TOTOKU

ME & CCL Series

Flat Display Systems for Medical Imaging

i *model* *i2*

i **model**

Performance and reliability through experience

ME & CCL Series

TOTOKU offers reliable medical image display system backed by experience and expertise

TOTOKU's high performance and highly reliable medical imaging displays are backed by its unique technology and decades of solid experience in the display industry.

Since 1972, TOTOKU has supplied displays for diagnostic imaging, factories, broadcast, engineering, and many other applications, and has earned high marks in the most demanding of work environments, yours.

TOTOKU's highly reliable medical imaging display system

Medical imaging displays are required to have much higher levels of accuracy, luminance stability, longer backlight life, reduced leakage current, and many other features.

Regulations and standards on display quality control for medical image displays are being established around the world. The ability to easily control and maintain display accuracy has become a necessity.

TOTOKU offers comprehensive reliable solutions with the combination of medical displays and a quality control series software, the Medivisor series.

Higher Image Quality and Total Management

— DICOM Conformance —
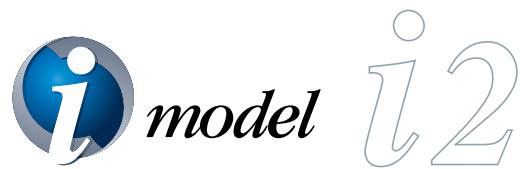
i model *i2*

The **i model** series is the realization of high-quality images through high-performance LCD panel, unique LCD drive technology and luminance stabilizing system λ-Sentinel II. Combined with the Medivisor series software to monitor and maintain display performance, display quality control is made easy and accurate.

Lineup

The **i model** series includes a wide line up of medical imaging displays designed under a unified concept.

5 Megapixel

5 Megapixel
21.3" Monochrome Display

ME551i2

ME551i2 /C (Clear-base)
ME551i2 /B (Blue-base)

Best suited for mammography applications, the ME551i2 is FDA 510(k) cleared for a use of FFDM (Full Field Digital Mammography).

| 21.3" | Digital Input | 750 cd/m² | 800:1 | Calibration function | 11-bit display | Color/Monochrome Conversion | λ-Sentinel II |
| OSD | Dual Link input | Luminance Uniformity Correction | Hardware Pivot | LED Indicator | Protective filter | | |

3 Megapixel

3 Megapixel
20.8" Monochrome Display

ME355i2

Monochrome 3MP display, best suited for chest X-rays. The high luminance, high contrast LCD panel achieves excellent grayscale rendering.

| 20.8" | Digital Input | 1000 cd/m² | 900:1 | Calibration function | 11-bit display | Color/Monochrome Conversion | λ-Sentinel II |
| Dual Link input | OSD | Luminance Uniformity Correction | Hardware Pivot | LED Indicator | Protective filter | | |

NEW
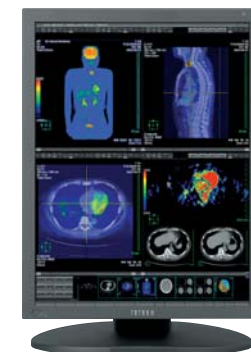
3 Megapixel
21.3" Color Display

CCL354i2

The high luminance, high contrast color LCD panel displays excellent grayscale images as well. This is capable of displaying both color and monochrome images in one screen.

| 21.3" | Digital Input | 800 cd/m² | 750:1 | Calibration function | 10Bit LUT | λ-Sentinel II |
| Dual Link input | OSD | Luminance Uniformity Correction | Hardware Pivot | LED Indicator | Protective filter | High Luminance |

2 Megapixel

2 Megapixel
21.3" Monochrome Display

ME253i2

ME253i2 /C (Clear-base)
ME253i2 /B (Blue-base)

2MP display with ultra high luminance, best suited for CT images. The hardware pivot function enables fast drawing even in portrait orientation.

| 21.3" | Digital Input | 1800 cd/m² | 700:1 | Calibration function | 11-bit display | λ-Sentinel II |
| Color/Monochrome Conversion | OSD | Luminance Uniformity Correction | Hardware Pivot | LED Indicator | Protective filter | |

NEW
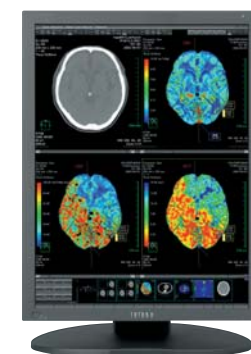
2 Megapixel
21.3" Color Display

CCL254i2

The high luminance, high contrast color LCD panel displays excellent grayscale images as well. This is capable of displaying both color and monochrome images in one screen.

| 21.3" | Digital Input | 950 cd/m² | 900:1 | Calibration function | 10Bit LUT | λ-Sentinel II |
| OSD | Luminance Uniformity Correction | Hardware Pivot | LED Indicator | Protective filter | | High Luminance |

i model i2

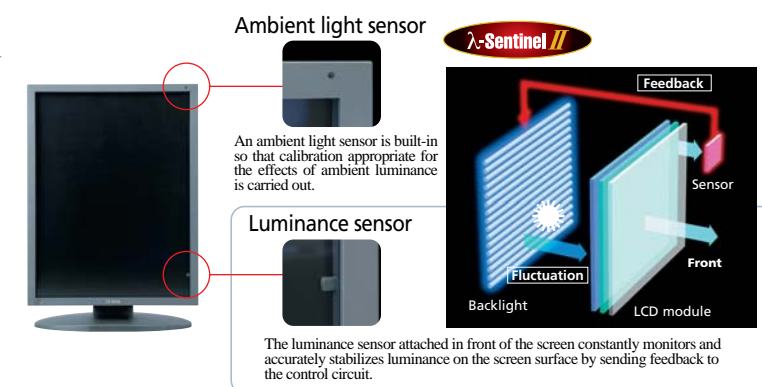*Advanced quality control solution provided by the i model.*

Medical imaging displays need to be impervious to temperature changes and color changes associated with age degradation. In response, the implementation of guidelines such as AAPM, DIN and JESRA is spreading and the demand for simple and easy quality control in accordance with such guidelines is growing.

The **i model** series boasts excellent stability provided by its built-in luminance stabilizing system λ-Sentinel II. When coupled with Medivisor, comprehensive support becomes available such as periodic evaluation against the results of the installation acceptance test, monitoring and adjustment of displays that are currently in use. The **i model** and the software combined together provide highly accurate and stable display of medical images and realize cost reduction on display quality control.

