



# **M-Series Industrial Flat Panel Monitor User's Guide**

## Revision List

Revision Number	Description of Change	Release Date
A	Initial Release	9-2006
B	Added Windows Vista driver to list of supported drivers, Added notes to driver list, Changed Logo, Corrected H X W Reversals on page 5	4-2007
C	Added DVI functionality, UL Hazardous Locations Notes and Warnings	6-2008
D	Replaced "Power" with "Display Power" on button description, added IEC 60950-1& RoHS to Agency Approvals, Added Input Source Select instructions, Changed input power to 25 Watts and updated display specifications.	8-2008
E	Revision for Field Wiring Requirements	5-2010
F	Combined all monitors into one, Added –EN options and M1200	9-2010

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## WARRANTY

Nematron warrants to Customer that the Products will be free from defects in material and workmanship under normal use and service for a period of two years from date of invoice. Customer's exclusive remedy for breach of this warranty is that Nematron will either (i) repair or replace, at its option, any Product which fails during the warranty period because of such defect (if Customer promptly reported the failure to Nematron in writing) or, (ii) if Nematron is unable to repair or replace, Nematron will refund the purchase price of the Product upon its return to Nematron. This warranty does not apply to any Product which has been subjected to misuse, abnormal service or handling, or which has been altered or modified in design or construction, or which has been serviced by anyone other than Nematron. The warranty set forth herein is in lieu of, and exclusive of, all other warranties, express or implied.

## Chapter 1 - Introduction

The M-Series are high performance TFT flat panel monitors specifically designed for harsh industrial environments including Class I & II, Division 2 Hazardous Locations. The monitors accept standard analog VGA or Digital DVI inputs. They can display VESA video modes up to 1280 x 1024 at 75Hz with 16 million colors. An optional 5-wire analog touch screen is available that offers both RS-232 and USB interface capability. The monitor is housed in a heavy duty steel chassis with a powder coated machined aluminum bezel. The monitor is certified to NEMA 4/4X/12 standards, is UL/CUL listed, meets CE requirements and is RoHS compliant. Panel mounting is simplified using convenient mounting clips instead of conventional studs. Options include: a 5-wire analog resistive touch screen or clear Lexan window, a 304 stainless steel bezel, rack mount bezel (M1900 only), enclosed versions (M1500 and M1900 only), and 24 volt DC input power supply (not available on the enclosed optio). All monitors are shipped with a power input wiring receptacle, VGA cable, touch screen cable (if equipped), mounting hardware, manual and driver software.

### Features

- UL 508 and UL 1604 listed for Hazardous Locations: Class I, Division 2, Groups A, B, C, D and Class II, Division 2, Groups F and G, Class III hazardous locations when mounted in a NEMA Type 1, 4, 4x, or 12 enclosure (does not include –EN options, -EN units only have UL 508 approvals)
- NEMA 4/4X/12 front bezel (does not include –EN or –RM options)
- 2-Year warranty
- RoHS Compliant
- Integral 100 -240 VAC power supply
- Simplified installation with no studs
- Thin design – Only 2.7” behind bezel
- Accepts Analog Video or Digital Video (DVI) inputs
- VESA compliant – all modes up to SXGA, 75Hz
- Optional 5-wire resistive touch screen with both RS-232 and USB interface
- Optional 304 stainless steel front bezel
- Optional 24 VDC input power
- Optional Rack Mount front bezel on the M1900 (19”)
- Optional Rear NEMA 1 Enclosure (-EN)

## Supported PC Video Modes

The M-Series monitors support the following video modes:

**Note:** The highlighted PC display modes produce the best image quality on the size monitors as follows:

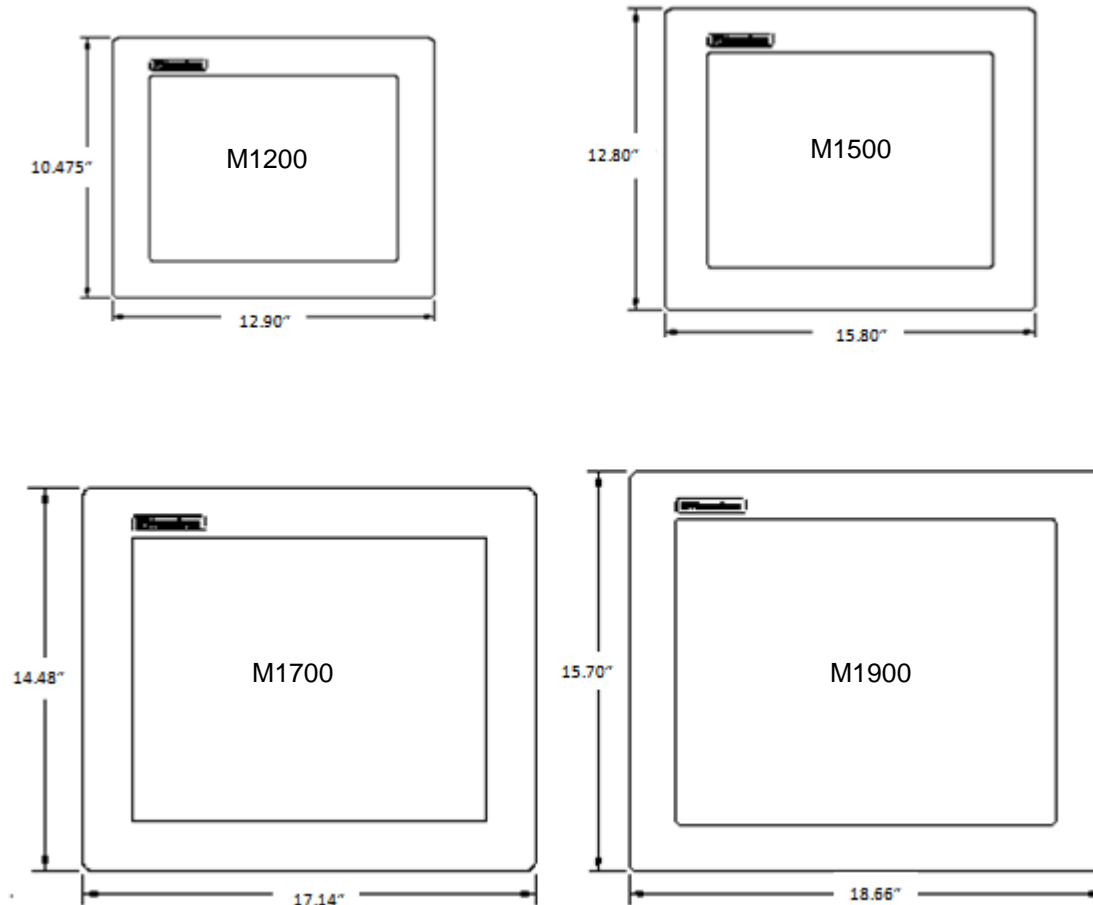
- M1200
- M1500
- M1700 & M1900

Mode	Dot Clock (MHz)	Horizontal Freq (KHZ)	Vertical Freq (Hz)	H Sync Polarity	V Sync Polarity
640 x 350 @ 70Hz	25.144	31.430	70.000	P	N
640 x 400 @ 70Hz	28.287	31.430	70.000	N	P
720 x 400 @ 70Hz	28.287	31.430	70.000	N	P
640 x 480 @ 60Hz	25.175	31.469	59.940	N	N
640 x 480 @ 72Hz	31.500	37.861	72.809	N	N
640 x 480 @ 75Hz	31.500	37.500	75.000	N	N
800 x 600 @ 56Hz	36.000	35.156	56.250	P	P
800 x 600 @ 60Hz	40.000	37.879	60.317	P	P
800 x 600 @ 72Hz	50.000	48.077	72.188	P	P
800 x 600 @ 75Hz	49.500	46.875	75.000	P	P
1024 x 768 @ 60Hz	65.000	48.363	60.005	N	N
1024 x 768 @ 70Hz	75.000	56.476	70.070	N	P
1024 x 768 @ 75Hz	78.750	60.023	75.030	P	P
1280 x 1024 @ 60Hz	108.000	63.981	60.020	P	P
1280 x 1024 @ 75Hz	135.000	79.976	75.035	P	P

## Specifications

### Front Panels

The M-Series monitors have NEMA 4/4X/12 sealed front panels when mounted in an appropriate NEMA rated enclosure. See Chapter 2 for more details on installation and selection of an appropriate enclosure. All four sizes have very similar front panels with different dimensions.



**Figure 1.0: M-Series Front Panel Comparison**

The standard front panels are powder coated aluminum. The optional Stainless Steel front panel is type 304 and will not contain a logo pocket or logo on the front. The window area is clear polycarbonate when ordered without a touchscreen. The touchscreen option is chemically strengthened glass covered by a polyester overlay. The polyester overlay has better resistance to chemicals than the polycarbonate window. Depending on the chemicals involved in your application consideration should be given to choosing the proper window material. In addition there is a Rack Mount front panel option for the M1900 (19" unit) only. This front panel is powder coated aluminum and is 9U high with four rack mount spaced counter-bored mounting holes on each side of the panel. This panel is not NEMA sealed when installed.

