



Fusion Splicer for Multimode and Singlemode, 3 Axis, 6 Motors



User Manual

DN-FS-6-2

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1. Notice before using

1.1. Important safety instructions

To avoid dangerous situations as far as possible, you must observe the following safety instructions:

CAUTION: Failure to observe these safety instructions may result in personal injury due to electrical and thermal hazards!

1.1.1. Intended use

- Only use the device at the approved locations and under the permitted ambient conditions (as described below) and only for the purpose described in the section “Intended use”.

1.1.2. Before putting the device into operation

CAUTION: Read these operating instructions carefully! It contains important information on the installation, ambient conditions and maintenance of the device.

Keep these operating instructions for future use and for handover in the event of a change of owner or operator. A PDF version of these operating instructions is available online under assmann.shop

- Check the packaging and the appliance immediately for transport damage. Do not operate a damaged appliance.
- Transporting the device by the mains cable can damage the mains cable or the strain relief and is therefore not permitted.

1.1.3. Installation, operation, maintenance

- The electrical connection conditions must comply with the specifications on the appliance rating plate.

The ambient temperatures specified in the technical data must be observed, even if the climatic conditions change (e.g. due to solar radiation).

Overheating of the device can damage the insulation used to insulate the mains voltage.

- The appliance and its cable may only be operated away from radiant heat and other heat sources.
- To avoid heat build-up, free ventilation on all sides must be ensured.
- Do not place any objects on the appliance.

- The device is not protected against water and may therefore only be operated and connected in dry rooms. It must not be exposed to splashing, dripping or condensation water or other sources of moisture.
- Comply with all applicable national safety regulations and standards.
- The device is ready for operation when it is connected to the mains or when the supplied lithium battery is charged and inserted in the battery compartment of the device.
- Excessive mechanical loads (e.g. falls, shocks, vibrations) can damage the insulation used to protect against the mains voltage.
- High overvoltages (lightning strikes, overvoltages in the power grid) can damage insulation that protects against the mains voltage.
- If there is no information on the intended use (e.g. place of use, ambient conditions) or if the operating instructions do not contain any corresponding information, you must contact the manufacturer of the device to ensure that the device can be used.
If you do not receive any information from the manufacturer, do not put the device into operation.
- Ensure that the product is set to the available mains voltage, that the correct fuse is installed and that all safety precautions have been taken.
- Do not use the appliance in the vicinity of flammable gases or vapors.

- Operating personnel must not remove the covers of the instruments. The replacement of components and internal settings may only be carried out by qualified service personnel.
- If malfunctions occur, refrain from further use of the appliance. (See section “Maintenance and repair”).
- Users must immediately disconnect the power cable from the power supply input or the socket (output) if they observe the following or if the splicer exhibits the following faults: smoke, unpleasant odor, noise or overheating. Liquid or foreign objects have entered the housing. The splicer is damaged or has fallen down.
If the splicer is left in a damaged condition, this may result in equipment failure, electric shock or fire and may lead to personal injury or death.
- Only use the power supply/battery charger intended for this splicer. Use of an unsuitable AC power source may cause smoke, electric shock or equipment damage and may result in personal injury, death or fire.
- Do not disassemble the splicer, the power supply unit or the battery and do not make any modifications. In particular, do not remove or bypass any electrical or mechanical devices (e.g. a fuse or safety switch) that were installed during the design and manufacture of this device. Modifications may cause damage that could result in personal injury, death, electric shock or fire.
- Never use the splicer in an environment where flammable liquids or vapors are present. There is a risk of a dangerous fire or explosion in such an environment due to the electrical arc of the splicer.

- Do not use compressed gas or compressed air to clean the splicer. These may contain flammable materials that could ignite during the electrical discharge.
- Do not touch the electrodes when the splicer is switched on and the device is supplied with power. The electrodes generate high voltage and high temperatures, which can cause severe electric shock or burns.

NOTE: The arc discharge stops when the draft shield is opened.

- Always wear safety goggles when preparing the fibers and during the splicing process. Fiber Optic splinters can be extremely dangerous if they come into contact with the eye or skin or are swallowed.
- Check the AC power source before use: The correct AC power source is AC 100-240V, 50-60Hz. The correct direct current source is DC 10-12V. The use of an unsuitable AC or DC power source may cause smoke, electric shock or damage to the appliance and result in personal injury, death or fire.
- AC generators usually generate an unusually high AC output voltage or irregular frequencies. Measure the AC output voltage with a voltage tester before connecting the mains cable. Such abnormally high voltages or frequencies from a generator can cause smoke, electric shock or equipment damage and result in personal injury, death or fire. Ensure that the generator is checked and serviced regularly.
- The power cable supplied must not be modified, misused, heated or pulled excessively. The use of a damaged cable

can cause smoke, electric shock or damage to the appliance and result in personal injury, death or fire.

- The Product uses a three-pole, earthed mains cable. The splicer **MUST** be earthed. Only use the three-pole power cable supplied. **NEVER** use a two-prong power cord, a two-prong extension cord or a two-prong plug.
- Connect the mains cable properly to the splicer (input) and to the socket (output). When plugging in the mains plug, make sure that there is no dust or dirt on the connections. Push the socket into the splicer (input) and the plug into the socket (output) until both plugs are fully inserted. If the plug is not fully inserted, this can cause smoke, electric shock or damage to the appliance and result in personal injury, death or fire.
- Do not short-circuit the connections of the power supply unit and the optional battery. Excessive electrical currents can lead to personal injury from vapors, electric shocks and damage to the device.
- Do not touch the splicer, the mains cable or the mains plug with wet hands. This can lead to an electrical shock. Do not operate the splicer near hot objects, in environments with high temperatures, in dusty/humid environments or if there is condensation on the splicer. This can lead to electric shock, malfunction of the splicer or poor splicing performance.
- If you are using a lithium-ion battery, follow the instructions below. Failure to do so may result in an explosion or personal injury.

Do not use any methods other than those specified to charge the battery.

Do not dispose of the battery in an incinerator or fire.

Do not charge or discharge the battery near an open fire or in direct sunlight.

Do not shake or shake the battery excessively.

If liquid leaks from the battery, handle the battery with care so that the liquid does not come into contact with your skin or eyes. If you come into contact with the liquid, wash your skin or eyes thoroughly immediately and seek medical advice. Dispose of the battery and call the Service Center to replace it.

If the charging process is not completed within four hours or the charging LED is constantly lit, stop charging immediately and call the Service Center for repair.

- Do not store the splicer in a place with extremely high temperatures and humidity. This may result in device failure.
- Do not touch the splice guard or the heating compartment for shrinking the splice guard during heating or for a short time after heating has finished. Their surfaces are very hot and touching them can cause skin burns.
- Do not place the splicer in an unstable or unbalanced position. The splicer may slip or become unbalanced, causing the device to fall. Possible personal injury or damage to appliances may result.
- The splicer is set and aligned with extreme precision. Ensure that the device is not subjected to strong impacts or shocks.

This may result in device failure. Use the transport case supplied for transportation and storage.

The transport case protects the splicer from damage, moisture, shocks and impacts during storage and transportation.

- Operating personnel must not remove the covers of the instruments. The replacement of components and internal settings may only be carried out by qualified service personnel.

1.1.4. Maintenance

- Switch off the splicer and disconnect the power cable before replacing the electrodes.

Follow the instructions below for handling the electrodes.

Only use the specified electrodes.

Insert the new electrodes in the correct position.

Replace the electrodes in pairs.

Failure to follow the above instructions may result in abnormal arc discharge. This can lead to damage to the device or a deterioration in splicing performance.

- Do not use chemicals other than pure alcohol (at least 99%) to clean the objective lens, V-groove, mirror, LCD monitor, etc. of the splicer. Otherwise, blurring, discoloration, damage or deterioration of the splicing performance may occur.

- The splicer does not need to be oiled or lubricated. Oil or grease can impair the splicing performance and damage the splicer.
- The power indicator merely shows whether the DC voltage supplying the components of the device has been disconnected from the mains. If the power indicators (of the power supply unit or the device) do not light up, this does not mean that the device is completely disconnected from the mains.
- It is essential to observe: EN 60728 - Part 1 Safety requirements: No service work during thunderstorms.

