

# Care and Handling of Liquid Crystal Displays

*Application Note 821-01*

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*This Application Note describes the methods to care for and handle LCDs to avoid damage.*

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## LCD Handling Precautions

LCDs typically have a life between 5 and 20 years. To prolong the life of your LCD, take note of the following precautions.

### ***Impact and Scratching***

LCDs are made of glass, so care should be taken to avoid any type of mechanical stress including shock, impact, and torque or tension.

The front and rear surfaces of an LCD are typically laminated with a soft plastic polarizing material. The polarizer can easily be damaged by impact, scratching, or rubbing the LCD's surfaces. The front polarizer is usually protected by a removable "release liner" which should be removed no sooner than necessary. This protective film can best be removed by applying some hi-tack adhesive tape to it, and then peeling the tape back.

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**Note:** Some LCDs provided by Planar have a rear release liner in addition to the front protective sheet.

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### ***Environmental Factors***

Ultra-violet light will deteriorate an LCD over time. All Planar LCDs using a front polarizer are equipped with a UV-reduction filter, however even these filters are subject to damage and loss of effectiveness from prolonged exposure to UV. The life of the polarizer can be extended by placing a protective transparent material in front of the display in your application.

Avoid extended operation or storage at the extreme limits of the temperature and humidity range. To prolong LCD life, artificial environmental control should be considered. The use of a cooling fan, for example, may be appropriate if the LCD will be exposed to high temperatures for long periods.

### ***Direct Current***

For optimum LCD operation, DC components of an LCD's drive signal must be within the specifications for the LCD. Operation outside of the specifications—DC offset—can cause plating, fluid breakdown, bubbles within the LCD viewing area, and/or "front to back" electrical shorts.

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## Cleaning LCDs

To clean the surface of the LCD, gently wipe the LCD with a nonabrasive soft dry cloth. To avoid damaging the front and rear surfaces of the LCD, do not scrub hard. If desired, moisten the cloth with a solution of 25% isopropyl alcohol (IPA) and 75% deionized or distilled water.

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**Note:** Date code information is required should parts be returned for analysis or credit. IPA will remove the LCD's date code. IPA may also damage any other inks printed by Planar on the exterior surfaces of the LCD. For these reasons it is suggested that the IPA concentration, or alternate cleaning method or solvent, be evaluated on a design-by-design basis.

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Immediately dry the LCD with forced "air" (clean, dry compressed gas). Remove condensation/water drops immediately as water can stain, swell, or cause polarizers to fade. Water or other electrolytes on the contacts when the LCD is activated can cause corrosion of the conductors.

Do not immerse the LCD in any cleaning solution. The polarizers are immediately damaged by contact with most organic solvents.

## Bonding Connectors to LCDs

The LCD ledge must be cleaned on LCDs which will be receiving a flex bond. At a minimum, wipe the LCD ledge with a non-abrasive applicator soaked with IPA or Ethanol immediately prior to the bond operation. The exact cleaning method depends upon the type of flex connector that is being used. Contact the manufacturer of the flex material to determine the best cleaning method for your application.

## Soldering LCDs with Terminals

Terminals are phosphor-bronze with a 60/40 tin plate. We suggest soldering at 300 °C for 5 seconds maximum. Care should be taken not to allow the LCD to exceed its maximum rated storage temperature while soldering. Also, the LCD surface should not be subjected to possible splattering of solder/flux since these would cause cosmetic defects.

The pins on Planar LCDs are solderable in accordance with ISO-610A. The rated shelf life for solderability to this specification is one year when stored at < 27 °C, < 70% RH.

Cleaning after soldering should be performed in accordance with the above cleaning instructions.

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Visit the Planar website: <http://www.planar.com>

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