17" COLOR DISPLAY UNIT CDU1786D/MI01 (DSM 50-175)

This display unit is manufactured by **MITSUBISHI** and is identified as **DSM 50-175** on the front and rear of the case, and in the Progetto di Gestione. This unit is also identified as **CDU 1786D/MI01** on the homologation plate on the rear of the case.

CHARACTERISTICS

VGA-compatible, high resolution, multiscan analog color monitor with the power management and DDC-1/2B features.

- Diagonal screen size: 17"
- Horizontal size: 300 ± 3 mm (281± 3 mm for a 1280x1024 resolution)
  Vertical size: 225 ± 3 mm
- Input voltage: 90-127 V/195-265 V (Universal power supply)
  Line frequency: 50-60 Hz ± 5 %
  Degaussing: Manual and automatic at power on
  Power dissipation: 120 W
  Current: < 3 A (90 - 127 V)
  < 2 A (195 - 265 V)
- Video input signals: Separate Red, Green, Blue, H.s. and V.s
  Composite Red, Green, Blue, H.s. and V.s.
  Composite Red, Green, Blue, H.s. and V.s. on Green

  Video input: 75/1000 Ω to ground
  Level: 0-700 mV
  Polarity: Positive
  Rise/fall time: ≤ 8 ns
- External controls: POWER SWITCH
  MANUAL DEGAUSS
  ADJUSTMENT BUTTON
  CONTRAST ADJUSTMENT
  SELECT BUTTON
  AUTOMATIC CALIBRATION
  RESET

  NOTE: See the section VIDEO ADJUSTMENTS in this chapter for information on the possible adjustments.
- Input timing limits

Parameter	**Horizontal**	**Vertical**
Frequency	31 - 86 KHz	50 - 152 Hz
Blanking	≥ 3.5 µs	≥ 0.6 ms
Back Porch	≥ 0.1 µs	≥ 0.42 ms
Front Porch	≤ Back Porch	
Sync Pulse	≥ 1 µs	≥ 0.03 ms

- Preset timings

VIDEO MODE	**VGA**			**VGA ERGO**	**SVGA**			**VGA PLUS**			**H.R.**	
HORIZ. (DOTS)	640			640	800			1024			1280	
FREQ. (KHz)	31.469			37.5	37.88	48.07	46.87	48.36	56.47	60.02	64.25	79.97
VERT. (LINES)	350	400	480	480	600			768			1024	
FREQ. (Hz)	70.08	70.08	59.95	75	60.31	72.19	75	60	70.07	75.03	60.05	75.02
INTERL.	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
V/H POLARITY	-/+	+/-	-/-	-/-	+/+	+/+	+/+	-/-	+/+	+/+	-/-	+/+
PIXEL R. (MHz)	25.17	25.17	25.17	31.5	40	50	49.5	65	75	78.75	110	135

NOTE: The monitor can automatically store 12 video modes. The new video modes must differ from the existing ones by at least a 1 KHz horizontal scan frequency or by a 5 Hz vertical scan frequency, or the sync signal must have different polarities.

- Power Management

VIDEO MODE	**HORIZONTAL SYNC**	VERTICAL SYNC	**VIDEO**	**POWER SAVING**	**RESTORE TIME**
ON	PULSE	PULSE	ACTIVE	120 W	
STAND-BY	NO PULSE	PULSE	BLANKED	< 90 W	5 SEC
SUSPEND	PULSE	NO PULSE	BLANKED	< 15 W	5 SEC
OFF	NO PULSE	NO PULSE	BLANKED	< 8 W	12 SEC

- VGA Connector

1 Red video input
2 Green video input
3 Blue video input
4 Identify output (connected to ground)
5 Connected to ground
6 Red video ground
7 Green video ground
8 Blue video ground
9 Not present
10 Logic ground
11 Identify output (connected to ground)
12 SDA (Serial Data)
13 Horizontal sync
14 Vertical sync
15 SCL (Serial Clock)

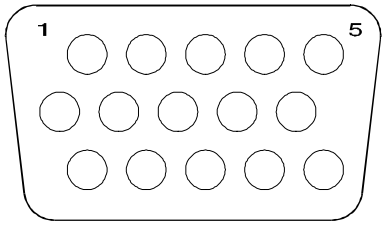


Fig. 1-1 VGA Connector

MONITOR CONNECTIONS

There are eight connectors on the rear of the monitor:

1. AC power supply
2. Serial interface
3. VGA video signals interface
4. Red signal BNC
5. Green signal BNC
6. Blue signal BNC
7. Horizontal sync BNC
8. Vertical sync BNC

CONNECTING THE POWER SUPPLY CABLE

Attach one end of the power supply cable to the power supply connector located on the rear of the monitor. Attach the other end to the auxiliary power supply socket on the PC. The monitor power supply can automatically detect the 90-127 V or 195-265 V power supply ranges.

CONNECTION TO ANY VGA-COMPATIBLE SYSTEM

The following figure shows the connection of the VGA video signals cable to any VGA-compatible system.

1. Power off the monitor and personal computer.
2. Attach the video signals cable to the monitor and personal computer.
3. Power on the monitor and personal computer in this order.
4. After having used the system, power off the monitor then the personal computer.

