



Datasheet

Compact Panel

DI-150X02-A01

SA-02-018

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1 Revision History

| Date | Rev.No. | Description | Page |
|------------|---------|-------------------------------|------|
| 30.05.2007 | 1.0 | First release of datasheet | All |
| 09.07.2007 | 1.0 | T _{Storage} adjusted | 4 |
| 25.07.2007 | 1.0 | Drawings updated | 18 |

2 General Description

DI-150X02-A01 from DDGroup's Compact Panel Series is an open frame monitor providing an analog RGB and DVI interface for 15" XGA TFT-LCD panels with a high quality screen image and is designed for a wide temperature range usage. This monitor supports from VGA to UXGA resolution at a maximum of 85Hz refresh rate (refer to section 6.2) with automatic up- and downscaling function to full screen size.

It gives a lot of convenience to the user in installing various applications such as gaming, amusement, industry and so on and accessing the GUI (Graphic User Interface).

| ITEM | DESCRIPTION | REMARKS |
|-------------------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| Model Name | DI-150X02-A01 | |
| LCD Module | G150X1-L0x | Refer to section "4.1 Panel Specification" |
| Input Signal | Analog RGB Digital DVI DC 12V/2.2A * | * Measured at 23°C ambient temperature |
| Resolution | Horizontal: Typ. 48.3, Max. 60 KHz Vertical: Typ. 60, Max. 75 Hz Analog RGB : VGA/SVGA/XGA/SXGA/UXGA | Special timing available 1600x1200 @ 60Hz Max. |
| Receptacle | DC Jack, KEY Connector, RGB Connector, DVI Connector | |
| User Controls | 5 Buttons Controls | |
| Image Scaler | gm5621 | Genesis Microchip |
| Power Consumption | 27W Max * | * Measured at 23°C ambient temperature |
| Dimension | 342,5mm x 253,5mm x 25,0mm | Refer to section "7. Mechanical Specification" |
| Plug & Play | DDC 2B | VESA |
| Power Management | Supports VESA DPMS | |

DI-150X02-A01 is a  certified product.

DI-150X02-A01 is RoHS compliant.

3 Absolute Maximum Ratings

| Item | Symbol | Min. | Max. | Unit | Note |
|---------------------------------------------|--------|------|------|------|----------|
| Storage temperature | TSTG | -25 | 70 | °C | (1), (5) |
| Operating temperature (Surface of Glass) | TOPR | -10 | 60 | °C | (1), (5) |
| Shock (non-operating) | Snop | - | 50 | G | (2), (4) |
| Vibration (non-operating) | Vnop | - | 1.5 | G | (3), (4) |

Note

- (1) 90 % RH Max. ($40\text{ °C} \geq T_a$)
Maximum wet-bulb temperature at 39 °C or less. ($T_a > 40\text{ °C}$) No condensation.
- (2) 11 ms, sine wave, 1 time for $\pm X, \pm Y, \pm Z$ axis
- (3) 10-500-10 Hz, Sweep rate 10 min, 30 min for X, Y, Z axis
- (4) At testing Vibration and Shock, the fixture which holds the module to be tested has to be hard and rigid enough so that the module would not be twisted or bent by the fixture.
- (5) If product is used for extended time excessively or exposed to high temperatures for extended time, there is a possibility of wide viewing angle film damage which could affect visual characteristics.

