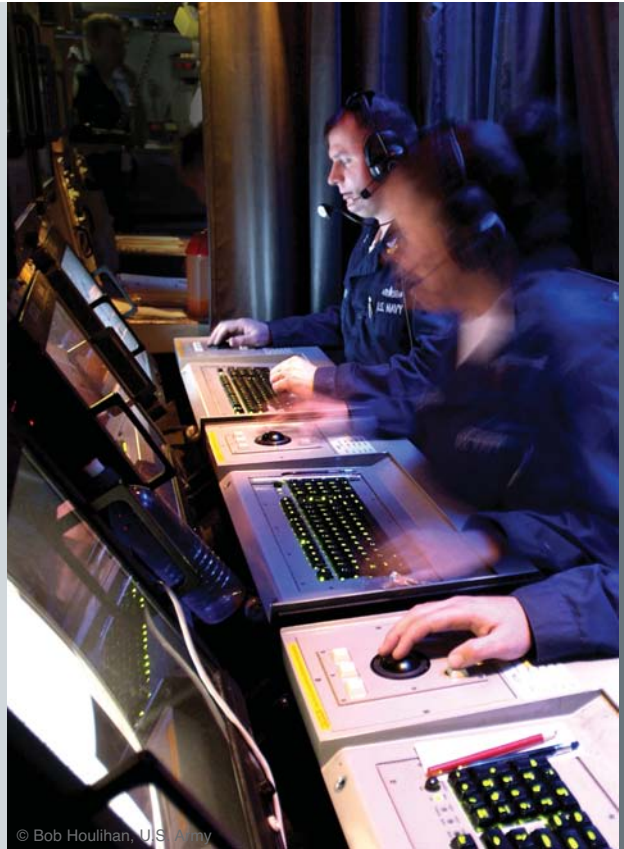


# MRFD family



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A full range of  
Modular Rugged Flat Displays

**BARCO**

Visibly yours

# A full range of Modular Rugged Flat Displays

Barco's range of Modular Rugged Flat Displays (MRFD) has been designed for demanding defense applications requiring graphics, video and other RGB data on a single display. The MRFD family offers users a flexible, modular design, which allows for easy adaptation to specific requirements. Target application platforms include aircraft, helicopters, surface ships, submarines, ground vehicles and mobile shelters.

## Smart modular architecture

The MRFD's modular architecture combines a Rugged Display Module (RDM) with a Display Control Module (DCM), connected by a single cable, the Barco Intermodule Link (BIL). Thanks to this split design, the DCM can be placed in a remote location, requiring less console space. To provide a single LRU installation, the DCM can also be attached to the RDM.

### Main features & benefits

- Broad and extendable panel range
- Front bonded displays
- Automatic Phase Adjust
- Versatile signal interfacing
- Versatile mounting
- Versatile image control
- COTS solution, allowing for easy technology insertion and lower obsolescence risks



## State-of-the-art Display Modules

Barco offers Display Modules in various screen sizes, ranging from 17" to 21". All modules are completely enclosed and have front filters bonded to the LCD for improved optical performance and elimination of all condensation problems. Moreover, all Display Modules feature Automatic Phase Adjust (APA) technology, offering clear and sharp images over time.



A full range of state-of-the-art Display Modules

## User-definable Display Control Modules

The Display Control Modules (DCM) are modular electronics boxes, which can be configured to meet specific application requirements (e.g. multiple analog or digital video inputs, direct camera input). The mixing functionality incorporated in the MRFD results in a total, low-cost solution for image overlay and mixing, with no need for separate video mixing cards to be installed at the host computer. The MRFD also features BIT (Built-in Test), which assists users in fault isolation.



