Maintenance Manual

Optical fiber fusion splicer

Keyman S1

Please read through this manual completely before its first use.

INDEX

ILSINTECH
HIGH PRECISION TECHNOLOGY

This specification is applied to the maintenance and management of released products of which versions are later than Keyman-S1 Version 3.00.

I. Safety guide

Keyman S1 has been designed and manufactured for convenient use in indoor or outdoor working conditions. It is easy and simple to use, but please read through this manual completely to avoid failures and safety accidents before you use it. Keyman S1 is designed to easily use, but also contains potential danger. Therefore, this manual contains all necessary instructions to assure safe splice.

☐ Please keep this manual with the product all the time.

Ilsintech(Inc.) is not responsible for equipment damage and personal or physical damage caused by improper use or modification.

Warning

If an abnormal condition such as the following occurs, immediately turn off power and disconnect the power source. Next, contact the maintenance service personnel in Ilsintech(Inc.).

- ☐ If unusual smoke, noise or odor or unusual overheating occurs,
- ☐ If foreign substance or liquid gets inside the splicer, or
- ☐ If the splicer is dropped from a high place or suffers damage

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Do not use AC power code other than the allowable power cord indicated. Doing so may cause a fire, electric shock or injury. Use the power code provided with S1.

Do not touch the electrodes when S1 is switched on. High voltage and High temperature from them may cause serious shock or a burn.

Make sure that there is no dust or foreign substance inside the AC plug. Then, Connect AC power cord to the specified charger and the outlet. Unsafe splice may cause smoke, fire, equipment damage, serious injury or death.

Warning

Do not use a voltage other than the allowable power voltage indicated.

AC power supply for the specified charger is AC 100-240V, 50-60Hz.

Please check the AC power supply before using. AC power supply within the improper range may cause electric shock, equipment damage, serious injury or even a death. Abnormally high AC output voltage or frequency from the generator is a common problem. Measure AC output voltage with a circuit tester before connecting AC power cord. Regular inspection is needed because improper high voltage or frequency from the generator may cause serious injury, electric shock, equipment damage or death.

Do not severely pull, heat or modify the provided AC power cord. The use of damaged power cord may cause hazardous conditions such as fire or injury.

Connect only to 3-core AC power cord. Do not connect to 2-core power cord, cable or plug.

To reduce the risk of electric shock, do not touch the AC plug, the AC power

code and the splicer with wet hands.

Do not disassemble AC adapter, battery or the splicer. Any modification to the splicer may cause a fire, electric shock or injury.

When you use external battery, see the following instructions.

☐ The use of improper external battery may cause smoke, equipment damage, or in serious cases burning, injury or death.

☐ Do not throw the battery into a fire or a garbage dump.

☐ Do not charge the battery close to flames.

☐ Do not give severe vibration or shock to the battery.

☐ If the battery is not fully charged within 6 hours or green LED lamp is not on, immediately stop charging and contact Ilsintech(Inc.) Do not place any object on AC adapter during charging.

Only use the specified battery charger(S-1B) and the specified battery pack(S-1B). The use of any battery pack other than the specified one may cause smoke or fire, equipment damage, injury or death.

Warning

Only use the specified battery charger(S-11).

Do not use AC power other than the allowable power indicated.

Do not let battery(S-1B) or the terminal of the specified charger be short-circuited. Excessive current flow may cause damage to the equipment and persons.

Avoid the use of S1 in a hazardous location in which harmful gas or flammable gas can generate. In such conditions, the electrical arc of the fusion splicer can result in bursting or fire.

Do not use compressed gas to clean S1.

If you carry the transport case connected with a belt, first check the belt is strong enough. The worn belt may fail to sustain the case, resulting in

equipment loss or injury.

Wear safety glasses for protection from glass fibers. Glass fibers may cause serious damage to eyes or skin tissue.

Do not use the splicer in high temperature conditions. Doing so may cause equipment loss or injury.

Do not use a splicer in high temperature conditions. Doing so may cause equipment loss or injury.

Caution

During or after heating protection sleeves in the tube heater, do not touch both parts. Injury from high temperature could occur.

Do not place S1 in unstable locations. If the equipment is dropped, injury or equipment damage could occur.

S1 is a precision instrument. It should be handled with care and precision. When transporting it, use its specified transport case to protect it from dust, dust, moisture, shock and impact.

Replace the electrodes the right way.

- ☐Only use the specified electrodes.
- ☐ Place the new electrode in the right position.
- ☐ Replace the electrodes in pairs.

Not doing so may cause abnormal arc and equipment damage or deterioration in splice performance.

Only use ethyl alcohol (more than 96 %) to clean the splicer including object

lenses, V-grooves, wind-proof glass, LCD monitor, and the main body.

To prevent modification, discoloration and low performance, do not use any kind of chemicals.

Do not use lubricants including oil and grease for S1. Doing so may cause performance deterioration and equipment damage.

Do not store the equipment in high-temperature or high-humidity conditions. Equipment damage could occur.

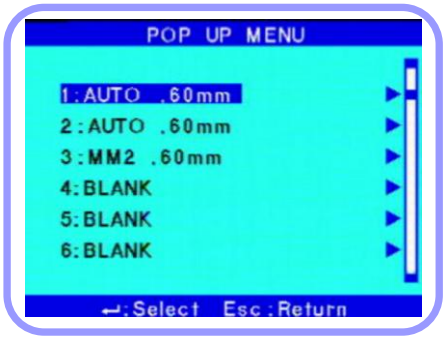
Qualified experts should check up technical matters concerning S1. Not doing so may cause fire or electric shock. Please contact qualified service personnel in Ilsintech(Inc.) and get A/S service.

1. Pop-up Menu Registration

Both Connection Mode and Heater Mode can be registered in Pop-up menu, which allows user to select each mode in a quick manner by pushing either up or down direction key.

Push ▲ or ▼

⇒ To activate a mode, select the mode by moving the cursor and then push ↵ key. Push Esc to return to previous menu.



Registering each mode

- Connection Mode Registration

Push Menu Key → Select Connection Mode → Move to the mode to be registered → Push Set Key → Pop-up menu registration box appears → Assign a number to be used by moving up and down direction keys → Push → Completion of the registration

- Heater Mode Registration

Push Menu Key → Select Heater Mode → Move to the mode to be registered → Push Set Key → Pop-up menu registration box appears → Assign a number to be used by moving up and down direction keys → Push → Completion of the registration

2. Setting Auto Heat

The function of setting auto heat is useful, especially, in performing consecutive connection works. When the wind protection cover is opened after completing a connection, the heater starts to be operating and stops at the end of pre-set time period.

Menu Key → Main Menu → Select additional function of connection → Select basic → Set to On or Off in Auto heat

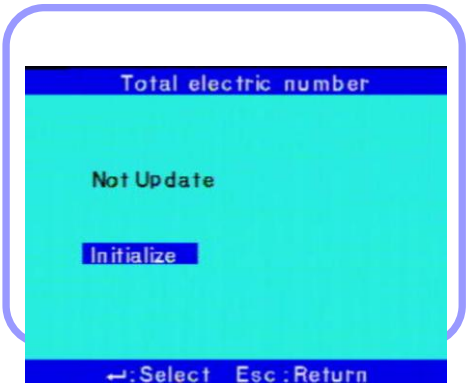
3. Setting Errors to be Affected or Ignored

Errors not affecting the operative function of connection can be either ignored or selected.

