IEI Integration Corp.

MODEL:

DM-F Series

12”~24” LCD Monitor

DisplayPort/DVI/VGA, IP 65 Protection, RoHS

User Manual

Rev. 1.10 – 23 December, 2014

RoHS Lead Free

Revision

Date	Version	Changes
23 December, 2014	1.10	Update to R11 version
10 June, 2014	1.01	Update Section 4.4.1: Panel Mounting
25 March, 2014	1.00	Initial Release

Copyright

COPYRIGHT NOTICE

The information in this document is subject to change without prior notice in order to improve reliability, design and function and does not represent a commitment on the part of the manufacturer.

In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

TRADEMARKS

All registered trademarks and product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective owners.

Table of Contents

1 INTRODUCTION 1

1.1 OVERVIEW 2
1.2 FEATURES 2
1.3 MODEL VARIATIONS 3
1.4 APPLICATIONS 3
1.5 EXTERNAL OVERVIEW 4
1.5.1 Front View 4
1.5.2 Rear View 5
1.5.3 Connectors 6
1.6 TECHNICAL SPECIFICATIONS 7
1.7 CERTIFICATIONS 8
1.8 PHYSICAL DIMENSIONS 9
1.8.1 DM-F12A Physical Dimensions 9
1.8.2 DM-F15A Physical Dimensions 10
1.8.3 DM-F17A Physical Dimensions 11
1.8.4 DM-F22A Physical Dimensions 12
1.8.5 DM-F24A Physical Dimensions 13

2 UNPACKING 14

2.1 UNPACKING PROCEDURE 15
2.2 PACKING LIST 16
2.3 OPTIONAL ITEMS 17

3 INSTALLATION 18

3.1 INSTALLATION PRECAUTIONS 19
3.2 PRE-INSTALLATION PREPARATION 20
3.2.1 Tools 20
3.3 EXTERNAL PERIPHERAL DEVICE CONNECTION 20
3.3.1 DisplayPort Connector 21
3.3.2 9V-36V Terminal Block 22
3.3.3 9V-36V DC Jack 22

3.3.4 DVI Connector 23
3.3.5 RS-232 for Touch Panel Connector (Reserved for resistive touch ATO) 23
3.3.6 USB for Touch Panel Connector 24
3.3.7 VGA Connector 24
3.4 MOUNTING THE MONITOR 25
3.4.1 Panel Mounting 25
3.4.2 Cabinet and Rack Installation 28
3.4.3 Wall Mounting 30
3.4.4 Monitor Stand Installation 32
3.4.5 Monitor Arm Installation 33

4 ON-SCREEN-DISPLAY (OSD) CONTROLS 35

4.1 USER MODE OSD STRUCTURE 36
4.1.1 OSD Keypad 36
4.1.2 OSD Menu Structure 37
4.2 USING THE OSD 38
4.2.1 Image Menu 38
4.2.1.1 Color Setting 38
4.2.2 Display Menu 39
4.2.3 System Menu 40
4.2.3.1 Input 41
4.2.3.2 OSD Settings 43

5 SOFTWARE DRIVERS 44

5.1 INTRODUCTION 45
5.2 RS-232 OR USB TOUCH SCREEN 45
5.3 TOUCH PANEL DRIVER INSTALLATION 46
5.4 CHANGE THE TOUCH SCREEN INTERFACE 50
5.5 CALIBRATING THE TOUCH SCREEN 50

A SAFETY PRECAUTIONS 53

A.1 SAFETY PRECAUTIONS 54
A.1.1 General Safety Precautions 54
A.1.2 Anti-static Precautions 55
A.2 MAINTENANCE AND CLEANING PRECAUTIONS 55
A.2.1 Maintenance and Cleaning 55

A.2.2 Cleaning Tools *56*

B CERTIFICATIONS ***57***

B.1 RoHS Compliant *58*
B.2 IP 65 Compliant Front Panel *58*

C SMARTOSD ***59***

C.1 IEI smartOSD Quick Installation Guide *60*
C.2 Pre-installation Notice *60*
C.3 smartOSD Install *60*
C.4 Software Illustration *63*
C.4.1 Manage Page *66*
C.4.2 EDID Page *67*
C.4.3 Image Page *68*
C.4.4 Display Page (for analog signal) *69*
C.4.5 Color Page *70*
C.4.6 PIP Page *71*
C.4.7 System Page *72*
C.4.8 About Page *73*
C.5 smartOSD FAQ *74*
C.5.1 Windows 2000 Installation Failure *74*
C.5.2 Vista Installation Failure *74*
C.5.3 Model Failure *75*
C.5.4 DDC Port Failure *76*

List of Figures

Figure 1-1: DM-F Series 2
Figure 1-2: Typical Monitor Front View 4
Figure 1-3: Typical Rear View 5
Figure 1-4: Connectors (DM-F12A/15A/17A) 6
Figure 1-5: Connectors (DM-F22A/24A) 6
Figure 1-6: DM-F12A Physical Dimensions (millimeters) 9
Figure 1-7: DM-F15A Physical Dimensions (millimeters) 10
Figure 1-8: DM-F17A Physical Dimensions (millimeters) 11
Figure 1-9: DM-F22A Physical Dimensions (millimeters) 12
Figure 1-10: DM-F24A Physical Dimensions (millimeters) 13
Figure 3-1: Connectors (DM-F12A/15A/17A) 21
Figure 3-2: Connectors (DM-F22A/24A) 21
Figure 3-3: DisplayPort connector 22
Figure 3-4: 3-pin Terminal Block 22
Figure 3-5: 9V-36V DC Jack 23
Figure 3-6: DVI Connector 23
Figure 3-7: RS-232 Touch Panel Connector 24
Figure 3-8: USB Touch Panel Connector 24
Figure 3-9: VGA Connector 25
Figure 3-10: DM-F12A Cutout Dimensions (Unit: mm) 26
Figure 3-11: DM-F15A Cutout Dimensions (Unit: mm) 26
Figure 3-12: DM-F17A Cutout Dimensions (Unit: mm) 27
Figure 3-13: DM-F22A Cutout Dimensions (Unit: mm) 27
Figure 3-14: DM-F24A Cutout Dimensions (Unit: mm) 27
Figure 3-15: Panel Mounting Clamp Position 28
Figure 3-16: The Rack/Cabinet Bracket 29
Figure 3-17: Secure the Rack/Cabinet Bracket 29
Figure 3-18: Install into a Rack/Cabinet 30
Figure 3-19: Wall-mounting Bracket 31
Figure 3-20: Mount the Chassis 32

Figure 3-21: VESA Mounting Holes 32
Figure 3-22: Monitor Stand Mounting 33
Figure 3-23: Monitor Arm Mounting 34
Figure 4-1: OSD Keypad 36
Figure 4-2: Image Menu 38
Figure 4-3: Color Settings 39
Figure 4-4: Display Menu 40
Figure 4-5: System Menu 41
Figure 4-6: Input Options 42
Figure 4-7: OSD Settings Menu 43
Figure 5-1: Setup Icon 47
Figure 5-2: Welcome Screen 47
Figure 5-3: License Agreement 48
Figure 5-4: Initiate Install 48
Figure 5-5: Installation Starts 49
Figure 5-6: Finish Installation 49
Figure 5-7: PenMount Monitor Icon 50
Figure 5-8: PenMount Monitor Popup Menu 51
Figure 5-9: Configuration Screen 51
Figure 5-10: Calibration Initiation Screen 52
Figure 5-11: Calibration Screen 52
Figure C-1: smartOSD Welcome Screen 61
Figure C-2: smartOSD Folder Select Screen 61
Figure C-3: smartOSD Confirm Installation 62
Figure C-4: smartOSD Installation Progress 62
Figure C-5: smartOSD Installation Complete 63
Figure C-6: Manage Page 66
Figure C-7: EDID Page 67
Figure C-8: Image Page 68
Figure C-9: Display Page 69
Figure C-10: Color Page 70
Figure C-11: PIP Page 71
Figure C-12: System Page 72
Figure C-13: About Page 73
Figure C-14: DLL Missing 74

Figure C-15: Windows Vista Error 74
Figure C-16: Install as Administrator.....75
Figure C-17: Firmware Incompatibility 75
Figure C-18: DDC Port Failure.....76

List of Tables

Table 1-1: DM-F Series Model Variations 3
Table 1-2: DM-F Series Specifications 8
Table 2-1: Packing List 16
Table 2-2: Optional Items 17
Table 3-1: Display Port Connector Pinouts 22
Table 3-2: DVI Connector Pinouts 23
Table 3-3: RS-232 Touch Panel Connector Pinouts 24
Table 3-4: USB Touch Panel Connector Pinouts 24
Table 3-5: VGA Connector Pinouts 25
Table 3-6: Panel Mounting Clamps 26
Table 4-1: OSD Menu Structure 37
Table C-1: SmartOSD Menu Structure 65

Chapter

1

Introduction

1.1 Overview

Figure 1-1: DM-F Series

The DM-F series LCD monitor is the latest member of IEI's line of sophisticated LCD designs, and it has been improved to be RoHS compliant. It is designed to fit industrial automation, or any other applications that require minimum installation space and flexible configuration. The flat front panel provides IP 65 protection, which effectively wards off dust and water. Flexible analog or digital interfaces are provided for ease of connection with a management computer.

1.2 Features

The DM-F series have the following standard features:

- Robust IP 65 aluminum front bezel
- Aesthetic ultra-thin bezel for seamless panel mount installation
- Wide range 9V~36V DC input
- DVI/Display Port/VGA flexible video input solution
- Projected capacitive multi-touch/ resistive single touch options

1.3 Model Variations

The DM-F series LCD monitor base models have a variety of variants. The model variations are listed in **Table 1-1**.

Model Number	LCD	Touch Screen
DM-F12A/R-R10	12”	W/ USB resistive touch screen
DM-F12A/PC-R10		W/ USB projected capacitive touch screen
DM-F15A/R-R10	15”	W/ USB resistive touch screen
DM-F15A/PC-R10		W/ USB projected capacitive touch screen
DM-F17A/R-R10	17”	W/ USB resistive touch screen,
DM-F17A/PC-R10		W/ USB projected capacitive touch screen
DM-F22A/PC-R10	21.5”	W/ USB projected capacitive touch screen
DM-F24A/PC-R10	24”	W/ USB projected capacitive touch screen

Table 1-1: DM-F Series Model Variations

1.4 Applications

The DM-F series LCD monitor is designed for rigorous industrial environments where it may be exposed to both heat and moisture. Its durability and strength also makes it an ideal choice for public access computers. Some possible applications include:

- Digital surveillance
- Multimedia advertising platform
- General Computing
  - Computer-based testing center
  - General purpose information system
  - Mobile nursing station
  - Interactive education use
- Automation & Control
  - Plant environment monitoring
  - Factory automation HMI terminal
  - Shop-floor/MES control
- Self-service Kiosk

- Full-service receptionist kiosk
- Hospital self-registration terminal
- Interactive photo kiosk
- Video rental kiosk
- Self-service POS terminal

1.5 External Overview

The DM-F series LCD monitors are durable devices that can be used in harsh industrial environments. The following sections describe the physical layout of the DM-F series LCD monitors.

1.5.1 Front View

The front of the DM-F series LCD monitor is a flat panel LCD screen surrounded by an aluminum frame.

Figure 1-2 shows a typical monitor front view.

Figure 1-2: Typical Monitor Front View

1.5.2 Rear View

The rear panel provides access to retention screw holes that support various mounting. There is a 7-key membrane OSD keypad on the rear panel.

Figure 1-3 shows a typical DM-F rear panel.

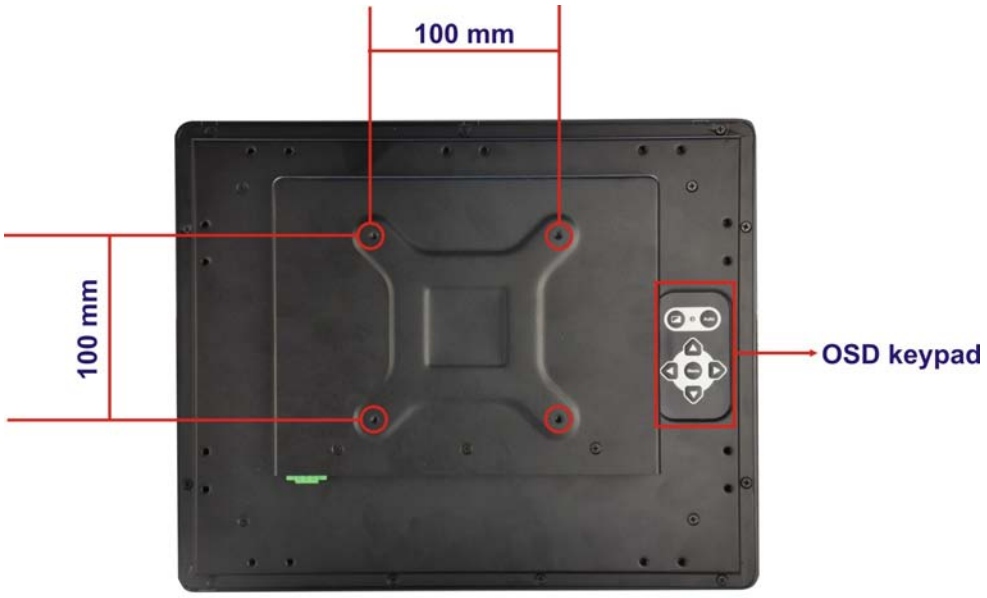

Figure 1-3: Typical Rear View

1.5.3 Connectors

Figure 1-4 and **Figure 1-5** shows the bottom panel of the DM-F series LCD monitor. All connectors are fully described in **Section 3.3**.

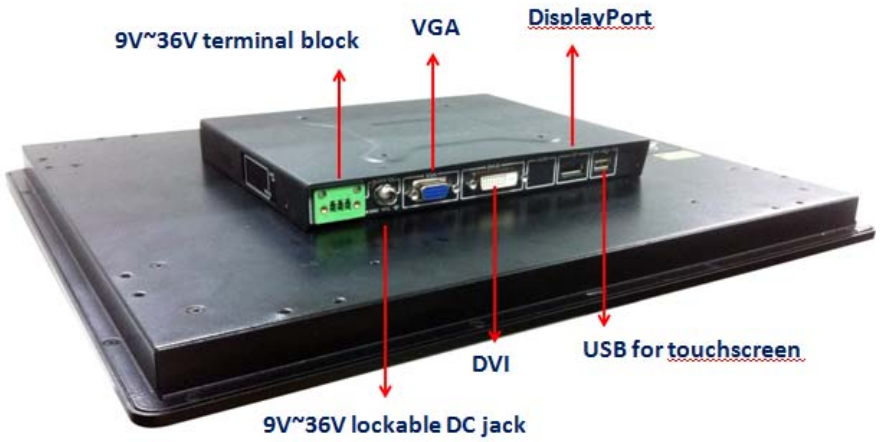

Figure 1-4: Connectors (DM-F12A/15A/17A)

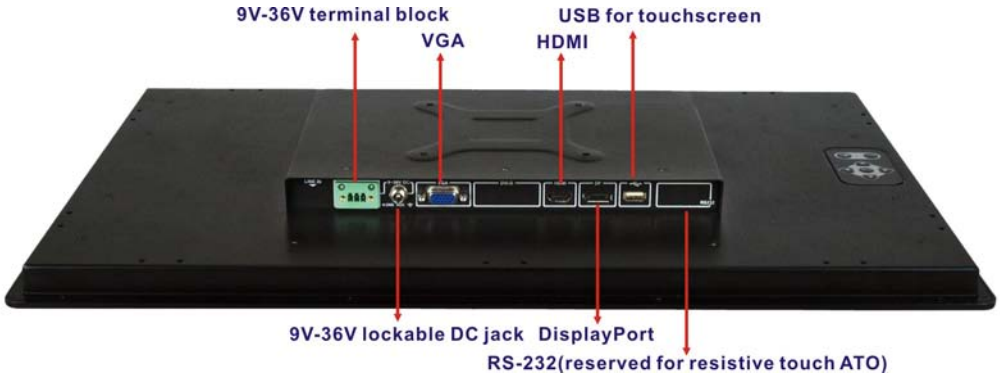

Figure 1-5: Connectors (DM-F22A/24A)

1.6 Technical Specifications

Table 1-2 shows the DM-F series technical specifications.