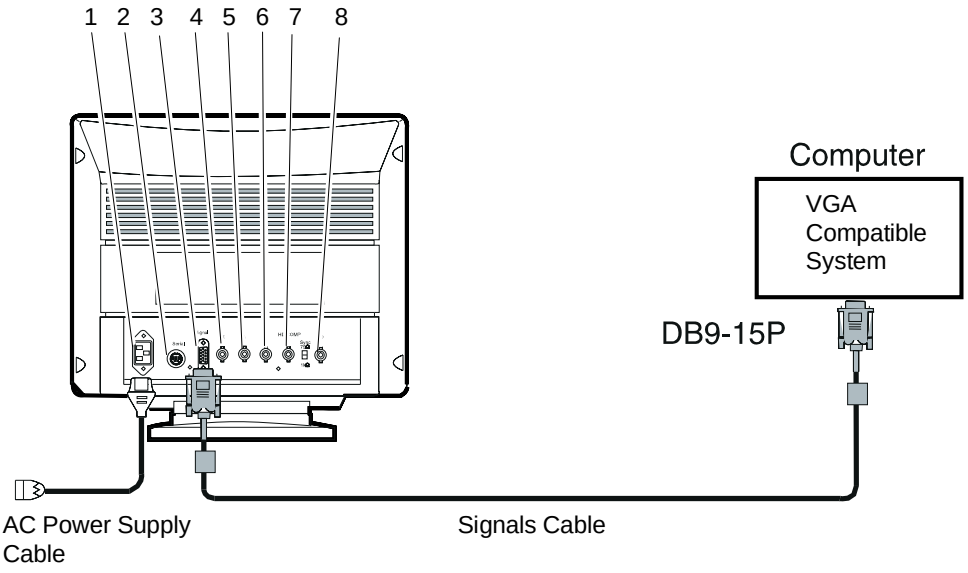
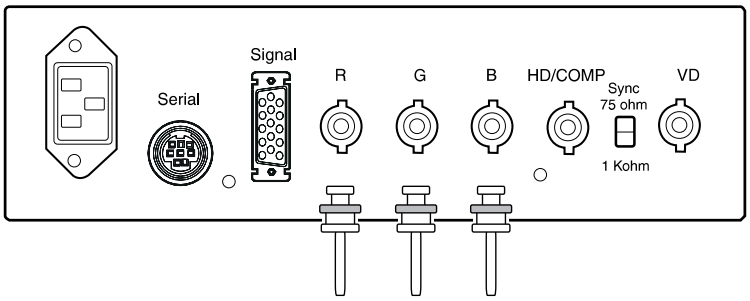


Fig. 1-2 Connection of the Signals and Power Supply Cables

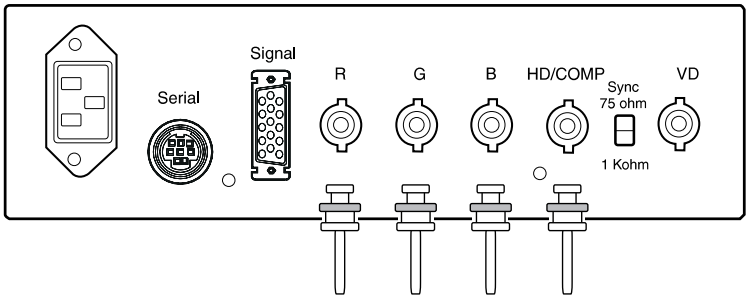
NOTE: The monitor remains powered even when the power switch is turned off. It is therefore important that the power supply socket be easily accessible in case of emergency or to completely disconnect the monitor.

CONNECTION WITH BNC CABLES

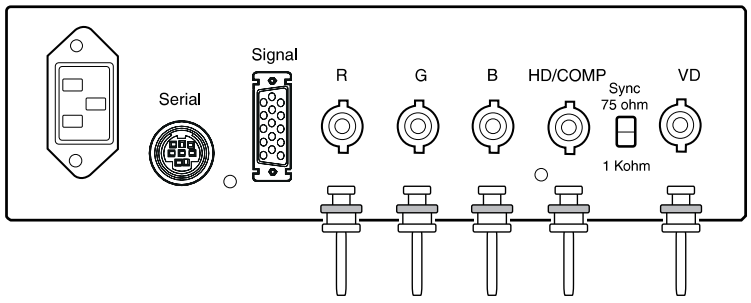
- **Connection with green composite sync video signal (green sync):** attach the R, G, B video signals to the BNC jacks located on the rear panel of the monitor.



- **Connection with an external composite signal**: Attach the R, G, B video signals and the composite sync signal to the related BNC jacks located on the rear panel of the monitor.



- **Connection with separate horizontal and vertical sync signals:**
  Attach the R, G, B video signals and the horizontal/vertical sync signals to the related BNC jacks located on the rear panel of the monitor.



NOTE: When using the TLL synchronized signal, set the termination switch to the 1 KΩ position which would otherwise be set to "75 Ω".