## DISPLAY

	M1200	M1500	M1700	M1900
Display Diagonal	12.1" (307.34mm)	15.0" (381.0mm)	17.0" (431.8mm)	19.0" (482.6mm)
Display Size (Active Area HxV)	9.69" x 7.26" (246.0mm x 184.5mm)	11.97" x 8.98" (304.0mm x 228.1mm)	13.30" x 10.64" (337.8mm x 270.3mm)	14.82" x 11.85" (376.4mm x 301.0mm)
Native Resolution	SVGA, 800 x 600	XGA, 1024 x 768	SXGA, 1280 x 1024	SXGA, 1280 x 1024
Displayable Colors	262K	16M	16M	16M
Brightness, Typical	400 Nit	250 Nit	300 Nit	300 Nit
Contrast Ratio, Typical	500:1	800:1	800:1	1300:1
Horizon/Vertical View Angle, CR>5, Typical	130°/110°	150°/145°	176°/170°	178°/178°
Backlight Life, Typical	50,000 hrs	50,000 hrs	50,000 hrs	50,000 hrs

## TOUCH SCREEN (Optional)

Touch Screen Technology	5- Wire Analog Resistive
Interface	RS-232 or USB
Resolution	4096 x 4096
Positional Accuracy (Maximum Error)	0.18" (0.19" ePC1900) 4.57mm (4.83mm ePC1900)
Positional Accuracy (Standard Deviation of Error)	< 0.08" (< 2.0 mm)
Expected Life	>35,000,000 Activations

## PHYSICAL

	M1200	M1500	M1700	M1900
Over All Dimensions (H x W x D)	10.475" x 12.9" x 2.6" (266.1mm x 327.2mm x 66.0mm)	12.80" x 15.80" x 2.65" (325.1mm x 401.3mm x 67.3mm)	14.48" x 17.14" x 32.85" (367.8mm x 442.0mm x 72.4mm)	15.70" x 18.66" x 2.95" (398.8mm x 474.0mm x 75.0mm)
Panel Mounting Depth	2.35" (59.7mm)	2.4" (61.0mm)	2.6" (66.0mm)	2.7" (68.6mm)
Cutout Dimensions (H x W)	9.68" x 12.10" (245.9mm x 307.3mm)	12.00" x 15.00" (305mm x 381mm)	13.70" x 16.35" (348mm x 415.3mm)	14.90" x 17.75" (378.5mm x 450.9mm)
Weight	9.45 lbs (4.31kg)	14.0 lbs (6.35kg)	18.5 lbs (8.39kg)	22.5 lbs (10.21kg)
Shipping Weight	14.0 lbs (5.89kg)	19.0 lbs (8.62kg)	23.5 lbs (10.66kg)	27.5 lbs (12.47kg)
Option Weight (-SS)	+2.5 lbs (1.13kg)	+3.5 lbs (1.58kg)	+3.75 lbs (1.70kg)	+4.0 lbs (1.81kg)

## ELECTRICAL

AC Input Voltage	100 – 240 VAC, 50/60 Hz
AC Input Current	M1200 & M1500 – 0.5 A Maximum M1700 & M1900 - 1.0 A Maximum
DC Input Voltage (Optional)	18 – 36 VDC
DC Input Current (Optional)	2.0 A Max
Input Power	M1200/M1500 - 25 W Typical* M1700 – 30 W Typical* M1900 – 35 W Typical*

\* Typical Power is measured without any additional I/O or expansion options. Any additional I/O installed during application can increase this value.

## ENVIROMENTAL

Operating Temperature	0°C to 50°C
Non-Operating Temperature	-20°C to 60°C
Operating & Non-Operating Humidity	20% to 80% RH, non-condensing
Operating Shock*	15g peak acceleration, 11msec
Non-Operating Shock	30g peak acceleration 11msec
Operating Vibration (5-2000 Hz) <sup>1</sup>	0.006" peak to peak displacement, 1g maximum acceleration
Non-Operating Vibration (5-2000 Hz) <sup>1</sup>	
Operating Altitude <sup>2</sup>	Sea level – 10,000 feet
Non-Operating Altitude <sup>2</sup>	Sea level – 40,000 feet

1 Shock and Vibration specifications are established using Solid State drives and non-rotating media.

2 Altitude Specification is established by using all internal component specifications.

## AGENCY

Front Panel NEMA Rating	NEMA 4/4X/12, IP65
FCC	47 CFR, Part 15, Class A
EU CE Marking Compliance	CE, EN 55022: Class A, EN 61000-3-2: Class A, EN 61000-3-3, EN 61000-6-2,
Safety Agency Approvals (panel mount versions only)	UL 508 Listed, UL 1604 Listed*, cUL Listed CSA C22.2, #142, CSA C22.2, #143*
Safety Agency Approvals (enclosed versions only)	UL 508 Listed, cUL Listed CSA C22.2

\* See appropriate note below for the applicable unit or option being utilized.

### **NOTE (PANEL MOUNT VERSIONS):**

SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C AND D, CLASS II DIVISION 2, GROUPS F AND G, CLASS III HAZARDOUS LOCATIONS, OR NONHAZARDOUS LOCATIONS ONLY

FOR USE ON A FLAT SURFACE OF A TYPE 1, 4, 4X, OR 12 ENCLOSURE WITH PROVISIONS FOR CLASS I DIVISION 2 WIRING METHODS

TEMPERATURE CODE: T5

**NOTE (RACK MOUNT VERSIONS):**

SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C AND D, CLASS II DIVISION 2, GROUPS F AND G, CLASS III HAZARDOUS LOCATIONS, OR NONHAZARDOUS LOCATIONS ONLY

FOR RACK MOUNT INSTALLATION ON A TYPE 1 ENCLOSURE WITH PROVISIONS FOR CLASS I DIVISION 2 WIRING METHODS

TEMPERATURE CODE: T5

**NOTE: (ENCLOSED M-SERIES VERSIONS):**

A LISTED VESA STYLE MOUNT SUITABLE WITH A MINIMUM LOAD RATING OF 35 POUNDS SHALL BE USED IN THE END INSTALLATION

FOR USE IN NONHAZARDOUS LOCATIONS ONLY

TYPE 1 ENCLOSURE

**WARNING – EXPLOSION HAZARD –** SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2

**WARNING – EXPLOSION HAZARD –** DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATIONS.

**WARNING – EXPLOSION HAZARD –** DO NOT DISCONNECT THE USB PORTS UNLESS THE POWER HAS BEEN SWITCHED OFF AND THE AREA IS KNOWN TO BE NON-HAZARDOUS

## Chapter 2 - Installation of Computer

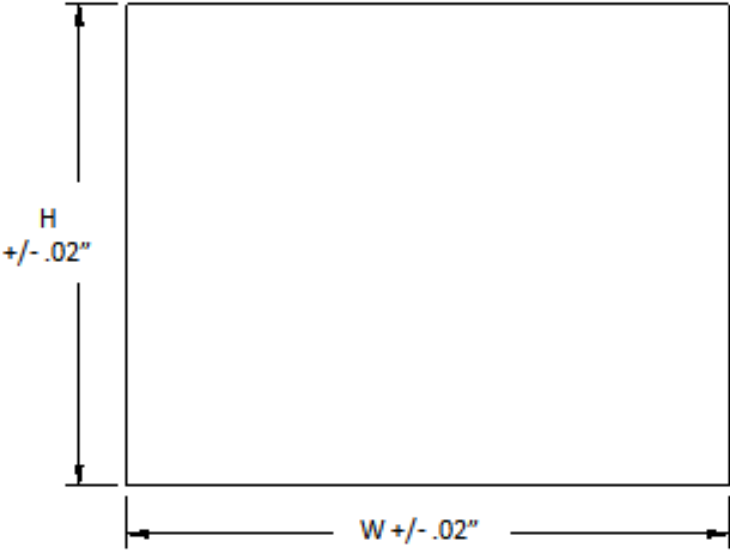
### Panel Mount M-Series Unit installation

The panel mount versions of the M-Series are intended to be mounted in and used where NEMA 1, NEMA 4/4x and NEMA 12 type enclosures are employed. Enclosures made of heavier gauge metal work better because they won't deform or bend as easily when the monitor's sealing gasket is compressed. The monitor meets NEMA 4/12 sealing specifications when properly installed in an approved NEMA enclosure constructed from 14-gauge or heavier steel. The computer uses "U"-shaped clips and a special gasket to achieve the proper seal.

