
Installation, Operation and Maintenance Manual

FFS-R12000



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1. PREFACE

MAIN CONTENT

Thanks for choosing **STAR Ribbon Fiber Fusion Splicer** product.

To help users master this machine quickly, this manual particularly introduces the function feature, operation skills, maintenance notes and precautions of **STAR R-12000 Fusion Splicer**.

Description:

In this manual, the R12000 pictures are used for description (including the cover) by default, and other model products of this series are used in the same way.



Important !!

Be sure to read all this manual carefully before use.

For more information, please contact local distributor or visit website:

www.star-technologies.co.in

SAFETY PRECAUTIONS

This machine is only used for splicing the silica optical fiber.

It can not be used for other purpose.

As the splicer is the high precision machine, please be cautious to carry and operate, conforming to the following safety regulations:

- Do not use the machine in an explosive hazardous situation.
- Do not touch the electrodes when the machine is power-on!
- Never disassemble the machine by yourself. Any problem, please contact the authorized maintenance center to repair it.
- Do not expose the machine in fire, thunder, rain, and humid environment.
- Do not stack the battery and adapter up each other when charging, otherwise it will cause the fire.

MAINTENACE NOTES

- Do not use hard and sharp objects to clean V-groove and electrodes.
- Do not use acetone, gas or other chemistry agent to clean any parts.

- Please conform to more maintenance instructions in the subsequent chapters of this manual.

SPECIFICATIONS FFS-R12000 RIBBON FIBER FUSION SPLICER

Type	Ribbon Fiber Fusion Splicer
Alignment Mode	Clad to Clad Alignment (Fixed V-groove System)
Applicable fibers	Single Mode (SM),Multi-Mode (MM),Dispersion-Shifted (DS),Non- Zero Dispersion -Shifted (NZDS)
Fiber count	1,8,12
Size and Weight	(190*140*150)mm &1.8kg (2.2kg with battery)
Minimum Cladding Diameter for Single Fiber	80
Maximum Cladding Diameter for Single Fiber	150
Minimum Sheath Diameter for Single Fiber	100
Maximum Sheath Diameter for Single Fiber (maximum)	1000
Cleave length	10mm to 13mm
IP Protection	IP 66
Typical Splicing Time for standard SM Fiber	15
Typical Heating Time for 1 to 2 Core	13
Typical Heating Time for 4 to 12 Core	20
Pre - Set user Programmable Splicing modes	50
Pre - Set user Heating modes	30
Fiber image magnification for viewing X or Y axis	33X

separately (Max)	
Fiber image magnification for viewing X and Y axes simultaneously	20X
Applicable protection sleeve	60
Internal storage	10000
Return loss	60
Tensile load	2.25
Fiber View	Two axis CMOS camera
Minimum Operating Temperature	Altitude: 0~3800m above sea level, Temperature : -10~+50°C Wind : 15m/sec Humidity : 0 ~95%RH
Maximum Operating Temperature	50
Operating Humidity - Non Condensing, Rh	95
Maximum Altitude (above sea level)	5000
Maximum Wind Velocity (in m/s)	15
Electrode life	3500
Voltage of each Battery	12
Battery capacity(mAh)	8400
Battery Life per charger	150
Connectivity interface	USB
Display	4.9inch



STRUCTURE



POWER SUPPLY AND CHARGING

- Install/Remove the battery:



Insert the [Battery Pack](#) into the machine in the direction as indicated by the red arrow.



Press the **Battery Release Button** to remove the battery
As indicated by the red circle.

- Power supply with AC Adapter:



1. Remove the **Battery** from the machine;
2. Insert the **AC Adapter/Battery Charger** into the machine (same place as the battery);
3. Insert **AC Power Cable** into the AC Adapter/Battery Charger and start getting energized.

- Battery charging:



1. Connect the AC Adapter with the Battery by **DC Power Cable**;
2. Insert **AC Power Cable** into the AC Adapter, and then start getting energized.




Important !!

Do not put the Battery and Adapter overlapped when charging.

