

MODEL:
DM-F Series

8" ~ 23.8" LCD Monitor

DisplayPort, HDMI, VGA, IP 65 Protection, RoHS

User Manual

Revision

Date	Version	Changes
January 31, 2024	2.10	Updated DM-F08's power connector spec. Updated Appendix C.2: smart OSD Pre-installation Notice
May 7, 2021	2.01	Updated Chapter 4: On-Screen-Display (OSD) Controls Updated Chapter 6: AD Boards Updated Section 2.3: Optional Items Modified the max. resolution of the DM-FW15A and the DM-FW19A
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June 10, 2014	1.01	Update Section 4.4.1: Panel Mounting
March 25, 2014	1.00	Initial Release



Safety Instructions

- en** Warning! Read the user manual before connecting the system to the power source.
- de** Vorsicht! Bitte lesen Sie die Bedienungsanleitung, bevor Sie das System an eine Stromquelle anschließen.
- fr** Attention! Avant de brancher le système à la source d'alimentation, consultez le mode d'emploi.
- it** Avvertenza! Consultare il manuale utente prima di collegare il sistema all'alimentatore.
- es** Atención! Lea atentamente este manual del usuario antes de operar la fuente de alimentación.
- zh** 警告! 在將系統連接到電源之前, 請仔細閱讀使用手冊。
- cn** 警告! 在將系統連接到電源之前, 請仔細閱讀使用手冊。
-

- en** Warning! To prevent the system from overheating, do not operate it in an area that exceeds the maximum operating temperature described in the user manual.
- de** Vorsicht! Um eine Überhitzung des Systems zu vermeiden, betreiben Sie es ausschließlich im zulässigen Betriebstemperaturbereich. Dieser ist in der Bedienungsanleitung vermerkt.
- fr** Attention! Pour éviter la surchauffe du système, ne l'utilisez pas dans une zone dont la température dépasse les limites décrits dans le mode d'emploi.
- it** Avvertenza! Per evitare che il sistema si surriscaldi, non utilizzarlo in aree che superino la temperatura massima d'esercizio descritta nel manuale utente.
- es** Atención! Para evitar el excesivo calentamiento del sistema, no opere en las condiciones de temperatura superior a lo recomendado en este manual del usuario.
- zh** 警告! 為防止系統過熱, 不要在超過使用手冊上記載的產品工作溫度範圍之外操作此系統。
- cn** 警告! 為防止系統過熱, 不要在超過使用手冊上記載的產品工作溫度範圍之外操作此系統。
-

- en** Warning! Use only the adapter and power cord approved for this system. Use of another type of adapter may risk fire or explosion. Please refer to the user manual for the power adapter specifications.
- de** Vorsicht! Nur zugelassene Netzteile und Netzkabel dürfen verwendet werden. Die Benutzung von anderen Netzteilen kann einen Brand oder eine Explosion zur Folge haben. Prüfen Sie die jeweiligen Spezifikationen in der Bedienungsanleitung.
- fr** Attention! Utilisez exclusivement le câble d'alimentation et l'adaptateur homologués pour ce système. L'utilisation d'un autre type d'adaptateur risquerait de provoquer un incendie ou une explosion. Veuillez référer au mode d'emploi pour les spécifications de l'adaptateur d'alimentation.
- it** Avvertenza! Utilizzare solo l'adattatore e il cavo di alimentazione approvati per questo sistema. L'uso di un altro tipo di adattatore può causare rischio d'incendio o esplosione. Si prega di fare riferimento al manuale utente per le specifiche sull'alimentazione.
- es** Atención! Utilice solamente el adaptador de corriente alterna (CA) con Marcas Conformidad otorgadas. Cualquier otro adaptador no otorgado aumenta el riesgo de explosión o incendio. Por favor consulte el manual del usuario para las especificaciones del adaptador de alimentación.
- zh** 警告! 只能使用經過認證、適用於本系統的電源變壓器與電源線。使用不適用的電源變壓器將可能導致火災或爆炸。電源變壓器規格請參考使用手冊。
- cn** 警告! 只能使用经过认证, 适用于本系统的电源适配器与电源线。使用不适用的电源适配器将可能导致火灾或爆炸。电源适配器规格请参考使用手册。

-
- en** Warning! Ultimate disposal of this product should be handled according to all national laws and regulations.
- de** Vorsicht! Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.
- fr** Attention! La mise au rebut ou le recyclage de ce produit sont généralement soumis aux lois et/ou directives de respect de l'environnement. Renseignez-vous auprès de l'organisme compétent.
- it** Avvertenza! Lo smaltimento di questo prodotto deve essere eseguito secondo le leggi e i regolamenti locali.
- es** Atención! La disposición final de residuos de este producto se debe cumplir con las normativas y leyes del país.
- zh** 警告! 本產品的廢棄處理應根據該國家的法律和規章進行。
- cn** 警告! 本产品的废弃处理应根据该国家的法律和规章进行。
-

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Manual Conventions



WARNING

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously.



CAUTION

Cautionary messages should be heeded to help reduce the chance of losing data or damaging the product.



NOTE

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes.



HOT SURFACE

This symbol indicates a hot surface that should not be touched without taking care.

