OPTICAL FIBER FUSION SPLICER

USER'S MANUAL

2014.09

Optical Fiber Fusion Splicer

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FOREWORD

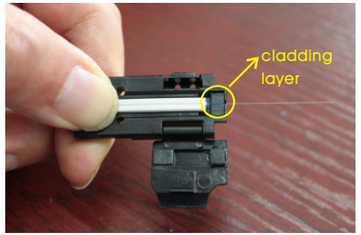
Thank you for choosing our product, its performance price ratio is the highest in the industry which reaches high and accurate quality. For your convenience, please read this manual carefully before use. We aim to try our best to meet your needs as our responsibility, ensure to provide you with high-quality equipment, and bring you with best after-sales-service. Our aim is "best quality, best service" to provide satisfactory products and services is our commitment to customers.

This manual describes the purpose, performance characteristics, use and precautions of the product. To help you become familiar with and master the instrument's operating methods and points as quickly as possible. Please read this manual carefully and correctly guide the operator in accordance with the manual.

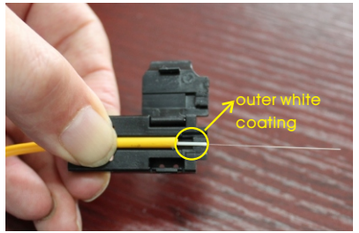
⚠ 1. This device complies with Part 18 of the FCC Rules.
2. Information on the following matters shall be provided to the user in the Instruction manual:
(a) The interference potential of the device or system;
(b) Maintenance of the system;
(c) Simple measures that can be taken by the user to correct interference;
(d) Manufacturers of RF lighting devices must provide an advisory statement, either on the product packaging or with other user documentation, similar to the following: This product may cause interference to radio equipment and should not be installed near maritime safety communications equipment or other critical navigation or communication equipment operating is between 0.43 kHz and 30 kHz. Variations of this language are permitted provided all the points of the statement are addressed.

FAST OPERATION GUIDE

BE SURE TO CAREFULLY READ THIS GUIDE BEFORE OPERATION.



Please put the rubble wire into clamp "ZS55". Please put the non-stripped cladding part into the front side of V-groove of clamp. The non-stripped cladding part can not exceed the end face of the clamp.



Please put the jumper wire into clamp "ZS57". Please put the white plastic protective layer part into the V-groove of clamp, please do not exceed the end face of clamp.

FAST OPERATION GUIDE

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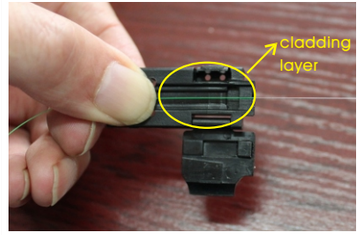
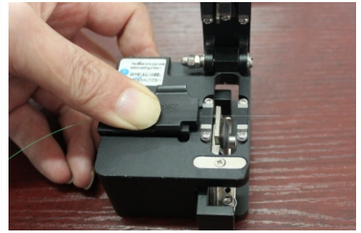


Please put the bare fiber into clamp "ZS55". Please put the non-stripped cladding part into the front side of V-groove of clamp. The non-stripped cladding part can not exceed the end face of the clamp.



When you cleave the fiber, please must put the fiber clamp which already load with fiber into the cleaver groove, the front side of clamp must press against the front side of platen on the cleaver. The blade on cleaver is perpendicular to the fiber.

FAST OPERATION GUIDE

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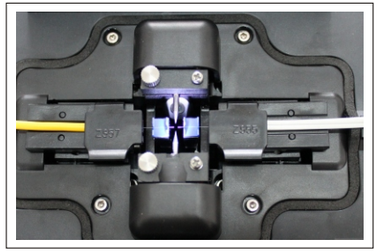
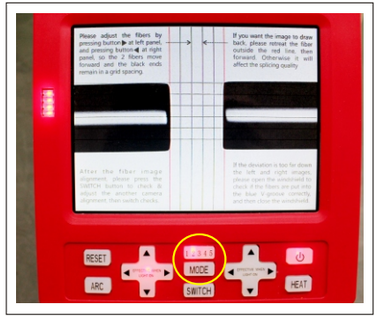


Please open the windshield of splicer, put the fiber clamp into the platform of splicer (there are 2 pillars positioned on the platform on each side, two holes on clamp corresponding to the 2 pillars), then the fiber will be right in the V-groove center.



Please press MODE button to select the arc discharge level, it depends on the external environment to select the level accordingly, 1 is for the weakest and 4 is for the strongest. 2 is for most parts of the country to adapt. Mode 5 is only for multi-mode fiber. It can also be connected to the computer to modify the parameters of each stall after downloading the software.

FAST OPERATION GUIDE

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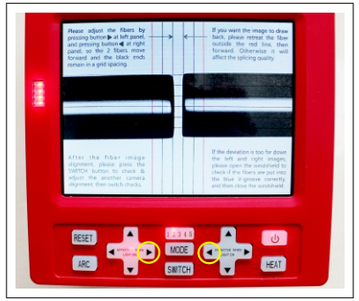

Please adjust the fibers by pressing button ▶ at left side, and pressing button ◀ at right side, so the 2 fibers move forward and the black ends remain in a grid spacing. If you need to move back the fibers, please retreat the fiber to outside of the red vertical line, then adjust the fibers again.

Fiber aligning: when the light at left panel is on, it indicates the left fiber is adjustable. Please press UP and DOWN button to adjust the left fiber, so it is aligned with the right side of the fiber at the same horizontal line.

FAST OPERATION GUIDE

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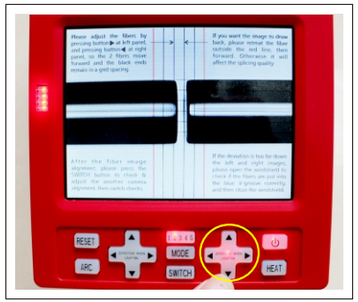
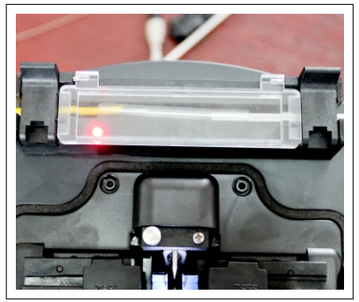


Fiber aligning: please press SWITCH button, then the light at right panel is on, it indicates the right fiber is adjustable. Please press UP and DOWN button to adjust the right fiber, so it is aligned with the left side of the fiber at the same horizontal line. When it finished, please press the SWITCH button several times to confirm the fibers are aligned in the horizontal direction under 2 cameras.

