IMAGESYSTEMS

User's Manual

FP1800MBNC

TFT-LCD Monitor

Thank you for purchasing our Monochrome LCD Display.

◆ Carefully read this User's Manual and use the product properly. Before using it, also read "Safety Precautions."

◆ Keep the User's Manual as close to you as possible and in safe custody.

◆ If you have lost the manual, contact your dealer. We will reissue a manual.

◆ The names of companies and products are registered brand names or brand names.

Contents

Safety Precautions

FCC Information

FCC (U.S.Federal Communications Commission) This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause unacceptable inter- ference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult your dealer or an experienced radio/TV technician for help.

FCC Warning:

To assure continued FCC compliance, the user must use a grounded power supply cord and the provided shielded video interface cable with bonded ferrite cores. Also, any unauthorized changes or modifications to this monitor would void the user's authority to operate this device.

CE Certification

This device complies with the requirements of the MDD directive 93/42/EEC "Medical Device Directive".

$C\epsilon$

Warning

- This apparatus must be earthed because of Class I equipment.
- This apparatus is no patient contact equipment.
- When using at 240 V in United States, supply must be from center-tapped, 240 V, single phase circuit.
- Please consult with the dealer from whom you purchased it about waste disposal.
- This equipment shall not to be used around the patient vicinity, which is the space with surfaces likely to be contacted by the patient or an attendant who can touch the patient. This encloses a space within the room 1.83 m (6 feet) beyond the perimeter of the bed in its intended location, and extending vertically 2.29 m (7-1/ 2 feet) above the floor.

Equipment Classification

- Type of protection against electric shock: Class II equipment
- Protection against harmful ingress of water : Ordinary Equipment (IPX0)-No protection.
- Not suitable for use in the presence of a flammable anesthetics or oxygen.
- Mode of operation: Continuous operation

Follow the instructions below for safety use of the monochrome LCD display.
-Read this user's manual and properly use the unit.

●Symbols
-This user's manual contains various symbols to guide users to properly use the product.
-The contents in each box below express the events that will occur following neglects of signs and misuse.
-Confirm the contents shown here and then read this manual carefully.

●Meaning of symbols

🚫 Expresses DO NOT.

⚠️ **Warning** Person could be at risk of severe injury or death.

⚠️ **Caution** Person or properties could be at risk of injury or damage.

❗ Expresses MUST DO.

Cautions when setting up

⚠️ **Caution**
●Do not put the unit on unstable placees (on a wonky table and inclined place), which might cause injuries arising from its dropping or falling.

●Do not place the unit where it is subject to direct sunlight or near any heating device. The cabinet and/or components may be damaged, which may cause generation of fever and ignition.

Cautions when using

⚠️ **Warning**
●Do not put the unit in such place where it has bad air circulation, dust, humidity, oily smoke and steam. It may lead to fire.

●Do not put any metal materials or flammable foreign objects into the unit (from vent holes). It may lead to electric shock and/or fire.
※ In case that any object mentioned above is placed inside, immediately turn off the power, disconnect the plug from outlet, and contact shops.

⚠️ **Caution**
●Scratching or hitting with hard objects may break the unit.
●Do not use the unit turned over on its back, pushed on its side, or upside down. These may lead the fever that the unit generates to pile up inside the unit, which may lead to generation of fever and ignition. Also, falling may cause injuries.

●Do not place any container filled with water or any chemicals near the unit. In case of containers falling down, liquid may permeate inside and insulation failure may occur, which may lead to electric shock.
※ In case of any liquid entering inside, immediately turn off the power, disconnect the plug from outlet, and contact shops.

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Caution ●Do not put the unit in such place where it is subject to direct sunlight or near any heating device. The cabinet and/or components may be damaged, which may cause generation of fever and ignition.

●During a long-hour use, take a break 10 to 15 minutes every one hour for your eyes. Otherwise, it may cause eyestrain.

Abnormal circumstances

Warning ●In case of any abnormality such as odor, sound, and overheat taking place, immediately turn off the power and disconnect the plug from outlet. Continuance of using the unit under such condition may lead to electric shock and/or fire. Immediately turn off the power, disconnect the plug from outlet, and contact shops.

●In the event of thunder, immediately turn off the power and disconnect the plug from outlet. Lightning strikes may cause electric shock and/or fire.

Warning ●In the event of broken panel and leaking liquid crystal, do not inhale, swallow, or touch the liquid crystal. It may cause you getting poisoned and/or having a skin irritation. If you put it in your mouth, immediately gargle with water and go to see a doctor to get a checkup. In case of taking it on your skin and/or cloth, wipe it off with alcohol and rinse them.

Maintenance

Warning ●Do not remove the cabinet. There are high-voltage parts inside that may lead to electric shock. ※ Ask shops for adjustments and inspection.

●Do not remodel or repair. It may lead to fire, electric shock, or injuries.

Caution ●Clean inside the display once a year. The dust inside the unit may lead to fire. ※ Ask shops for adjustments and inspection.

●Disconnect the plug from outlet when not using the unit for a prolonged period. Disconnect the plug from outlet when not using for a prolonged period for such as trip.

Notes

- Even if the unit is properly used, it may have an effect on radio and/or TV reception upon the condition of electric wave. If it is the case, give caution to the followings.
  1) Ensure enough space between the unit and radio and/or TV.
  2) Connect the unit and radio and/or TV to separate outlets.
- Monochrome LCD display may have tiny spots and unevenness according to the displaying conditions, but they are not any sign of failure.
- LCD panel is produced with high-definition technology, but there may be some imperfect displaying pixels (lacking, constant lighting).
- When placing LCD panel near windows or outside for a long period of time, give caution to it; sunlight may cause damage on the panel.
- Do not give LCD panel a strong push, scratch it, or place any object on it. It may cause LCD panel failure.
- When using the unit in a cold place, you will see images leave traces or a dark screen, but it is not a failure. It will go back to the normal state as temperature rises.
- Do not display still pictures for a long period of time, which may cause afterimages.
- The minimum state of the brightness adjustment may make images difficult to see.
- The quality of computer signals may have an effect on the unit's quality. We recommend you to select computers with high-quality video signal output.
- Instantaneous voltage change
  This unit may have defects upon momentary voltage drops of power supply caused by incidents such as lightning strikes. For the countermeasure for it, we recommend you to use devices such as uninterruptive power supply.

Disposal of the unit

◆ Do not dispose of the unit with general wastes.
◆ Do not dispose of the unit together with general wastes.
◆ The unit contains mercury in its phospher tube. Follow your local regulations or rules upon disposal of the unit.

Auxiliaries

Confirm the auxiliaries listed below are included.

☐ Power cable   1   ☐ User's Manual (this manual)   1
☐ VGA analog signal cable   1
☐ Composite video cable   1
☐ S-Video cable   1

NOTES

∗ We recommend you to keep the packing box for transportation and the like.
∗ In case of transporting and packing the unit in the packing box, carefully place it, keeping its
  panel from touching any objects.

Features

●**18.1-inch LCD display with 1.3 million pixels**
This monochrome LCD display has a multi-scanning function corresponding to the resolution from VGA 640 x400 to SXGA1280 x 1024. This is also compliant with VESA standard display mode.

