NEWHAVEN DISPLAY INTERNATIONAL

SYSTEM CERTIFICATION ISO 9001:2008 SGS

User's Guide

LCD Safe Handling Procedure

For product support, contact

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USING LCD MODULES

LIQUID CRYSTAL DISPLAY MODULES

LCD's are composed of glass, liquid crystal fluid, and a polarizer. Please pay attention to the following items when handling:

1. Keep the temperature within a specified range for use and storage. Polarization degradation, bubble generation or polarizer peel-off may occur with high temperatures and high humidity.
2. Do not touch, push or rub the exposed polarizer with anything harder than an HB lead pencil (glass, tweezers, etc).
3. N-hexane is recommended for cleaning the adhesives used to attach the front/rear polarizer. Reflectors made of organic substances will be damaged by chemicals such as acetone, toluene, ethanol and isopropyl alcohol.
4. If the display surface becomes contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If it is heavily contaminated, wipe it gently with absorbent cotton or another soft material like a chamois soaked in Isopropyl alcohol or Ethyl alcohol. Scrub gently to avoid damaging the display surface.
5. Wipe off saliva or water immediately! Contact with water over a long period of time may cause deformation or color fading.
6. Avoid contact with oil or any greasy substances.
7. If there is condensation on the surface and contact with the terminals while cold, it will damage, stain or dirty the polarizer. After the product is tested at a low temperature, they must be warmed up in a container before being exposed to room temperature environments.
8. Do not put or attach anything on the display area in order to avoid leaving marks.
9. Do not touch the display with bare hands. This will stain the display area and degrade the insulation between terminals. (Some cosmetics are detrimental to the polarizer).
10. Exercise care to minimize corrosion of the electrode. Corrosion of the electrodes is accelerated by water droplets, moisture condensation or a current flow in a high-humidity environment.
11. As glass is fragile, care should be taken to avoid chipping, while handling the edges especially.

PRECAUTIONS FOR HANDLING LCD MODULES

Since the LCD module has been assembled and adjusted with a high degree of precision, avoid applying excessive shock or force to the module or making any alterations or modifications to it.

1. Do not alter, modify or change the shape of the tab on the metal frame.
2. Do not make extra holes on the printed circuit board, modify its shape or change the positions of components to be attached.
3. Do not damage or modify the pattern wiring on the printed circuit board.
4. Absolutely do not modify the zebra rubber strip (conductive rubber) or heat the seal connector!
5. Except for soldering the interface, do not make any alterations or modifications with a soldering iron.
6. Do not drop, bend or twist the LCD module. In particular, don't forcibly pull or bend the I/O cable or backlight cable.

7. In order to avoid cracking the FPC, pay attention to the area where the FPC is bent, the edge of the overlay, the area of the surface of Ni-Au plating, the area of soldering land, and the area of the through hole.

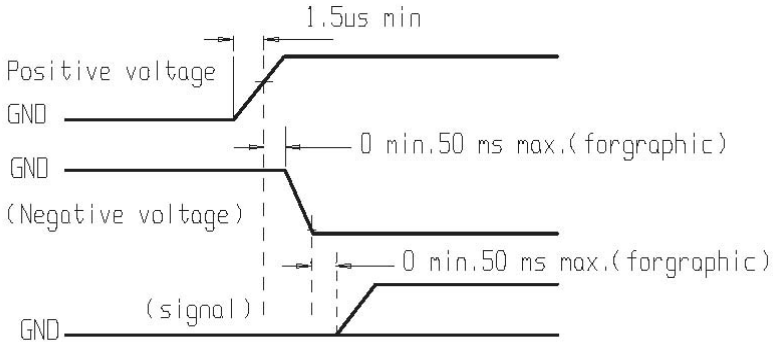
ELECTRO-STATIC DISCHARGE CONTROL

Since this module uses a CMOS LSI, give the same careful attention to the electrostatic discharge as you would for an ordinary CMOS IC.