MAIN SCREEN

Insert the Battery Pack or AC Adapter/Battery Charger and








press the power key  until it turns green, then the splicer starts work and check itself. After finished, the splicer enters into the **Main screen** and shows "Ready" .

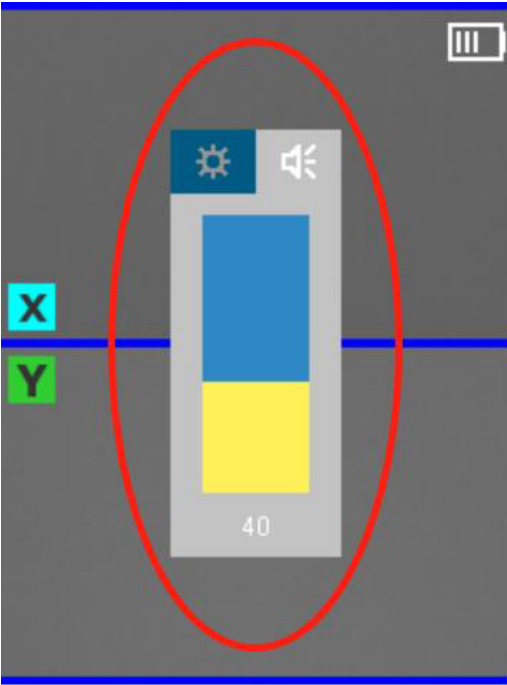


- Splice mode;
- Heat mode;
- The electrode life time

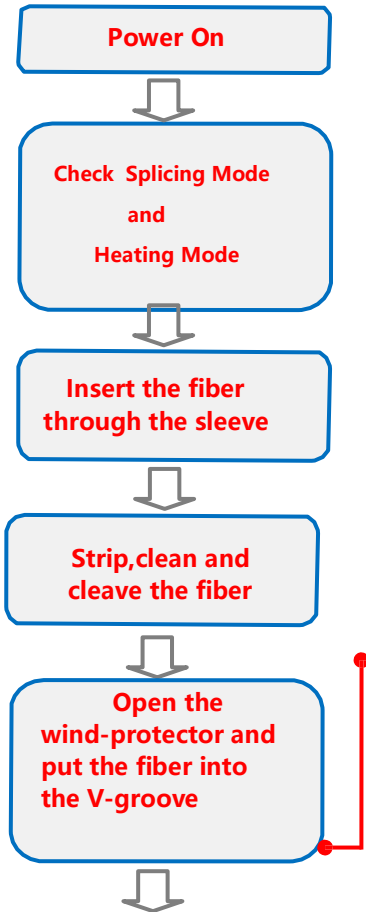
BRIGHTNESS AND VOLUME SETTING

Follow these steps:

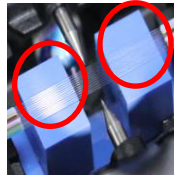
- On the [Work interface](#), press UP key  or DOWN key , then the brightness and volume menu come out;
- Press the menu key  to change between brightness Tab and volume Tab;
- Press UP key  and DOWN key  to adjust the brightness or volume. After selecting the suitable brightness or volume, press the  to store (or press back key  to give up).



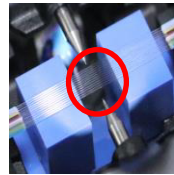
2. QUICK REFERENCE GUIDE



The groove



The center of electrode



Place the end of fiber between the V-groove edge and the center of electrodes.

Notice: Do not touch the cleaved fiber end face against any surface.

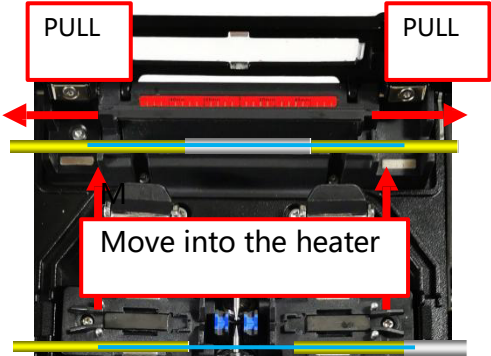
Close the wind-protector and start the splicing process

Having finished Splicing, take the fibers away.

Move the protection sleeves to cover the splicing point.