After check and assure the fibers are horizontally aligned, please click ARC button, wait for the completion of splicing.

FAST OPERATION GUIDE

BE SURE TO CAREFULLY READ THIS GUIDE BEFORE OPERATION.



Upon completion of splicing, please put a heat-shrinkable tube to wrap bare fiber portion and place it to central heating tank and press the HEAT key (it is in heating process when the light on the HEAT key is on, the heating has been completed when the light is off)

Please put the shrink part inside the protective sleeve, the process of splicing is completed. (If you hear the beep voice for consecutive 5 times when you turn on the machine, it indicates that the electrode life has almost expired, please replace the original electrode)

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Safety Requirements

Any stage of operation on the fusion splicer, you must take the following general safety precautions. Not take these warnings and precautions or not comply with the warnings which described in this manual, would violate the fusion splicer design, manufacture and use of safety standards. My company does not assume any responsibility for the consequences of breaching these requirements for users caused!

The fusion splicer's work, environment and the power supply, please refer to the technical parameters in Chapter III. Before connect the power supply, please be sure to provide a matching power supply voltage for the fusion splicer, and take all the safety measures.

Do not use the fusion splicer in explosive environments

Do not use the fusion splicer in the presence of flammable gases or fumes

Do not attempt to disassemble any of the components of fusion splicer

In addition to the statements in this manual to allow user-replaceable parts, please do not attempt to disassemble any of the components of fusion splicer. Replacement parts and internal adjustments can only be commissioned by our authorized service personnel.

Warnings

► **AC/DC Adapter**
The output characteristics of the power adapter must meet the following requirements. Voltage: 13V ~ 14V; Current: ⩾ 4.4A; Polarity: Center is positive. Using higher voltage will cause damage to the fusion splicer. AC / DC power adapter input AC voltage of 100 ~ 240V, 50/60Hz, if input voltage exceeds this range may cause permanent damage to the adapter!

► **Internal Lithium Battery**
There is a lithium-ion battery cells in the fusion splicer, the use of other batteries may damage the fusion splicer and jeopardize personal safety.
For safety sake, lithium battery pack can not be disassembled to prevent short circuits; do not crash battery, do not let the battery close to a fire or an excessive heat to prevent lithium battery explosion.

► **The use of fusion splicer**
When below situation happens on fusion splicer, please immediately turn off the fusion splicer and unplug the power adapter input from fusion splicer, otherwise it will cause the fusion splicer may not work properly or can not be repaired and other serious consequences.
liquid, foreign substances enter the interior of fusion splicer
fusion splicer subjected to strong vibrations and shocks
There is no necessary parts that need to maintain inside the fusion splicer, it is forbidden to dismantle the fusion splicer, any dismantlement may result in personal injury or equipment can not be repaired.
In the discharge electrode of fusion splicer, the voltage between the two electrodes rods up to several thousand volts, please do not touch the electrode, otherwise it will cause fusion splicer damage, personal injury, serious consequences etc.

Matters needing attention

► **AC/DC Adapter**

Please use our company provided adapter for the fusion splicer, use of other adapters may cause damage to the fusion splicer.

► **Internal Lithium Battery**

1.The batter may goes into hibernation after long time placed, the capacity is lower than normal at this time, the durable battery time has also come to be shortened, but only after 2 to 3 times of normal charge-discharge cycles, the battery can be activated to restore normal capacity. Lithium is almost no memory effect, can be charged at any time.

2.The lithium batteries has the phenomenon of self-discharge, if the battery is preserved for a long time in low battery power, the internal structure of the battery may damage from self-discharge, reducing battery life. Therefore, long-term preservation of lithium batteries please recharge it every 3 to 6 months, pay attention to the battery charge capacity can be 60% to 80%, not full.

3.Long-term storage battery (stored for more than 6 months) temperature range: 0 ℃ ~ 40 ℃. Battery short-term storage (storage time is less than or equal to 6 months) temperature range: -20 ℃ ~ 60 ℃.
4.To ensure that the security of battery charging, the lithium battery in the fusion splicer is charging temperature range of 0 ℃ ~ 40 ℃.

Matters needing attention

► **LCD Display**

1.Please do not let sharp object click on the LCD display, LCD display can not be forced shock.
2.Do not use organic solvents or contaminants dripping on the LCD display , such as acetone, oil, antifreeze, grease, etc., otherwise may cause the LCD display not working.
3.Use silk or soft fabric to wipe & clean the LCD display.
4.Depending on the perspective of the viewing screen, the brightness of the display will be different. But may also have some black, red, blue or green dots on the screen, these are not the fault of the LCD display, it is normal phenomenon.

► **The use of fusion splicer**

1.Fusion splicer is for welding silica glass fiber, please do not use this equipment for other purposes. Please read this manual carefully before using.
2.When used in dusty environments, please try to keep the windshield to be closed on fusion splicer.
3.When fusion splicer machine moved from a cold to a high temperature environment, please try to take a gradual warming way, otherwise it will cause condensation inside the instrument, it will has an adverse effect on the instrument.
4.Fusion splicer machine is a calibrated precision instrument, it is strongly advised to avoid vibration and shock. Storage should be used with a dedicated carrying case, long-distance transportation needs to pack a carrying case outside plus a suitable buffer box.

Warranty and Maintenance

The warranty of product is 3 years from the date of purchase, the specific details are as following:

1.Machine is broken down in one year from the date of purchase, we will provide free replacement of spare parts. However the electrodes and battery are not inclusive.

2.Machine is broken down after one year but within 3 years from the date of purchase, we will only charge the cost price of spare parts, not charge for repair costs.

3.Consumption parts: battery is in warranty for 6 months, the electrodes are not in the warranty.