●**High-intensity, high-contrast**
Beautiful and clear images of the brightness of 700cd/m^2 and contrast ratio of 700 : 1 have been achieved. Viewing angles are the wide range of 170 degrees in both horizontal and vertical directions (CR>=10). The unit has installed our unique automatic brightness stabilizing circuit that restrains deteriorations and brightness drifts when power is turned on. Gamma curve adjustments are made by OSD. This is for various modarity terminals, medical image displays for PACS [1], and graphics.

●**Internal power supply compliant with medical safety standards with high reliability**
The monitor has an internal power supply that is compliant with UL2601 and TUV-GM.

●**Support BNC input and interlace-timing**
BNC input has been supported for replacement with a CRT used as a modarity device. It also supports input modes: one line (Sync On Video), two line (Video, Composite Sync), three line (Video, HD, VD). Interlace timing can be displayed.

●**Two analog interfaces**
This facilitates 15-pin Mini D-sub as well as BNC input, which supports signal inputs from conventional PCs.

●**Support TV signal input**
Supporting TV signal inputs such as NTSC and PAL, the monitor can be used as a substitute for conventional CRT monitors. The monitor is prepared for TV inputs such as composite input (Y signal), S-Video input (Y/C), and component input (YCrCb). Thus, it can display various kinds of images.

●**PIP function**
This monochrome LCD display has loaded the PIP (Picture In Picture) function that can partly display TV inputs on screen besides displaying regular PC images.

●**Remote control port**
This monochrome LCD display has the remote control port that controls the functions of the monitor via serial communication. A separate control software allows you to remote-control OSD operations from your PC.

●**User-friendly control dial and OSD**
This monochrome LCD display can be handled by Control dial. This button not only rotates up and down but also functions as a push button. Also, the on-screen display has an icon that is so comprehensible that users can easily make settings.

●**Power management**
This unit has loaded the power management system. The power management mode functions when either horizontal or vertical signals or both disappears, and it reduces power consumption to less than 15W.

●**PIVOT (combined vertical/horizontal display function)**
The LCD panel can be used to display images in a vertical position by turning the panel 90 degrees from the horizontal position.

●**VESA**® **standard wall/arm mountings**
  The unit is compliant with VESA's 100mm-pitch hanging tools. The tilt stand is detachable; the unit can be set for wall-hanging or arm according to users' environment.

●**Security device slot for Kensington**® **security system**
  Anti-theft security device slot has been loaded to correspond to MicroSave® security system of Kensington®.

  Note 1) PACS: Picture Archive & Communication System

Connection Method

1. Confirm that your computer is off.
   Then, confirm that the main switch of the monochrome LCD monitor on the back is off.

2. Connect the attached power cord into the inlet.
   Then, connect the plug into the AC inlet on
   the back of the monochrome LCD monitor.

Main Power Supply
Switch

**Power cord
(accessory)**

To power outlet
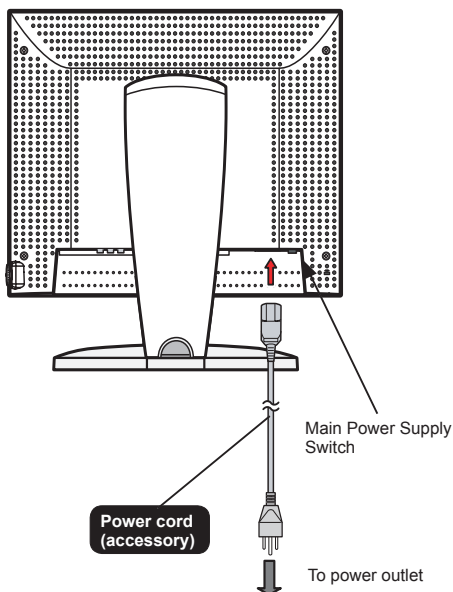
3. Connect the signal cable (for PC input)
   Connect the VGA connector of the monitor and the analog RGB output connector with the attached
   VGA cable (15-pin Mini D-sub).
   For the connection with BNC connector, connect the BNC connector of the monitor and the PC's video
   output with a commercial BNC signal cable.

**VGA signal cable
(accessory)**

**BNC signal cable
(commercial)**

Analog RGB output of computer
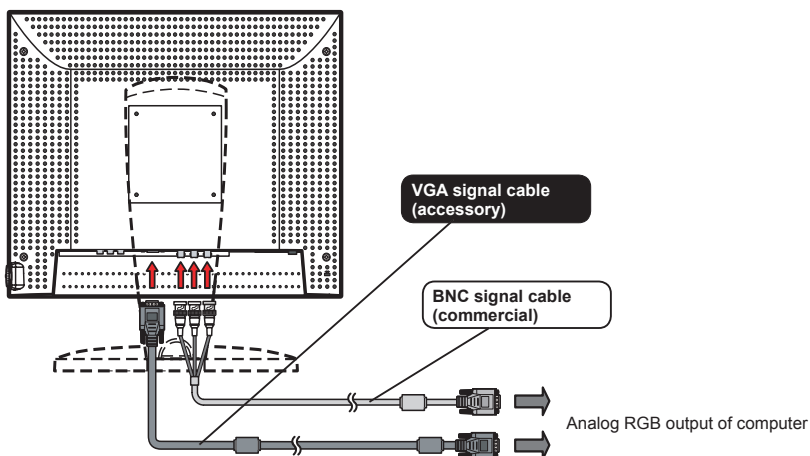
The BNC connection would look like in the figure on the right.
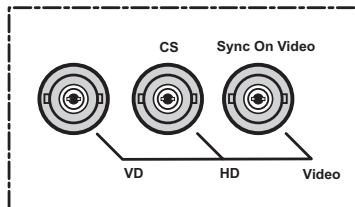
4. Connect signal cable (for video device input)
    Connect S-Video connector of the monitor and an S-Video output device with the attached S-Video
    cable. For composite signal (NTSC/PAL) or component signal (Y-Cb-Cr) input, connect the
    RCA connector of the monitor and a composite video output device with the attached composite video
    cable.