Placing the fiber into the heater. Start the heating process.

Completed.




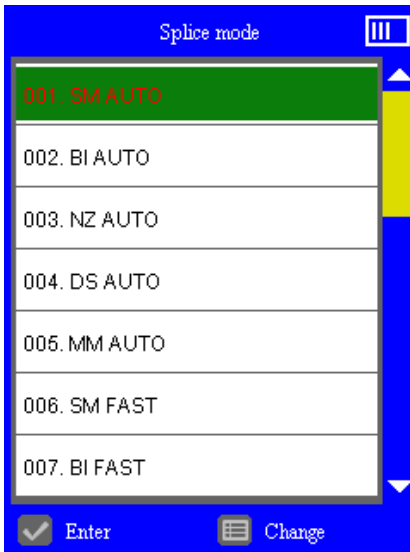
While maintaining a slight tension on the fiber end, do not twist or flex the fiber. Just lower the fiber into the heater as the arrow pointing direction. The oven hood will be closed and start heating automatically.

3. SPLICE

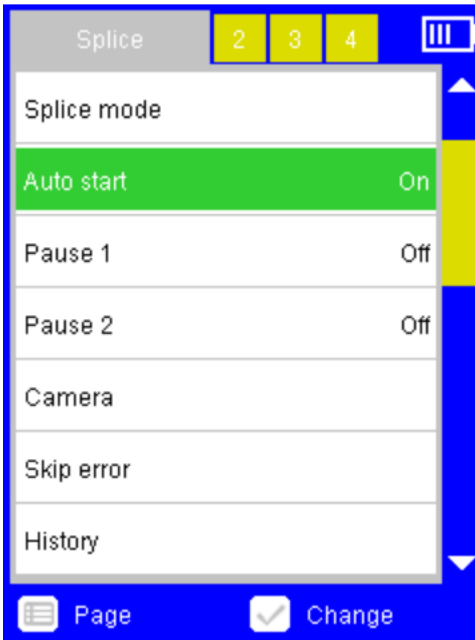
SPLICE MODE

When the splice mode is not matched with the fiber type,

click the **Menu**  key, then enter into the **Splice / Splice mode**, select and enable the splice mode matched with the fiber type.



AUTO START



Auto start includes two options:

ON	Close the wind-protector under operation interface , start to splice automatically.
OFF	Close the wind-protector under operation interface , no response.

PAUSE 1, PAUSE 2

Pause 1 includes the following options:

ON	When starts to splice under the operation interface , the splicer will be paused for confirmation after finishing cleaning & discharging operation
----	--------------------------------------------------------------------------------------------------------------------------------------------------------------------

OFF	When start to splice under the operation interface , the splicer will keep operating after finishing cleaning & discharging operation.
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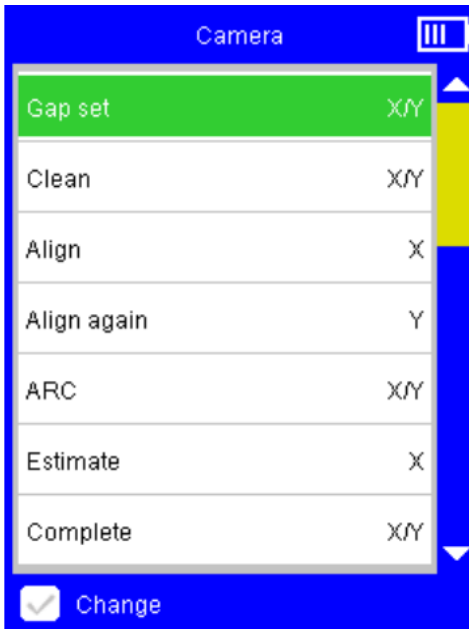
Pause 2 includes the following options:

ON	When starts to splice under the operation interface ,the splicer will be paused for confirmation after finishing the second time alignment.
OFF	When start to splice under the operation interface ,the splicer will keep operating after finishing the second time alignment.

CAMERA

This option is for setting up the display mode of the X/Y view in the fiber splicing process.