4.The number of discharges is to 20,000 times which is also considered three-year warranty expires.

5.Even under the above conditions, the warranty is not valid if the following cases happen:

a.Failure or damage caused by outside force majeure which caused by natural disasters.

b.Do not follow the instructions from the user's manual as a result of human factors misuse fusion splicer damage or performance degradation.

c. Without our authorization, unauthorized disassembly or repair the splicer. At the same time our company reserves all rights over the responsibility.

Note:we retains the right to make any changes at any time on the fusion splicer s design and structure,but hot have the obligation and responsibility to provide free improvements or replacement on the products that have been sold.

Chapter I: Foreword

The fusion splicer machine is mainly used for permanent splicing fiber, it is widely used in optical fiber communication engineering and production testing of optical passive devices. By replacing the fiber holder, the machine can continue to splice ordinary rubber-covered fiber cable, jumper wire and a cladding diameter of 80 μm ~ 150 μm, single mode, multimode and other quartz-based dispersion shifted fiber. Fusion splicer is integration with light, mechanical, electrical products, the operation process should be taken to keep clean, free subjected to strong vibration or shock. Fusion splicer is shown in Figure 1-1.

Figure 1-1: Fusion splicer

Chapter II: Technical Terms

2.1 Single Mode Fiber

2.2 Multimode Fiber

2.3 Dispersion Shifted Fiber

2.4 Non-zero Dispersion Shifted Fiber

2.5 Bare Fiber

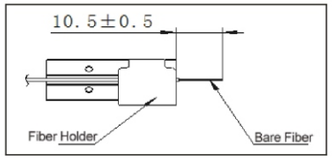


Figure 2-1: Fiber Cleaving Length

After the fiber coating is removed, leaving only the fiber core and the cladding layer is called the bare fiber.

2.6 Fiber Cleaving Length

After stripped the coating layer, the length from the front side of holder to the fiber end called “Fiber Cleaving Length”, the length must be controlled when cleave the fiber, please use our specified “fiber cleaver” which can guarantee its length at 10.5 ± 0.5mm. Too short or too long can cause fusion splicer is not working properly

2.7 Display

On the LCD display to see the fiber image shown in Figure 2-2, the spatial position of the fiber is got from two mutually perpendicular video cameras, imaging principle shown in Figure 2-3.

Figure 2-2

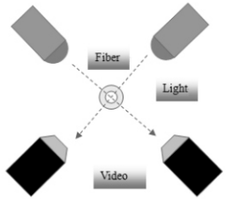


Figure 2-3

Chapter II: Technical Terms

2.8 Reset

Reset means the execution parameters to restore the machine to its initial state, after reset the fusion splicer can continue to operate fiber splice.

2.9 Fiber Alignment

The left and right connecting two optical fibers to be aligned with the mandrel core is called Fiber Alignment. If the two fibers are not aligned spindle fiber, there will cause a deviation in both the horizontal (X) and vertical (Y), it is called radial deviation. Aligning radial deviation of the process is to be adjusted within the allowable range.

2.10

Axial movement of the optical fiber is called propulsion. Conducting gap adjustment and splicing, the fiber has to propulsion. When the right side of the optical fiber is in splicing, the propulsion distance is called propulsion amount.

2.11 Heat Shrinkable Tube

Please see figure 2-4, the heat shrinkable tube is to protect the splicing point at the central position of heating.

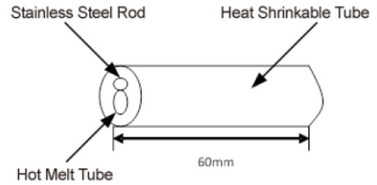


Figure 2-4: Structure of Heat Shrinkable Tube

Chapter III: Technical Parameter

3.1 Applicable Fiber

Applicable to the fiber of ITU-T G.651 ~ G.655, other quartz-based fiber meets the following conditions can also be splicing, but can not guarantee.

Material: quartz-based fiber

Mode: Single Mode

Type of optical-fibers: SM(Single-mode), MM(Multi-mode), DS(Dispersion displacement), NZDS(Non-zero dispersion displacement)

Fiber Cleaving Length 13.5±0.5mm

Cladding diameter：80 ~150μm

Coating diameter：0.1mm～1.0mm

Other Fibers

3.2 Fiber Heater

Effective Heating Length≤60mm Cleaving

Heating Regular time: 90S

Typical heating time: 40s (standard heat shrinkable tube 40mm)

3.3 Power Supply

External DC power input

Input voltage is 13.5 ± 0.5V; Input Current ≥ 4A; outlet center is positive

Built-in lithium battery

Built-in lithium battery 11.1V, 7.8Ah, full charge time is about 3.5 hours

3.4 Measurement and Weight

Measurement: 158mm (L) ×173mm (W)×186mm(H)

Weight: 2.4kg

3.5 Operating Environment

Working temperature: 0℃～+40℃

Limit temperature: -10℃～+50℃

Humidity: below 95%RH (No condensation)

Maximum wind speed: 15m/s

Storage temperature: -20℃～+60℃

Storage humidity: No condensation

Chapter III: Technical Parameter

3.6 Fusion Loss

For the recommended fiber of ITU-T G.651 ~ G.655, conducted with the same fiber splicing, its splice loss is typically as below:

Single Mode Fiber: 0.02dB

Multi-mode Fiber: 0.01dB

DS Fiber: 0.04dB

NZDS Fiber: 0.04dB

3.7 Others

Typical Splicing Time: 8s

Image processing methods: analog signal processing; X, Y-axis independent display

Tension test: 2N

Display: 5.6 inches LCD

Real-time image: magnification 258 times

USB Port: Standard USB port

Battery remaining time display

Built-in high brightness lighting, convenient for place fiber

Chapter IV Fusion Splicer Accessories List

Please see chart 4-1 for Accessories List

ACCESSORIES

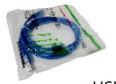
 Fiber Cleaver 1	 Power Adapter 1	 Fiber clamp for covered with rubble wire 3	 Fiber clamp for jumper wire 3	 Strap for carrying case 1	 Wire stripping pliers 1
 USB cable 1	 Hex key 2	 Alcohol Bottle 1	 Cooling Tray 1	Brush 1	 Miller stripper 1
 Teaching CD 1	 Warranty Card 1	 User's Manual Book 1	 packing list 1	 Quality Certificate 1	

Chart 4-1 Accessories List

Chapter V Structure and Operation Panel

5.1 Structure

The fusion splicer is portable, it is easy to carry at construction field; external large-screen LCD display, it is flexible to change the placement angle, convenient for the operator to operate.