FRONT PANEL FUNCTIONS

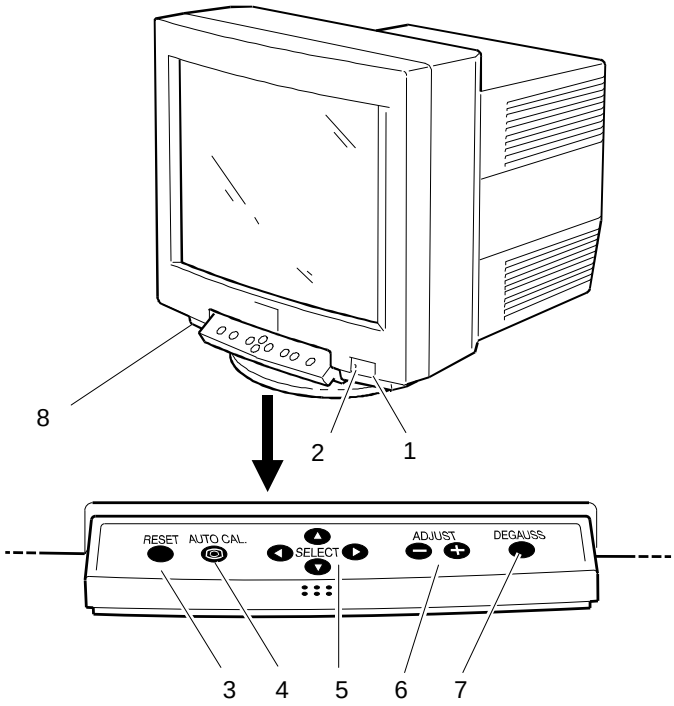


Fig. 1-3 Front Panel Functions

1. **POWER SWITCH**: powers the monitor on or off.
2. **POWER ON INDICATOR**: comes on when the monitor is powered on.
3. **RESET BUTTON**: restores a user-modified factory setting. This button has two functions.
   - When making adjustments using the H-SIZE, H-PHASE, V-SIZE, V-PHASE, PCC-AMP, PCC-PHASE, PIN-BALANCE, KEY-BALANCE, MOIRE-CLEAR LEVEL (ON-OFF), H-POSI, V-POSI, V-LIN, V-LIN-BAL, CENTER-PCC, TOP-PCC, BOTTOM-PCC, CENTER-BAL, TOP-BALANCE, BOTTOM-BALANCE, CLAMP-PULSE POSITION controls, pressing the RESET button restores the factory setting relating to the screen geometry if the timing of the current video signal corresponds to a factory-defined program.
   - When the color level is adjusted, the RESET button restores the factory-set color level relating to the number of the selected color.
4. **AUTO CALIBRATION BUTTON (Available on specific versions only)**: automatically calibrates screen geometry, dimensions and position.
5. **FUNCTION SELECT BUTTONS**: select one of the functions that are superimposed on the screen.
6. **ADJUST BUTTONS**: adjust the function selected using the function selection buttons.
7. **DEGAUSS BUTTON**: clears the screen from any shading or impurities.
8. **CONTRAST CONTROL**: turn clockwise to increase the contrast. Adjust the contrast in this way instead of using the + and - adjustment buttons.

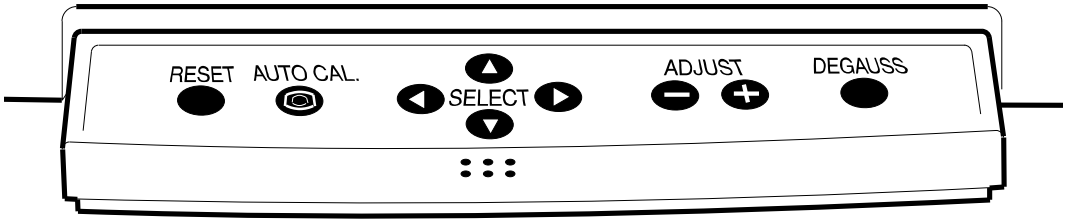
FUNCTION CONTROLS

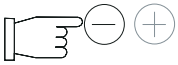
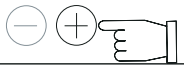
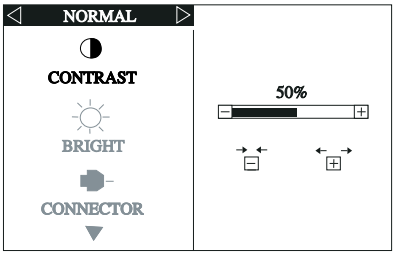
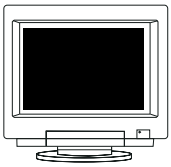
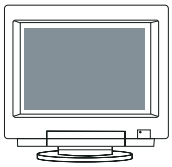
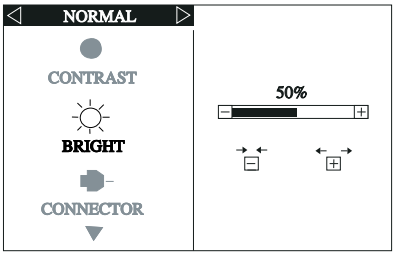
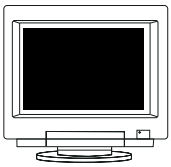
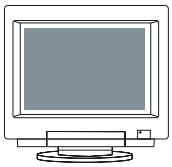
NORMAL MODE

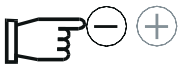
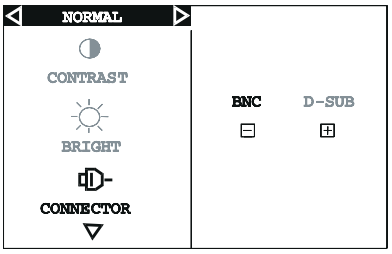
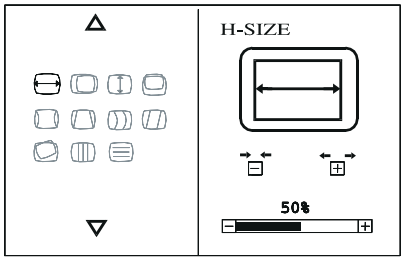
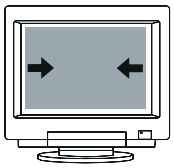
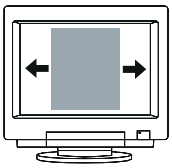
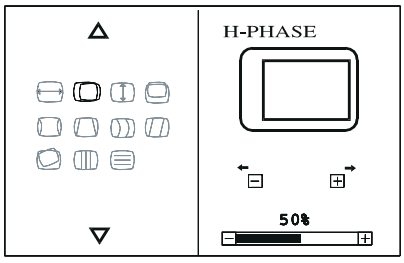
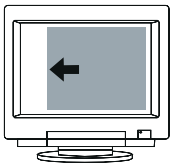
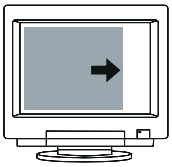
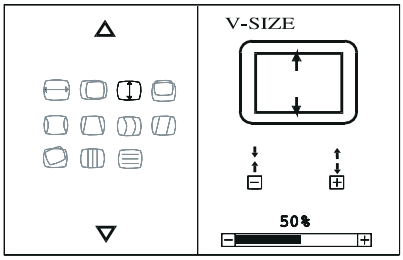
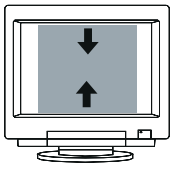
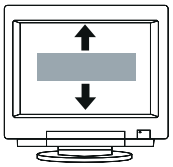
Press any selection button to display the control indicators. When the indicator of a function symbol is displayed in blue, the related control is active and can be adjusted using the adjustment buttons. The display unit will automatically store all the adjustments that are made. If the control buttons are remain inactive for 10 seconds, the OSD will disappear.