S-Video cable (Accessory)

Composite video cable (RCA plug x 3) (Accessory)

S-Video source

Composite video output device (NTSC/PAL or Y-Cb-Cr)
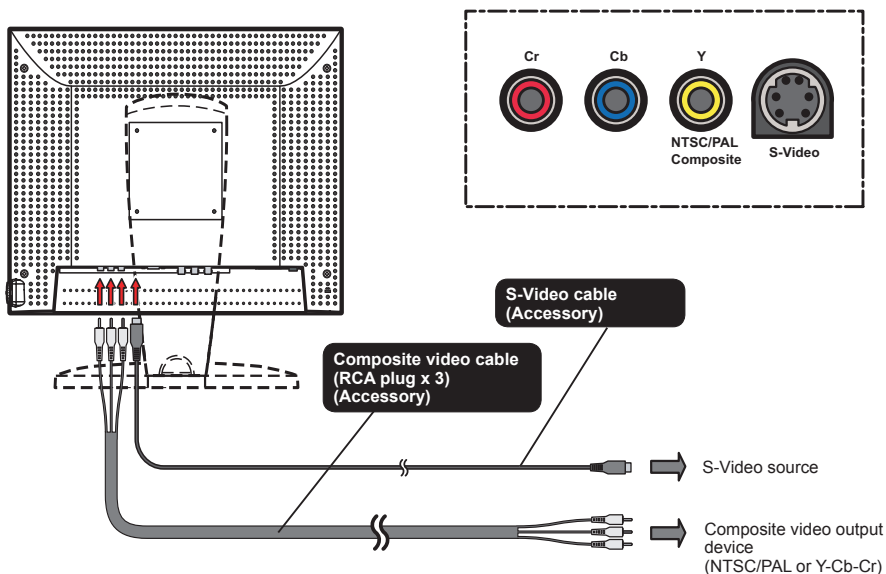
A calibration sensor will be connected to PC-LINK.
Refer to the user's manual of the separate calibration kit for the details.

5. Remove the cable cover
   Lifting the hook of the upper cable cover, slowly remove the cover to expose the cable holders.

Hook
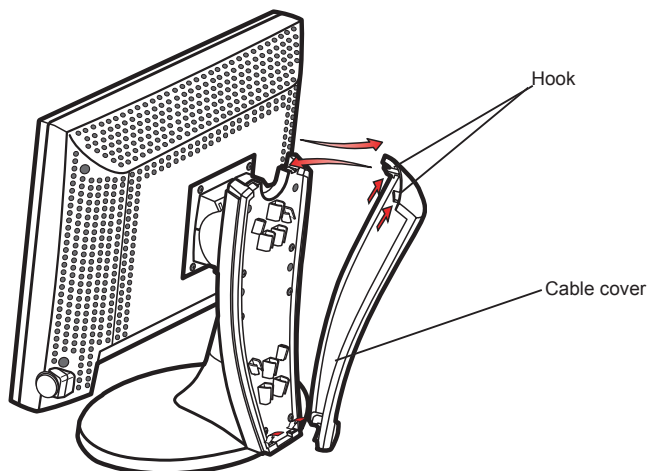
Cable cover

6. Install the cable cover and connector cover
   Secure cables to the cable holders on the back of the stand. (See the figure below)
   Install the cable cover and connector cover.
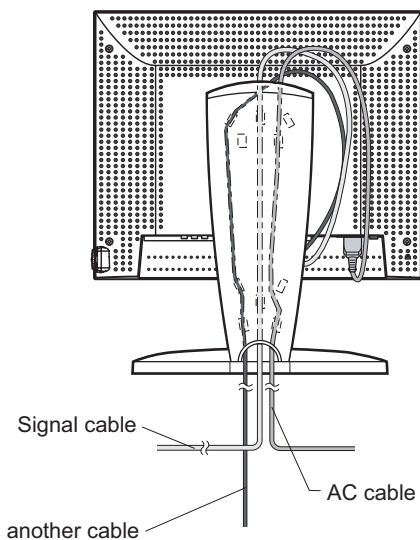
It is free to arrange cable settings according to environment.

Signal cable

AC cable

another cable

⚠ **Caution**

● Do not give signal cables or power cord a strong pull.
● A strong pull may cause damage on the connection part inside the display where high-precision processing technology is applied. It also may result in felling the display and damaging on the LCD panel. In the worst-case scenario, the LCD panel will be broken.

7. Antitheft security device slot

This product has loaded an antitheft security device slot compliant with MicroSaver® Security System of Kensington® on the back of the monochrome LCD display.

MicroSaver® security System can be purchased at PC supply shops.
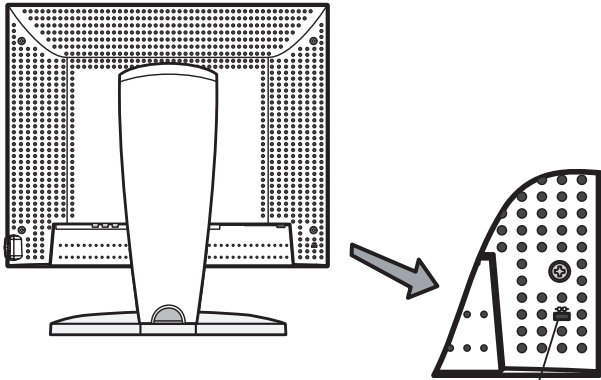
∗ Kensington® is a registered brand of Kensington

Antitheft security device slot

How to Operate

1. Names and Functions of Each Part

Alternative ⑭
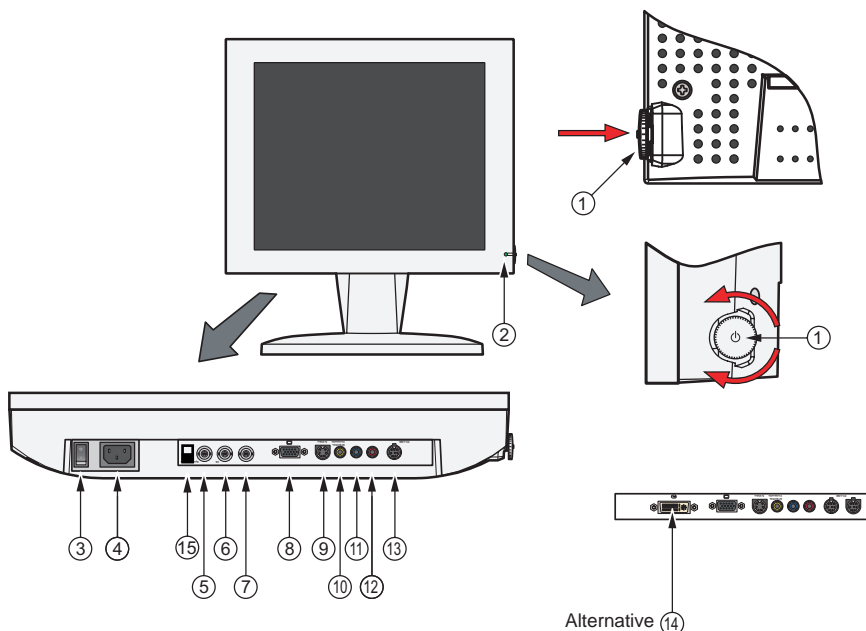
① **Control dial** (Power switch)

Power ON/OFF
・With the main swith, ③ , on, pressing Control dial turns on the monochrome LCD display.
・Pressing Control dial for more than two seconds turns the power off.
　Caution : Take more than 5 seconds between power switchings.

OSD control
・When Control dial is pressed while images are on screen, OSD* will appear on screen.
　*OSD stands for on-screen-display. Its function is to display information such as characters
　 and symbols.
・Control dial is a rotary switch. Execution of selected items and display of submenus can be
　performed while OSD is on screen.
　Two functions of Control dial are as follows:
　　Rotate clockwise or counterclockwise : up-and-down movement/ left-and-right movement/
　　　　　　　　　　　　　　　　　　　　　　increase and decrease etc.
　　Press : execute/ select items/ save data

② **POWER indicator** (Power/ Power management display)
・The indicator illuminates green when power normally on.
・The indicator illuminates orange and the display turns off when power management function on
　or no signals.
・The indicator goes out when power off.