Menu Key → Main Menu → Select additional function of connection → Ignore connection errors → Set On or Off for each item

4. Menu Clearing the Record of Total Number of Electric Discharge

The total number of electric discharge can be initialized.



Menu Key → Aux → Select CLEAR ARC COUNT, in which push, simultaneously, both X, Y Key and △ Key.

The total number of electric discharge becomes 0 when selecting Initialize and

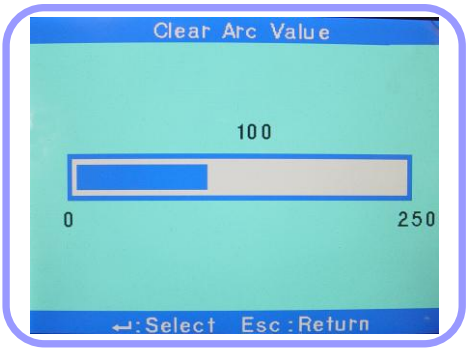
pushing Enter key.

5. Setting the Amount of Electric Discharge to be Cleared

The electric discharge amount to be cleared can be set.

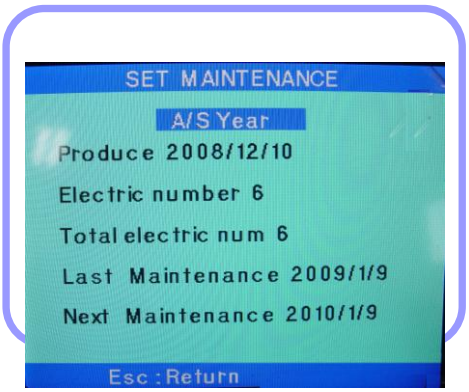
Menu Key → Main→ Select Splice Option, in which push, simultaneously, both keys of X, Y and △.

The amount of electric discharge to be cleared can be re-set.



6. Changing Maintenance Schedule.

Menu Key → Other→ Select Maintenance, in which push, simultaneously, both X, Y Key and △ Key. Change the date.



III. Correction Menu

1. Selecting Correction Menu

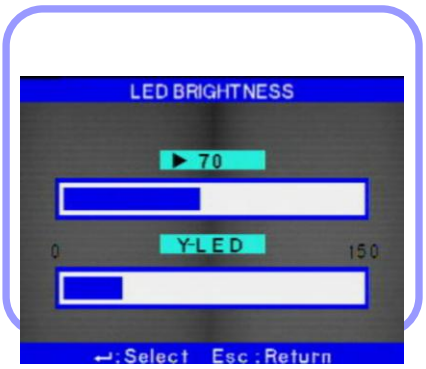
Push Menu Key → SUB → OTHER → Select System Setting → in which screen, push, simultaneously, both X, Y Key and △ Key.

2. LED Bright Menu

This menu is used for adjusting the brightness of camera flashes. A sub menu appears when selecting this menu.

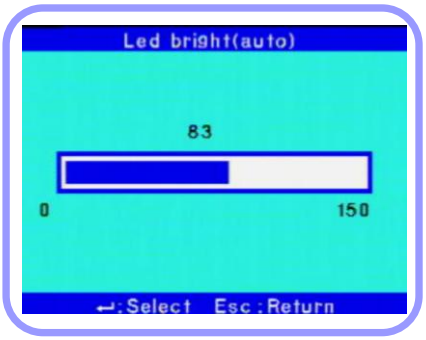
~~LED Bright~~

After adjusting the brightness of flashes by selecting the menu for adjusting the brightness of camera flashes,



select Menu Key → OTHER → LED CHECK, in which keep the brightness value between 80~86.

~~LED Bright (Auto)~~



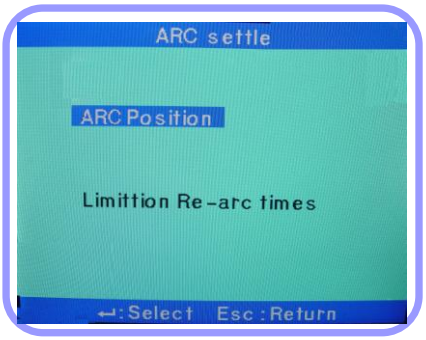
This is an automatically adjusted brightness value of LED flashes which is applied when the device is booted. The standard value has been set to 83.

3. Uart Port

Check if it has been set to Data Download when performing Program Up-Grade.

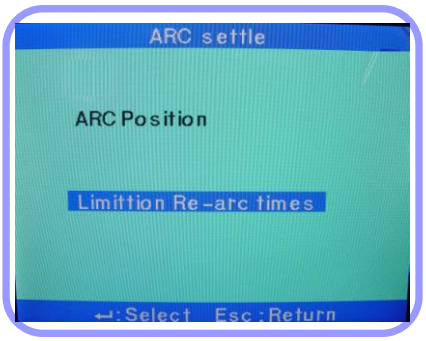
4. ARC Settle

~~ARC Position~~



Menu used for correcting the centers of arranged optical fibers and ARC

~~Limittion Re-arc times~~

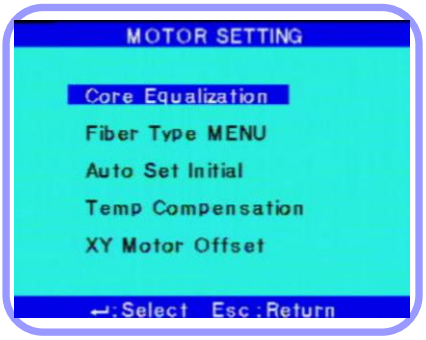


Menu for setting re-arc discharge times

The number set is the maximum times allowing re-arc discharge.

5. Motor Setting

Menu for setting measuring values of camera motor and X, Y motor
The initial setting value of each motor shall be recorded prior to Up-Grade.
A screen as next figure appears upon selecting the menu.



Core Equalization

Menu for correcting images from the camera

- Auto Mode: Menu for setting the reference position of the camera in Auto Mode (Do not change the initially set value)
- Except Auto: Menu for correcting the size of optic fibers' core when conducting ALIGNMENT (Do not change the initially set value)
- Loss Calculation equalize: The control value of camera, which is to be applied in calculating Loss (Do not change the initially set value)

Fiber Type Menu

Menu for correcting image data of optical fibers in Auto Mode

- Fiber Type Resister: Menu for setting a standard value for recognizing Fibers in Auto Mode (Do not change the initially set value). The value is automatically adjusted when correcting the motor.
- Fiber Type Limit: Menu for setting a threshold value for recognizing Fibers in Auto mode (Do not change the initially set value).
- Fiber Total Limit: Menu for setting a threshold value of Fiber data (Do not change the initially set value).
- First-Time Compensation: Menu for setting an automatic correction value in Auto Mode (Do not change the initially set value).

Temp Compensation

Menu for setting temperature compensation (Do not change the initially set value).

X, Y Motor Offset

Menu for setting a compensation value when a length difference occurs upon placing right and left fibers

6. Check Up

- Motor Setting: A screen which shows the reference line when adjusting the position of optical fibers (, which are used in replacing a lens or camera)

- Fiber Shape Set 1: A standard value used for judging the faulty status of a cut section of optical fibers (Clad Section). The bigger the size of this value is, the less sensitive the fault detection capability becomes.
- 1Fiber Shape Set 2: A standard value used for judging the faulty status of a cut section of optical fibers' core. The bigger the size of this value is, the less sensitive the fault detection capability becomes.
- Fiber Shape Set 3: A standard value used for judging the broken status of optical fibers. The smaller the size of this value is, the less sensitive the function becomes.