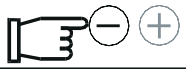
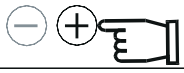
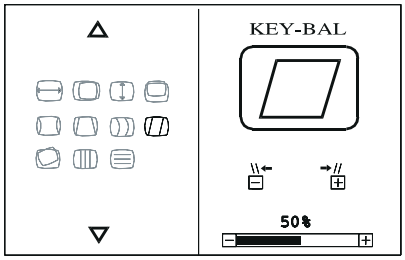
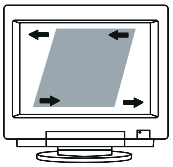
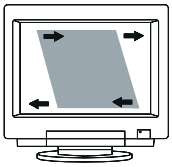
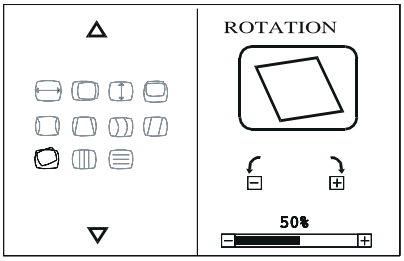
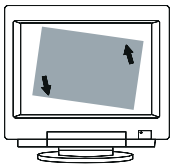
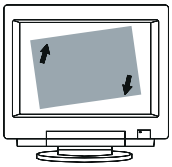
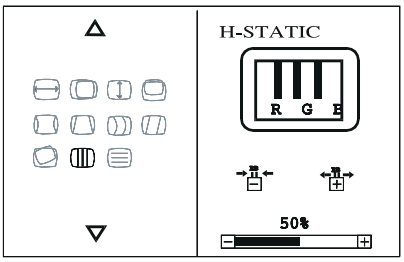
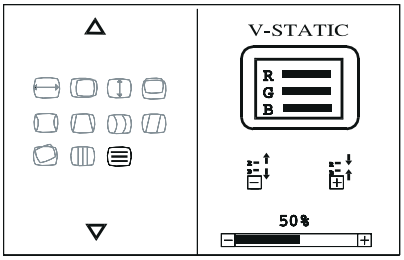
1. **CONTRAST** - Sets the desired contrast.
2. **BRIGHT** - Sets the degree of black on the screen.
3. **CONNECTOR-SELECT** - Selects the video input connection to use.
4. **H-SIZE** - Adjusts the horizontal size of the image on the screen.
5. **H-PHASE** - Adjusts the horizontal position of the image on the screen.
6. **V-SIZE** - Adjusts the vertical size of the image on the screen.
7. **V-PHASE** - Adjusts the vertical position of the image on the screen.
8. **PCC-AMP** - Straightens the right and left sides of the image on the screen.
9. **PCC-PHASE** - Adjusts the parallelism of the right and left sides on the screen.
10. **PIN-BALANCE** - Adjusts the curvature of the right and left sides of the image on the screen.
11. **KEY-BALANCE** - Adjusts the vertical slant of the image on the screen.
12. **ROTATION** - Adjusts image rotation.
13. **H-STATIC** - Adjusts Red, Green and Blue horizontal alignment.
14. **V-STATIC** - Adjusts Red, Green and Blue vertical alignment.
15. **COLOR 1-RED, COLOR 2-RED, COLOR 3-RED** - Balances the red on the monitor.
16. **COLOR 1-GREEN, COLOR 2-GREEN, COLOR 3-GREEN** - Balances the green on the monitor.
17. **COLOR 1-BLUE, COLOR 2-BLUE, COLOR 3-BLUE** - Balances the blue on the monitor.
18. **POWER SAVE (ON/OFF)** - When set to ON, reduces the monitor's power consumption when it is on but not used.
19. **MOIRE-CLEAR (ON-OFF)** - When set to ON, the moire level on the screen can be reduced by MOIRE CLEAR LEVEL.
20. **MOIRE-CLEAR LEVEL** - When MOIRE-CLEAR is activated, reduces the moire level on the screen.
21. **ADJUST-VR** - Transfers function adjustments to the external potentiometer.

NORMAL MODE



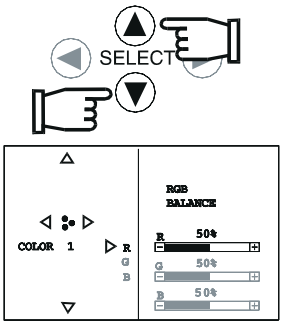
FUNCTION AND OSD	Press the Minus Adjust Button: 	Press the Plus Adjust Button: 
(1) CONTRAST ◑ 	 To decrease the contrast	 To increase the contrast
	Press plus and minus buttons at once, restore to factory preset level.	
(2) BRIGHT ☼ 	 To decrease the brightness.	 To increase the brightness.
	Press plus and minus buttons at once, restore to factory preset level.	

