



19INCH LCD MONITOR FOR MEDICAL

REV A

User Manual

19” LCD Monitor for Medical HL1916

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1. Application

This high-resolution color display is specifically designed to meet the rigorous performance standards needed for diagnostic, interventional radiology, and other medical applications. To guarantee image integrity, features include accurate signal conversion and a wide range of interfacing options.

Compact design -Low weight and small size with improved performance make the color flat panel display HL1916 preferable to conventional CRT monitors.

Embedded LUT(Look Up Table)-This monitor is factory calibrated to achieve DICOM part 3.14 compliance and Linear gray level reproduction at the factory set point. 5 different settings are stored within the display.

Screen resolution- HL1916 is equipped with a panel with Super In Plane switching technology. The optimal picture resolution is 1280 x 1024 pixels. Video signals with other resolutions typical to medical engineering are optimally zoomed in or out to the screen size.

Fast backlight stability- The luminance stabilization circuit employs a built in photo sensor to keep the back-light lamps at a constant luminance for consistent calibration over the life of the display and can control the back light system automatically to extend the life of the monitor and achieve very short warming up time.

2. Safety precautions



Medical Equipment

With respect to electric shock, Fire and mechanical hazards only in accordance with UL 60601-1 and CAN/CSA C22.2 No. 601.1

Regular maintenance and calibration are recommended

Please note that liquid crystal displays such as the HL1916 do not have a failure rate of zero and image parameters may change over time (e.g. luminance or discoloration). Please ensure that all measures are taken to prevent injuries or incorrect diagnoses. Regular maintenance and calibration are recommended.

Correct and safe operation of the flat panel displays is dependent on proper transport, storage, installation and assembly, as well as careful operation and maintenance. The units must only be used for applications for which monitors are normally used. The information in the Section "Technical data" must be observed exactly.

For the sake of safety, the following precautions must be observed:



Danger: There is a danger to life if the warning information is not observed. Severe personal injury or damage to property may occur. Do not open the unit yourself.

Certain components inside the units are at high-voltage, i.e. touching these components presents a **danger to life!**

Only use a perfect power supply cable

A damaged power supply cable may result in a fire or electric shock. When disconnecting the power supply cable, always do so by holding the plug.

**Only use the same type of fuse
3.15A/250V**

Do not insert any objects into the housing

Objects inserted into the housing may result in damage to the unit or personal injury.

Do not place any objects on top of the units

Penetrating liquids may result in a fire or electric shock.

Connection

No contact to a patient must occur when handling the cables.

Do not hurt yourself, when moving the display

The display can be tilted backwards and forwards. Please, pay attention not to hurt yourself, when moving the display. Fingers or small objects may get stuck at the bottom of the display.

When moving the display up and down (height adjustment), make sure you do not squeeze your hand or any other object. The minimum distance between the display edge and the bottom is only 83 mm.

Caution

**Incorrect installation may result in extensive damage to property.
Installation should be carried out by trained personnel**

When installing your medical electrical system with our products in an environment with patients, please observe the safety requirements of EN 60601-1-1 (IEC 601-1-1) for "Specifications for the safety of medical electrical systems" in order to prevent injury to patients and users of your systems.

Take appropriate measures to particularly ensure that discharge currents remain below the required limits: Appropriate measures:

- Disconnecting devices for signal input or output unit
- Use of a safety transformer
- Use of additional PE conductor

Only use the signal cables and interface cables specified by the manufacturer for the installation.

Use power cables with a PE contact. Only insert into sockets with a PE contact.

For certain applications, the video earth can be separately connected to the PE via the additional PE connection in the plug panel (observe IEC 601-1-1).

Close the plug panel using the provided cover (meaning the display stand), and secure using the screws.

Turn switch off and then remove power cord.

Mounting information: The stability of the display must be guaranteed following mounting of the foot/holder. The immersion depth of the mounting screws has to be 10 to 12 mm including a 3 mm VESA mounting plate. (See also table "Mounting screws" on the following). All these requirements are satisfied when using the original foot. All requirements must be observed when using customer-specific mounting solutions.

Notice for users: The plug panel closed by the cover (display stand), must not be opened by users.

Servicing information: If housing components have to be removed for servicing, this must not be carried out in the presence of patients, the user, or other persons not involved with servicing.

The following applies to installations in the USA and Canada: Molded power supply plugs must comply with the requirements for "Hospital Grade Attachments" UL 498.

Caution

Failure to observe the warnings may result in substantial damage to property.