STAR Ribbon Fusion Splicer has two cameras, the display images from these two cameras called X-view and Y-view.



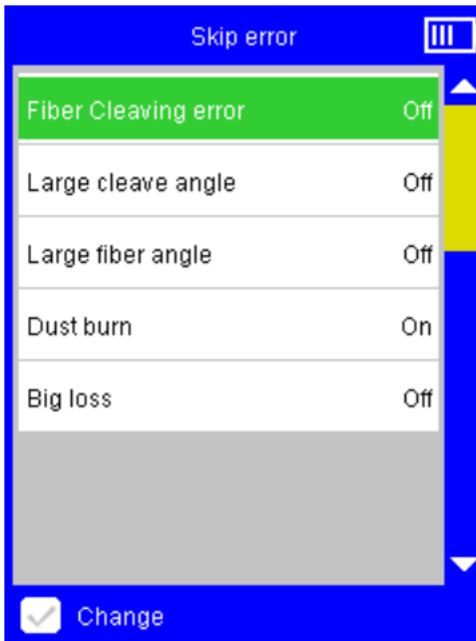
Camera interface shows every steps of a fiber splicing process:

Gap set	Push the fibers into view.
Clean	ARC to clean the fiber.
Align	Adjust fibers to align approximately.
Align again	Adjust fibers to align accurately.
ARC	ARC to splice the fibers.
Estimate	Estimate the splicing loss.
Complete	Splicing finished, wait for tension test.

For each step, [Camera](#) options are available as below:

X	Show the X-view only
Y	Show the Y-view only.
X Y	Show both X-view and Y-view .

SKIP ERROR



[Skip error](#) interface lists various errors that may be detected in a fiber splicing process:

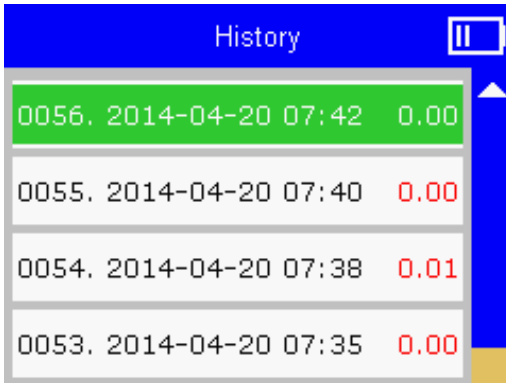
Fiber angle too large	The fibers of V-grooves are not in the same level (There may be dust on the V-grooves or fiber surface.)
Dust burn	It finds dust burning when discharging and splicing (There is dust on the fiber surface or the fiber end face.)
Loss too large	The estimated loss is large after spliced (This splicing may be not eligible.)

For each error, the [Skip error](#) options are available:

ON	Warn and pause to confirm when detects corresponding error.
OFF	Skip and keep operating when detects corresponding error.

SPLICE HISTORY

History interface will automatically record the specification data of each splicing operation and the estimate loss in order to take reference inquires about the statistics.



ID	Timestamp	Estimated Loss
0056	2014-04-20 07:42	0.00
0055	2014-04-20 07:40	0.00
0054	2014-04-20 07:38	0.01
0053	2014-04-20 07:35	0.00

The data of each splicing operation will be recorded according to the time order. The latest record will be arranged on top.


SCREENSHOT

Screenshot interface is used for saving the images of X-view and Y-view for project record or error analysis.

This function is to automatically save the error image when the splicer reports an error, and adopt rolling overlay storage. The sub-item function has the functions of viewing image records and clearing image records.

4. HEAT

HEAT MODE


Press the  key in the [Operation interface](#) when the heating mode is not matched with the protection sleeve which is currently being used. Then enter into the [Heat / Heat mode](#) interface, choose a heating mode that is matched with the protection sleeve.