4 Electrical Specification

4.1 Panel Specification

| Item | Description | Unit |
|---------------------------|---------------------------------------------------------------------------|--------|
| Type No. | Chi Mei G150X1-L0x | |
| Size | 15" Diagonal | Inch |
| Active Display Area | 304.1 x 228.1 | mm |
| Number of Pixels | 1024 (H) x 768 (V) | |
| Pixel Arrangement | RGB Vertical Stripe | |
| Pixel Pitch | 0.297 x 0.297 | mm |
| Color Depth | 16.2M True Color | |
| Surface Treatments | Hard Coating (3H), Haze 25% | |
| Viewing Angle (CR≥ 10) | Horizontal : Θ L 80 Θ R 80 Vertical : Φ U 80 Φ D 80 | degree |
| Contrast Ratio | Typ. 700:1 | |
| Response Time | Rise time (tr) : 5 (Typ.) Fall time (tf) : 20(Typ.) | ms |
| Average Brightness | Typ. 450 | cd/m2 |
| Frame Rate | Typ. 60, Max. 75 | Hz |
| Panel Dimension | (WHD) 326,5 x 253,5 x 14,0 | mm |
| CCFL | 2 Lifetime: 50.000 hours (min.) | |

4.2 Input Signal Characteristics

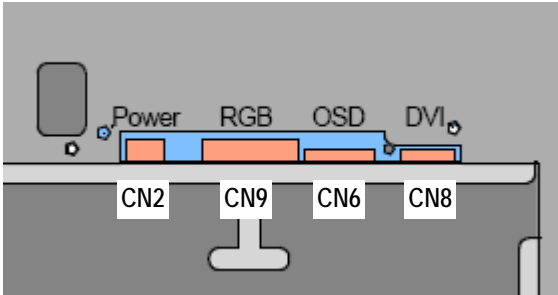
| Input Signal | Description | Unit | Min | Typical | Max | Remarks |
|--------------|----------------------|-------|------|---------|------|-----------------|
| DC input | DC Voltage | Vdc | 11.4 | 12 | 13,2 | |
| | Power Consumption | Watts | | 22 | 27 | for full Option |
| 15Pin D-Sub | Video(SOG) | Vp-p | | 0.7 | 1.0 | 75Ω Terminated |
| | Sync Voltage | Vp-p | | 5.0 | | |
| | Horizontal Frequency | kHz | 31 | 48 | 60 | Depends on Mode |
| | Vertical Frequency | Hz | 55 | 60 | 75 | Depends on Mode |

4.3 Power Management

VESA DPMS standard is applied for power management control.

| Mode | HSync. | VSync. | LED (red) | LED (grn) | Power Consumption (nominal) |
|----------|----------|----------|-----------|-----------|-----------------------------|
| On | Active | Active | Off | On | < 27 W |
| Stand-by | Inactive | Active | Blinking | Off | < 3 W |
| Suspend | Active | Inactive | Blinking | Off | |
| Off | Inactive | Inactive | Off | Off | |

4.4 Connector Pin Assignments



4.4.1 CN2: DC Input

| Part No. | Pin No. | Description | Remarks |
|----------------|---------|-------------|---------|
| PHR-4 (JST) | 1,2 | GND | |
| | 3,4 | Vcc(12V) | |

4.4.2 CN6: OSD-Panel

| Part No. | Pin No. | Description | Remarks |
|-----------------------|---------|----------------------|------------------|
| 53261-1490 (MOLEX) | 1 | LED2 | |
| | 2 | LED1 | |
| | 3 | GND | |
| | 4 | POWER | |
| | 5 | GND | |
| | 6 | MENU | |
| | 7 | RIGHT (Brightness +) | |
| | 8 | NC | Option in 8 keys |
| | 9 | NC | Option in 8 keys |
| | 10 | LEFT (Brightness -) | |
| | 11 | EXIT | |
| | 12 | AUTO | |
| | 13 | GND | |
| | 14 | +3.3V (100mA) | |

4.4.3 CN8: DVI Input

| Part No. | Pin No. | Description | Remarks |
|-----------------------|---------|-------------|---------|
| 100SH-15MT (Nexus) | 1 | RX2- | |
| | 2 | RX2+ | |
| | 3 | GND | |
| | 4 | DVI_SCL | |
| | 5 | DVI_SDA | |
| | 6 | GND | |
| | 7 | RX1- | |
| | 8 | RX1+ | |
| | 9 | GND | |
| | 10 | RX0- | |
| | 11 | RX0+ | |
| | 12 | DVI_5V | |
| | 13 | RXC+ | |
| | 14 | RXC- | |
| | 15 | Hotplug | |