Provide sufficient heat dissipation

Slots are provided at the rear of the housing. The display must be placed or secured on a hard, level surface at least 10 cm from the wall and 15 cm away from other devices. Several displays can be butt-mounted horizontally and vertically.

The following must be observed when mounting (VESA connection):

Mounting screws	
Number	4
Thread	M4
Strength	12
Immersion depth	Min. 10 mm; Max. 12 mm
Torque	Max. 3 Nm

The permissible ambient temperature range (5 °C ... 40 °C) must not be violated. Do not subject device to unnecessary shocks. Take care when transporting! **Use the original packaging!** The panel in particular should be protected against shocks.

When touching the panel surface, the mechanical contact or an electrical discharge may cause a brief disturbance in the picture quality.

Care of unit / cleaning agents

– The front panel is extremely sensitive to mechanical damage. Avoid all scratches, knocks etc.!

– Remove water drops immediately; extended contact with water discolors the surface.

Clean the front panel when dirty using a micro fiber cloth and, if necessary, a glass cleaning agent*. Only clean housing parts using a cleaning agent for plastics*.

● **Note:**

Do not use cleaning agents containing solvent, e.g. petroleum spirit!

3. Installation

Provide adequate ventilation

Ventilation slots are located on the rear of the housing.

Ambient temperature

The permissible ambient temperature range must not be violated.

Minimize reflections

The display should be positioned so that reflections of lights, windows, furniture with shiny surfaces or light-colored walls do not appear on the screen.

Minimize mirroring

In order to reduce mirroring on the unit, ceiling lighting or reflected light (no dazzling) should be used. Mirroring can only be eliminated if the screen is clean and free of grease. Clean the display using a suitable micro fiber cloth.

Change of environment

If the unit is brought into a warm environment from a cold one, water may condense upon it. The unit should not be switched on until all the condensed water has evaporated, including that inside the unit. This may take several hours, depending on the conditions.

4. Start-up



Caution

In order to ensure safe operation of the equipment, close attention must be paid to the information contained in this Instruction Manual as well as the warnings in Section 2 "Safety precautions".

Caution Information for end customer

None of the settings must be changed on site by the user, otherwise the guarantee is canceled. This also applies to settings made using the HL1916 keys. These are therefore locked for certain applications. If settings have to be changed, please contact the responsible servicing department.

The display is designed for individual connection to a graphics card with a power supply of 100 or 240 Volt (TN-S system with PE conductor). If the display is to be used in a sequence of several displays, or if it is not exactly known whether the graphics card standard can be output by the display, refer to Section 5.1 "Connection of the flat panel display".

In order to start the unit properly, the following steps should be carried out in the given sequence.

4.1 Connecting the power and signal cables



Warning The display can be tilted backwards and forwards. Please, pay attention not to hurt yourself, when moving the display. Fingers or small objects may get stuck at the bottom of the display.

Caution

Use a power cable with PE conductor corresponding to the safety requirements of the respective country of use. Note for North America: Molded power supply plugs must comply with the requirements for hospitals with respect to CSA Std. C22.2 No. 21 and UL 498. The power supply and signal connections are located on the rear of the color flat panel display.

Note

Note that the cables are already positioned when you receive the display (power cable and DVI-D cable). The following steps are only necessary if you need to connect/disconnect the cables of the scope of supply.

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4.1.1 Little cover (removing)

Remove the one screws with an M4 Slot screwdriver (one turn suffices). Open the little cover and remove it

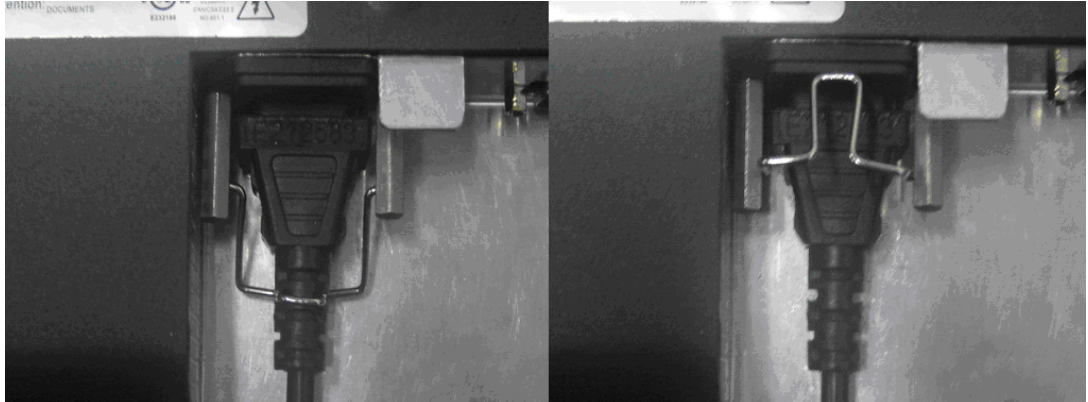


4.1.2 Cable (attaching)



Connect the cables to the display.