1. Make sure you are grounded when handling LCD modules. To minimize the performance degradation of the LCD modules resulting from destruction caused by static electricity, exercise care to avoid holding the following sections when handling the modules: exposed area of the printed circuit board, terminal electrode sections.
2. Before removing the LCD module from its packing case or incorporating it into a set, be sure the module and your body have the same electric potential.
3. When soldering the terminal of the LCD module, make sure the AC power source for the soldering iron does not leak.
4. When using an electric screwdriver to attach the LCD module, the screwdriver should be of ground potentiality, to minimize any transmission of electromagnetic waves producing sparks coming from the commutator of the motor.
5. As far as possible, make the electric potential of your work clothes and that of the work bench the ground potential.
6. To reduce the generation of static electricity, be careful that the air in the working environment is not too dry. (A relative humidity of 50-60% is recommended).

PRECAUTIONS FOR OPERATION

1. Viewing angle varies with the change of liquid crystal driving voltage (VO). Adjust VO to show the best contrast.
2. Driving the LCD in the voltage above the limit shortens its life.
3. If the LCD modules have been operating for a long time showing the same display patterns, the display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. A normal operating status can be regained by suspending use for some time. It should be noted that this phenomenon does not adversely affect performance reliability.
4. Response time is greatly delayed at temperatures below the operating temperature range, however this does not mean the LCD will be out of order. It will recover when it returns to the specified temperature range.
5. If the display area is pushed hard during operation, the display may become abnormal, however it will return to normal if it is turned off and then turned back on.
6. Condensation on terminals can cause an electrochemical reaction disrupting the terminal circuit, therefore it must be used under the relative condition of 40°C, 50% RH.
7. When turning the power on, input each signal after the positive/negative voltage becomes stable.



STORAGE

WHEN STORING LCD'S, THE FOLLOWING PRECAUTIONS ARE NECESSARY:

1. Store them in a sealed polyethylene bag. If properly sealed, there is no need for desiccant.
2. Store them in a dark place; do not expose them to sunlight or fluorescent light. Keep the temperature between 0°C and 35°C.
3. The polarizer surface should not come in contact with any other objects. (We advise you to store them in the container in which they were shipped).
4. Environmental conditions:
    A). Do not leave them for more than 160 hours at 70°C
    B). They should not be left for more than 48 hours at -20°C

SAFETY

1. It is recommended to crush damaged or unnecessary LCDs into pieces and wash them off with solvents such as acetone and ethanol, which should later be burned.
2. If any liquid leaks out of a damaged glass cell and comes in contact with the hands, wash off thoroughly with soap and water.

LIMITED WARRANTY

Newhaven Display MAKES NO WARRANTY RESPECTING THE MERCHANTABILITY OF THE PRODUCTS OR THEIR SUITABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OR USE OR RESPECTING INFRINGEMENT. Newhaven Display's liability arising out of any sale of products to Customer is expressly limited to repair and/or replacement of such Products, at Newhaven Display's election, with such remedies exclusive and in lieu of all others. Newhaven Display will not be responsible for any subsequent or consequential events or injury or damage to any personnel or user including third party personnel and/or user. This warranty is in lieu of any and all other warranties, whether oral, written, expressed, implied or statutory. Implied warranties of fitness for a particular purpose and merchantability are specifically excluded and shall not apply. Customer's obligations and Newhaven Display's remedies with respect to defective or nonconforming products, are solely and exclusively as stated herein. Furthermore, no warranty will apply if the Product has been subject to misuse, static discharge, neglect, accident, modification, or has been soldered or altered in any way or if any of the LCD handling precautions have been disregarded. Broken glass, scratches on polarizer, mechanical damages, as well as defects that are caused by accelerated environment tests are excluded from warranty. In returning products, they must be returned in their original packaging. If the original packaging is not used, the returned product must be properly packaged to prevent damage or warranty will be void. There must be a detailed description of the failures or defect for each returned part.