1.1.5. Repair

- Repairs may only be carried out by the manufacturer. Incorrectly carried out repairs can result in considerable danger to the user.
- In the event of malfunctions, the appliance must be disconnected from the power supply and authorized specialist personnel must be called in. If necessary, the appliance must be returned to the manufacturer.

1.2. Note

1. This model machine only applies to quartz glass fiber splicing, not to any other things.
2. Don't use or store the machine in high temperature or humidity environment (otherwise it may damage the equipment or reduce performance of the machine).
3. While using the machine in dust environment, try to avoid dust as far as possible.
4. When moving the machine from low temperature to high temperature, there should be any heating process to eliminate condensation.
5. Please use high-purity anhydrous alcohol (purity>99%) to clean magnifying lens, reflector and fiber v-groove surface.
6. The splicing machine must be handled gently to avoid strong vibration or impact, and with carrying case for transportation or storage.
7. Maintain the whole machine once a year.

2. Start to comprehend splicer

2.1. Overview of splicer



Figure 2.1

2.2. Keyboard

2.2.1. Keyboard appearance

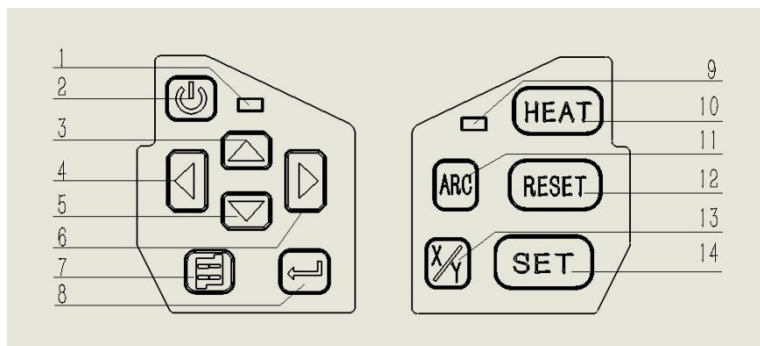









Figure 2.2


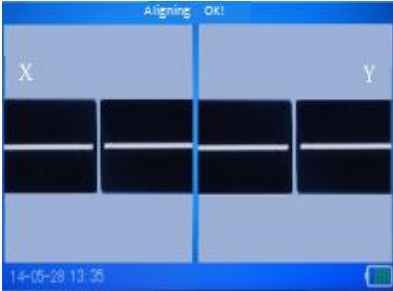




Table 2.1

1. Power Light	2. Power	3. Up
4. Left	5. Down	6. Right
7. Menu / Exit	8. Enter	9. Heating light
10. Heat	11. Arc	12. Reset
13. Image switch	14. Auto splice	

Table 2.2

	<ul style="list-style-type: none"> • While Power On, press this key to shut down. • While Power OFF, press this key to Power On.
	<ul style="list-style-type: none"> • Under standby interface, press this key to discharge weak arc. • In menu, press this key to enter the next submenu. • If permitted, press this key to run. • If permitted, press this key to switch between the left and right sides of CMOS Sensor, Motors and so on.
	<ul style="list-style-type: none"> • Under standby interface, press this key to enter main menu. • Under the main menu interface, press this key to return the upper menu.
	<ul style="list-style-type: none"> • Under standby interface, press this key to increase the LCD backlight. • In CMOS sensor step, press this key to increase the CMOS sensor backlight. • In motor adjustment, press this key to drive up the fiber. • If permitted, press this key to move up the cursor.

	<ul style="list-style-type: none"> • Under standby interface, press this key to gap the fiber.  <ul style="list-style-type: none"> • Under the main menu, press this key to select the left icon. • In motor adjustment, press this key to drive the corresponding motor move to left.
	<ul style="list-style-type: none"> • Under standby interface, press this key to decrease the LCD backlight. • In setup of CMOS sensor, press this key to decrease the CMOS sensor backlight. • In function of motor test, press this key to move down the corresponding motor. • If permitted, press this key to move down the cursor.

	<ul style="list-style-type: none"> • Under standby interface, press this key to align the fiber.  <ul style="list-style-type: none"> • Under the main menu, press this key to select the right icon. • In motor adjustment, press this key to drive the corresponding motor move to right.
	<ul style="list-style-type: none"> • Under standby interface, press this key to fuse.
	<ul style="list-style-type: none"> • In Power On state, press this key to reset motor position.
	<ul style="list-style-type: none"> • Under standby interface, press this key to switch video mode.
	<ul style="list-style-type: none"> • Under standby interface, press this key to run auto splice.

2.3. Technical parameters

Table 2.3

Applicable fiber	SM, MM, DS, NZDS, EDFA, others
Cladding diameter	80 -150um
Coating diameter	100 - 1000um
Typical loss	SM: \leq 0.02dB; MM: \leq 0.01dB; DS: \leq 0.04dB; NZDS: \leq 0.04dB
Return loss	> 60dB
Cutting length	5-16mm (Coating layer Diameter: <250 μ m) 16mm (Coating layer Diameter: 250~1000 μ m)
Program	40 groups
Operation mode	Auto mode and Manual mode
Auto to heat	Supported
Splice time	6 seconds
Heating time	18 seconds (heat-shrinking tube width is 40mm or 60mm)
Magnification	125 times/double show, 250 times/single show
Observation mode	High sensitivity CMOS sensor, Color LCD of 5.0 inch

Fusion Records	4000 groups of fusion records
Estimate loss	Supported
Tension	>2.2N
Operation Interface	GUI
Battery capacity	5200mAh; More than 250 times fusion and heating; Show remaining real-time
Power supply	Adapter: AC100-240V (50/60HZ); Output: DC11~13.5V
Electrodes times	More than 4000 times
Interface	12V DC power input, USB2.0
Operation Enviroment	Altitude: 0-5000m; Humidity: 0-95%; Temp: -20°C- +50°C; Air speed: <=15m/s
Volume/weight	156mm (L) x 141mm (W) x 156mm (H) / 2.45kg (Battery Included)

3. A complete splice

A full fiber splice procedure including: the fiber end face preparation, fiber splicing, tension test, heating and cooling of shrink tube. This chapter will introduce details of the specific process of the fiber splice.

3.1. Power on



Figure 3.1

Press and hold the power button until the power indicator light, then, LCD also enter the self-test screen.

3.2. Preparation of fiber end face

Prepare two optical fibers, as shown in Figure 3.2, which an optical fiber is set into the heat shrink tube.

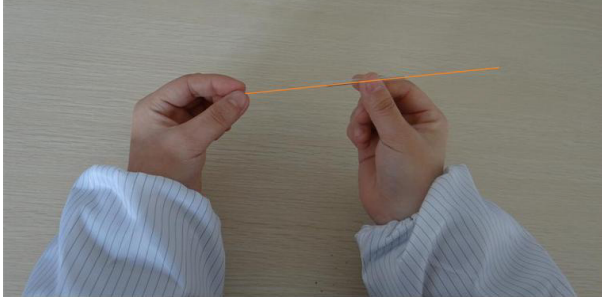


Figure 3.2

As shown in Figure 3.3, clenched fiber cleaver, place the fiber into the tooth of clamp by the left hand, reserve bare fiber 30 to 40 mm stripped fiber coating. Use a cotton ball dipped in anhydrous alcohol (purity>99%) wipe optical fiber coating layer that residual debris, Figure 3.4 shows.



Figure 3.3

Put the cleaned fiber into the cutter positioned groove, the edge alignment of the fiber coating cutter ruler “13” scale outside (the scale is greater than 13, shown in Figure 3.4). Close small platen, requiring that the bare fiber straight on the left and right rubber on the chopping block. Together close the large plate, and push the cutter blade slider to the other end to cut off the fiber.

After Cutting, open the large platen to take away cutting broken fiber into the waste fiber storage box. (Broken fiber has a great harm to human health, so, please be sure to collect and chop broken fiber). Open the small platen, and carefully take out the cut end face fiber. Don't make the fiber cross section touching any other objects, in order to avoid damage or contamination end face.