To remove the power cable, first remove the strain relief. It is used for protecting the connection. As the following figure shows. When fixing the power cable, reverse the steps.



15-pin Sub-D connector: the flat panel display can be connected to the computer system using the Sub-D connector. The display is adapted using an OSD menu.

DVI connection: The connection to the computer can also be made via the digital single link or via the analog channel of the DVI connection. The picture quality, noise immunity and radiated interference of the complete system depend on the cable quality and length.

Serial connection: you can connect the display via the 9pin D-SUB connector to the computer for firmware updating.

4.1.3 Little cover (attaching)



Lead the monitor end of the cables through the little cover's cable duct. Connect the little cover to the rear cover.

4.2 Switching on the display

Switch on the flat panel display using the power switch. The operation LED lights up (color: green, provided the timing has been recognized – please refer to section 7 "Fault diagnostics").

4.3 Adjusting the image geometry

The display automatically recognizes the used standard, and set-up values for each standard are preprogrammed. However, depending on the graphics card used, it may still be necessary to align and size the picture for the selected standard (see Section 6.1 "Picture adjustment"). Normally auto adjust will work.

4.4 Adjusting the brightness and contrast

The brightness and contrast must be adjusted for the respective graphics card (different output levels) in the system on site.

Note on adjustment

- Use the SMPTE test pattern.
- Adjust the brightness so that image sections with 5% and 0% blackness still visibly contrast from one another.
- Adjust the contrast so that image sections with 95% and 100% whiteness still visibly contrast from one another. To adapt the luminosity to the ambient lighting, adjust the backlight brightness (note: 137 cd/m² factory setting is then modified).

4.5 Screen saver



A screen saver function should be used in order to reduce "image sticking" which can occur in TFT displays. It is high risk to display a static graphic over half an hour. Image sticking is the effect where a faint image of the previous screen contents can still be seen after the display contents have changed. By using a screen saver with permanently changing screen contents, unnecessary effects of the same image are avoided.

If the keyboard is locked, contact the servicing department in order to unlock it. The guarantee is cancelled if you unlock it yourself!

5. Connections

5.1 Connecting the flat panel display

Note

All screening precautions contained in the corresponding EMC guidelines must be observed. If these guidelines are not observed, interference signals could penetrate the monitor.

Information on cable installation

Only screened cables are permitted for the signal connections.

All connectors should be of screw or locking types (as far as possible).

Signal and power cables must not be routed in the same duct.

The display must not share a power supply with motors or valves (glitches!).

5.2 Connection panel

A connection panel for the signals and power supply is located at the rear of the flat panel display underneath the stand and its cover.



5.3 Information on additional serial interface (Service Only)

Serial connection: you can connect the display via the 9pin D-SUB connector to the computer for firmware updating and monitor test.

5.4 Analog and digital inputs (DVI-D, VGA)

15-pin Sub-D connector

Connect VGA cable with 15-pin Sub-D connector (male) for the analog input to the 15-pin Sub-D connector (female).

With DVI-I analog signal (connected with DVI-I to VGA converter)

DVI socket

With DVI digital signal.

5.5 Power supply connection

Note

Device fuses can not be exchanged outside of the repair centers.

The display power supply is connected using an appliance plug. Only use the power cable supplied in the delivery, or a cable with PE conductor and appliance socket to DIN 49 547, IEC 320.

Caution

A power cable with PE conductor must be used which corresponds to the safety requirements of the respective country of use.

5.6 Serial interface

Caution

No other units may be connected to the service socket. Connection or disconnection of a unit may only be carried out by servicing personnel or those trained by them. A Serial Spot Meter or Universal Serial Luminance Meter must not be connected in the presence of patients.

The display has a serial RS 232 interface sockets to update the SW.

6. Adjustments

6.1 Picture adjustment

This section describes the settings for operation of the flat panel display with a video source. The most important settings are:

Adjusting the graphics memory of the video source

As with all monitors, the flat panel display also has certain limits, e.g. maximum resolution and vertical frequency. The graphics adapter must be set when using the flat panel display such that the limits are observed.