The new fiber holder is suitable for FTTH environment. Suitable for a variety of mutual splicing and heating fiber, such as covered wire fiber, jumper wire fiber, bare fiber etc. Please see below figures to show the holder, the figure represents the distance (mm)

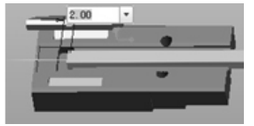


Figure 5-1.1: Fiber holder
FH-35-125-R-A for covered wire

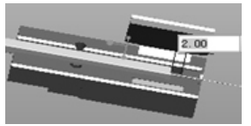


Figure 5-1.2: Fiber holder
FH-35-125-R-B for covered wire

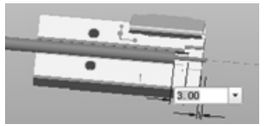


Figure 5-1.3: Fiber holder
L-36-86-L for jumper wire

5.2 Operation Panel

5.2.1 windshield

Usually the windshield should be turned off, only allowed to open when you need to put the fiber in the holder. Windshield should be closed before you operate on the keyboard. Windshield includes LED lights to provide illumination for microscope, and include hammer which is for stabilize and fix the bare fiber in V-groove. It can anti dust, wind and other effects In standby mode, when the windshield switch once, the propelling mechanism will return to its initial state

5.2.2 Display

5.6 inches TFT-LCD display, can adjust the placing height and angle. Please pay attention to protect the LCD when using, to avoid scratches.

5.2.3 Power Supply

For the convenience of the user, the machine uses the built-in lithium battery and external DC power input in two ways. The external DC input is provided by the AC adapter. When using a power adapter, the fusion splicer is charging at the same time.

5.2.4 Charging indicator

When plugged into an AC adapter, LED light is red, this time is to charge the internal lithium battery. When charging is completed, the indicator light turns to green.

5.3 Keyboard

Keyboard keys are arranged as shown in Figure 5-3.    Are effective at any situation, its function as shown in Chart 5-1

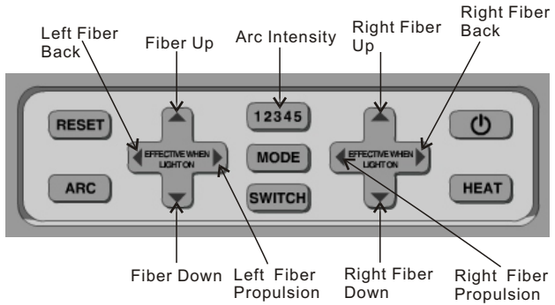


Figure5-3 The keyboard

Chart 5-1 Independentfunction keys

Keys	Function
	P**ower ON/OFF**. When the fusion splicer is at off status, press the button then release. the red indicator light is on and the machine is ON. When the fusion splicer is switched on, press this button, fusion splicer will be OFF.
	Heat. Press this key corresponding to the red indicator light, automatic completion of a heating process. Pressing this key during heating,, you can stop heating
	Reset. Press this key, the parameters of propulsion can be restored to the initial state.
	ARC. Press this key, the electrode will discharge arc and fusion the fiber by the selected arc, also propulsion the fiber.
	Mode. At standby mode, press this key to select different discharge mode, the green indicator light shows corresponding mode. Arc intensity from 1 to 5 in order to enhance,Mode 1--4 are for single mode fiber (usually please select mode 2). Mode 5 is only for multi-mode fiber.
	Switch. Press this key, choose left or right side aligning optical fiber, the corresponding green light is lit, its corresponding side button to enter the mode of operation, and it locked on the other side of aligning key which the operation is invalid; press this button, the camera also switches to the corresponding simultaneously lens

Chapter V Structure and Operation Panel

5.4 Port

Input and output ports are on rear of fusion splicer, shown in Figure 5-3, each function is shown in Chart 5-4.

Figure 5-4 Rear panel

Chart 5-4 Rear Panel Description

Name	Description
POWER IN	DC power adapter input, 13.5V, 4.5A. After the access adapter, the adapter supplies power to the instrument, while charging the internal lithium battery
CHARGE	Charge indicator. A red indicator means lithium is charging; green indicates lithium battery is fully charged
USB	Data cable interface. Use to write and modify the system & parameters upgrade.

5.5 Standby Interface

The standby interface shown in Figure 5-5, you can press the key SWITCH to switch the direction of the fiber image display. It is for display real-time images of fiber.

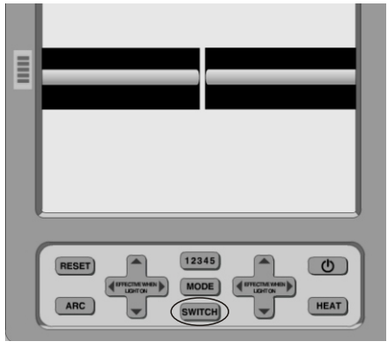


Figure 5-5 Standby Interface

Chapter VI Installation and Adjust

6.1 install

a）Open the windshield, check if the fiber holding parts shown in Figure 6-1 has dust or other foreign objects (eg broken fiber, cotton fiber etc.)

b）Use a cotton swab dipped in ethanol to unidirectional clean the groove which for holding the bare fiber (also known as V-groove)

c）Turn ON the machine, and then refer to Figure 6-1 and Figure 2-2 to install left and right fiber. Please note that when you install fiber, the bare fiber cleaving length should be 13 ± 0.5mm; bare fiber to be placed in the V-groove; fiber holder to firmly press the fiber and naturally straight. Then cover the windshield slightly.