Model	DM-F12A	DM-F15A	DM-F17A	DM-F22A	DM-F24A
LCD Display	12" (4:3)	15'' (4:3)	17'' (5:4)	21.5'' (16:9)	24'' (16:9)
Max. Resolution	1024(W) x 768(H)	1024(W) x 768(H)	1280(W) x 1024(H)	1920(W) x 1080(H)	1920(W) x 1080(H)
Brightness (cd/m²)	500	400	350	250	250
Contrast Ratio	700:1	700:1	1000:1	1000:1	3000:1
LCD Color	16.2M	16.2M	16.7M	16.7M	16.7M
Pixel Pitch (mm)	0.24 x 0.24	0.29 x 0.29	0.26 x 0.26	0.25 x 0.25	0.28 x 0.28
Viewing Angle (H/V)	160°/140°	160°/140°	170°/160°	170°/160°	178°/178°
Backlight MTBF (Hrs)	50000	50000	50000	30000	30000
Touch	Resistive type 5-wire flat touch window/ Penmount 6000 Projected capacitive flat touch window/ EETI EXC7200			Projected capacitive flat touch window/ EETI EXC7200	Projected capacitive flat touch window/ EETI EXC3000
AD Board	AV-6038	AV-6038	AV-6038	AV-6038	AV-6038
I/O Ports	1 x VGA (DB-15) 1 x DVI or 1 x HDMI 1 x DisplayPort 1.1 1 x USB 2.0 (touch) 1 x RS-232 (touch) [reserved for resistive touch ATO] 1 x Lockable 9V-36V DC jack 1 x 9V-36V terminal block				
OSD Button	7-key membrane OSD keypad				
Smart OSD	Smart OSD Software				
Construction Material	Aluminum front cover and sheet metal rear cover				
Mounting	Panel Mount/ Rack Mount/ 100*100 VESA Mount				
Enclosure Color	Black C				
Dimension	262.2 x 322.2 x 40.5 mm	303 x 378.5 x 43.2 mm	341.4 x 408.4 x 49.3 mm	350.4 x 550.4 x 49.1 mm	382 x 600 x 49.4 mm
Cutout Dimensions	234.8 x 303.8 mm	284.6 x 68.1 mm	323 x 398 mm	340 x 532 mm	358.6 x 578.6 mm

Model	DM-F12A	DM-F15A	DM-F17A	DM-F22A	DM-F24A
Weight (Net/Gross) Kg	2.7/4.9	3.5/5.5	4.4/7.1	6.3/9.6	7.6/10.9
Operating Temperature	-20°C ~ 60°C (with air flow)			-10°C ~ 50°C (with air flow)	
Storage Temperature	-20°C ~ 70°C			-20°C ~ 60°C	
Humidity	10% to 95% (non-condensing)				
IP Level	IP 65 compliant front panel				
Safety and EMC	CE & FCC certified				
Power Input	9V~36V DC				

Table 1-2: DM-F Series Specifications

1.7 Certifications

All DM-F series LCD monitor models comply with the following international standards:

- RoHS
- IP 65

For a more detailed description of these standards, please refer to **Appendix B**.

1.8 Physical Dimensions

The following sections describe the physical dimensions for each model of the DM-F series LCD monitor.

1.8.1 DM-F12A Physical Dimensions

The physical dimensions of the DM-F12A are shown in **Figure 1-6**.

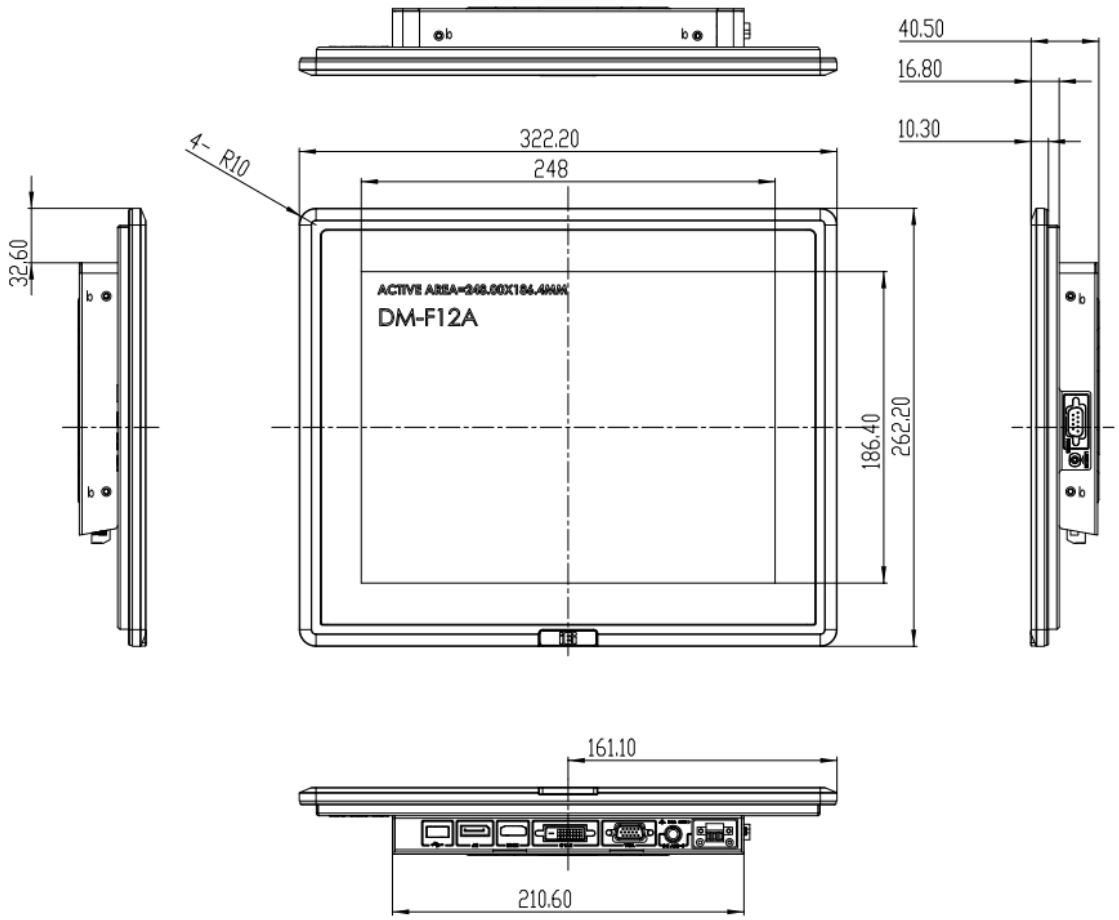

Figure 1-6: DM-F12A Physical Dimensions (millimeters)

1.8.2 DM-F15A Physical Dimensions

The physical dimensions of the DM-F15A are shown in **Figure 1-7**.

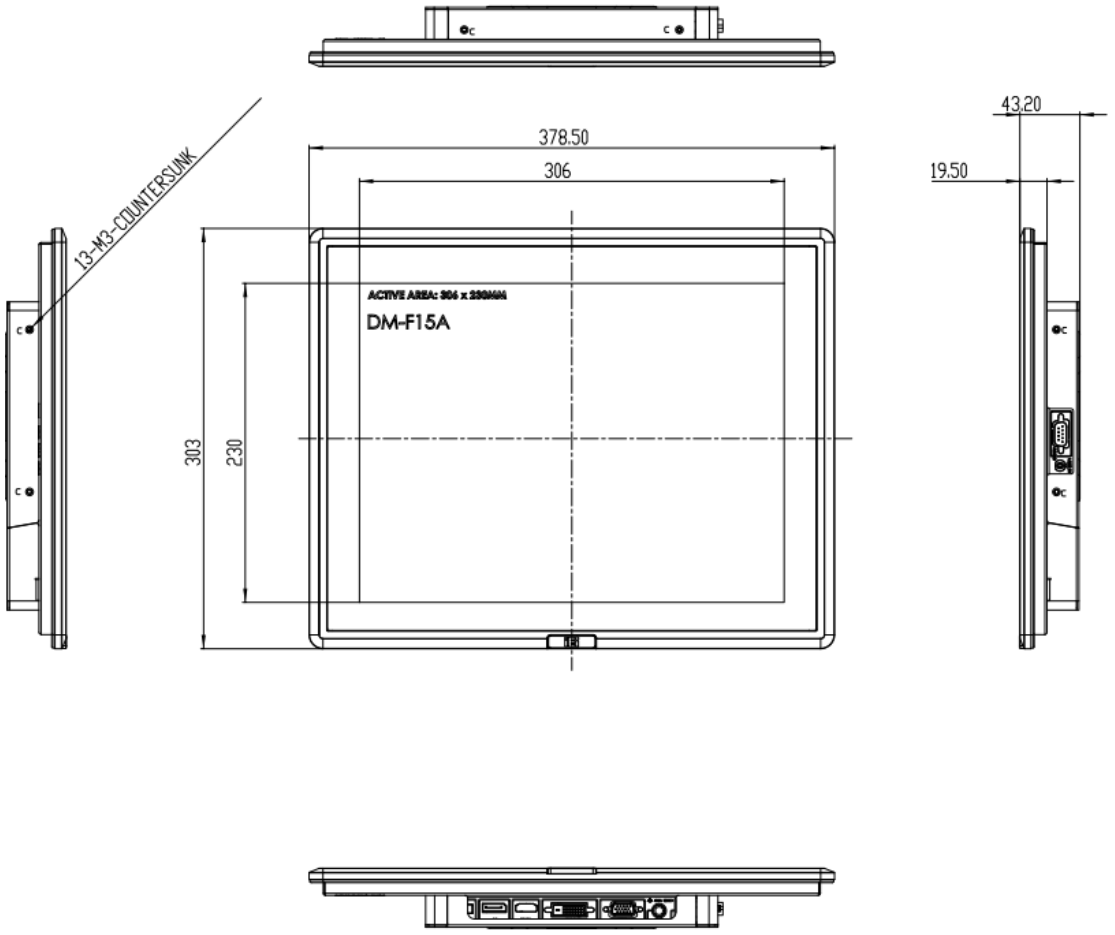

Figure 1-7: DM-F15A Physical Dimensions (millimeters)

1.8.3 DM-F17A Physical Dimensions

The physical dimensions of the DM-F17A are shown in **Figure 1-8**.

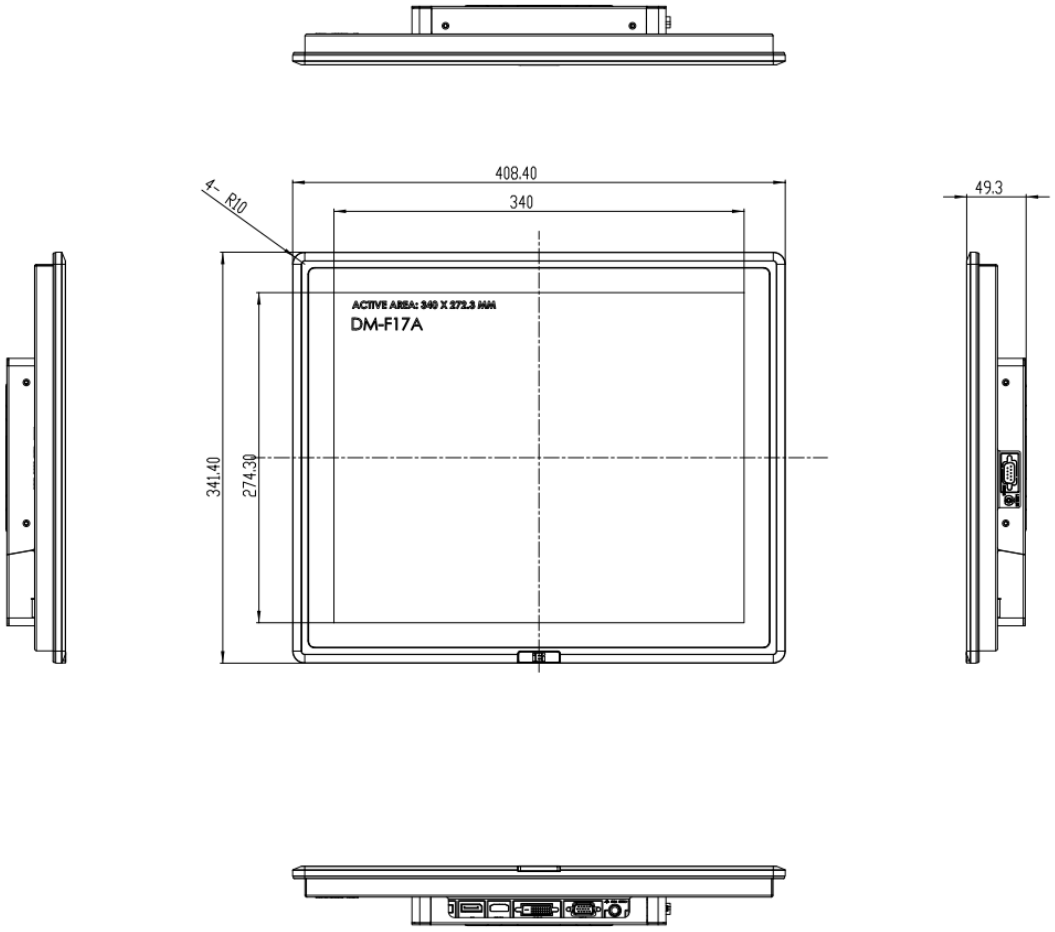

Figure 1-8: DM-F17A Physical Dimensions (millimeters)

1.8.4 DM-F22A Physical Dimensions

The physical dimensions of the DM-F22A are shown in **Figure 1-9**.

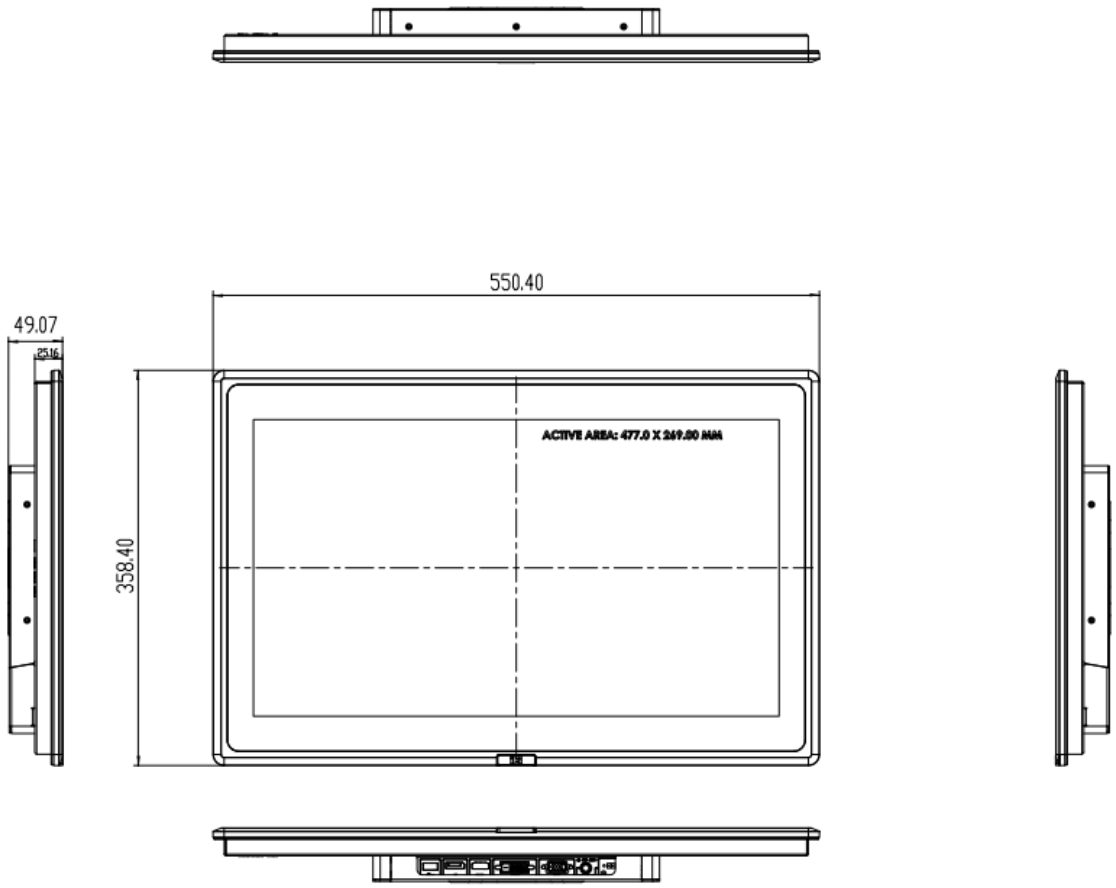

Figure 1-9: DM-F22A Physical Dimensions (millimeters)

1.8.5 DM-F24A Physical Dimensions

The physical dimensions of the DM-F24A are shown in **Figure 1-10**.

