

TOTOKU

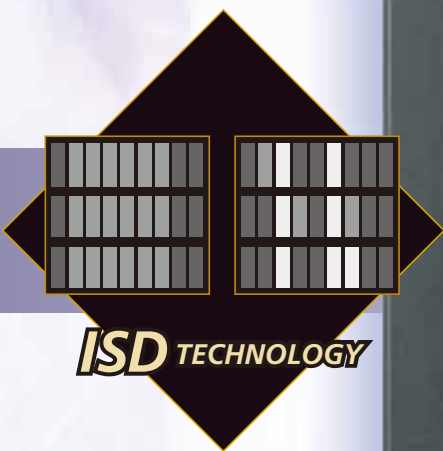


3MP with ISD Technology
21.3" Digital Mammography Display

MS31i2



Medivisor®



World's FIRST
3MP-based Display for Digital Mammography

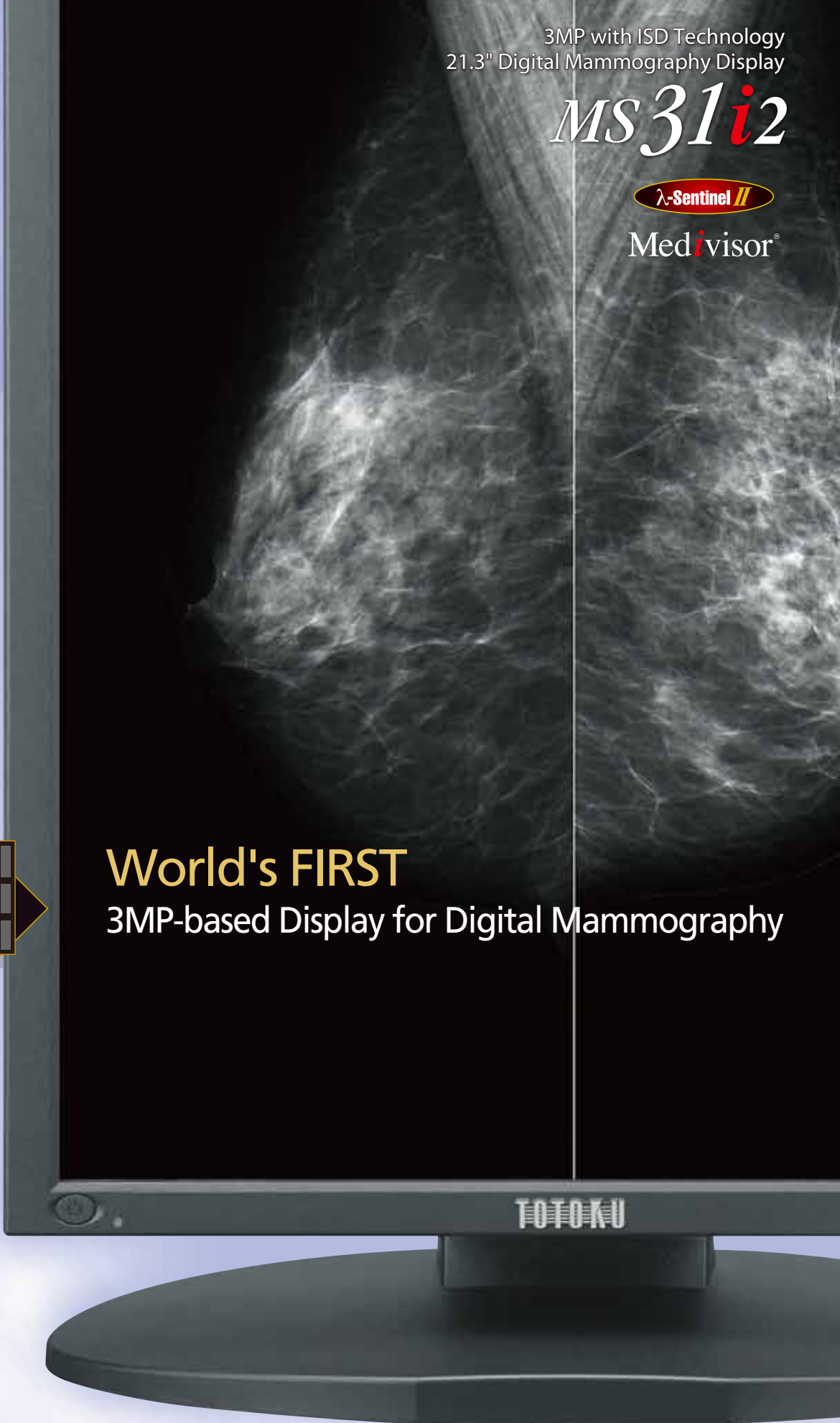
New

9M

Independent
Sub-pixel Drive



TOTOKU supports
Pink Ribbon activities.



