

MD-224 Series

Preliminary

24-inch wide screen marine display, 16:9 aspect ratio, full HD 1920 x 1080 resolution



- > 24" flat full HD wide screen LCD panel with wide angles
- > Full range dimming from 0% to 100%: ideal for low light conditions
- > Uni-body aluminum chassis with fanless design delivers a lightweight yet rugged display
- > Unique Savvy touch display controls allows easier control in low light environment and provides proactive hardware health status
- > Optional PCT multi-touch screen, ECDIS color calibration are available upon request



Introduction

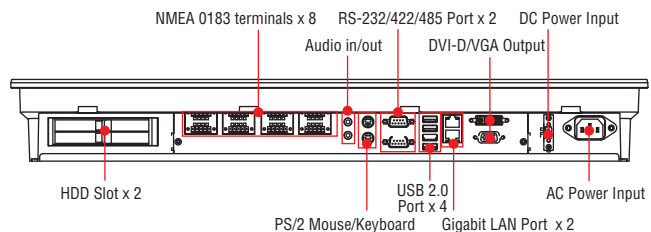
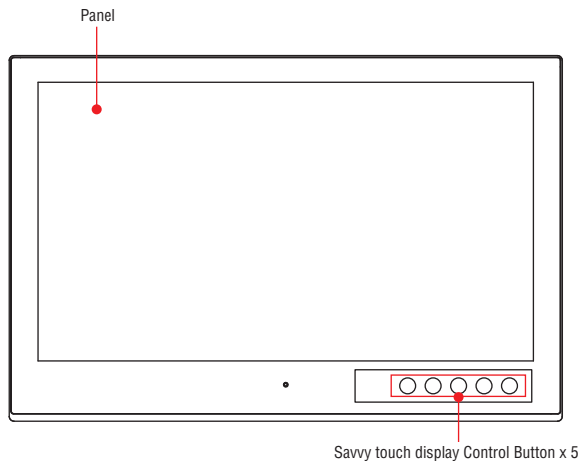
The MD-224 series of marine displays comes with full range dimming, wide viewing angles and optional optical bonding. These displays are built with a small-profile modular design that allows easier integration into industrial marine systems, reducing deployment costs and overall time-to-market.

The innovative and user-friendly Savvy touch display controls offer several unique features not found on any other marine display console: a proximity sensor for convenient adjustments in dark conditions, an info button for immediate updates on hardware status, and a quick-switch to adjust between day, dusk, and night-time ECDIS modes (for color-calibrated ECDIS models only).

MD-224 series displays are compliant with IEC 60945, DNV, and IACS-E10, verifying their resilience and durability in maritime conditions. Their IP66 rated enclosure provides additional protection against dust and moisture above and beyond the limits established by these international standards bodies.

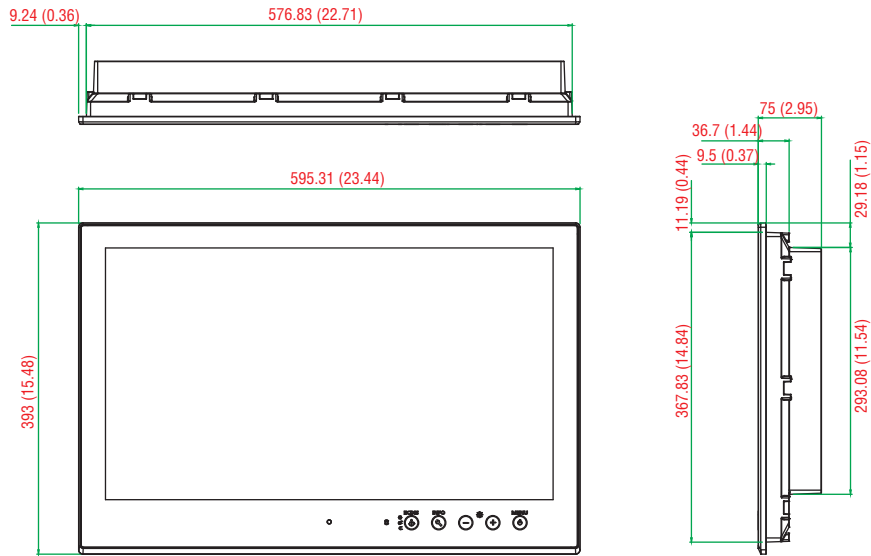
ECDIS-approved models are also available, offering an excellent HMI solution for ECDIS charting and navigation stations.