FUNCTION AND OSD	Press the Minus Adjust Button: 	Press the Plus Adjust Button: 
(3) CONNECTOR 	Press the minus adjust button to select the BNC connection.	Press the plus adjust button to select the D-SUB input connector.
	If the selected connector is no signal, the monitor will select another one automatically.	
(4) H-SIZE (Horizontal Size) 	 To narrow the width of the image on the screen.	 To expand the width of the image on the screen.
(5) H-PHASE(Horizontal Position) 	 To move the image to the left.	 To move the image to the right.
(6) V-SIZE(Vertical Size) 	 To narrow the height of the image on the screen.	 To expand the height of the image on the screen.

FUNCTION AND OSD	Press the Minus Adjust Button: 	Press the Plus Adjust Button: 
(11) KEY-BALANCE 	 To make the screen slant to the left.	 To make the screen slant to the right.
(12) ROTATION 	 To rotate to the left.	 To rotate to the right.
	Press plus and minus buttons at once, restore to factory preset level.	
(13) H-STATIC 	A white line on the screen is made up of red, green and blue lines. If there are no convergence error on the picture, the line will be exactly overlaid and the resulting color is white. If there is a serious convergence error, separate green and blue lines will be seen instead of white.	
	To move the red to the right and the blue to the left.	To move the red to the left and the blue to the right.
	Press plus and minus buttons at once, restore to factory preset level.	
(14) V-STATIC 		
	To move the red to the upper and the blue to the lower.	To move the red to the lower and the blue to the upper.
	Press plus and minus buttons at once, restore to factory preset level.	

The monitor can use three levels of white of which only the first is factory preset. The user can modify and store the level of the three primary colors.

(15) COLOR 1-RED, COLOR 2-RED, COLOR 3-RED



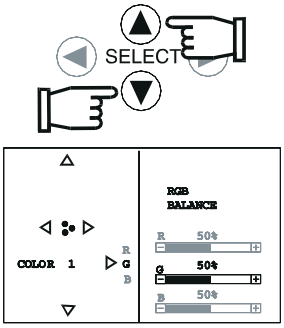
Press the select buttons (right or left) to choose COLOR-1, COLOR-2, and COLOR-3.

Press the select buttons (up or down) to choose COLOR-1 R.

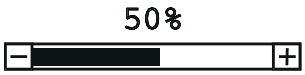
Press the minus adjust button to decrease the red color level.

Press the plus adjust button to increase red color level.

(16) COLOR 1-GREEN, COLOR 2-GREEN, COLOR 3-GREEN



Press the select buttons (right or left) to choose COLOR-1, COLOR-2, and COLOR-3.

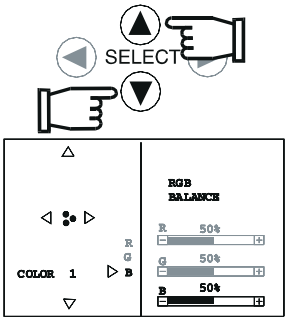


Press the select buttons (up or down) to choose COLOR-1 G.

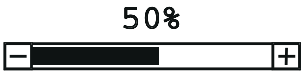
Press the minus adjust button to decrease the green color level.

Press the plus adjust button to increase the green color level.

(17) COLOR 1-BLUE, COLOR 2-BLUE, COLOR 3-BLUE



Press the select buttons (right or left) to choose COLOR-1, COLOR-2, and COLOR-3.



Press the select buttons (up or down) to choose COLOR-1 B.

Press the minus adjust button to decrease the blue color level.

Press the plus adjust button to increase the blue color level.

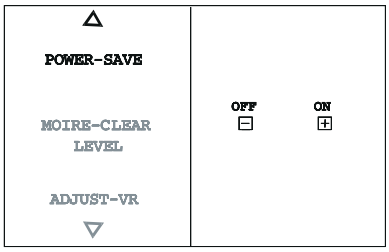
* Press the reset button, restore to factorypreset color.

(18) POWER-SAVE (ON/OFF)

Press the up or down SELECT buttons to choose POWER-SAVE.

Press the minus adjust button to select the constant power-on mode.

Press the plus adjust button to select the power-save mode.

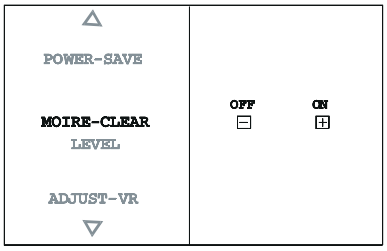


(19) MOIRE-CLEAR (ON/OFF)

Press the up or down SELECT buttons to choose MOIRE-CLEAR.

Press the minus adjust button to select the moire-clear mode off.

Press the plus adjust button to select the moire-clear mode on.



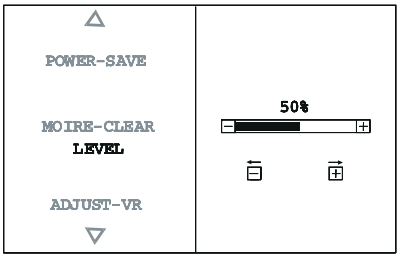
(20) MOIRE-CLEAR LEVEL

Press the up or down SELECT buttons to choose MOIRE-CLEAR LEVEL.

Press the minus adjust button to decrease the level of the moire-clear wave.

Press the plus adjust button to increase the level of the moire-clear wave.

The over-adjustment might degrade picture quality.