③ **Main power supply switch**
　Main switch for the monochrome LCD display.

④ **AC inlet**
Connect the attached AC cord to.

⑤ **BNC connector_Sync On Video/Video**
For one-line (Sync On Video) input, BNC connector is used as Sync On Video. For two-line (VIDEO + composite sync signal) and three-line inputs, used as Video.

⑥ **BNC connector_CS/HD**
For two-line (Sync On Video) input, connect to CS (composite sync signal). For three-line (separate sync signal) input, connect to HD (horizontal sync signal).

⑦ **BNC connector_VD**
For three-line (separate sync signal) input, connect to VD (vertical sync signal).

⑧ **Analog input connector_VGA**
Analog video signal input. The attached VGA analog signal cable is plugged into this to connect the monitor and a computer.

⑨ **S-Video input connector_VGA**
S-Video signal input. The attached VGA analog signal cable is connected to this and an S-Video output video device.

⑩ **RCA input connector_Y**
Composite brightness signal input. The attached composite video connection cable is connected to this and a video output device.

⑪ **RCA input connector_Cb**
Composite B signal input. The attached composite video connection cable is connected to this and a video output device.

⑫ **RCA input connector_Cr**
Composite R signal input. The attached composite video connection cable is connected to this and a video output device.

⑬ **RS232 Input / Output**
Firmware update.

⑭ **DVI connector**
Digital video signal input. The attached DVI digital signal cable is plugged into this to connect the monitor and a computer.

⑮ **Video-Term**
ON: Sync on video.
OFF: Connect with other monitor serially.

2. Adjusting the Display Angle

The best display angle is head-on.
Make tilt arrangements to obtain the best angle.

Tilt 20°
90°
6°
Pivot
140°
Swivel
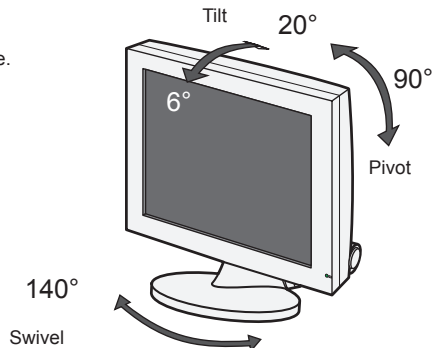
3. Rotating the LCD Panel

When setting the monochrome LCD display to vertical display (portrait orientation), lift the LCD panel to the top of the tilt stand as shown in the figure below and rotate it by 90 degrees.

Procedure

① Tilt the LCD panel upward. (Perform this procedure before sliding the panel upward.)
② Lift the LCD panel to the top (The tilt stand will slide about 50mm.).
③ Rotate the LCD panel by 90 degrees.
④ Replace the LCD panel to the bottom while in the vertical position (portrait orientation).
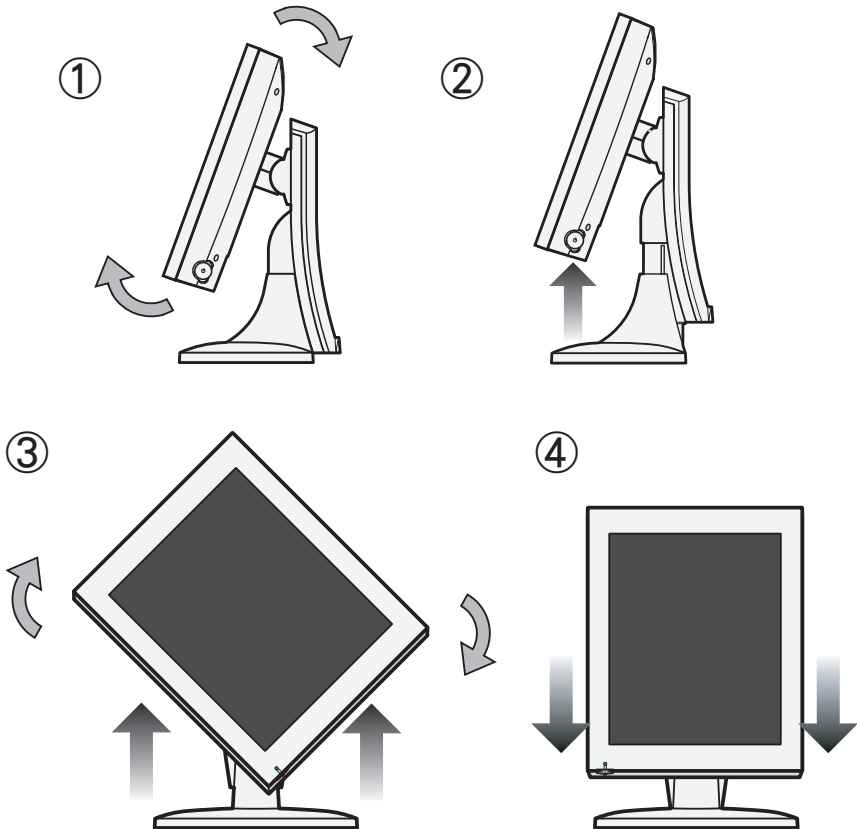
Display in portrait orientation

Pivot,,,
Pivot$^®$ software or graphics card that enables portrait orientation is necessary.

＊ Pivot$^®$ is a registered brand of Portrait Displays of the United States.

4. OSD Adjustments

The unit has loaded adjustment functiona through OSD to perfectly display video signal input. Operating the control dial on the back of the monochrome LCD display enables to make settings and adjustments for selected items.

OSD display

OSD Display

The OSD menu is displayed with icons, adjustment items, and setting values as shown below.
(The figure below is the main menu.)

Main Menu Display

Adjustment item icons
Icons of adjustable items

Cursor display
The menu pressed will be shown.

Input selection and timing
Display input connector and input timing currently selected.

Signal timing number
The number previously preset will be shown (user can't change it).
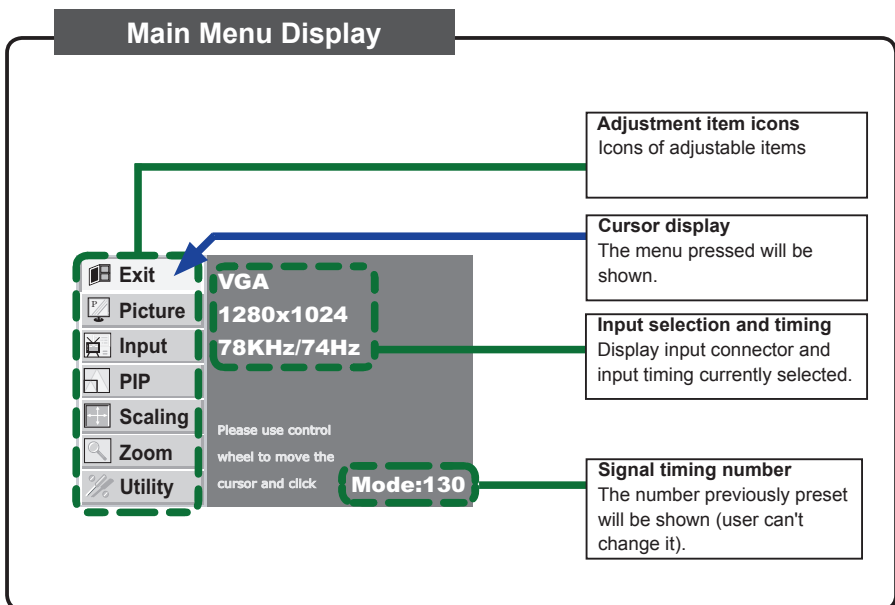
OSD adjustment screen has "main menu" and "submenus."