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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 with flat bezel. 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 DC input: 9 V–36 V or 12 V
- Flexible video input solution: VGA, HDMI, DisplayPort or DVI-D
- Resistive single touch or projected capacitive multi-touch options available

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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	Touchscreen	Power	VGA	HDMI/DVI	DisplayPort
DM-F08A/R	8"	Resistive	12 V	Yes	DVI-D	No
DM-F12A/R	12.1"	Resistive	9~36 V	Yes	HDMI	Yes
DM-F12A/PC		Capacitive	9~36 V	Yes	HDMI	Yes
DM-F15A/R	15"	Resistive	9~36 V	Yes	HDMI	Yes
DM-F15A/PC		Capacitive	9~36 V	Yes	HDMI	Yes
DM-FW15A/PC	15.6"	Capacitive	9~36 V	Yes	HDMI	Yes
DM-F17A/R	17"	Resistive	9~36 V	Yes	HDMI	Yes
DM-F17A/PC		Capacitive	9~36 V	Yes	HDMI	Yes
DM-FW19A/PC	18.5"	Capacitive	9~36 V	Yes	HDMI	Yes
DM-F19A/R	19"	Resistive	9~36 V	Yes	DVI-D	Yes
DM-F19A/PC		Capacitive	9~36 V	Yes	DVI-D	Yes
DM-F22A/PC	21.5"	Capacitive	9~36 V	Yes	HDMI	Yes
DM-F24A/PC	23.8"	Capacitive	9~36 V	Yes	HDMI	Yes

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 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.

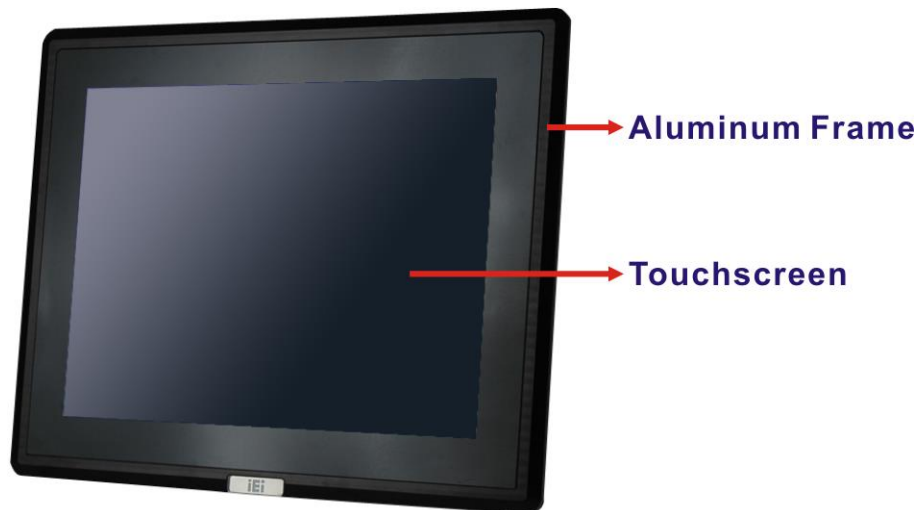


Figure 1-2: Typical Monitor Front View

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1.6 Rear View

The rear panel provides access to retention screw holes that support VESA mounting. A 5-key/7-key membrane OSD keypad is also located on the rear panel.

The following diagrams show the rear panel of the DM-F series.