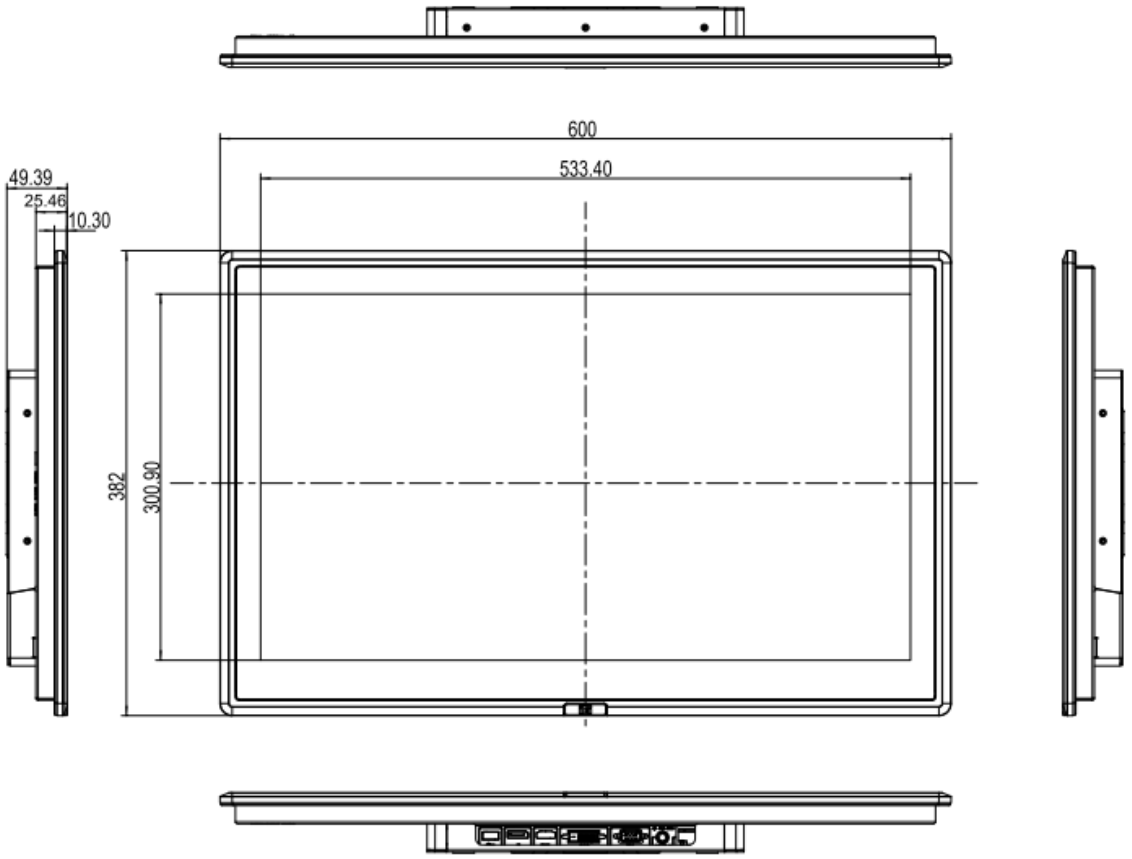

Figure 1-10: DM-F24A Physical Dimensions (millimeters)

Chapter

2

Unpacking

2.1 Unpacking Procedure

To unpack the DM-F series LCD monitor, follow the steps below:

WARNING:

The front side LCD screen has a protective plastic cover stuck to the screen. Only remove the plastic cover after the DM-F series LCD monitor has been properly installed. This ensures the screen is protected during the installation process.

Step 1: Use box cutters, a knife or a sharp pair of scissors that seals the top side of the external (second) box.

Step 2: Open the external (second) box.

Step 3: Use box cutters, a knife or a sharp pair of scissors that seals the top side of the internal (first) box.

Step 4: Lift the monitor out of the boxes.

Step 5: Remove both polystyrene ends, one from each side.

Step 6: Pull the plastic cover off the DM-F series LCD monitor.

Step 7: Make sure all the components listed in the packing list are present.

2.2 Packing List

The DM-F series monitor is shipped with the following components:

Quantity	Item	Image
1	DM-F series	
1	USB Cable (For touch screen) (**P/N**: 32001-006100-100-RS)	
1	VGA Cable (**P/N**: 32000-036200-RS)	
1	Touch pen (Resistive touch only) (**P/N**: 43125-0002C0-00-RS)	
1	Utility CD (Drivers and user manual)	

Table 2-1: Packing List

If any of the above items are missing or damaged, contact the distributor or sales representative immediately.

2.3 Optional Items

The following items are optional accessories for the DM-F series monitor:

Item	DM-F12A	DM-F15A	DM-F17A	DM-F22A	DM-F24A
Arm	**ARM-11-RS**	**ARM-31-RS**			
Stand	**STAND-A12-RS**	**STAND-A19-RS** **STAND-B19-RS**	**STAND-C19-RS** **STAND-A21-R10**		
Wall Mount Kit	**WK-190MS-R10**				
Panel Mount Kit	**FPK-01-R10**			**FPK-02-R10**	**FPK-03-R10**
Rack Mount Kit	**FRK12-R10**	**FRK15-R10**	**FRK17-R10**	**N/A**	
Cable Cover	**N/A**	**DM-F-CC01-R10**		**DM-F-CC02-R10**	
RS-232 Touch Cable Kit	**DM-F-COMKIT01-R10**			**N/A**	
HDMI Cable	**32012-000100-200-RS**				
Display Port Cable	**32004-000200-100-RS**				
Power Adapter	**63040-010060-040-RS (60W 12V DC adapter with lock)**				
Power cord	**Depends on shipping region**				

Table 2-2: Optional Items

Chapter

3

Installation

3.1 Installation Precautions

When installing the DM-F series LCD monitor, please follow the precautions listed below:

- **Read the user manual**: The user manual provides a complete description of the DM-F series LCD monitor, installation instructions and configuration options.
- **DANGER! Disconnect Power**: Power to the monitor must be disconnected when installing the DM-F series LCD monitor, or before any attempt is made to access the rear panel. Electric shock and personal injury might occur if the rear panel of the monitor is opened while the power cord is still connected to an electrical outlet.
- **Qualified Personnel**: The DM-F series LCD monitor must be installed and operated only by trained and qualified personnel. Maintenance, upgrades, or repairs may only be carried out by qualified personnel who are familiar with the associated dangers.
- **Mounting**: Since the monitor may weigh up to 10 kg (not including a swing arm or other accessories), please ensure at least two people assist with mounting the monitor.
- **Air Circulation**: Make sure there is sufficient air circulation when installing the monitor. The monitor's cooling vents must not be obstructed by any objects. Blocking the vents can cause overheating of the monitor. Leave at least 5 cm of clearance around the monitor to prevent overheating.
- **Grounding**: The monitor should be properly grounded. The voltage feeds must not be overloaded. Adjust the cabling and provide external overcharge protection per the electrical values indicated on the label attached to the back of the monitor.
- **Anti-static Discharge**: The rear panel of the monitor must to be removed to configure the monitor's AD board voltage select jumper. When doing so, be sure the monitor is disconnected from its power source and take all necessary safety precautions to avoid electrocution and static discharge to the AD board. The use of a grounded wrist strap and an anti-static work pad is recommended.

3.2 Pre-installation Preparation

3.2.1 Tools

Before installing the DM-F series LCD monitor, make sure the following tools are on hand:

- **Philips (crosshead) screwdriver**: All the retention screws on the system are Philips screws.
- **Soft working mat**: When the DM-F series LCD monitor is installed, the screen is placed on the working surface. It is therefore important to rest the MPC industrial workstation on a soft at that cannot damage the LCD screen on the front of the DM-F series LCD monitor.

3.3 External Peripheral Device Connection

The external peripheral interface panel connectors for the DM-F series industrial monitors are listed below.

- 1 x DisplayPort 1.1
- 1 x 9V-36V terminal block
- 1 x Lockable 9V-36V DC jack
- 1 x DVI or 1 x HDMI
- 1 x RS-232 (reserved for resistive touch ATO)
- 1 x USB 2.0 for touch screen
- 1 x VGA

Figure 3-1 and **Figure 3-2** shows the EPIC panel connectors for the DM-F series LCD monitor. The following sections fully describe EPIC panel connectors.

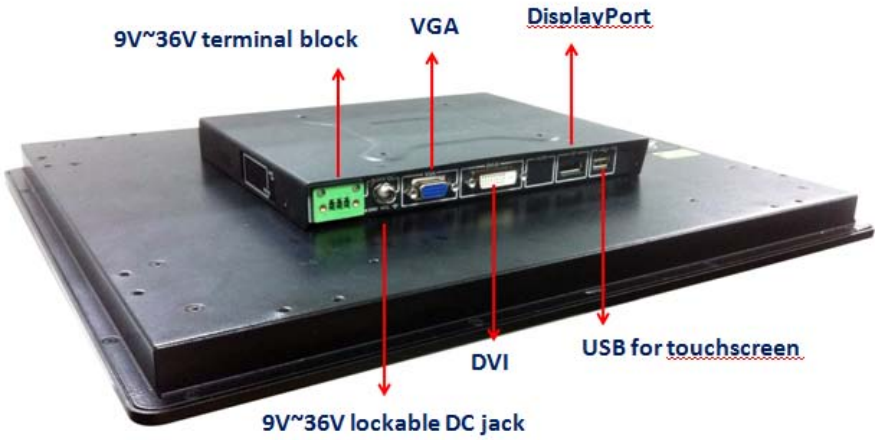

Figure 3-1: Connectors (DM-F12A/15A/17A)

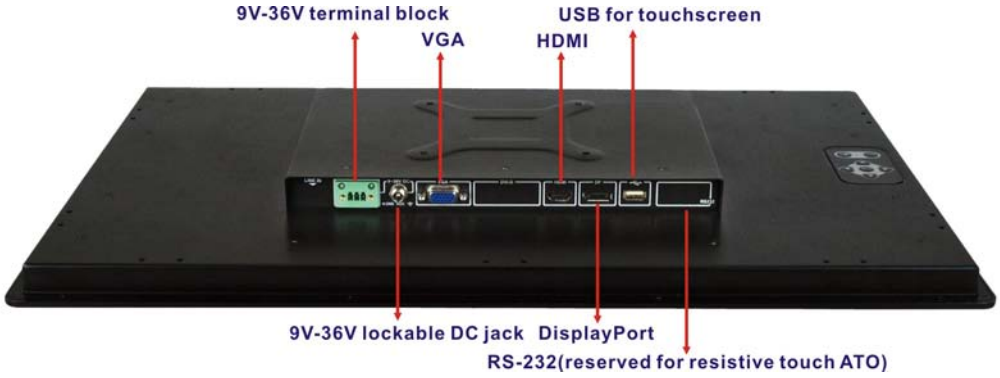

Figure 3-2: Connectors (DM-F22A/24A)

3.3.1 DisplayPort Connector

The DisplayPort connector transmits a digital signal to compatible DisplayPort display devices such as a TV or computer screen.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	ML_L3N	2	GND
3	ML_L3P	4	ML_L2N
5	GND	6	ML_L2P
7	ML_L1N	8	GND
9	ML_L1P	10	ML_L0N

11	GND	12	ML_L0P
13	GND	14	GND
15	C_DDI0_DP_AUXP	16	GND
17	C_DDI0_DP_AUXN	18	C_DDI0_DP_HPD
19	GND	20	VCC
21	GND	22	GND
23	GND	24	GND

Table 3-1: Display Port Connector Pinouts

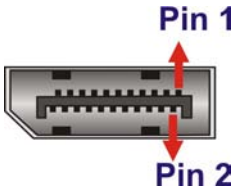

Figure 3-3: DisplayPort connector

3.3.2 9V-36V Terminal Block

Connect the leads of 9V-36V DC power supply into the terminal block. Make sure that the power and ground wires are attached to the correct sockets of the connector.

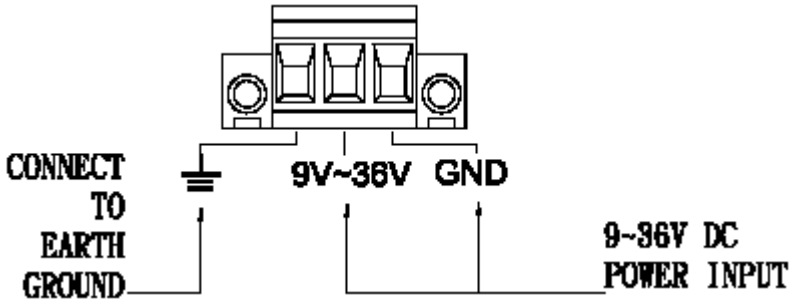

Figure 3-4: 3-pin Terminal Block

3.3.3 9V-36V DC Jack

The power connector connects to the 9V-36V DC power adapter.

Figure 3-5: 9V-36V DC Jack

3.3.4 DVI Connector

The DVI connector connects to a display device with DVI interface.

PIN	Description	PIN	Description
1	RX2-	2	RX2+
3	GND	4	NC
5	NC	6	DVI-SCL
7	DVI-SDA	8	NC
9	RX1-	10	RX1+
11	GND	12	NC
13	NC	14	DVI-5V
15	GND	16	HOT-PLUG
17	RX0-	18	RX0+
19	GND	20	NC
21	NC	22	GND
23	RXC+	24	RXC-

Table 3-2: DVI Connector Pinouts

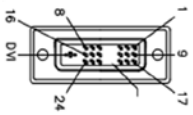

Figure 3-6: DVI Connector

3.3.5 RS-232 for Touch Panel Connector (Reserved for resistive touch ATO)

Use the rear panel standard RS-232 DB-9 female touch panel connector to connect the monitor to the system graphics interface.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	N/A	6	NDSR
2	NRX	7	NRTS
3	NTX	8	N/A
4	NDTR	9	N/A
5	GND		

Table 3-3: RS-232 Touch Panel Connector Pinouts

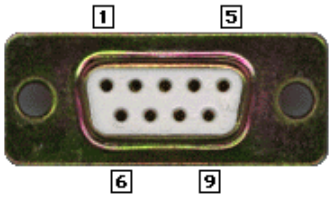

Figure 3-7: RS-232 Touch Panel Connector

3.3.6 USB for Touch Panel Connector

Use the rear panel standard USB touch panel connector to connect the monitor to the system graphics interface.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC	2	USB20_N11
3	USB20_P11	4	GND

Table 3-4: USB Touch Panel Connector Pinouts

Figure 3-8: USB Touch Panel Connector

3.3.7 VGA Connector

Use the rear panel standard 15-pin female VGA connector to connect the monitor to the system graphics interface.

PIN	DESCRIPTION	PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	6	GROUND	11	NC
2	GREEN	7	GROUND	12	DDCDAT
3	BLUE	8	GROUND	13	HSYNC
4	NC	9	NC	14	VSYNC
5	GROUND	10	GROUND	15	DDCCLK

Table 3-5: VGA Connector Pinouts

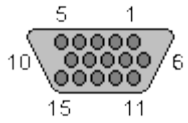

Figure 3-9: VGA Connector

3.4 Mounting the Monitor

The DM-F series LCD monitor can be mounted in a panel, cabinet, rack or wall. The monitor can also be mounted on a monitor arm or stand. The mounting methods are described below.

CAUTION:

When mounting the monitor take care to tighten the retention screws or bolts until fully secure, but do not over tighten. Over tightening the retention screws or bolts may cause them to become stripped, rendering them useless.

3.4.1 Panel Mounting

Each model of the DM-F series LCD monitor has a series of mounting slots located on the top and bottom panel for mounting the monitor to a panel.

Table 3- lists the number of mounting clamps required to mount the monitor to a panel.