4.4.4 CN9: Analog RGB Input

| Part No. | Pin No. | Description | Remarks |
|-------------------------|---------|-----------------|---------|
| S13B-PH-SM3-TB (JST) | 1 | CABLE DETECT | |
| | 2 | DDC SDA | |
| | 3 | DDC SCL | |
| | 4 | RED GND | |
| | 5 | RED INPUT | |
| | 6 | GREEN GND | |
| | 7 | GREEN INPUT | |
| | 8 | BLUE GND | |
| | 9 | BLUE INPUT | |
| | 10 | NC | |
| | 11 | VERTICAL SYNC | |
| | 12 | SYNC GND | |
| | 13 | HORIZONTAL SYNC | |

5 Operation Guide

5.1 Installation

This monitor is designed as a RGB/DVI monitor using a 15" TFT LCD panel. This section provides some guidelines for assembly and preparation of a finished display solution. Before proceeding, it is important to familiarize yourself with the parts making up a system and the various connectors, mounting holes and general layout of the monitor. Please follow the below procedure.

1. **Appearance Inspection**
Please check the monitor whether it is damaged in appearance or not during transportation. And assemble this monitor to your system or applications.
2. **Signal Inputs Connection**
Analog input is available. Please refer to the clause 5.4 Connector Pin Assignment and connect the signal what you want to apply to the monitor. Especially, the Analog RGB cable may affect the visual characteristics and regulatory emission test. So, a suitably shielded cable should be used.
3. **Power Input Connection**
Refer to the 5.4 Connector Pin Assignment and connect the power input cable to the monitor. Every connection is done but you should consider electrical insulation, grounding, EMI shielding and heat & ventilation.
4. **Apply Power**
Apply power and turn on the monitor and refer to the following clause.

5.2 OSD Adjustment

DI-150X02-A01 gives a various and very easy graphics interface to its users. Users have easy access to the functions that they want to adjust. Be sure that your system's power and LED are turned on, before the OSD controls are being used.

5.2.1 Key Name and Function

| Key name | Description |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power | Turns ON/OFF the system |
| Menu | - Opens the main menu - Confirmation button for selected menu points - Back to the sub menu |
| Exit | - Toggles the input between RGB/DVI input - Goes directly to the exit icon, when the OSD main or sub menu is shown. The exit icon must still be confirmed via the Menu – button to leave the OSD menu! |
| Left | - Activates directly the brightness menu - To decrease setting bars - Menu icon selection to the left |
| Right | - Activates directly the contrast menu - To increase setting bars - Menu icon selection to the right |

