3Mp Grayscale Display for Diagnostic Medical Imaging

The MML2032 is a 3Mpixel monochrome Flat Panel Display specifically designed for digital medical imaging. Fully compliant with the DICOM 3.14 standard demanding prescriptions, thanks to its internal 10 bit look up table, this display matches the highest requirement of the medical market in terms of grayscale rendition, picture quality and performances.

Highlights

- 20.8” QXGA fixed resolution (1536 x 2048 pixels)
- DVI-D input
- Wide viewing angle (170° H&V)
- High brightness (max 800 Cd/sqm)
- High contrast ratio (600:1)
- Backlight Stabilization
- Automatic Grayscale calibration: Factory + User
- Internal LUT – 10Bit
- Useful grey levels: 1024 out of 3061
- Native / DICOM User selectable LUT
- USB-A & USB-B Interface
- Universal mounting (GCX/VES A plate)
- Bundled Dual Head 10bit Graphic card
- Real 10 bit video chain up to the monitor
- Medical Grade External 12Vdc SMPS
3Mp Grayscale Display

Specifications

**Display:**
- Technology: TFT AMLCD Dual Domain IPS
- Display size: 20.8" QXGA (1536 x 2048)
- Pixel pitch: 0.207 x 0.207 mm
- Viewing angle: 170° (+/-85°) hor. and vert.
- Response time: 35ms Typical

**Characteristics:**
- Brightness: 800 cd/sqm - Typical
- Contrast ratio: 600 :1 - Typical
- Palette: Up to 3,061 grayscale tones
- DICOM conformance: Dynamically adjusted
- Output Transfer Function: Programmable 10 bit LUT

**Input/Output Connectors:**
- Video Input: DVI-D connector
- Serial port: RS232
- USB port: 1xUSB-A & 2xUSB-B

**Power Supply:**
- External AC/DC Power Supply
- Input Voltage: 100 to 240 VAC, 50-60 Hz
- Output voltage: +12V, < 60 W (max), < 7 W (stand-by)

**User Control:**
- A 5 button keyboard on the back of the monitor allows the User to interact with the monitor through a simple OSD menu. Direct access to Brightness adjustment. Keyboard lock available (when remotely controlled).

**Environmental Specifications:**
- Temperature (operating): 0°C to 40°C
- Temperature (storage): -5°C to 60°C
- Humidity (non-condensing): 20% to 90%

**Physical Characteristics:**
- Dimensions: Width: 370.0 mm, Height: 476.0 mm, Depth: 98.0 mm
- Weight (with pedestal): 9.88 kg

**Regulations/Standards & Markings:**
- Medical Electrical Safety:
  - UL60601-1
  - IEC60601-1
  - EN60601-1
- Medical EMC:
  - IEC60601-1-2
  - EN60601-1-2
  - ENS50111 / CISPR 11
- Approvals/Marking:
  - CE, C-UL-US, DEMKO
  - CCC (in progress)

**Calibration:**

**Automatic Backlight Stabilization:**
An internal feedback circuitry allows to quickly stabilize the brightness at power up and to keep it stable at any desired level over the time. The brightness is factory preset at the nominal value of 600 Cd/sqm.

**SmartEye:**
The MML2032 is equipped with an embedded light-meter located on one side of the screen which can be used to periodically recalibrate the internal display LUT (Look Up Table) to achieve the best possible matching of the Display Transfer Function to the DICOM standard when working in stand alone mode. It can also be used as entry level light-meter by the MediQA application.

**Grayscale correction:**
Thanks to the Internal 10bit LUT 1,024 simultaneous gray levels can be selected out of a palette of 3,061 grayscale tones.

**Factory calibration:**
The MML2032 will come factory calibrated according to the DICOM standard, and, thanks to proprietary embedded algorithm the conformity to DICOM is granted at any User selected brightness value.

**User calibration:**
When used in Stand Alone mode, the MML2032 can be recalibrated at any time by means of a proper function accessible through the OSD, without any external tool thanks to the embedded SmartEye.

**MediQA:**
With this application, the MML2032 can work in Remote Control mode can be calibrated to comply with DICOM 3.14 and can be tested according to DIN-6868/57, AAPM/TG18 by either means of the embedded SmartEye or an external light-meter.

**Special Features:**

**SmartEye:**
Front sensor for User DICOM smaller char.set.calibration

**SmartPivot:**
Automatic Portrait/Landscape smaller char.set. rotation This unique feature allows the User, by simply pivoting the screen to rapidly switch from a portrait display (1536 x 2048) to a landscape one (2048 x 1536) and have the image automatically rotated accordingly for the best fit of the native image resolution, without performing any time-consuming setup or configuration.

**MediQA:**
Optional DICOM Conformance Check and QA application (DICOM, DIN6868/57, AAPM/TG18).

**Options:**

**Protective Glass:**
The MML2032 is available as option with an AR protective panel.

**Backlight color:**
The MML2032 is available either in the Bluish (P45) version or in Clear Base (8000 °K) version to fulfill the traditional preferences of both the EU and US market.

**Graphic Cards:**
The MML2032 is available in 10-bit configuration in bundle with the following graphic cards:

**Matrox MED 3MP:**
PCI-64/66; Short Length, Full height 256 MB memory; Dual DVI connector, 10-bit out, WEEE and RoHS compliant.

**RealVision SMD-3 Adv:**
PCI-Express – single lane, 512 MB Frame Buffer; Dual DVI connector, 10-bit out, WEEE and RoHS compliant.