Model	Mounting Clamps
DM-F12A	9
DM-F15A	9
DM-F17A	9
DM-F22A	10
DM-F24A	12

Table 3-6: Panel Mounting Clamps

To mount the DM-F series LCD monitor into a panel, please follow the steps below.

Step 1: Select the position on the panel to mount the monitor.

Step 2: Cut out a section of the panel that corresponds to the rear panel dimensions of the monitor. Take care that the panel section that is cut out is smaller than the overall size of the metal frame that surrounds the monitor but just large enough for the rear panel of the monitor to fit through.

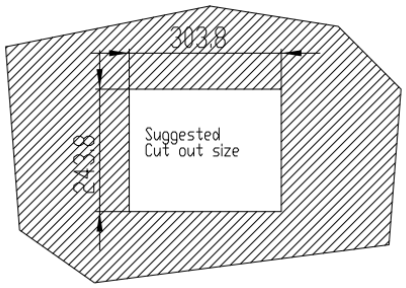

Figure 3-10: DM-F12A Cutout Dimensions (Unit: mm)

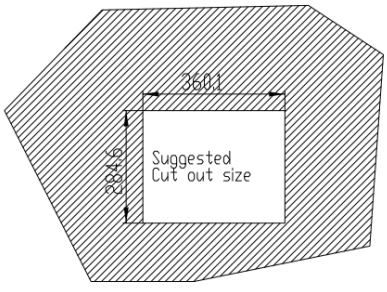

Figure 3-11: DM-F15A Cutout Dimensions (Unit: mm)

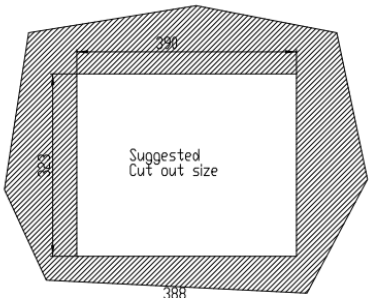

Figure 3-12: DM-F17A Cutout Dimensions (Unit: mm)

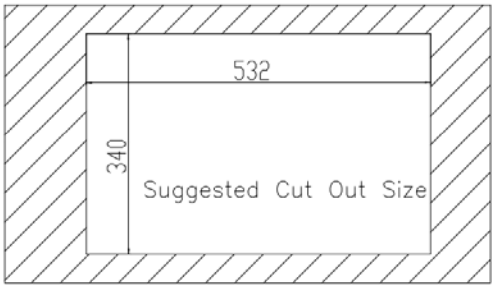

Figure 3-13: DM-F22A Cutout Dimensions (Unit: mm)

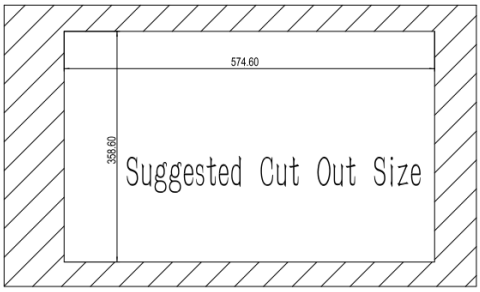

Figure 3-14: DM-F24A Cutout Dimensions (Unit: mm)

Step 3: Slide the monitor through the hole until the aluminum frame is flush against the panel.

Step 4: Secure the panel mounting brackets to the rear of the monitor and insert the panel mounting clamps into the pre-formed holes along the two edges of the panel mounting brackets (**Figure 3-15**).

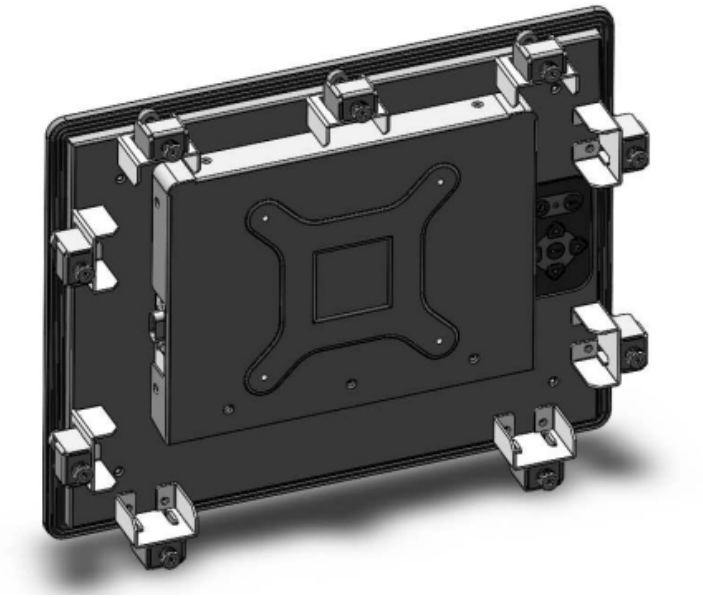

Figure 3-15: Panel Mounting Clamp Position

Step 5: Tighten the screws that pass through the panel mounting clamps until the plastic caps at the front of all the screws are firmly secured to the panel (**Figure 3-17**).

3.4.2 Cabinet and Rack Installation

The DM-F series LCD monitor can be installed into a cabinet or rack. The installation procedures are similar to the panel mounting installation. To do this, please follow the steps below:

NOTE:

When purchasing a cabinet/rack installation bracket, make sure it is compatible with both the monitor and the cabinet/rack into which the monitor is installed.

Step 1: Slide the rear of the DM-F series LCD monitor through the rack/cabinet bracket until the aluminum frame is flush against the front of the bracket (**Figure 3-16**).

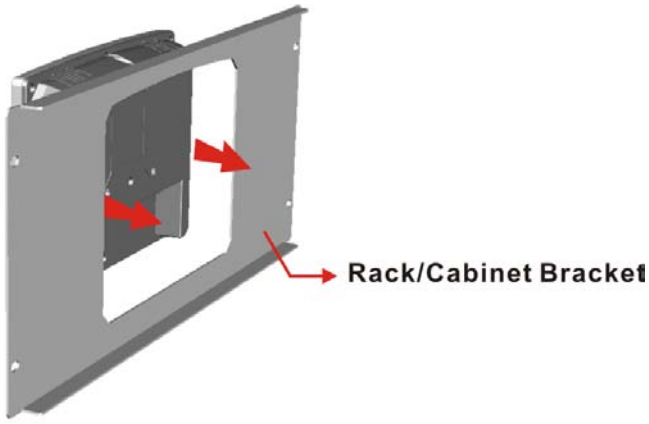

Figure 3-16: The Rack/Cabinet Bracket

Step 2: Secure the panel mounting brackets to the rear of the monitor and insert the panel mounting clamps into the pre-formed holes along the two edges of the panel mounting brackets (**Figure 3-15**).

Step 3: Tighten the screws that pass through the rack mounting clamps until the plastic caps at the front of all the screws are firmly secured to the bracket (**Figure 3-17**).

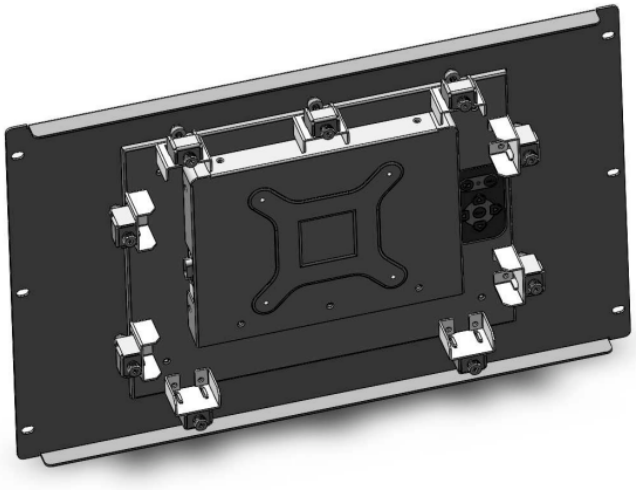

Figure 3-17: Secure the Rack/Cabinet Bracket

Step 4: Slide the LCD monitor with the attached rack/cabinet bracket into a rack or cabinet (**Figure 3-18**).

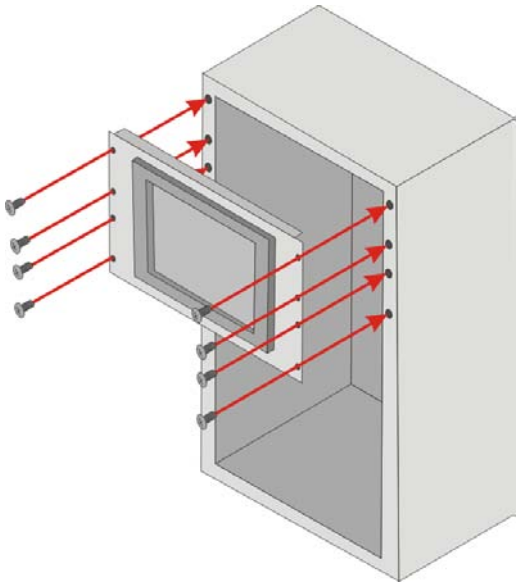

Figure 3-18: Install into a Rack/Cabinet

Step 5: Once the LCD monitor with the attached rack/cabinet bracket has been properly inserted into the rack or cabinet, secure the front of the rack/cabinet bracket to the front of the rack or cabinet (**Figure 3-18**).

3.4.3 Wall Mounting

CAUTION:

Due to safety concerns, it is highly recommended to use the VESA mounting kits provided by IEI for wall, stand and arm mounting. If the VESA mounting kit is purchased separately, please make sure the mounting kit is UL-listed.

Each model of the DM-F series LCD monitor has four holes located on the rear panel for mounting the monitor to a wall. To mount the DM-F series LCD monitor onto a wall, please follow the steps below.

Step 6: Select a location on the wall for the wall-mounting bracket.

Step 7: Carefully mark the locations of the four bracket screw holes on the wall.

Step 8: Drill four pilot holes at the marked locations on the wall for the bracket retention screws.

Step 9: Align the wall-mounting bracket screw holes with the pilot holes.

Step 10: Secure the mounting-bracket to the wall by inserting the retention screws into the four pilot holes and tightening them (**Figure 3-19**).

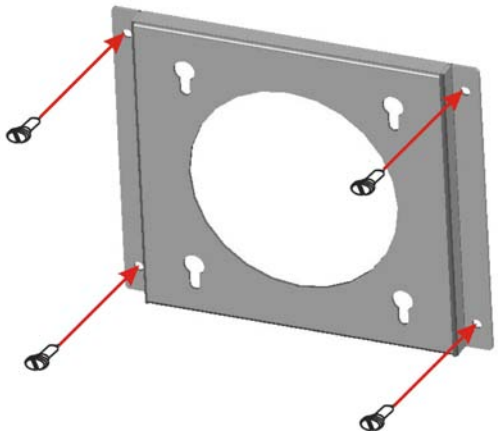

Figure 3-19: Wall-mounting Bracket

Step 11: Insert the four monitor mounting screws provided in the wall mounting kit into the four screw holes on the real panel of the monitor and tighten until the screw shank is secured against the rear panel (**Figure 3-20**).

Step 12: Align the mounting screws on the monitor rear panel with the mounting holes on the bracket.

Step 13: Carefully insert the screws through the holes and gently pull the monitor downwards until the monitor rests securely in the slotted holes (**Figure 3-20**). Ensure that all four of the mounting screws fit snuggly into their respective slotted holes.

NOTE:

In the diagram below the bracket is already installed on the wall.

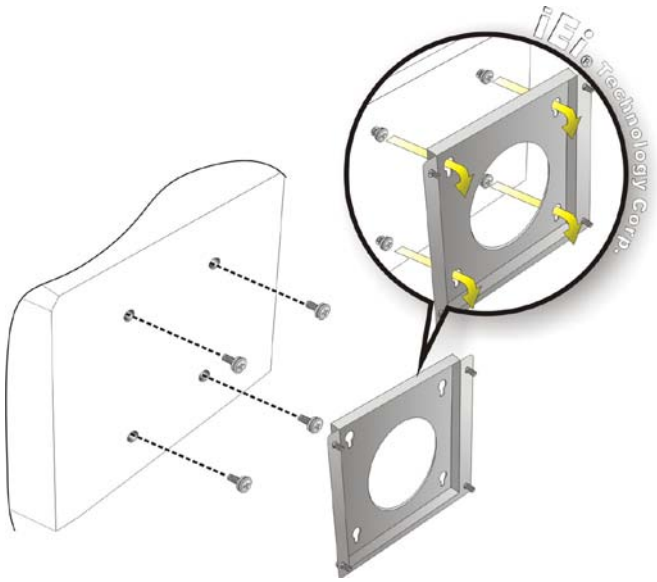

Figure 3-20: Mount the Chassis

3.4.4 Monitor Stand Installation

The DM-F series LCD monitor has Video Electronics Standards Association (VESA) standard mounting holes tapped into the rear panel. The standard holes are M4 set at 100m x 100mm apart (**Figure 3-21**).

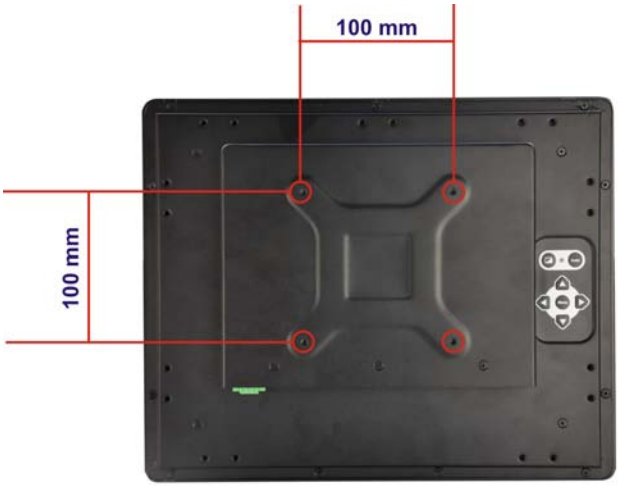

Figure 3-21: VESA Mounting Holes

The monitor stand mounting plate has a matching VESA hole pattern. To mount the DM-F series LCD monitor onto a stand, please follow the steps below.

Step 1: Line up the threaded holes on the monitor rear panel with the screw holes on the monitor stand mounting plate.

Step 2: Secure the monitor to the stand with the supplied retention screws (**Figure 3-22**).

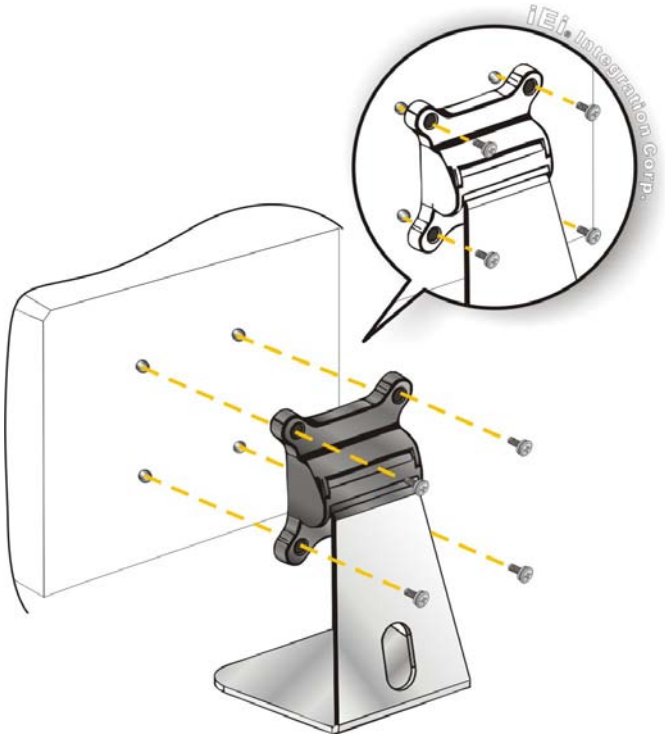

Figure 3-22: Monitor Stand Mounting

3.4.5 Monitor Arm Installation

The DM-F series LCD monitor has Video Electronics Standards Association (VESA) standard mounting holes tapped into the rear panel. The standard holes are M4 set at 100m x 100mm apart (**Figure 3-21**). The monitor arm mounting plate has a matching VESA hole pattern. To mount the DM-F series LCD monitor onto a monitor arm, please follow the steps below.

Step 1: Line up the threaded holes on the monitor rear panel with the screw holes on the monitor arm mounting plate.