Figure 3.4

3.3. Fiber clamping

Open the windproof cover and the two side fiber platens, then, put the prepared fiber into V-groove through the locating slot. Make sure that the fiber end face should be located between V-groove edge and two electrodes. Shown in Figure 3.5



Figure 3.5

Please operate carefully and don't let the fiber end face touch any other object. Then close the large platen to fix optical fiber, which should be placed horizontally in the V-groove, without upturned phenomenon. If clamping failed, you can lift fiber carefully and repeat the operation above until the fiber clamping is qualified.

Similarly, prepare and clamp the other optical fiber.

Then, close the windproof and continue to observe the amplified fiber from the display. If the fiber end face is obviously uneven, tilt or damaged, you need to remove the fiber to cut again.

3.4. Optical fiber fusion

After clamping, the machine is in ready state, as shown below. If in "Automatic" splice mode, auto splice begins as soon as the windproof closed. If in "Manual" splice mode, user must press the "SET" button to run the splice routine.

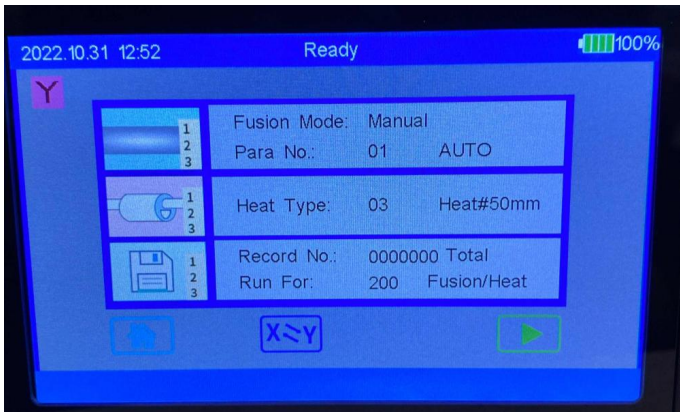


Figure 3.6

First, select fusion parameter group according to the optical fiber type. Press "MENU" to enter the main menu, and then select the "parameters" icon and press the "confirm" key to enter the menu. We need to select fusion parameter group matched with splice fiber type. It is suggested to choose SM8.

Press "SET" to start the splice procedure. The machine drives the motor, which will promote both sides of fibers to the middle of the screen, judging the fiber end face whether meet the requirements. If qualified, turn to the next process, otherwise show a tip of bad end face and stop.

After judgment, alignment motor will adjust fiber position to make both sides of fibers align in three-dimensional. At last,

the electrode discharge arc to fuse fiber. When fusion completed, the machine will give the loss estimates, and have a tension test if needed.

3.5. Heat-shrinkable

Optical fiber fusion point is really fragile and easily broken, so, you need protection by using heat shrinkable. Open the windproof cover, large platen and heater cover. Gently remove fiber, and don't bend fiber greatly to avoid the fusion point broken.

Move heat shrinkable tubing to the fusion point, which must be in the middle. Then, place heat shrinkable tubing in the middle of the heating furnace. The heater begins heating as soon as heating furnace closed. About 34 seconds later, heating shrinking has completed. The figure below is the heat shrink tubing before thermal shrinkage and after thermal shrinkage.

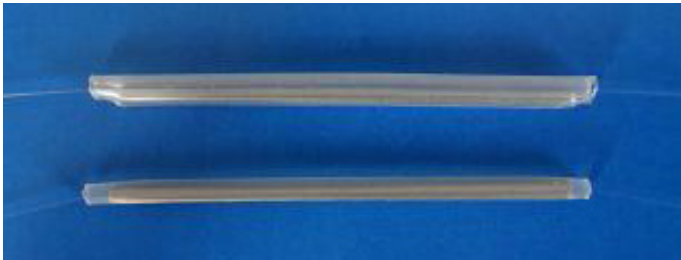


Figure 3.7

3.6. Cooling

The heat shrinkable tubing after heating is in high temperature and need cooling. Hang the cooling tray on the carrying handle. So, after heating, pull out the fiber from the heating furnace to the cooling tray by hands.

About 1 minute later, it cools to the ordinary temperature.


4. Menu instruction


The machine adopts METRO-style menu, whose interface is simple, beautiful and convenience for operation. The operation interface has 8 icons, and each icon corresponds to a different functional menu.




Figure 4.1

For the main menu interface :



In standby state, press the key  to enter interface of main menu.



In the main menu, press the key  to exit the main menu to standby interface.

In the main menu, press the direction keys, and the corresponding direction on the next icon is selected.


Press the key  to enter the submenu.

In submenu:


Press the key  or  to select the up down cursor.

Press the key  or  to modify the current data.

Press the key  to enter the next sub-menu.

Press the key  to enter the upper menu.

4.1. Workbench

In the main menu interface, touch the workbench or press the key  to enter the standby interface. The standby interface is shown in Figure 4.2.

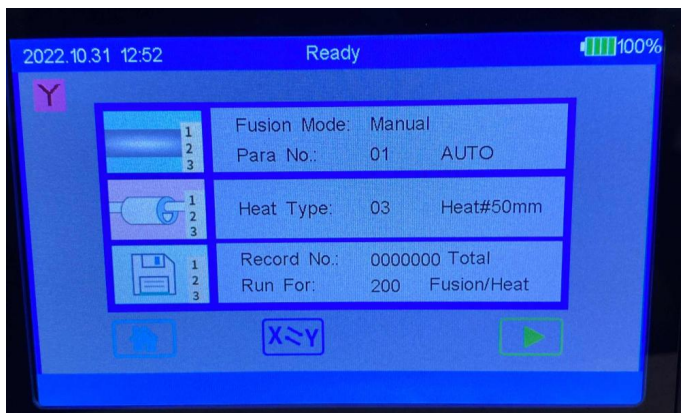





Figure 4.2

Ready	The status bar of the fusion splicer, showing the status of fusion splicer and splicing process information
🔋 100%	The battery bar of the fusion splicer, showing the battery level.
Fusion Mode:	Display the fusion mode of the fusion splicer.
Para No.:	Showing the current splice parameters.
Heat Type:	Showing the temperature of the heater.
Record No.	Showing total splicing numbers
Run For:	Showing how many splicing and heating times the remaining battery power could support

	Click to start fiber splicing
	Click to the main menu
	Click to switch X/Y view

4.2. Shortcut

Shortcut menu is for quick enter to some often use menus.
As shown in below figure 4.3.

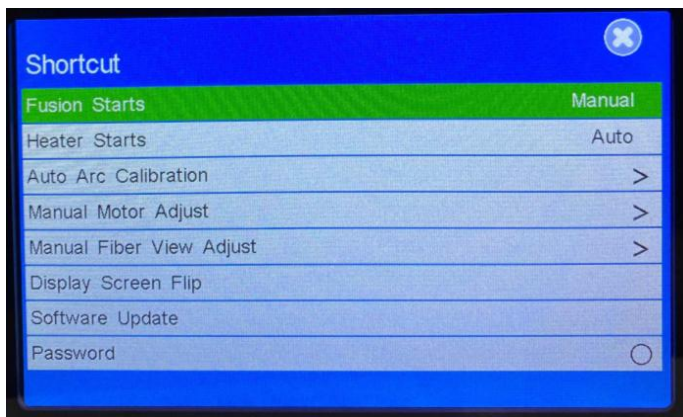


Figure 4.3

4.2.1. Fusion Starts

Users can press ◀ or ▶ or touch this menu to switch the fusion mode between Auto or Manual.

Heating Starts

Users can press ◀ or ▶ or touch this menu to switch the heating mode between Auto or Manual.

4.2.2. Auto Arc Calibration

See details in 4.6.1

4.2.3. Manual Motor Adjust

See details in 4.4.5.

4.2.4. Manual Fiber View Adjust

This function is used to move the fiber image positions up/down/left/right. Press the key ↵ to enter the video interface. Press the key ↵ to switch the X and Y fibers.

The fibers will drive up /down/left/right by pressing the key ▲, ▼, ◀, ▶. Shown as below Figure 4.4.

