IBM

Personal Computer Hardware Reference Library

IBM Enhanced Color Display

Contents

Description

The IBM Enhanced Color Display is an advanced color display capable of operating in two separate modes. Mode 1 is a 16 color 640 by 200 overscan mode with a horizontal scan frequency of 15.75 kHz. Mode 2 is a 64 color 640 by 350 mode with a horizontal scan frequency of 21.8 kHz. Both modes are non-interlaced. The monitor determines which mode to operate in by decoding the vertical sync polarity.

The IBM Enhanced Color Display attaches to the system unit by a signal cable that is approximately 3.5 feet (1.07 meters) in length. This signal cable provides a direct-drive interface from the IBM Personal Computer.

A second cable provides ac power to the display from a standard wall outlet. The display has its own power control and indicator. Three models are provided. Model 001 is for northern hemisphere operation and operates on 120 volts 50/60 Hz. Model 002 is for northern hemisphere operation and operates on 220/240 volts 50/60 Hz. Model 003 is for southern hemisphere operation and operates on 220/240 volts 50/60 Hz.

The display has a 13-inch, high-contrast CRT. The CRT and analog circuits are packaged in an enclosure so the display may sit either on top of the system unit or on a nearby tabletop or desk. Front panel controls and indicators include: Power-On control, Power-On indicator, Brightness and Contrast controls. Additional controls on the rear of the display are: Vertical Size 1 and Vertical Size 2. There are two service controls on the rear of the unit, black level adjustment and contrast default value adjustment.

Operating Characteristics

Screen

- Etched anti-glare screen

- 0.31mm dot mask

- Displays 16 or 64 colors depending on the mode selected

User Controls

- Brightness control affects the contribution of all input bits by controlling the gain of the video stages. The display contains a protection circuit which may overide this control.

- Contrast control affects the contribution of the least significant bits only. When pushed in, the contrast control is rendered inoperative and contrast is determined by the setting of the contrast default value adjustment on the rear of the display. Pulling the contrast control knob out engages the front contrast control.

- V. Size 1 control controls the vertical size of the screen in mode 1.

- V. Size 2 control controls the vertical size of the screen in mode 2.

Service Controls

- Black level adjust control is adjusted to make the raster lines just disappear when black input signal is supplied.

- Contrast default value control is used to set the contrast value when the front contrast control is pushed in. Normally adjust for best brown color.

Vertical Sync

*   Uses polarity of Vertical Sync signal to automatically select Mode 1 or Mode 2 operation. Mode 1 is selected by a normally low positive going TTL pulse. Mode 2 is selected by a normally high negative going TTL pulse.

*   Screen may be refreshed from 50 to 60 Hz. At 60 Hz there are either 200 or 350 vertical lines of resolution depending on the mode selected.

*   700 μsec retrace time

Horizontal Sync

*   Normally low, positive going TTL pulse

*   In Mode 1, 15.75 kHz.

*   In Mode 2, 21.8 kHz.

*   6 μsec retrace time

When operating in Mode 1, the display maps the 4 input bits into 16 of the possible 64 colors as shown in the following chart.

I	R	G	B	Color	R r	G g	B b
0	0	0	0	Black	0 0	0 0	0 0
0	0	0	1	Blue	0 0	0 0	1 0
0	0	1	0	Green	0 0	1 0	0 0
0	0	1	1	Cyan	0 0	1 0	1 0
0	1	0	0	Red	1 0	0 0	0 0
0	1	0	1	Magenta	1 0	0 0	1 0
0	1	1	0	Brown	1 0	0 1	0 0
0	1	1	1	Gray 1	1 0	1 0	1 0
1	0	0	0	Gray 2	0 1	0 1	0 1
1	0	0	1	Light Blue	0 1	0 1	1 1
1	0	1	0	Light Green	0 1	1 1	0 1
1	0	1	1	Light Cyan	0 1	1 1	1 1
1	1	0	0	Light Red	1 1	0 1	0 1
1	1	0	1	Light Magenta	1 1	0 1	1 1
1	1	1	0	Light Yellow	1 1	1 1	0 1
1	1	1	1	White	1 1	1 1	1 1

Note: The R G and B are the most significant bits. The r g and b are the least significant bits.

Specifications

Size:

Length - 15.4 in (392 mm)

Depth - 15.6 in (407 mm)

Height - 11.7 in (297 mm)

Weight:

32 lbs

Heat Output:

300 BTU/hr

Power Cable:

Length - 6 ft (1.83 m)

Size - 18 AWG

Signal Cable:

Length - 3.5 ft (1.07 m)

Connector Information

The signals that are on the pins vary with the driver card being used and the mode in which it is operating. All signals are expected to be TTL levels supplied by totem pole drivers.

Pin	Mode 1 (16 Color)	Mode 2 (64 Color)
1	Shield Gnd	Ground
2	Signal Gnd	r
3	Red	R
4	Green	G
5	Blue	B
6	Intensity	g
7	Unused	b
8	Horiz Sync	Horiz Sync
9	Vert Sync	Vert Sync

Note: The R G and B are the most significant bits. The r g and b are the least significant bits.