Luminance stabilizing system λ-Sentinel II

λ-Sentinel II consists of a luminance sensor and a luminance control circuit. The luminance sensor in integrated into the front bezel, directly against the screen, and constantly monitors and accurately stabilizes luminance on the screen surface by sending feedback instantaneously to the control circuit.
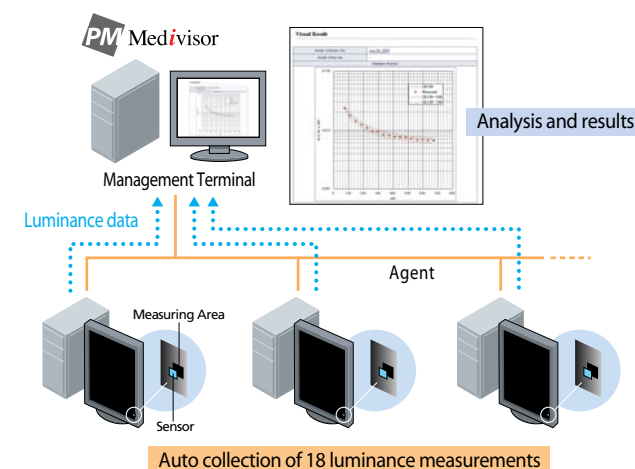
● With luminance fluctuation caused by the LCD module taken into account, highly accurate luminance control is achieved.

● Actual luminance measurements including intermediate luminance are taken on the screen surface.

Ambient light sensor

An ambient light sensor is built-in so that calibration appropriate for the effects of ambient luminance is carried out.

Luminance sensor

The luminance sensor attached in front of the screen constantly monitors and accurately stabilizes luminance on the screen surface by sending feedback to the control circuit.

λ-Sentinel II

Feedback

Sensor

Fluctuation

Front

Backlight

LCD module

Auto remote grayscale conformance evaluation

Combined with TOTOKU's performance monitoring software PM Medivisor, grayscale conformance to DICOM according to AAPM TG18 can be checked automatically and remotely.

● PM Medivisor's scheduling function activates periodic auto-evaluation.

● The test runs as a background process. Thus it can be carried out even when the display is in use.

● Results are available graphically for easy review and are centrally managed by PM Medivisor.

PM Medivisor

Management Terminal

Analysis and results

Luminance data

Agent

Measuring Area

Sensor

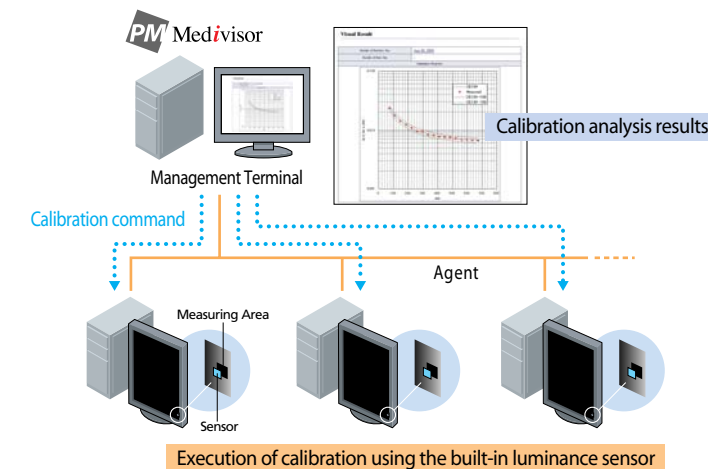Auto collection of 18 luminance measurements

Remote calibration capability *

The remote calibration feature is added to reduce the burden on system administrators. Calibration of remote displays can be accomplished from a management terminal.

● Execution of calibration using the built-in luminance sensor.

● Results are centrally managed by PM Medivisor.

* Remote calibration is available when ME551i2, ME355i2, ME253i2, CCL352i2 or CCL252i2 is used along with PM Medivisor Ver. 4.0 and above.
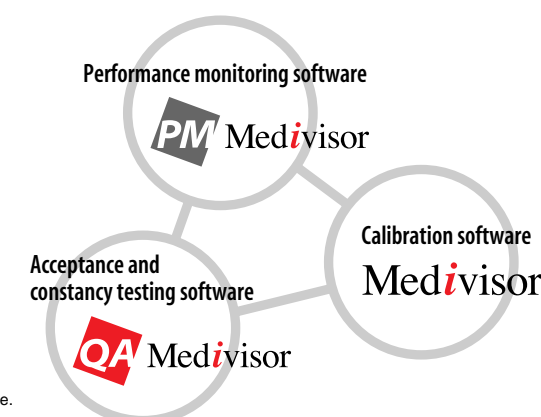
PM Medivisor

Management Terminal

Calibration analysis results

Calibration command

Agent

Measuring Area

Sensor

Execution of calibration using the built-in luminance sensor

Collective support for display quality control

Med*i*visor® Series
(Optional software)

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.

* See pages 12 and 13 for a full-blown explanation on the Medivisor series software.

Performance monitoring software

PM Med*i*visor

Acceptance and constancy testing software

QA Med*i*visor

Calibration software

Med*i*visor

TOTOKU's unique LCD drive technology realizes superior image quality, remarkable display accuracy, and user-friendly functions.

Medical imaging displays are expected to have enough resolution to accurately render microscopic detail and the gradation display capability to faithfully reproduce subtle changes in density. In addition, a fast processing speed is a must for stress-free operations in dealing with enormous amount of image data, and the capability to display both color and monochrome images in one screen is a very important factor.

The **i model** series displays, loaded with the high-performance LCD panel based upon unique technologies cultivated from years of expertise, provide highly-developed display capabilities and ease of use through its user-centered design.

i model i2
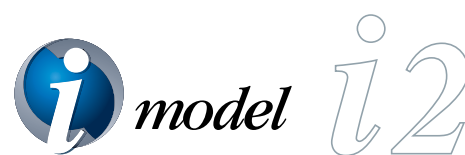
High image quality with high precision

### Luminance equalizer λ-Uniformity Congruence

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

* Images shown are for illustrative purposes only.

Simultaneous display of 2048 shades of gray

Combined with a viewer software, 2048 shades of grapy (11 bit) can be simultaneously displayed. It realizes smoother grayscale display required for medical image displays.

11.9bit LUT   8bit
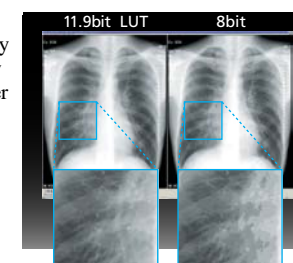
* A viewer software that supports TOTOKU's multi-shade display system is required for 11-bit simultaneous display.
* Images are for illustrative purposes only.
* Color models display 256 shades of gray (8bit) out of 1021 shades of gray.

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. Color models have a wide dynamic range enabling crisp and clear grayscale display, which is challenging for conventional displays. They are also capable of displaying both color and monochrome images in one screen.

Calibration function

Is built in to adjust gamma, and luminance levels to achieve DICOM GSDF compliant grayscale presentation.

Supported models: All ME/CCL Series models except ME183L and CCL192 plus
Note: An optional calibration kit is required. As for color displays, color temperature can be adjusted as well.

High speed drawing technology to realize stress-free operation

Dual Link input

The dual-link input feature provides smooth display of motion pictures.
*Supported models: ME551i2, ME355i2, CCL354i2

Hardware-based pivoting for fast drawing in portrait orientation

TOTOKU's hardware pivot function is directly implemented in display hardware. Therefore, hardware pivoting is much faster and less noise. Unlike other pivoting functions that are dependent on graphics cards or special software.