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Charts of OSD Adjustment Functions

The chart below displays the function tree and brief explanations of the functions. Color, LCD, and other adjustments have submenus under each tree.

● **OSD display**

Main Menu display

・ **Exit**..Close the OSD screen
・ **Picture**
   ├ **Return To Main Menu**............Return to Main Menu
   ├ **Auto Adjustment**...................Automatically adjust the display
   ├ **Brightness**.............................Adjust the brightness of the full screen at the range from 0 to 100
   ├ **Contrast**.................................Adjust the contrast of the full screen at the range from 0 to 100
   ├ **Black Level**............................Adjust black level
   ├ **Gamma**
      ├ **1.6**..................................Gamma, 1.6
      ├ **1.8**..................................Gamma, 1.8
      ├ **2.0**..................................Gamma, 2.0
      ├ **2.2**..................................Gamma, 2.2
      ├ **2.4**..................................Gamma, 2.4
      ├ **DICOM**...........................Gamma value set as the medical standard
      ├ **User 1**............................User set gamma value
      ├ **User 2**............................User set gamma value
      ├ **User 3**............................User set gamma value
      └ **User 4**............................User set gamma value
   ├ **Color compatible**
      ├ **Normal**...........................Normal display mode (input the same signals to each R,G, and B)
      ├ **Color compatible**..........Color compatible gradation (contrast calibration for color images)
      └ **User**
         ├ **Exit**.........................Return to Picture Menu
         ├ **R**.. ....User adjusts the intensity of Red channel at the range from 0 to 100
         ├ **G**.............................User adjusts the intensity of Green channel at the range from 0 to 100
         └ **B**.............................User adjusts the intensity of Blue channel at the range from 0 to 100
   ├ **Clock**....................................Fine adjustments on horizontal position of video signals
   ├ **Phase**...................................Phase adjustments
   ├ **Sharpness**..........................Five-step adjustments from soft to sharp of character outline
   ├ **H.Position**...........................Adjust horizontal screen position
   └ **V.Position**...........................Adjust vertical screen position

・ **Input**
   ├ **Exit**.......................................Return to Main Menu
   ├ **Auto**
      ├ **Exit**................................Return to Input menu
      ├ **Auto 1**.. ....Full-time input signal detection mode
      └ **Auto 2**............................Start-up input signal detection mode
   ├ **VGA**......................................Select 15-pin Mini D-sub input signals
   ├ **BNC**......................................Select BNC input signals
   ├ **S-Video**.................................Select S-Video input signals
   ├ **Composite**...........................Select composite input signals
   └ **Y Cb Cr**.................................Select component input signals

- **PIP(Picture in Picture)**
  - **Return To Main Menu**...........................Return to Main Menu
  - **PIP Size**
    - **OFF**..Not display PIP
    - **Small**...Display PIP small
    - **Medium**..Display PIP in normal size
    - **Large**...Display PIP in large size
  - **PIP Position**...Select PIP position from the nine point of the screen
  - **PIP Source**
    - **Auto**..Automatically select PIP input signals
    - **S-Video**..Set PIP input signals S-Video
    - **Composite**.....................................Set PIP input signals composite
    - **YCbCr**.. ....Set PIP input signals YCbCr
  - **PIP Contrast**...Adjust PIP contrast
  - **PIP Black Level**.....................................Adjust PIP Black level
  - **PIP Sharpness**.....................................Calibrate outline of the PIP image
- **Scaling**
  - **Maintain Aspect Ratio** ....Full-screen display (maintain aspect ratio)
  - **ONE to ONE** ....Display actual resolution
  - **FULL 5:4**   ....Full-screen display of images with aspect ratio, 5:4
  - **FULL 4:3** ....Full-screen display of images with aspect ratio, 4:3
  - **FULL 16:9**............................Full-screen display of images with aspect ratio, 16:9
  - **4:3 to 16:9**...........................Change aspect ratio of images (4:3 → 16:9)
  - **Letterbox to 16:9** ....Display letterbox images with aspect ratio, 16:9
  - **Letterbox to 4:3** ....Display letterbox images with aspect ratio, 4:3
- **Zoom**
  - **Return To Main Menu**.. ....Return to Main Menu
  - **Zoom In** ....Zoom image
  - **Horizontal Panning**.............................Horizontally pan zoomed image
  - **Vertical Panning** ....Vertically pan zoomed image
- **Utility**
  - **Return To Main Menu** ....Return to Main Menu
  - **Key Lock** .... Display OSD Lock
  - **OSD Horizontal Position** ....Adjust horizontal position of OSD
  - **OSD Vertical Position**.........Adjust vertical position of OSD
  - **Multi Language**
    - **English**..........................Display OSD in English
    - 日本語............................Display OSD in Japan
    - **Deutsch**........................Display OSD in German
    - **Français** ....Display OSD in French
    - **Italiano** ....Display OSD in Italian
    - **Español** ....Display OSD in Spanish
    - **Portuguễs** ....Display OSD in Portuguese
  - **OSD Background**
    - **Translucent** ....Display OSD in see-through background
    - **Opaque** ....Display OSD in black background
  - **OSD Display Timer** ....Adjust time to display OSD
  - **EPA Power Saving**
    - **ON** ....Turn on power management
    - **OFF** ....Turn off power management
  - **Auto Setup Function**...........VGA / BNC auto setup ON/OFF
  - **Restore To Factory**
    - **Default Setting** ....Restore to factroy setting

How to Operate

Adjustment examples from the main menu below.

e.g., "Brightness" adjustment

Adjustment 1…from the main menu
1. Press Control dial and display the OSD menu (See Fig. 1).

2. Rotate the dial to select "Picture" and press the dial. (See Fig. 2).

3. Rotate the dial to select "Brightness" and press the dial. ("Brightness" display will appear) (See Fig. 3).

4. Press the dial to make brightness adjustments (See Fig. 4).

5. Rotate the dial to make brightness adjustments (See Fig. 5).
   Adjustable at the range from 0 to 100.

6. Press the dial to finish adjustments (return to Fig. 2). The cursor is placed on "Exit." Press Control dial to return to the OSD main menu (return to Fig. 1).