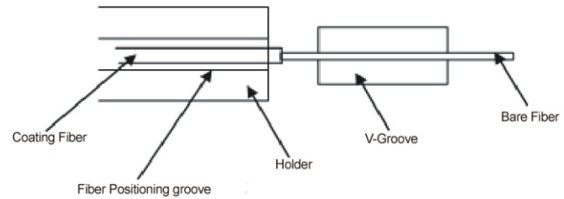


Figure 6-1: Left fiber positioning groove into the left holder

d）Check all key operating functions, if any unusual, please contact the manufacturer.

6.2 Software download

6.2.1 Please visit http://www.signalfiresplicer.com and click

6.2.2 Then click Download

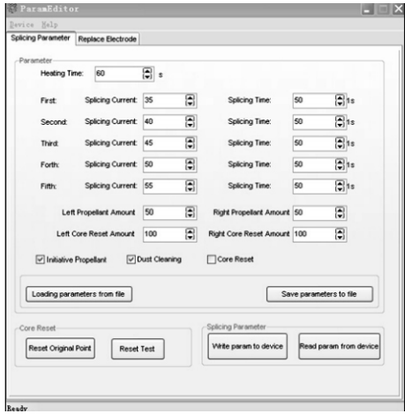
6.2.3 Then please select the file  and downlaod it to your computer.

6.2.4 After you finished downloading, please un-zip the folder 

6.2.5 Please connect the USB port on the splicer with your computer, then turn on the splicer.

6.2.6 Double click  and open this foder.

6.2.7 Click  and the computer will run the software automatically, your it will pop-up a dialog box on your computer.



6.3 Parameter Adjust

6.3.1 Introduction

a) The splicer is preset total five sets of splicing modes, respectively for different splicing environments. The ARC discharge from weak to strong intensity gradually increasing. The first set of pattern to the fifth set of pattern of splicing current index (splicing current) is 32,35,38,41,44, splicing times are 50 (unit is 100ms);

b) Heating time is preset as 90S.

c) Left Propellant Amount and Right Propellant Amount is preset as 50

When you use the specified fiber clamps and fiber cleaver which we supplied with the machine, the preset Propellant Amount can guarantee the both sides fibers propel to the LCD screen automatically and do not overlap after you placed the fibers at both sides and close the windshield.

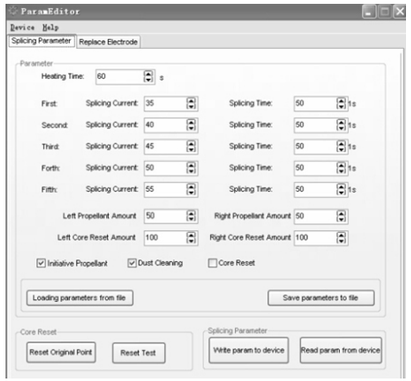
6.3.2 Parameter Editor

The above parameters can be modified to meet your splicing requirement in different environments, to improve work efficiency.

a) Please connect the USB port on the splicer with your computer, then turn on the splicer.

b) Click  , then select “Device”, then select “Connect”

Chapter VI Installation and Adjust



C) Click Splicing Parameter, and enter the editor. Please click Read param from device , please click the relevant options which you need to modify, or you can directly enter the number in the number box. Then click Write param to device and turn OFF the splicer and re-start it.

6.3.3 If you want to save the modified results in the computer to facilitate your query and modify the parameters of the next load, you can click Save parameters to file And then the modified results will be saved in the configuration file in the folder.

6.3.4 If you want to use the last saved parameters, please do as in accordance with 3.2.2 and 3.2.3 then click Loading parameters from file then click Write param to device , then re-start the splicer. The Parameters stored in the computer will write into your splicer.

Chapter VII Basic Operation

7.1 Power Supply

For the convenience of the user, the machine uses the built-in lithium battery and external DC power input in two ways, the external DC input is provided by the AC adapter. When using a power adapter, it is also charging the fusion splicer at the same time. In the field work without power adapter, can be used directly in the machine lithium battery-powered mode, turn on the switch can be turned on.

7.2 Fusion Mode Settings

Arc intensity adjustment is mainly for large changes in ambient temperature situations, in order to make the fusion splicer in the best condition, and to maintain a low fiber splice loss

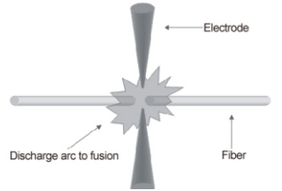
Turn on the fusion splicer, please set the fusion mode first. Press MODE , select the appropriate Arc Intensity, use the same type of optical fiber to do a fusion experiment, and use light source, optical power meter, OTDR and other special light table node loss values measured in line. In

The splicer has set up five kinds of splicing modes, respectively with figures 1,2,3,4,5, the larger the number, the higher the intensity of the arc. Used in a damp place please select 1 or 2; using 2 or 3 mode under normal circumstances; alpine and plateau regions please use 4 or 5 mode.

Of particular note: If multimode fiber splice, the splicing time needs to be changed to 90 (see 6.3 Parameter adjustment)

7.2.1 The principle of fusion splicer

The principle of fusion splicer is very simple, first find the correct fusion core of the fiber and accurately align it, and then through the high discharge arc between the electrodes to promote the re-melting of the fiber splice.



7.2.2 Parameter adjustment: you can connect the fusion splicer with your home computers by cables. Insert the supplied CD-ROM in your computer, open software called , modify data then click confirm.

7.3 Fiber Operation

Step 1: Put a heat shrinkable tube to one side of the fiber, it is for protect the fusion joints after splicing.

Step 2: Use fiber stripping the fiber coating then clean. Please use Fiber stripper to strip the fiber coating, to a length of about 30mm. Then use alcohol swab to clean bare fiber. Suggested the use of 99% alcohol.

Step 3: Use fiber cleaver to cleave the bare fiber.

Step 4: Place the fiber, carefully open the windshield and fiber holder, please put the cleaved fiber in V-shaped trough; hand pinch the optical fiber, then gently put down the fiber holder, pressed fiber. Ensure that the fiber is placed in the bottom of the V-groove, and if not, repositioning the fiber.

Step 5: Use the same method in step 4 to place fiber in another holder, then close down the windshield gently.