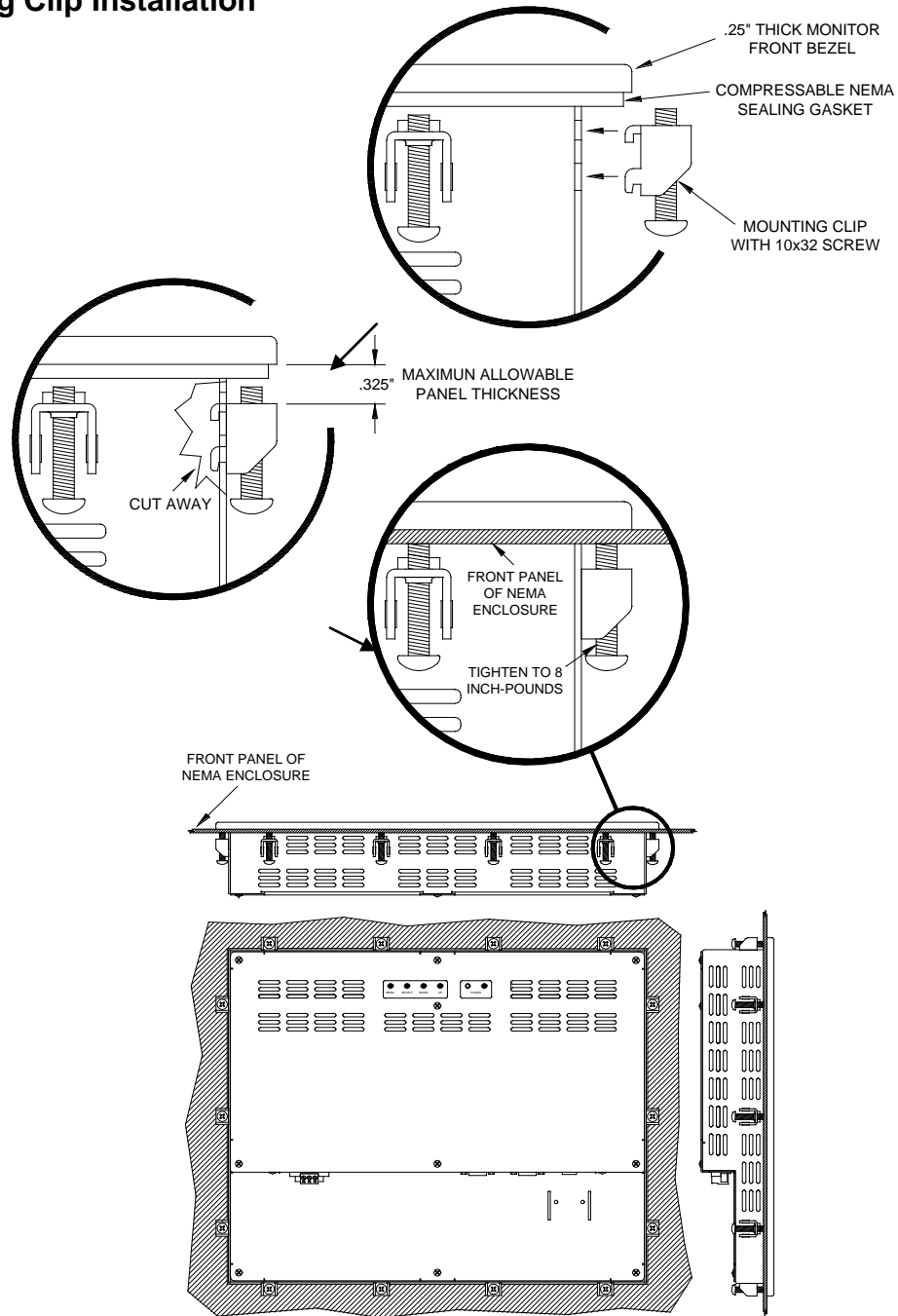
When selecting an enclosure remember to allow adequate space around the rear of the computer for good air flow. Do not block air flow from below or above the monitor. If possible mount the computer in a vertical orientation. The unit is designed to work in environments up to 50 degrees Centigrade ambient temperature inside the enclosure. Remember to account for heat dissipated from other equipment that may be installed inside the same enclosure.

To install the computer, make a cutout according to the diagrams below in one of the walls of your NEMA enclosure. Next hold the unit in place while you install the mounting clips. Tighten the clips to the point where the back of the unit's front bezel just begins to contact the front of the NEMA enclosure. The use of an adjustable torque driver is recommended. The screws should be tightened to 8 inch-pounds. Tighten the clips in a cross pattern. This will help to develop an even pressure on the sealing gasket. **DO NOT OVER TIGHTEN AS DAMAGE CAN RESULT IN THE COMPUTER CAUSING LOSS OF SEALING INTEGRITY.**

	M1200	M1500	M1700	M1900
Cutout Dimensions (H x W)	9.68" x 12.10" (245.9mm x 307.3mm)	12.00" x 15.00" (305mm x 381mm)	13.70" x 16.35" (348mm x 415.3mm)	14.90" x 17.75" (378.5mm x 450.9mm)



## Mounting Clip Installation



**REAR VIEW OF PANEL  
MOUNTED M-SERIES MONITOR**

**NOTE:** WHEN INSTALLING THE MOUNTING CLIPS TIGHTEN THE SCREWS TO **8-10 INCH-POUNDS MAXIMUM**. OVERTIGHTENING THE SCREWS WILL RESULT IN A COMPROMISED NEMA SEAL AND MAY CAUSE TOUCH SCREEN BREAKAGE.

## Rack Mount Unit Installation

The M1900 with a rack mount front panel is intended to be mounted to a 19.0" wide rack in a NEMA Type 1 or better enclosure. The unit can be mounted using standard rack mount hardware (not supplied) via the eight (4 each side) counter-bored holes in the front of the panel. The front panel is intended to be mounted in a vertical height of 9 U (16.0") on the rack. This unit is not NEMA sealed when mounted like the panel mount versions.

When selecting an enclosure remember to allow adequate space around the rear side of the computer for good air flow. The unit is designed to work in environments up to 50 degrees Centigrade ambient temperature inside the enclosure. Remember to account for heat dissipated from other equipment that may be installed inside the same enclosure.

## Enclosed Unit Installation

The enclosed M-Series products are intended to be stand-alone NEMA Type 1 units. These are required to be mounted to a VESA style mount with a minimum load rating of 35 pounds. A desktop stand, wall mount, or articulating arms are examples of VESA style mounts that can be utilized. These units are vented for air flow and are not dust or water proof. Care should be taken to not utilize these units in areas where high concentration of particulate matter or moisture are present. If these conditions do exist then the use of the panel mount versions in an appropriate NEMA 4, 4x, or 12 enclosure should be considered. The warranty may be voided if high levels of moisture or particulate matter are determined to be the cause of a failure.

These units are designed to work in environments up to 50 degrees Centigrade ambient temperature around the enclosure. Impeding the airflow around this unit or clogged filters will severely affect the reliability of the unit by raising the internal temperature. Assure that there is adequate airflow around the unit.

NEMA Type 1 is not sealed against water and/or dust; it is simply provides protection from operators shocking themselves. It also offers a certain amount of fire containment it the event of a catastrophic failure inside the unit. As stated previously NEMA 1 is not waterproof or dust proof and is not intended to be utilized in environments exhibiting high levels of these conditions.

Example of an Enclosed Unit Mounted To an Articulating Arm



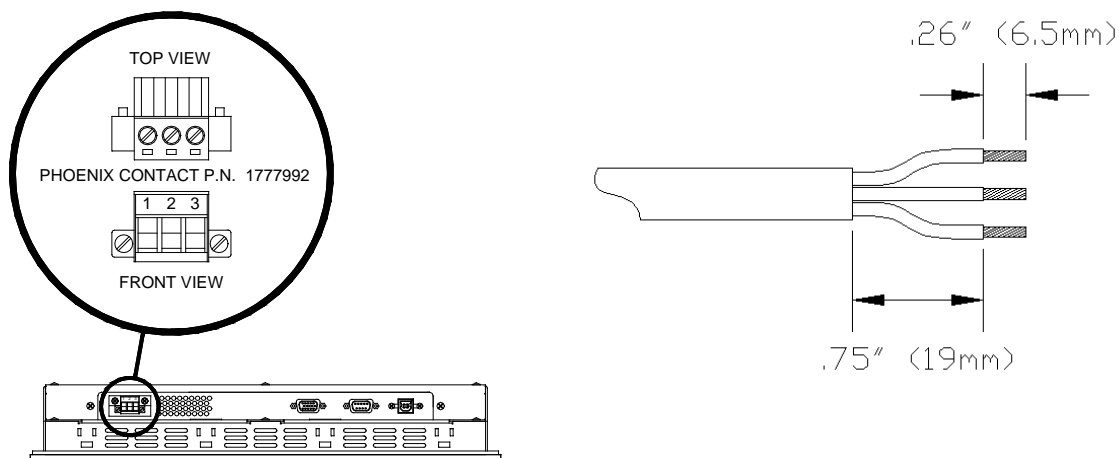
## Connecting Power to the M-Series

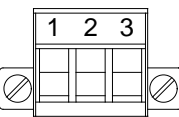
### Connecting power to the Panel Mount and Rack Mount M-Series units:

The M-Series units are powered from 100-240 VAC, 50/60 Hz or optionally from 24 VDC. **Damage will occur if 100-240 VAC power is connected to an M-Series unit equipped with the 24 VDC input power option.** ePC-Series equipped units with the 24 VDC option will have a “-24” suffix in their model number such as M1500-24 or M1900T-24.

Because the M-Series units (not –EN option) are UL 1604 listed for Hazardous Location use, (Class I Division2, Groups A, B, C, D; Class II Division 2 Groups F and G: Temperature Code T5), the units do not have a power switch for switching off supplied power. Consideration should be give to the installation of an appropriately rated external power switch if the application requires powering off the M-Series unit.