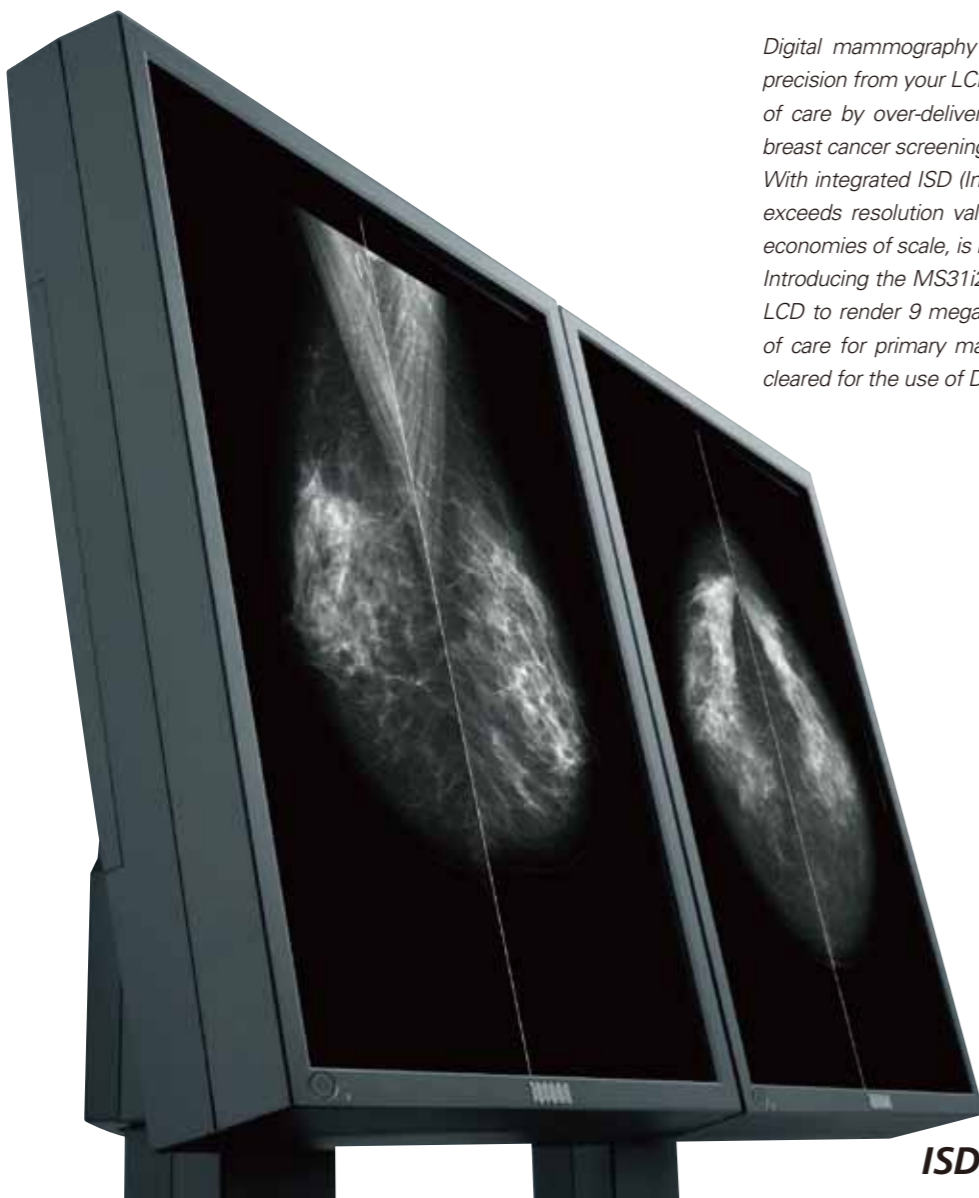
9M Independent Sub-pixel Drive

3MP-based Display for Digital Mammography

Digital mammography viewing demands an extraordinarily high level of precision from your LCD display. Totoku's MS31i2 redefines new standards of care by over-delivering resolution and clarity for improved accuracy in breast cancer screening.

With integrated ISD (Independent Sub-pixel Drive) technology, the MS31i2 exceeds resolution values of traditional 5 megapixel displays, and due to economies of scale, is more affordable than its 5 megapixel counterpart.