High-speed graphics card (Optional)

TOTOKU's lineup of PCI Express graphics cards, the fastest graphics card ever, enable smooth transfer of image data, the size of which can be expected to grow even bigger in the future.

User-friendly functions

Clear base/Blue base LCD panels

The LCD panels are available in both clear and blue base colors.

*Implemented on ME551i2, ME253i2   Clear Base   Blue Base

Color/Monochrome conversion

The built-in LUT (Look-up table) converts the RGB input into a monochrome output, realizing sharp monochrome images on color systems. And multi-display setups with both color and monochrome displays can be achieved.   * This function is equipped on monochrome models.

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.

Luminance is being stabilized.   Luminance is being adjusted. Wait until the LED goes off.   The display is in power save mode.   An error is detected.

Enhanced convenience with utility software

■ Advanced power saving*

The backlight dims as the screensaver starts, reducing power consumption and preventing unnecessary deterioration of the backlight.

* This feature may not be available, depending on the specifications of the graphics card used.

■ User-selectable display configurations

Luminance/gamma settings are selectable from three preset levels according to the needs.

■ Gamma check

18 points of luminance values are measured and plotted into a graph.

■ Ambient light and display luminance measurement

The built-in illuminance and illuminance sensors measure display luminance and ambient illuminance.

High reliance and a full range of services provide confidence.

Medical image displays are required to have a much higher level of reliance than general use displays. Backed up with its over 30 years of manufacturing experience, TOTOKU offers a wide range of products and services that meet the expectations of medical facilities.

i *model* i2

Quality management system

TOTOKU considers quality as the foundation for building trust with our customers. Thus we have acquired the ISO 9000S and ISO13485 certifications in order to promote quality improvement activities throughout the design and production phases and to enhance customer satisfaction.

ISO 9001
ISO 13485

Worldwide medical safety and EMI standards

TOTOKU medical image displays comply with various stringent worldwide medical standards. They ensure safety and reliability required for use in medical facilities.

Pairing service to match display colors (Optional)

Due to the variation in colors among cold cathode fluorescent lamps (CCFL) used as backlights, slight differences in color tone between displays are unavoidable. TOTOKU offers a display pairing service to match color tones of two displays using a high-definition spectrophotometer before shipping.

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

About TOTOKU

TOTOKU, founded in 1940 and headquartered in Tokyo, Japan, is a leading manufacturer of high-end medical image displays and touch panels. Since its launch on the display business in 1972, TOTOKU has supplied displays for various fields and has earned high marks for its product reliability under harsh conditions and post installation support, not to mention specialized technologies that are required for the respective fields. TOTOKU's products and services are available via the US, EU, and Asia offices and distributors throughout the world.
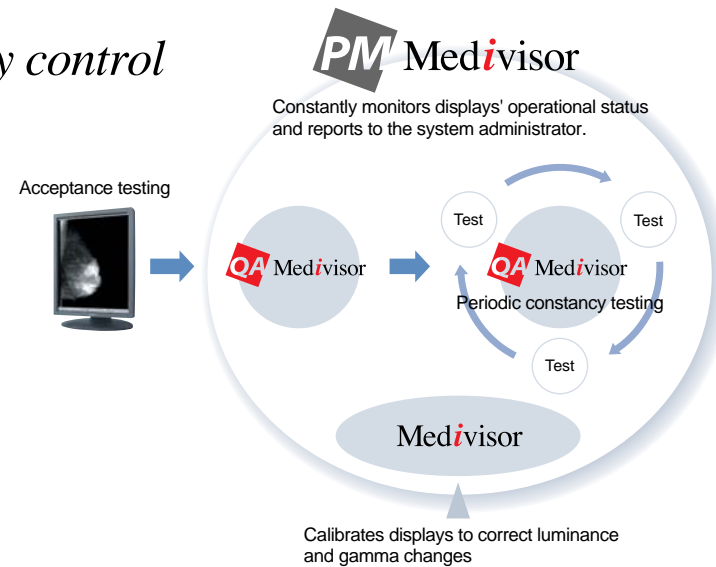
UEDA Factory

NAGAOKA Factory

Collective support for display quality control

Med*i*visor® Series

(Optional software)

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.

PM Med*i*visor

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

Acceptance testing

QA Med*i*visor → QA Med*i*visor
Test · Test · Test
Periodic constancy testing

Med*i*visor

Calibrates displays to correct luminance and gamma changes

Performance monitoring software

PM Med*i*visor

PM Medivisor is a software solution that continually collects and analyzes the operational status of medical displays installed in the hospital and reports to the system administrator. The introduction of PM Medivisor can result in significant labor savings enhancements.

Centralized control of display information

PM Medivisor enables the system administrator to manage a wide range of information such as calibration history and general information of each display including operating hours.
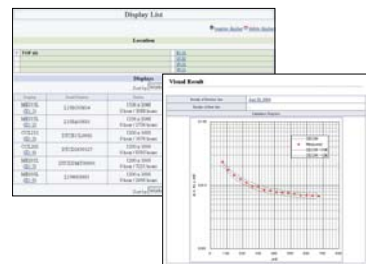
### Display operational status monitoring

The system administrator will be notified of various information including changes in luminance, configuration change such as changes of resolution, the addition or deletion of displays and workstations from the network..

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.

* The remote functions are loaded on the i model i2 series displays.

PM Med*i*visor

Management Terminal

Luminance data   Calibration command

LAN

Agent   Agent   Agent
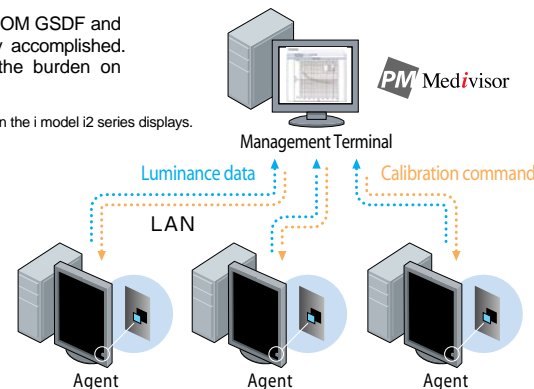
Other functions

◆ E-mail auto-delivery of alert information and other notifications
◆ Report generation in PDF format

Management Terminal
Management Station
Agent
Agent
Agent

◆ **Performance monitoring software   PM Medivisor**

Supported models:
All ME/CCL Series models except ME183L and CCL192 plus

Supported operating system:
Windows XP/2000

Acceptance and constancy testing software
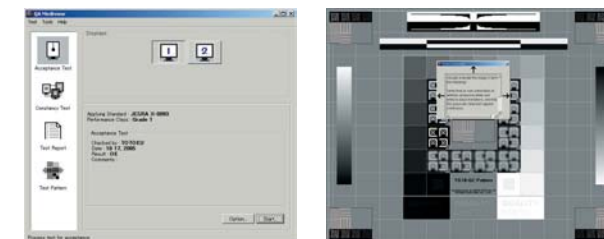
QA Med*i*visor

Acceptance and constancy tests are essential to providing and maintaining the image quality of medical image displays. QA Medivisor supports acceptance and constancy tests according to the following standards:

· AAPM TG18 - American Association of Physicists in Medicine
· DIN 6868-57V - Deutsches Institut für Normung
· JESRA X-0093-2005 - Japan Engineering Standard of Radiation Apparatus

Testing made easy and accurate. Just follow the on-screen instructions

Each standard has its own set of test items for the acceptance and constancy tests, QA Medivisor supports major standards and guides the user through the steps required for the respective standards. Acceptance and constancy tests are made easy and accurate.