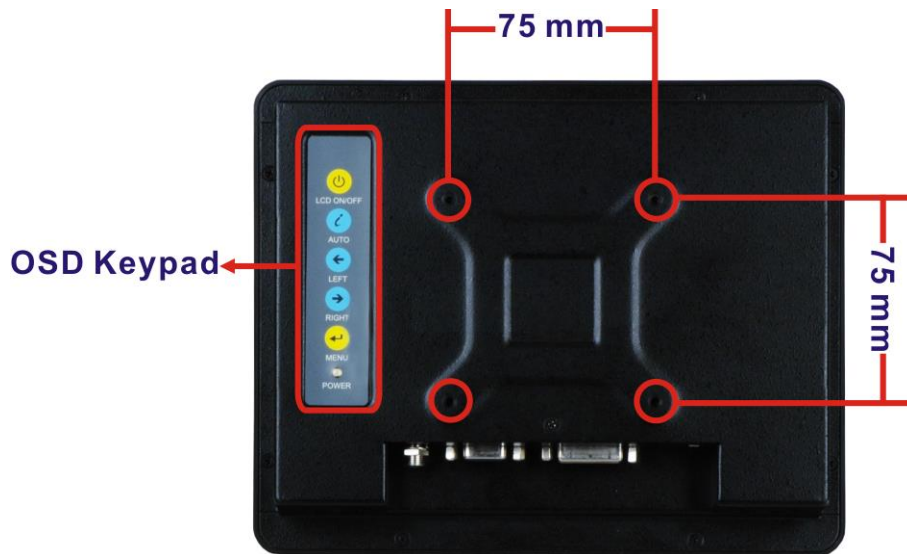


Figure 1-3: DM-F08A Rear View

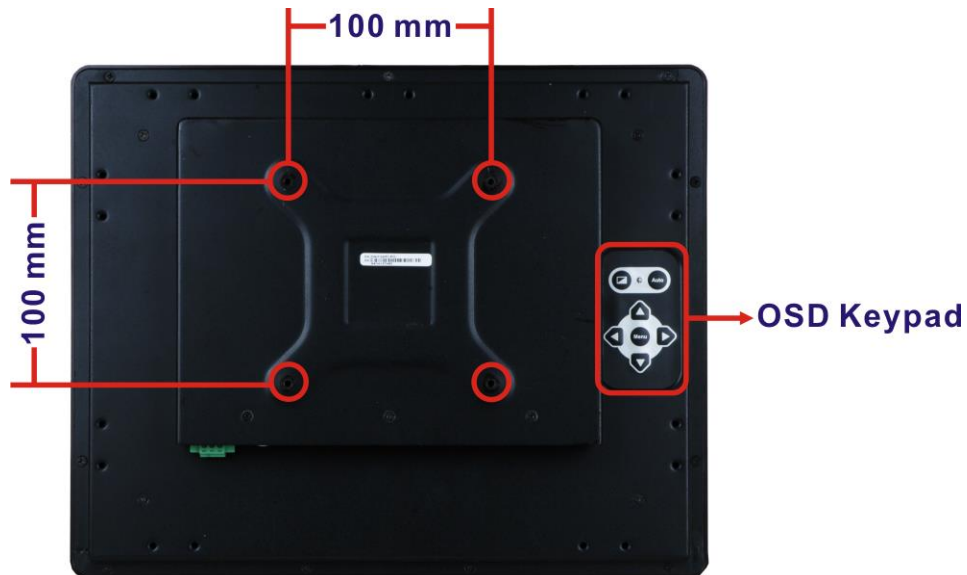


Figure 1-4: DM-F12A/15A/W15A/17A/19A/W19A/22A/24A Rear View

1.7 Connectors

The following sections show the I/O interfaces of the DM-F series LCD monitor. All connectors are fully described in **Section 3.2**.

1.7.1 DM-F08A Connectors



Figure 1-5: Bottom Panel Connectors (DM-F08A)

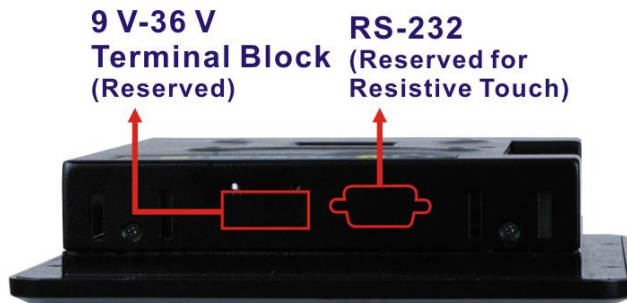


Figure 1-6: Side Panel Connectors (DM-F08A)

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1.7.2 DM-F12A ~ DM-F19A Connectors

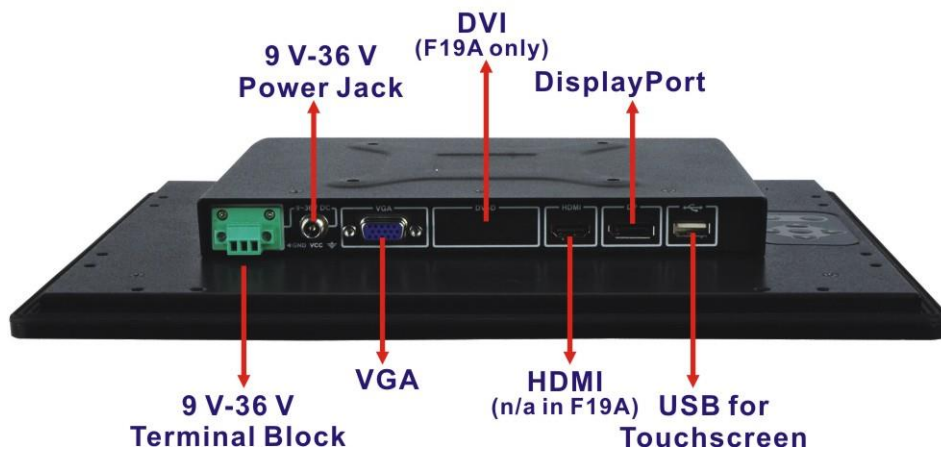


Figure 1-7: Bottom Panel Connectors (DM-F12A/15A/W15A/17A/19A/W19A)



Figure 1-8: Side Panel Connector (DM-F12A/15A/17A/19A)

1.7.3 DM-F22A and DM-F24A Connectors

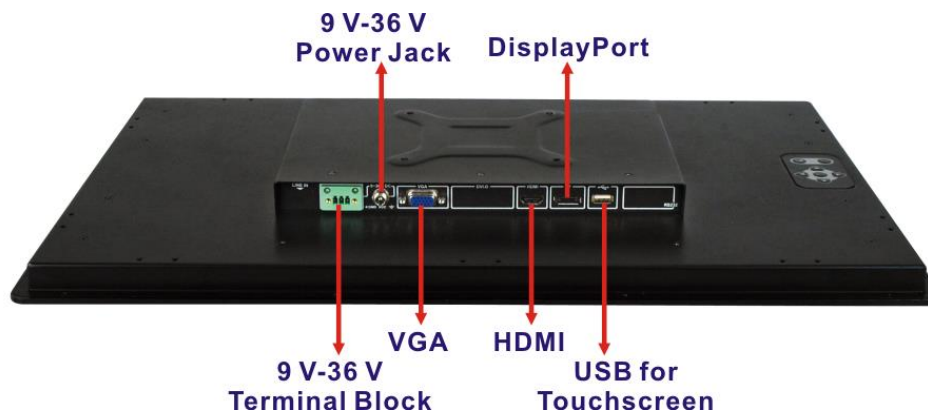


Figure 1-9: Bottom Panel Connectors (DM-F22A/24A)

1.8 Technical Specifications

The following tables show the DM-F series technical specifications.