Precautions

a) Be careful when you place fiber, bare fiber ends do not touch any object, is shown in Figure 7-3

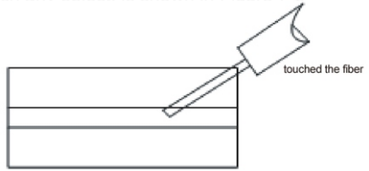


Figure 7-3 Wong placement of fiber

B） The ends of the fiber coating should be pressed pedestal holding the edge, shown in Figure 7-4

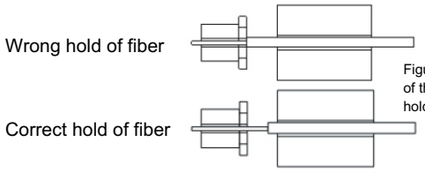


Figure 7-4 Comparison of the two fiber holding methods.

c）Should ensure the plate on holder press the coated fiber; when close the windshield, please pay attention the windshield should press the fibers at 2 sides.

7.4 Arc Test

The arc discharge conditions is very important to obtain a lower splice loss is, so before the fusion operation starts, the arc should be tested to check whether the center of the electrode and the discharge conditions to meet the operational requirements of the site.

7.5 Manual Mode

a）Carefully open the windshield, and place the cleaved 2 fibers in the holder which shown in Figure 2-2, and then gently close down the windshield. The machine will self-propelled the fiber, making it visible on the display, but do not overlap

b）To determine if the cleaved surface is ok, if there are defects in the cleaved, burrs, or end angle too dirty you can not start to fusion, as shown in Figure 7-5, the fiber ends needs to be re-preparation.

If the fiber optic image blurred or significantly deviate from the display center position, then reinstall and clean bare fiber and fiber V-groove

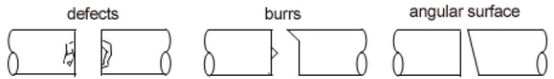


Figure 7-5 defects fiber end

C） Press (left) ◀ and (right) ▶ key to propulsion to the nearby center of the display optical fiber, to show the left and right fiber on the display ((visual from 2 ~ 6mm), to complete the fiber propulsion and gap adjustment.

Note: If the end clearance is less than 3mm, you can open the windshield, wait a moment and then shut, the propulsion parameters of the machine will automatically reset and the display will show it.

d) Press ▲ and ▼, the fusion splicer will complete the alignment of one side fiber, then press SWITCH , please press this switch key and align the fiber 2 times, so get an advanced fusion quality.

e) Press ARC key, to complete fusion.

After completion of fusion, you can press switch key to SWITCH to observe, to judge the quality of the fusion connection point.

f) Open the windshield, the fusion splicer will complete the tension test automatically.

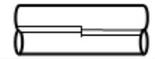
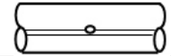
7.6 Fusion Assessment

Good fusion condition or not can be judged by the analysis of the post-fusion process of welding and weld images

If the fiber splicing after being checked out there is abnormal circumstances, such as: too thick, too thin, or have bubbles, you can press the key ARC again to fusion, or re-fusion.

a） If the fusion joints have the defects shown in Chart 7-3, it is necessary to re-fusion.

b） When a different fiber (with different diameter), or multimode fiber is fusion, it sometimes generated in a vertical line in the fusion joints, which does not affect the splice loss or strength of joints.

Defects	Reason	Solutions
dislocation core 	There is dust on V-groove or holder plate	Clean the V-groove and holder plate
too thin 	Arc intensity too high	Adjust arc intensity
	Fusion parameters I nappropriate	Increase the discharge time and propulsion
Black lined 	Fusion parameters inappropriate	Adjust arc intensity and discharge time
fiber bending 	Bad quality of cleaving end	Check if the cleaver is working well
	Arc intensity is small or discharge time is short	Increase the discharge time and time
bubbles 	Bad quality of cleaving end with dust	Check if the cleaver is working well
	Arc intensity is small or discharge time is short	Increase the discharge time and time
Fiber separation 	Fiber propulsion is too small	Increase propulsion
	Propulsion motor not propulse	Rest and place the fiber again
	Arc intensity is too big or discharge time is too long	Re-select the fusion mode
too thick 	Propulsion amount is too big	Reduce propulsion amount, or increase the 2 fiber’ s distance
	Arc intensity is too small	Re-select the fusion mode

Chapter VII Basic Operation

7.7 Operations of Heating

a Before splicing fiber, please load the heat shrinkable tube first. Open the heater cover, windshield cover, left and right holder plate, gently take out the spliced fiber.

b Please move the heat shrinkable tube to the bar fiber part, then put them together into the heating tank heater, pay attention to the correct position, as shown in Figure 7-8

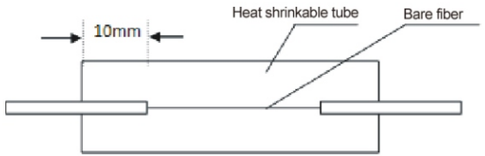


Figure 7-8 heat shrinkable tube illustration

c）Gently put down the heater cover, press the HEAT key, the heating function is activated when the indicator light on. Be careful not to bend or move its position in the heat shrinkable tube.

d）When the key lamp is off, the heating regular time is complete.

e）You can observe the heat shrinkable tube heating through the plastic window on heater, it indicates the heat process is completed after the air is completely discharged and the tube looks more transparent. After heating is complete, turn on the heater cover, cool moment, gently take out the fiber. Be careful not to force grabbed both ends of the fiber or pulled out from heat shrinkable tube to avoid fiber breakage.

f）If the heating process of heat shrinkable tube is not success in the regular time , you need to start heating again G) Repeatedly press the key HEAT when it is heating, the heating function stops.

Chapter VIII Maintenance

8.1 Dustproof and Remove Dust

Bare fiber positioning groove, and microscopic electrodes must be kept clean and windshield cover should be closed when not in operation

a）If the V-groove has dirty, it can not properly hold the fiber, which will cause the splice loss is too large. Thus in the daily work, you should always check the V-groove and regular cleaning V-groove. Follow the steps below to clean the V-groove.