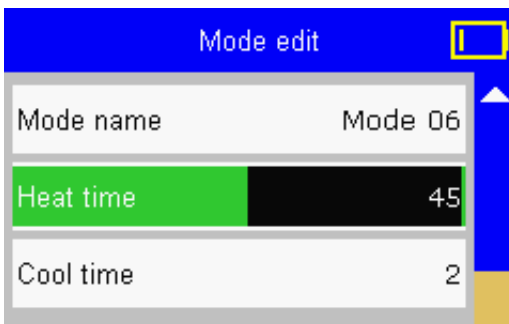


The [\[40mm std.\]](#) and [\[60mm std.\]](#) mode are designed for working above 0°C which are respectively used for heating the common 0~40mm and 40~60mm protection sleeve.


When the heating is not sufficient due to the fairly thick protection sleeve or the low temperature, please follow these steps until improved:

1. Switch from [XXmm std.] mode to the corresponding [XXmm plus] mode.
2. Heat the 40mm protection sleeve under the [60mm std.] or [60mm plus] mode;
3. When the heating is not sufficient even under the

[60mm plus] mode, select [New =>] item, press  key to create a new heating mode, set up the heating time to 45s, return and select this option to start this mode;




4. When the heating is still not sufficient even finished the above steps, select the new heating mode created

above, press  key to enter into the **Mode edit** interface, add 5 to **Heat time** and test whether successful;

-
- Repeat the step 4 until getting the most suitable heating time that can heat sufficiently under the current environment.

AUTO START

Auto start includes the follow options:

ON	Put the fiber in the heater. The splicer will start heating automatically once the heater cover is closed.
OFF	Put the fiber in the heater. The splicer will start heating only when press the  key.

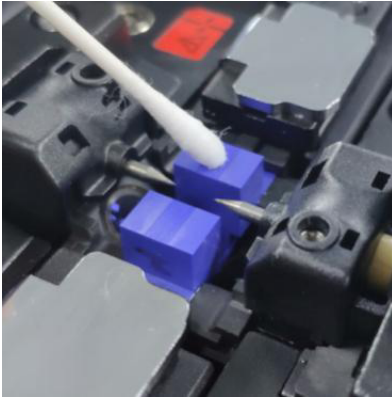
5. MAINTENANCE

Since the splicer is the high precision machine, it should be cleaned and maintained regularly while being used in order to guarantee the optimum performance.

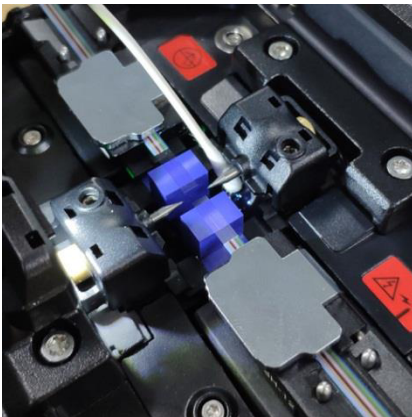
DAILY CLEANING

There are mainly two parts need daily cleaning: V-groove and Microscope Lens:

- When clean the **V-groove**, follow these steps:
 - Wipe the bottom of the V-groove with a small cotton swab dipped by alcohol;



- Suck the remaining alcohol in the V-groove with a dry cotton swab;
2. When clean the [microscope lens](#), follow these steps:
- Wipe the surface of the microscope lens with a small cotton swab dipped by alcohol;



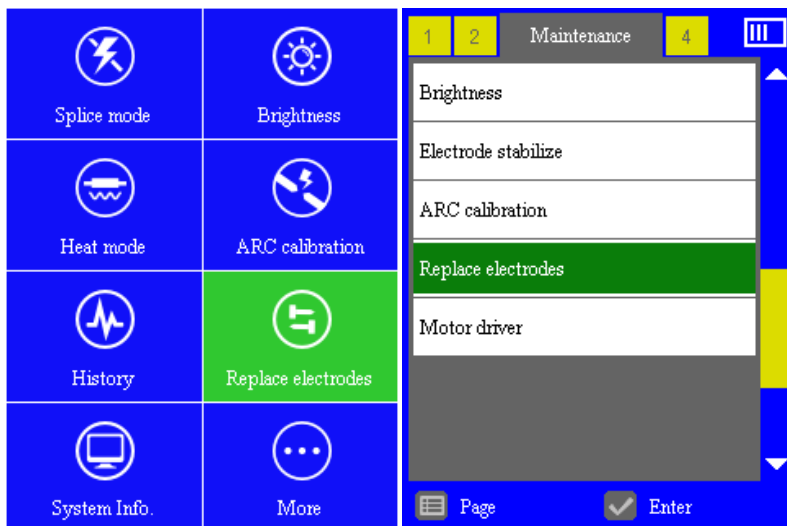
- Suck the remaining alcohol on the surface of the microscope lens with a dry cotton swab.