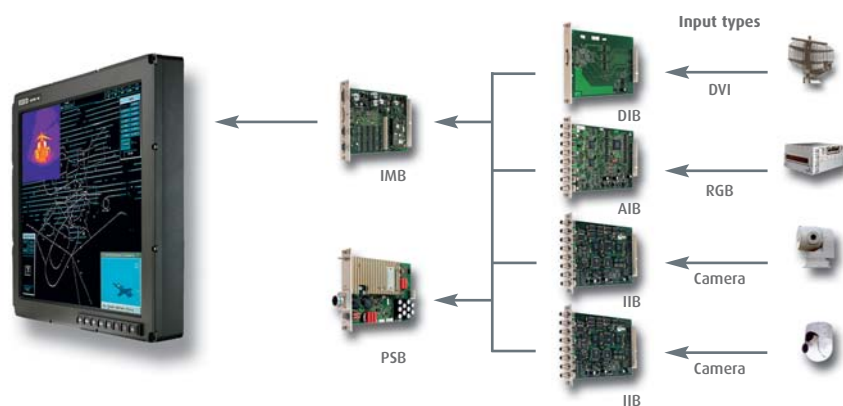
Single Height



Dual Height

## High-performance functional boards

The MRFD's modular Display Control Module can be equipped with a full range of high-performance imaging boards to operate in a broad variety of applications. The basic configuration consists of a Power Supply Board and a Signal Interface Board, providing analog and digital RGB input. By selecting additional boards, users can define a configuration that meets their specific functional requirements.



## A full family of Modular Rugged Flat Displays

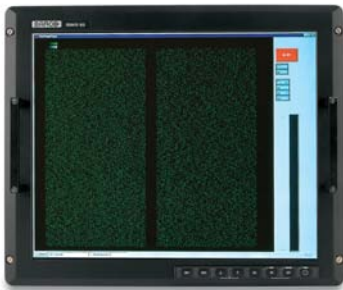
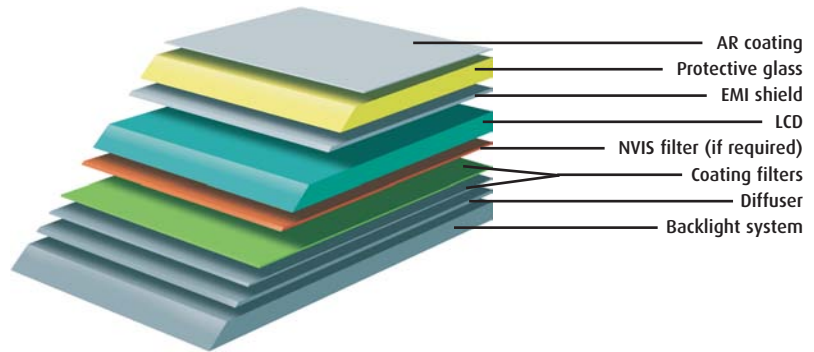
The MRFD family is available in a wide variety of configurations, combining user-configurable Display Control Modules with a broad range of Display Modules.

PRODUCT	SIZE	RESOLUTION	AVAILABLE FEATURES/OPTIONS
• MRFD-243	17"	1280x1024 SXGA	<ul style="list-style-type: none"> <li>• Analog and/or digital inputs</li> <li>• Up to 2 Direct Video Inputs (optional)</li> <li>• picture-in-picture</li> <li>• Automatic Phase Adjust</li> <li>• LCD Flicker Compensation*</li> <li>• Touch Screen Option*</li> </ul> <p>* = not on all versions (please check availability)</p>
• MRFD-243 A (Airborne)	17"	1280x1024 SXGA	
• MRFD-248	19"	1280x1024 SXGA	
• MRFD-248 A (Airborne)	19"	1280x1024 SXGA	
• MRFD-248 HB (High-Bright)	19"	1280x1024 SXGA	
• MRFD-251	20"	1280x1024 SXGA	
• MRFD-251 A (Airborne)	20"	1280x1024 SXGA	
• MRFD-351	20"	1600x1200 UXGA	
• MRFD-351 A (Airborne)	20"	1600x1200 UXGA	
• MRFD-354	21"	1600x1200 UXGA	
• MRFD-354 A (Airborne)	21"	1600x1200 UXGA	

# Technologically advanced solutions

## Front bonding

Barco has developed unique bonding capabilities to protect the LCD against extreme environmental conditions (temperature, shock, vibration, humidity, EMI,...) and to significantly improve optical performance and protection against condensation.