（1）Open the windshield cover

（2）Use a cleaved fiber tail in one direction push the pollutants removed from the V-groove

（3）If the fiber can not clear the V-groove pollutants, then moistened with alcohol cotton swab to clean the bottom of the V-groove, and use a dry cotton swab to wipe off the extra alcohol in the V-groove.

b）Cleaning and replacing the electrode

（1）If the electrode is dirty, you can clean electrode by using the cleaning electrode function in main menu in the equipment maintenance, and then use a cotton swab dipped in alcohol to gently wipe the electrode tip, or use 3mm wide, 50mm long metallographic sandpaper to gently rub the electrode tip. Note To protect the electrode tip from damage.

（2）The electrode on fusion splicer has a very long life, but hen the electrode needs to be replaced, the machine will have intermittent beep to remind you; If the electrode life limit is reached, the machine will have a long beep and automatically close the program. Please refer to Appendix F.

c）Clean the objective lens

If the objective lens is dirty, the normal position of the observation optical fiber core may be affected, which leads to a higher splice loss or poor fusion. So you should regularly clean two objective lenses, otherwise it will continue to accumulate dust and ultimately can not be removed. Follow the steps below to clean the objective lens

（1）Before cleaning the objective lens, please must turn off the power.

（2）Use cotton swab moistened with alcohol to gently wipe the objective lens. Beginning with a cotton swab to wipe from the middle of the lens, do a circular motion, until the edges of the lens spin out. Then wipe with a clean, dry cotton swab to remove extra alcohol.

（3）Turn on the power, make sure that the display is not visible dust and stripes.

8.2 Prevent Strong Shock or Vibration

When you need to move or transport the fusion splicer, you should handle with care and gently. In addition, do not forget to put the machine into a carrying case and shipping box during long-distance transportation.

8.3 Storage

When you do not use the machine for a long time, please must turn on the machine once half a year. Especially in high moisture season, should always be turned on, and the desiccant should be placed inside the carry case to prevent mildew microscope head.

8.4 Precautions

a）When the fusion splicer is using AC power , please take attention to protect the adapter , and the power supply is properly grounded.

b）When the fusion splicer is in the discharge process, there are several kilovolt high voltage between the electrodes, please do not touch the electrode rod at this time!

c）Please be sure that there is no gasoline, mashgas, freon gas and other flammable gas in the environment and, so as not to lead to poor fusion or accident.

d）When you wipe to clean the fiber holder and microscope head, please must us absolute ethanol, cotton swab to wipe the direction should be one-way, two-way wipe is forbidden.

e) There are many mechanical components in the fusion splicer with structural precision, in addition to the electrodes, the other part is prohibited for user disassemble and change. Because these mechanical parts are precision-machining and calibration, once there is any changes, it is difficult to return to its original position. You can replace only the electrode-yourself

The objective lens, V-groove, display screen, etc should be kept clean. Clean only with absolute ethanol, you can not use other chemicals

Chapter VIII Maintenance

8.5 Troubleshooting

Table 8-1 shows the general troubleshooting method for user reference. When the user can resolve the problem, please contact the manufacturer.

Table 8-1 General Troubleshooting

Problem	Reason	Solutions
No image after place the fiber	1.Not turn on 2.Fiber not place into the V-groove 3.Fiber cleaved length is too short or broken 4.Fiber is not put into the holder 5.Aligning mechanism is not reset	1.Turn ON 2.Place the fiber again 3.Cleave the fiber again 4.Re-position the fiber and cleave 5.Restart the machine
Can not switch on	lower power	1.Recharge the battery 2.Use external power by the adapter
Fail to splice or have a scar after splicing.	1.Poor quality of fiber end cleaving. 2.Splicing parameter is set too small.	1.Re-cleave the fiber. 2.Use a higher splicing mode.
Image tilt	Fiber not enter the V-groove completely	1.Place the fiber again 2.Restart the machine
Image very weak	1.Fiber not enter the V-groove 2.The V-groove has dirty	1.Place the fiber again 2.Clean the V-groove
No beep by pressing key	Machine stops respond	Restart the machine
Propulsion motor does not stop after turn on	reset sensor does not send a signal	Restart the machine

Appendix A: Electrode Replacement

When you need to replace the electrode, the machine will have intermittent beep to remind you; If the electrode life limit is reached, the machine will have a long beep and automatically close the program.

When replace the electrode, you must use the original electrode which is designed specifically by our factory for this machine. When the using time of electrode has reached the limit frequency, the electrode should be replaced, otherwise it may affect the fusion quality. Even automatically close the program and can not be spliced.

Electrode replacement procedure is as follows:

a） Electrode replacement must be carried out when the machine is switched off. Because there are several kilovolt high-voltage at the electrode when discharge, causing greater damage to human life.

b） Open the windshielf, you can see the electrode structure as shown in Figure 5-2 in Chapter V.

c） Loosen "electrode layering" screws first, use forceps to hold "electrode", and then screw off "screw" and remove "electrode layering" out. Be careful not to let the "electrode" fall into the fusion splicer. Then put the new "electrode" into the electrode holder slot, in the meanwhile insert the "electrode layering" to the "holder", and screw the screws , pushed the"electrode" to the end, and then tighten the "screws”.

d） Replace another electrode.

e) Please connect the USB port on the splicer with your computer, then turn on the splicer.Click 

, then select “Device”, then select “Connect”

Appendix A Electrode Replacement

f) Click Replace Electrode, then input electrode number, click Acquire Device Number, so you can get the device number. If the computer you are using has connected to network, you can click the "Acquire Activation Code from Internet" to get the activation code. Or you can access to http://sczhuoshi.com/check by using other methods, input the electrode number and device number to acquire activation code.

g) Input activation code, then click Verification, please restart the splicer after it shows Activation successfully.

Appendix B Fiber Cleaver Operation

B.1 Summary

Fiber cleaver can cut single mode fiber, multimode and ordinary quartz optical fiber. This cleaver can be used in optical fiber communication engineering construction, manufacturers of fiber optic cable testing, optical devices, such as factory production.

