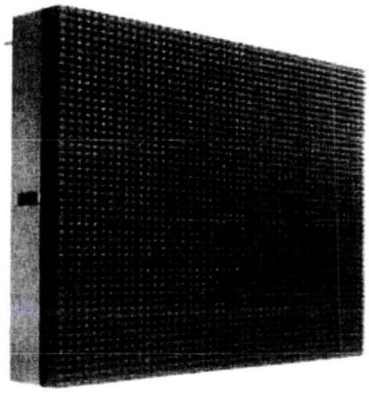
PLANNING AND
BUILDING CONTROL

1. TF-10, all condition outdoor 10mm SMD display



The DOOH market reference

With TF-10 series Barco sets the standard in Digital Out Of Home video displays. 12 years of years LED display technology and over 50 years in professional display technology is the basis of its success. TF-10 most eye catching features:

- Advanced Remote Diagnostics, Control and Management Capabilities
- World-class image quality
- Green technology
- Ultra Reliable
- Low Cost of Ownership

1.1 General

Barco's TF-10 is an all condition outdoor full color modular 10mm SMD LED video display system. With modules of approximate 0.6sqm, infinite display sizes and shapes can be created, making your dreams come through. The display system is specifically designed for low TCO 24/7 operations which is very common in DOOH industry. High grade long life industrial components and extensive (remote) management capabilities make this display system unbeatable.

Other applications areas like corporate branding (NYC Time Square spectacular displays e.g.) and sports benefits as well of the high reliability and low cost of ownership together with the remote management functionality of Barco's TF-10 to optimize their operational work flow, either pre-scheduled or live operated.

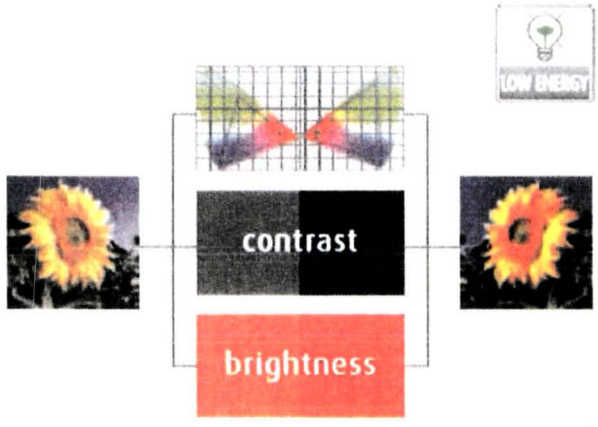
Barco TF-10 will lead to amazing experiences, increased brand recognition and time spent longer in front of the display for your audience whether this is in advertising, corporate branding or sports.



Typical application area Timesquare NYC

- Remote (scheduled) software/firmware update of display and video processor hardware
- Advanced calibration options (brightness and color uniformity), gamma control
- Advanced intelligent brightness control
- Scheduled power On/Off
- Image failsafe: detection of main signal failure, ability to switch to back-up player in DMP-100
- Security: automated shutdown at un-authorized access of control cabinet
- Proof of performance reporting
- Live camera view (optional)

1.3 World Class Image Quality



World class image quality is all about finding the right balance between parameters that influence image quality. These parameters are color depth, saturation, brightness, contrast and uniformity. Over achieving in any of these categories is not bringing any good if others lack behind. An important factor nowadays can also be found in green technology. This might not have a direct impact on visual performance, but does have big indirect impact. This can easily be imagined by the fact that increasing the contrast will allow you to run your display on lower power (=lower brightness) while providing better image quality at the same time.

The perfect balance between brightness and contrast also allows Barco to limit the brightness on the TF-10 to 6,000 Nits, since this provides identical or better image quality compared to others at 8,000+ Nits brightness. Limiting brightness contributes to longer lifetime and higher maximum brightness over time. Achieving 4,500 Nits after 60,000 hours runtime on Barco TF-10 is not an exception. This is only 10% degradation over a 7 years period at average usage. Never seen before in the market.