ELECTRODES REPLACE

When ARC times surpass the electrodes' lifetime, the discharging will be unstable, and splicing loss goes larger. So when the splicer warns users of replacing electrodes, please change the electrodes as required to guarantee the splicer' s performance.

Please operate as these steps bellow:

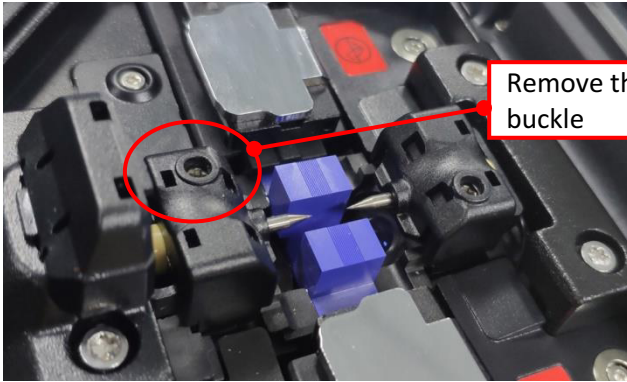
1. Enter into the " Electrode Replace" interface, do as the operation tips. Two ways to enter into " Electrode Replace" interface: one is via the main menu interface, the other one is via the maintenance menu interface.



Main menu interface

Maintenance menu interface

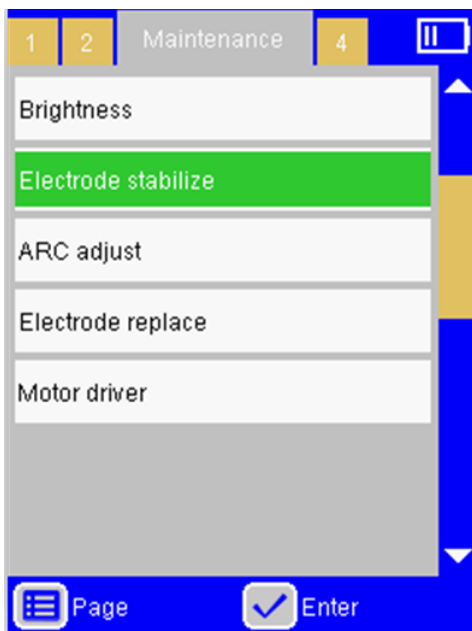
2. Follow the [Step 1] as the interface prompts : Shut down the splicer and replace by new and original STAR Ribbon electrodes .
3. Shut down the splicer, unfasten the screws to remove the electrodes, replace the old electrodes with the new ones, then install electrodes holder on the splicer and fasten the screws.



3. Boot up and re-enter into the “Electrode replace” interface, clear the electrode counts to zero.



4. After finishing all steps of electrode replace,
, please enter into the “Maintenance menu” to implement
“Electrode stabilize” and “ARC adjust”

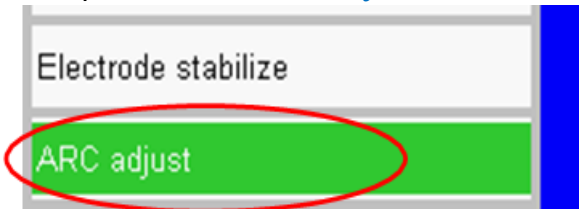


Power on the splicer, press the key, and then enter into the Maintenance menu.