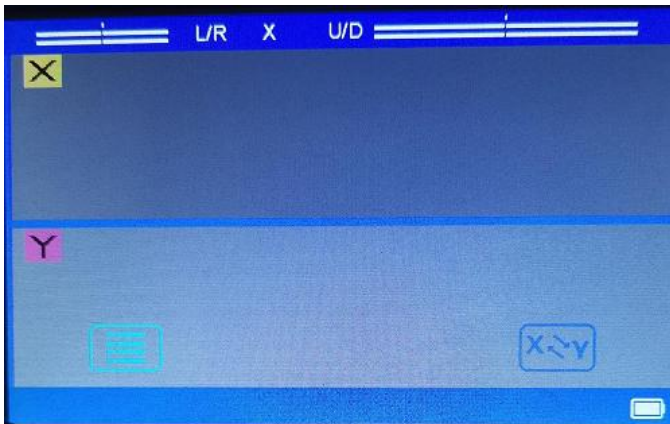





Figure 4.4

4.2.5. Display Screen Flip

This function is used to flip screen for the opposite direction operation. It is very user friendly. Press  or touch this menu to flip the screen, press  or touch this menu again to flip the display screen back.

4.2.6. Software upgrade

This function is used to upgrade software in the machine. After the U disk with upgrade file inserted into USB port, choose this option and press the key  to upgrade.

4.3. Fusion Mode

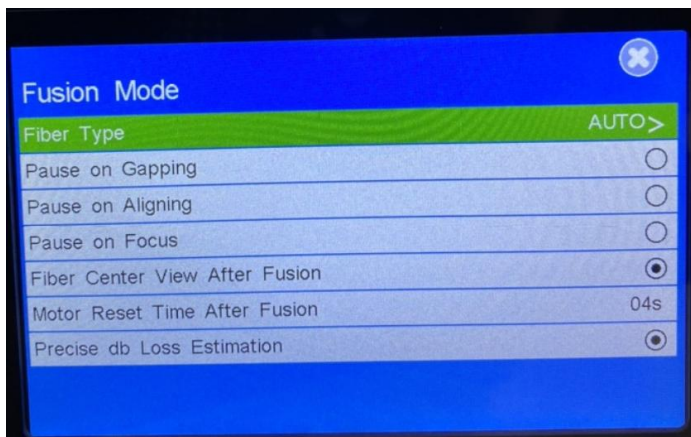


Figure 4.5

Fusion Mode menu is used to select and set the fiber splicing parameters and settings, shown as above Figure 4.5.

4.3.1. Fiber Type

Fibe Type Menu is formed by different fiber type splicing parameters program sub-menus, as shown in Figure 4.6.

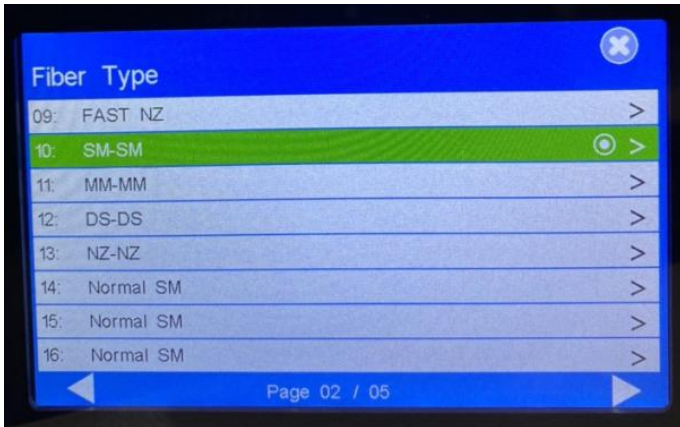


Figure 4.6

Each sub-menu is a group of splicing parameters, and the menu is composed by the part of the number, file name, pattern and state. Number from 1 to 40, a total of 40 groups of fiber type parameters can be used. Mode Auto, FAST and Normal three kinds, of which the Auto class of parameters derived experimental optimization for the factory and cannot be modified and recommended for new users. The data of FAST and Normal parameters can be modified. FAST type reduces the fiber focusing process to make the fiber splicing speed faster.

The “type” represent which the fiber is fused by the parameter. Abbreviations are explained in the following.

SM: Single mode fiber

MM: Multi mode fiber

DS: Dispersion shifted fiber

NZDS: Non-zero dispersion-shifted fiber

The state ON/OFF says the group is currently used or not.

Press the key ▲ or ▼ to change the current splicing parameter group. Press the key ↵ to enter the para group, as shown in Figure 4.7.

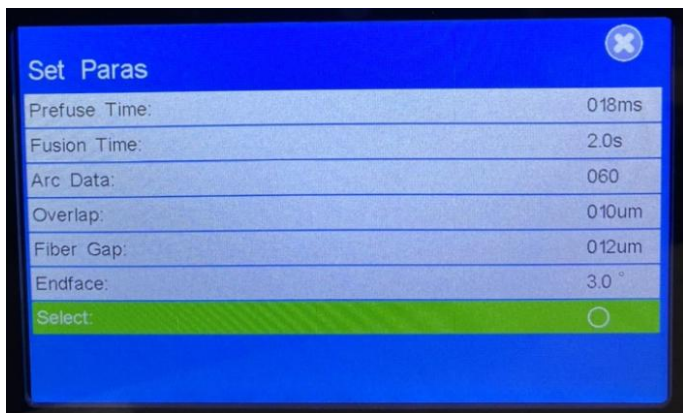


Figure 4.7

The parameter consists of the following parameters:

Pre Fuse time

Prefuse time in total fusion process, a short time about 30ms in SM 16ms in MM. It is not recommended for the new user to modify.

Fusion time

Fuse time in total fusion process, a long time 2.0 seconds in SM, 1.2 seconds in MM. It is not recommended for the new user to modify.

Arc Data

Discharge current means that the discharge arc current intensity. The high value of the current corresponds to a greater arc, resulting in a higher temperature. The fiber is ablated more seriously. Press the key ◀ or ▶ to increase or decrease the parameter value.

Overlap

The pushing forward distance in fusion process. Press the key ◀ or ▶ to add or sub the value of overlap.


Fiber Gap

The distance of fiber gap before fusing. Press the key ◀ or ▶ to change it.



Endface

The angle between the fiber end and vertical direction is the end face. In the process of judging the fiber end face, the fiber end face should not more than the Max end face.



Select

It shows the using state of the current viewing parameter group. You can press  key to select this option or touch this menu directly.



4.3.2. Pause on Gapping

It means that during fiber splicing, after the optical fiber is forwarded to meet the gap condition, the program suspends operation and waits for further operation by the user. To continue splicing, press “SET” button or  at the bottom of the screen. To interrupt splicing, press the “RESET” button. Press the key  or touch this option, the parameter value will be switched between “ON” and “OFF”.


4.3.3. Pause on Aligning

It means fiber suspend the running at the end of the subsequent process of aligning. To continue splicing, press “SET” button or  at the bottom of the screen. Press the key  or touch this option, the parameter value will be switched between “ON” and “OFF”.





4.3.4. Pause on Focusing

It means fiber suspend the running at the end of the subsequent process of focusing. To continue splicing, press “SET” button or  at the bottom of the screen. Press the key  or touch this option, the parameter value will be switched between “ON” and “OFF”.

4.3.5. Fiber Center View After Fusion

When it is “ON”, the fiber is aligned and the fiber is centered during aligning process; when “OFF”, the fiber is not aligned, and it may not be centered. Press the key  or touch this option, the parameter value will be switched between “ON” and “OFF”.

4.3.6. Motor Reset Time After Fusion

After the optical fiber is spliced, open the windshield and wait for a period of time for the motors back to initial position. The waiting time is “Motor Reset Time After Fusion”. After selecting this menu, press key  or ; or touch key  or  icon on the screen to change the parameter values.

4.3.7. Precise db Loss Estimation

Turn on this function, fusion splicer will enlarge the fiber core image to estimate the fusion loss, which is more accurate, this is usually used for high loss requirement conditions.