Power is connected to the units through a removable Phoenix Contact plug (Phoenix Contact P.N. 1777992) that allows for screw termination of field wiring. This plug is included with each unit and is keyed to prevent installation in a unit with the wrong input voltage rating. **When Field Wiring to these terminals the use of 18 AWG or greater (12 AWG maximum) copper wire with 60°C or 60/75°C wire insulation and the terminal tightening torque of 7.0 lb/in. (0.79 Nm) is required.** The terminal screws are shown in “Top View” below. Connect the field wiring according to the appropriate voltage in the table below. Strip the wire insulation back on each conductor **6.5 mm (0.26 in)** and assure that the remaining wire is twisted together, not frayed, and clean. If an outer jacket over each conductor is utilized then strip the outer jacket back an additional **19.0 mm (0.75 in)** as shown in figure below. When installing the conductors take care that there are not any stray strands of wire that can contact an adjoining connection. Tinning of each lead can be utilized to prevent frays if desired. Optionally the included protective cover can be utilized to prevent electrical shocks when handling the power connector and provide strain relief for each conductor connection (see the following section for installation instructions). After the connections are made, make sure the plug retention screws (the two screws shown in the “Front View” below) are securely tightened. This will prevent the plug from pulling out. The use of these screws is mandatory when the unit is utilized in applications requiring hazardous locations approvals.



 FRONT VIEW	PIN NUMBER	100 VAC – 240 VAC INPUT	18 VDC – 36 VDC INPUT
	1	AC Line Input	+ DC Input
	2	AC Neutral Return	- DC Return
	3	Protective Earth Ground	Protective Earth Ground

**NOTE:** WHEN USING USB CONNECTION FOR THE TOUCHSCREEN THE USE OF THE USB RETENTION BRACKET IS REQUIRED FOR HAZARDOUS LOCATIONS AND HIGHLY RECOMMENDED FOR NONHAZARDOUS

**NOTE:** TO PREVENT INADVERTENT DISCONNECTION OF VIDEO AND/OR SERIAL TOUCHSCREEN CABLES ASSURE THAT THE THUBSCREWS ARE SUFFICIENTLY TIGHTENED.

**WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATIONS.**

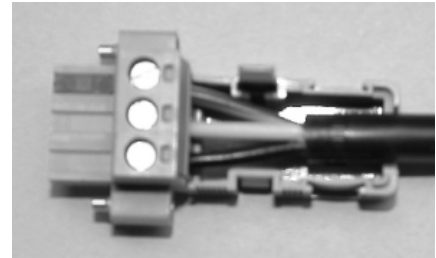
**WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT UNLESS THE POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS. USB CONNECTIONS MUST BE SECURED WITH INCLUDED RETENTION BRACKET – SEE INSTALLATION INSTRUCTIONS**

## Protective Cover Installation (Optional if desired)

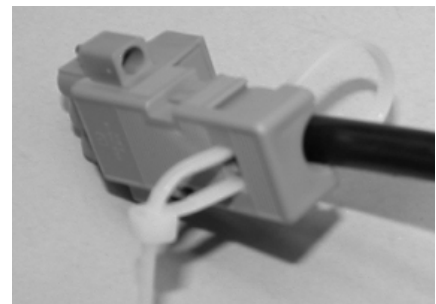
**Step 1:** Gather the parts of the protective cover; top shell, bottom shell, label insert, and wire tie. The picture shows wire tie (top), label insert (right), bottom shell (left), and top shell (lower right).



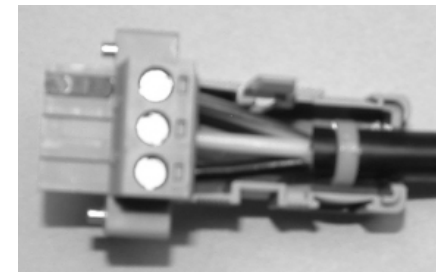
**Step 2:** Insert your pre-wired connector (with the screws facing up) into the bottom shell. (See manual for cable wiring instructions).



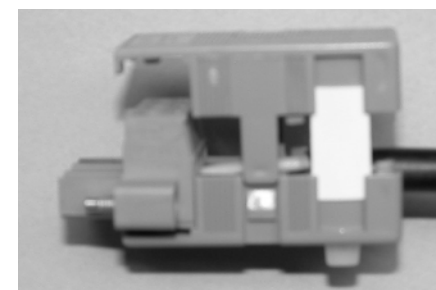
**Step 3:** Insert the wire tie from the bottom shell, loop around the cable and come back out of the opposite hole in the bottom shell.



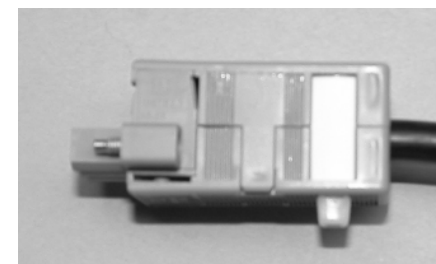
**Step 4:** Tighten the wire tie around the cable and the bottom shell.



**Step 5:** Seat the top shell onto the bottom as shown. Insert label strip (if desired) in slot on top shell and bottom shell.



**Step 6:** Snap the top and bottom shells together.



## Connecting Power to Enclosed (-EN) units:

The enclosed M-Series units are powered from 100-240 VAC, 50/60 Hz only. Because these are stand alone Type 1 devices and do not require an additional NEMA type enclosure, a different type power connection is required. These units use a more standard IEC type power cord like found on most computers. There is a retention clip that can be utilized to help retain the cord from falling out. A US three prong cord is supplied. If another country connection method is required then an appropriate UL recognized power cord can be chosen locally (not supplied by Nematron). Optionally available is an IEC type connector that can be directly wired to for field wiring. This can be ordered separately from Nematron and is part number PWR-AC-EN



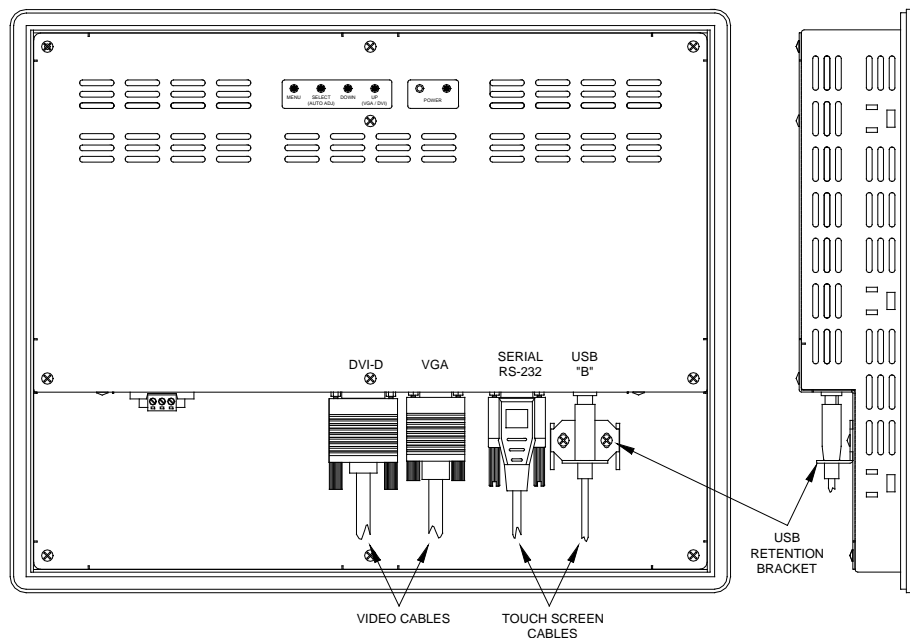
Enclosed M-Series IEC Power Cable



Power Cable Retention Clip Installed

## Connection of VGA and Touch Screen Cables

Connect either a 15-pin VGA or DVI-D cable and either an RS-232 or USB cable if the monitor is equipped with a touch screen. All communication cables should include a chassis ground shield. Hazardous location, Division 2, requires that all cables have adequate strain relief. For this reason, tighten all connector thumb screws securely. If a USB cable is being used, install the provided USB retention bracket. Insert the USB connector through the square cutout in the base of the bracket and pull the cable and body of the connector back through the round hole in the bracket flange. Now insert the bracket into the two slots on the rear of the monitor and slide it forward so the connector is fully inserted in the mating bulkhead connector. Install and tighten two 4-40 x .25" Philips screws.



**NOTE:** WHEN USING USB TOUCHSCREEN CONNECTION THE USE OF THE USB RETENTION BRACKET IS REQUIRED FOR HAZARDOUS LOCATIONS AND HIGHLY RECOMMENDED FOR NONHAZARDOUS LOCATIONS.

**NOTE:** TO PREVENT INADVERTENT DISCONNECTION OF VIDEO AND/OR SERIAL TOUCHSCREEN CABLES ASSURE THAT THE THUBSCREWS ARE SUFFICIENTLY TIGHTENED.

**WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATIONS.**

**WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT UNLESS THE POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS. USB CONNECTIONS MUST BE SECURED WITH INCLUDED RETENTION BRACKET – SEE INSTALLATION INSTRUCTIONS**

## Turning on the Computer and Monitor

With power applied to the monitor and all cables connected you may power up the computer and press the POWER button on the rear of the monitor. The POWER LED will switch from off to green. The monitor will perform an automatic self configuration and begin displaying an image. If no image appears, it may be because the monitor has the wrong video input selected. Press the UP button on the rear of the monitor to change between VGA and DVI-D inputs. If the computer is subsequently powered off, the monitor will remain on and display the NO SIGNAL error message indefinitely. The POWER LED remains green. The touch screen remains active during this time. When the computer is powered on again, the NO SIGNAL message disappears and normal image display resumes.