- Operate under [Electrode Stabilize](#);



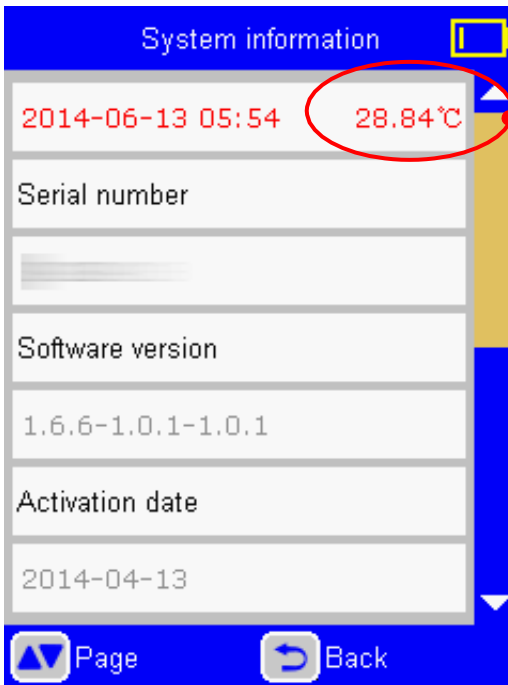
- Operate under [ARC Adjust](#);



6. SYSTEM

SYSTEM INFORMATION

[System information](#) interface presents all the basic information of the current system of the splicer, including the temperature inside the wind-protector detected by temperature sensor.



Temperature inside the Wind-protector

LANGUAGE

Language interface is available for the specific area. All the languages under this menu can be selected.

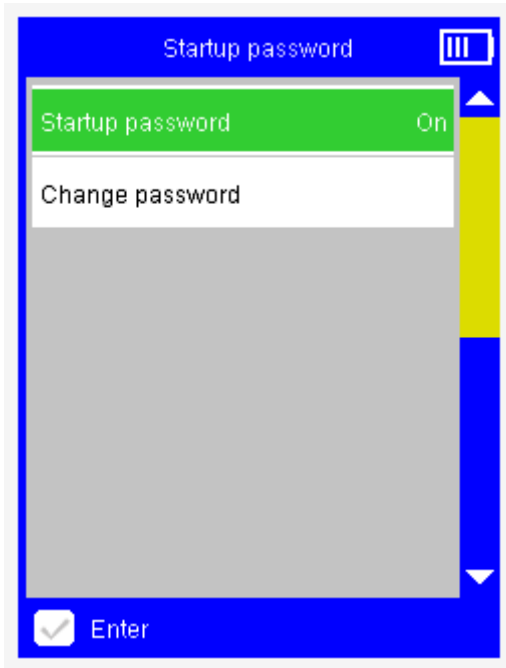
DATETIME

Datetime interface is for setting date and time. The exact date and time would be shown on functions like splice history and image storage, etc. Correct date and time can make your information more accurate.

The power supply on the main board makes sure time run precisely when the machine is off. Normally, the power supply can work several years. If the system time stops working when the machine is off, please contact the authorized STAR service center to change a new power supply.

SARTUP PASSWORD

Startup password function is used to set power-on password



Startup password switch settings:

OFF	Turn off startup password function, it can be used directly after boot up.
ON	Turn on startup password function, it can't be used till enter password. Initial password:0000 , do remember the password after turn on start up password function.

Select the password Settings to set up password:

LOW POWER MODE

The splicer can run at [Low power mode](#) when idling time.

These options are available:

OFF	When the Low power mode is OFF, the splicer will not run at low power mode anytime.
(Number)	The splicer will run at Low power mode when there is no operation during the setting times. Unit: second.

AUTO SHUTDOWN

The splicer can shutdown automatically when idling time.

These options are available:

OFF	When this function is off, the machine won' t shut down automatically anytime.
(Number)	The machine will shut down automatically when there is no operation during the setting times. Unit: second.

LCD DIRECTION

When the LCD Screen direction is up or down,the image on the display will change accordingly at the same time.




These operations are available:

Auto	The image on the display will turn up or down automatically.
Front	The image on the display always shows forward.
Back	The display image always shows backward.

7. ERRORS AND SOLUTIONS

” FIBER PLACED ERROR”

ERROR	REASON	SOLUTION
“Fiber placed error”	<ul style="list-style-type: none">● The fiber is placed in the incorrect position.● There is some dust in the V-groove.	<ul style="list-style-type: none">● Press the , replace the fiber, and make sure that the end-face of the fiber is between the edge of the V-groove and the middle of the two electrodes.● Clean the V-groove.