Test report generation

Test procedures according to respective standards are embedded and their results can be output in PDF format. QA Medivisor also manages the generated reports.

Centralized control of test results

Test results are sent to PM Medivisor for centralized control of display performance.

◆ **Acceptance and constancy testing software   QA Medivisor**

Supported models:
All ME/CCL Series models except ME183L and CCL192 plus

* QA Medivisor is included in calibration kit CAL008.
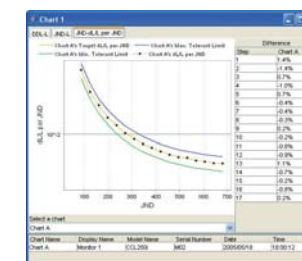

Calibration software

Med*i*visor

Medivisor provide accurate calibration required for medical image displays.

Calibration to DICOM GSDF

It goes without saying that maintaining grayscale accuracy is of significant importance for monochrome medical image displays. Periodic calibration provides accuracy control that conforms to the GSDF according to DICOM Part 14.

Test patterns for easy visual examination

Various test patterns are available for simple visual examination of display characteristics.

Graphical presentation of calibration results

Calibration results are shown not only numerically but also graphically providing quick and easy visual summaries.

User-friendly calibration

Attaching a calibration sensor, luminance, gamma, and color temperature (for color models only) can be simply but accurately calibrated. All that's required is to follow Medivisor's instructions.
In addition, a built-in front sensor provided with i2 models enables even simpler calibration without attaching the calibration sensor.

*Color temperature calibration by the front sensor is available only for models CCL354i2 and CCL254i2.

Periodic calibration of the front sensor is recommended. It can be performed automatically by calibration using a calibration sensor.

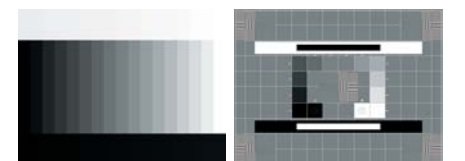### Calibration history control features

Combined with PM Medivisor, calibration results saved in each display by Medivisor can be sent to a management terminal within the network, and controlled centrally by PM Medivisor with other test results.

◆ **Medivisor for i2 Series**

Supported models:
MS51i2, ME551i2, ME355i2, ME253i2, CCL354i2, CCL352i2, CCL254i2, CCL252i2,

Supported operating system:
Windows Vista/XP/2000

◆ **Calibration kit CAL008**

Package contents	· **Calibration software:**
	Medivisor for i2 Series, Medivisor Grayscale, Medivisor Color, Medivisor for ME201L, ME181L
	· **QA Medivisor**
	· **Display Utility Software for i2 Series**
	· **GSDF Checker**
	· **Luminance sensor**

With the calibration function loaded, dual analog/digital interface, high definition LCDs are suited for modalities such a CT and MR.

2 Megapixel
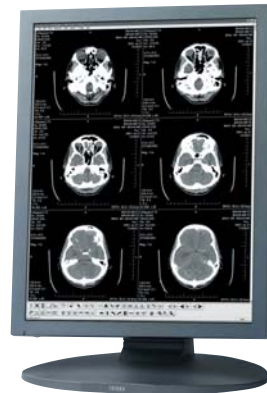
ME201L /r
2 Megapixel 20.1" Monochrome Display

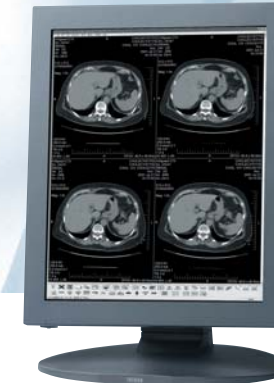| 20.1" | Analog & Digital | 700 cd/m² | 1000:1 | Calibration function | 10Bit LUT |

CCL206
2 Megapixel 20.1" Color Display

| 20.1" | Analog & Digital | 300 cd/m² | 800:1 | Calibration function | 10Bit LUT |

1.3 Megapixel

ME181L /r
1.3 Megapixel 18.1" Monochrome Display

| 18.1" | Analog & Digital | 700 cd/m² | 600:1 | Calibration function | 10Bit LUT |

CCL182 /r
1.3 Megapixel 18.1" Color Display

| 18.1" | Analog & Digital | 270 cd/m² | 400:1 | Calibration function | 10Bit LUT |

Calibration function
The built-in calibration function is capable of adjusting gamma, color temperature, and luminance levels to achieve DICOM GSDF compliant grayscale presentation.

Note: Calibration requires an optional calibration kit. The color temperature adjustment is for color displays only.
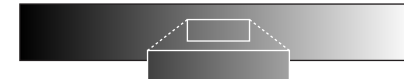
10bit LUT
The 10 bit look up table (LUT) carries calibrated 10 bit (1021 shades of gray) data and converts 8 bit video signal sent from a graphics card into LUT's calibrated data.

Conventional Grayscale
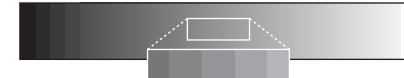
10 bit LUT Grayscale

* Images shown are for illustrative purposes only.

Luminance stabilizing system λ-Sentinel
The panel luminance changes due to age deterioration of the backlight and temperature change. The ME/CCL Series provides stable luminance resistant to such factors.

Dual digital/analog interface
Analog RGB and digital DVI inputs are supported.

Worldwide medical safety and EMI standards
TOTOKU medical image displays comply with various stringent worldwide medical standards. They ensure safety and reliability required for use in medical facilities.

Pairing service to match display colors (Optional)
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.
Supported models: ME181L /r, ME201L /r

Medivisor Series software (Optional)

Med*i*visor

The Medivisor Series software offers collective support for display quality control and delivers high-quality and stable medical images while realizing reduction in display quality management costs.

Supported models:
All ME/CCL Series models except ME183L and CCL192plus

Multiple interfaces and internal power supply : perfect solution for many modalities.

1.3 Megapixel

ME183L
1.3 Megapixel 18.1" Monochrome Display

| 18.1" | Multi Interface | 700 cd/m² | 600:1 | Preset Gamma Setting | Picture in Picture | Built-in Power supply |

CCL192 plus
1.3 Megapixel 19" Color Display

| 19" | Multi Interface | 450 cd/m² | 600:1 | High Response LCD | Preset Gamma Setting | Picture in Picture | Built-in Power supply |

Multiple interfaces
Includes digital DVI, interlaced/non-interlaced analog RGB, S-Video, and NTSC/PAL composite signals.