## Selection of PC Video Settings

Although the M-Series monitors can display several different video modes, the optimum display image performance occurs when the PC's video settings match the native resolution of monitor's LCD. For this reason it is recommended that you set the video mode optimal for the size M-Series unit that you have. Refer to the table on Page 5 to determine the optimal resolution for your monitor.

This can be done using Window's control panel or by right clicking on the desktop and choosing "Properties". This will bring up the "Display Properties" menu. From this menu, select the "Setting" tab and choose the optimal Screen resolution. From the Settings menu, choose "Advanced" and then click on the "Monitor" tab to set the Screen refresh rate.

## Installing the Touch Screen Driver Software

Drivers for the following operating systems are located on the enclosed CD:

Windows Vista\*

Windows XP

Windows 2000\*\*

Windows Me

Windows 98

Windows 95

Windows NT 4.0\*\*

DOS and Windows 3.x\*\*\*

**Notes:** \* The driver for Windows Vista only supports USB touchscreen connections. RS-232 Serial touchscreen and multiple monitor connections are not supported.

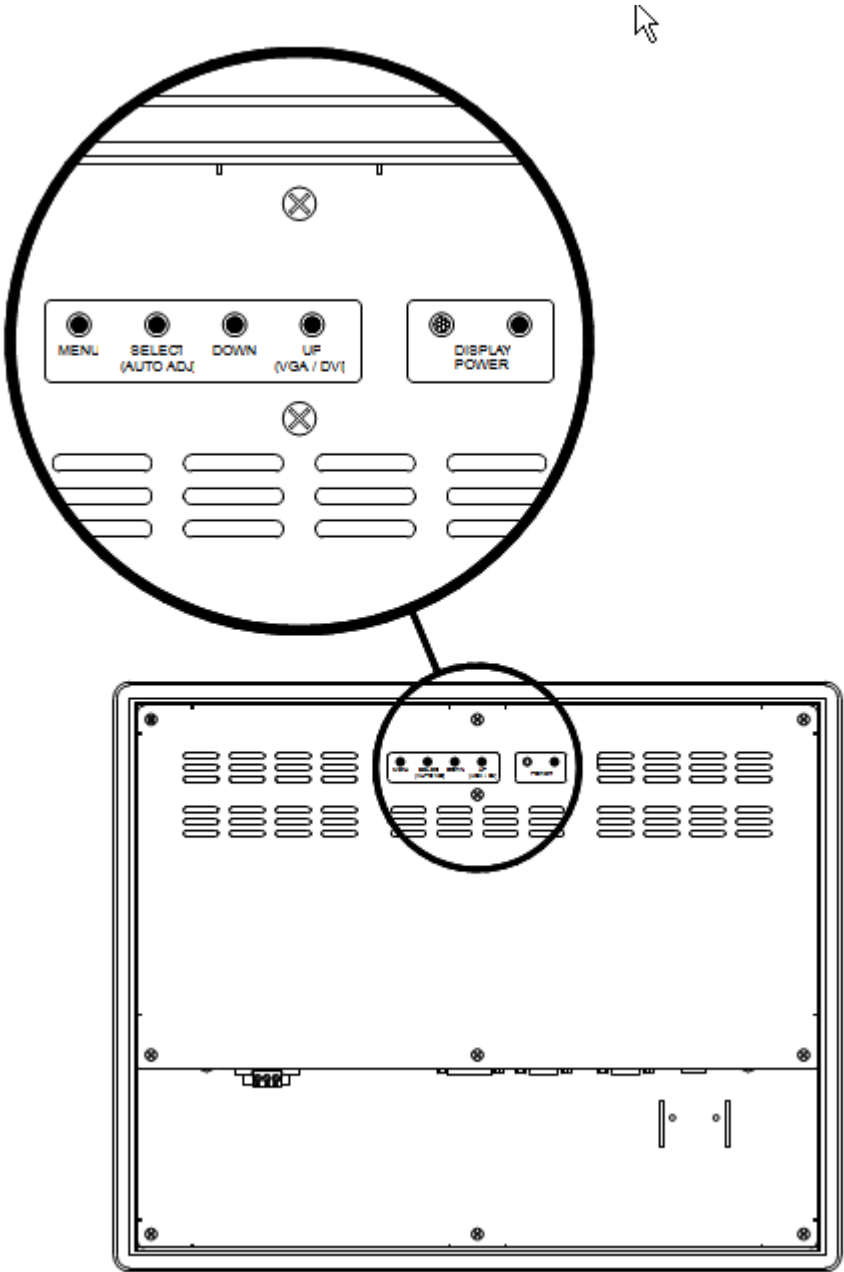
\*\* For Windows 2000 and NT 4.0 you must have administrator access rights to install the driver.

\*\*\* All of the drivers are self extracting and executing except for the DOS and Windows 3.x driver. This has an install.exe file that will need to be run.

# Chapter 3 - Monitor OSD and Settings

## On Screen Display (OSD) Controls

The OSD controls are used for making adjustments to the monitor's settings and are located on the back of the monitor. They consist of a single LED and five push buttons whose functions are described in the tables below.



## Button and LED Functions

BUTTON	FUNCTION
DISPLAY POWER	Pressing this button once wakes the monitor up. Pressing the POWER button again turns off the back light inverter and puts the monitor in a reduced power state but the touch screen remains active. It is important to note that this switch does not disconnect power from the monitor. Power is always supplied to the internal AC/DC power supply (or the optional 24V DC to DC converter) which in turn, continually supplies power to the internal monitor electronics and the optional touch screen controller.
MENU	Pressing this button causes the main OSD menu to be displayed. Pressing it again will cause the Main OSD menu to disappear. If the button is not pressed a second time, the main OSD menu will disappear after the set timeout period.
SELECT (AUTO ADJ)	When the OSD main menu is displayed, pressing this button selects one of five sub-menus. Within a sub-menu, this button selects and deselects menu choices.  <b>HOT KEY:</b> When the OSD is not displayed, pressing this button will initiate an automatic configuration and cause the "Processing Auto Configuration" message to be displayed.
DOWN	Within the main OSD menu and sub-menus, this button acts as an down cursor key, moving the highlighted item for selection to move downward to the next highlighted item for selection.  When an item has been selected from a sub-menu, pressing this key decreases its value.
UP (VGA / DVI)	Within the main OSD menu and sub-menus, this button acts as an up cursor key, moving the highlighted item for selection to move upward to the next highlighted item for selection.  When an item has been selected from a sub-menu, pressing this key increases its value.  <b>HOT KEY:</b> When the OSD main menu is not displayed, pressing this button causes the monitor to switch between VGA (PC) and DVI (Digital) video inputs.

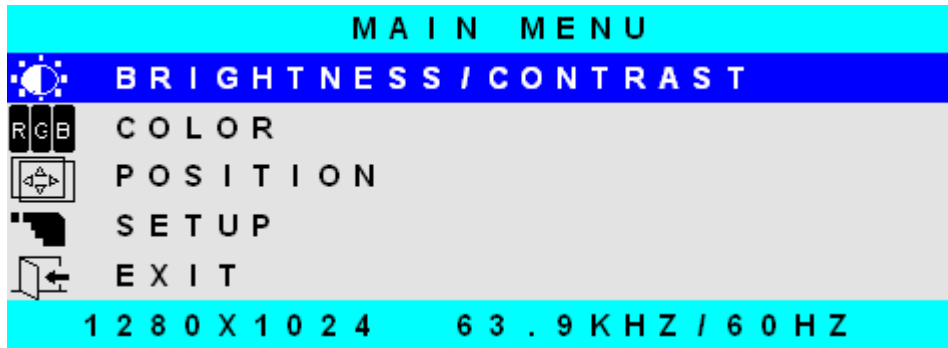
LED	FUNCTION
Not Lit	Power off mode.
Green	Monitor is on and receiving a normal video signal.
Amber	Monitor is on but in DPMS (Display Power Management Signaling) mode because it is not receiving a normal incoming video signal.

**WARNING** - PRESSING THE DISPLAY POWER ONLY REMOVES POWER TO THE BACKLIGHT INVERTER. THE TOUCHSCREEN IS STILL ACTIVE WHEN DISPLAY POWER IS OFF.

## OSD Menus and Settings

### MAIN MENU

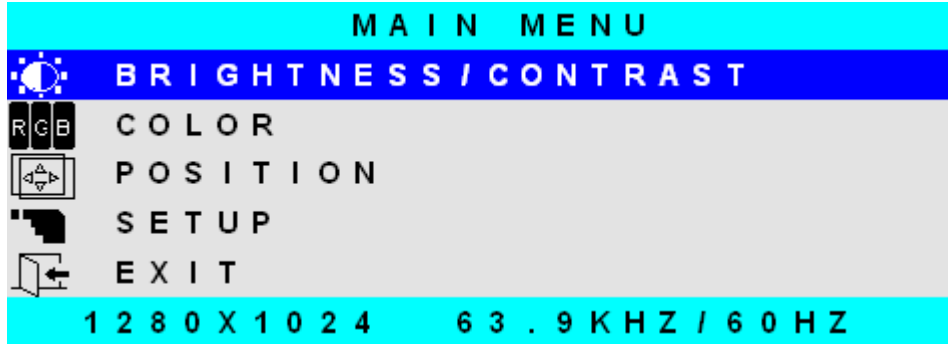
The following section describes the monitor's OSD menus and settings. With the monitor powered up and receiving a normal video signal, pressing the MENU button once will cause the following screen to appear:



Pressing MENU again will turn this screen off. Alternatively it will turn off after a time out period that is set in the SET UP sub-menu. Finally it can be turned off by pressing the DOWN button to move the blue highlighted band down to the EXIT sub-menu and pressing the SELECT button.