Fine adjustment of the flat panel display

Note

Fine adjustment of the flat panel display can only be carried out via the analog port 15-pin SUB-D. The digital input (DVI-D) does not require a fine adjustment since the display signal is always optimum.

RGB picture sources via 15-pin Sub-D connector supply analog signals which are basically intended for conventional CRT monitors and which are processed directly by them.

In contrast, the analog signals must be converted for a flat panel display into digital signals by a video digitizer. Depending on the picture source, cable length and video mode (e.g. VGA, SVGA, XGA) this conversion may cause certain deviations which cannot be corrected fully automatically by the flat panel display. A manual fine adjustment is therefore necessary during which the flat panel display (or, more precisely, the video digitizer) is matched to the respective video source. The fine adjustment comprises e.g. setting the horizontal/vertical picture position and the picture sharpness. This can be carried out for the color flat panel display HL1916 using an OSD menu.

To optimize the display settings for the installed graphic board, and to ensure all gray levels are distinguishable, we recommend to adjust the brightness and contrast levels for and only for analog inputs. Note that the calibration (in the Look Up Table) is not changed by these adjustments (All the monitors are and remain factory calibrated):

Using a 100% black picture and an appropriate measurement device (a spot meter recommended), decrease the brightness level using the OSD controls until the measurement device displays a constant level (i.e. the measured value no longer changes). Once this is achieved, increase the brightness level

slightly until the display is just above the absolute lowest black level (one step is generally sufficient).

Similarly, set the white level using a 100%-white test pattern and the measurement device. Only the contrast level should be adjusted to ensure that the black level remains unchanged.

- Control again the black value did not change. In case it did you need to duplicate the two previous steps until it does not change anymore (cause: pedestal).

Increase the contrast level until the measurement device no longer detects an increase in luminance. Once this is achieved, decrease the contrast level slightly (1 or 2 steps is generally sufficient).

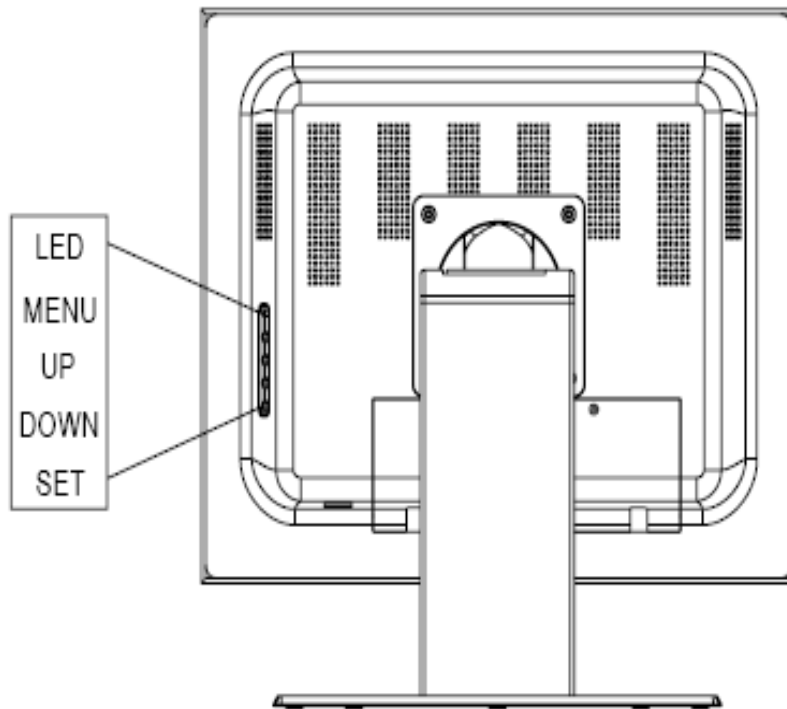
At this point, the display is configured for optimal performance with the installed graphic board. If one is not yet satisfied with the luminance level, the black and white levels can be further increased by adjusting the backlight level in the OSD menu. Please note that higher backlight level settings tend to reduce the stability of luminance over time.

6.2 Optimum picture quality

In order to achieve an optimum picture quality, the color flat panel display HL1916 should be operated with a graphics resolution of 1280 x 1024 pixels (settings for graphics card in the PC). When adjusting the picture position and size, ensure that the picture appears exactly on the active surface of the display and that it is not offset by even one pixel. For example, if the horizontal position is offset by one step to the right, the right-hand edge of the picture will disappear, and a black pixel column will appear at the left-hand edge. And similarly for an offset to the left, top or bottom. If the vertical lines are still slightly fuzzy, adjust the setting "Frequency/phase" (see Section 6.4 "Description of the menus").

