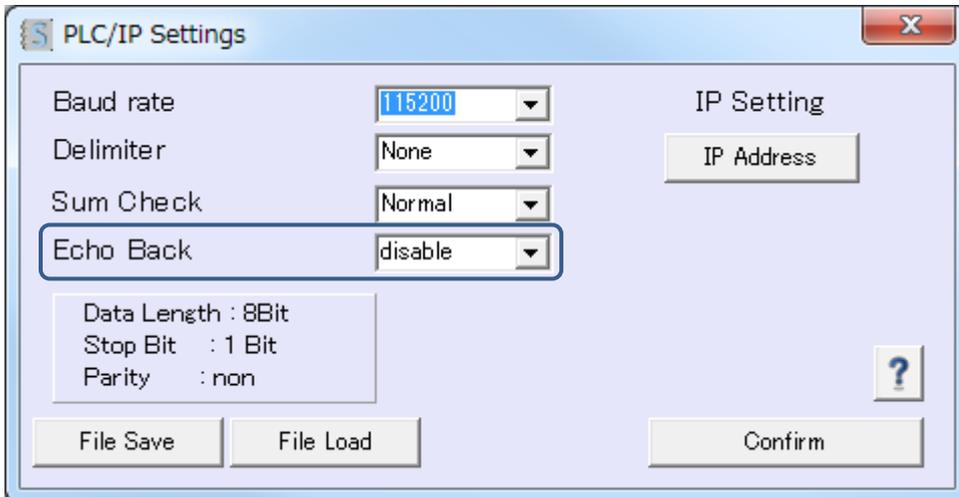

PLC (send)	MB2	PLC (receive)
Command 01		Command 01 and ACK/NACK
Command 03		Command 03 and ACK/NACK
Command 05	→	Command 05 and response status
Command 09		Command 09 and ACK/NACK
Command 11		Command 11 and ACK/NACK