4.4. Settings

The “Settings” menu is used to set the data including the Battery Save Mode, Tension Test, Language, Date and Time etc., as shown in below Figure 4.8.

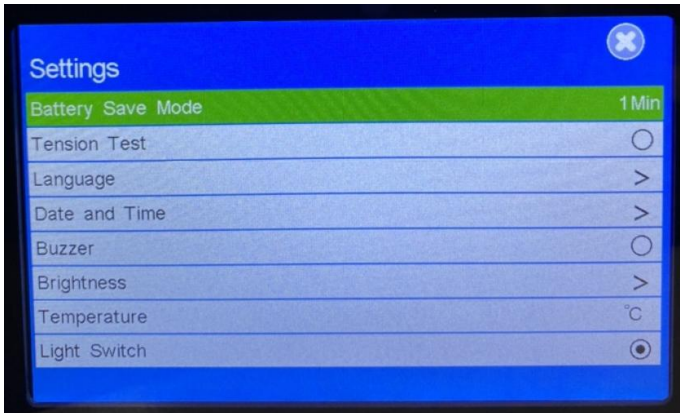


Figure 4.8

4.4.1. Battery Save Mode

When the option is turned on, if there is no operation within 10 minutes, the machine will automatically turn off to save battery power.

4.4.2. Tension Test

Open the option, splice completed, the machine would impose 2 Newton's pulling on the fiber to test the quality of splicing. If the fiber broken, it means the fusion failed. Press the key \leftarrow to switch the tension state between “ON” and „OFF“.

4.4.3. Language

Language shows the display language current software used. If there is more than one language available, users can change the language via this menu, shown as below Figure 4.9.

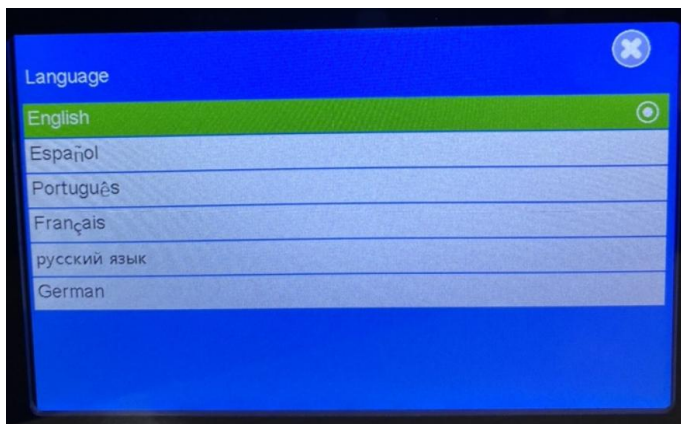


Figure 4.9

4.4.4. Date and Time

Press the key \leftarrow to enter the interface of Date and Time as shown in figure 4.10. Press the key \blacktriangleleft or \blacktriangleright to move the selection cursor, and then press the key \blacktriangleup or \blacktriangledown to modify the selection value.

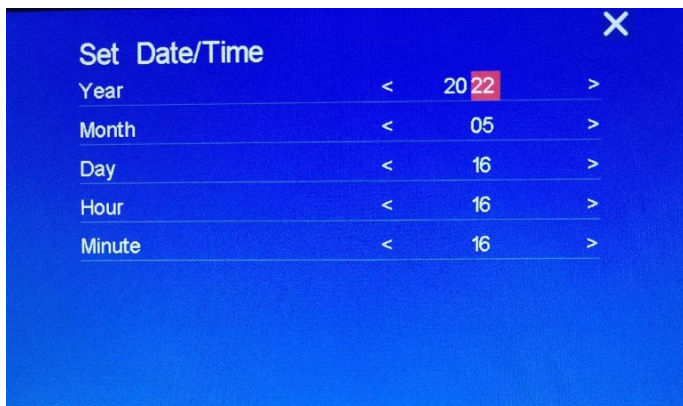


Figure 4.10

4.4.5. Buzzer

When this option is selected, when pressing the button or touching the screen, there will be a beep sound. When it is off, there will be no sound in such an operation.


4.4.6. Brightness

Press the key \leftarrow to enter the interface of camera brightness, as shown below Figure 4.11. Press or Touch the key \blacktriangle or \blacktriangledown to modify the gain of CMOS camera resulting in the change of camera brightness. Press the key \leftarrow to switch the CMOS camera sensor between X and Y.



Figure 4.11

4.4.7. Temperature

It is used to switch the temperature unit °C and °F. Press  or touch this menu to switch.

4.4.8. Light Switch

It is used to turn on/off the white working LED light. When users flip the display screen and splice from the backside of the splicer, it needs to switch off the white working LED light to avoid the light direct into eyes.

4.5. Maintenance

The Maintenance menu consists of Quick Optimization, Auto Camera Focus Adjust, Auto Push Motor Test, Auto LED Calibration etc., as shown in Figure 4.12.

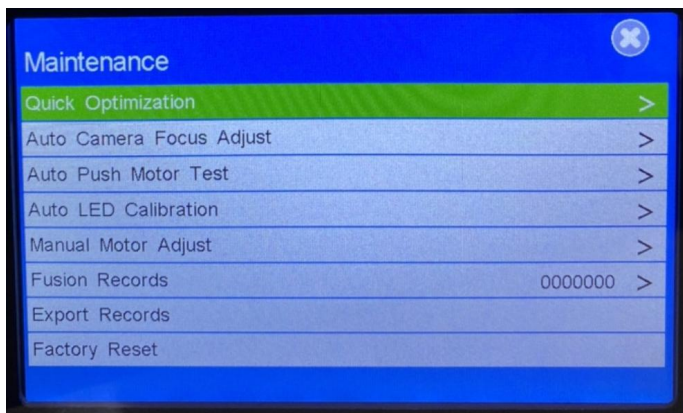


Figure 4.12

4.5.1. Quick Optimization

It is used to do quick checking and optimization automatically for the fusion splicer. Load fiber and press \leftarrow key to start, shown in below Figure 4.13.

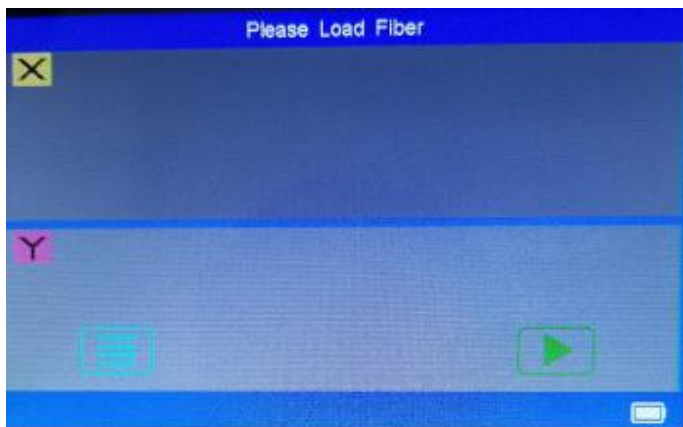


Figure 4.13

4.5.2. Auto Camera Focus Adjust

When the fiber cutting is not good, the V groove not clean, the fiber core image will become blurred, it is because the focus is deviated. You can press "focus reset" to make the fiber image focus well again. It is a feature of real core to core alignment fusion splicer. Press ← key to start, shown in below Figure 4.14.

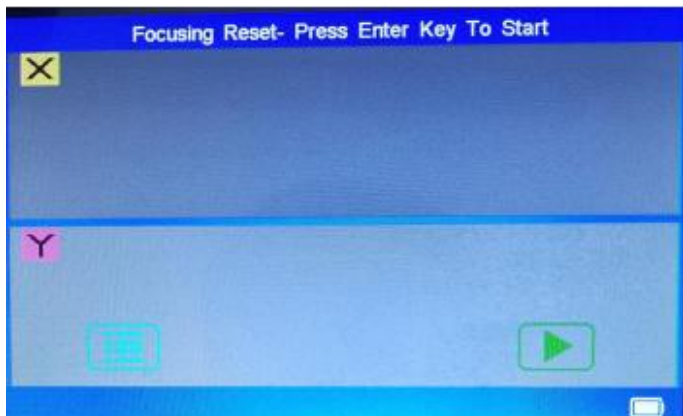


Figure 4.14

4.5.3. Auto Push Motor Test

This function imitates the distance of the push motor moving forward in the fusion process. Press the key \leftarrow to start, shown in below Figure 4.15.