6.3 OSD menu

6.3.1 Keys assignment and operation LED



A “dynamic help for keypad function” is available for each menu: it explains the role of each key depending on the OSD menu window, which is currently active.

6.3.2 Key functions without active OSD menu

Key(s)	Action
Menu	Activate OSD
Up (toggle function)	Adjust backlight
Down (toggle function)	Do auto adjust manually(VGA only)

This function can be disabled by OSD

6.3.3 Key functions in the OSD menu

Key(s)	Situation	Action
Menu	Always	Jump to next line
Up	Slide controller	Increase value
	Selection point	To previous selection
	Command	"Enter key"
Down	Slide controller	Decrease value
	Selection point	To subsequent selection
Set	Except "Exit OSD" menu	One menu level upwards (settings are retained)
	In "Exit OSD" menu	Return to main menu (settings are retained)

6.3.4 Submenu calls

Press the “Menu” key while the OSD is active, the function icon will jump to next line. Pressing the “Up” key, the coordinate submenu will be selected.

6.3.5 Locking of OSD menu

Key(s)	Action
In a sequence Set, Up, Up ,Up	Lock or unlock OSD If the OSD is locked, it is only possible to switch over the source (see Section 6.3.2).

6.3.6 Keys function hints

A “dynamic help for keypad function” is available for each menu: it explains the role of each key depending on the OSD menu window, which is currently active.

6.4 Description of the menus

Main	Function	Adjustment	Description
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Menu		range	
Brightness /Contrast	Brightness	0...255	<p>It is used to adjust the black level of the monitor. The center point is in 0 position. This allows the darker area to be seen more distinctly.</p> <p>Note: for DVI-D signals the brightness setting is optimized. Manual changes are not recommended.</p>
	Contrast	0...255	<p>Adjustment of contrast</p> <p>This allows the brighter area to be seen more distinctly. The center point is in 128 position.</p> <p>Note: for DVI-D signals the Contrast setting is optimized. Manual changes are not recommended.</p>
	Backlight	0...255	<p>Adjustment brightness of LCD backlight to adapt total brightness for room illumination</p>
	Color	1 2 3 User define	<p>Set desired color Hue</p> <p>Three fixed color temperatures and one adjustable color temperature are available</p> <p>The color locations 1 to 3 can not be saved The default value is:</p> <p>Color 1: 6500K x=0.313, y=0.329; Color 2: 7500K x=0.300, y=0.315; Color 3: 9300K x=0.283, y=0.297</p> <p>While choose color 1,2,3 state it will recall factory default Brightness, Contrast, Backlight, R G B Gain and R G B Bias setting.</p>

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	Set user color Red Gain Green Gain Blue Gain Red bias Green bias Blue bias	0...255 -50...50	<p>Define user color temperature Select Red, Green, Blue gain and Red, Green, Blue bias separately. The default state is in 255 position and color 1 state. Red, Green, Blue gain are used to adjust white color temperature. Red, Green, Blue bias are used to adjust Red, Green, Blue bias separately. It is used adjust the dark color temperature. The default state is in 0 position. Note: due to LCD panel characteristic it is not recommended to change the bias too much from 0 point.</p>
Position (Analog input only)	H Position	0...100	Shift picture in horizontal direction
	V Position	0...100	Shift picture in vertical direction
Picture Source		VGA (DVI-A) DVI-D	<p>Select source for main display When you enter this OSD menu the current source is highlighted. Following switch off and on of the display, the picture sources are searched one after another.</p>
Auto function (Analog input only)			<p>The auto functions are used to assist the automatic setting of parameters. The quality of settings depends on the picture contents and the type of synchronization. Corresponding items in the OSD can adjust all settings finely.</p>
	Auto brightness /contrast	On/Off	Automatically get input signal match with the monitor
	Auto position /phase /frequency	On/Off	Automatically adjusts the image position, H-Size (or V-Size) and Fine settings. Improve focus clarity and image stability.