1.8.1 DM-F08A ~ DM-F(W)15A Specifications

Model	DM-F08A	DM-F12A	DM-F15A	DM-FW15A
LCD Display	8" (4:3)	12.1" (4:3)	15" (4:3)	15.6" (16:9)
Max. Resolution	800x600	1024 x768	1024 x768	1366x768
Brightness (cd/m²)	500	600	450	400
Contrast Ratio	500:1	700:1	800:1	500:1
LCD Color	262K	16.2M	16.2M	16.2M
Pixel Pitch (mm)	0.0675 x 0.2025	0.24 x 0.24	0.29 x 0.29	0.252 x 0.252
Viewing Angle (H/V)	140°/120°	160°/140°	160°/150°	170°/160°
Backlight MTBF (hrs)	50,000	50,000	70,000	50,000
Touchscreen	5-wire resistive type	5-wire resistive type or projected capacitive type (DM-FW15A P-CAP only)		
Touch Controller	PenMount 6000	Resistive type: PenMount 6000 Projected capacitive type: EETI EXC31xx series		
AD Board	AV-25251	AV-2525		
OSD Button	5-key	7-key	7-key	7-key
Smart OSD	Yes	Yes	Yes	Yes
Dimensions (mm) (W x H x D)	222.2 x 182.2 x 42.7	322.2 x 262.2 x 40.5	378.5 x 303 x 43.2	400.1 x 253.3 x 52.9
Cutout Dimensions (W x H) (mm)	206 x 154	304.8 x 244.8	361.1 x 285.6	379.1 x 232.3
Weight (kg) (Net/Gross)	1.33/4.5	2.7/4.9	3.5/5.5	4/6.5
Enclosure Color	Black C	Black C	Black C	Black C
Front Frame	Aluminum	Aluminum	Aluminum	Aluminum
Rear Cover	Sheet Metal	Sheet Metal	Sheet Metal	Sheet Metal

DM-F Series Monitor

Model	DM-F08A	DM-F12A	DM-F15A	DM-FW15A
VESA Mount	75	100	100	100
Optional Mounting Kit	Wall	Wall	Wall	Wall
	Rack	Rack	Rack	Rack
	Panel	Panel	Panel	Panel
	Arm	Arm	Arm	Arm
	Stand	Stand	Stand	Stand
Operating Temp.	-20°C ~ 60°C (with air flow)			
Storage Temp.	-20°C ~ 70°C			
Humidity	10% ~ 95% (non-condensing)			
I/O Ports	1 x VGA 1 x DVI 1 x USB 2.0 (for touch)	1 x VGA 1 x HDMI 1 x DisplayPort 1.1 1 x USB 2.0 (for touch)		
Reserved Ports	1 x RS-232 (for resistive touch)			
Power	1 x Lockable DC-in jack (12 V)		1 x Lockable DC-in jack (9 V - 36 V) 1 x Power input terminal block (9 V - 36 V)	
Power Consumption	12V@0.5A	9V@2.2A 36V@0.5A	9V@1.6A 36V@0.4A	9V@1.3A 36V@0.33A
IP Level	IP 65 compliant front panel			
Safety & EMC	CE, FCC			

Table 1-2: DM-F08A ~ DM-F(W)15A Specifications

1.8.1 DM-F17A ~ DM-F24A Specifications

Model	DM-F17A	DM-FW19A	DM-F19A	DM-F22A	DM-F24A
LCD Display	17" (5:4)	18.5" (16:9)	19" (5:4)	21.5" (16:9)	23.8" (16:9)
Max. Resolution	1280x1024	1366x768	1280x1024	1920x1080	1920x1080
Brightness (cd/m²)	350	400	350	250	250
Contrast Ratio	1000:1	1000:1	1000:1	1000:1	3000:1
LCD Color	16.7M	16.7M	16.7M	16.7M	16.7M
Pixel Pitch (mm)	0.26 x 0.26	0.3 x 0.3	0.294 x 0.294	0.25 x 0.25	0.28 x 0.28
Viewing Angle (H/V)	170°/160°	170°/160°	170°/160°	170°/160°	178°/178°
Backlight MTBF (hrs)	50,000	50,000	50,000	30,000	30,000
Touchscreen	5-wire resistive type or projected capacitive type (DM-FW19A P-CAP only)			Projected capacitive type	
Touch Controller	Resistive type: PenMount 6000 Projected capacitive type: EETI EXC31xx series			EETI EXC31xx series	
AD Board	AV-2525	AV-2525	AV-2525	AV-2525	AV-2525
OSD Button	7-key	7-key	7-key	7-key	7-key
Smart OSD	Yes	Yes	Yes	Yes	Yes
Dimensions (mm) (W x H x D)	408.4 x 341.4 x 49.3	468.8 x 288.2 x 48.9	447.4 x 372.4 x 49.6	550.4 x 358.4 x 49.1	600 x 382 x 49.4
Cutout Dimensions (W x H) (mm)	391 x 324	447.8 x 267.2	430 x 355	532 x 340	577 x 359
Weight (kg) (Net/Gross)	4.4/7.1	5/8.1	5.4/8.4	6.3/9.6	7.6/10.9
Enclosure Color	Black C	Black C	Black C	Black C	Black C
Front Frame	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum
Rear Cover	Sheet Metal	Sheet Metal	Sheet Metal	Sheet Metal	Sheet Metal
VESA Mount	100	100	100	100	100
Optional Mounting Kit	Wall Rack Panel Arm Stand	Wall Rack Panel Arm Stand	Wall Rack Panel Arm Stand	Wall Panel Arm Stand	Wall Panel Arm Stand
Operating Temp.	-20°C ~ 60°C (with air flow)			-10°C ~ 50°C (with air flow)	