Introducing the MS31i2, with ISD technology enables a 3 megapixel-based LCD to render 9 mega sub-pixel images, exceeding the current standards of care for primary mammography diagnosis. The MS31i2 is FDA (510K) cleared for the use of Digital Mammography.



3MP with ISD Technology
21.3" Digital Mammography Display

MS31i2

- 21.3" Digital Input
- 1450 cd/m²
- 900:1
- Calibration Function
- 1276 Step Grayscale
- OSD
- Luminance Uniformity Correction
- Hardware Pivot
- LED Indicator
- Special AR Coating

ISD TECHNOLOGY Medivisor

High image quality with high precision & user-friendly functions

Luminance equalizer λ -Uniformity Congruence

Is built in to achieve highly accurate luminance uniformity across the screen. Luminance unevenness is minimized in the final tune-up prior to shipping.

Calibration function

Calibrates luminance and gamma to enable smooth grayscale display that is faithful to DICOM GSDF.
* Optional calibration kit is required.

Simultaneous display of 1276 shades of gray

Realizes smoother grayscale display required for medical image displays.

Hardware pivot function

Stress-free operation is made possible by fast drawing speed for on-the-fly change to portrait orientation.

High luminance, high contrast and wide viewing angle

With the highest-in-class luminance and contrast and a wide viewing angle, TOTOKU's LCD drive technology maximizes the display's performance for the best image quality.

Dual Link input

Provides smooth display of motion pictures.

OSD Information Display

With a push of a button, the display's current status can be checked such as the display model, total operating time, actual measurement of luminance, and calibration settings.

LED indicator

A glance at the LED indicator tells you the display's current operating status.

3MP-based display with the ISD technology performs either equaling or surpassing the 5MP's

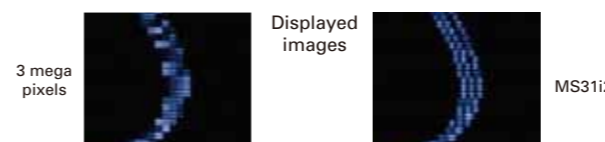
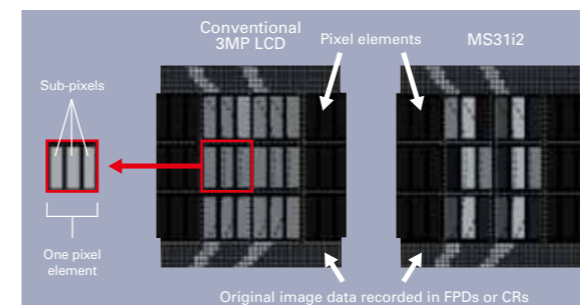
Faithful Reproduction of Image Details

MS31i2 achieves 70 μ m in sub-pixel chain direction by newly developed ISD technology to realize excellent depiction of image details.

ISD (Independent Sub-pixel Drive)

Driven by each sub-pixel value corresponding to detailed information recorded in an original image, three times resolution enhancement is achieved. (Patent pending) In addition, up to 1276 shades of gray are now simultaneously displayable by the upgraded ISD technology.

*Customized viewer software is required to display images with enhanced resolution by the ISD technology



Advanced Image Quality with Less Degradation

To display an overall image whose native resolution is higher than the monitor is able to reproduce, the image is converted to a lower resolution image with a certain amount of data loss. The MS31i2 with super high resolution offers excellent image reproduction, faithful to the original captured by the modality device with less image degradation.

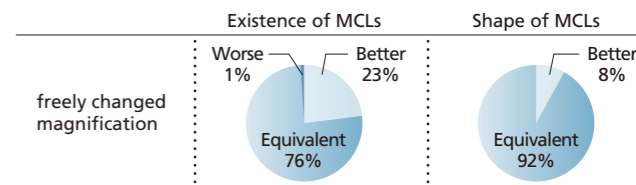
Comparison between 9 MsP and 5 MP

Visibility comparison

Visibility comparison of existence and shape evaluation of microcalcifications (MCLs), using 50 clinical cases obtained by a digital mammography system (pixel size: 70 μ m).