7. Splice Data Update

Used in conducting Splice Mode and Heater Mode Update.

※ Upon performing Splice Mode and Heater Mode, all existing data is initialized. Extra caution is required.

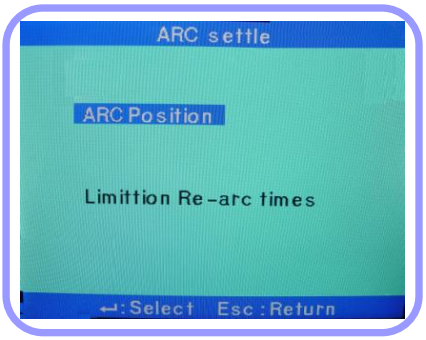
IV. Maintenance

1. When an Error in Classifying SM and MM in Auto Mode Occurs,

Correct the error according to following steps;
Push Menu Key → Select OTHER Menu → Select DIAGNOSTIC TEST. Place SM Optical Fiber → ↵ → Completion of Correction → ESC → Return

2. Eccentricity of Position of ARC Discharge

If the position of Arc, which is produced upon connection, is not placed at the middle of optical fibers, which are set opposite each other, and inclined toward the right or left side, perform a correction to place it at the central position.
Select Arc Position, and increase or decrease the value toward + direction when the Arc is leaned to the right side, and – direction when it is leaned to the left side.



3. Abnormal Arrangement of Optical Fibers in Connection Operation

If connection job is performed while the center of optical fibers is placed at a wrong position in the process of aligning their centers during connection, correct

the focus of the camera.

Locate and set the position where no malfunction occurs by increasing or decreasing the value after selecting Except Auto Mode.

4. Occurrence of a Length Difference When Optical Fibers are Initially Placed

In case that a length difference occurs when optical fibers are initially placed, first of all, remove all dirt in the V-Groove and clean optical fibers, and re-verify the status.

If the same difference occurs again, perform X, Y Motor Offset illustrated in article 3.4.5.

Select X, Y Motor Offset Menu.

In case that X axis is higher or lower;

Increase X-M toward + direction when it is higher.

Increase X-M toward – direction when it is lower.

In case that Y axis is higher or lower;

Increase Y-M toward + direction when it is higher.

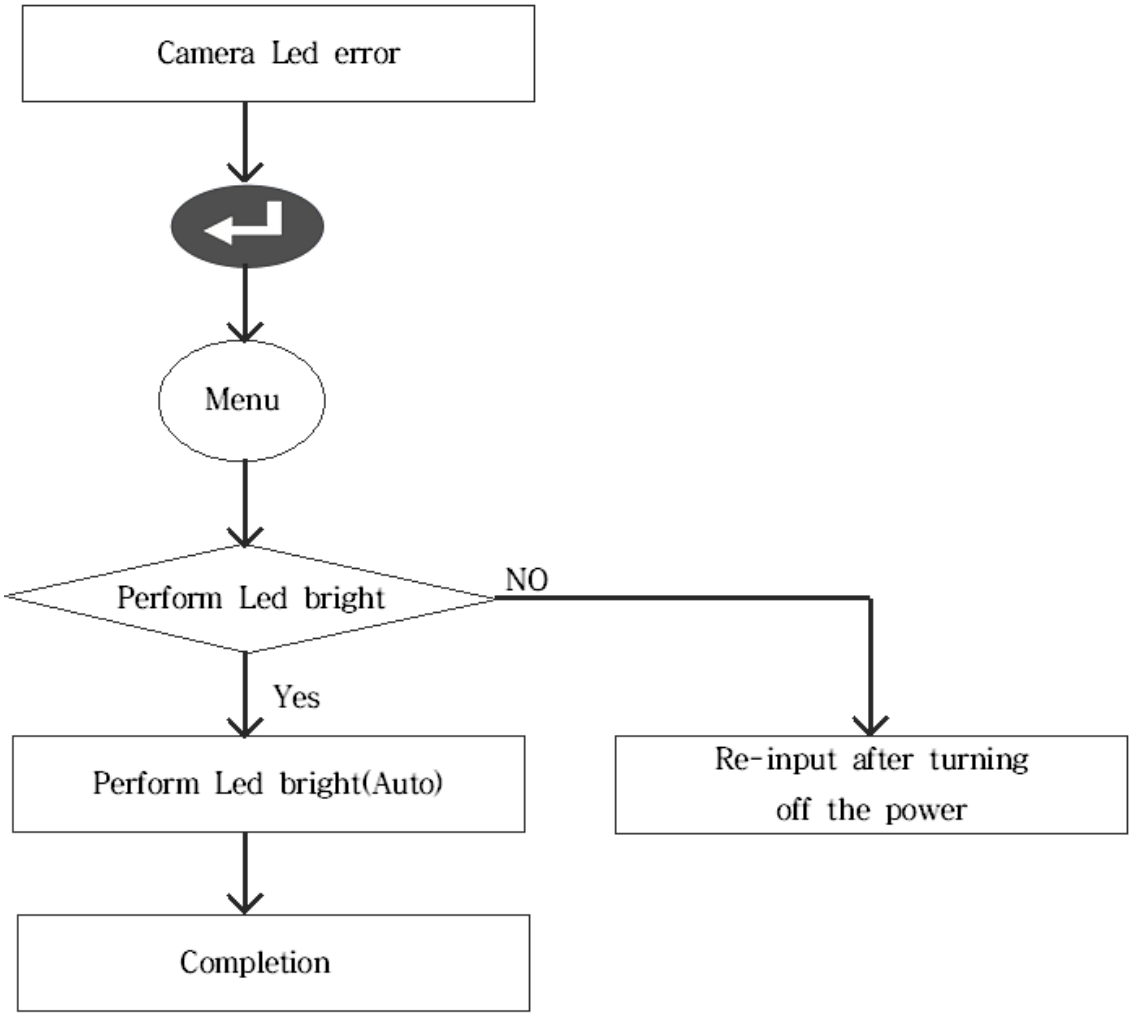
Increase Y-M toward – direction when it is lower.

Select Motor Drive in Other Menu after conducting Set, return and then initialize the camera.