Step 2: Secure the monitor to the arm with the supplied retention screws (**Figure 3-23**).

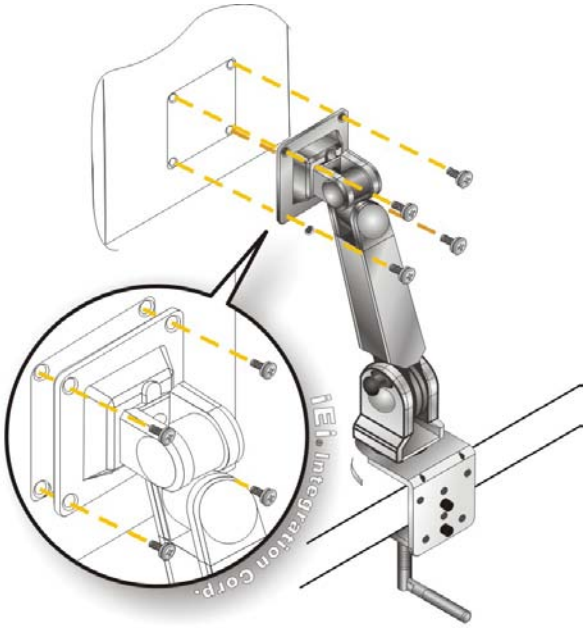

Figure 3-23: Monitor Arm Mounting

Chapter

4

On-Screen-Display (OSD) Controls

4.1 User Mode OSD Structure

4.1.1 OSD Keypad

There are several on-screen-display (OSD) control buttons of the OSD keypad on the monitor rear panel. **Figure 4-1** shows the 7-key membrane OSD keypad of the DM-F series LCD monitor.

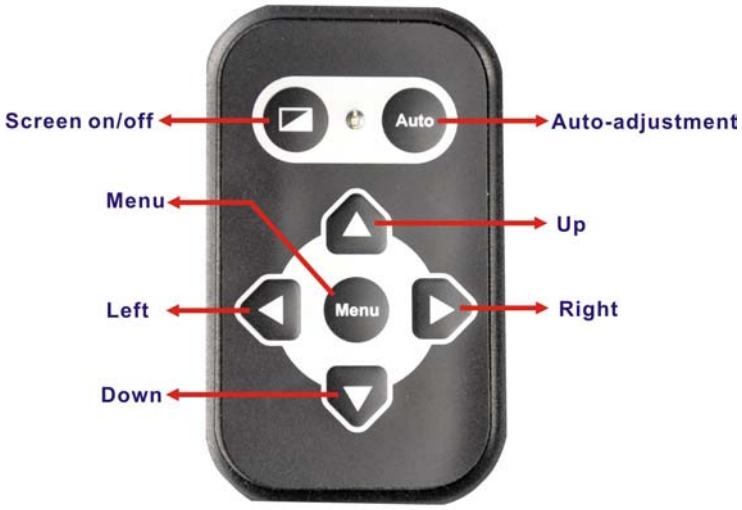

Figure 4-1: OSD Keypad

4.1.2 OSD Menu Structure

Table 4-1 shows the OSD menu structure for all models of the DM-F series LCD monitor.

Level 0	Level 1	Level 2	Value
Image	Brightness		0 to 100
	Contrast		0 to 100
	Sharpness		-4 to 4
	Color	Auto	
		Color temp	5000K
			6500K
			9300K
			User
			Reset
Display	Auto Adjust		
	Phase		0 to 100
	Clock		0 to 100
	Display Position		
	Display Modes		Gamma off
			Gamma 2.2
System	Input	Display Port	
		VGA	
		DVI/HDMI	
		autoscan	
	OSD Setting	Timer	10sec/30sec/60sec
		Rotation	0°/90°/180°/270°
		Position	
		Transparency	0 to 100
	Information		
	Reset		

Table 4-1: OSD Menu Structure

4.2 Using the OSD

OSD menu options are described below.

4.2.1 Image Menu

Image menu features are shown in **Figure 4-2**.

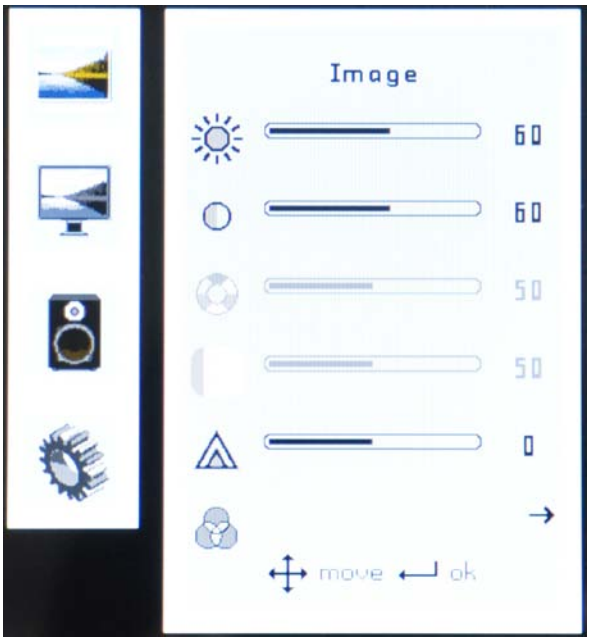

Figure 4-2: Image Menu

Brightness	The brightness option adjusts the brightness of screen. This function adjusts the offset value of ADC. Setting this value too high or too low will affect the quality of image.
Contrast	This function adjusts the gain value of ADC. Adjusting this value too high or too low will worsen the quality of image.
Sharpness	Adjusts the sharpness level. This option softens the edges around objects on the screen.
Color	Provides options for color settings. (**Figure 4-3**)

4.2.1.1 Color Setting

Color settings are shown in **Figure 4-2**.

Figure 4-3: Color Settings

auto Automatically adjusts the color settings.

Color temp This item allows adjustment of the following items.

- **5000k –** NTSC standard Kelvin
- **6500k –** NTSC standard Kelvin
- **9300k –** NTSC standard Kelvin
- **User** – This item allows fine-tuning the balance among Red, Green, and Blue color hues if images look garish or unrealistic.

4.2.2 Display Menu

Display menu features are shown in **Figure 4-4**.

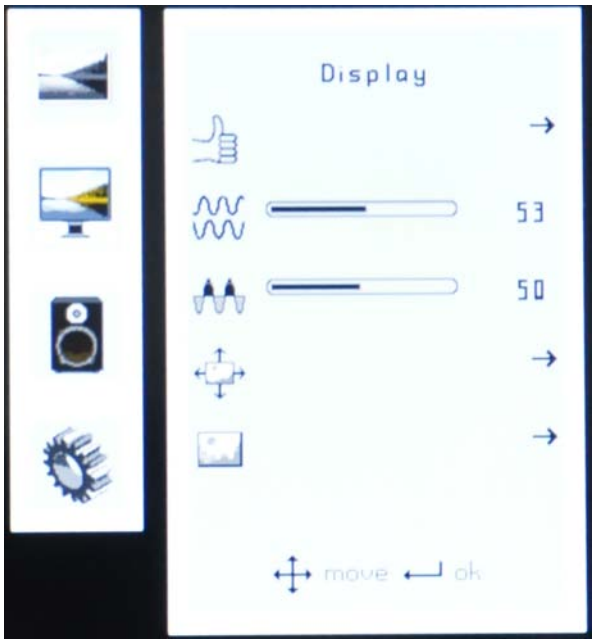

Figure 4-4: Display Menu

Auto Adjust	Automatically adjusts the LCD screen position.
Phase	Adjusts the input signal (Analog only)
Clock	Adjusts the dot clock position
Display Position	Adjusts the horizontal and vertical position of the display screen
Display Mode	This item allows adjustment of the Gamma.

4.2.3 System Menu

System menu features are shown in **Figure 4-5**.

Figure 4-5: System Menu

Input	Allows selection of input device to use. (**Figure 4-6**)
OSD Settings	Provides options for OSD configuration. (**Figure 4-7**)
Information	Provides information on the LCD monitor, such as firmware version, release date and input resolution.
Reset	Restores the default OSD settings. Note that this will restore all default display settings.

4.2.3.1 Input

Input options are shown in **Figure 4-6**.

Figure 4-6: Input Options

Input options are described below.

Display Port	This item sets the input device to display port.
VGA	This item sets the input device to VGA.
DVI/HDMI	This item sets the input device to DVI/HDMI.
autoscan	Selects the input device to use automatically.

4.2.3.2 OSD Settings

The OSD settings are shown in **Figure 4-7**.

Figure 4-7: OSD Settings Menu

OSD settings are described below.

Timer	Determines how many seconds the OSD screen stays on screen before it disappears when OSD is left unattended.
Rotation	Adjusts the OSD rotation angle on the screen.
Position	Adjusts the OSD position on the screen.
Transparency	Adjust the transparency of the OSD menu background.

Chapter

5

Software Drivers

5.1 Introduction

The touch panel controller enables analog resistive touch panels for four-wire, five-wire & eight-wire models. The controller directly communicates with the PC system through the touch panel communications interface. The controller design is superior in sensitivity, accuracy, and friendly operation. The touch panel driver emulates the left mouse button and the right mouse button functions.

The touch panel driver supports the following operating systems:

- Microsoft® Windows® versions:
  - Microsoft® Windows® 2000
  - Microsoft® Windows® XP
  - Microsoft® Windows® 2003
  - Microsoft® Windows® 2008
  - Microsoft® Windows® Vista
  - Microsoft® Windows® 7
  - Microsoft® Windows® 8
- Microsoft® Windows® CE versions:
  - Microsoft® Windows® CE 4.2
  - Microsoft® Windows® CE 5.0
  - Microsoft® Windows® CE 6.0
- Linux Kernel 2.6
- DOS

Driver installation is described below.

5.2 RS-232 or USB Touch Screen

Before installing the driver, connect the DM-F series monitor to the motherboard. The DM-F series monitors support touch screen modality through an RS-232 or USB interface connection. Decide through which interface the touch screen is to be controlled.

NOTE:

The default touch screen interface for the DM-F series monitor is USB interface.

The RS-232 interface is only reserved for resistive touch ATO

- **RS-232 Interface:** If the touch screen interface connection is an RS-232 connection, connect the RS-232 connector on the single board computer to the DB-9 connector of the DM-F series monitor.

- **USB Interface:** If the touch screen interface connection is a USB connection, connect the USB connector on the single board computer to the external USB port connector of the DM-F series monitor.

5.3 Touch Panel Driver Installation

WARNING:

Before the touch screen driver is installed, make sure the system is connected to the monitor with a USB cable or an RS-232 null cable. Also, make sure the VGA connector on the system is connected to the VGA connector on the bottom of the monitor.

To install the touch panel driver for the DM-F series, please follow the instructions below:

Step 1: **Connect the DM-F series monitor to the single board computer**. See above.

Step 2: **Install the driver CD**. Install the driver CD into the system to which the DM-F series monitor is connected.

Step 3: Select the **Touch Screen** option in the menu of driver CD. The directory in **Figure 5-1** appears.

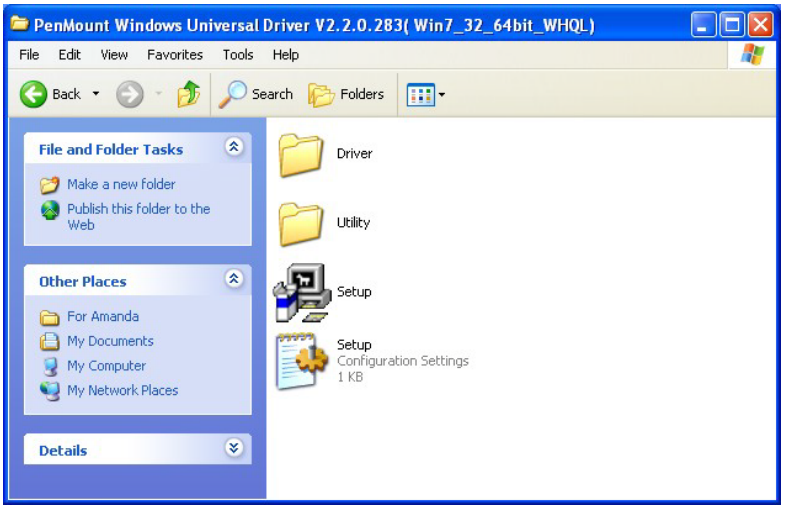

Figure 5-1: Setup Icon

Step 4: Double click the setup icon in **Figure 5-1**.

Step 5: The Welcome screen in **Figure 5-2** appears.

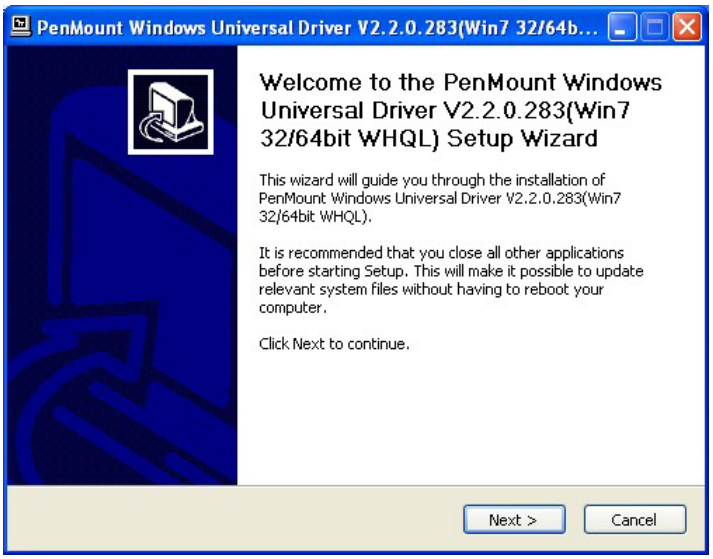

Figure 5-2: Welcome Screen

Step 6: Click **Next** to continue.

Step 7: The license agreement in **Figure 5-3** appears. Accept the terms of the agreement by clicking **I Agree**.

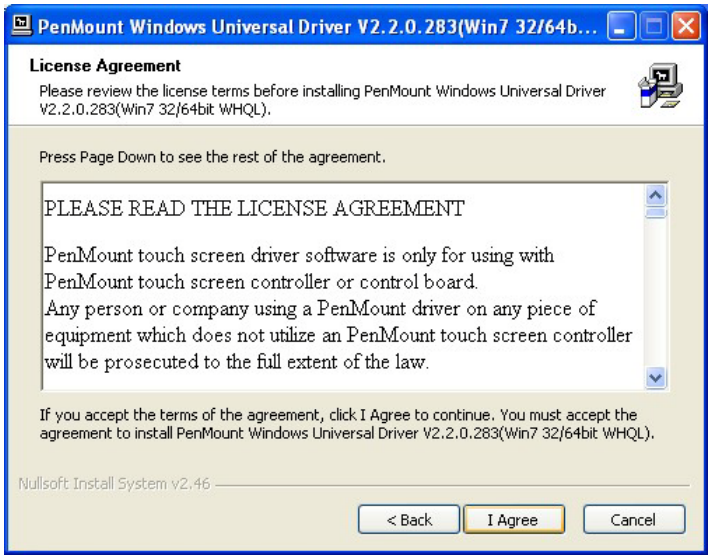

Figure 5-3: License Agreement

Step 8: The installation destination screen appears. See **Figure 5-4**. Click **Install**.

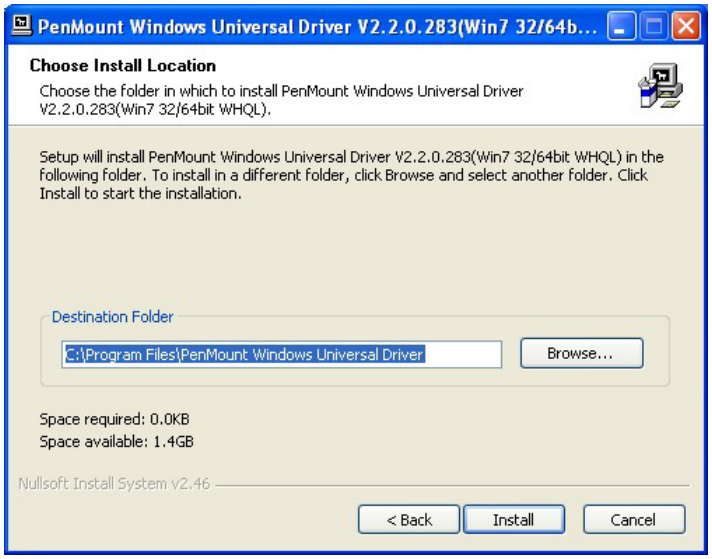

Figure 5-4: Initiate Install

Step 9: The installation of the program begins. See **Figure 5-5**.