Scoring method for 9MsP superiority

Inferior	Worse	Equivalent	Better	Superior
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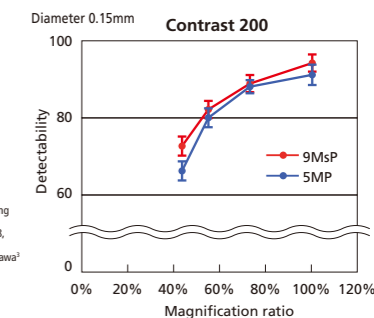
The most of cases were rated as "Equivalent", and 23% were answered as "Better". Our study indicated that the potential performance of the 9MsP LCD was equivalent to or better than the conventional 5MP LCD for evaluating very small MCLs and interpreting clinical digital mammography with various types of MCLs.

Note: Display magnification % was adjusted freely by each observer.

Source: Title: Comparative Study between 9 Mega-sub-Pixel and 5 Mega-Pixel LCDs using Simulated Microcalcification Images and Clinical Mammography (RSNA2009)
Katsuhiro Ichikawa Ph.D1, Hiroko Kawashima, MD1, Aya Nishimura2, Mikio Hasegawa3, Naohiro Kimura3
1) Institute of Medical, Pharmaceutical and Health Sciences, Kanazawa University 2) Kanazawa University hospital 3) TOTOKU Electric Co., Ltd.

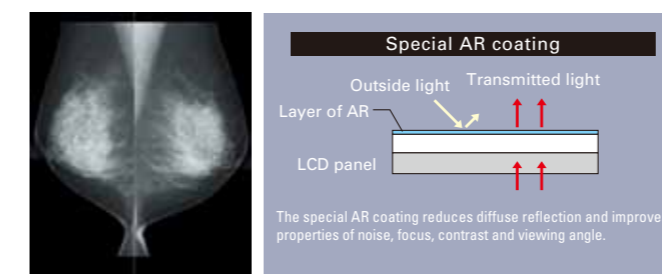
Visual Detection study using images of 0.15mm simulated microcalcification

This chart shows relationship magnifications and detectability for the 9MsP and the 5MP's where the 9MsP exceeds 5MP in detectability.

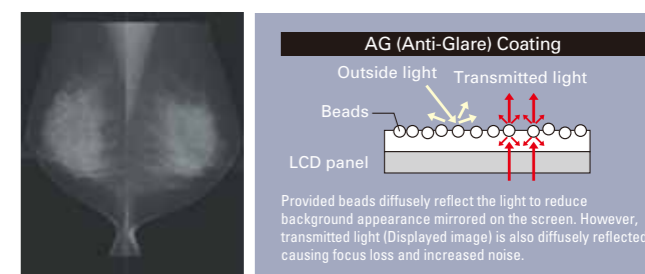


Source: Title: Clinical Usefulness of Super High-Resolution Liquid Crystal Displays Using Independent Sub-pixel Driving Technology
International Workshop on Digital Mammography (IWDM) 2008 August 2008, THE UNIVERSITY OF ARIZONA, U.S.A
Katsuhiro Ichikawa¹, Hiroko Kawashima², Naohiro Kimura³, and Mikio Hasegawa³
1) Graduate School of Medical Science, Kanazawa University
2) Department of Radiology, Kanazawa University Hospital
3) Totoku Electric Co., Ltd.

Special AR Coating for Film-like Black and Improved Sharpness



TOTOKU's new special AR coating technology addresses properties of focus, noise reduction, contrast, and viewing angle achieving film-like black and accurate reproduction of images.



*The image explains general ideas of each mechanism and may be different from the actual structures.

Advanced quality control solution

Luminance stabilizing system λ -Sentinel II

The luminance sensor, integrated into the front bezel, consistently monitors and accurately stabilizes luminance on the screen by rapidly communicating with the backlight sensor. In addition, a build-in luminance sensor provided with i2 models enables even simpler calibration without attaching the calibration sensor.

Remote grayscale check and remote calibration functions

Conformance testing to DICOM GSDF and calibration can be remotely accomplished. These features minimize the burden on display administrators.

* Optional PM Medivisor software is required.

High reliance and a full range of services provide confidence

Worldwide medical safety standards

This display is certified under various medical safety standards that are much more demanding than those for general-purpose IT equipment.

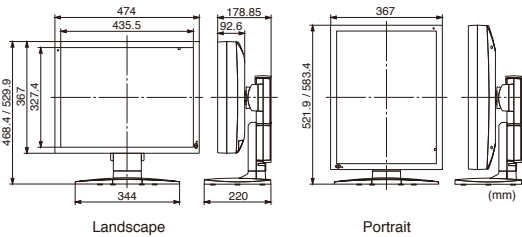
Pairing service to match display colors (Optional)

Medical imaging often uses two displays side-by-side, and it is very important that they present the same color temperature. TOTOKU offers a display pairing service that match colors of two displays using a high-definition spectrophotometer before shipping.