5. Occurrence of an Error during Booting

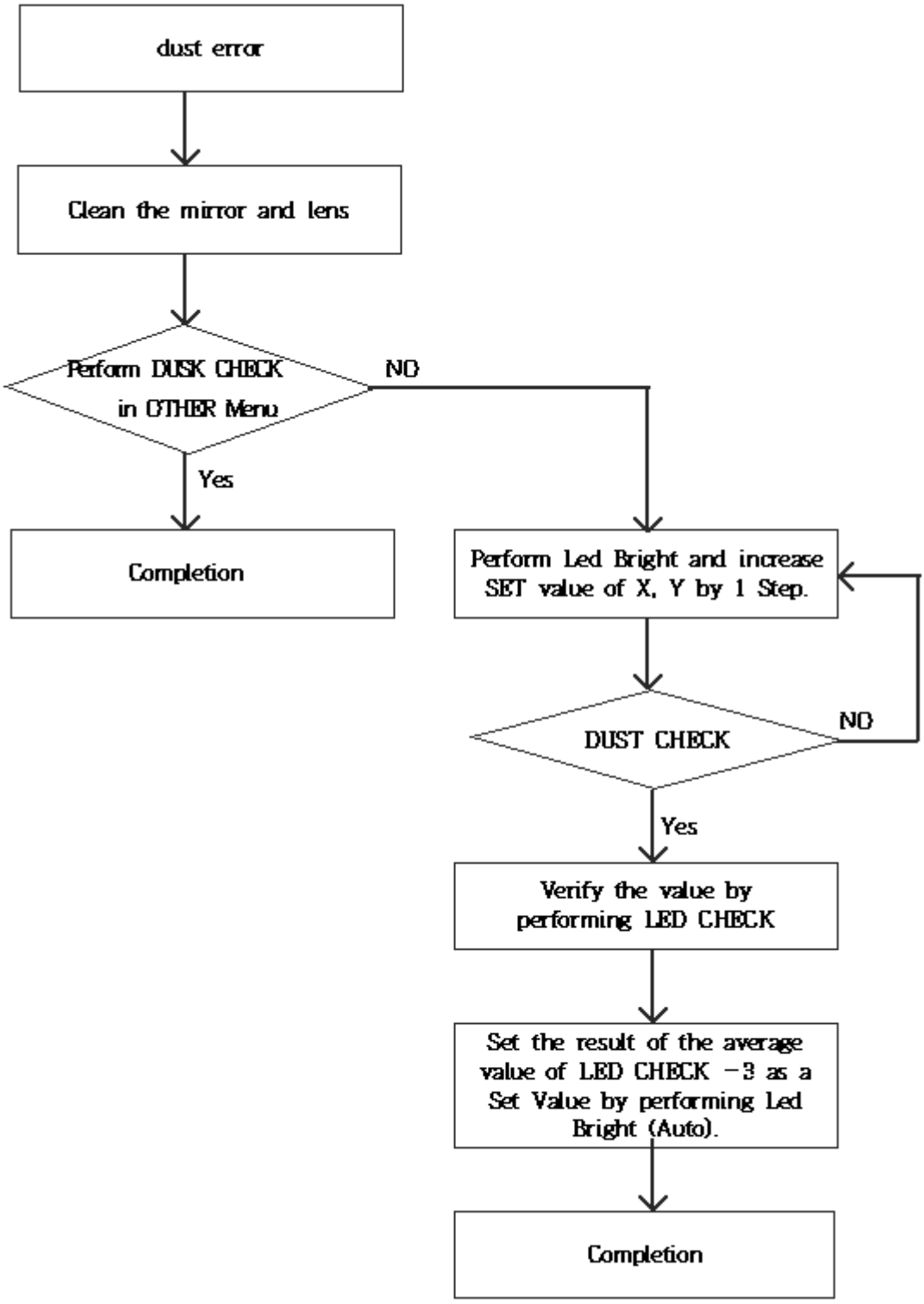
~~Camera Led error~~

Upon conducting Self Check after inputting power, if Camera Led error is displayed;



~~Dust Check Error~~

Upon conducting Self Check after inputting power, if Dust error message is displayed;


dust error
Clean the mirror and lens
Perform DUSK CHECK in OTHER Menu
NO
Yes
Completion
Perform Led Bright and increase SET value of X, Y by 1 Step.
DUST CHECK
NO
Yes
Verify the value by performing LED CHECK
Set the result of the average value of LED CHECK -3 as a Set Value by performing Led Bright (Auto).
Completion

6. In case of High Connection Loss Rate

- Check the status of electrode and replace it, if it has worn down.

- If the electric discharge shows an inclination toward the right or left side in the screen upon connection, correct the center of discharge by selecting Arc Position in Correction Menu.

In case that the Arc is leaned to the right side in the screen

Compensate it by increasing it toward + direction

In case that the Arc is leaned to the left side in the screen

Compensate it by increasing it toward - direction

7. Replacing the Battery

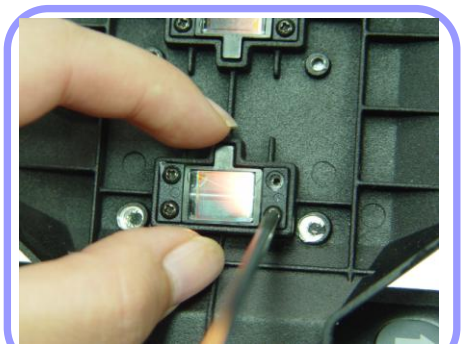
- Disassemble the batter cover.

Replace the batter after removing battery cables.

8. Replacing the Mirror

Replacement of Wind Protection Cover Mirror

The mirror shall be replaced, if unable to make it clean or remove stains by

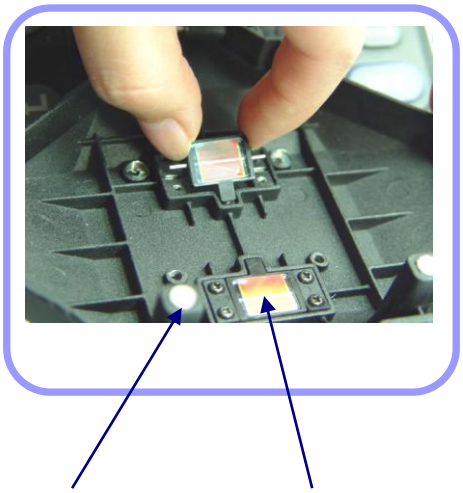


- Turn off the fusion splicer

- Open the wind protection cover and detach the mirror using a (+) type screwdriver. Use extra caution in separating the mirror because a spring is place behind the mirror.

- Take out the shaft pin placed in the old mirror and insert it into the new mirror, and reassemble it in the reverse order of disassembling.

> Be careful not to lose the
>
> Verify whether the mirror has been correctly placed. If it hasn't been assembled in a right manner, optical fibers are not correctly identified.



- Clean the mirror.

- Inspect if there are any lines, stripes or stains through the monitor screen after turning on the machine. Verify the status of lens' surface through X and

Y screens while changing the screen by pushing X/Y keys.

9. Program Upgrade

Data may be changed when Program Upgrade is done; therefore, it is required to separately keep the record of Set values of Correction Menu and verify them after completion of Upgrade.

~~Core Equalization~~

Menu for correcting images from the camera

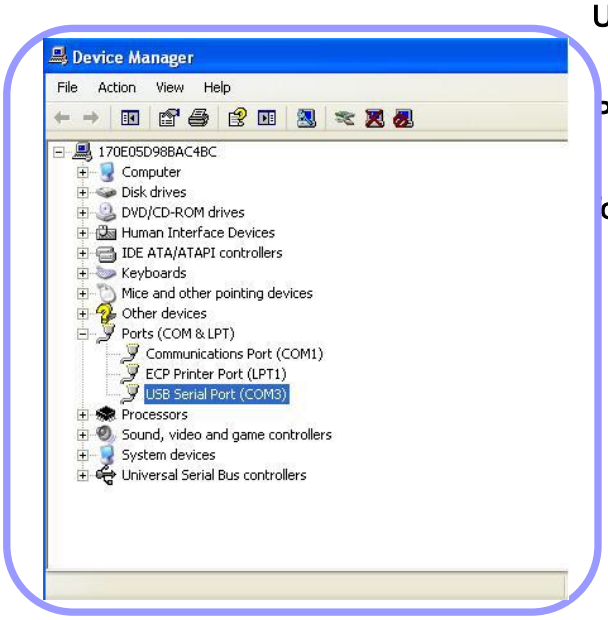
- Save in a PC a copy of both Keyman S1_X_XX.bin File and Firm_ware.bin File, which are used for upgrading the interface adapter.
- Make a copy of FTDRIVER.ZIP File and save it in a PC after decompressing it.
- Push, simultaneously, both ↵ Key and Power Key in the interface adapter. (If the Logo screen is displayed without freezing the screen, perform it again after turning off the power).
- Connect the interface adapter with PC using a USB Cable.