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	Execute selected auto function		The selected auto functions are executed. Note: The quality of the function depends on the applied picture contents. To get better effect it is recommended to apply full screen and including whiteness contents picture.
	Auto Adjust On Mode Change		Enable or disable automatically get input signal match with the monitor, when the signal mode is changed
Language	English Chinese		Select the language of OSD menu. Note: English menu is default state.
Others			You can make further settings for the picture source
	Frequency /Phase (analog input only)		Adjust the frequency and phase of the input signal.
	Sharpness	Interpolation filter 1 to 7	One of the 7 filters can be selected for the focus setting to reduce scaling artifacts. Interpolation filters depend on the input resolution. A filter is not usually used with 1280X1024 since each pixel is controlled by its own pulse. The user should individually adjust the filter depending on the application. The default interpolation filter position is 1.
	OSD setting	H position V position	Adjustment of OSD horizontal position Adjustment of OSD vertical position (Default state is on the 3/4 bottom right corner of the screen)
	Hot Key		Enable or disable the Hotkey. The up key was used for brightness, down key was used for Auto Adjust.
	DPMS setting	DPMS on	The backlight is switched off while it is no input signal. (The default state is DPMS on)

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		DPMS off	The backlight will not switch off if it is no input signal. Only switches off along with the power switches off.
	Status		Current display settings can be called here in the respective picture mode. Working hours of display, firmware type and version, OSD version, configuration version, current source, current timing of input signal, current LUT, current temperature inside the monitor.
Service Level2	Dicom		Settings in this menu must only be carried out by service person. Default setting is Dicom. To enter this menu Press key in this sequence: Up,Down,Down
	CIE		
	Gamma 1.8		
	Gamma 2.0		
	Gamma 2.2		
	Native		
	Quit OSD menu	Accept changes Reject changes	Quick OSD menu and either save or reject the changes. If you have reached this menu unintentionally, you can return to the main menu using the Set key.
	OSD is locked		If this message is displayed, you do not have the authority to carry out the changes in the OSD menu. Please contact your servicing partner in this case.

Notice: To enter the Aadv. Option press 1xSet key +2x Down. key

7. Fault diagnostics

Fault	Cause	Remedy
No picture appears on the display, operation LED off	Broken fuse	Inform servicing department
	Power cable not inserted or incorrectly inserted	Insert power cable
No picture appears on the display, operation LED green blinking	No video signal	Check video cable
	Video source not supplying a signal	Check video source
Fuzzy picture, interference in vertical lines	Scanning frequency or phase incorrectly set	Adjust frequency and phase
Other faults –LED orange blinking	Loose plugs	Plug cables in properly and secure them
	Faulty cable	Replace cable
Other faults: “Temp. High” on screen	Temperature shutdown value has been reached	Display will be automatically shut down after a certain time (and turn on again when the temperature decreases enough again)

Other information available from the 2-colors LED

LED	Display status
LED orange	No error, stand-by has been activated
LED green	Video signal has been recognized, no error

8. Technical data

All technical data are valid after a warming-up period of 2 hours.

8.1 Display

Type	TFT, color active matrix
Display area	376 mm x 301 mm
Picture diagonal	19" or 48 cm
Native resolution	1280 x 1024 (full-screen format)
Pixel organization	3 vertical sub pixels
Pixel pitch	0.294 mm x 0.294 mm
Contrast ratio	Typically 600:1
Horizontal viewing angle	Typically $\pm 89^\circ$
Vertical viewing angle	Typically $\pm 89^\circ$
Backlight	6 dual CCFT (cold cathode fluorescent tube)
Brightness	Typically 280 cd/m ² Factory setting: 137 cd/m ²
Lifetime of backlight	50,000 hours typically for CCFT (applies to an ambient temperature for the backlight of 25° C)

8.2 Power supply

Power Supply	Input Voltage		AC100-240V, 50 / 60Hz; <0.9A
	Power Consumption	Normal operation	<60W
		Power saving	<2W
	Input Connector		3P IEC Type

8.3 Electronics

Multi-standard technology	Video modes with resolutions less than 1280 x 1024 can be expanded to the TFT resolution, and thus utilize the full display area (like multi-sync CRTs). In the same way, resolutions higher than 1280 x 1024 can be reduced and then displayed. (Caution: depending if the timing is frame buffered or frame sync, image information might get lost; the gray levels - the color depth for color images - will also be reduced and might be visible)
Timing recognition	H frequency, V frequency

8.4 Inputs/outputs

8.4.1 Analog signal input

RGB input, H/C Sync input and V Sync input	Via 15-pin Sub-D connector (female) Any polarity
DVI-D input	Via DVI-D socket (analog pins are used)
CVS signal	Video level: 0.5 ... 1.0 Vpp Sync level: 0.2 ... 0.3 Vpp