DM-F Series Monitor

Model	DM-F17A	DM-FW19A	DM-F19A	DM-F22A	DM-F24A
Storage Temp.	-20°C ~ 70°C			-20°C ~ 60°C	
Humidity	10% ~ 95% (non-condensing)				
I/O Ports	1 x VGA 1 x HDMI 1 x DP 1.1 1 x USB 2.0 (for touch)	1 x VGA 1 x HDMI 1 x DP 1.1 1 x USB 2.0 (for touch)	1 x VGA 1 x DP 1.1 1 x DVI 1 x USB 2.0 (for touch)	1 x VGA 1 x HDMI 1 x DisplayPort 1.1 1 x USB 2.0 (for touch)	
Reserved Ports	1 x RS-232 (for resistive touch)			N/A	
Power	1 x Lockable DC-in jack (9 V - 36 V) 1 x Power input terminal block (9 V - 36 V)				
Power Consumption	9V@2.6A 36V@0.6A	9V@1.3A 36V@0.4A	9V@3.3A 36V@0.8A	9V@2.5A 36V@0.6A	9V@3.4A 36V@0.8A
IP Level	IP 65 compliant front panel				
Safety & EMC	CE, FCC				

Table 1-3: DM-F17A ~ DM-F24A Specifications

1.9 Physical Dimensions

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

1.9.1 DM-F08A Physical Dimensions

The physical dimensions of the DM-F08A are shown in **Figure 1-11**.

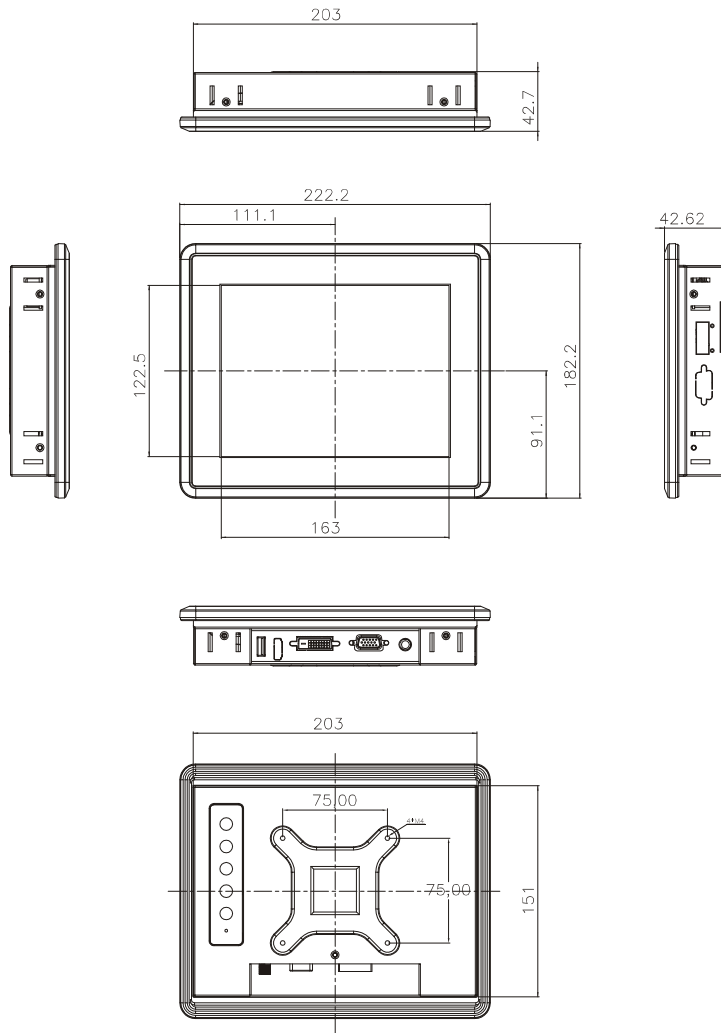


Figure 1-10: DM-F08A Physical Dimensions (Unit: mm)

DM-F Series Monitor

1.9.2 DM-F12A Physical Dimensions

The physical dimensions of the DM-F12A are shown in Figure 1-11.