RETURN LCD MODULES UNDER WARRANTY

The Customer must notify Newhaven Display within one year from date of shipment of any defective product. If Newhaven Display agrees to accept a return, return freight charges may be paid by Newhaven Display. Newhaven Display will not accept COD shipments. Contact a sales representative for a Return Materials Authorization Number and addressing instructions prior to returning product.

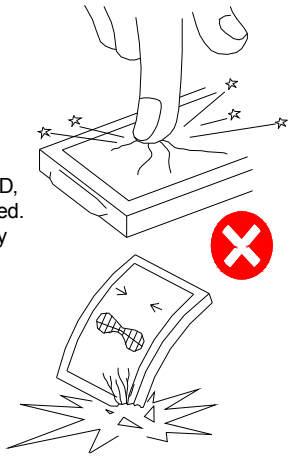
Handling Precautions

1. Limitation of Application:
Newhaven products are designed for use in ordinary electronic devices such as business machines, telecommunications equipment, measurement devices..etc. Please handle the products with care. (See below)
Newhaven products are not designed, intended or authorized for use in any application which the failure of the product could result in a situation where personal injury or death may occur. These applications include, but are not limited to: life-sustaining equipment, nuclear control devices, aerospace equipment, devices related to hazardous or flammable materials...etc. (If Buyer intends to purchase or use the Newhaven products for such unintended or unauthorized applications, Buyer must secure prior written consent to such use by a responsible officer of Newhaven Display). Should Buyer purchase or use Newhaven products for any such unintended or unauthorized application (without such consent), Buyer shall indemnify and hold Newhaven and its officers, employees, subsidaries, affiliates and distributors harmless against all claims, costs, damages and expenses, and reasonable attorney's fees, arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Newhaven was negligent regarding the design or manufacture of the part.

2. Industrial Rights and Patents
Newhaven shall not be responsible for any infringement of industrial property rights of third parties in any country arising out of the application or use of Newhaven products, except which directly concern the structure or production of such products.

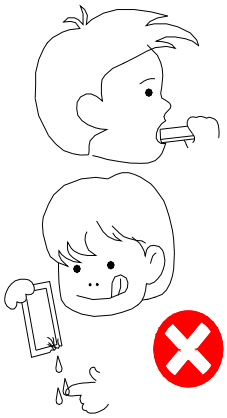
Do Not Press!

If pressure is applied to LCD, orientation may be disturbed. The LCD can be broken by shock!



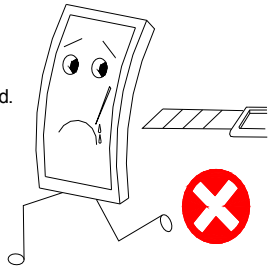
Don't Swallow or Touch Liquid Crystal!

Liquid Crystal may leak if the display breaks. If it accidentally gets on your hands, wash them with soap and water!



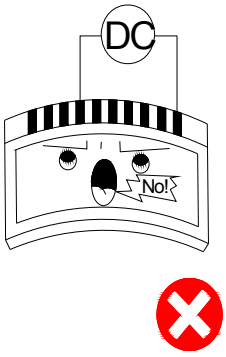
Do Not Scratch!

Polarizer is a soft material and can easily be scratched.



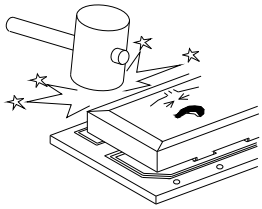
No DC Voltage to LCD!

DC voltage or higher voltage than specified will reduce the lifetime of the LCD.

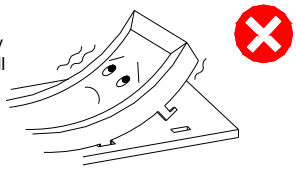


Do Not Put Pressure on the Metallic Frame or Disassemble the LCD Module

Pressure on the metallic frame and PCB may deform the conductive rubber or break the liquid crystal cell and backlight, which will cause defects.