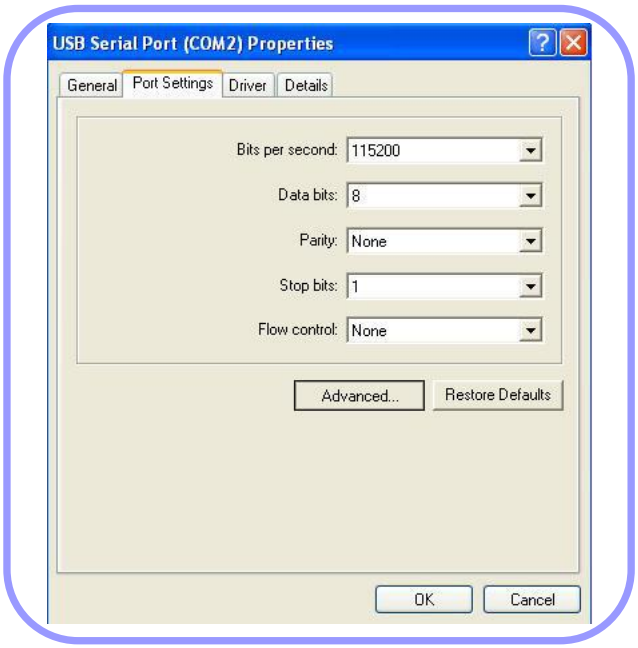
- When a PC message indicating the detection of a new hardware appears, install FTDRIVER by selecting install.

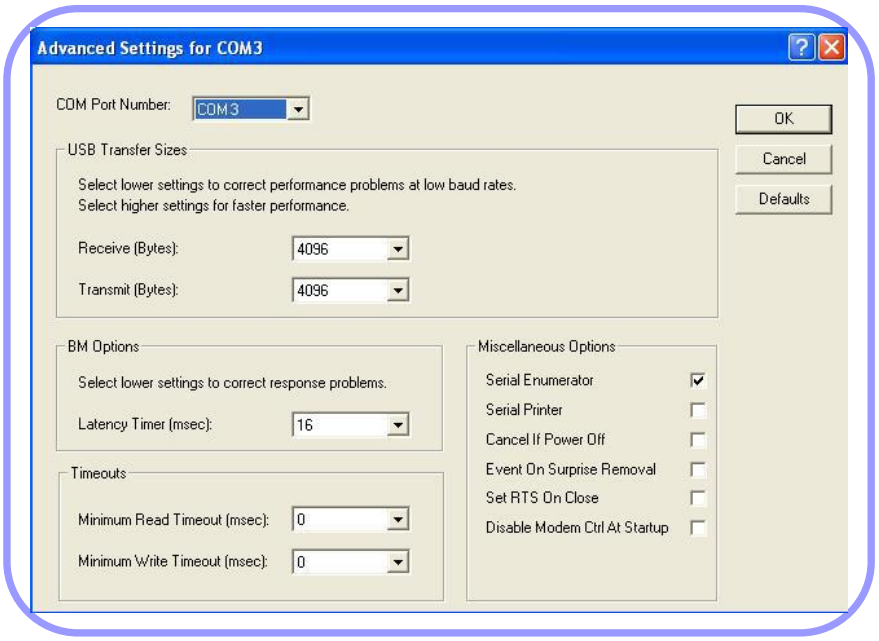
- Set the PC as follow;

Select Control Panel → System → Hardware → Device Manager → Port

After selecting USB (COM3), complete the Port setting as given by following figure.







- In Windows' All Programs, go to Accessories → Communication → execute Hyper Terminal

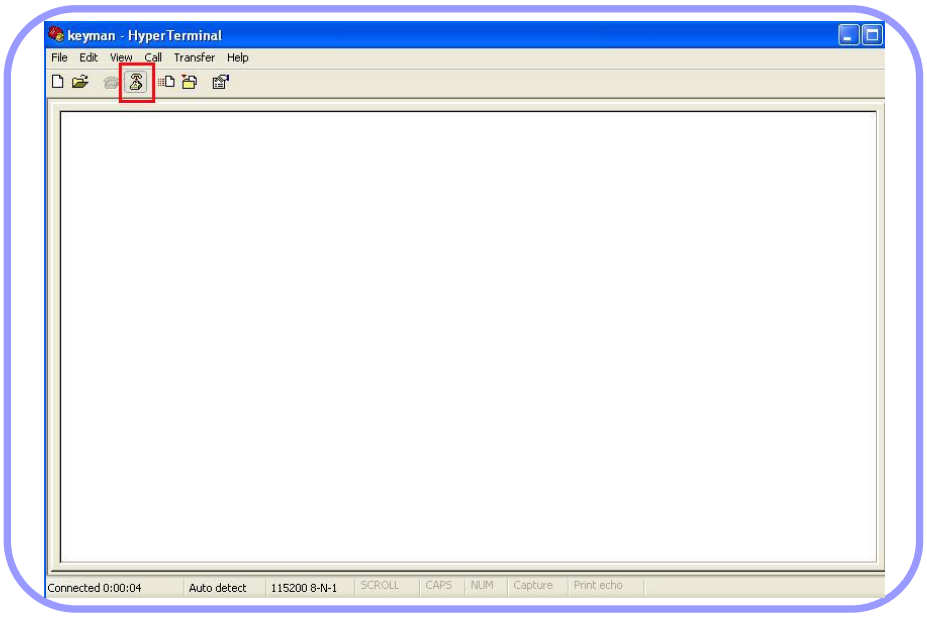
  When an error message appears, click Confirm and continue the process.

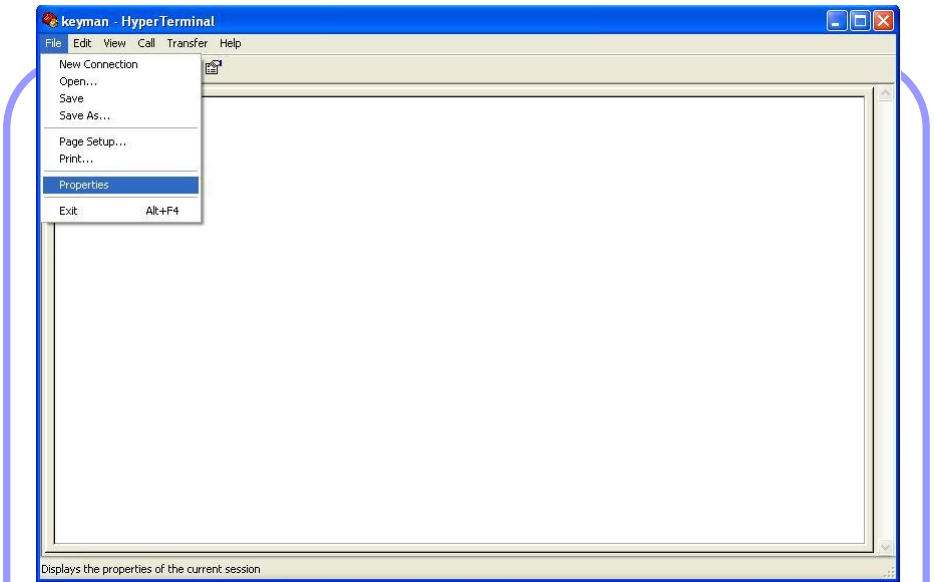
  If a New Connection box appears, enter any number into it and click OK.