When cleaving ordinary single fiber, just use the cleaver splint which supplied with the cleaver.
To ensure the long-term use of the cleaver, please handle with gently, the operation should be gentle. Should take more attention to shock collision. Cleaver should be kept clean and dry all parts. Please use anhydrous alcohol to clean the cleaver blade and each plastic sheet, do not use other solvents such as acetone. Please clean up the broken fiber in time, to avoid the optical fiber goes into the rail to cause damage to the rail.

B.2 Structural characteristics and method of use

1.Parts and structure function
【precision guide】 to provide the direction of blade movement
【slide platform】 slide the platform, let the blade across the fiber
【Chopping plate】the optical fiber is cleaved once the chopping fall and touch the fiber.
【holder】 To open the holder to provide a fulcrum
【disc blade】 the blade across the fiber lightly and leave sliding mark on fiber surface.
【fiber clamp】 to hold the fibers.

Appendix B Fiber Cleaver Operation

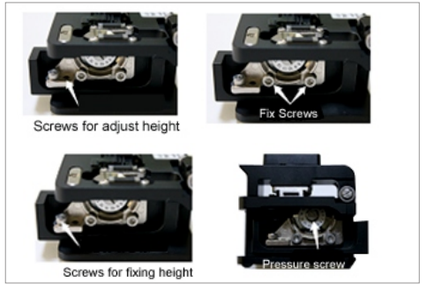


Figure B-1 side view

The principle of each structure is as follows
【Fixing screws】Loosen this screw first, then you can adjust ‘screws for adjust blade height”.
【Pressure screw】Loosen this screw and you can replace the blade angle, thus change the blade cleaving surface.

【screws for adjust blade height】 can adjust the blade height by this screw

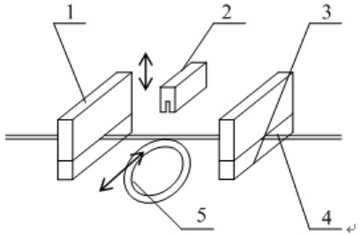
2.Use of the cleaver
a）Open the holder b）Strip the fiber coating about 40mm, use cotton balls dipped in anhydrous alcohol to wipe clean the bare fiber.
c）Please put the fiber into the fiber holder and fix it according to the required length,
(Figure 5-1 Figure 5-1.2 Figure 5-1.3)

d）Please close the fiber holder, then put the fiber in the positioning groove, push in the end. Then close the upper bracket
e）Hold the cleaver by right hand, then gently slide the platform according to direction of the arrow, let the blade across the fiber lightly.
f）Chopping fall down automatically, so that the optical fiber is cleaved once the chopping fall and touch the fiber;
g）Open the holder (right index finger in the cradle, push your thumb on the front slope of the mount), remove the fiber holder and fiber breakage. ;

Appendix B Fiber Cleaver Operation

B.3 Working principle and technical parameters

1.Principle



1.upper platen / 2.chopping / 3.lower platen
4.bare fiber / 5.round blade

Figure B-2 Principle figure

Clamp the bare fiber between the upper and lower platen, the sliding round blade to leave microcracks on the tighten bare fiber surface, chopping automatically fall under the action of the spring to make contact with the bare fiber micro-crack and cut fiber

2.Technical parameters
a）Applicable Fiber: Apply to a diameter of 0.08 ~ 0.125mm ordinary single mode or multimode fiber quartz series fiber
b）Fiber Count: Suitable for single fiber
c）End face angle: After cutting the fiber end face squareness ≤ 1
d）Cleaving length: minimum cleave length 10mm
e）Working environment: 0 ~ 40 ℃, 90% RH (40 ℃ no condensation);
f）Round blade life: about 20,000 times
g）Dimensions: 70mm×57mm×49mm；
h）Weight: About 0.3kg

Appendix B Fiber Cleaver Operation

B.4 Maintenance and Repair

Precautions
a）Must use cotton balls dipped ethanol to wipe clean before cleave the fiber.
b）Keep each plastic sheet and blade surface cleaning, and please use anhydrous alcohol, when cleaning the blades of each sheet. Do not use of other solvents such as acetone
c）In order to increase the frequency of use blades, please adjust the blade position, please press the number counterclockwise order to adjust the blade, do not mess tune.
d）This is a precision tool, handle with care and gently.
e）Clean up the broken fiber in time, prevent the damage fiber injuries and damage to broken plastic sheet cutter and guide
f）Should carry anti-collision avoidance, to ensure cleaving accuracy

Maintenance
2.1 Blade height adjustment method (refer to Figure B-2)
a）Loose screws for platform
b）Adjust the “screws for adjust blade height”: Please adjust screw to rotate in a clockwise direction when you need to raise blade height.
Please adjust screw to rotate in a counterclockwise direction when you need to reduce blade height.
Use a cotton swab to press the bottom edge of the blade, while rotating blade height adjustment screws.
c）Tighten screws for platform

2.2 Replacement blade method (refer to Figure B-2)
a）Loose screw for blade
b）Replace a new blade
c）Tighten screw for blade

2.3 Cleaving blade position adjustment (refer to Figure B-2)
a）Loose screw for blade
b）Counterclockwise rotation of the blade to the next digit position
c）Tighten screw for blade

Appendix B Fiber Cleaver Operation

2.4 roubleshooting and solutions solutions Table B-1

Problem	Reason	Solutions
Fiber cleaving quality deteriorates	The plastic chop and blade edge has oil dirty	Please clean the plastic chop and disc blade by using a cotton swab dipped ethanol
	Disc blade edge is not sharp	a）Adjust cleaving face of disc blade b）Replace the disc blade
	Disc Blade is too high	Adjust the blade height carefully
cleave fiber failed	Blade is not sharp	a）Adjust cleaving face of disc blade b）Replace the disc blade
	Disc Blade is too low	Adjust the blade height carefully
	Not strip the coating on fiber	a）please strip the coating
Fiber has a rounded edge		1.Raise the blade height 2.If the rubber plate is abrasion or aging, please replace the rubber plate
Fiber cutting face has shadow or gradient		Blade is too low. In particular, the blade is too high causes large gradient. Please adjust the blade height accordingly.
Fiber core defects		Collapse of the fiber core is usually caused by blade height, please adjust the blade height accordingly.

Table B-1 Troubleshooting and solutions