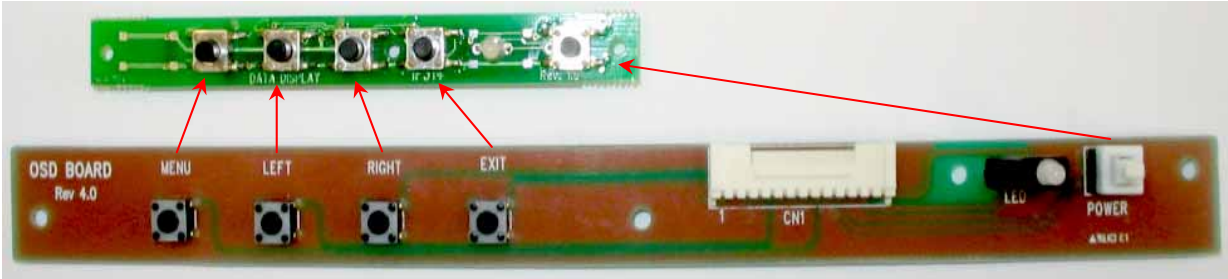
Accessing the menu system

1. With the OSD is off, push the **Menu** button to activate the main OSD menu.
2. Use the **Left** and **Right** buttons to move through the main menu. To select a desired sub menu, press the **Menu** button after your selection. The selection tabs are also highlighted and explained via onscreen text in the upper right of the OSD screen.
3. After selecting a sub menu, use the **Left** or **Right** buttons to move through the sub menu. To select a setting icon, press the **Menu** button after your selection. The selected icons are highlighted and explained via onscreen text in the lower right of the OSD screen.
4. There are two types of icons: Some have a single function and must be confirmed with the **Menu** button, the other option are setting bars. Once a setting bar appears, it can be increased or decreased via the **Left** and **Right** buttons. The setting bar moves and the numeric value indicator changes to reflect your adjustments.
NOTE: The numeric value indicator is provided as a point of reference only and has nothing to do with a real measurement.
5. There are several ways to close the OSD menu:
 - Waiting some seconds (timeout). This time can be adjusted as needed in one of the menus.
 - In the main and sub menu, press the **Exit** button. This highlights the "Exit" icon in the menu. Then press the **Menu** button to leave the OSD menu.
 - After an Autoadjust and confirmation the OSD menu closes automatically.
 - After adjusting a setting, press the **Menu** button to go back to the sub menu, then press the **Exit** button or use the **Right** button to select the "Exit" icon. Confirm via the **Menu** button and the OSD turns off.

5.2.2 OSD Structure

| Main Menu | 1st Level | 2nd Level | 3rd Level |
|-----------------------|---------------------|--------------------------|-----------|
| Input Select | RGB | | |
| | DVI | | |
| | Exit | | |
| Brightness - Contrast | Brightness | | |
| | Contrast | | |
| | Exit | | |
| Color | Auto Color | | |
| | sRGB | | |
| | Color Temperature | User | Red |
| | | | Green |
| | | | Blue |
| | | 4200k | |
| | | 5000k | |
| | | 6500k | |
| | | 7500k | |
| | | 9300k | |
| | Exit | | |
| | Exit | | |
| Image | Auto configuration | | |
| | Width | | |
| | Phase | | |
| | Horizontal Position | | |
| | Vertical Position | | |
| | Exit | | |
| Tools | OSD Settings | OSD Timeout | |
| | | OSD Hor. Position | |
| | | OSD Ver. Position | |
| | | OSD Direction | Normal |
| | | | Mirror |
| | | | Left |
| | | | Right |
| | | | Down |
| | | | Exit |
| | | Exit | |
| | | Factory Reset | |
| | | Factory Reset (Color) | |
| | | Factory Reset (Position) | |
| | Sharpness | | |
| | Overlapped Mode | | |
| | Exit | | |
| Exit | | | |

5.2.3 Window structure



Available OSD controller boards

5.2.4 Detailed description of the On-Screen-Menu

The following paragraphs describe the OSM main and sub-menus and the associated functions.

Adjusted menu items will be saved if

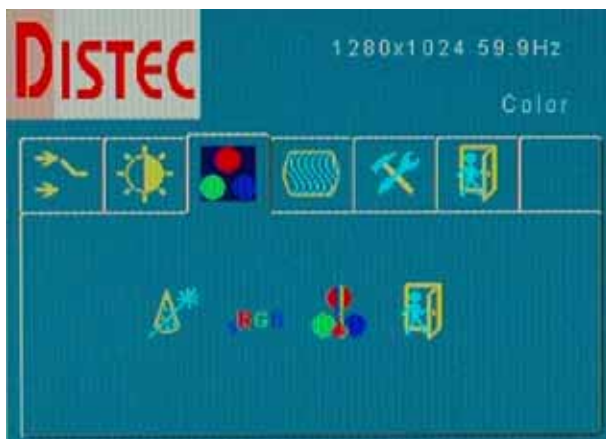
- The OSM is closed by selecting and confirming the Exit Menu icon
- Toggling the sleep mode with the Power Key
- Selecting the green smiley after Autoconfiguration in Color or Image menu
- Resetting the color value to sRGB default

Brightness – Contrast



- **Brightness:** Adjusts display brightness. If supported, brightness will be regulated using the connected inverter.
- **Contrast:** Adjusts image contrast

Color



- **Autoconfiguration:** Performs a calibration of the ADC for optimum colors. For best result, black and white level should be present in the image.
- **sRGB:** Return to default sRGB color values (also activates sRGB color space)
- **Color Temperature:** Allows you to choose different values for the color temperature including a user defined setting in RGB color space.