7. The cursor is placed on "Exit." Press Control dial to close the OSD main menu.
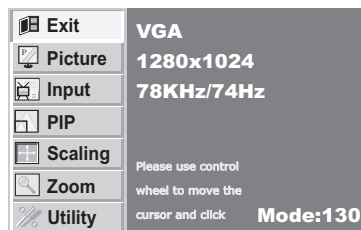
Fig.1 Main menu

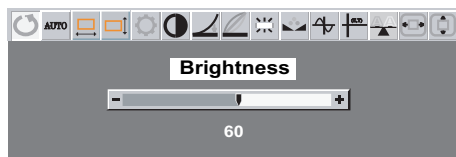Fig.2 Select "Picture"

Fig.3 Select "Brightness"

Fig.4 "Brightness" adjustment menu

Fig.5 "Brightness" adjustment menu

Details of Adjustment Items

The adjustment functions are described as follows.

Exit

Close the OSD main menu.

Picture *(adjust images)*

Return To Main Menu

Return to the main menu.

Auto adjustment (automatic adjustment)

Automatically adjust the size, position, brightness, contrast, and the like of the screen. When first using this monochrome display or inputting new timings, perform this adjustment.

【Caution】

In order to make this properly work, display application such as word processing or spreadsheet software on full-size screen or one close to it. This may not work properly with MS-DOS screen.

《 Procedure 》
1. Select "Auto adjustment" and press Control dial.
2. Make adjustments, If flickers, flurs, or small horizontal stripes appears on screen (See "Phase" on page 20).
   If partially phased screen is observed on screen, make fine adjustments on video signal position to horizontal synchronized signals by rotating the control knob. (See "Clock" on page 20)

Brightness (adjust brightness)

Adjust brightness of the screen. The larger the value is, the brighter the screen is, and vice versa. Adjustable at the range from 0 to 100 by a couple of steps.

Contrast (adjust contrast)

Adjust contrast of the screen. The larger the value is, the stronger the contrast is, and vice versa. Adjustable at the range from 0 to 100 by a couple of steps.

Black Level (adjust black level)

Adjust black level of the screen. The larger the value is, the brighter the brightness of the background contrast is, and vice versa. Adjustable at the range from 0 to 100 by one.

Gamma (adjust gamma)

Adjust gamma values as follows.
- 1.6 ....set gamma to 1.6
- 1.8 ....set gamma to 1.8
- 2.0 ....set gamma to 2.0
- 2.2 ....set gamma to 2.2
- 2.4 ....set gamma to 2.4
- DICOM ....set gamma set for medical standards
- User 1 ....set gamma value set by user.
- User 2 ....set gamma value set by user.
- User 3 ....set gamma value set by user.
- User 4 ....set gamma value set by user.

Color Compatible (color compatibility)

User can make tone adjustments and settings.

- **Normal** .... Normal display mode. Maximum brightness is available as a result of inputting the same signals to each R, G, and B.
- **Color compatible**...........Highlight contrast in monochrome display. Used for verification of tones in R, G, and B. (do not operate in BNC input)

- **User** .... User can adjust and set tones.
  - **Exit**............... Return to Picture Menu.
  - **R**................... Adjust red and equivalent colors at the range from 0 to 100. The greater the value is, the deeper the color is, and vice versa.
  - **G**................... Adjust green and equivalent colors at the range from 0 to 100. The greater the value is, the deeper the color is, and vice versa.
  - **B**................... Adjust blue and equivalent colors at the range from 0 to 100. The greater the value is, the deeper the color is, and vice versa.

Clock (clock adjustment)

When operating "Auto adjustment" and if any partially phased screen, make fine adjustments on video signal position to horizontally synchronized signals by rotating the control knob. As the value gets larger, the screen moves to the right, and vice versa. Adjustable at the range from 0 to 100.

Phase (phase adjustment)

Make "Phase" adjustments, if any flickers, blurs, or horizontal stripes on screen. Adjustable at the range from 0 to 100.

Sharpness (correct outline)

Five-step adjustments for outline correction is available according to display resolution.
As the value gets larger, the outline gets sharper, and vice versa.
To make characters look shaper, set a large value. To make pictures and images look finer, set a small value.

H-Position (horizontal position adjustment)

Adjust the horizontal position of the display. When rotating Control dial clockwise, the display moves to the left, and vice versa.

V-Position (Vertical position adjustment)

Adjust the vertical position of the display. When rotating Control dial clockwise, the display moves upward, and vice versa.

Input

Exit

Return to the main menu.

Auto (detect input signal)

Set detection mode to detect input signals.
- ●**Exit**.......................Return to Input menu.
- ●**Auto 1**.................. Full-time input signal detection mode. When currently used signals have no input with more than two lines used, this function automatically detects such an event and switches to other line that has input signals.
- ●**Auto 2**...................Start-up input signal detection mode. Only at the time of start-up, this automatically detects whether input signals are present. After start-up, manual operation is available. This function can be selected when user wants video signals consistently from one computer or does not want automatic switching as described in Auto 1.

VGA

Display signals from VGA connector (15-pin Mini D-sub).

BNC

Display signals from BNC connector. Inputs are as follows.
- ●**One-line Sync On Video input**.............VIDEO
- ●**Two-line input** ....VIDEO + CS (HD)
- ●**Three-line input** ....VIDEO + CS (HD) + VD

S-Video

Display signals from S-Video connector.
Inputs in which brightness signals, Y, and color-difference signals are separate can display images with higher resolution than that of Y signals.

Composite

Display signals from composite connector (RCA connector). Only Y input is available.

Y Cb Cr

Display signals from component connector (RCA connector). Three video inputs: brightness signals (Y), R color-difference signals (Cr), B color-difference signals (Cb) are available.

PIP *(Picture In Picture)*

This monitor has loaded the PIP (Picture In Picture) function that can display video signals (Y, YCbCr, S-Video signals) on part of the screen when displaying input signals from BNC or VGA (15-pin Mini D-sub). This is available, only when BNC or VGA (15-pin Mini D-sub) is selected and fixed.

Return To Main Menu

Return to the main menu.

PIP Size

Select display size of the PIP image. The size varies depending on the display resolution.
- **OFF** ....Does not display the PIP image.
- **Small**....................................Display PIP images in a small scale.
- **Medium**................................Display PIP images in the regular scale.
- **Large**....................................Display PIP images in a large scale.

PIP Position (PIP display posiion)

Select the PIP position from the nine points as shown on the right.

1	2	3
4	5	6
7	8	9

PIP Source (PIP display input selection)

Select PIP display input from the followings.
- **Auto** .... Set automatic selection for PIP display input.
- **S-Video** .... Set PIP display input S-Video.
- **Composite**.................. Set PIP display input composite.
- **YCbCr** .... Set PIP display input YCbCr.

PIP Contrast

Adjust PIP contrast at the range from 0 to 100.

PIP Black Level

Adjust PIP black level at the range from 0 to 100.

PIP Sharpness (PIP outline calibration)

Calibrate outline of the PIP image. Adjust it at the range from 0 to 100. The larger the value is, the shaper the image is.

Scaling *(adjust scale)*

Select one scale from the followings to display images.

