

# MD-224 Series

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



- > 24-inch display, 16:9 aspect ratio
- > Sunlight readable 1000-nit LED backlight
- > Color calibrated for ECDIS compliance
- > Full range dimming, 0 to 100%
- > SavvyTouch™ display controls
- > Built-in RS-232/422/485 interfaces
- > Dual power supplies (AC & DC)
- > IP54-rated front panel (IP66 available by request)
- > Optical bonding available on 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.

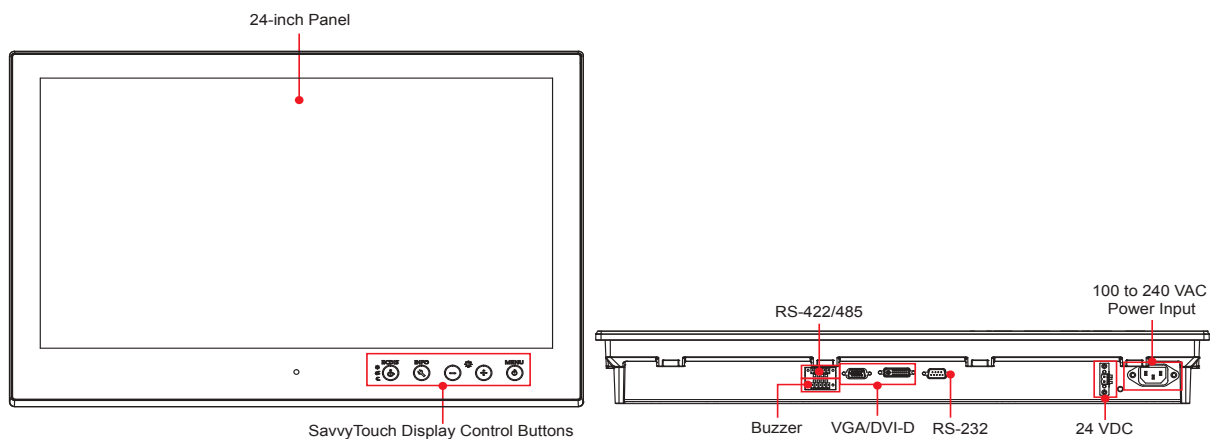
The innovative and user-friendly SavvyTouch display controls offer several unique features not found on any other marine display consoles: a proximity sensor for convenient adjustments in dark conditions, an info button for immediate updates of power status, and

a quick-switch to adjust between day, dusk, and night-time ECDIS modes (for colorcalibrated ECDIS models only).

The MD-224 series displays are compliant with IEC 60945, DNV, ABS, and IACS E10, making them suitable for maritime applications. Their IP54 (IP66-rated models available on request) rated enclosure provides additional protection against dust and moisture above and beyond the limits established by these international standards bodies.

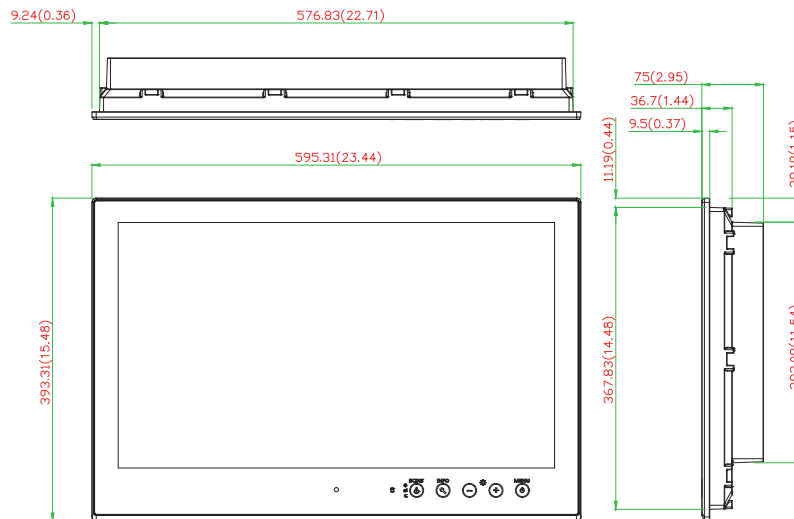
ECDIS-approved models are also available, offering an excellent HMI solution for ECDIS charting and navigation stations.