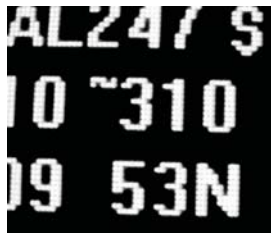


## LCD Flicker Compensation (patented)

When updating images with high contrast and high density (such as sonar or dense tactical data) the LCD's brightness varies with the rate of updating. This luminance variation, referred to as 'LCD Flicker', can cause serious eye-fatigue and affect the interpretation of the displayed data. Barco has integrated a unique set of algorithms that reside in the hardware interface of the display (between the graphics generator and the LCD). This feature compensates for LCD Flicker, without affecting the displayed data, over all operating parameters.

## Automatic Phase Adjust (APA)

The APA function automatically locks the LCD sampling clock to the (drifting) graphics generator pixel frequency, thus avoiding image artifacts like pixel noise. Drift can be caused by temperature changes, electromagnetic interference and other environmental factors.



With APA



Without APA

## Highly efficient Power Supply Board

Barco's proprietary Power Supply Boards are designed for maximum efficiency. The board's low-heat design provides optimum operator convenience.

## Extended dimming range

For many products, Barco uses in-house manufactured circuitry to provide advanced dimming solutions. This provides the advantages of a darker background resulting in higher contrast for lower ambient light conditions and/or high-bright solutions for higher ambient light conditions.

# Technical specifications

		MRFD	MRFD A
VIBRATION	operating	MIL-STD-167-1 Type I, MIL-E-5400T: 2g	MIL-STD-167-1 Type I, MIL-E-5400T: 5g
SHOCK	operating optional	30g - 12.5msec half sine 60g - Z axis/40g - X,Y axis MIL-S-901D (for specific configurations)	30g - 12.5msec half sine n/a
TEMPERATURE	operating non-operating	-25°C - 55°C -40°C - 70°C (MIL-STD-810E)	-25°C - 55°C -40°C - 70°C (MIL-STD-810E)
COLD START-UP		Start-up @ -25°C 3min. usable picture 20 min. full spec (MIL-STD-810E)	Start-up @ -25°C 3min. usable picture 20 min. full spec (MIL-STD-810E)
HUMIDITY	operating	max. 95% @ 40°C non-condensing (MIL-STD-810E)	max. 95% @ 40°C non-condensing (MIL-STD-810E)
EMI/EMC	FCC EN MIL-STD	Emission: FCC-A  Emission: EN 55022 Limit A Immunity: EN 61000-4-x  MIL-STD-461E: aircraft-air force MIL-STD-461E: Ground-Army	Emission: FCC-A  Emission: EN 55022 Limit A Immunity: EN 61000-4-x  MIL-STD-461E: aircraft-air force MIL-STD-461E: Ground-Army
ALTITUDE	operating non-operating	up to 25,000ft up to 40,000ft (MIL-STD-810E)	up to 35,000ft up to 40,000ft (MIL-STD-810E)
CRASH SAFETY	non-operating	n/a	Crash safety test 40g - 9msec
RAPID DECOMPRESSION		n/a	Operating from 5,000ft (843mbar) to 35,000ft (238mbar) @ 1 inch Hg/sec
DRIP PROOF	operating	At unit level: +/- 45° in all directions (MIL-STD-810E)	At unit level: +/- 45° in all directions (MIL-STD-810E)
FUNGUS		Fungus inert materials are selected (MIL-STD-810E)	Fungus inert materials are selected (MIL-STD-810E)
SALT FOG		Complies at unit level (MIL-STD-810D)	Complies at unit level (MIL-STD-810D)
SAND DUST		Complies at unit level (MIL-STD-810D)	Complies at unit level (MIL-STD-810D)
SAFETY		IEC 60950	IEC 60950



In search of continuous improvement

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Technical specifications are subject to change without prior notice

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