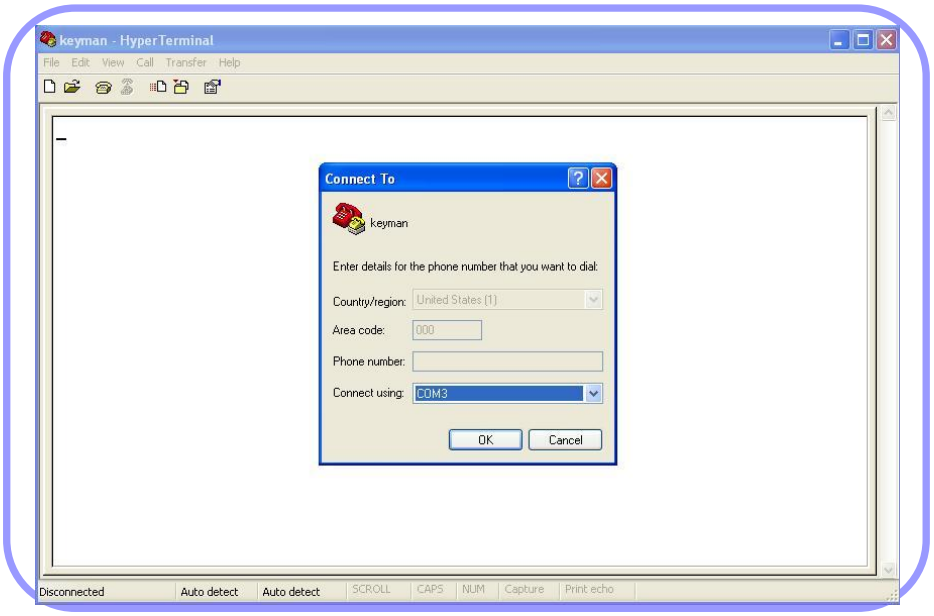
  If an error message pops up, click OK and continue the process.

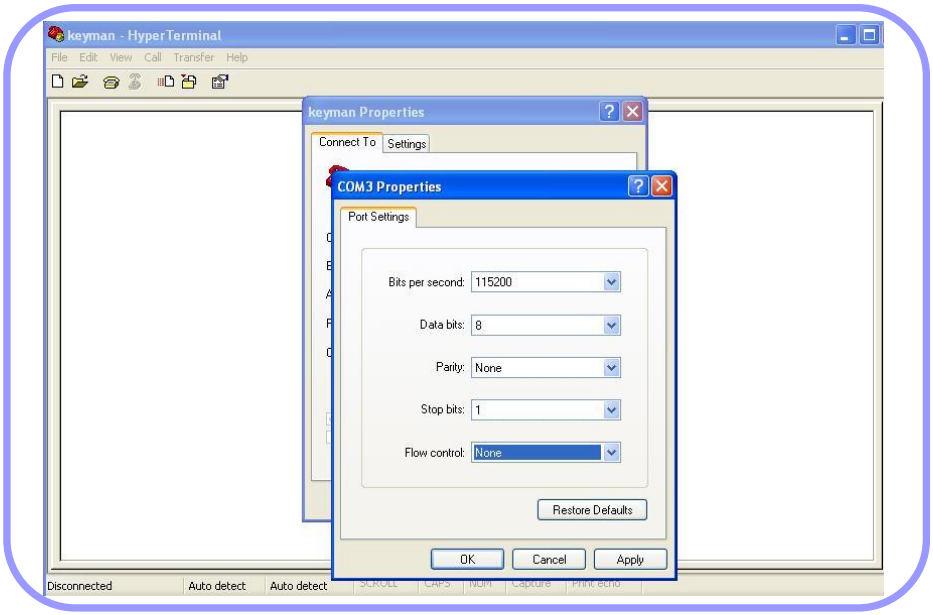
  ※ In case of using Windows VISTA, install Hyper Terminal 6.3 first, and then perform the process.

- When Connect To box appears, select "Connect using", open the port which was set in the article, and then execute the port.

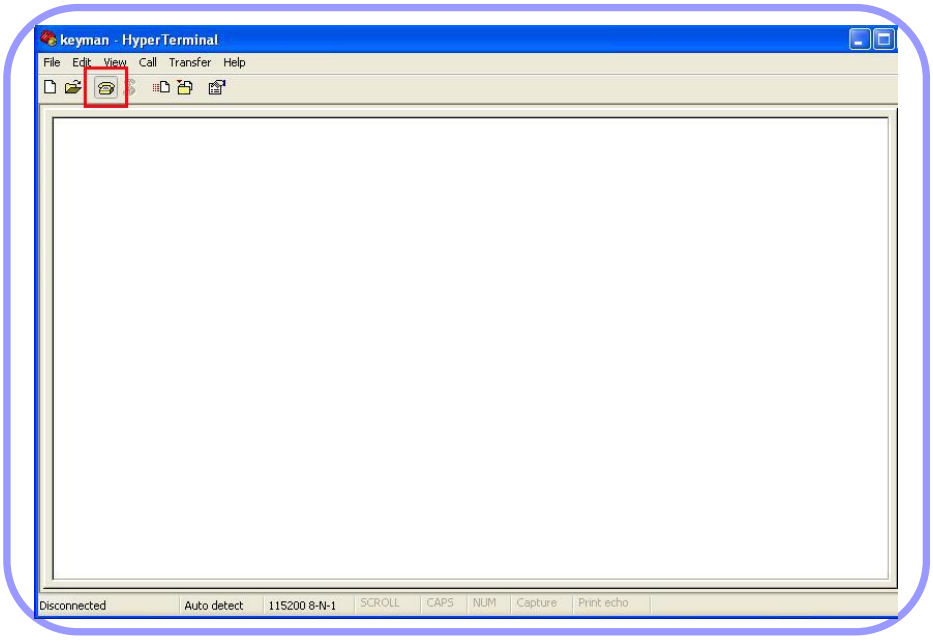

keyman - HyperTerminal
File Edit View Call Transfer Help
Connected 0:00:04
Auto detect
115200 8-N-1
SCROLL
CAPS
NUM
Capture
Print echo