* Digital DVI is supported by CCL192 plus only.

ME183L   NTSC / PAL   D-sub

PC Link   S-Video   BNC

CCL192 plus   NTSC / PAL   D-sub

PC Link   S-Video   DVI-D
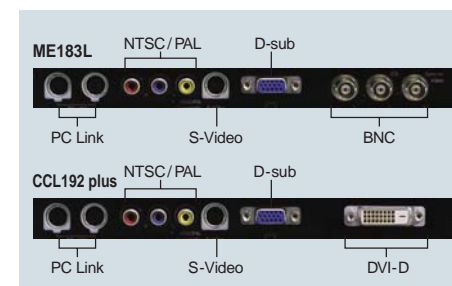
Picture-in-Picture
The Picture-in-Picture feature allows you to have two screens (a TV signal and computer data) simultaneously.

* The PIP function is available for NTSC/PAL and S-Video only.

Luminance stabilizing system
The luminance stabilizing system delivers stable display of images by automatically stabilizing luminance fluctuations caused by startup drift, temperature change, and age deterioration.

Internal power supply
The internal power supply unit eliminates the need for an external AC adapter and frees more desk space.

Built-in overdrive circuit for smooth illustration of motion pictures
The overdrive circuit realizes a 12ms response time, while minimizing afterimage effects.

* Implemented on CCL192 plus.

DICOM gamma preset
6 gamma presets, including DICOM-compliant gamma, are available to cover various applications.

Worldwide medical safety and EMI standards
TOTOKU medical image displays comply with various stringent worldwide medical standards. They ensure safety and reliability required for use in medical facilities.

Specifications

5 Megapixel

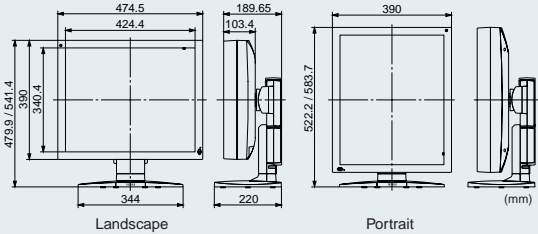| Model Name		ME551i2 /C (Clear-base), ME551i2 / B (Blue-base)
LCD Panel	Technology	21.3-inch, TFT Monochrome, Active matrix
	Display Area	422.4mm X 337.9mm
	Pixel Pitch	0.165mm X 0.165mm
	Contrast Ratio	800 :1 typ.
	Maximum Luminance	750cd/m² typ. (calibrated to 410cd/m² by factory default)
	Viewing Angle	170° vertical and horizontal
Visual Performance	Available Resolution	640 X 480 (VGA), 2048 X 2560 or 2560 X 2048
	Grayscale	11.9bit (3826) grayscale to 8bit (256) grayscale Simultaneous display of 11 bit (2048 shades of gray) is possible with the customized viewer.
Input Signal	Input Sync Signal	DVI 1.0 compliant
	Plug and Play	DDC2B compliant
Input Power Supply	Input	AC adapter 100V ~ 240V (±10%) 50/60Hz
	Maximum Power Consumption	80W typ. (with power management feature)
Features	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.
	USB Hub	USB Rev. 2.0 compliant, Self-powered USB upstream connector (x1), USB downstream connector (x2)
	Other Features	Luminance Uniformity Correction, Hardware Pivot, Color/Monochrome conversion, LED indicator
Approvals		UL60601-1, CSA C22.2 No.601.1, MDD/CE, FCC-B, VCCI-B, FDA510 (k), MIC, CCC
Physical Characteristics	Dimensions (incl. tilt stand)	Landscape : 474.5 (W) X 479.9 / 541.4 (H) X 220 (D) mm Portrait : 390 (W) X 522.2 / 583.7 (H) X 220 (D) mm
	Weight	Net: approx. 12.1kg, Without tiltstand: approx. 7.9kg
	Tilt stand	Tilt, Swivel, Portrait / Landscape
	Mount	100mm VESA mounting
	Security Slot	On the back of the panel and the tilt stand
	Protective Filter	Antireflection-coated
Accessories		AC adapter, Power cord (3P), DVI cable, USB cable, Operation manual

ME551i2

Landscape | Portrait (mm)

3 Megapixel

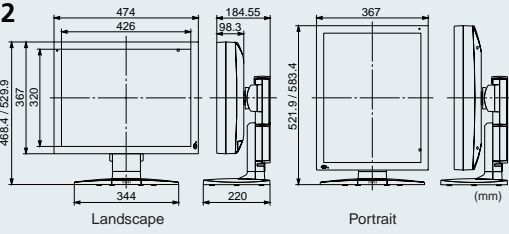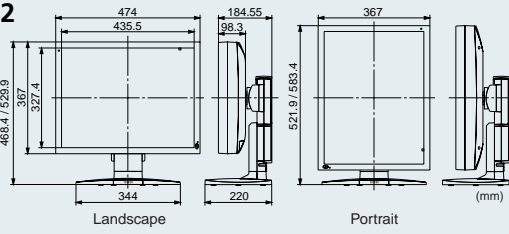| Model Name		ME355i2	CCL354i2
LCD Panel	Technology	20.8-inch, TFT Monochrome, Active matrix	21.3-inch, TFT Color Active matrix
	Display Area	423.9mm X 318.0mm	433.152mm X 324.864mm
	Pixel Pitch	0.207mm X 0.207mm	0.2115mm X 0.2115mm
	Contrast Ratio	900 :1 typ.	750 :1 typ.
	Maximum Luminance	1000cd/m² typ. (calibrated to 410cd/m² by factory default)	800cd/m² typ. (calibrated to 410cd/m² • 300cd/m² by factory default)
	Viewing Angle	170° vertical and horizontal	←
Visual Performance	Available Resolution	USTEXT, 640 X 480 (VGA), 800 X 600 (SVGA), 1024 X 768 (XGA), 2048 X 1536 (QXGA)	←
	Grayscale	11.9bit (3826) grayscale to 8bit (256) grayscale Simultaneous display of 11 bit (2048 shades of gray) is possible with the customized viewer.	10bit(1021) grayscale to 8bit(256) grayscale
	Color display	————	Full color (16.77million colors)
Input Signal	Input Sync Signal	DVI 1.0 compliant	←
	Plug and Play	DDC2B compliant	←
Input Power Supply	Input	AC adapter 100V ~ 240V (±10%) 50/60Hz	←
	Maximum Power Consumption	85W typ. (with power management feature)	120W typ. (with power management feature)
Features	Calibration Control	Luminance, Gamma, Capability of saving 3 sets of LUT settings (An optional calibration kit is required.)	Luminance, Gamma, Color temp., Capability to save 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.	Model name, Serial No., Total operating time, Calibration settings (Operating time from Last Calibration, Luminance, Gamma, Color temp, etc.), Current luminance, etc.
	USB Hub	USB Rev. 2.0 compliant, Self-powered USB upstream connector (x1), USB downstream connector (x2)	
	Other Features	Luminance Uniformity Correction, Hardware Pivot, Color/Monochrome conversion, LED indicator	Luminance Uniformity Correction, Hardware Pivot, LED indicator
Approvals		UL60601-1, CSA C22.2 No.601.1, MDD/CE, FCC-B, VCCI-B, FDA510 (k), MIC, CCC	UL60601-1, CSA C22.2 No.601.1, MDD/CE, FDA510(k), FCC-B, VCCI-B
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. 11kg, Without tiltstand: approx. 6.8kg	Net: approx. 11.5kg, Without tiltstand: approx. 7.3kg
	Tilt stand	Tilt, Swivel, Portrait / Landscape	←
	Mount	100mm VESA mounting	←
	Security Slot	On the back of the panel and the tilt stand	←
	Protective Filter	Antireflection-coated	←
Accessories		AC adapter, Power cord (3P), DVI cable, USB cable, Operation manual	←