A-3. Spare Parts No. and List

< 3315 series >

Complete set : 3315S-1
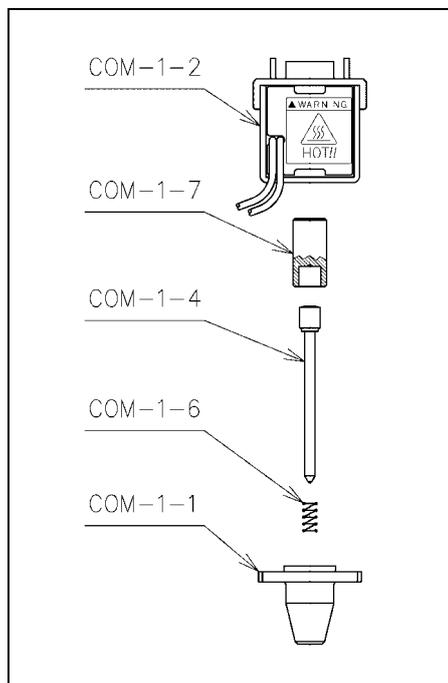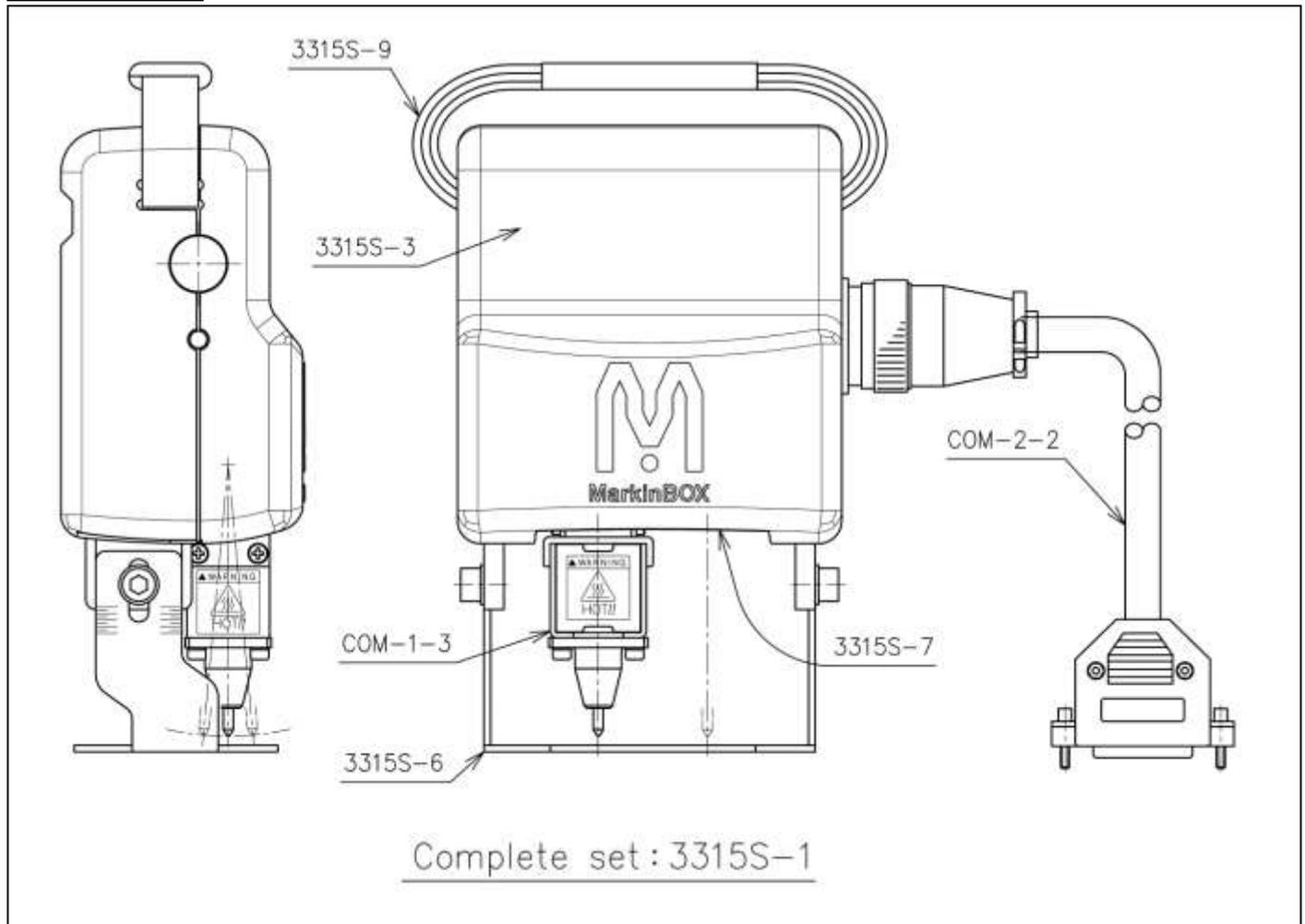
No.	Name	No.	Name
3315S-1	Marking Head	**COM-1-1**	**Pin Holder**
COM-2-2	Head Cable Assy	**COM-1-2**	**Solenoid Assy**
3315S-3	Head Cover	**COM-1-3**	**Solenoid Block**
3315S-6	Marking Guide Window	**COM-1-4**	**Stylus Pin**
3315S-7	Shutter Kit	**COM-1-6**	**Spring**
3315S-9	Strap	**COM-1-7**	**Hammer**

*The above **bold section** is consumption articles. Please change them when you got some quality problems.