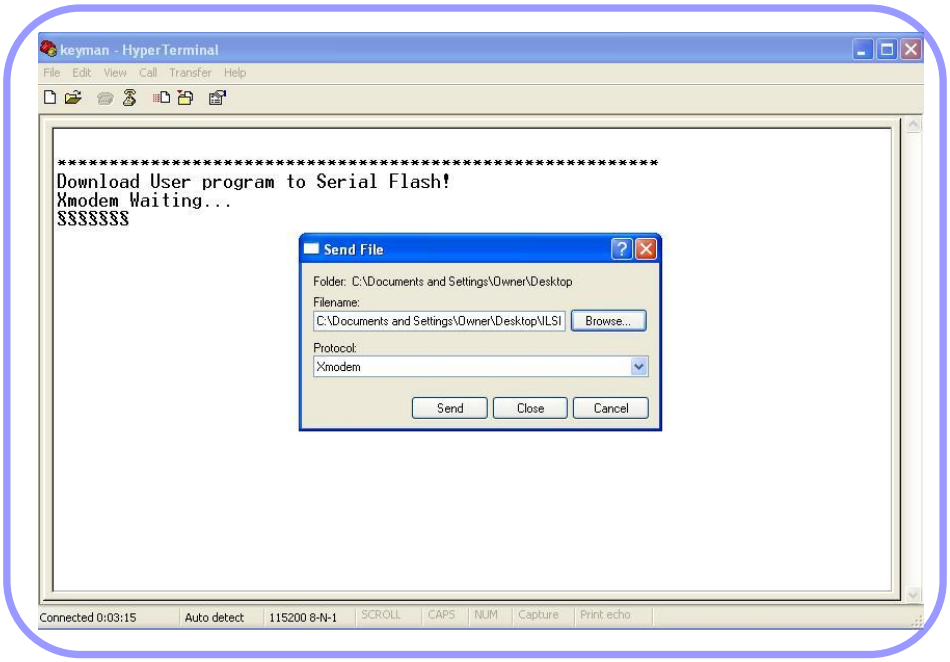

keyman - HyperTerminal
File Edit View Call Transfer Help
New Connection
Open...
Save
Save As...
Page Setup...
Print...
Properties
Exit Alt+F4
Displays the properties of the current session


keyman - HyperTerminal
File Edit View Call Transfer Help
Connect To
keyman
Enter details for the phone number that you want to dial:
Country/region: United States (1)
Area code: 000
Phone number:
Connect using: COM3
OK
Cancel
Disconnected
Auto detect
Auto detect
SCROLL
CAPS
NUM
Capture
Print echo

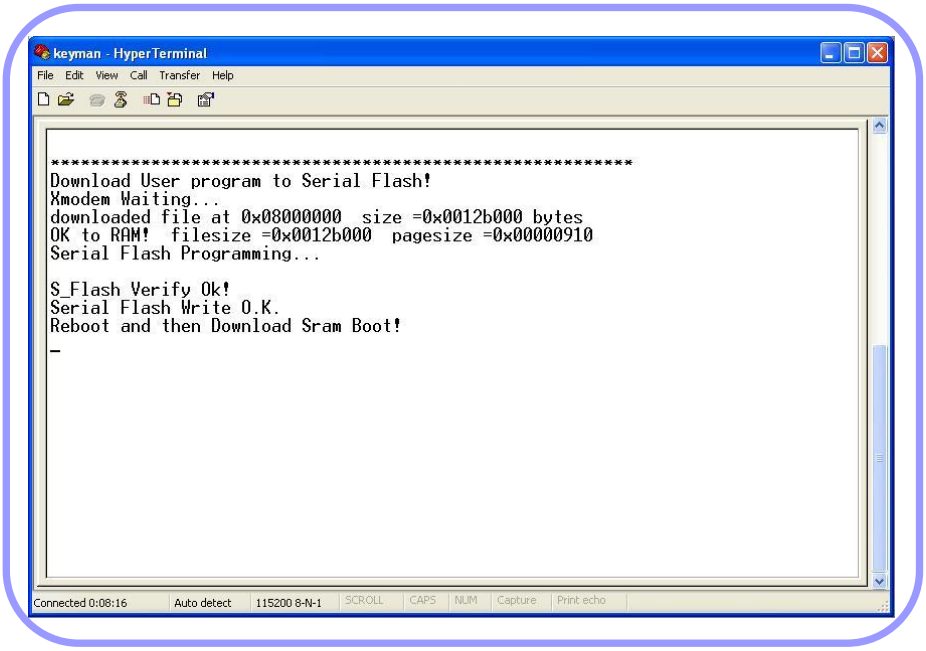

keyman - HyperTerminal
File Edit View Call Transfer Help
keyman Properties
Connect To
Settings
COM3 Properties
Port Settings
Bits per second: 115200
Data bits: 8
Parity: None
Stop bits: 1
Flow control: None
Restore Defaults
OK
Cancel
Apply
Disconnected
Auto detect
Auto detect

- When setting the port is completed, select Transfer in the full down menu of Hyper Terminal and click Send.
  Select Upgrade Program Keyman S1_X_XX.bin File, which is saved in the PC, by clicking Brows button of Filename. Select Xmodem as a protocol, and click Send.