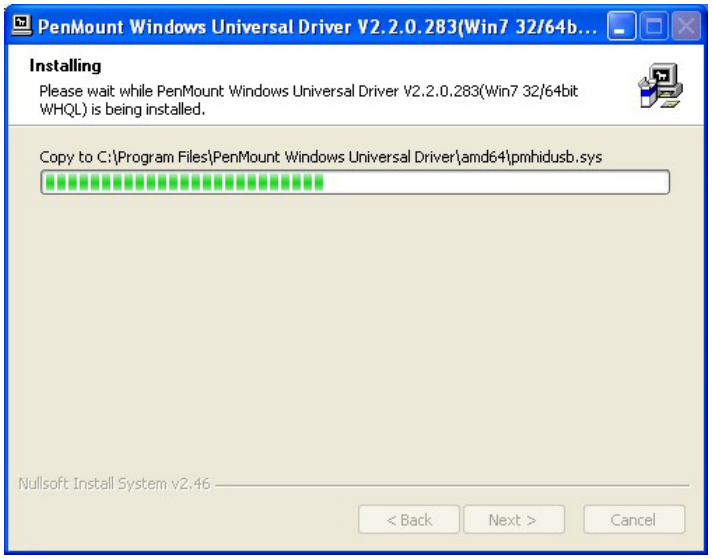

Figure 5-5: Installation Starts

Step 10: When the installation is complete, the complete screen appears. See **Figure 5-6**.

To complete the installation process click **Finish**.

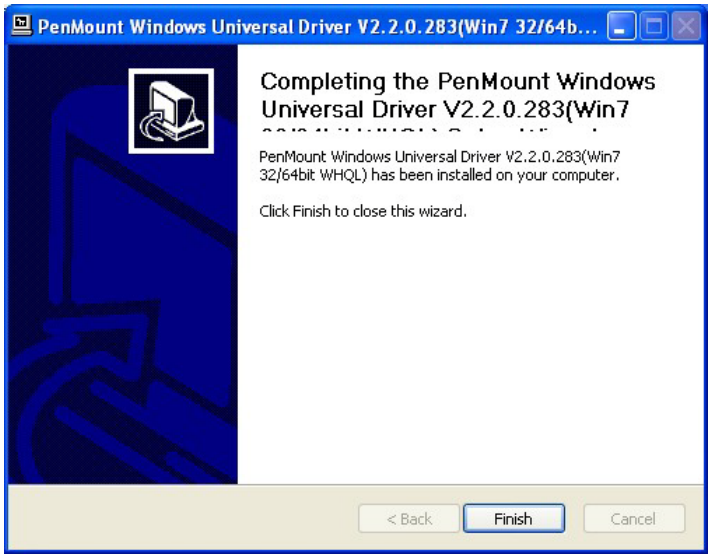

Figure 5-6: Finish Installation

5.4 Change the Touch Screen Interface

If the touch screen interface must be changed from an RS-232 interface to a USB interface or, from a USB interface to an RS-232 interface, the following steps must be followed.

Step 1: Uninstall the touch screen driver

Step 2: Remove the interface cable i.e. remove the RS-232 cable or the USB cable

Step 3: Install the new cable i.e. install the USB cable or the RS-232 cable.

Step 4: Reinstall the driver CD as described above.

5.5 Calibrating the Touch Screen

To calibrate the touch screen cursor with the motion of the touch screen pen (or finger), please follow the steps below:

Step 1: Make sure the system is properly connected through an RS-232 or a USB interface to the DM-F series monitor.

Step 2: Make sure the touch screen driver is properly installed.

Step 3: Locate the PenMount Monitor icon in the bottom left corner of the screen.

Figure 5-7: PenMount Monitor Icon

Step 4: Click the icon. A pop up menu appears. See **Figure 5-8**.

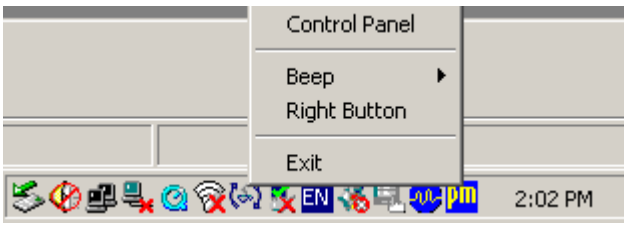

Figure 5-8: PenMount Monitor Popup Menu

Step 5: Click Control Panel in the pop up menu shown in **Figure 5-8.**

Step 6: The configuration screen in **Figure 5-9** appears.

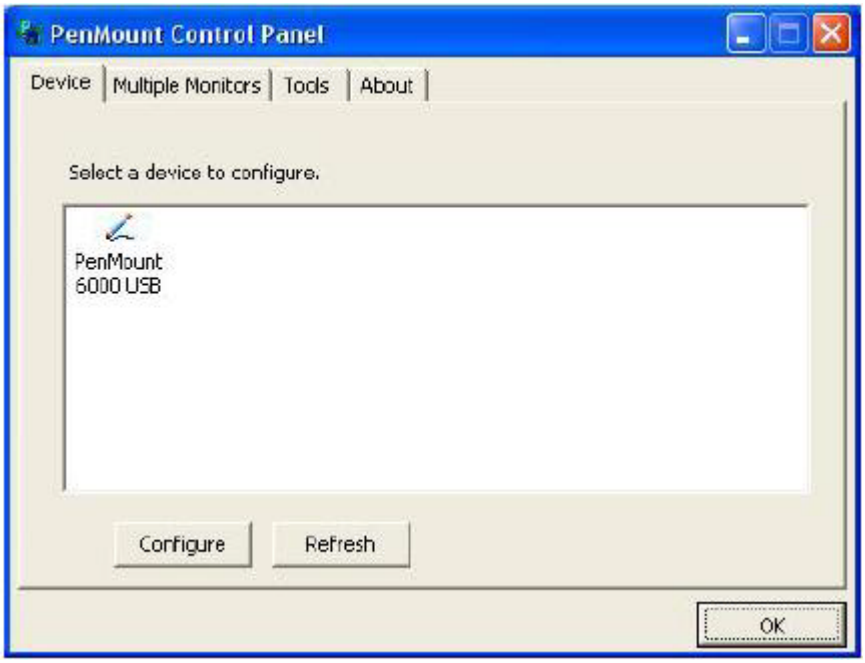

Figure 5-9: Configuration Screen

Step 7: Double click the PenMount 6000 icon as shown in **Figure 5-9**.

Step 8: The calibration initiation screen in **Figure 5-10** appears.

Step 9: Select the Standard Calibration button as shown in **Figure 5-10**.

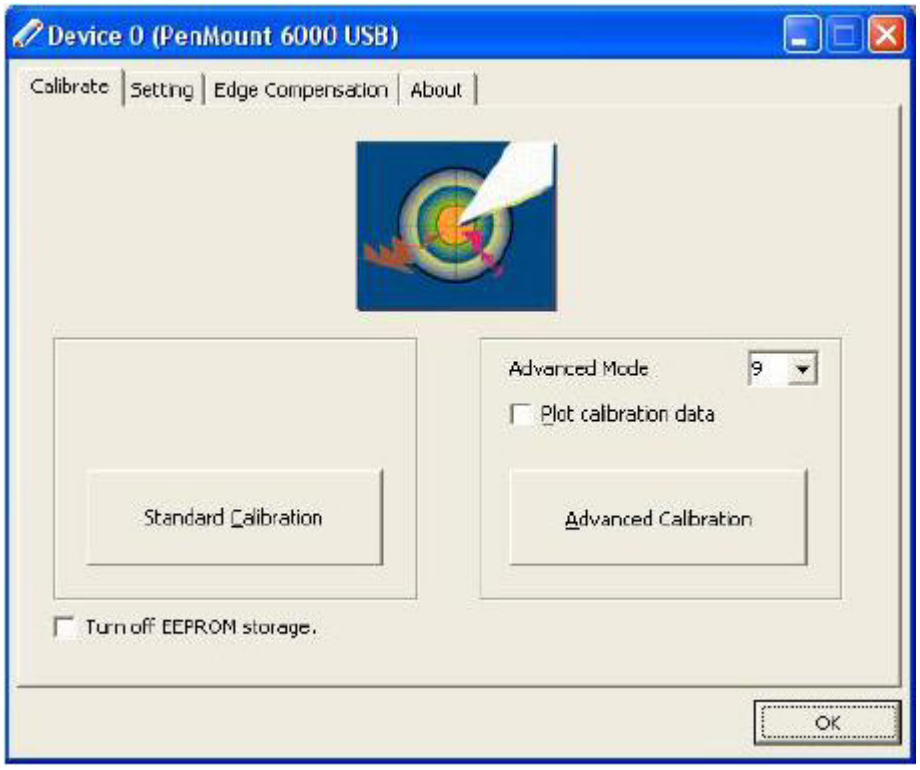

Figure 5-10: Calibration Initiation Screen

Step 10: The calibration screen in is shown. See **Figure 5-11**.

Figure 5-11: Calibration Screen

Step 11: Follow the instructions. The user is asked touch the screen at five specified points after which the screen is calibrated.

Appendix

A

Safety Precautions

WARNING:

The precautions outlined in this chapter should be strictly followed. Failure to follow these precautions may result in permanent damage to the DM-F Series.

A.1 Safety Precautions

Please follow the safety precautions outlined in the sections that follow:

A.1.1 General Safety Precautions

Please ensure the following safety precautions are adhered to at all times.

- ***Follow the electrostatic precautions*** outlined below whenever the DM-F Series is opened.
- ***Make sure the power is turned off and the power cord is disconnected*** whenever the DM-F Series is being installed, moved or modified.
- ***Do not apply voltage levels that exceed the specified voltage range***. Doing so may cause fire and/or an electrical shock.
- ***Electric shocks can occur*** if the DM-F Series chassis is opened when the DM-F Series is running.
- ***Do not drop or insert any objects*** into the ventilation openings of the DM-F Series.
- ***If considerable amounts of dust, water, or fluids enter the*** DM-F Series, turn off the power supply immediately, unplug the power cord, and contact the DM-F Series vendor.
- **DO NOT**:
  - Drop the DM-F Series against a hard surface.
  - Strike or exert excessive force onto the LCD panel.
  - Touch any of the LCD panels with a sharp object
  - In a site where the ambient temperature exceeds the rated temperature

A.1.2 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the DM-F Series may result in permanent damage to the DM-F Series and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the DM-F Series. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the DM-F Series is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging any electrical component.
- ***Self-grounding***: Before handling any electrical component, touch any grounded conducting material. During the time the electrical component is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring or working with an electrical component, place it on an antic-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the electrical component***: When handling the electrical component, hold the electrical component by its edges.

A.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the DM-F Series, please follow the guidelines below.

A.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the DM-F Series, please read the details below.

- Except for the LCD panel, never spray or squirt liquids directly onto any other components. To clean the LCD panel, gently wipe it with a piece of soft dry cloth or a slightly moistened cloth.

- The interior of the DM-F Series does not require cleaning. Keep fluids away from the DM-F Series interior.
- Be cautious of all small removable components when vacuuming the DM-F Series.
- Turn the DM-F Series off before cleaning the DM-F Series.
- Never drop any objects or liquids through the openings of the DM-F Series.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the DM-F Series.
- Avoid eating, drinking and smoking within vicinity of the DM-F Series.

A.2.2 Cleaning Tools

Some components in the DM-F Series may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below is a list of items to use when cleaning the DM-F Series.

- Cloth – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the DM-F Series.
- Water or rubbing alcohol – A cloth moistened with water or rubbing alcohol can be used to clean the DM-F Series.
- Using solvents – The use of solvents is not recommended when cleaning the DM-F Series as they may damage the plastic parts.
- Vacuum cleaner – Using a vacuum specifically designed for computers is one of the best methods of cleaning the DM-F Series. Dust and dirt can restrict the airflow in the DM-F Series and cause its circuitry to corrode.
- Cotton swabs - Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas.
- Foam swabs - Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix

B

Certifications

B.1 RoHS Compliant

All models in the DM-F LCD monitor series comply with the Restriction of Hazardous Materials (RoHS) Directive. This means that all components used to build the industrial workstations and the workstation itself are RoHS compliant.

The RoHS Directive bans the placing on the EU market of new electrical and electronic equipment containing more than agreed levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants.

B.2 IP 65 Compliant Front Panel

The front panels on all five models in the DM-F series LCD monitors have an ingress protection rating (IP) of 65, IP65. The front panels are protected from dust particles and water spray.

Appendix

C

smartOSD

C.1 IEI smartOSD Quick Installation Guide

IEI smartOSD is a proprietary On-Screen-Display (OSD) software solution from IEI that enables easy, remote monitor setting adjustments in a Windows environment. IEI smartOSD delivers excellent performance and provides more flexibility than the typical OSD hardware solutions when adjusting a monitor. smartOSD also allows monitor settings such as brightness, contrast, screen position, size, color gain to be read and changed over normal video cable (VGA or DVI).

C.2 Pre-installation Notice

Before installing smartOSD software, please make sure one of the following operating systems is installed:

- Windows 95
- Windows NT 4.0
- Windows 98
- Windows 2000
- Windows 2003
- Windows XP
- Windows Vista
- Windows 7

C.3 smartOSD Install

Connect the DM-F series to a host computer. Insert the CD that came with the system and follow the instructions below.

Step 1: Insert the CD into a CD drive connected to the system.

Step 2: Locate the setup file and double click on it.

Step 3: The welcome screen shown in Figure C-1 appears.

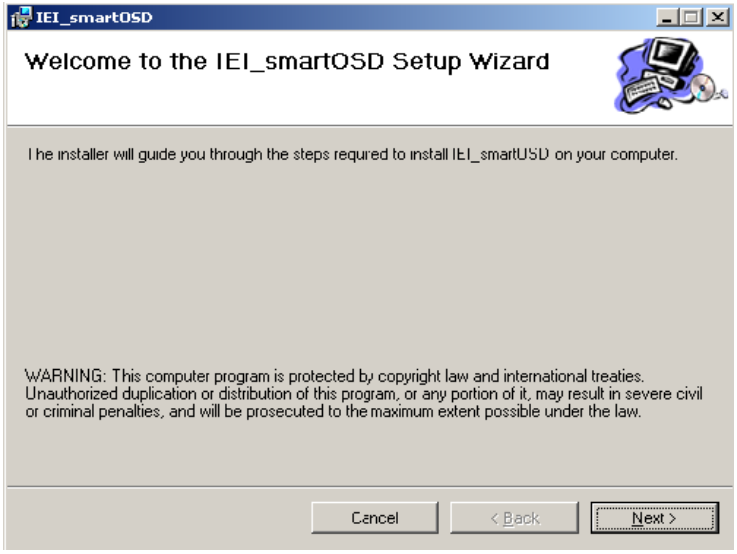

Figure C-1: smartOSD Welcome Screen

Step 4: Click **Next** to continue.

Step 5: The Folder Select screen in **Figure C-2** appears.

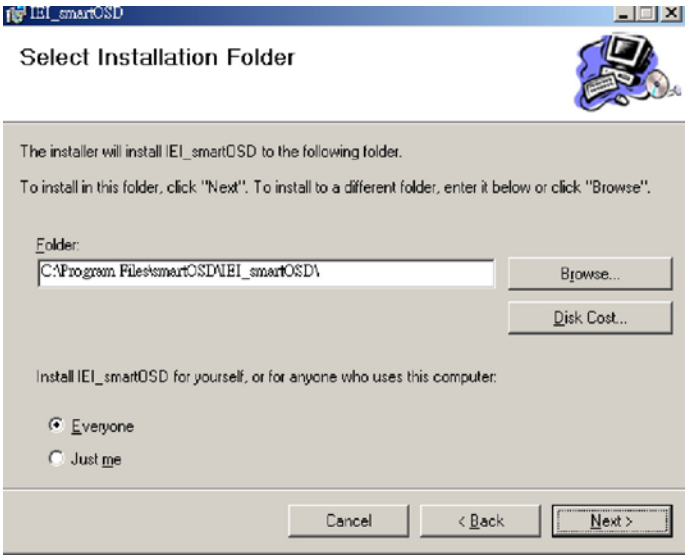

Figure C-2: smartOSD Folder Select Screen

Step 6: Select the installation folder in Figure C-2 shown above.