Another unique feature is the automated gamma control in function of the brightness for optimum image quality. Especially in low light levels this significantly improves the image.

1.3.1 Image quality assurance over time

Biggest impact on image quality over time is contamination of front face and de colorization of LED filling material due to UV impact. Barco's TF-10 display uses UV protection mask in front of LED to prevent physical damage to the LEDs itself. In the unlikely event that front face de colorization will occur over time, the complete front face, both black louvers and transparent mask can be easily replaced at the minimum costs. Once done, the display system has again the outlook as it has at first appearance. This assurance maximum black level and excellent image quality over time.

1.4.1 Electromagnetic Compatibility



TF-series displays operate in a self-contained electromagnetic field, unaffected by surrounding electrical devices, and causing no interference to other devices (cell phones, medical devices, vehicle safety features, etc.).

1.4.2 Social Responsibility

TF series displays are designed to attract maximum attention with maximum acceptance factor. The intelligent brightness control ensures least annoying light pollution towards people living close and opposite the screen location. It will not lit their house at night and no annoying flickering of changing media content when setup right. At the same time, content is displayed in the best possible way in function of the environmental conditions.

At the same time, the same intelligent brightness control ensures minimum distraction for drivers. Messages are clean, clear and easily adapted by the audience, also for drivers, but I will not take their attention off the road by being to bright which diverts their focus from the road.

In case of powering up after unexpected power breakdown, the display will not return at the latest known brightness level, but will first check all available parameters (time of day, position of sun towards billboard, day/night time calculation, display orientation and location, light sensor value, active restrictions) and only then switch the display on. This will never cause irritating situations for people living close to the screen and it will prevent unsafe situation for drivers.

1.5 Ultra Reliable

1.5.1 Power supply redundancy

Barco's custom fit one piece 10mm displays are available in multiple sizes. Standard offering is 6.8sqm and 8sqm, the most common DOOH dimensions in European street furniture at the moment. Although these displays are highly reliable (failure rate of less then 0.1%), the most critical component is the power supply unit.

With Barco's power supply redundancy individual sections cannot break down due to PSU failures. Adjacent section will take over power supply to the failed section, preventing section going black on the display. At the same time, an email notification will be send to the service operator.

1.5.2 Industrial components

Barco only uses first class industrial components with wide operating condition specifications, allowing TF-10 and derivative displays to be installed worldwide without A/C, up to 50°C environmental temperature. Industrial components produce less heat and are better

against weather influences, but also graffiti and other liquids) are fully replaceable, leaving all electronics intact.

1.6 Low Total Cost of Ownership

1.6.1 Power Consumption

Total cost of ownership is more then just power consumption, although power consumption is the easiest measurable value. This is directly related to content and brightness. With high energy efficient main components (LED, CCD and power supplies), Barco's TF-10 is between the lowest in the market already, delivering content to the audience in the most energy efficient way.

Maximum power consumption is 762 W/m², on average the power consumption is 179W/m². Typical brands are between 1000 and 1500 W/m² maximum, 235 and 352 W/m² average.

For a network of 20 screens of 8sqm each, running 24/7, Barco TF-10 saves you between 10,988 and 33,947 EUR/year[1].

Next to that, the intelligent brightness control ensures optimal brightness level at any time, taking in mind lowest acceptable values to limit power consumption. This makes Barco's TF-10 already much cheaper versus comparable products.

1.6.2 Heat Management

Based on the reliability arguments and power consumption statements above, less heat is generated by the display system; this already put Barco's TF-10 display upfront above comparable products. Next to that, the selected components are industrial grade which can withstand already higher temperatures. Fans are being used to create airflow through the tiles to reduce thermal stress which lowers the failure rate significantly.

Barco's TF-10 display has separated air channels from power supply and other electronics, to avoid heat generated by the power supply units affecting the other electronics. Fans are only activated by the control system when required in function of the internally measured temperature. Since these are the only mechanical rotating components, they will last significantly longer when active only when necessary. When operated 24/7 day in day out, fans will last at least 30,000hrs.