Image



- **Autoconfiguration:** Optimizes the displayed image. Adjusts phase and image position automatically.
- **Width:** Adjusts image width.
- **Phase:** Adjusts image phase.
- **Horizontal position:** Adjusts horizontal image position.
- **Vertical position:** Adjusts vertical image position

Tools & OSD



- **OSD**
 - **OSD Timeout:** The OSD vanishes after a certain time of inactivity. Values of 2-16s are possible
 - **OSD Horizontal Position:** Adjusts position horizontally
 - **OSD Vertical Position:** Adjusts position vertically
 - **OSD Direction:** The rotation function a submenu which has five directional buttons to rotate/flip the OSD
- **Factory reset:** Return to factory default values
- **Factory reset (color):** Return color settings to factory default values
- **Factory reset (Position):** Return position settings to factory default values
- **Sharpness:** Modifies the image filtering with shrinking and expansion
- **Overlapped mode:** DOS compatibility mode for 640 / 720 resolutions

Exit



Use this submenu to exit the On-Screen-Menu. In the lower right corner the actual Firmware revision and the OSD revision are displayed.

6 Appendix

6.1 Available Accessories

The following accessories are available for DI-150X02-A01:

| Distec order code | Item |
|-------------------|--------------------------------------------------------------|
| DB-09-011 | Consumer cable set (RGB- & Power-Cable, OSD-Keypad) with PCB |
| DB-09-012 | Distec cable set (RGB- & Power-Cable, OSD-Keypad) |
| KA-30-116 | DVI cable (in addition to one of the cable sets!) |
| | |
| DB-07-227R1.1 | AC Adapter-LSE9901B1260 (12V/5A) |
| DB-07-225 | Power Cable for Germany |
| DB-07-226 | Power Cable for Great Britain |