<8020 series>

Complete set:8020S-1
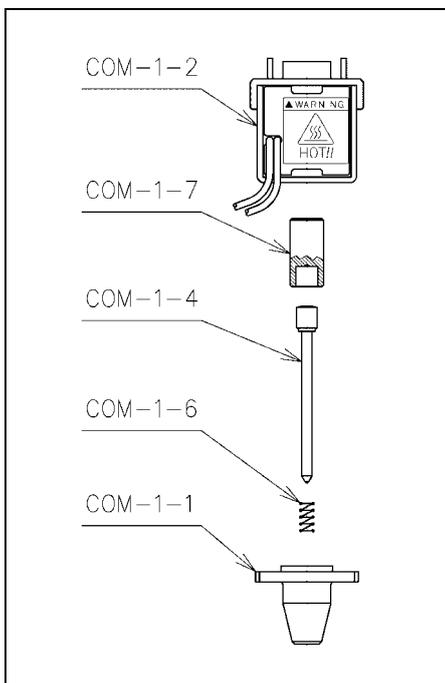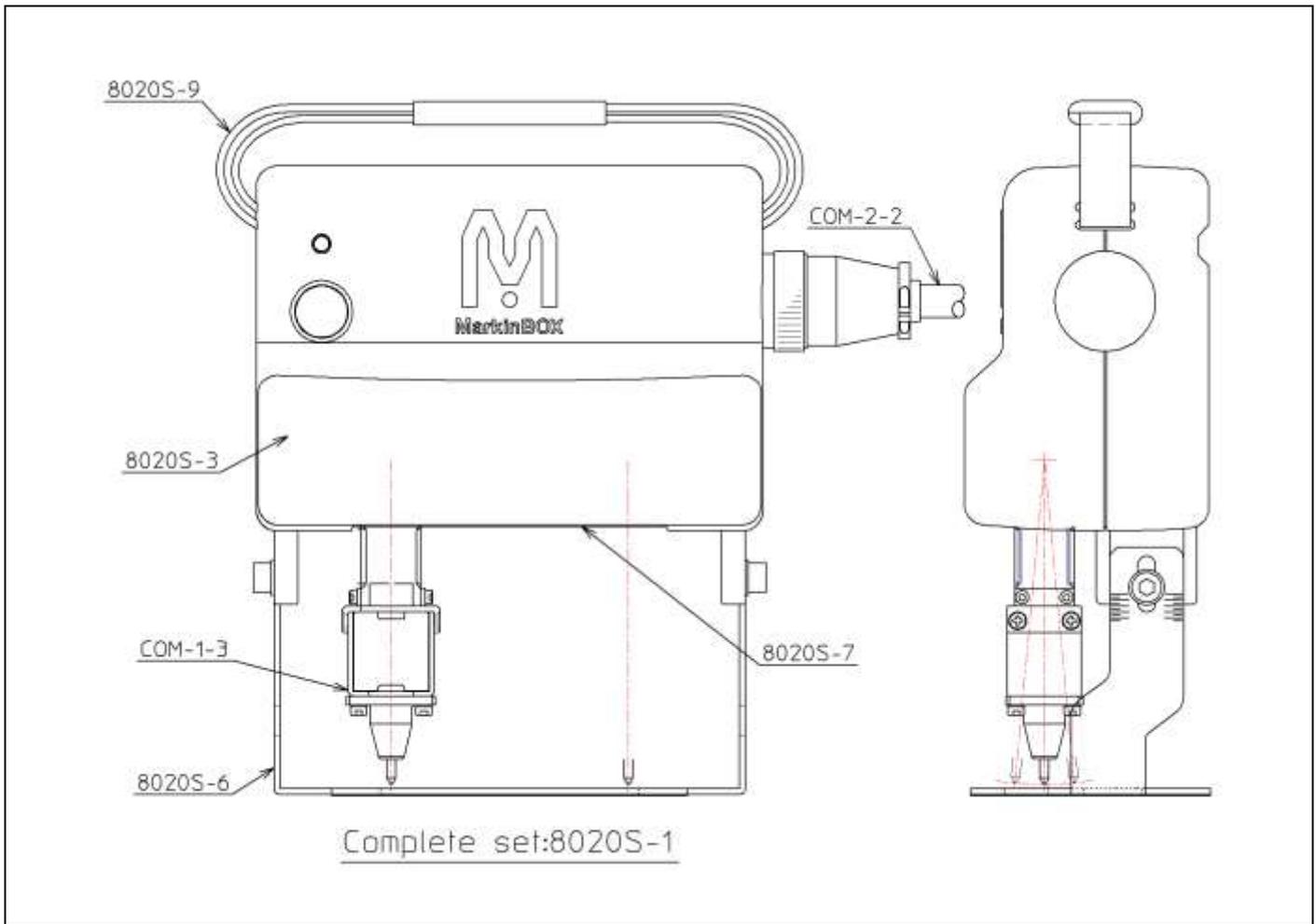
No.	Name	No.	Name
8020S-1	Marking Head	**COM-1-1**	**Pin Holder**
COM-2-2	Head Cable Assy	**COM-1-2**	**Solenoid Assy**
8020S-3	Head Cover	**COM-1-3**	**Solenoid Block**
8020S-6	Marking Guide Window	**COM-1-4**	**Stylus Pin**
8020S-7	Shutter Kit	**COM-1-6**	**Spring**
8020S-9	Strap	**COM-1-7**	**Hammer**