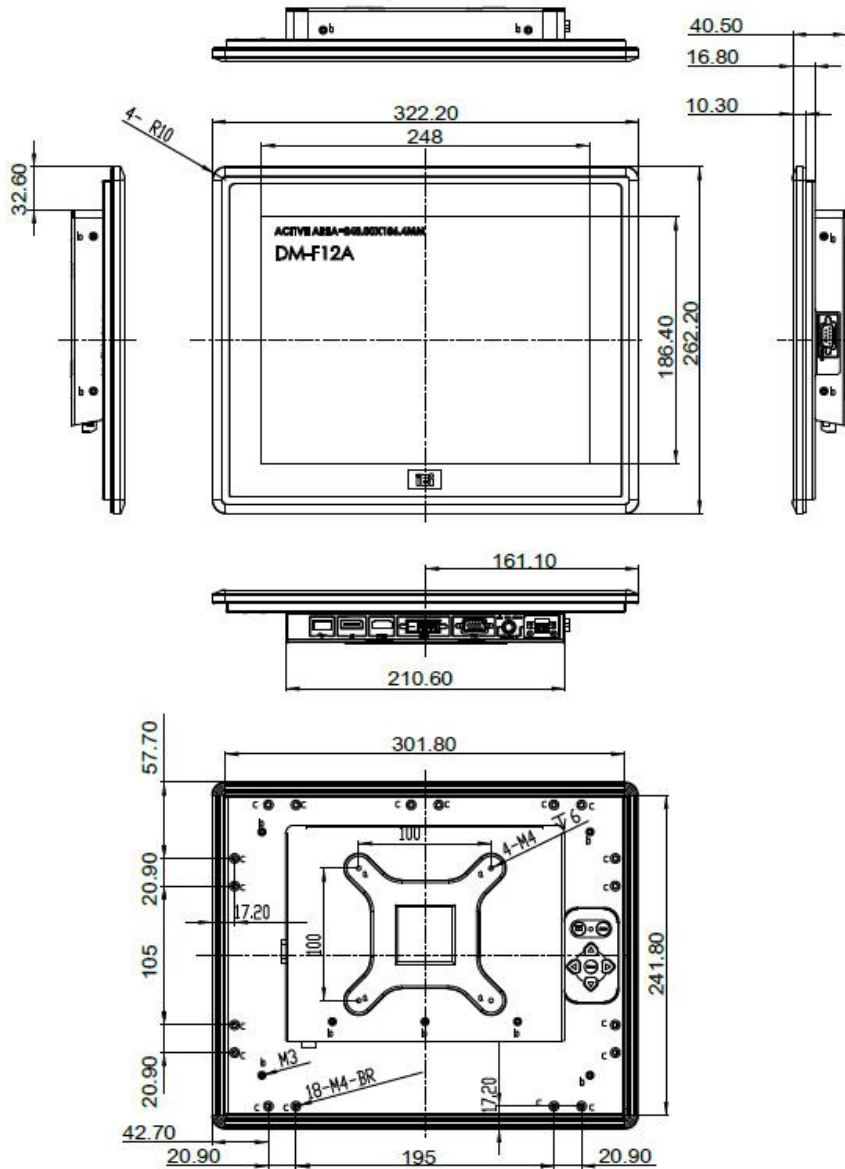


Figure 1-11: DM-F12A Physical Dimensions (Unit: mm)

1.9.3 DM-F15A Physical Dimensions

The physical dimensions of the DM-F15A are shown in **Figure 1-12**.