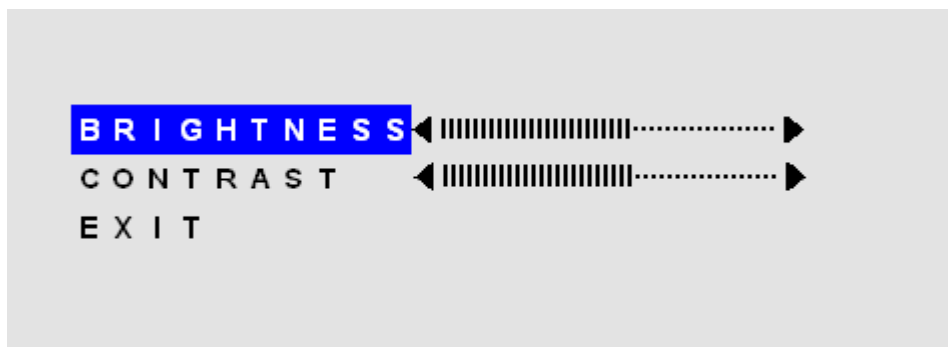
The bottom line on this screen displays the incoming video horizontal and vertical resolution and refresh rates.

### BRIGHTNESS/CONTRAST



### BRIGHTNESS

With BRIGHTNESS/CONTRAST highlighted on the MAIN MENU pressing SELECT will cause the following screen to be displayed:



Pressing the SELECT button will cause the following screen to be displayed:



Pressing the UP and DOWN buttons will adjust the brightness accordingly. Pressing the SELECT button again will deselect this function causing the following screen to appear:



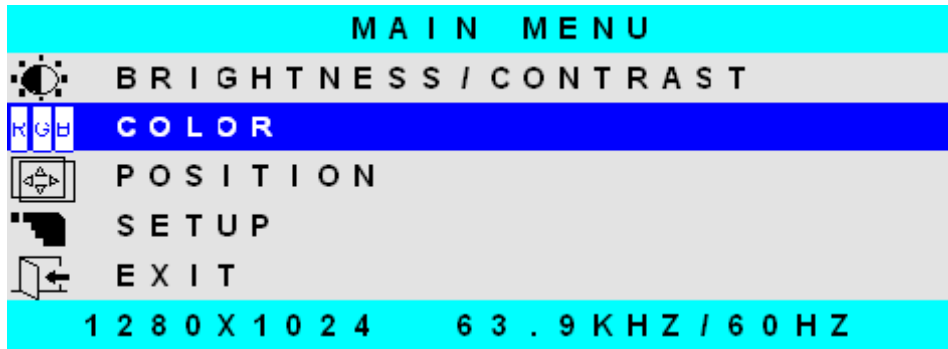
### CONTRAST

Pressing the DOWN button once and the SELECT button once will cause the following screen to appear:

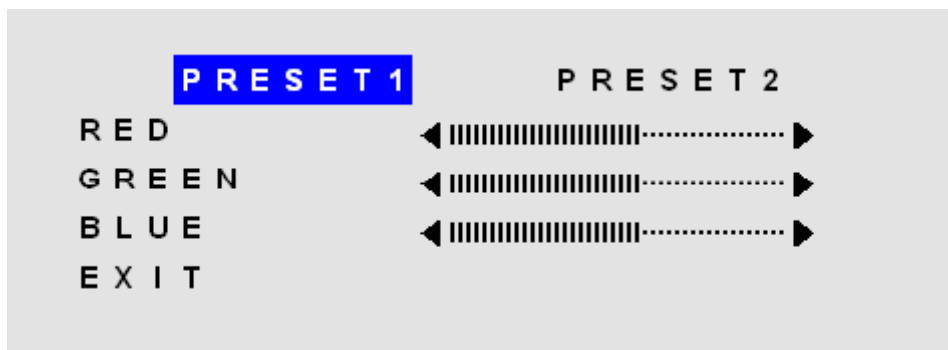


Pressing the UP and DOWN buttons will adjust the contrast accordingly. Pressing the SELECT button again will deselect this function. Press the DOWN button to highlight EXIT and then pressing SELECT will return to the MIN MENU.

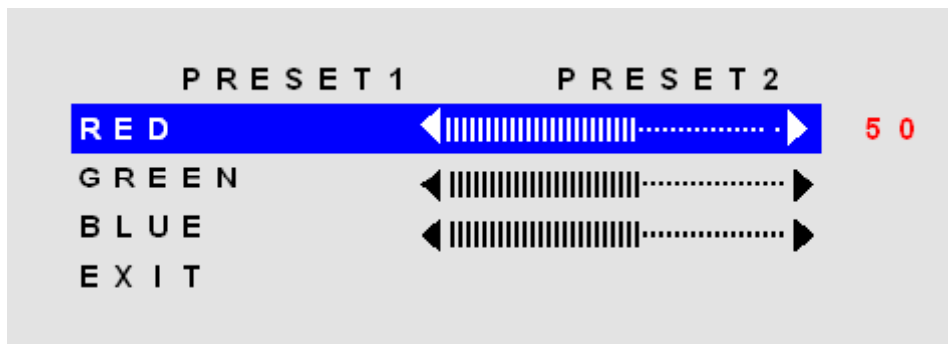
## COLOR



With COLOR highlighted on the MAIN MENU pressing SELECT will cause the following screen to be displayed:

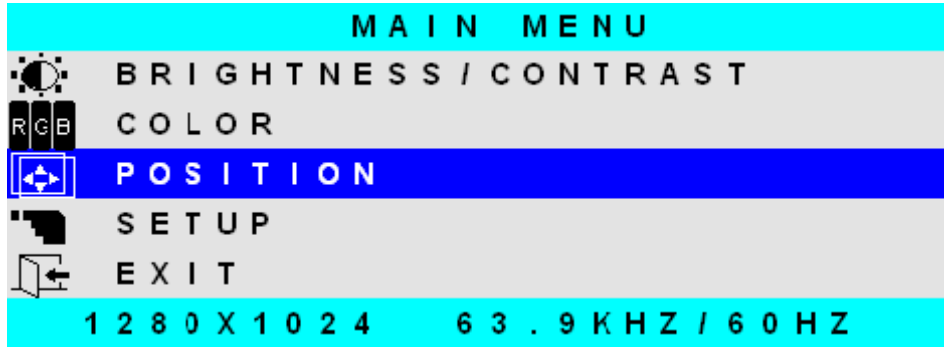


PRESET1 and PRESET2 are preset color balances. PRESET1 produces a bluer screen while PRESET2 produces a more aqua screen. Use the UP and Down buttons to highlight PRESET1 or PRESET2 and press SELECT to make your selection and return to the MAIN MENU. If you highlight RED GREEN or BLU and press select, the following screen appears:

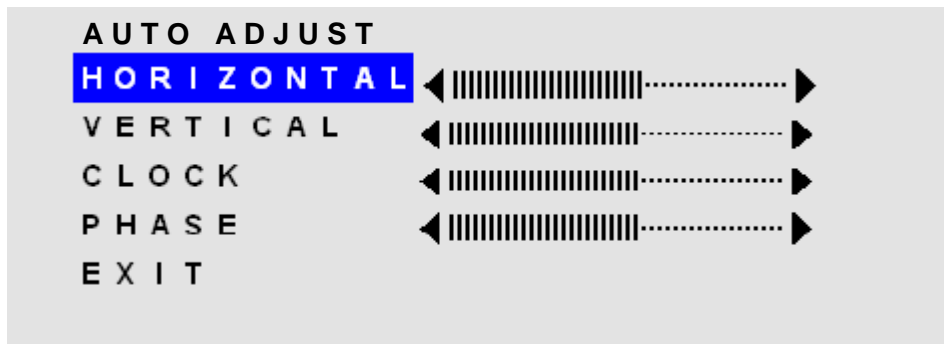


Pressing the UP and DOWN buttons causes the setting to change from the default of 50 to a value between 0 and 100. Pressing SELECT again saves the setting and deselects the menu item. Highlighting EXIT and pressing SELECT will return to the MAIN MENU.