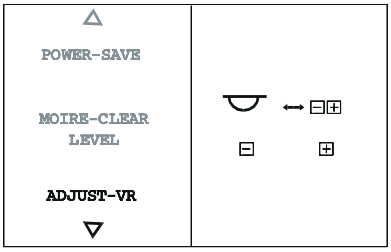


(21) ADJUST-VR

Press the up or down SELECT buttons to choose ADJUST-VR.

Press the minus adjust button to adjust the screen by rotary encoder.

Press the plus adjust button to adjust the screen by minus or plus adjust button.

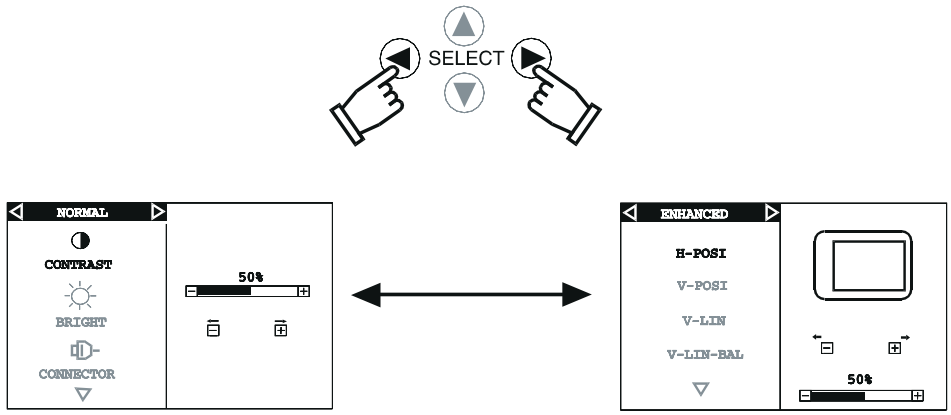


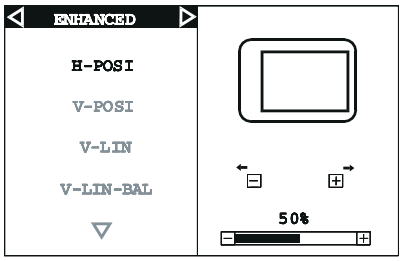
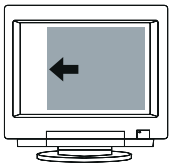
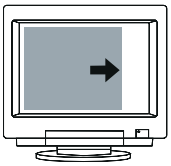
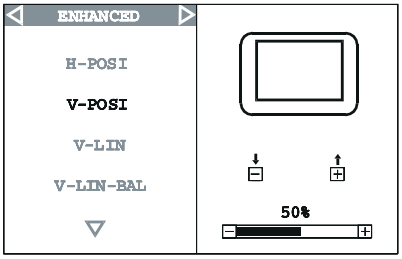
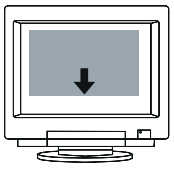
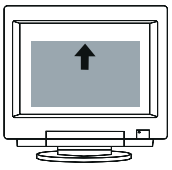
ENHANCED MODE

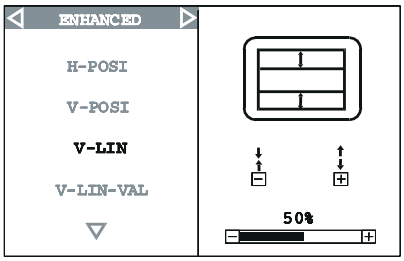
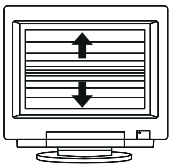
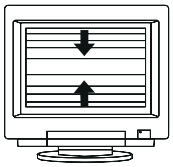
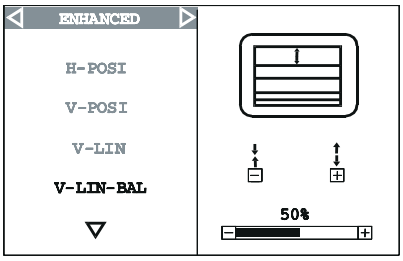
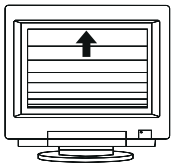
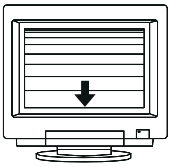
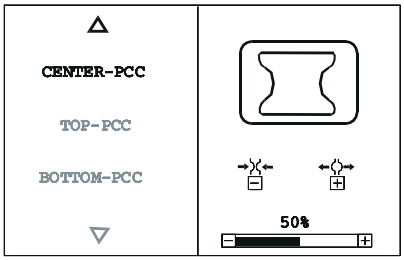
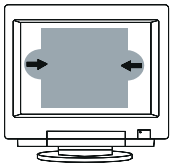
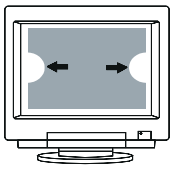
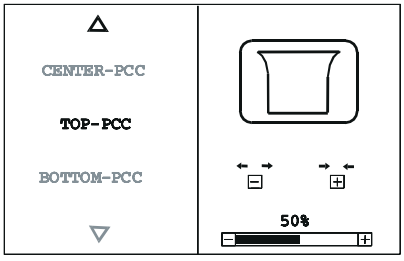
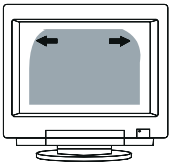
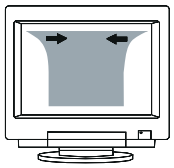
22. **H-POSI (Horizontal Position)** - Adjusts the horizontal positioning of the screen.
23. **V-POS (Vertical Position)** - Adjusts the vertical positioning of the screen.
24. **V-LIN (Vertical Linearity)** - Adjusts the linearity of the screen vertical axis.
25. **V-LIN-BALANCE (Vertical Linearity Balance)** - Centers the linearity of the screen vertical axis.
26. **CENTER-PCC (Center Pincushion or Bow Amplitude)** - Adjusts the pincushion near the vertical center of the screen.
27. **TOP-PCC (Top of Corner Pincushion or Bow Amplitude)** - Adjusts the pincushion near the top corners of the screen.
28. **BOTTOM-PCC (Bottom of Corner Pincushion or Bow Amplitude)** - Adjusts the pincushion near the bottom corners of the screen.
29. **CENTER-BALANCE (Center Pincushion or Bow Balance)** - Adjusts the curvature of the top part of the left and right sides of the image on the screen.
30. **TOP-BALANCE (Top of Corner Pincushion or Bow Balance)** - Adjusts the curvature of the lower part of the left and right sides of the image on the screen.
31. **BOTTOM-BALANCE (Bottom of Corner Pincushion or Bow Balance)** - Adjusts the curvature of the left and right sides of the image on the screen.
32. **CLAMP PULSE POSITION** - In the sync-on-green mode helps to correctly balance the background color.
33. **PURITY** - Adjusts screen purity.
34. **VIDEO LEVEL** - Selects the 1 V or 0.7 V video levels.