8.4.2 Digital signal input

DVI-D input	Via DVI socket , single link
DDC	Via DVI

8.4.3 Serial interface

RS232	Via D-sub 9pin
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8.4.4 Timing Input

Input Signals		Analog	Digital
	Horizontal frequency	31kHz -82kHz	31kHz -82kHz
	Vertical frequency	50.0Hz - 85.0 Hz (Non-Interlaced)	50.0Hz - 85.0 Hz (Non-Interlaced)
	Video Signal	Analog RGB	Digital RGB
	Sync. Signal	Separate Sync. (TTL) Composite Sync. Sync on green	TMDS
	Pixel Clock	25.0MHz -140.0MHz	25.0MHz -140.0MHz
	Input connector	Mini D-sub 15Pin	DVI-D

8.5 Controls and connection elements

Left Side	Four keys for OSD menu, operation-LED
Rear	<ul style="list-style-type: none">• Power switch• Power supply connection• DVI socket• 15-contact 3-row Sub-D socket• RS 232 sockets Sub-D 9 pin

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8.6 Mechanical design

Housing components	Aluminum
Protective screen	No
Visible screen surface	Approx. 376 mm x 301 mm
Ventilation slots	In rear panel
Degree of protection (front)	IP20 to DIN 40 050
Connection panel	At rear, covered
Weight: Without stand With stand	5.0 kg (approximate) 7.6 kg (approximate)
Dimensions (W x H x D) in mm Without stand With stand(down) With stand(up)	423 × 348 × 72mm 423 × 429 × 210mm 423 × 509 × 210mm

8.7 Climatic conditions

Operation

Ambient temperature range	+5 ... +40 °C
Temperature gradient	Max. 5 °C/h
Relative Humidity	30-80%, no condensation
Atmospheric pressure	1040 - 674 kPa

Transport and storage (packed)

Ambient temperature range	- 20 ... + 60°C
Temperature gradient	Max. 5 °C/h
Relative Humidity	10-85%, no condensation
Atmospheric pressure	1040 ... 674 kPa (0 ... 3048 m)

8.8 Mechanical requirements

Operation

Vibration	According to EN 60068-2-6 10 ... 58 Hz with ± 0.075 mm deflection 58 ... 500 Hz at 10 m/s^2
Shock	According to EN 60068-2-27 (single shock) 150 m/s^2 , 6 ms No permanent shock allowed in operating conditions

Packed unit

Vibration	According to EN 60068-2-6 5 ... 9 Hz with ± 3.5 mm deflection 9 ... 500 Hz at 10 m/s^2
Shock	According to EN 60068-2-27 (single shock) 250 m/s^2 , 6 ms (in storage packaging) According to EN 60068-2-29 (permanent shock)

8.9 Safety specifications

Safety standards	EN 60601, IEC 601
Approvals	CAN/CSA - C 22.2 No. 601.1-M 90, CSA/us mark, UL 60601-1,CCC
Protection class	Protection class I
Degree of protection to DIN 40050	IP 20
Type B/BF/CF applied part	No Applied Part
Category AP/APG equipment	No AP/APG
Conformity	CE

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8.10 Electromagnetic compatibility