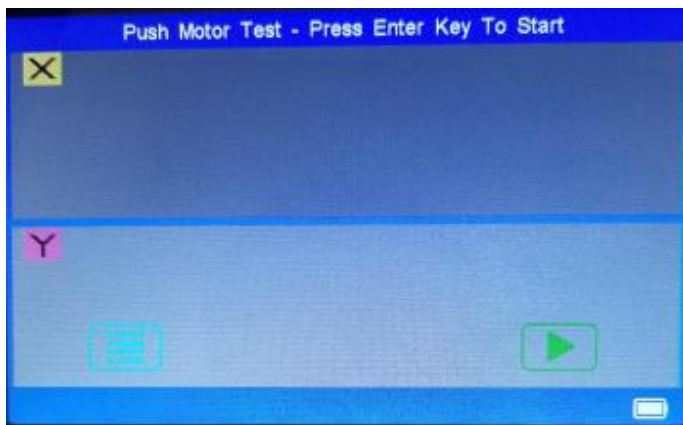


Figure 4.15

4.5.4. Auto LED Calibration

Press \leftarrow key to the interface, press \leftarrow key or touch the Start button on display to start the LED brightness calibration. It will adjust the X/Y view brightness automatically. Shown as below Figure 4.16.

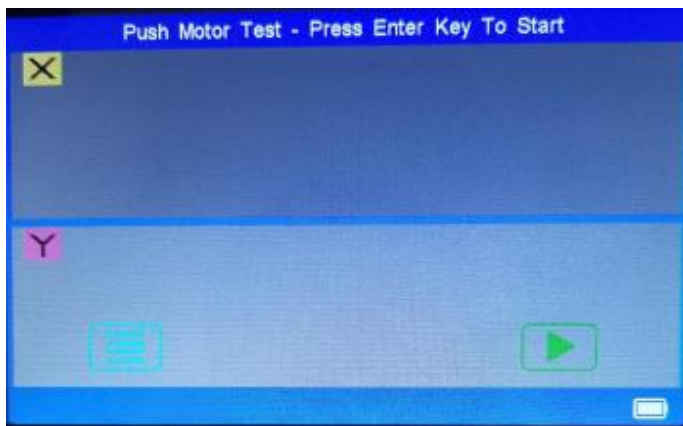


Figure 4.16

4.5.5. Manual Motor adjust

Motor adjust is used to check the motor performance and change the motor position.



Figure 4.17

Press the key \leftarrow to enter the video interface. Press the key \leftarrow to switch the Left, Right, ZX and ZY motors. Press \blacktriangle , \blacktriangledown , \blacktriangleleft , \blacktriangleright to move the motors UP/DOWN/BACK/FORWARD/FOCUSING to adjust the fiber position and images. Shown in Figure 4.17 and Figure 4.18.



Figure 4.18

4.5.6. Fusion Records



The screenshot shows a blue menu titled "Fusion Records" with a close button (X) in the top right corner. The menu contains a list of ten records. The first record is highlighted with a white border. At the bottom of the menu, there are navigation arrows (left and right) and the text "Page 00001 / 00004".

ID	Mode	Date	Loss
0000027	SM-SM	2022-03-15	0.01dB
0000026	AUTO	2000-01-01	0.01dB
0000025	AUTO	2000-01-01	0.01dB
0000024	AUTO	2000-01-01	0.01dB
0000023	AUTO	2000-01-01	0.01dB
0000022	AUTO	2000-01-01	0.01dB
0000021	AUTO	2000-01-01	0.01dB
0000020	SM-SM	2000-01-01	0.01dB

Figure 4.19

This option stores working parameters, fiber end face, the environment and date in each splicing. The machine can store 10000 groups of fusion records. The key \leftarrow can be pressed to enter the page of fusion record, and the page displays ten groups of fusion records, sequence from top to bottom by the latest fusion time as shown above. Press the key \blacktriangle or \blacktriangledown to the contiguous page. Press the key \leftarrow to enter the page of fusion records.



Figure 4.20

4.5.7. Export Records

The option is used to export the fusion records memories in the machine. After the U disk is inserted into the USB port, choose this option and press the key \leftarrow to confirm fusion records export. The program begins to test USB port and then find the records. If there's no record, program will prompt error.

4.5.8. Factory Reset

This function could make all parameters back to factory setting.

4.6. ARC

The menu consists of Auto Arc calibration, Manual Arc Calibration, Electrodes Stabilization, Current Arc Count, Total Arc Count and Replace Electrodes, as shown in Figure 4.21.

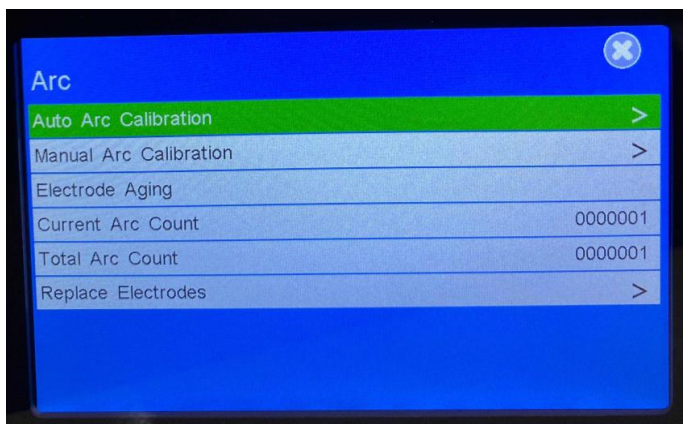



Figure 4.21

4.6.1. Auto Arc Calibration

Automatic Arc Calibration can automatically change the fusion parameters of Arc data until the test results meet the requirements on the basis of test results.

The test interface is shown in Figure 4.22. Load fibers and press  key to start. It will discharge several times to adjust the Arc data until Arc data is proper for fusion, it says Calibration OK, shown in Figure 4.23.

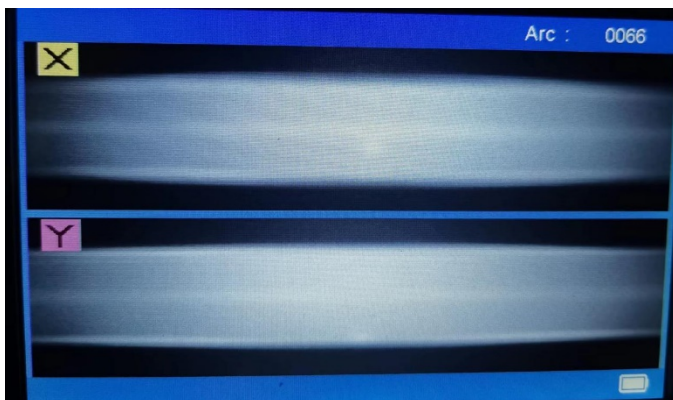


Figure 4.22

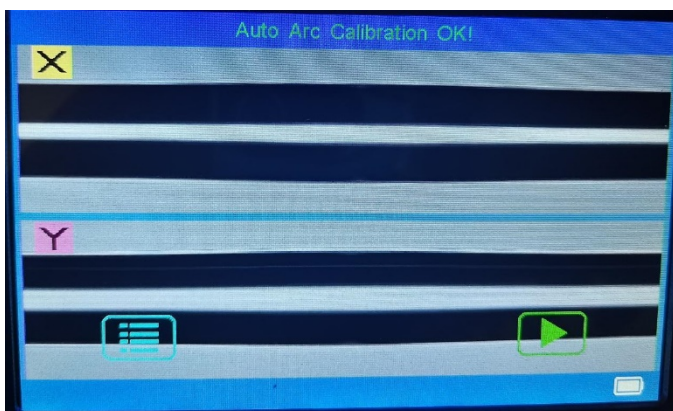


Figure 4.23

4.6.2. Manual Arc Calibration

Cut and clamp fiber according to splice procedure, and then press the key \leftarrow . The calibration program starts to run and test results are given. According to the test results, manually set the splicing parameters of Arc data, and repeat the above steps until the test results meet the requirements.