Appearance



Dimensions

Unit: mm (inch)



Specifications

Display

- Panel Size:** 24" viewable image size
- Panel Type:** MVA
- Aspect Ratio:** 16:9
- Pixels:** 1920 x 1080 (WSXGA+)
- Pixel Pitch (RGB):** 0.282 (H) x 0.282 (V) mm
- Response Time:** 8 ms (gray to gray)
- Contrast Ratio:** 5000:1
- Light Intensity:** 300 cd/m²
- Viewing Angles:** 178°/178°
- Active Display Area:** 531.36 (H) x 298.89 (V) mm
- Max Colors:** 16.7M / 8-bit color
- Resolution:**
 - VGA: 640 x 480
 - SVGA: 800 x 600
 - XGA: 1024 x 768
 - SXGA: 1280 x 1024
 - WSXGA+: 1920 x 1080 (optimal setting)

Panel Type: MVA

Ethernet Interface

- LAN:** 2 auto-sensing 10/100/1000 Mbps ports (RJ45)
- Magnetic Isolation Protection:** 1.5 kV built-in

Serial Interface

Serial Standards: 1 software-selectable RS-232/422/485 port (DB9 male)

Optical Isolation Protection: 4 kV

Serial Signals

- RS-232:** TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
- RS-422:** TxD+, TxD-, RxD+, RxD-, GND
- RS-485-4w:** TxD+, TxD-, RxD+, RxD-, GND
- RS-485-2w:** Data+, Data-, GND

Front Panel

- LEDs:** Storage, Power
- Savvy touch display controls:** 5 display control buttons, 3 ECDIS LEDs
- USB:** 1 USB 2.0 port
- Potentiometer:** For brightness control

Physical Characteristics

- Housing:** Aluminum sheet metal
- Weight:** 15 kg
- Dimensions:** 593 x 392 x 76 mm (23.25 x 15.44 x 2.99 in)
- Mounting:** Flush mounting

Environmental Limits

- Operating Temperature:** -15 to 55°C (5 to 131°F)
- Storage Temperature:** -20 to 60°C (-4 to 140°F)
- Ambient Relative Humidity:** 5 to 95% (non-condensing)
- Anti-Vibration:**

- 0.7 g @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis
- 1 G_{rms} @ DNV 2.4, random wave, 3-100 Hz, 2.5 hr per axis
- 2.1 g @ DNV 2.4 (Class C), sine wave, 2-50 Hz, 1 Oct./min., 1.5 hr per axis

Power Requirements

- Input Voltage:** 24 VDC (18 to 36 VDC), screw-type terminal block
- Power Consumption:** 112 W
- 6.21 A @ 18 VDC
- 4.55 A @ 24 VDC
- 2.95 A @ 36 VDC

Standards and Certifications

- Safety:** UL/cUL, CCC
- EMC:** EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class A
- Marine:** IEC 60945 4th. (Pending), DNV (Pending), IACS-E10 (Pending), IEC 61174 (Pending)
- Green Product:** RoHS, cRoHS, WEEE

Reliability

- Automatic Reboot Trigger:** Built-in WDT (watchdog timer) supporting 1-255 levels for time interval system reset, software programmable
- MTBF (mean time between failures):** 39,675 hrs

Warranty

- Warranty Period:** 1 year
- Details:** See www.moxa.com/warranty

We recommend taking the following precautions to minimize heat build-up within the display:

- Position the display within $\pm 40^\circ$ of the vertical.
- Install an external fan to increase airflow upwards through the display if (a) the display is not positioned within $\pm 40^\circ$ of the vertical, (b) the ambient temperature exceeds 25°C , or (c) the display is used in a location with minimal ventilation.

Important Safety Precaution:

Even though the display is rated to operate within the IEC 60945 standard of -15 to 55°C , it is best to ensure that the ambient temperature does not exceed 25°C . Doing so will increase the life of your display and minimize service costs.

Ordering Information

Available Models

MD-224X: 24-inch tape bonded marine display with 16:9 aspect ratio, full HD (1920x1080), LED backlighting, multi-power supply (AC/DC)

MD-224Y: 24-inch optically bonded marine display with 16:9 aspect ratio, full HD (1920x1080), LED backlighting, multi-power supply (AC/DC)

MD-224Z: 24-inch marine touch-screen display with 16:9 aspect ratio, full HD (1920x1080), LED backlighting, multi-power supply (AC/DC)

Package Checklist

- MD-224 display panel
- Rubber waterproofing gasket
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Factory Options:

- Projected capacitive (PCT) touch screen (multi-touch, USB interface)
- Optical bonding
- Sunlight readable / high brightness (includes optical bonding)
- ECDIS color calibration
- Customized options for SSD/HDD drives, RAM, operating system