- **Maintain Aspect Ratio**.......Display full-size screen with maintaing the aspect ratio.
- **ONE to ONE** ....Display images with the actual resolution.
- **FULL 5:4** ....Display images of 5:4 aspect ratio in full-size screen.
- **FULL 4:3** ....Display images of 4:3 aspect ratio in full-size screen.
- **FULL 16:9**..........................Display images of 16:9 aspect ratio in full-size screen.
- **4:3 to16:9** ....Display images of 4:3 in 16:9.
- **Letterbox to 16:9** ....Display letterbox images in 16:9 aspect ratio.
- **Letterbox to 4:3** ....Display letterbox images in 4:3 aspect ratio.

Zoom

Return To Main Menu

Return to the main menu.

Zoom In (expand iamges)

Zoom images currently on screen.
【Caution】The images zoomed will return to the original state when the power of the monochrome
monitor is turned off.

Horizontal Panning

Pan the zoomed images horizontally.
【Caution】The panned images will return to the original state when the power of the monochrome
monitor is turned off.

Vertical Panning

Pan the zoomed images vertically.
【Caution】The panned images will return to the original state when the power of the monochrome
monitor is turned off.

Utility

Return To Main Menu

Return to the main menu.

Key Lock

Display OSD lock.

OSD Horizontal Position

Adjust the horizontal position of OSD. When rotating Control dial clockwise, OSD moves to the right, and
vice versa.

OSD Vertical Position

Adjust the vertical position of OSD. When rotating Control dial clockwise, the display moves downward,
and vice versa.

Multi Language

Select an OSD language out of six languages below.
English............................. English
日本語................................. Japanese
Deutsch .... German
Fran**çais** .... French
Italiano ....Italian
Espa**ñol** ....Spanish
Português ....Portuguese

OSD Background

Select the background of OSD from black background and see-through.
Translucent ....See-through display.
Opaque ....Black background display.

OSD Display Timer

Set a time period of OSD display from 0 to 255 seconds by one second.
When "0 (zero)" is chosen, OSD will keep appearing on screen until "Exit" is pressed.
OSD will automatically disappear after the time set has passed if the timer is set from 1 to 255 seconds.

EPA Power Saving

Select the power management function to save power.
ON....................................Turn on the power management.
OFF..................................Turn off the power management.

BNC Auto Setup Function

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Restore To factory Default Setting

Initialize the data such as display position and automatic adjustment data to factory default. After initialization, perform "Auto Adjustment" again.

Reference

DDC[*1]

◆ This unit has loaded a function compliant with DDC-2B, VESA[*2] standard.
The DDC function is located in 15-pin D-sub connector and 24-pin DVI-D connector.
This function reads into the set data written in the monochrome LCD display internal device in advance on start-up of Windows[®]95/98/Me/2000 or Windows[®]XP and sets the detailed information of the monochrome LCD display in the system file in order to achieve Plug&Play.
Data reading from the monochrome LCD display is done through a video signal cable, which needs to be connected when Windows[®]95/98/Me/2000 or Windows[®]XP is on.

Note   [*1]DDC(Display Data channel) and [*2]VESA are registered trademarks of Video Electronics Standards Association.

Power Management

What is power management?
This is the function that truns off the screen by detecting input signal change to reduce power consumption for power saving.
Setting
Refer to the user's manuals of your computer and display drivers for DPMS[*3] settings and time-settings for mode change.

Note   [*3]DPMS stands for Display Power Management Signaling.

Applicable Signals

1. Applicable Signal Timings

※ The display may not work correctly with timings other than listed below.

◎ : Recommended timing　　　○ : Applied timing

|	Display mode	Horizontal frequency	Vertical frequency	Pixel frequency	Remark
V E S A	VGA 640 x 480	31.47 kHz	70.09Hz	25.175 MHz	○
	VGA 640 x 480	31.47 kHz	59.94 Hz	25.175 MHz	○
		37.50 kHz	75.00 Hz	31.50 MHz	○
		37.86kHz	72.81 Hz	31.50 MHz	○
		43.27 kHz	85.01 Hz	36.00 MHz	○
	SVGA 800 x 600	35.16 kHz	56.25 Hz	36.00 MHz	○
		37.88 kHz	60.32 Hz	40.00 MHz	○
		48.08 kHz	72.19 Hz	50.00 MHz	○
		46.88 kHz	75.00 Hz	49.50 MHz	○
		53.67 kHz	85.06 Hz	56.25 MHz	○
	XGA 1024 x 768	48.36 kHz	60.00 Hz	65.00 MHz	○
		56.48 kHz	70.07 Hz	75.00 MHz	○
		60.02 kHz	75.03 Hz	78.75 MHz	○
		68.68 kHz	85.00 Hz	94.50 MHz	○
	SXGA 1280 x 1024	63.98 kHz	60.02 Hz	108.00 MHz	◎
		79.98 kHz	75.03 Hz	135.00 MHz	○
TV in put	NTSC	15.73 kHz	59.94 Hz	14.32 MHz	Interlace display
	PAL	15.63 kHz	50.00 Hz	17.73 MHz	Interlace display

2. Assignment of Connector Pins

15-pin Mini D-sub Connector (female)

VGA signal connector

Pin #	Signal	Pin #	Signal
1	S1(R:Red)	9	-
2	S2(G:Green)	10	HS-GND
3	S3(B:Blue)	11	VS-GND
4	GND	12	DDC,SDT
5	GND	13	HS
6	S1-GND	14	VS
7	S2-GND	15	DDC,SCLK
8	S3-GND		

CS   **Sync On Video**

VD   **HD**   **Video**
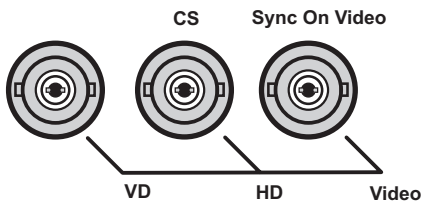
BNC Connector
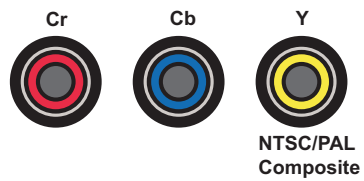
RCA Connector (female)

Cr   **Cb**   **Y**

S-Video

**NTSC/PAL
Composite**

S-Video Connector   Component Signal Connector

Failure Diagnosis

Check the followings before requesting repair.

Symptom	**Verify**	**Countermeasure**
Power doesn't turn on! (POWER indicator doesn't light!).	a: Is the power cord connected? b: Is the power ON?	a: Connect the power cord (see pg.10). b: Turn the power on.
The screen is not displayed! [*] **(POWER indicator lights up).**	a: Is the signal cable properly connected? b: Is contrast or brightness adjustment at minimum? c: Is it under the power saving mode? d: Is the system on? e: Is the signal input an applicable one within the stipulated frequency range?	a: Properly connect the appropriate signal cable (see pg. 10). b: Adjust contrast and brightness (See pg. 21). c: Cancel the power management mode (See pg. 25,26). d: Turn the system on. e: Input the applicable signals within the frequecy range.
Colors look strange!	a: Is the signal cable properly connected? b: Did you make color adjustments?	a: Properly connect the appropriate signal cable (See pg. 10). b: Readjust colors (See pg. 22).
Display size and position are not appropriate!	a: Is the preset adjusted to comply with input signals?	a: Make display adjustments (See pg. 21~25).
The display is dark (bright)! Or, saturated!	a: Is the input video signal level appropriate?	a: Make automatic adjustments (See pg. 21).
The display vibrates!	a: Is any signal that is out of the set frequency range input?	a: Input applicable signals within the frequecy range.
Control dial doesn't work!	a: Are you not rotating the dial so fast?	a: Rotate the dial slowly.