ME355i2

Landscape | Portrait (mm)

CCL354i2

Landscape | Portrait (mm)

2 Megapixel

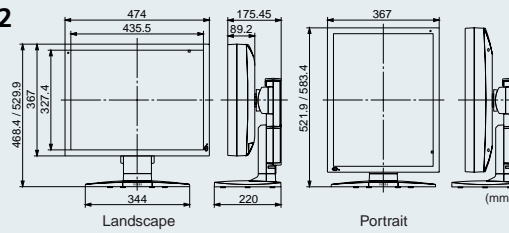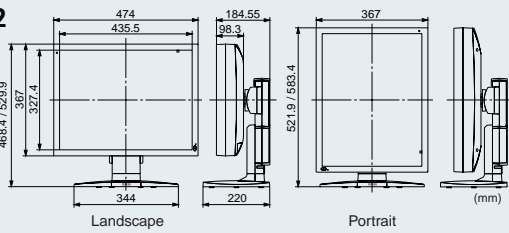| Model Name		ME253i2 /C (Clear-base), ME253i2 / B (Blue-base)	CCL254i2
LCD Panel	Technology	21.3-inch, TFT Monochrome, Active matrix	21.3-inch, TFT Color Active matrix
	Display Area	432mm X 324mm	←
	Pixel Pitch	0.270mm X 0.270mm	←
	Contrast Ratio	700 :1 typ.	900 :1 typ.
	Maximum Luminance	1800cd/m² typ. (calibrated to 410cd/m² by factory default)	950cd/m² typ. (calibrated to 410cd/m² • 300cd/m² by factory default)
	Viewing Angle	170° vertical and horizontal	←
Visual Performance	Available Resolution	USTEXT, 640 X 480 (VGA), 800 X 600 (SVGA), 1024 X 768 (XGA), 1280 X 1024 (SXGA), 1600 X 1200 (UXGA)	←
	Grayscale	11.9bit (3826) grayscale to 8bit (256) grayscale Simultaneous display of 11 bit (2048 shades of gray) is possible with the customized viewer.	10bit(1021) grayscale to 8bit(256) grayscale
	Color display	————	Full color (16.77million colors)
Input Signal	Input Sync Signal	DVI 1.0 compliant	←
	Plug and Play	DDC2B compliant	←
Input Power Supply	Input	AC adapter 100V ~ 240V (±10%) 50/60Hz	←
	Maximum Power Consumption	85W typ. (with power management feature)	120W typ. (with power management feature)
Features	Calibration Control	Luminance, Gamma, Capability of saving 3 sets of LUT settings (An optional calibration kit is required.)	Luminance, Gamma, Color temp., Capability to save 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.	Model name, Serial No., Total operating time, Calibration settings (Operating time from Last Calibration, Luminance, Gamma, Color temp, etc.), Current luminance, etc.
	USB Hub	USB Rev. 2.0 compliant, Self-powered USB upstream connector (x1), USB downstream connector (x2)	
	Other Features	Luminance Uniformity Correction, Hardware Pivot, Color/Monochrome conversion, LED indicator	Luminance Uniformity Correction, Hardware Pivot, LED indicator
Approvals		UL60601-1, CSA C22.2 No.601.1, MDD/CE, FDA510 (k), FCC-B, VCCI-B, MIC, CCC	UL60601-1, CSA C22.2 No.601.1, MDD/CE, FDA510(k), FCC-B, VCCI-B
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. 11.6kg, Without tiltstand: approx. 7.4kg	Net: approx. 11.5kg, Without tiltstand: approx. 7.3kg
	Tilt stand	Tilt, Swivel, Portrait / Landscape	←
	Mount	100mm VESA mounting	←
	Security Slot	On the back of the panel and the tilt stand	←
	Protective Filter	Antireflection-coated	←
Accessories		AC adapter, Power cord (3P), DVI cable, USB cable, Operation manual	←

ME253i2

Landscape | Portrait (mm)

CCL254i2

Landscape | Portrait (mm)

Graphics Cards

TOTOKU's lineup of PCI Express graphics cards enable smooth transfer of images whose size can be expected to grow even bigger in the future. (Optional.)

Model	LV22E4-N1	LV22E4-N16	LV32P1	LV32P4	LV32E2	LV33E1	LV52P1	LVU2E2-N16
Photo								
Max. resolution	1600 X 1200 Pixels		2048 X 1536 Pixels					2560 X 2048 Pixels
BUS	PCI Express X1	PCI Express X16	PCI 64bit (66MHz)/ 32bit (33MHz)	PCI 64bit (66MHz)/ 32bit (33MHz)	PCI Express X16	PCI Express X16	PCI 64bit(66MHz)/ 32bit(33MHz)	PCI Express X16
I/F	DVI X2		DVI X2			DVI X2 Analog RGB X1	DVI X2	DVI X2 (Dual-link)
Memory	256MB	256MB	256MB	128MB	128MB	128MB	256MB	256MB
OS	Vista/XP/2000	Vista/XP/2000	XP/2000/NT 4.0(SP6)	XP/2000	XP/2000	XP	XP/2000/NT 4.0(SP6)	Vista/XP/2000
Max. Power Consumption (W)	19W	21W	35W	15W	27W	25W	35W	38W
Approvals	IEC60601-1, JIS T0601-1-2							IEC60601-1, JIS T0601-1-2
Outline	168 X 65mm	168 X 65mm	190 X 107mm	133 X 65mm	163 X112mm	173 X 69mm	190 X 107mm	168 X 111mm
Compatible models	ME253i2, CCL254i2, ME181L /r, ME201L /r, CCL182 /r, CCL206		ME355i2, CCL354i2				ME551i2	ME551i2, ME355i2 CCL354i2

* 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.

*These specifications are as of May 2008. They are subject to change without notice.