## POSITION

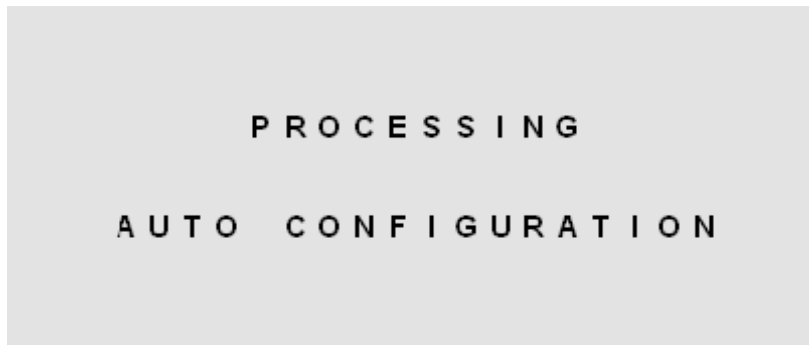


With POSITION highlighted on the MAIN MENU, pressing SELECT will cause the following screen to be displayed:



## AUTO ADJUST

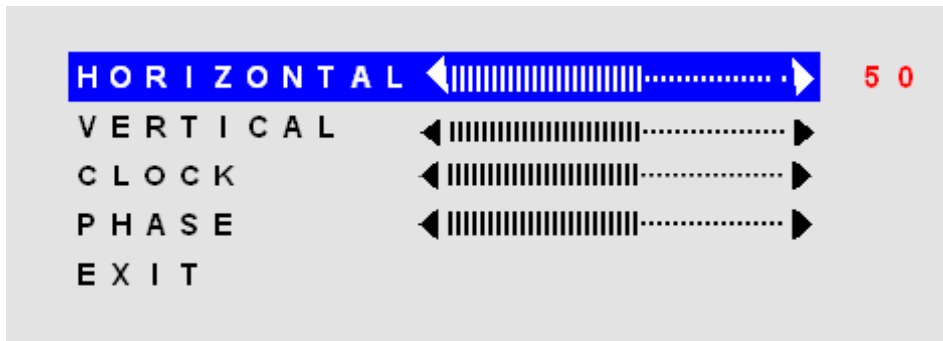
Highlighting AUTO ADJUST and pressing SELECT will initiate an automatic configuration and cause the "Processing Auto Configuration" message to be displayed.



During the auto configuration process, the monitor automatically centers the screen horizontally and vertically, sets the clock and optimizes the phase. After the process is complete, the screen is cleared of the OSD menu.

## HORIZONTAL

With HORIZONTAL highlighted on the POSITION menu, pressing SELECT will cause the following screen to be displayed:



Pressing the UP button causes the screen to move to the right while pressing the DOWN button causes the screen to move to the left. A setting number in the range of 0 to 100 is displayed. Pressing SELECT again will deselect the HORIZONTAL menu option and the setting will be saved.

## VERTICAL

With VERTICAL highlighted on the POSITION menu, pressing SELECT will display the VERTICAL adjustment menu. Pressing UP will cause the screen to move upward and pressing DOWN will cause the screen to move downward. A setting number in the range of 0 to 100 is displayed. Pressing SELECT again will deselect the VERTICAL adjustment menu and the setting will be saved.

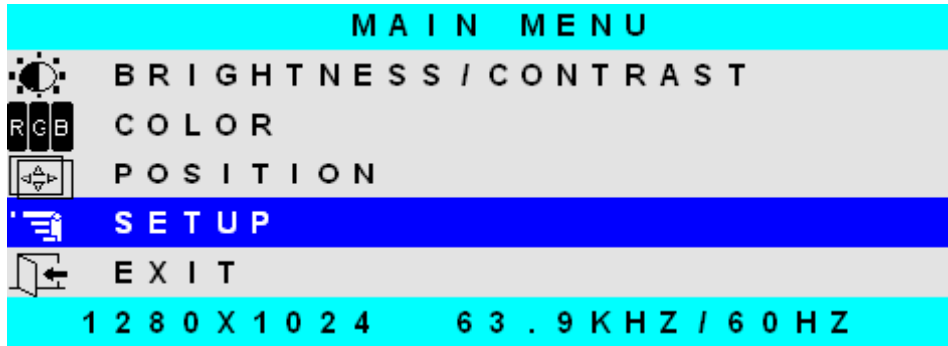
## CLOCK

With CLOCK highlighted on the POSITION menu, pressing SELECT will display the CLOCK adjustment menu. Pressing UP increases the CLOCK and causes the screen to increase in width. Pressing the DOWN button causes the CLOCK to decrease and the screen to reduce in width. A setting number in the range of 0 to 100 is displayed. Pressing SELECT again will deselect the CLOCK adjustment menu and the setting will be saved. Adjustment of this setting is normally not needed as it is automatically set to its optimum setting each time the monitor is turned on or when AUTO ADJUSTMENT is selected.

## PHASE

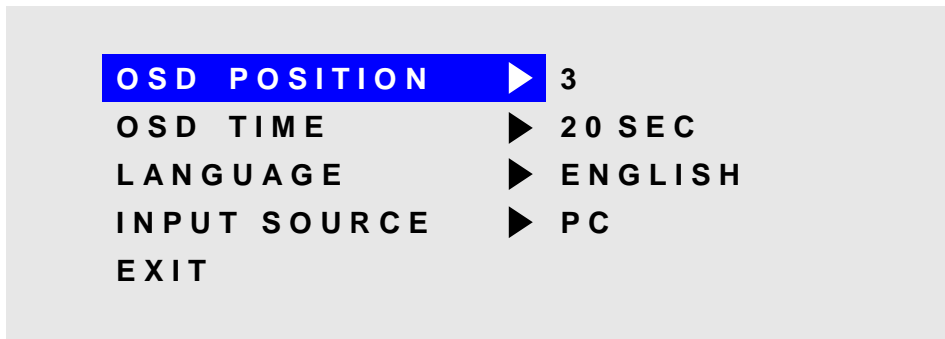
With PHASE highlighted on the POSITION menu, pressing SELECT will display the PHASE adjustment menu. Pressing UP increases the PHASE. Pressing the DOWN button causes the PHASE to decrease. A setting number in the range of 0 to 100 is displayed. Pressing SELECT again will deselect the PHASE adjustment menu and the setting will be saved. Adjustment of this setting is normally not needed as it is automatically set to its optimum setting each time the monitor is turned on or when AUTO ADJUSTMENT is selected.

## SETUP

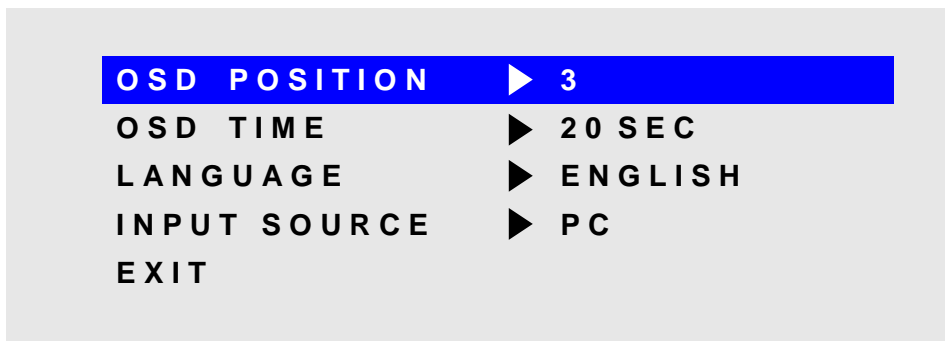


### OSD POSITION

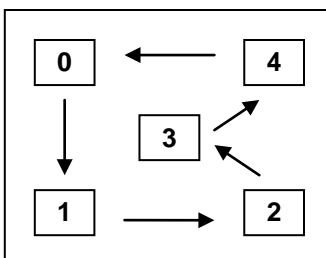
With SETUP highlighted on the MAIN MENU pressing SELECT will cause the following screen to be displayed:



With the OSD POSITION highlighted on the SETUP menu, pressing SELECT will cause the following screen to be displayed:



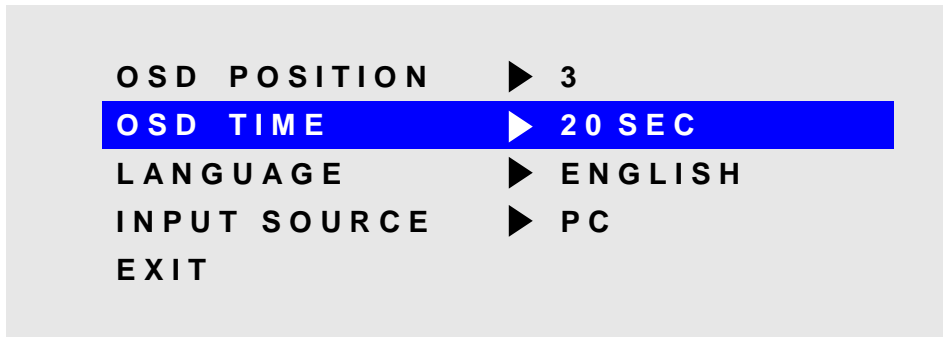
The default position of the OSD menu is 3 which is in the center of the screen. Pressing the UP or DOWN buttons will cause the OSD to move in the pattern below:



Pressing SELECT again will deselect the OSD POSITION adjustment menu and the setting will be saved.

### **OSD TIME**

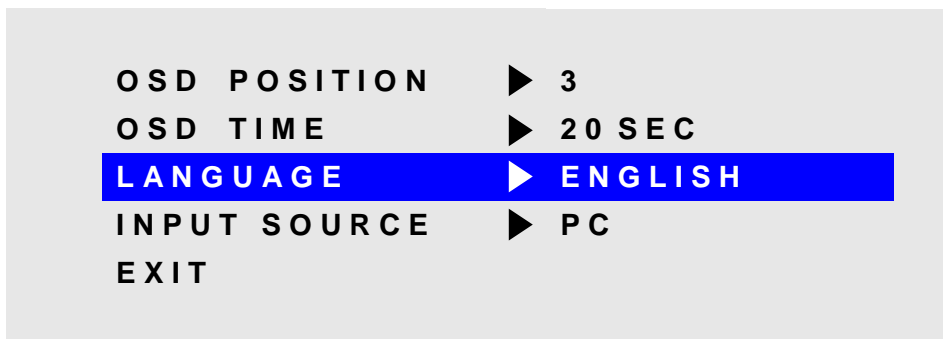
With OSD TIME highlighted on the SETUP menu, pressing SELECT will cause the following screen to be displayed:



Pressing the UP and DOWN buttons will allow adjustment of the OSD time out setting in the range from 5 to 60 seconds. Pressing SELECT again will deselect the OSD TIME menu and save the current setting.