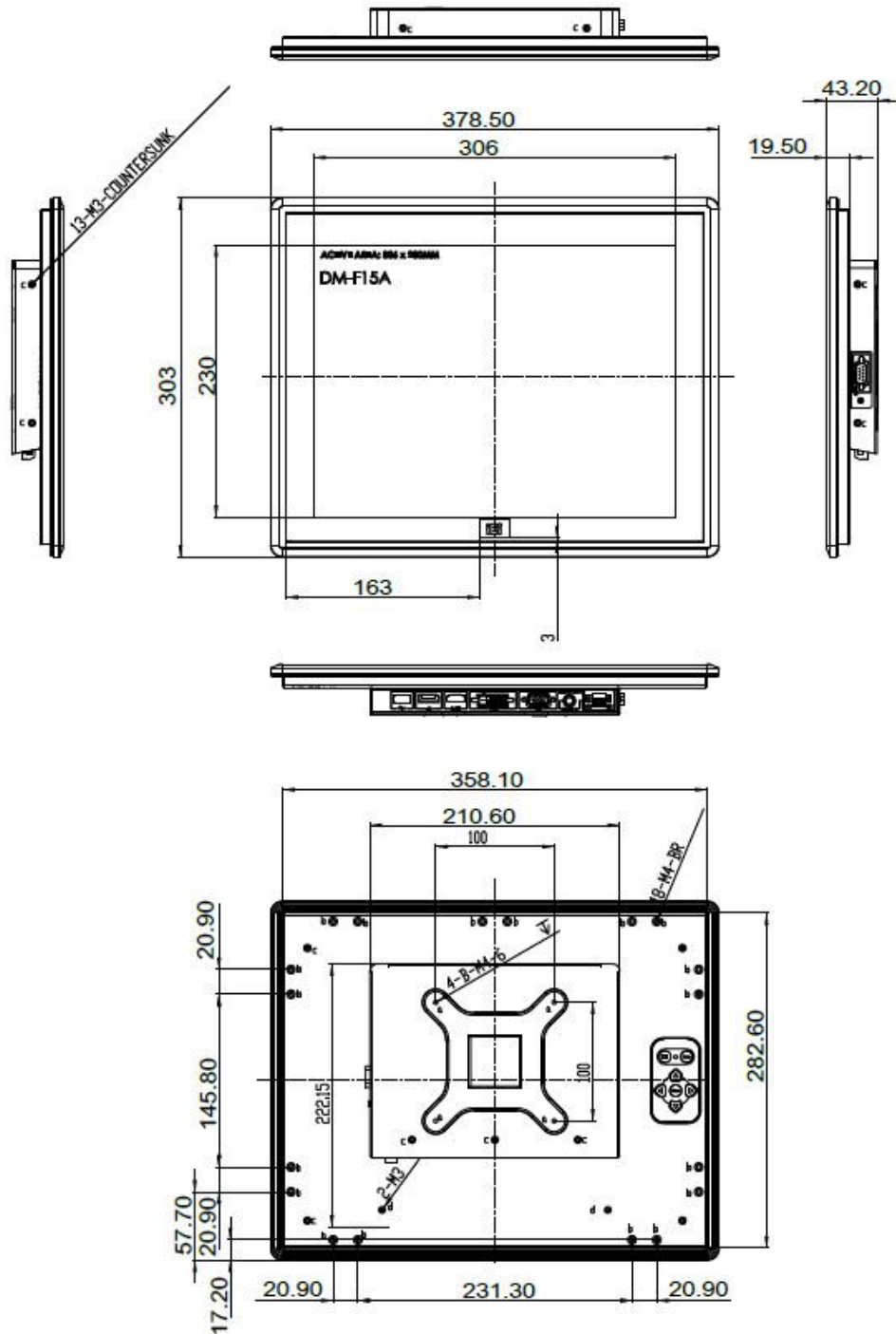


Figure 1-12: DM-F15A Physical Dimensions (Unit: mm)

DM-F Series Monitor

1.9.4 DM-FW15A Physical Dimensions

The physical dimensions of the DM-FW15A are shown in Figure 1-12.