2 Megapixel

| Model Name		ME201L /r	CCL206
LCD Panel	Technology	20.1-inch, TFT Monochrome, Active matrix	20.1-inch, TFT Color Active matrix
	Display Area	408.0mm X 306.2mm	408mm X 306mm
	Pixel Pitch	0.255mm X 0.255mm	←
	Contrast Ratio	1000 :1 typ.	800 :1 typ.
	Maximum Luminance	700cd/m² typ. (calibrated to 410cd/m² by factory default)	300cd/m² typ. (calibrated to 120cd/m² by factory default)
	Viewing Angle	170° vertical and horizontal	178° vertical and horizontal
Visual Performance	Available Resolution	640 X 480 (VGA), ~1600 X 1200 (UXGA)	←
	Grayscale	10bit(1021) grayscale to 8bit(256) grayscale	←
	Color display	—	Full color (16.77million colors)
Input Signal	Input Sync Signal	Digital DVI / Analog RGB	←
	Plug and Play	DDC2B compliant	←
Input Power Supply	Input	AC adapter 100V ~ 240V (-10%, +6%) 50/60Hz	AC adapter 100V ~ 240V (±10%) 50/60Hz
	Maximum Power Consumption	50W typ. (with power management feature)	70W typ. (with power management feature)
Features	Calibration Control	Luminance, Gamma (An optional calibration kit is required.)	Luminance, Gamma, Color temp. (An optional calibration kit is required.)
	USB Hub	USB Rev. 2.0 compliant, Self-powered USB upstream connector (x1), USB downstream connector (x2)	←
Approvals		UL2601-1, CSA C22.2 No.601.1, MDD/CE, FDA510 (k), MIC, CCC, FCC-B, VCCI-B	UL60601-1, CSA C22.2 No. 601.1, MDD/CE, FCC-B, VCCI-B, FDA510(k)
Physical Characteristics	Dimensions (incl. tilt stand)	Landscape : 453 (W) X 461 / 523 (H) X 220.0 (D) mm / Portrait : 353 (W) X 511 / 573 (H) X 220.0 (D) mm	
	Weight	Net: approx. 11.5kg, Without tiltstand: approx. 7.1kg	Net: approx. 11.4kg, Without tiltstand: 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	←
	Protective Filter	Antireflection-coated protective filter	←
Accessories		AC adapter, Power cord (3P), DVI cable, VGA cable, Serial cable, USB cable, Operation manual	←

ME201L /r

Landscape   Portrait

CCL206

Landscape   Portrait

1.3 Megapixel
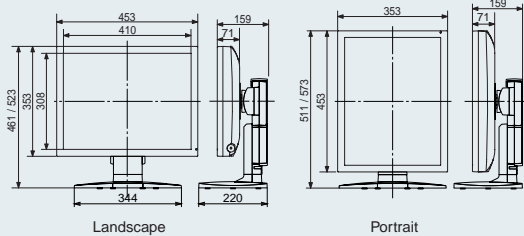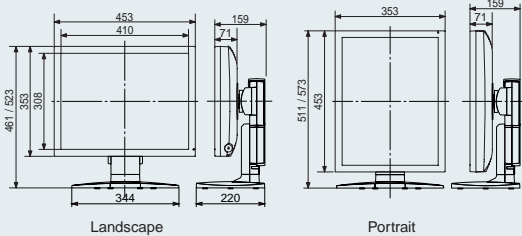
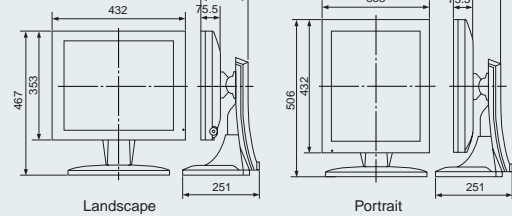| Model Name		ME181L /r	CCL182 /r
LCD Panel	Technology	18.1-inch, TFT Monochrome, Active matrix	18.1-inch, TFT Color Active matrix
	Display Area	359.0mm X 287.2mm	359mm X 287mm
	Pixel Pitch	0.2805mm X 0.2805mm	←
	Contrast Ratio	600 :1 (Typ.)	400 :1 (Typ.)
	Maximum Luminance	700cd/m² (Typ.), (calibrated to 410cd/m² by factory default)	270cd/m² (Typ.), (calibrated to 120cd/m² by factory default)
	Viewing Angle	170° vertical and horizontal	←
Visual Performance	Available Resolution	640 X 480 (VGA), ~1280 X 1024 (SXGA)	←
	Grayscale	10bit(1021) grayscale to 8bit(256) grayscale	←
	Color display	—	Full color (16.77million colors)
Input Signal	Input Sync Signal	Digital DVI / Analog RGB	←
	Plug and Play	DDC2B compliant	←
Input Power Supply	Input	AC adapter 100V ~ 240V (-10%, +6%) 50/60Hz	←
	Maximum Power Consumption	50W Typical (with power management feature)	←
Features	Calibration Control	Luminance, Gamma (An optional calibration kit is required.)	Luminance, Gamma, Color temp. (An optional calibration kit is required.)
	USB Hub	USB Rev. 2.0 compliant, Self-powered USB upstream connector (x1), USB downstream connector (x2)	←
Approvals		UL2601-1, CSA C22.2 No.601.1, MDD/CE, FDA510 (k), MIC, CCC, BSMI, FCC-B, VCCI-B	UL2601-1, CSA C22.2 No.601.1, MDD/CE, FDA510 (k), MIC, BSMI, FCC-B, VCCI-B
Physical Characteristics	Dimensions (incl. tilt stand)	Landscape : 432 (W) X 434 / 523 (H) X 220.0 (D) mm / Portrait : 353 (W) X 474 / 563 (H) X 220.0 (D) mm	
	Weight	Net: approx. 10kg, Without tiltstand: approx. 5.8kg	←
	Tilt stand	Tilt, Swivel, Portrait / Landscape	←
	Mount	100mm VESA mounting	←
	Security Slot	On the back of the panel and the tilt stand	←
Accessories		AC adapter, Power cord (3P), DVI cable, VGA cable, Serial cable, USB cable, Operation manual	←