*The above **bold section** is consumption articles. Please change them when you got some quality problems.

< 1010 series> (proper use with original stand)

Complete set：1010
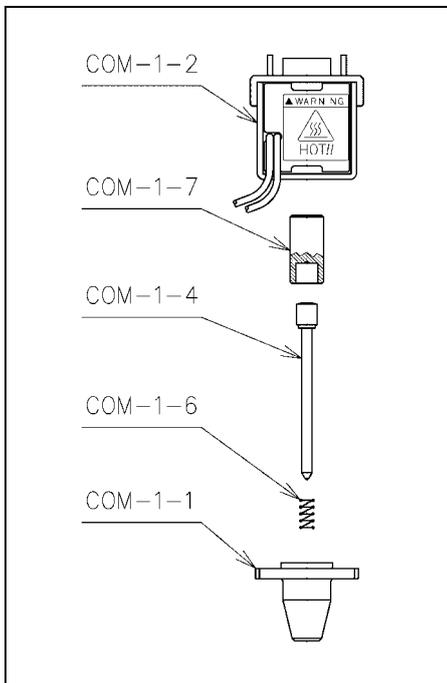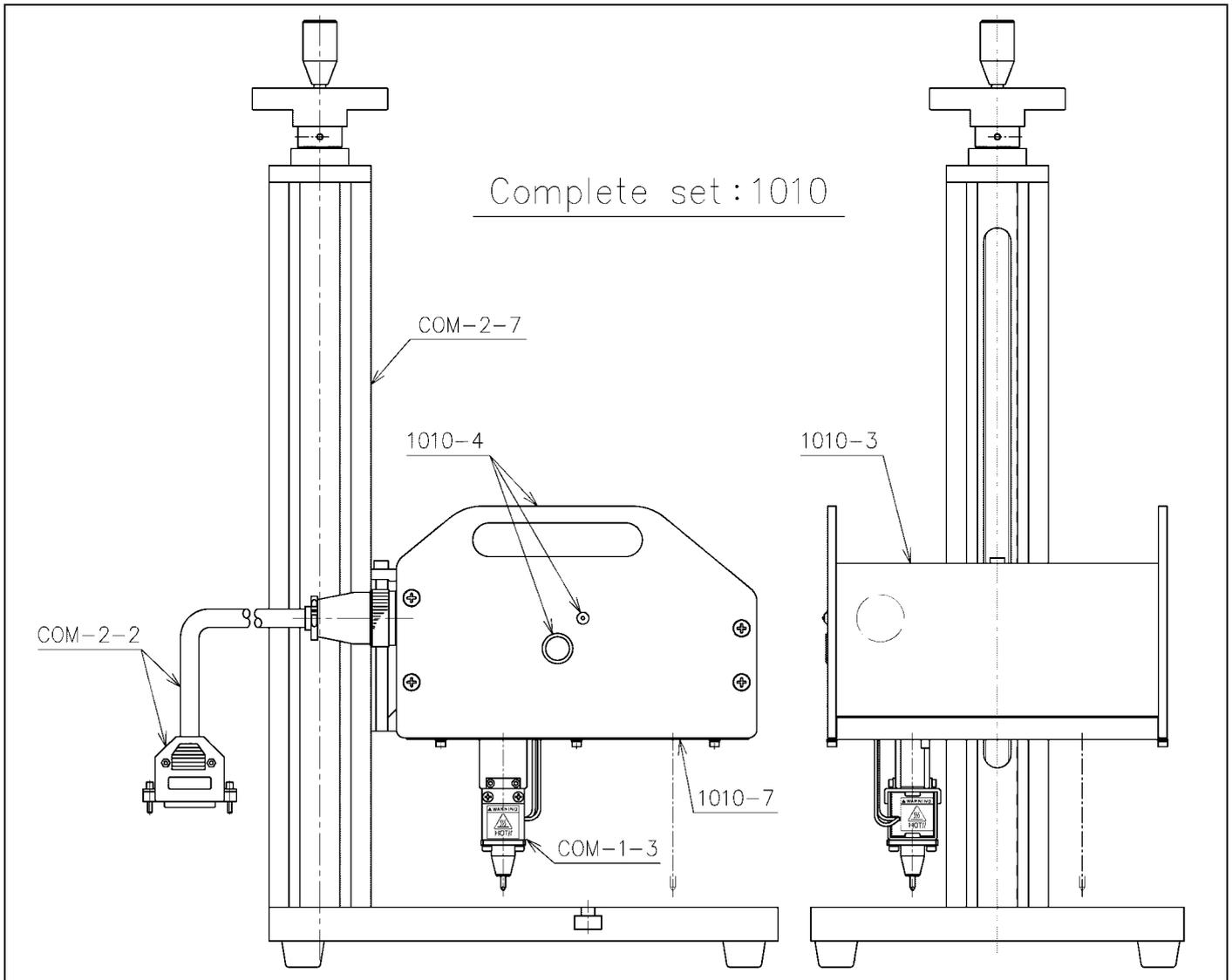
No.	Name	No.	Name
1010-1	Marking Head	**COM-1-1**	**Pin Holder**
COM-2-2	Head Cable Assy	**COM-1-2**	**Solenoid Assy**
1010-3	Head Cover	**COM-1-3**	**Solenoid Block**
1010-4	SW Plate Assy	**COM-1-4**	**Stylus Pin**
1010-7	Shutter Kit	**COM-1-6**	**Spring**
COM-2-7	Stand	**COM-1-7**	**Hammer**