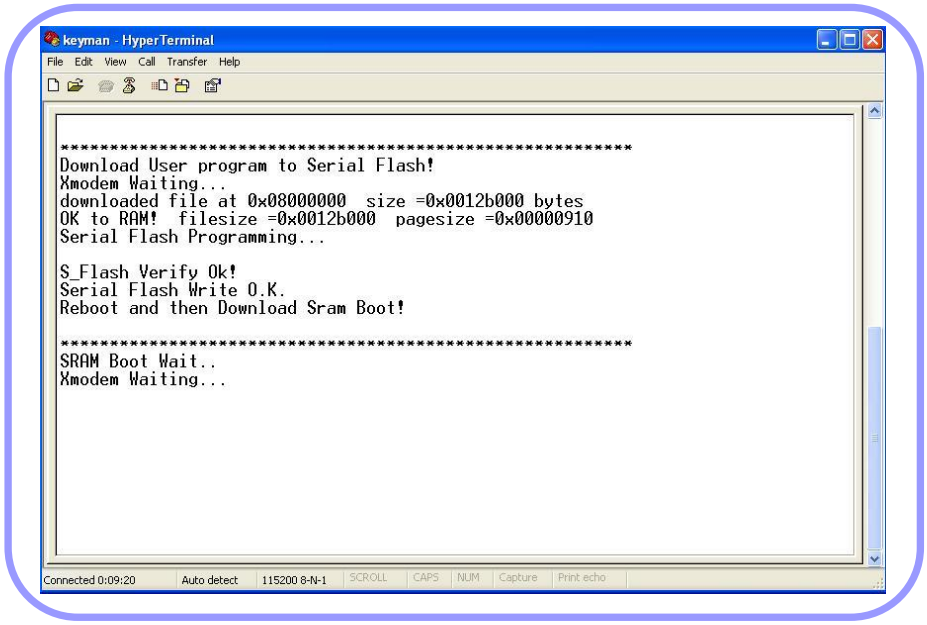


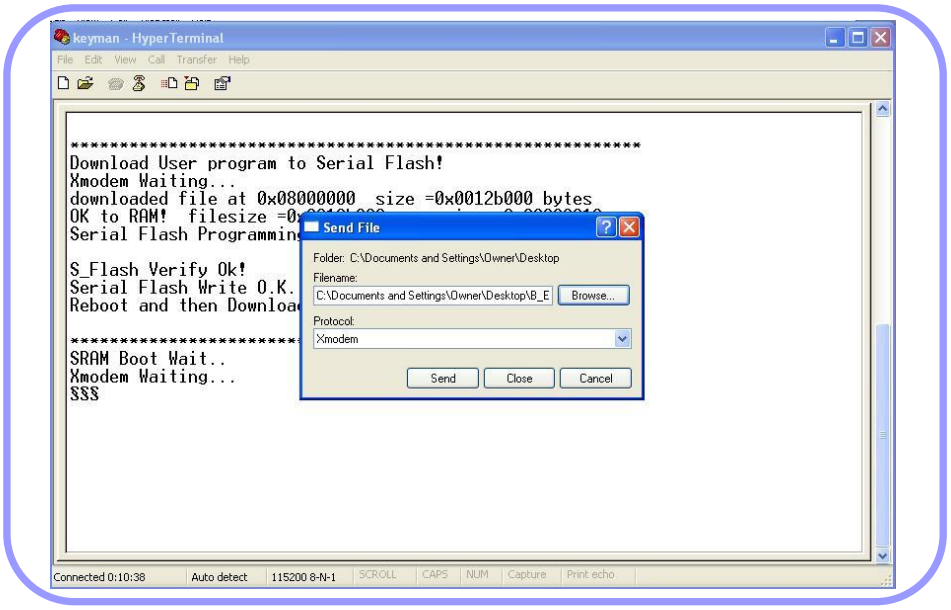
- When a message as below appears after the file transfer is completed, turn off the power by pushing emergency reset button.

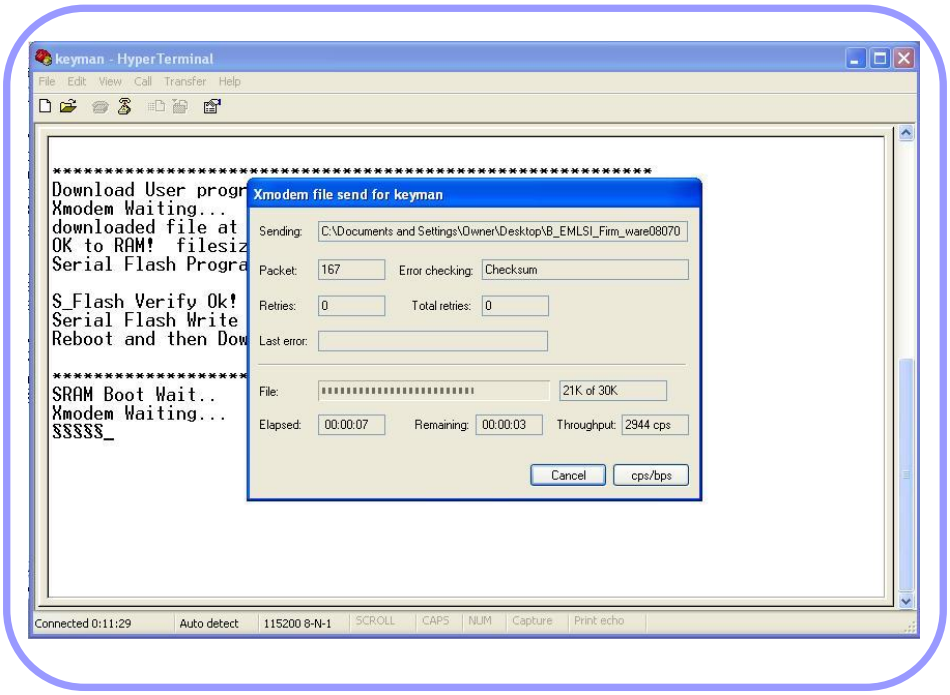


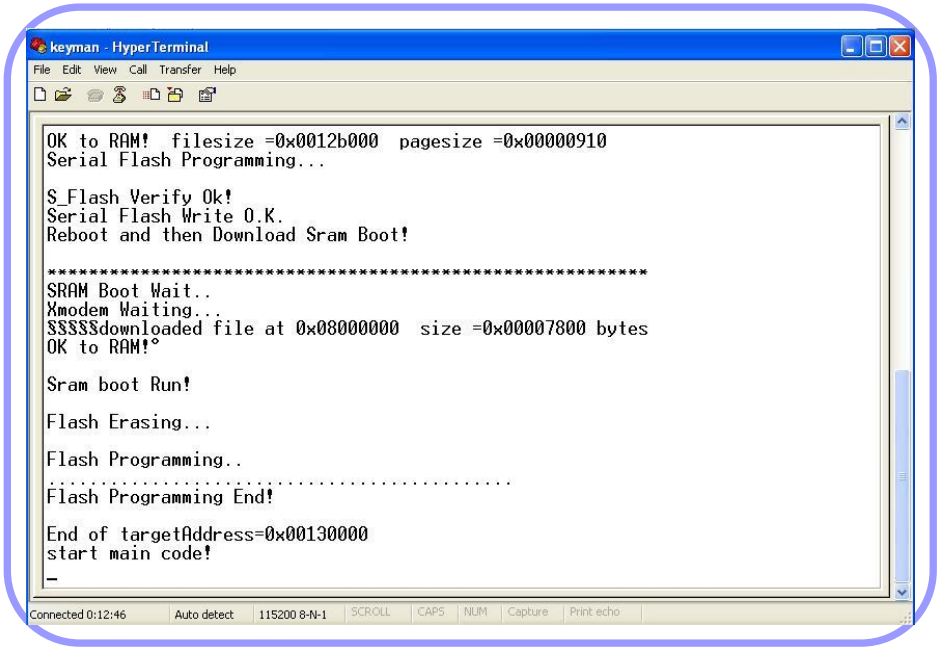
- Push, simultaneously, both ESC key and Power Key together

  (If the Logo screen is displayed without freezing the screen and the interface adapter is operated, perform it again after turning off the power).




keyman - HyperTerminal
File Edit View Call Transfer Help
Download User program to Serial Flash!
Xmodem Waiting...
downloaded file at 0x08000000 size =0x0012b000 bytes
OK to RAM! filesize =0x
Serial Flash Programmin
S_Flash Verify Ok!
Serial Flash Write O.K.
Reboot and then Downloa
SRAM Boot Wait..
Xmodem Waiting...
SSS
Send File
Folder: C:\Documents and Settings\Owner\Desktop
Filename:
C:\Documents and Settings\Owner\Desktop\B_E
Browse...
Protocol:
Xmodem
Send
Close
Cancel
Connected 0:10:38
Auto detect
115200 8-N-1
SCROLL
CAPS
NUM
Capture
Print echo


keyman - HyperTerminal
File Edit View Call Transfer Help
Download User progr
Xmodem Waiting...
downloaded file at
OK to RAM! filesiz
Serial Flash Progra
S_Flash Verify Ok!
Serial Flash Write
Reboot and then Dow
SRAM Boot Wait..
Xmodem Waiting...
SSSSS_
Xmodem file send for keyman
Sending: C:\Documents and Settings\Owner\Desktop\B_EMLSI_Firm_ware08070
Packet: 167
Error checking: Checksum
Retries: 0
Total retries: 0
Last error:
File:
21K of 30K
Elapsed: 00:00:07
Remaining: 00:00:03
Throughput: 2944 cps
Cancel
cps/bps
Connected 0:11:29
Auto detect
115200 8-N-1
SCROLL
CAPS
NUM
Capture
Print echo



- Once the transfer is completed, the interface adapter is automatically booted with an alarm sound.