Step 7: Click **Next** to continue.

Step 8: The screen in Figure C-3 appears.

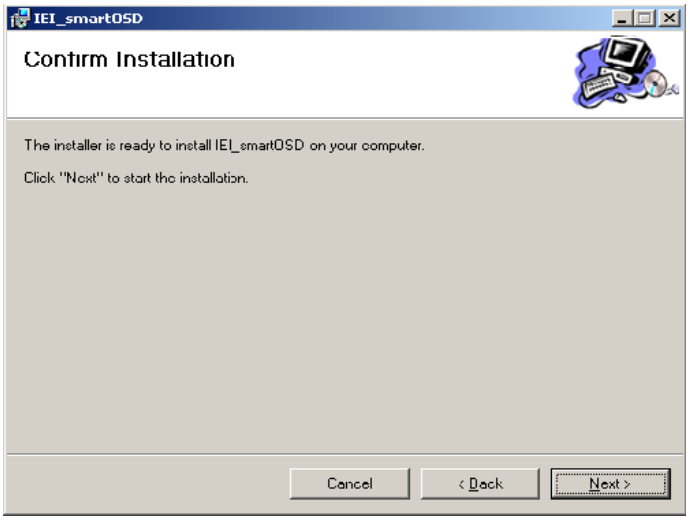

Figure C-3: smartOSD Confirm Installation

Step 9: Confirm the installation by clicking **Next** in the screen above.

Step 10: The program starts to install and the progress bar shown in FIgure C-4 appears.

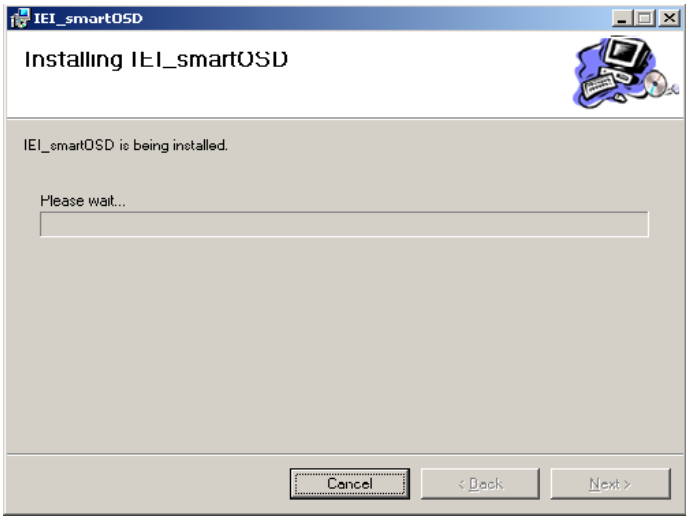

Figure C-4: smartOSD Installation Progress

Step 11: When the installation is complete the “Complete Installation” screen in Figure C-5 appears.

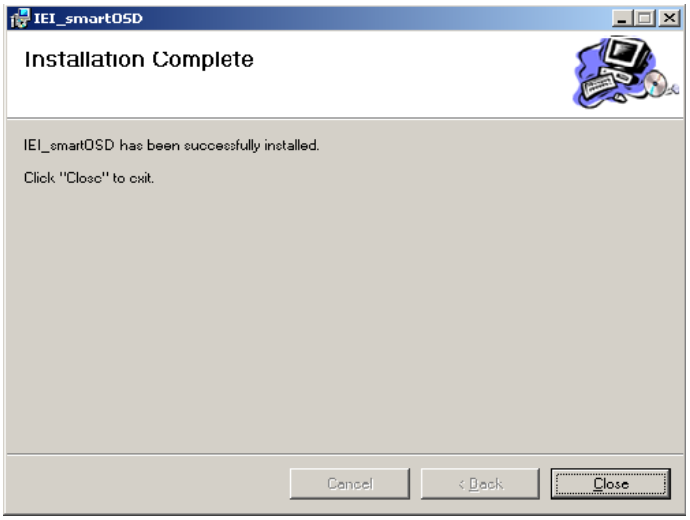

Figure C-5: smartOSD Installation Complete

Step 12: Click **Close** in the screen above.

Step 13: After quick setup is complete, the IEI smartOSD wizard logo appears on the desktop as shown in the screen below.

Step 14: To access the smartOSD, click the smartOSD wizard logo.

C.4 Software Illustration

The table below shows the smartOSD menu structure for all IEI LCD monitors.

NOTE:

To update the display setting status immediately, push the refresh button on every page

To turn the system on, press ALT + P.

Item	Elements
Management	Save/Load File
	Power Management
EDID	EDID contains basic information about the monitor and its capabilities.
Image	Brightness
	Contrast
	Sharpness
Display	Auto Adjust
	Phase
	Clock
Color	Auto Color
	User Red Gain
	User Green Gain
	User Blue Gain
	Color Temperature
	Gamma (disabled in the DM-F Series)
PIP	PIP (disabled in the DM-F Series)
	PIP Source Input (disabled in the DM-F Series)
	PIP Size (disabled in the DM-F Series)
System	Monitor Power Control

	Auto Brightness (disabled in the DM-F Series)
	Main Source Input (YPbPr, S-Video and CVBS disabled)
	Volume (disabled in the DM-F Series)
	Factory Presets/OSD Lock/OSD Unlock
	Mute (disabled in the DM-F Series)

Table C-1: SmartOSD Menu Structure

C.4.1 Manage Page

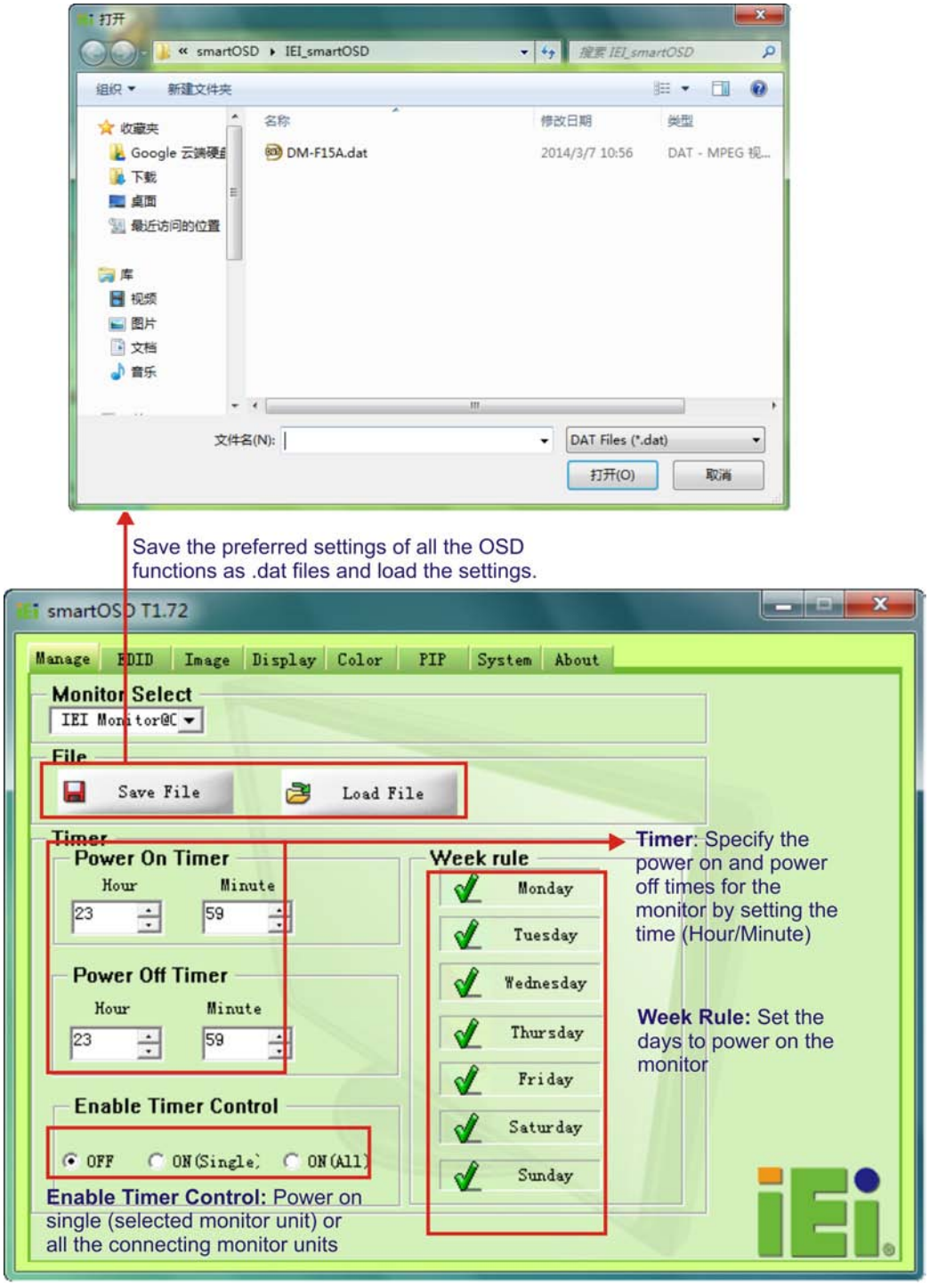

Figure C-6: Manage Page

C.4.2 EDID Page

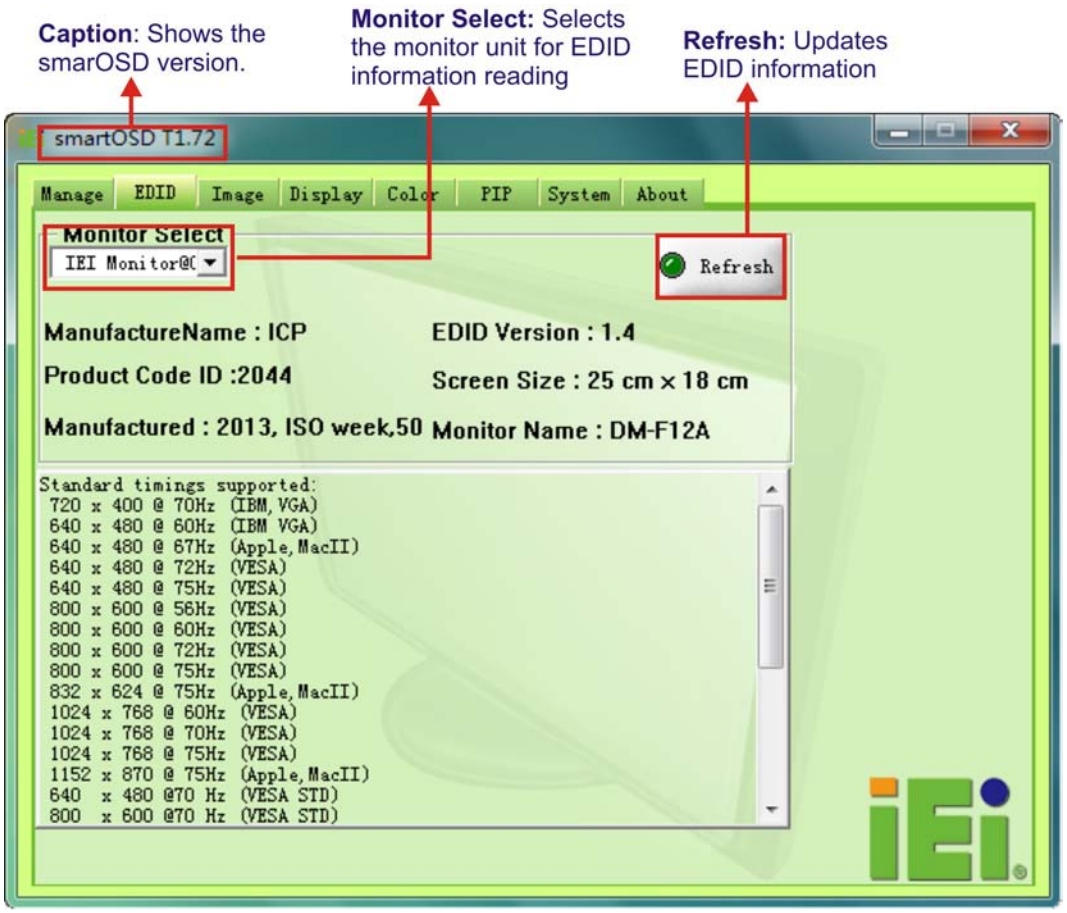

Figure C-7: EDID Page

C.4.3 Image Page

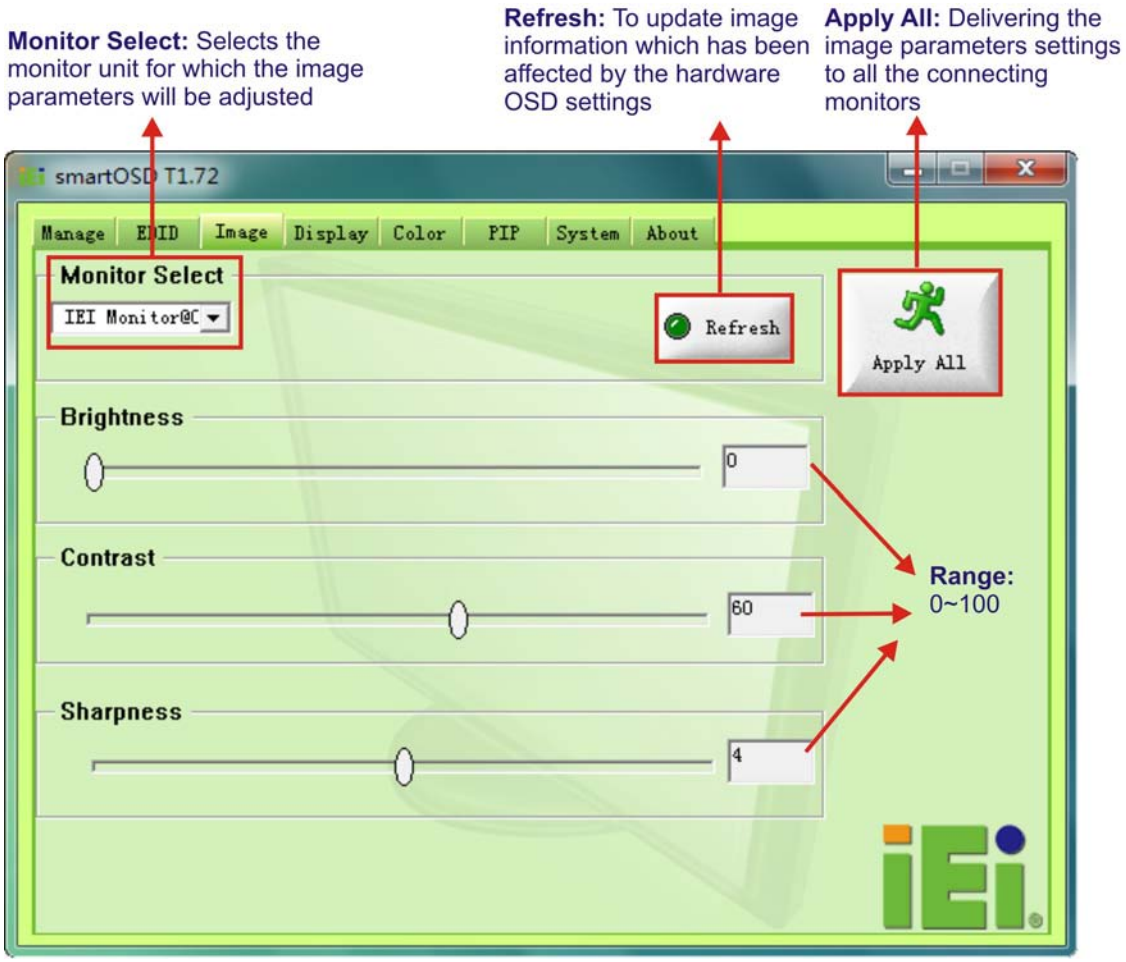

Figure C-8: Image Page

C.4.4 Display Page (for analog signal)