ME181L /r

Landscape   Portrait

CCL182 /r

Landscape   Portrait

1.3 Megapixel
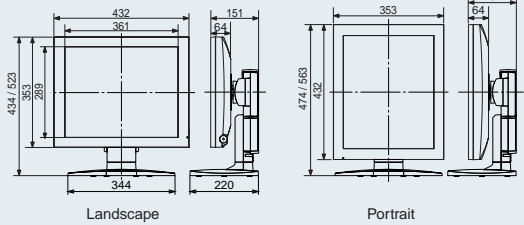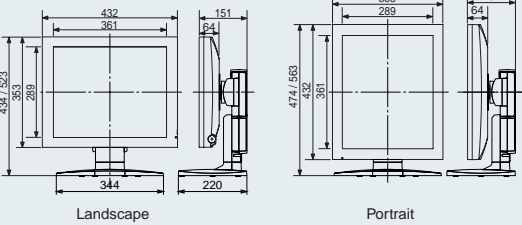
Model Name		ME183L
LCD Panel	Technology	18.1-inch, TFT Monochrome, Active matrix
	Display Area	359.0mm X 287.2mm
	Pixel Pitch	0.2805mm X 0.2805mm
	Contrast Ratio	600 :1 typ.
	Maximum Luminance	700cd/m² typ.
	Viewing Angle	170° vertical and horizontal
Available Resolution		640 X 480 (VGA), ~1280 X 1024 (SXGA)
Input Signal	Input Sync Signal	Analog: D-sub 15P, BNC (Sync on Video, Separate), S-Video, NTSC/PAL Composite, Y-Cb-Cr
	Plug and Play	DDC2B compliant
Input Power Supply	Input	100V ~ 240V (-10%, +6%) 50/60Hz
	Maximum Power Consumption	50W typ. (with power management feature)
Features	Gamma presets	1.6, 1.8, 2.0, 2.2, 2.4, and DICOM GSDF
	OSD Information Display	Auto adjustment, Brightness, Contrast, etc.
	Picture-In-Picture	S-Video, NTSC/PAL
Approvals		UL2601-1, CSA C22.2 No.601.1, MDD/CE, FDA510 (k), BSMI, MIC, FCC-B, VCCI-B
Physical Characteristics	Dimensions (incl. tilt stand)	Landscape : 432 (W) X 467 (H) X 251 (D) mm / Portrait : 353 (W) X 506 (H) X 251 (D) mm
	Weight	Net: approx. 10.6kg, Without tilt stand: approx. 7.9kg
	Tilt stand	Tilt, swivel, landscape/portrait
	Mount	100mm VESA mounting
	Security Slot	On the back of the panel and the tilt stand
Accessories		Power cord (3P), VGA cable, S-Video cable, Composite cable, Y-Cb-Cr cable, Serial cable, Operation manual

ME183L

Landscape   Portrait

Model Name		CCL192 plus
LCD Panel	Technology	19-inch, TFT Color Active matrix
	Display Area	376mm X 301mm
	Pixel Pitch	0.294mm X 0.294mm
	Contrast Ratio	600 :1 typ.
	Maximum Luminance	450cd/m² typ.
	Viewing Angle	178° vertical and horizontal
Visual Performance	Available Resolution	640 X 480 (VGA), 800 X 600 (SVGA), 1024 X 768 (XGA), 1280 X 1024 (SXGA)
	Color Display	Full color (16.77 million colors)
Input Signal	Input Sync Signal	DVI 1.0 compliant, Analog RGB, Composite, S-Video, Y-Cb-Cr, NTSC/PAL (Including interlace scan mode)
	Plug and Play	DDC2B compliant
Input Power Supply	Input	100V ~ 240V (±10%) 50/60Hz
	Maximum Power Consumption	65W typ. (with power management feature)
Features	Gamma presets	1.6, 1.8, 2.0, 2.2, 2.4, and DICOM GSDF
	Color presets	Cool, Neutral, Warm, User
	OSD Information Display	Auto adjustment, Brightness, Contrast, Black level, Size, etc.
	Picture-In-Picture	S-Video, NTSC/PAL
Approvals		UL60601-1, CSA C22.2 No.601.1, MDD/CE, FDA510 (k), CCC, MIC, Ek, FCC-B, VCCI-B
Physical Characteristics	Dimensions (incl. tilt stand)	Landscape : 432 (W) X 467 (H) X 251 (D) mm / Portrait : 353 (W) X 506 (H) X 251 (D) mm
	Weight	Net: approx. 9.4kg, Without tiltstand: approx. 6.7kg
	Tilt stand	Tilt, Swivel, Portrait / Landscape
	Mount	100mm VESA mounting
	Security Slot	On the back of the panel and the tilt stand
Accessories		Power cord (3P), DVI cable, VGA cable, S-Video cable, Y-Cb-Cr cable, Serial cable, Operation manual

CCL192 plus

Landscape   Portrait

Medical safety standards

TOTOKU medical imaging displays are certified under various medical safety standards in North America and EU countries where much more medical equipment are subject to significantly more stringent requirements then general IT devices, ensuring safety and reliability for use in medical facilities.

UL — UL (Underwriters Laboratories, Inc.) is an independent nonprofit testing and certification organization established in the United States. TOTOKU medical image displays are certified under UL60601-1, CSA C22.2 No.601.1, thus labeled with the UL Listing Marking.

CE Marking — CE Marking is provided for products sold in European countries to indicate that the products conform to the EU Directive. Products from outside the EU sold into the EU market are required to includethis CE Marking. TOTOKU medical image displays are certified under EN60601-1-1 (medical safety standard) and EN60601-1-2 (medical EMC standard) and conform to the Medical Device Directive (MDD), and are labeled with the CE Marking.

FDA 510(k) — 510(k), also known as Premarket Notification, refers to an application submitted to the Food and Drug Administration (FDA). It is an FDA national standard to allow a determination of the safety, effectiveness, and substantial equivalence of a device to a device already legally on the US market in the past or present. Its strict evaluation covers not only the safety and effectiveness of the device, but also proper labeling, including advertisements.
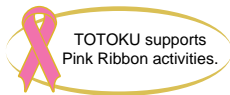
⚠ **Safety Precautions**   **Please read the user's manual for safe and proper use.**

Do not expose the product to dust, moisture, steam or oily smoke. It could cause fire, electric shock, or a failure.

i model

INTEGRATION OF HARDWARE AND SOFTWARE

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

JQA-EM0674

ISO 9001
ISO 13485

TOTOKU

TOTOKU Intelligent Devices and Solutions Dept. Sales and Marketing Division.
TOTOKU ELECTRIC CO., LTD.
1-3-21 Okubo, Shinjuku-ku, Tokyo 169-8543 TEL: +81 3-5273-2022 FAX: +81 3-5273-2091
*Osaka Branch: +81 6-6352-3541 *Nagoya Branch: +81 52-771-1161 *Shinetsu Branch: +81 268-34-5285

USA	EUROPE	ASIA
TOTOKU NORTH AMERICA, INC	*TOTOKU Europe GmbH*	*TOTOKU ELECTRIC CO., LTD.*
1425 Greenway Dr.,Ste. 565	Hammfelddamm 6.	3-21, Okubo-1 Chome
Irving, Tx 75038, U.S.A.	D-41460 Neuss, Germany	Shinjuku-ku, Tokyo, Japan
TEL : +1-972-550-1888	TEL : +49-2131-36668-0	TEL : +81-3-5273-2053
E-mail : info@totoku-na.com	E-mail : info@totoku.eu	E-mail : info-idsc@totoku.co.jp

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

*Microsoft and Windows are trademarks of the US Microsoft Corporation and are registered in the US and other countries. *Company names and product names are the trademarks or registered trademarks of the respective companies. *Product specifications and appearance are subject to change without notice. *Colors in photographs may differ from actual colors due to the printing process. *Images on screens are simulated.

Please contact the distributor below with inquiries and orders.

2008.05 i model-E-A-2K-2008.05 SE