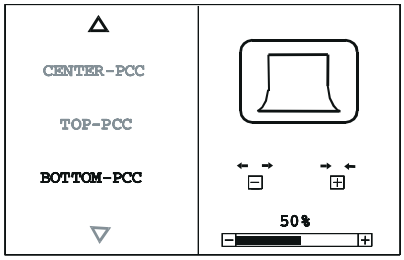
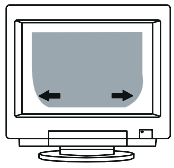
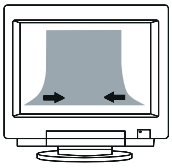
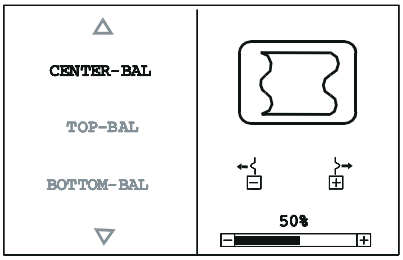
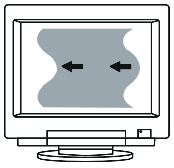
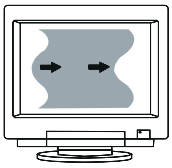
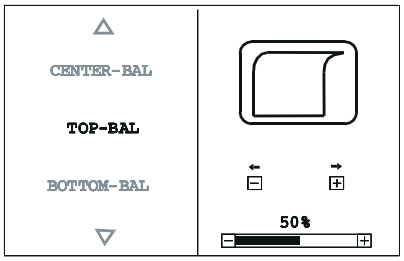
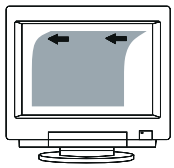
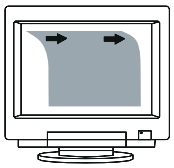
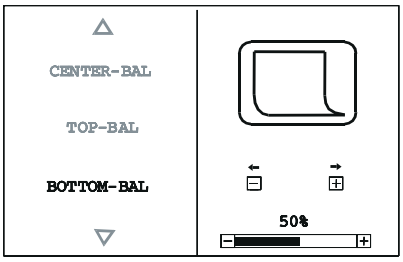
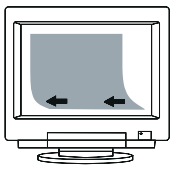
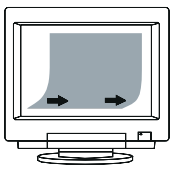
ENHANCED MODE

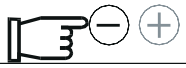
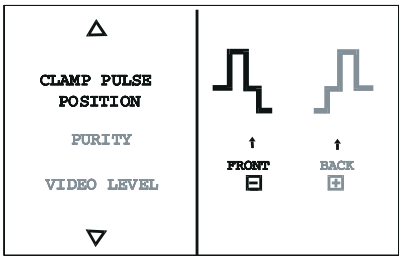
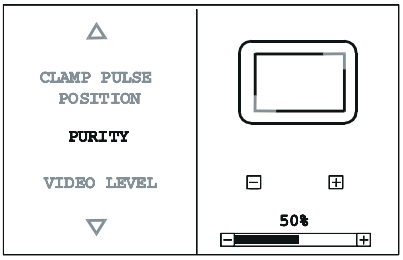
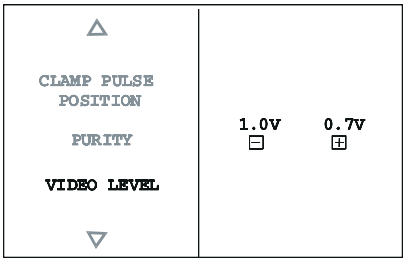
Press the upper or lower button to select CONTRAST and then press the right or left button to select the ENHANCED MODE. The following adjustments can be made in the advanced mode.



FUNCTION AND OSD	Press the Plus Adjust Button:	Press the Minus Adjust Button:
(22) H-POSI (Horizontal Position) 	 To move the screen to the left.	 To move the screen to the right.
(23) V-POS (Vertical Position) 	 To move the screen down.	 To move the screen up.