*The above **bold section** is consumption articles. Please change them when you got some quality problems.
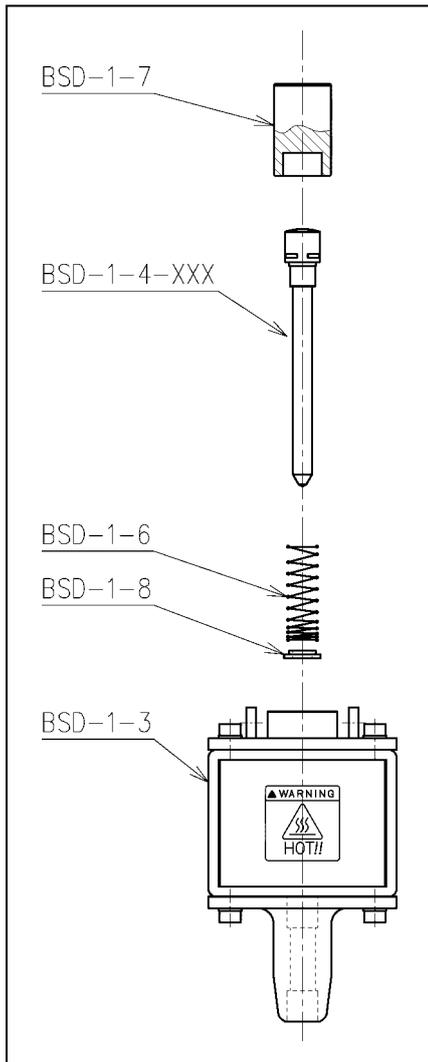
＜Big Solenoid＞

No.	Name
BSD-1-3	**BSD Solenoid Block**
BSD-1-4-XXX	**BSD Pin（XXX --- Angle）**
BSD-1-6	**BSD Spring**
BSD-1-7	**BSD Hammer**
BSD-1-8	**BSD Washer**

*The above **bold section** is consumption articles. Please change them when you got some quality problems.

13. Inquire about items inquiry

Please contact our distributer if you have inquiry for operation and malfunction.

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