* Consult your dealer for more information about the pairing service.

Specifications

Model Name		MS31i2
LCD Panel	Technology	21.3-inch, TFT Monochrome, IPS Technology
	Display Area	433mm X 325mm
	Pixel Pitch	0.2115mm X 0.2115mm
	Contrast Ratio	900 :1 typ.
	Maximum Luminance	1450cd/m ² typ. (calibrated to 500cd/m ² and 410cd/m ² by factory default)
Visual Performance	Viewing Angle	170° vertical and horizontal
	Native Resolution	1536 X 2048, ISD ON: 1536 X 6144 (sub-pixel)
Input Signal	Grayscale	3061 shades of gray to 256 shades of gray Simultaneous display of 1276 shades of gray is possible with the customized viewer.
	Input Sync Signal	DVI 1.0 compliant
Input Power Supply	Plug and Play	DDC2B compliant
	Input	AC adapter 100V ~ 240V (±10%) 50/60Hz
Features	Maximum Power Consumption	95W typ. (with power management feature)
	Calibration Control	Luminance, Gamma, Capability of saving 3 sets of LUT settings (An optional calibration kit is required.)
	OSD Information Display	Model name, Serial No., Total operating time, Calibration settings (Operating time from Last Calibration, Luminance, Gamma, etc.), Current luminance, etc.
Approvals	USB Hub	USB Rev. 2.0 compliant, Self-powered USB upstream connector (x1), USB downstream connector (x2)
	Other Features	Luminance Uniformity Correction, Hardware Pivot, LED indicator
	UL60601-1, CSA C22.2 No. 601.1, MDD/CE, FCC-B, VCCI-B, FDA510(k)	
Physical Characteristics	Dimensions (incl. tilt stand)	Landscape : 474.0 (W) X 468.4 / 529.9 (H) X 220.0 (D)mm Portrait : 367.0 (W) X 521.9 / 583.4 (H) X 220.0 (D)mm
	Weight	Net: approx. 11.2kg, Without tilstand: approx. 7.0kg
	Tilt stand	Tilt, Swivel, Portrait / Landscape
	Mount	100mm VESA mounting
	Security Slot	On the back of the panel and the tilt stand
	LCD surface treatment	Special AR Coating
	Accessories	AC adapter, Power cord (3P), DVI cable, USB cable, Operation manual



Options

Graphics Cards



LV Series

TOTOKU's lineup of PCI Express graphics cards enable smooth transfer of images.

	LV32P5-M	LVU2E2-N16
Max. resolution	2560 X 2048 Pixels	
BUS	PCI 64bit (66MHz) / 32bit (33MHz)	PCI Express X16
I/F	DVI X2	DVI X2 (Dual-Link)
Memory	256MB	256MB
OS	Vista/XP	Vista/XP/2000
Max. Power Consumption	11W	34W
Outline	168 X 65mm	168 X 111mm

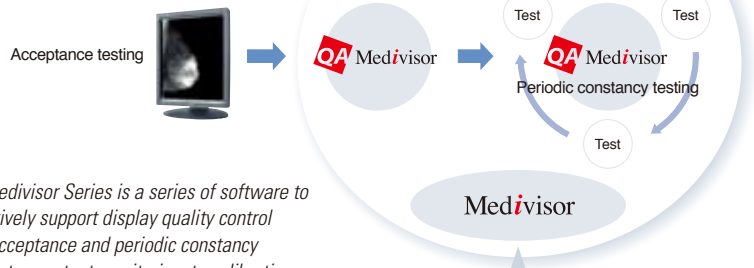
* Despite the hardware requirements for this graphics card, some computers or software and/or a combination of both may prevent the proper installation of this graphics card. Please check with your dealer before you purchase it.

Collective support for display quality control

Medivisor[®] Series



Constantly monitors displays' operational status and reports to the system administrator.



The Medivisor Series is a series of software to collectively support display quality control from acceptance and periodic constancy testing to constant monitoring, to calibration.

Calibrates displays to correct luminance and gamma changes

Viewer Software

MS31i2 supports 9M-ISD and 3M-normal modes. To use MS31i2 in 9M-ISD mode, customized viewer software is required.



TOTOKU supports Pink Ribbon activities.

TOTOKU has obtained ISO14001 and ISO9001/ISO13485 certification which are international standards concerning environment management and quality control respectively.



TOTOKU

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Additional product information is available at <http://www.totoku.com/display/>

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Please contact the distributor below with inquiries and orders.