### **LANGUAGE**

With LANGUAGE highlighted on the SETUP menu, pressing SELECT will cause the following screen to be displayed:



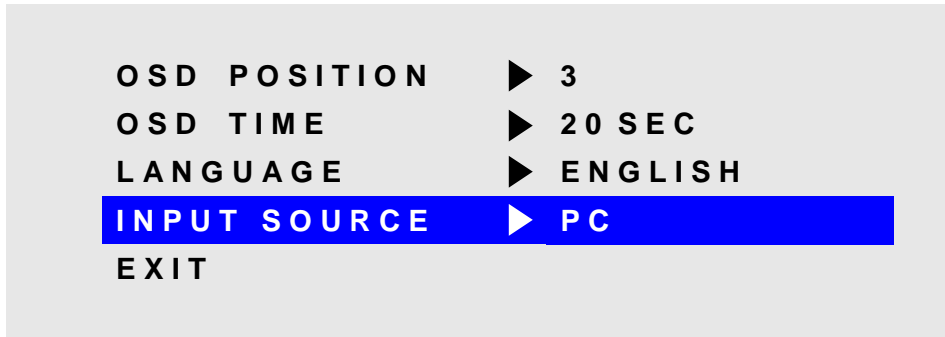
Pressing the UP and DOWN buttons allows the following LANGUAGE choices:

- ENGLISH
- FRANCAIS
- DEUTSCHE
- ITALIANO
- ESPANOL

Pressing SELECT will deselect the LANGUAGE option menu and save the current selection.

## INPUT SOURCE

With INPUT POSITION highlighted on the SETUP menu, pressing SELECT will cause the following screen to be displayed:

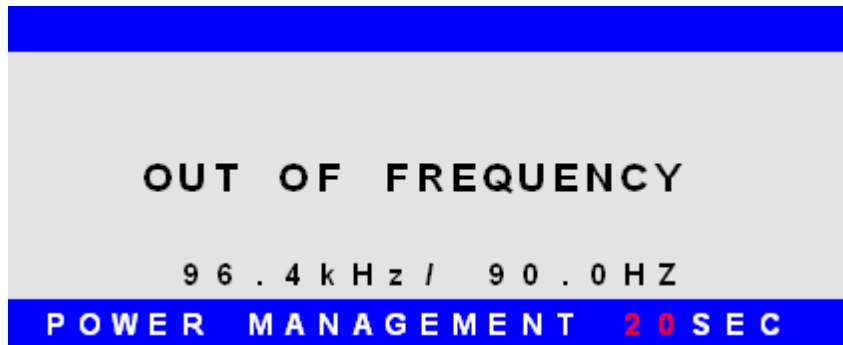


Pressing the UP and DOWN buttons switches between PC (the 15-pin analog VGA input connector) and DIGITAL (the DVI-D input connector) Pressing SELECT will deselect the INPUT SOURCE option menu and save the current selection.

## OSD Message Displays

### OUT OF FREQUENCY

The following OSD message will appear if the horizontal or vertical refresh rate of the incoming video signal is outside the range of the monitor.



### NO SIGNAL

When the monitor is first turned on it performs a set of self diagnostics. If no incoming video signal is detected immediately following self diagnostics, the following message will appear. This message will remain displayed indefinitely until a valid signal is detected. The LED remains green. The "PC" NO SIGNAL message indicates the monitor is setup to receive incoming video through the 15-pin analog VGA input connector.

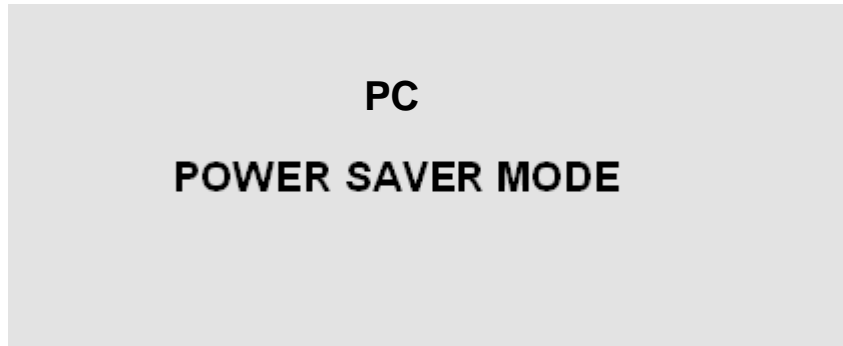


The "DIGITAL" NO SIGNAL message indicates the monitor is setup to receive incoming video through the DVI-D input connector.



## **POWER SAVER MODE**

The following message appears when the monitor is on but in DPMS (Display Power Management Signaling) mode. This occurs after a valid incoming video signal is no longer present or when the PC has signaled the monitor to enter the POWER SAVER MODE. The message is displayed for 5 seconds and then removed. The LED remains amber. The "PC" POWER SAVER MODE message indicates the monitor is setup to receive incoming video through the 15-pin analog VGA input connector.

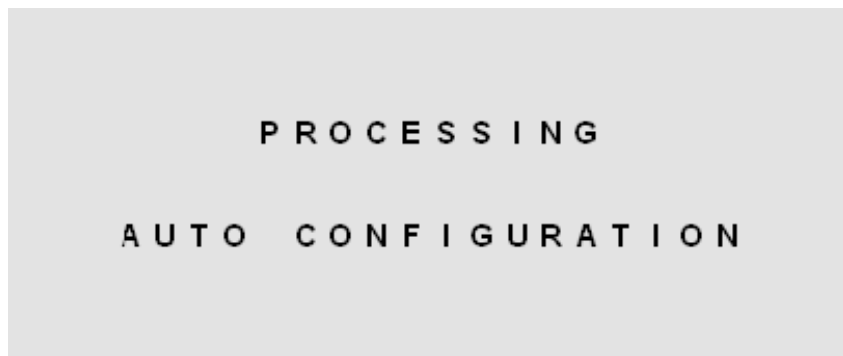


The "DIGITAL" POWER SAVER MODE message indicates the monitor is setup to receive incoming video through the DVI-D input connector.



## **PROCESSING AUTO CONFIGURATION**

The following message appears when the monitor is performing an automatic self configuration. An auto configuration can be initiated by pressing the SELECT button with no OSD screen being displayed or by selecting the AUTO ADJUST option from the POSITION OSD menu.



## Appendix

### Video Input Pin Assignment

#### DVI-D

Pin No.	Name	Description
1	TMDS DATA2-	TMDS DATA2 Differential Negative Signal
2	TMDS DATA2+	TMDS DATA2 Differential Positive Signal
3	TMDS DATA2 Shield	Shield for TMDS Channel #2
4	N.C.	No Connection
5	N.C.	No Connection
6	DDC Clock	The Data Line for the DDC Interface
7	DDC Data	The Clock Line for the DDC Interface
8	N.C.	No Connection
9	TMDS DATA1-	TMDS DATA1 Differential Negative Signal
10	TMDS DATA1+	TMDS DATA1 Differential Positive Signal
11	TMDS DATA1 Shield	Shield for TMDS Channel #1
12	N.C.	No Connection
13	N.C.	No Connection
14	+5V Power	+5 Volt signal for EDID
15	GND (+5V Return)	Ground for +5 Volt Power
16	HPD	Hot Plug Detect
17	TMDS DATA0-	TMDS DATA0 Differential Negative Signal
18	TMDS DATA0+	TMDS DATA0 Differential Positive Signal
19	TMDS DATA0 Shield	Shield for TMDS Channel #0
20	N.C.	No Connection
21	N.C.	No Connection
22	TMDS CLOCK Shield	Shield for TMDS Clock Differential Pair
23	TMDS CLOCK+	TMDS CLOCK Differential Positive Signal
24	TMDS CLOCK-	TMDS CLOCK Differential Negative Signal

### Analog 15- Pin D-Sub

Pin No.	Name	Description
1	Red	Red Analog Data
2	Green	Green Analog Data
3	Blue	Blue Analog Data
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	N.C.	No Connection
10	GND	Ground
11	GND	Ground
12	DSDA	DDC Serial Data
13	HSYNC	Horizontal Sync
14	VSYNC	Vertical Sync
15	DSCL	DDC Serial Clock

## Touch Screen Pin Assignment

### Serial RS-232

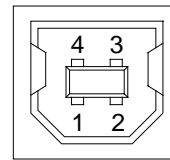
Pin No.	Name	Description
1	DCD	Data Carrier Detect
2	RX	Receive Data
3	TX	Transmit Data
4	DTR	Data Terminal Ready
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicator

Baud Rate	9600
Data Size	8 Bits
Stop Bits	1 Bit
Parity	No Parity (Only)
Handshaking	Hardware CTS/RTS

### USB

Pin No.	Name	Description
1	VBUS	+5V Power
2	USB_D-	USB Data -
3	USB_D+	USB Data +
4	GND	Ground

USB-B CONNECTOR ON  
REAR OF MONITOR



**Note: The touch controller receives its power from the monitor's internal power supply – not through the USB conn**