Barco's TF-10 can be used in outdoor conditions worldwide without the need of Air Conditioning, as long as environmental temperature does not exceeds 50°C. With environmental temperature, the temperature of the air at the air-intake is meant[2].

[1] Based on energy price of 0.14 EUR/kWh.
[2] In case temperature of air at the air intake exceeds 50°C a active cooling system is recommended

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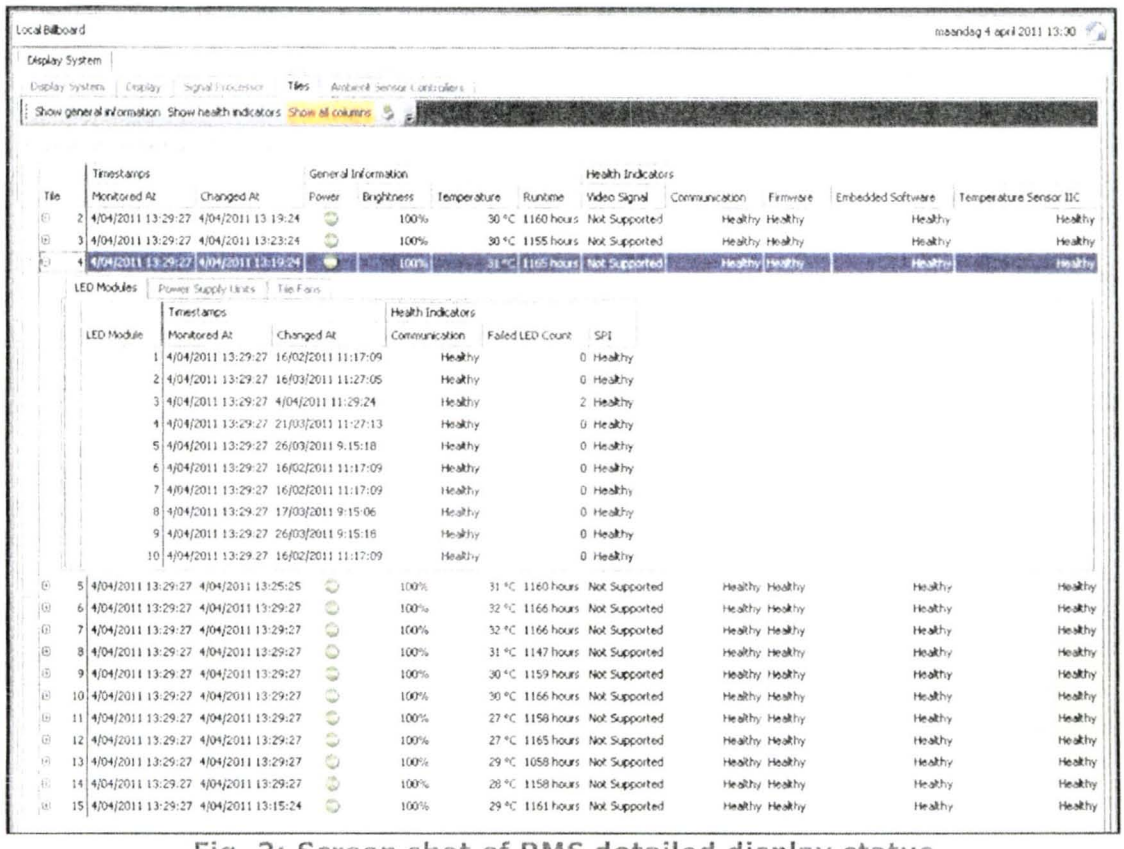

Fig. 3: Screen shot of RMS detailed display status

		installation within 500m of shore line

Mechanics

Dimensions (HxWxD)	mm	816x735x200
Module surface	m²	0.6
Weight (per tile)	Kg	39
Weight	kg/m²	65
Installation Access (Front/Back)	-	n/a
Service Access (Front/Back)	-	n/a

Other

Certifications	-	CE/ETL/RohS FCC Class A