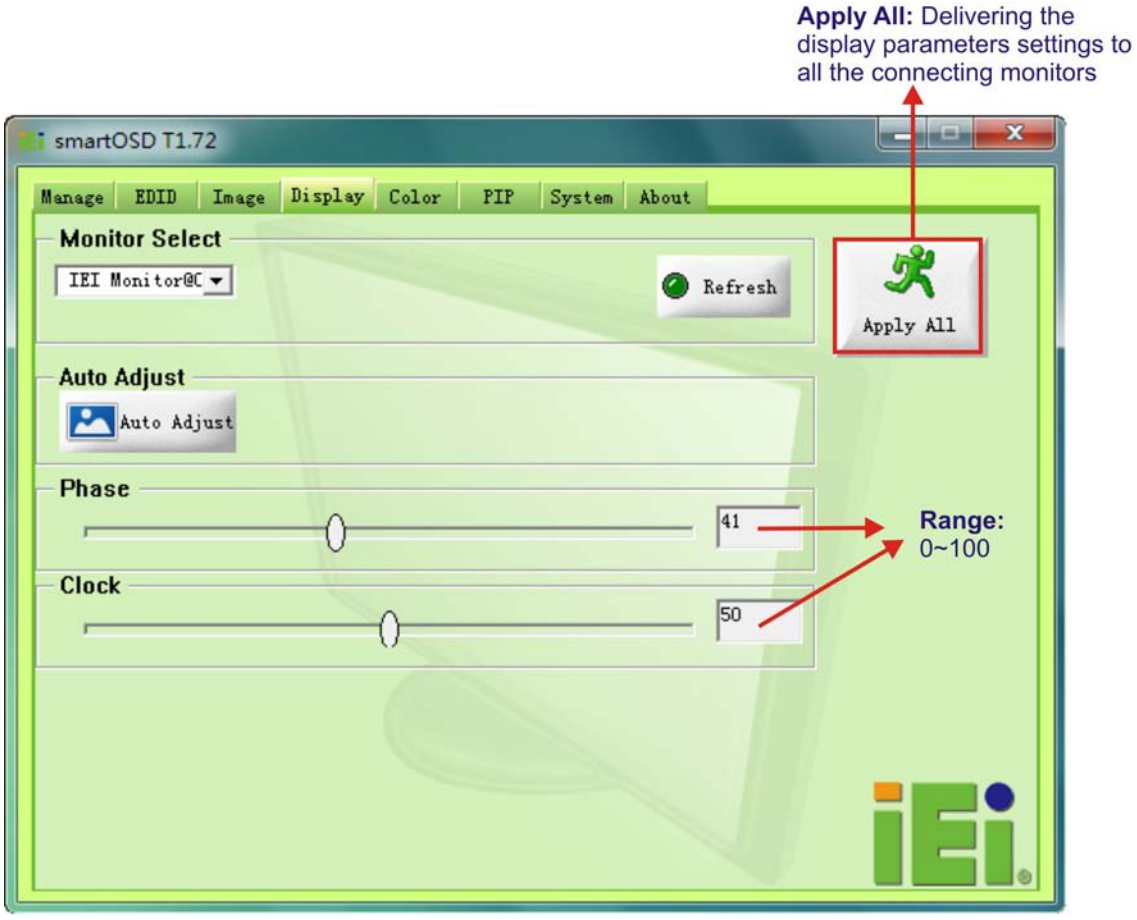

Figure C-9: Display Page

C.4.5 Color Page

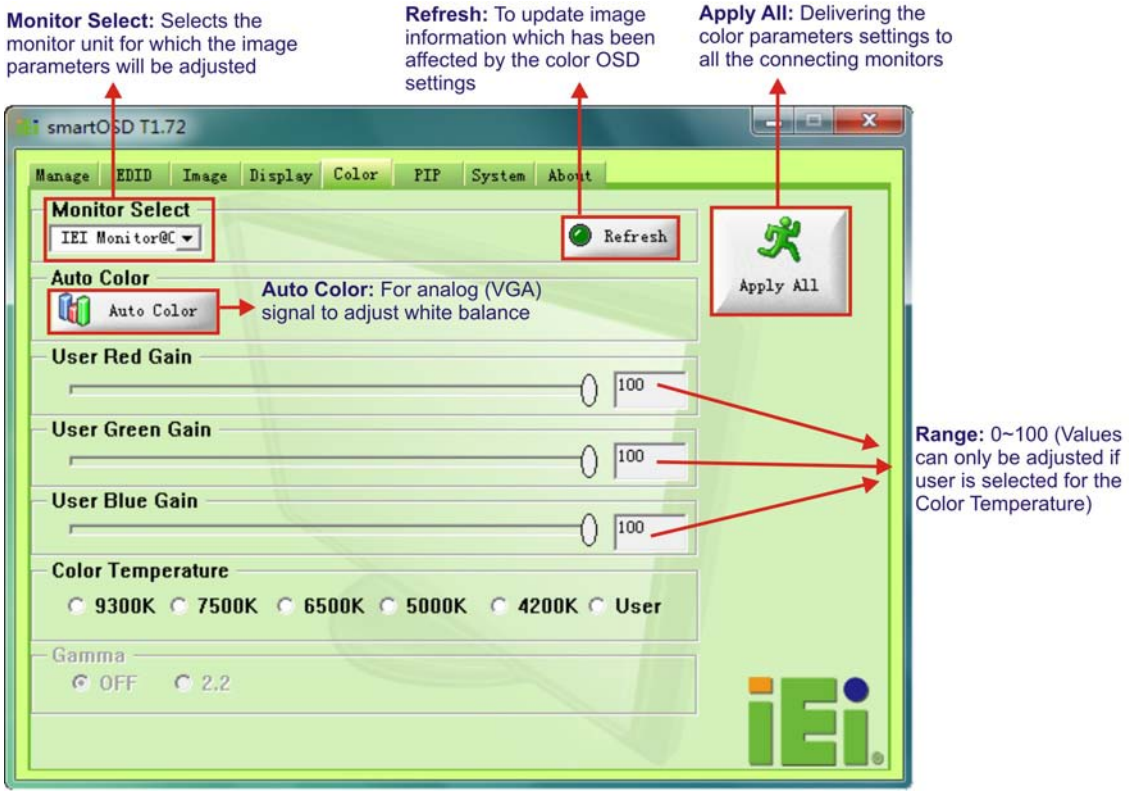

Figure C-10: Color Page

C.4.6 PIP Page

NOTE:

The functions in the PIP page are only available in the MLCD-KIT Series and AFOLUX Series monitors.

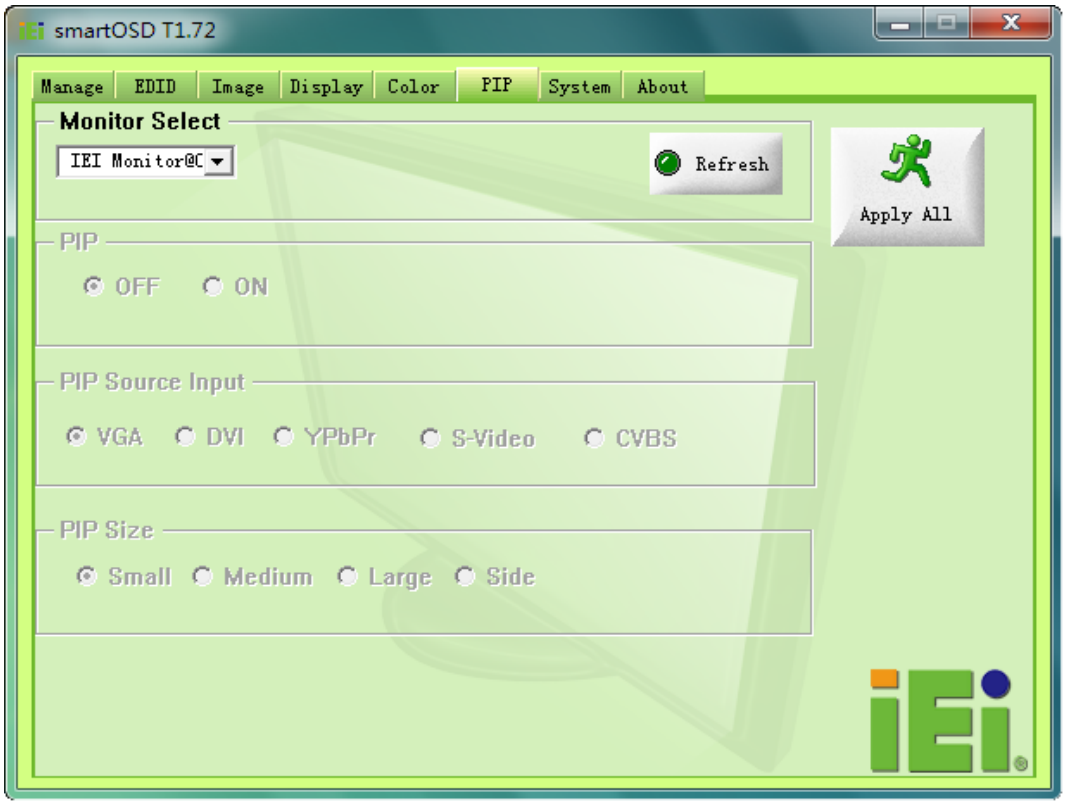

Figure C-11: PIP Page

C.4.7 System Page

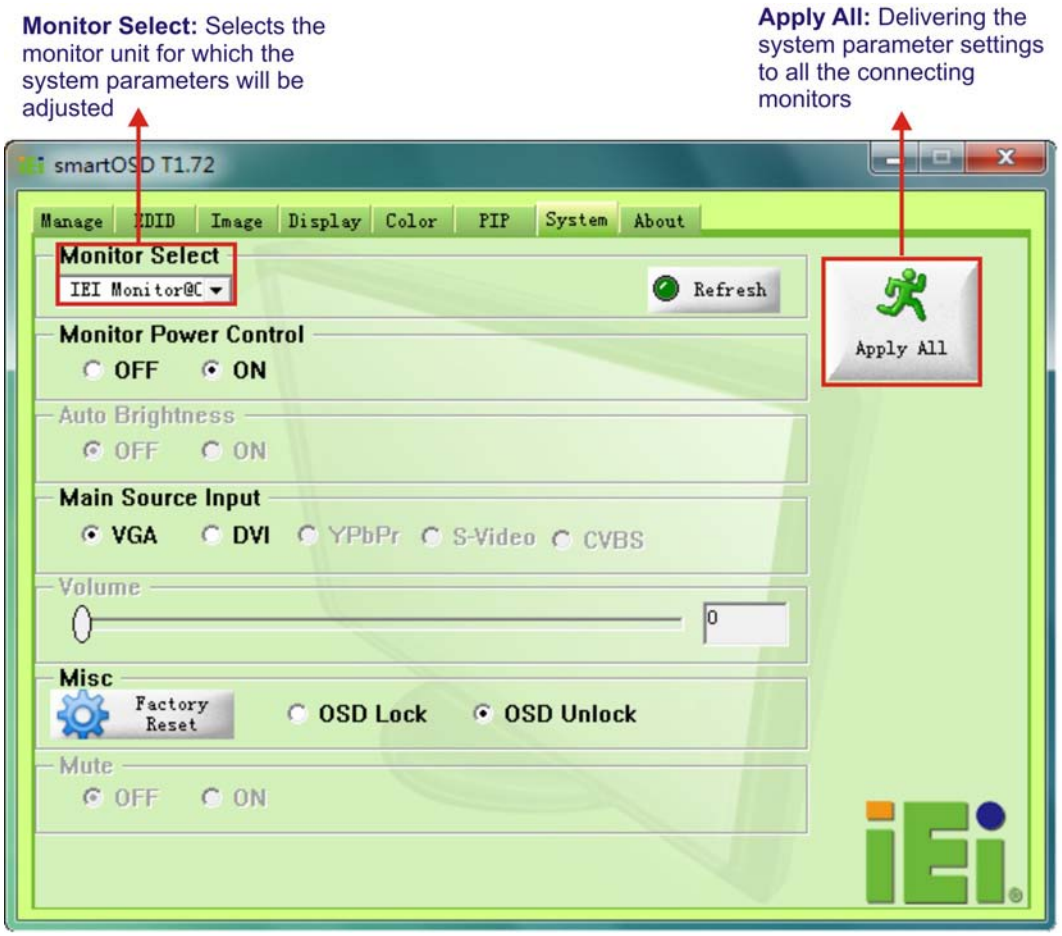

Figure C-12: System Page

NOTE:

Some of the functions in the System Page are only available to some of the IEI LCD series as following:

- Auto Brightness: SRM, MLCD-KIT and AFOLUX series only
- Main Source Input: MLCD-KIT and AFOLUX series only
- Volume: AFOLUX series only
- Mute: AFOLUX series only

C.4.8 About Page

Figure C-13: About Page

C.5 smartOSD FAQ

For troubleshooting, please see the steps below:

C.5.1 Windows 2000 Installation Failure

Installation fails under Windows 2000 and shows the following image:

Figure C-14: DLL Missing

Solution: Download and install service pack Windows Installer 3.1

C.5.2 Vista Installation Failure

Installation fail under Vista while showing following image:

Figure C-15: Windows Vista Error

Solution: Install SmartOSD.exe as the administrator authority

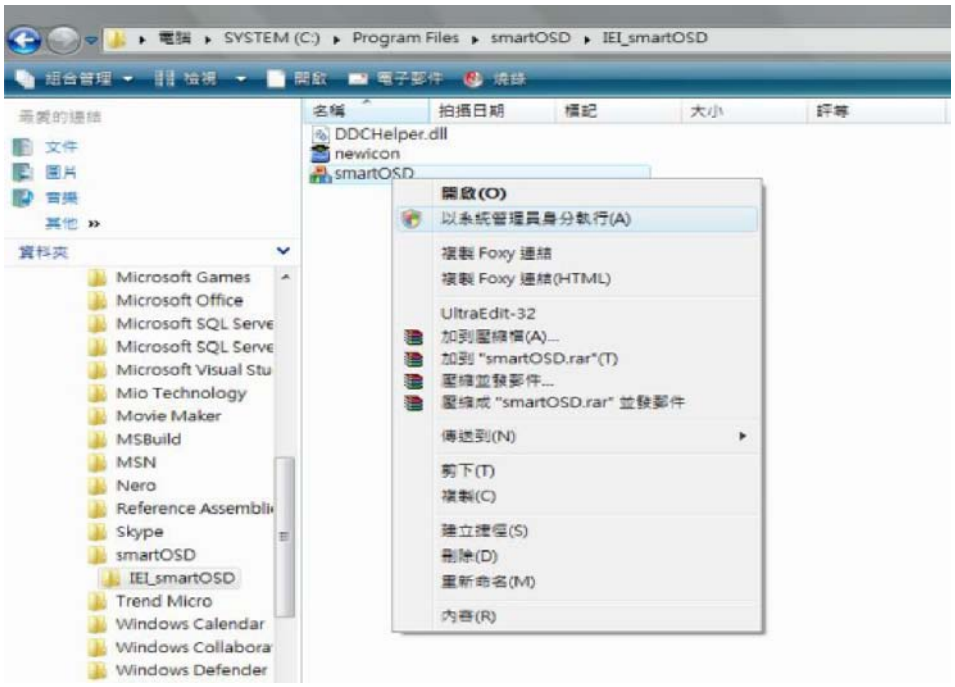

Figure C-16: Install as Administrator

C.5.3 Model Failure

The Model Fail error message shown below appears.

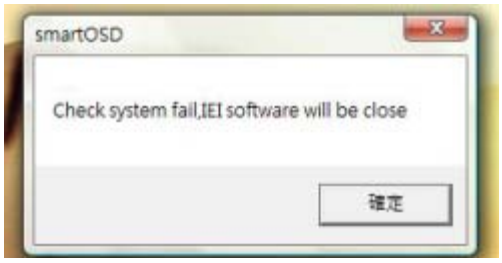

Figure C-17: Firmware Incompatibility

Solution: SmartOSD only supports firmware version 2.0 and following versions.

C.5.4 DDC Port Failure

The DDC port fail error message shown below appears.

Figure C-18: DDC Port Failure

Solutions:

- Check VGA or DVI cable
- Check an IEI monitor is being used
- Make sure the version is version 2.3 for the AFOLUX/MDM series and version 1.5 for the DM/ISDM/TDM/SRM/LCD-KIT series that have the SmartOSD functions
- Check if the OSD control status is busy. A busy signal may cause the signal message for a short time.