Note *: Signals from computers may not come into when power management function is on.

Cleaning

Cleaning the Cabinet and the Monochrome LCD Display

- ●When cleaning, remove the AC adapter from the monochrome LCD display and outlet for safety.
- ●Lightly wipe off dirt on the cabinet and LCD panel surface with a hard-wrung soft cloth soaked in a neutral cleaning solution. Follow its instruction when using a disposable cloth.
- ●Do not use thinner, benzine, alcohol or such on the cabinet that is made of plastic. These can damage the cabinet, alter its quality and cause the paint to peel off.
- ●Do not apply insecticides and other volatile items to the cabinet. Also do not leave rubber and vinyl products or such in contact with it for long hours. This can cause the quality to alter and the paint to peel off.
- ●Cleaners usable for the monochrome LCD panel are isopropyl alcohol (without abrasive), non-ammonic glass cleaner, and watered-down neutral cleaning solution. Do not use organic solvent such as acetone and toluene.
- ●When the screen has dust on the monochrome LCD panel surface, wipe it off with soft moist cloth.
- ●Treat the monochrome LCD panel with care. Do not rub the LCD panel surface with a rough item or hit it on the surface. Also, do not strongly press the LCD panel surface. This can lead to unevenness in the screen and also to failure of the product.

Specifications

Product name : Monochrome LCD Display

| Items	Specifications
LCD display device	46cm (18.1 inch) Monochrome TFT Normally Black
Pixel pitch	Horizontal 0.2805 mm × Vertical 0.2805 mm
Display area	Horizontal 359.0 mm × Vertical 287.2 mm
Pixel	1280 × 1024 pixels
Display gradation	256 (8 bit) x 3
Standard viewing angle	Horizontal : 170 deg. Vertical : 170 deg.

Input signal	(1) VGA (15-pin Mini D-sub) connector
	    Video signal : Analog RGB (0.714V_{P-P}/75Ω)
	                  compatible with RS-343-compliant composite signal, sync signal from S2 terminal
	                  (0.3V_{P-P}/75Ω)
	    Horizontal sync and composite sync signal: TTL level 2.5~5.5V(plus・minus)
	    Vertical sync signal: TTL level 2.5~5.5V (plus・minus)
	(2) BNC connector
	    Video signal : Analog RGB (0.714V_{P-P}/75Ω)
	                  Support RS-343-compliant composite signal. Sync signal from S2 terminal
	                  (0.3V_{P-P}/75Ω)
	    Horizontal sync and composite sync signal: TTL level 2.5~5.5V(plus・minus)
	    Vertical sync signal: TTL level 2.5~5.5V (plus・minus)
	(3) S-Video connector
	    Color signal: 0.286V_{P-P}/75Ω
	    Brightness signal: 1V_{P-P}/75Ω (composite sync signal)
	(4) RCA connector
	    Component R signal: ± 0.35V_{P-P}/75Ω (Red color-difference signal)
	    Component B signal: ± 0.35V_{P-P}/75Ω (Blue color-difference signal)
	    Composite brightness signal: 1V_{P-P}/75Ω (composite sync signal)

Input terminal	15-pin mini D-sub connector, BNC connector, RCA (YCbCr) connector, S-Video connector, 8-pin serial connector for communication, 8-pin serial connector for sensor connection
Temperature	On Off Temperature : 5~35℃ -20~60℃ Humidity (non-condensation) : 20~80% 10~90% Air pressure : 697~1060hPa 187~1060hPa
Power supply	AC100~240V (50/60Hz), 1.2A Max.
Consumption current	Approx. 60W Max. /Less than 8W when power management on
External dimensions	Width 432 mm x Depth 251 mm × Height 466 mm (landscape)
Mass	Approx. 9.2kg (net weight)
International standards	UL60601-1, CSA C22.2 N601.1, FCC Part15 ClassB, DOC-B, MDD/CE (EN60601-1, EN55011, EN60601-1-2)

●The specifications and appearance will be changed for improvement without notice.

External Dimensions
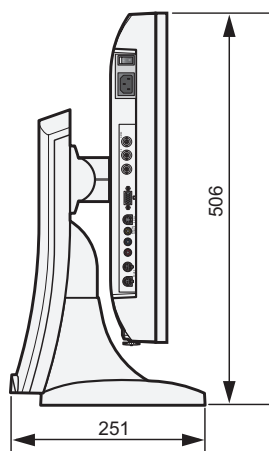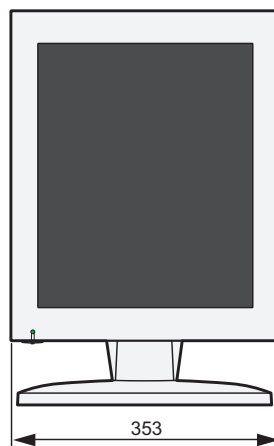
Landscape (longer side at the top)

432

466

251
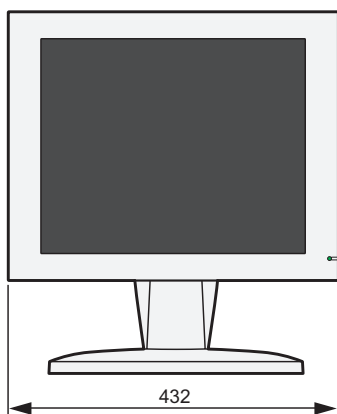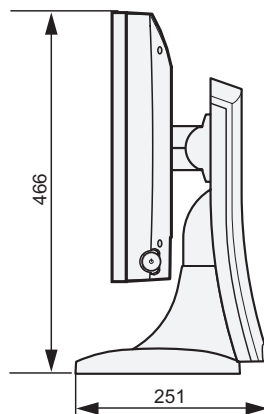
【Front】

【Right side view】

Portrait (shorter side at the top)

506

251

353

【Left side view】

【Front】

Technical Support

Requesting Repair

① Read "Failure Diagnosis (Pg. 29)" carefully and check them yourself.
② In case of having abnormalities on your driver, stop operating, unplug the AC cable from the outlet, and
   consult dealer.Do not repair by yourself. It is very dangerous.
③ Consult dealer for repair.
④ Use the product's packing and packing materials to send the product. Carefully place the unit in the
   packing, and keep the face from touching any packing materials.
   The panel surface touching the materials during transportation will cause damage on the panel surface;
   we will not cover the damage.

Contact Technical Support

Teklink Service.(Refferred to on the next page)

Notes for User's Manual

・It is prohibited that copying any part or all of this manual without authorization.
・The content of this manual will be subject to change without notice.
・This was made carefully. Please contact us if any unclear points, mistakes, or parts left out.

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