Parameter modification requirements: the default value is between 8-12, every 5 to modify 1 Arc data value. When the calibration result is larger than 12, we should reduce Arc data value. Or users can choose Auto Arc Calibration directly. Shown in below Figure 4.24.

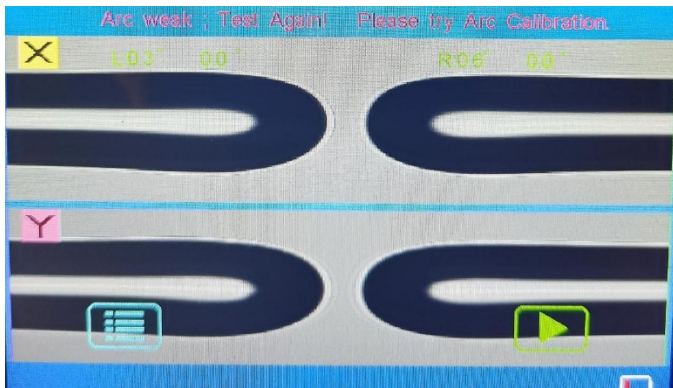


Figure 4.24

4.6.3. Electrodes Stabilization

New electrode discharge instability and the need for the discharge of a certain number of times to stabilize the arc which called electrode stabilization.

When electrode replaced, enter this menu and then press the key \leftarrow to start stabilizing the electrodes, as shown in Figure 4.25. Don't open windproof cover in the process.

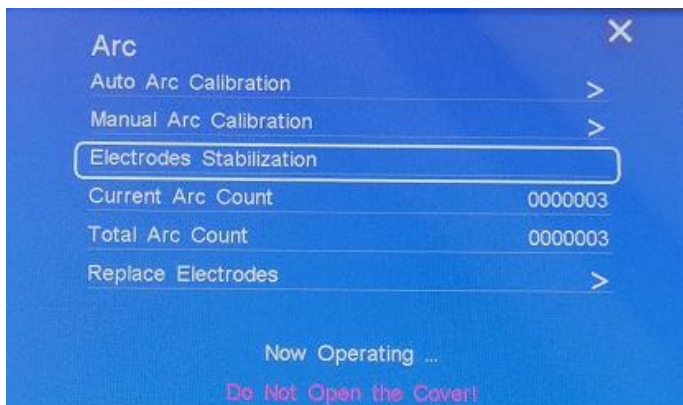


Figure 4.25


4.6.4. Current Arc Count

This option shows the Arc discharge times of current electrodes.

4.6.5. Total Arc Count

This option shows the total Arc discharge times since the fusion splicer starts working.

4.6.6. Replace Electrodes

When replacing electrodes, press  key to start, machine will power off automatically, replace the electrodes, restart the machine, shown as below Figure 4.26. Current Arc Count will be cleared to 0000000.

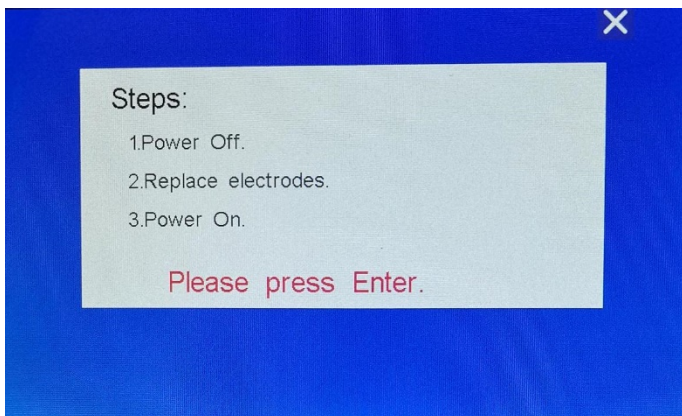


Figure 4.26

4.7. Heater

The Heater menu is used to set Heat Mode, Heat Time, Heat temperature etc., as shown in Figure 4.27.

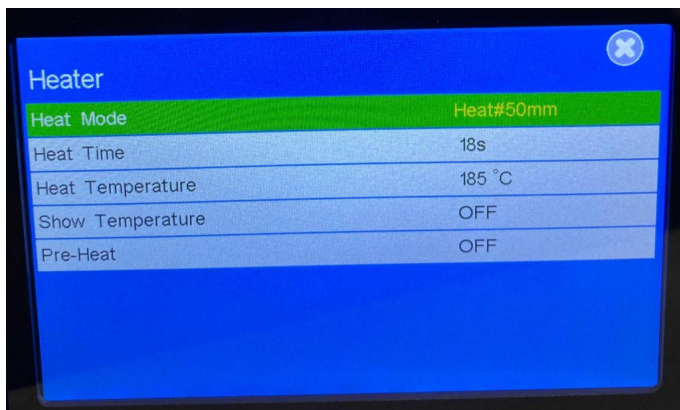


Figure 4.27

4.7.1. Heat Mode

User can choose different heat mode according to different shrinkable sleeves, it consists of Heat#50mm, Heat#60mm etc., press key ◀ or ▶ touch this menu to change the heat mode.

4.7.2. Heat Time

Heat time can be set by users according to specific heat shrinkable sleeve. Select this option "Heat Time" and press the key ◀ or ▶ to change the time.

4.7.3. Heat Temperature

Heat temperature can be set by users according to specific heat shrinkable sleeve. Select this option “Heat Temperature” and press the key ◀ or ▶ to change the time.

4.7.4. Show Temperature

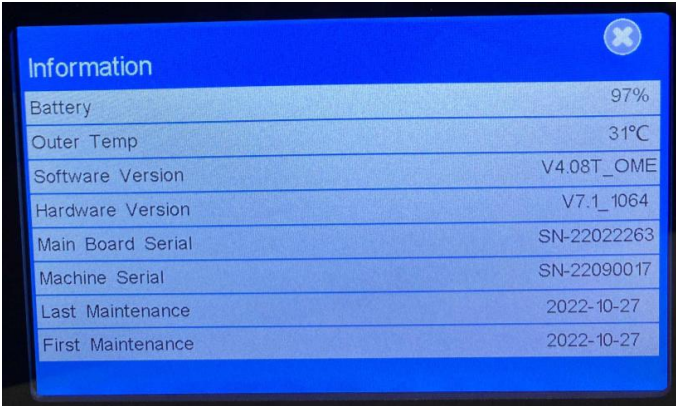
Users can also turn on or off the Show Temp function, if it is on, users can see the real-time temperature on display screen when heating.

4.7.5. Pre-Heat

Turn on this option, fusion splicer will start heating in a low temperature in advance before formal heating, this will increase the formal heating speed.

4.8. Information

In Info. menu, users can inquiry the basic information of the fusion splicer, including Battery capacity, Outer temperature, Software version, Machine Serial, Last maintenance date etc., as shown in Figure 4.28 below.



Information	
Battery	97%
Outer Temp	31°C
Software Version	V4.08T_OME
Hardware Version	V7.1_1064
Main Board Serial	SN-22022263
Machine Serial	SN-22090017
Last Maintenance	2022-10-27
First Maintenance	2022-10-27

Figure 4.27

5. Routine maintenance

5.1. Cleaning

5.1.1. Cleaning V groove

V-groove is a V slot on the ceramic substrate of narrow width, easily to accumulate dust which will make the fiber move instability and cause a bad fusion, therefore, the V groove should be cleaned regularly.

The following is the way of cleaning the V groove:

1. Place the fiber with good enface into the V groove to remove the pollution, shown in figure 5.1.

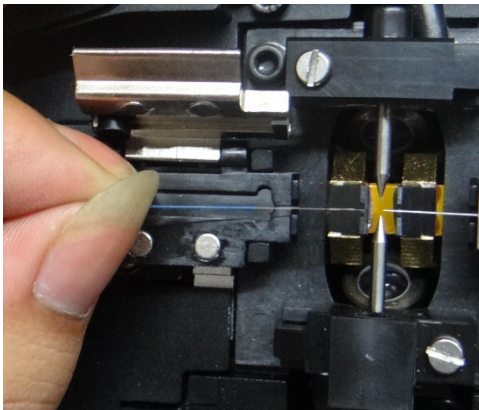


Figure 5.1

2. Use a cotton swab soaked with alcohol to clean the surface and bottom of the V groove. At last, the alcohol should be the natural air-dry or wiped dry by the dry cotton swab. Shown in figure 5.2.