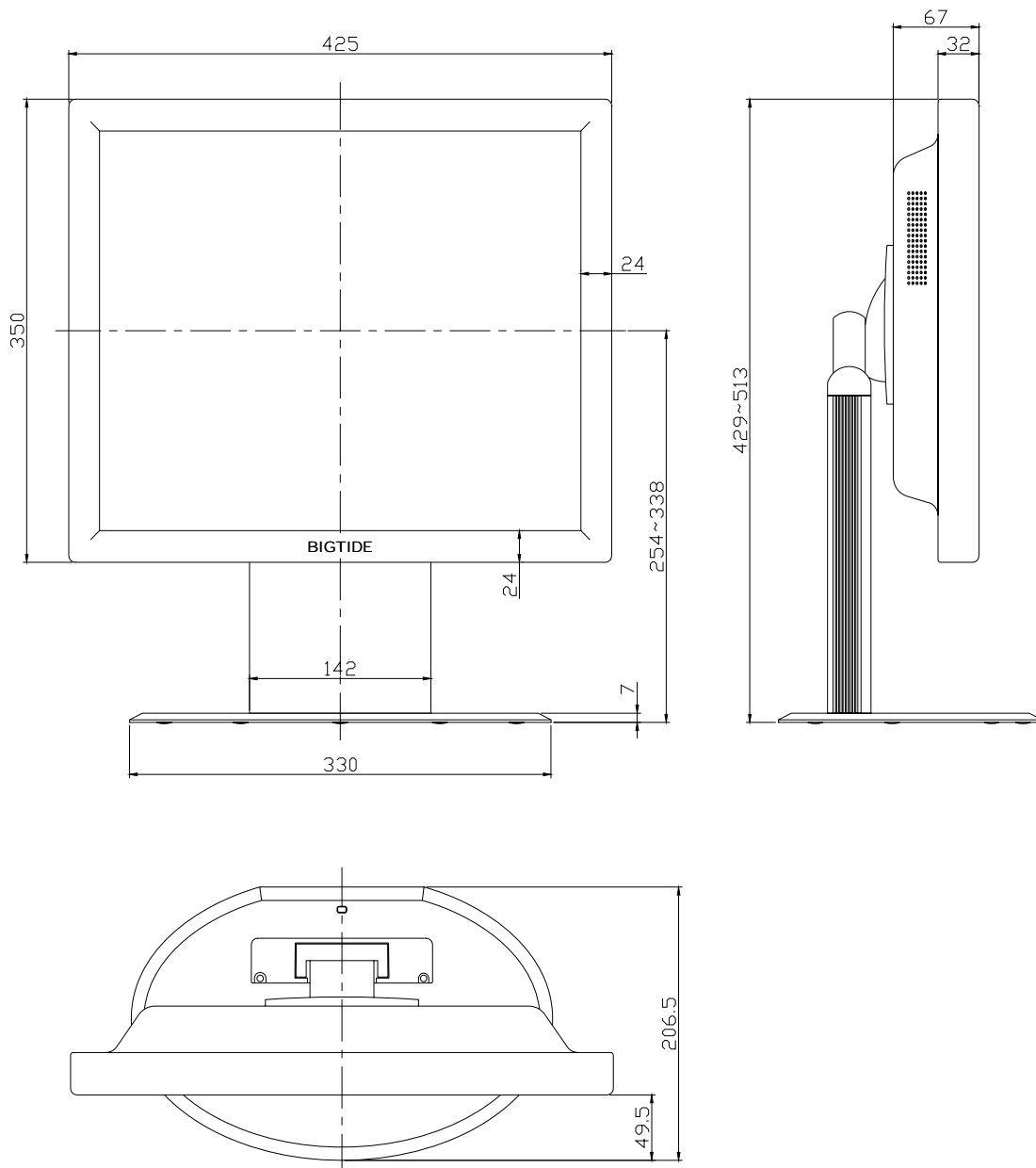
EMI voltage/ radiated interference	EN 60601-1-2
Voltage variations	EN 610004-11
Burst on power supply lines	EN 61000-4-4 1 kV
Surge on power supply lines	EN 61000-4-5 1 kV symmetric 2 kV unsymmetric
Static discharge on casing parts (ESD)	EN 61000-4-2 8 kV air, 4 kV contact
RF irradiation	EN 61000-4-3 80 MHz ... 2,5 GHz 3 V/m 80% AM 1 kHz
Noise immunity	EN 61000-4-6 150 kHz ... 80 MHz 3 V _{eff} 80% AM 1 kHz
Magnetic constant fields	EN 61000-4-8 Max. 4000 A/m
Magnetic alternating fields	EN 61000-4-8 Min. 10 A/m
Noise emission	FCC Class A

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9. Dimensional drawings

All dimensions in mm.

9.1 Front 、 Platform and Side view



10 Remarks and contact address

Invalidity of guarantee

All unauthorized electrical or mechanical alterations on or in the unit result in loss of the guarantee.

Information on the Instruction Manual

For clarity reasons, this Instruction Manual does not contain all detailed information on this product. Your attention is additionally drawn to the fact that the contents of this Instruction Manual are not part of a previous or existing agreement, commitment or statutory right and do not change the latter.

Guarantee

All commitments on the part of Torch-Bigtide are contained in the respective sales contract which also contains the complete and solely applicable warranty conditions. These warranty conditions in the contract are neither extended nor limited by the contents of this Instruction Manual.

Repairs

Please contact your distributor from whom you originally purchased the product.

Environmental protection

When disposing of the device, the requirements and laws in the respective country must be observed.

Name of Manufacture: Shenyang Torch-Bigtide Digital Technology Co., Ltd.

Address: No.108, Baishan Rd, Yuhong District, Shenyang, Liaoning, China (110034)

Person to be contacted: Mr. Yu yang

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