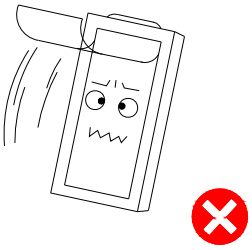


LCD may be shifted or conductive rubber may be reshaped, which will cause defects.



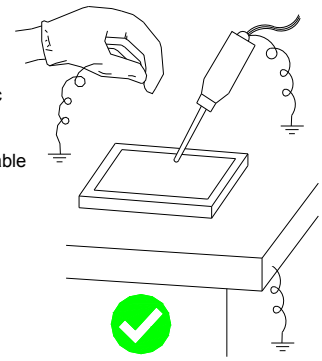
Slowly Peel Off Protective Film!

Avoid static electricity.



Avoid Static Electricity!

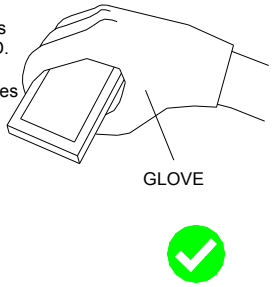
Please be sure to ground human body and electric appliances during work.
It is preferable to use a conductive mat on the table and wear cotton clothes or conduction processed fiber. Synthetic fiber is not recommended.



Wear Gloves While Handing!

It is preferable to wear gloves to avoid damaging the LCD.

Please do not touch electrodes with bare hands or leave any residue.

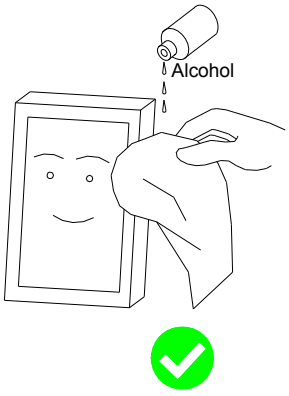


Keep Away From Extreme Heat and Humidity!

LCD deteriorates.

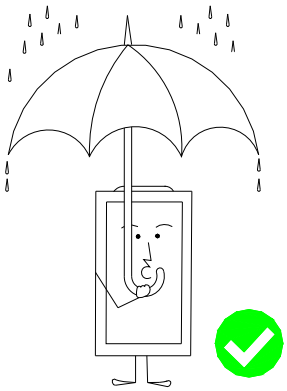
Use Alcohol to Clean Terminals!

When attaching with the heat seal or anisotropically conductive film, wipe off with alcohol before use.



Don't Drop Water on LCD!

Note that the presence of waterdrops or dew in the LCD panel may deteriorate the polarizer or corrode the electrodes.



Precaution in Soldering LCD Module

Basic instructions: Solder I/O terminals only.
Use soldering iron without leakage.
(1)Soldering condition to I/O terminals
Temperature at tip of the iron: 280±10°
Soldering time: 3~4 sec.
Type of solder: Eutectic solder (containing colophony-flux)
*Do not use flux because it may soak into the LCD Module or contaminate it.
*It is preferable to peel off protective film on the display surface after soldering I/O terminals are complete.
(2)Remove connector or cable
*When you remove connector or cable soldered to I/O terminals, please confirm that solder is fully melted. If you remove by force, electrodes at I/O terminals may be damaged(or stripped off).
*It is recommended to use a solder suction machine.

Long-term Storage

If it is necessary to store LCD modules for a period of time, please comply with the following procedures.
If storage conditions are not satisfactory,the display(especially polarizer) or soldering I/O terminals may become difficult(some oxide is generated at I/O terminals plating).
1.Store as delivered by Newhaven.
2.If you store it unpacked, put it in an anti-static bag, seal its opening and store where it is not subjected to direct sunlight or fluorescent light.
3.Store at temperature 0 to +35° and at low humidity.Please refer to our specification sheets for storage temperature range and humidity conditions.

Long-term Storage

Please use power supply with built-in surge protection circuit.