FUNCTION AND OSD	Press the Minus Adjust Button: 	Press the Plus Adjust Button: 
(24) V-LIN (Vertical Linearity) 	 To vertically expand the center of the screen and compress the top and bottom.	 To vertically compress the center of the screen and expand the top and buttom.
(25) V-LIN BALANCE (Vertical Linearity Balance) 	 To vertically expand the bottom of the screen and compress the top.	 To vertically compress the bottom of the screen and expand the top.
(26) CENTER-PCC (Center Pincushion or Bow Amplitude) 	 To narrow the center of the image horizontally .	 To expand the center of the image horizontally .
(27) TOP-PCC (Top of corner Pincushion or Bow Amplitude) 	 To expand the width of the screen image near the corners of top.	 To narrow the width of the screen image near the corners of top.

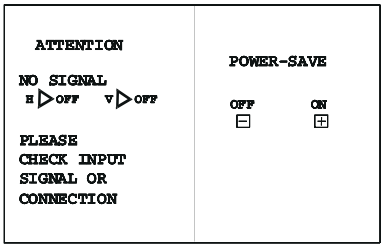
FUNCTION AND OSD	Press the Minus Adjust Button: 	Press the Plus Adjust Button: 
(28) BOTTOM-PCC (Bottom of Corner Pincushion or Bow Amplitude) 	 To expand the width of the screen image near the corners of bottom.	 To narrow the width of the screen image near the corners of bottom.
(29) CENTER-BALANCE (Center Pincushion or Bow balance) 	 To move the center of the screen image to the left.	 To move the center of the screen image to the right.
(30) TOP-BAL (Top of Corner Pincushion or Bow Balance) 	 To move the top corners of the screen image to the left.	 To move the top corners of the screen image to the right.
(31) BOTTOM-BAL (Bottom of Corner Pincushion or Bow Balance) 	 To move the bottom corners of the screen image to the left.	 To move the bottom corners of the screen image to the right.

FUNCTION AND OSD	Press the Minus Adjust Button: 	Press the Plus Adjust Button: 
(32) CLAMP PULSE POSITION 	To clamp the video signal at the front of the H-Sync pulse.	To clamp the video signal at the back of the H-Sync pulse.
(33) PURITY 	Input Full White signal to monitor. Press the plus and minus adjust button to get pure white at the corner of picture. Press plus and minus buttons at once, restore to factory preset level.	
(34) VIDEO LEVEL 	To select 1.0V of video input.	To select 0.7V of video input.

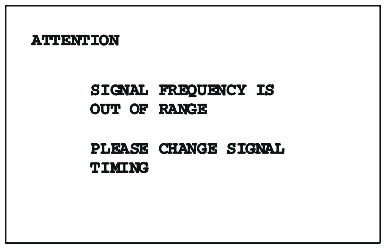
NOTE: If the monitor does not receive any synchronization signal or when it is not connected correctly and the signal frequency is not within range, the warning message shown below is displayed. Check the input signal, the connection of the signals cable and signal frequency.

POWER SAVE IS OFF

(1) When POWER SAVE is OFF and no sync signal, this picture comes.

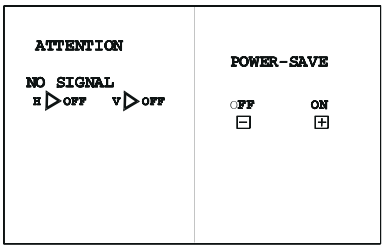


(2) When signal frequency is out of range, this picture comes.

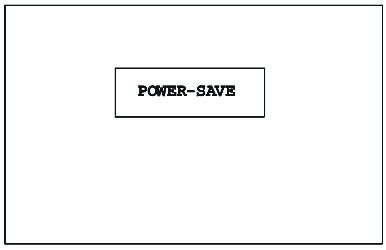


POWER SAVE IS ON

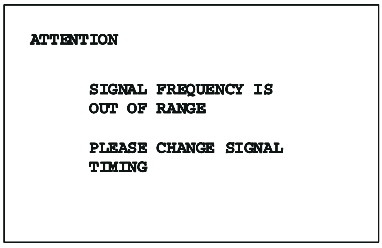
(1) When you push any button after POWER SAVE function work, this picture comes.



(2) Before 2 seconds POWER SAVE function work, this picture comes.



(3) When signal frequency is out of range, this picture comes.



TROUBLESHOOTING

PROBLEM		**WHAT TO CHECK**	**LOCATION OF CONTROLS**
No image	LED on	- Adjust brightness and contrast	- Front panel (adjust the brightness or press the Reset button)
	LED off	- Power switch - Unplugged power cord	- Front panel - Rear of the monitor
	Flashing LED	- Unplugged signals cable - BNC cable attached incorrectly or GREEN signal detached - Computer switch - Active power management	- Rear of the monitor - Check the video board and the BNC cable - Computer - See Power Save
Distorted or blurry image	Unstable image	- BNC cable attached incorrectly - Incompatible input video signal scan frequency - The CGA, EGA, MGA modes are not supported by the monitor	- Rear of the monitor - Check the monitor's video board
	No green displayed with the BNC cable	- BNC cable attached incorrectly (the green and synchronisms have inverted connections)	- BNC jacks on the rear of the monitor
	No image, image off-centered, image too small or too big	- Press the reset button for the standard signals - Adjust H-SIZE, V-SIZE, H-POSITION and V-POSITION with the non-standard video signals - Wait for a few seconds after having adjusted the image before changing or removing the signal or before powering off the monitor	- Front panel - On screen display
	Unstable monitor	- Unplugged BNC cable	- Rear of the monitor
	image too light or too dark	- The level of the input video signal is not the same as the one selected by the monitor (0.7 or 1 V)	- Front panel - On screen display

■