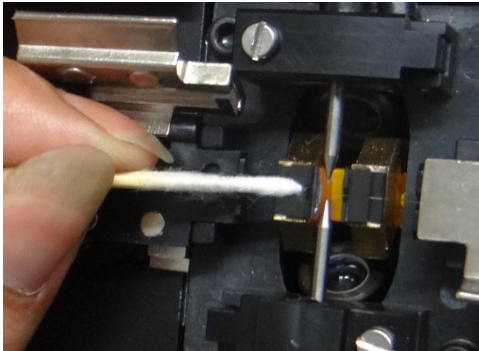


Figure 5.2

5.1.2. Cleaning fiber presser foot

The dust accumulated on the fiber press foot will cause pressure instability and affect the quality of fusion. So, it should be wiped off from the fiber pressure foot regularly.

Open the windproof cover, and then use the cotton dipped in alcohol to clean the surface of the presser foot. When cleaning, don't repeat back and forth with cotton, but to wipe the foot in one direction. Besides, users need to spin the cotton swabs, keeping the unused cotton facing the presser foot, waiting for the alcohol volatile.

5.1.3. Cleaning objective lens

Microscope is the core component of the machine optical system. So its surface must be kept clean, and users should regularly clean. The microscope is cleaned by the swab which is dipped in a little alcohol, with a spiral movement from the center to the edge of the lens and the rotation around the swab until to spin out the edge of the lens.

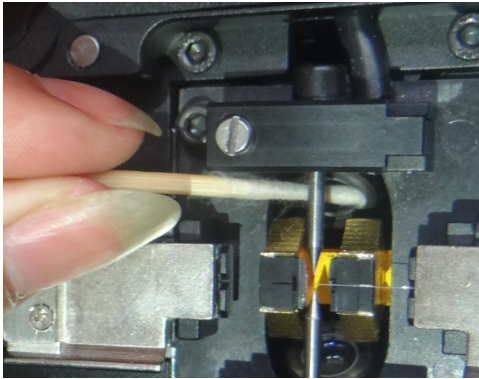


Figure 5.3

5.2. Replacing electrode

Arc produces by high temperature, melting the fiber, which will produce silicon oxide vapour and some deposited on the electrodes, causing the arc instability. Therefore, users are recommended to replace electrodes when discharge reached 3000 times.

Please replace the electrodes according to the following steps:

1. Shut down the power.
2. Loosen setscrews of electrodes cover and remove the electrodes cover, as shown in Figure 5.4
3. Take out the electrode from the electrode holder. (Electrode is fixed on the electrode holder, Figure 5.5).

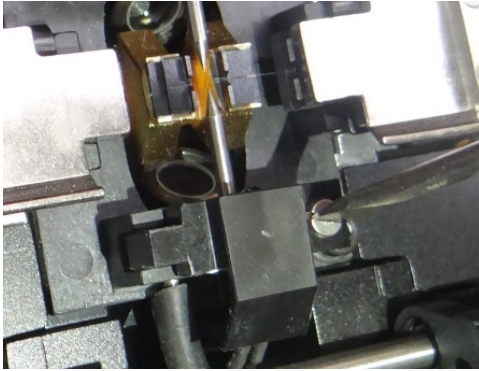


Figure 5.4

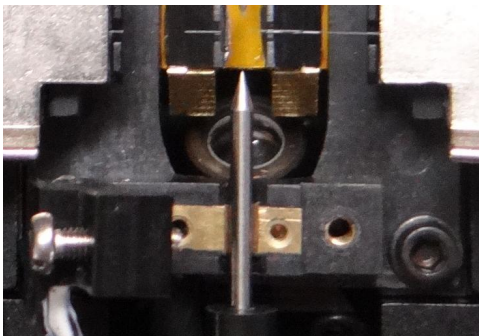


Figure 5.5

With tissue paper dipped in alcohol to clean the new electrodes, then, install the electrodes into the original electrodes seat position.

4. Close the electrodes cover and tighten the screws.
5. Close the windproof cover and power on the machine.
6. Take an electrode aging.
7. Run 3 times fiber fusion if current fusion parameter is Auto mode otherwise run Arc Test or Arc Calibrate if current fusion parameter is normal or calibrate

Note: The replacement of the electrodes should be gentle, so as not to damage the machine or stabbed himself.




5.3. Electrode aging

The electrodes arc begins unstably when the external environment such as the temperature and pressure changed greatly especially moving the machine from low altitude to high altitude. When happened, users should take an electrode aging to stabilize the electrodes arc. The machine runs 5 times of huge electrodes arc when the user selects the electrodes aging and executes it.

Note: Please according prompts to operate, do not open the cover while electrodes aging

5.4. Software upgrade

The user should insert the USB disk with an upgrade file into USB interface before software upgrade. When the software upgrade menu is selected and pressed, the machine will automatically complete the upgrading. After upgrading, the user should restart the machine.

1. Copy the upgrade document named “boot.dat” to the U-Disk, whose capacity must be more than 2GB.
2. Insert U-Disk into the USB interface of the machine.
3. Power on the machine. Press the menu button “”, entering the main menu.
4. Select the option “Function”, and press button “”.
5. Select the option “Software upgrade” in the interface of “Function”, and press the button “”, upgrade beginning.
6. After upgraded, pull out U-Disk, and restart machine.

6. Common fault and solution

Table 6.1

Phenomenon	Reason	Soultion
Tip of “Please check fiber!”	<ol style="list-style-type: none">1. The fiber is broken.2. No fiber is loaded.3. The fiber is far away from the Electrodes more than 2mm	Making the fiber image into the screen after loading the fiber.
Tip of “Please reload fiber”	The fiber is not completely loaded into the V groove.	Press the Reset key and reload the fiber in correct position.
Electrodes do not discharge	The electrodes are of dirty or damaged; Or the high-voltage board is fault.	Clean or replace the electrodes.
Tip of “Please check L(R) end face”	The end face of fiber is bad, or the fiber is polluted, or the image is unclear.	Recut fiber or clean the V groove or increase the max endface value of fusion para.

Tip of “Resetting push motors”	The motor exceeds the range of operation reset to the original Position.	Reload the fiber in correct position when resetting completed.
Tip of “Please close cover”	The cover is opened.	Operate when cover closed.
Tip of “X(Y) Image Light Error”	Display lamp does not light or some other reasons.	Check the mirror, lens or the image light.
Tip of “(L,R)Fiber On Error position!”	The fiber is not completely loaded into the V groove or fiber is dirty.	Reload fiber or recut fiber.
Tip of “Please Gap Again!”	The gap of fiber is un-fittable.	Take a gap process first.

Note: If the above-mentioned problems still exist after handling, please contact technical support.

7. Appendix A

Warranty terms and conditions

If the machine fault occurs on the date of delivery in a year, it will get a free repair. But if the following occurs, it is not in the warranty scope:

- ★ Failure or damage caused by natural disasters.
- ★ Failure or damage caused by abnormal voltage power supply.
- ★ Failure or damage caused by wrong operation.
- ★ Failure or damage caused by the operation not according to the user's manual.
- ★ Loss unit (such as electrodes).

Before sending the machine, please contact with the manufacturer or agent.

Required information of repair

(Please contain the following information in machine)

- <1> Your full name, your company, address, telephone number, fax number and e-mail address
- <2> Type of machine and the serial number.
- <3> The problems encountered.

When and under what conditions the problem happened.

Now how the condition of the machine.

Information of screen display and the error tips etc.

Hereby ASSMANN Electronic GmbH declares that the Declaration of Conformity is part of the shipping content. If the Declaration of Conformity is missing, you can request it by post under the below mentioned manufacturer address.

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