## 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+)

**Response Time:** 25 ms (gray to gray)

**Contrast Ratio:** 5000:1

**Light Intensity:**

Standard model: 300 nits

High brightness model: 1000 nits

**Viewing Angles:** 178°/178°

**Active Display Area:** 531.36 (H) x 298.89 (V) mm

**Max. No. of Colors:** 16.7M / 8-bit color

**Display Interface:**

- 1 VGA input
- 1 DVI-D input

**Resolution:**

- VGA: 640 x 480
- SVGA: 800 x 600
- XGA: 1024 x 768
- SXGA: 1280 x 1024
- WSXGA+: 1920 x 1080 (optimal setting)

### Serial Interface

**Serial Standards:** 1 RS-232 port (male DB9), 1 RS-422/485 port (terminal block)

**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-485-2w:** Data+, Data-, GND

### Front Panel

**LEDs:** MENU, Brightness, INFO, ECDIS, Day/Dusk/Night

**Smart OSD:** Yes

### Physical Characteristics

**Housing:** Aluminum sheet metal

**Weight:** 12 kg

**Dimensions:** 595 x 393 x 75 mm (23.43 x 15.47 x 2.95 in)

**Mounting:** VESA, panel, and desktop

### 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)

**IP Rating:**

- Front: IP54 (IP66 available by request)
- Rear: IP22

**Anti-Vibration:**

0.7 g @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis

### Power Requirements

**Input Voltage:**

- DC: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)
- AC: 100 to 240 VAC

**Power Consumption:** 40 W (Max)

### Standards and Certifications

**Safety:** UL 60950-1, CCC

**Hazardous Environments:** UL Class 1 Division 2

**EMC:** EN 55032/24

**EMI:** CISPR 32, FCC Part 15B Class A

**EMS:** IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV

IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m

IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV

IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV

IEC 61000-4-6 CS: Signal: 1 kV

IEC 61000-4-8

**Marine Standards:** IEC-60945 4th, IEC-61174

**Marine Type Approval:** DNV 2.4 and IACS E10, ABS

**Green Product:** RoHS, cRoHS, WEEE

### Warranty

**Warranty Period:** 1 year

**Details:** See [www.moxa.com/warranty](http://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  $25^\circ\text{C}$ , 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  $55^\circ\text{C}$ , it is best to ensure that the ambient temperature does not exceed  $25^\circ\text{C}$ . 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, dual-power supply (AC/DC)

**MD-224Z:** 24-inch tape bonded marine display with 16:9 aspect ratio, full HD (1920x1080), projected-capacitive touch panel, LED backlighting, dual-power supply (AC/DC)

**MD-224Z-HB:** 24-inch sunlight readable 1000-nit display, 16:9 aspect ratio, full HD (1920x1080), glove-friendly multi-touch, LED backlighting, dual-power supply (AC/DC)

**Optional Accessories** (can be purchased separately, for AC power input)

**PWC-C13US-3B-183:** Power cord with 3-pin connector, USA plug

**PWC-C13EU-3B-183:** Power cord with 3-pin connector, Euro plug

**PWC-C13UK-3B-183:** Power cord with 3-pin connector, British plug

**PWC-C13AU-3B-183:** Power cord with 3-pin connector, Australian plug

**PWC-C13CN-3B-183:** Power cord with 3-pin connector, Chinese plug

**Optional Mounting/Bracket Kits** (can be purchased separately)

**MPC-MD-2-24-PMTK:** 24-inch panel-mounting kit, consisting of 14 mounting clamps

**MPC-MD-2-24-VESAMTK:** 24-inch VESA-mounting kit (can be used with either 200 x 100 mm or 280 x 150 mm VESA mounts)

**MPC-MD-2-24-26-DMTK w/o hinge:** 24-inch desktop mounting kit without hinge

**MPC-MD-2-24-26-DMTK w/ hinge:** 24-inch desktop mounting kit with hinge

### Package Checklist

- MD-224 display
- VGA cable
- DVI-D cable
- 2-pin terminal block x 1
- 5-pin terminal block x 2
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card