” FIBER DIRTY”

ERROR	REASON	SOLUTION
“Fiber dirty”	<ul style="list-style-type: none">● There is some dust on the surface of the fibers.	<ul style="list-style-type: none">● Strip the fibers again, clean up them with dustless cloth dipped by alcohol, then cleave the fiber again.

” FACE ANGLE TOO LARGE”

ERROR	REASON	SOLUTION
“Face angle too large”	<ul style="list-style-type: none">● The fiber is not well-cleaved.	<ul style="list-style-type: none">● Strip the fibers again, clean up them with dustless cloth dipped by alcohol, then cleave the fiber again.

” FIBER ANGLE TOO LARGE”

ERROR	REASON	SOLUTION
“Fiber angle too large”	<ul style="list-style-type: none">● There is some dust on the surface of the fibers.● There is some dust in the V-groove.	<ul style="list-style-type: none">● Strip the fibers again, clean up them with dustless cloth dipped by alcohol, then cleave the fiber again.● Clean the V-groove.

" DUST BURN"

ERROR	REASON	SOLUTION
"Dust burn"	<ul style="list-style-type: none">● There is some dust on the surface of the fibers.● There is some dust on the V-groove	<ul style="list-style-type: none">● Strip the fibers again, clean up them with dustless cloth dipped by alcohol, then cleave the fiber again.● Clean the V-groove.

8. CONNECT THE PC SOFTWARE

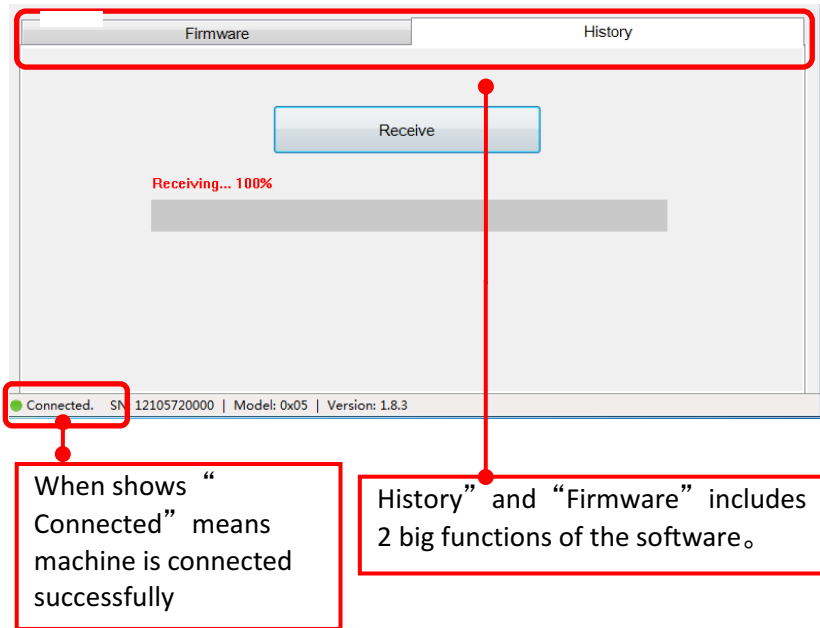
INSTALLATION AND CONNECTION

Follow these steps:

- Install the software [Fusion Splicer](#) for windows system on PC.
- Connect the fusion splicer and PC with USB cable.



- Start the [Fusion Splicer](#) software, press the [power on](#) button+[heat](#) button at the same time under [power off](#) situation, then the machine enters into the USB enable mode.



EXPORT STORED FUSIN SPLICE RECORDS

- With the assistance of [Fusion Splicer](#) software, it is much easier to export the fusion splicer records under the menu "History"
- Power on the machine, press menu button, enter into "More", under "Splice" menu then choose "History" and "Export History". Follow the steps shown on the display: [Create export files](#) till it shows "Complete"
- Start Fusion splicer software, choose "History", click "Receive" button;
- Click the "save" button on the [Fusion Splicer](#) software to save the fusion splice records on the PC.