6.2 Supported Display Modes

| Mode | Active Resolution | Total Pixels | Horizontal Frequency (kHz) | H-Pol. | Vertical Frequency (Hz) | V-Pol. | Pixel Clock | Failsafe Mode ¹⁾ | RGB test | DVI test | Description |
|------|-------------------|--------------|----------------------------|--------|-------------------------|--------|-------------|-----------------------------|----------|----------|--------------------------------------------------|
| | 640x350@70 Hz | 800x449 | 31,469 | P | 70,087 | N | 25,175 | | X | X | |
| | 640x350@85 Hz | 832x445 | 37,861 | P | 85,08 | N | 31,5 | X | X | X | Black borders on the bottom and top of the image |
| | 640x400@56 Hz | 848x440 | 24,823 | N | 56,416 | N | 21,05 | | X | | |
| | 640x400@70 Hz | 800x449 | 31,469 | N | 70,087 | P | 25,175 | | X | X | |
| | 640x400@85 Hz | 832x445 | 37,861 | N | 85,08 | P | 31,5 | X | X | X | |
| VGA | 640x480@60 Hz | 800x525 | 31,5 | N | 60 | N | 25,2 | | X | X | |
| VGA | 640x480@67 Hz | 864x525 | 35 | N | 66,667 | N | 30,24 | | X | X | |
| VGA | 640x480@72 Hz | 832x520 | 37,861 | N | 72,809 | N | 31,5 | | X | X | |
| VGA | 640x480@75 Hz | 840x500 | 37,5 | N | 75 | N | 31,5 | | X | X | |
| VGA | 640x480@85 Hz | 832x509 | 43,269 | N | 85,008 | N | 36 | X | X | X | |
| | 720x350@70 Hz | 900x449 | 31,469 | P | 70,087 | N | 28,322 | | X | X | |
| | 720x350@85 Hz | 936x445 | 37,861 | P | 85,08 | N | 35,438 | X | X | X | Black borders on the bottom and top of the image |
| | 720x400@70 Hz | 900x449 | 31,469 | N | 70,087 | P | 28,322 | | X | X | |
| | 720x400@85 Hz | 936x446 | 37,927 | N | 85,039 | P | 35,5 | X | X | X | |
| SVGA | 800x600@56 Hz | 1024x625 | 35,156 | P | 56,25 | P | 36 | | X | X | |
| SVGA | 800x600@60 Hz | 1056x628 | 37,879 | P | 60,317 | P | 40 | | X | X | |
| SVGA | 800x600@72 Hz | 1040x666 | 48,077 | P | 72,188 | P | 50 | | X | X | |
| SVGA | 800x600@75 Hz | 1056x625 | 46,875 | P | 75 | P | 49,5 | | X | X | |
| SVGA | 800x600@85 Hz | 1048x631 | 53,674 | P | 85,061 | P | 56,25 | X | X | X | |
| | 832x624@75 Hz | 1120x654 | 49,107 | N | 75,087 | N | 55 | | X | X | |
| XGA | 1024x768@60 Hz | 1344x806 | 48,363 | N | 60,004 | N | 65 | | X | X | Optimum Display Mode |
| XGA | 1024x768@60 Hz | 1312x813 | 48,78 | N | 60 | N | 64 | | X | X | Optimum Display Mode |
| XGA | 1024x768@70 Hz | 1328x806 | 56,476 | N | 70,069 | N | 75 | | X | X | |
| XGA | 1024x768@72 Hz | 1304x798 | 57,515 | P | 72,074 | P | 75 | | X | X | |
| XGA | 1024x768@75 Hz | 1312x800 | 60,023 | P | 75,029 | P | 78,75 | | X | X | |
| XGA | 1024x768@85 Hz | 1376x808 | 68,677 | P | 84,997 | P | 94,5 | X | X | X | |
| XGA | 1024x768@87Hz(i) | 1264x817 | 35,522 | P | 43,479 | P | 44,9 | | X | | |

| Mode | Active Resolution | Total Pixels | Horizontal Frequency (kHz) | H-Pol. | Vertical Frequency (Hz) | V-Pol. | Pixel Clock | Failsafe Mode 1) | RGB test | DVI test | Description |
|--------|-------------------|--------------|----------------------------|--------|-------------------------|--------|-------------|------------------|----------|----------|-------------|
| | 1152x864@60 Hz | 1520x895 | 53,7 | P | 60 | P | 81,624 | | X | X | |
| | 1152x864@70 Hz | 1480x912 | 63,851 | P | 70,013 | P | 94,5 | | X | X | |
| | 1152x864@75 Hz | 1600x900 | 67,5 | P | 75 | P | 108 | | X | X | |
| | 1152x870@75 Hz | 1456x915 | 68,681 | N | 75,062 | N | 100 | | X | X | |
| | 1152x900@66 Hz | 1504x937 | 61,795 | N | 65,95 | N | 92,94 | | X | X | |
| | 1152x900@76 Hz | 1472x943 | 71,713 | N | 76,047 | N | 105,561 | | X | X | |
| WXGA-H | 1280x720@60 Hz | 1664x746 | 44,76 | N | 60 | P | 74,481 | | X | X | |
| WXGA | 1280x768@60 Hz | 1680x795 | 47,7 | N | 60 | P | 80,136 | | X | X | |
| | 1280x960@60 Hz | 1800x1000 | 60 | P | 60 | P | 108 | | X | X | |
| | 1280x960@85 Hz | 1728x1011 | 85,938 | P | 85,002 | P | 148,5 | X | X | X | |
| SXGA | 1280x1024@60 Hz | 1688x1066 | 63,981 | P | 60,02 | P | 108 | | X | X | |
| SXGA | 1280x1024@60 Hz | 1708x1056 | 63,338 | N | 59,979 | N | 108,181 | | X | X | |
| SXGA | 1280x1024@67 Hz | 1696x1056 | 70,755 | N | 67,003 | N | 120 | | X | X | |
| SXGA | 1280x1024@72 Hz | 1728x1085 | 78,125 | N | 72,005 | N | 135 | | X | X | |
| SXGA | 1280x1024@75 Hz | 1688x1066 | 79,976 | P | 75,025 | P | 135 | | X | X | |
| SXGA | 1280x1024@85 Hz | 1728x1072 | 91,146 | P | 85,024 | P | 157,5 | X | X | X | |
| UXGA | 1600x1200@60 Hz | 2160x1250 | 75 | P | 60 | P | 162 | | X | X | |

Notes:

- 1) Do not use the display in Failsafe Mode over a longer period of time. Switch the input timing immediately back to a supported input timing.

8 General Precautions

8.1 Handling

- (a) When the module is assembled, it should be attached to the system firmly using all mounting holes. Be careful not to twist and bend the module.
- (b) Refrain from strong mechanical shock and / or any force to the module. In addition to damage, this may cause improper operation or damage to the module and CCFT backlight.
- (c) Note that polarizers are very fragile and could be damaged easily. Do not press or scratch the surface harder than a HB pencil lead.
- (d) Wipe off water droplets or oil immediately. If you leave the droplets for a long time, staining or discoloration may occur.
- (e) If the surface of the polarizer is dirty, clean it using some absorbent cotton or soft cloth.
- (f) Desirable cleaners are water, IPA (Isopropyl Alcohol) or Hexane. Do not use Ketone type materials (ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanent damage to the polarizer due to chemical reaction.
- (g) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, legs or clothes, it must be washed away with soap thoroughly.
- (h) Protect the module from static, or the CMOS Gate Array IC would be damaged.
- (i) Use finger-stalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.
- (j) Do not disassemble the module.
- (k) Do not pull at or fold the lamp wire.
- (l) Do not adjust the variable resistor located on the back side.
- (m) Pins of I/F connector should not be touched directly with bare hands.

8.2 Storage

- (a) Do not leave the module in high temperature, and high humidity for a long time. It is highly recommended to store the module with temperature from 0 to 35°C and relative humidity of less than 70%.
- (b) Do not store the TFT-LCD module in direct sunlight.
- (c) The module should be stored in a dark place. It is prohibited to apply sunlight or fluorescent light during storing.

8.3 Operation

- (a) Do not connect or disconnect the module in the "Power On" condition.
- (b) Power supply should always be turned on/off following the item "Power on/off sequence".
- (c) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference should be done by system manufacturers. Grounding and shielding methods may be important to minimize the interference.
- (d) The cable between the back-light connector and its inverter power supply should be connected directly with a minimized length. A longer cable between the backlight and the inverter may cause lower luminance of lamp (CCFT) and may require higher startup voltage (Vs).

8.4 Others

- (a) Ultra-violet ray filter is necessary for outdoor operation.
- (b) Avoid condensation of water. It may result in improper operation or disconnection of electrode.
- (c) Do not exceed the absolute maximum rating value (supply voltage variation, input voltage variation, variation in part contents and environmental temperature, and so on). Otherwise the module may be damaged.
- (d) If the module keeps displaying the same pattern for a long period of time, the image may be "sticked" to the screen. To avoid image sticking, it is recommended to use a screen saver.
- (e) This module has its circuitry PCB's on the rear side and should be handled carefully in order not to be stressed.
- (f) Please contact us in advance when you display the same pattern for a long time.



DATA DISPLAY GROUP

Our company network supports you worldwide with offices in Germany, Turkey, Great Britain and the USA. For more information please contact:



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DATA DISPLAY TEKNOLOJI

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