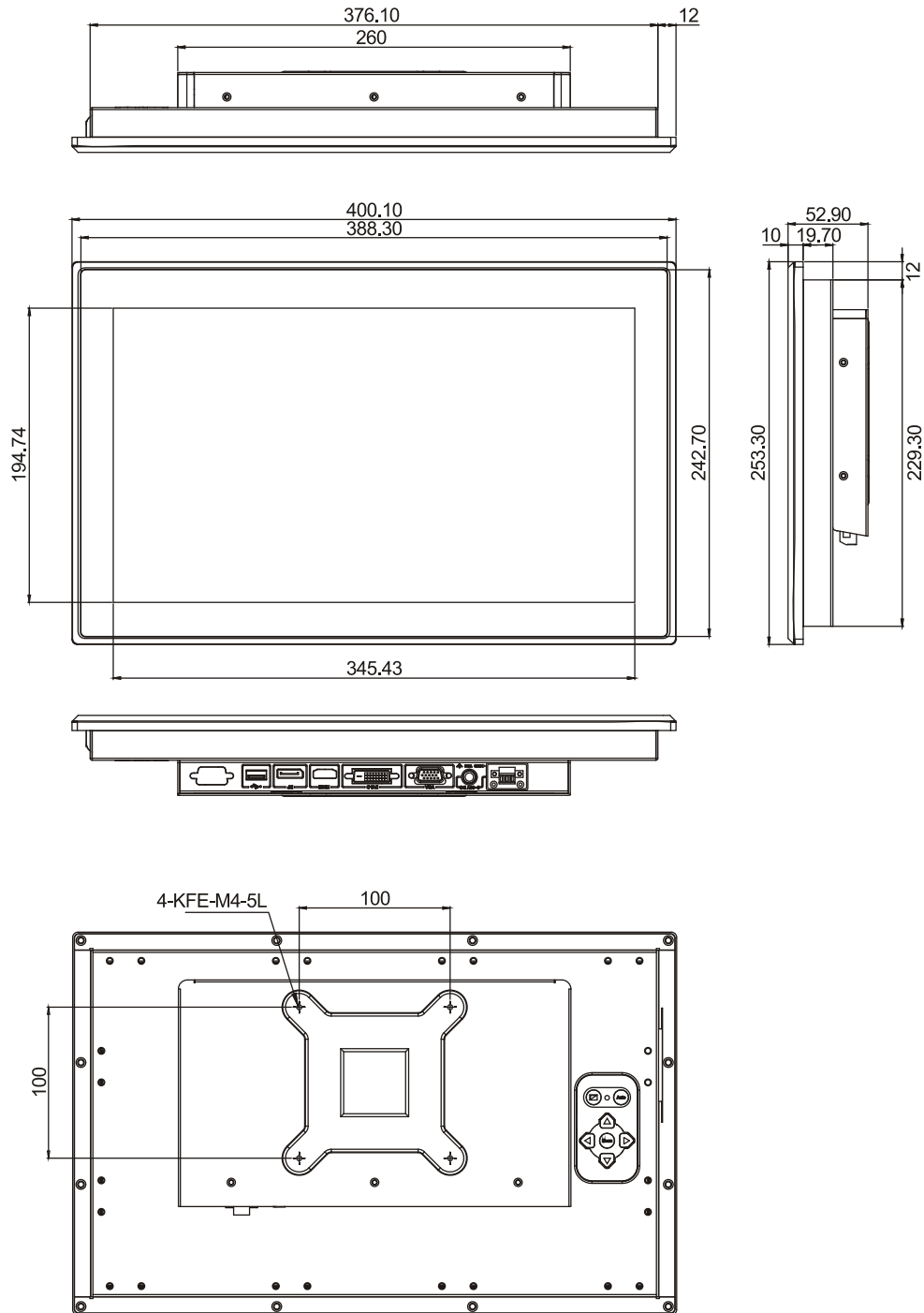


Figure 1-13: DM-FW15A Physical Dimensions (Unit: mm)

1.9.5 DM-F17A Physical Dimensions

The physical dimensions of the DM-F17A are shown in **Figure 1-14**.

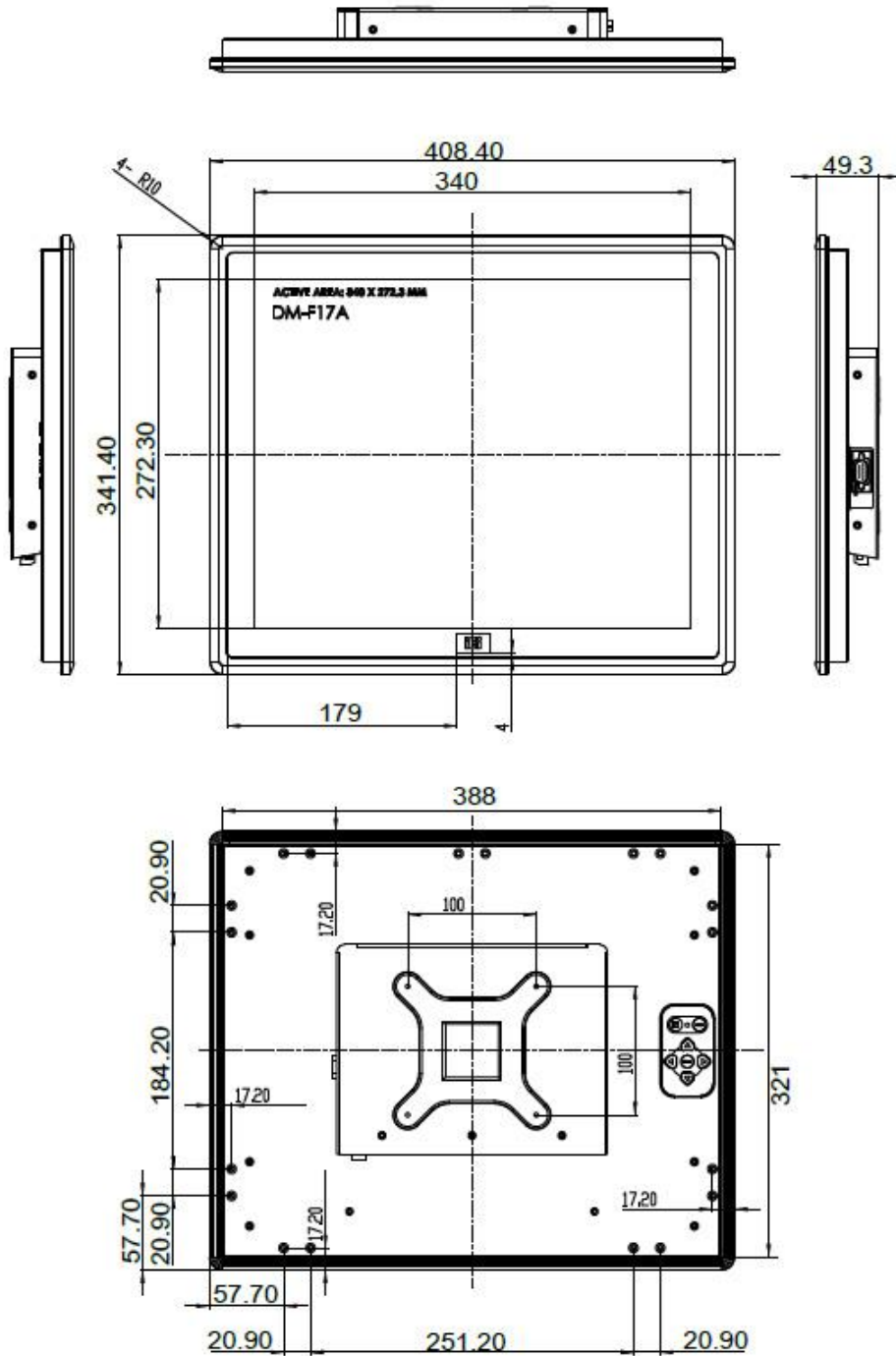


Figure 1-14: DM-F17A Physical Dimensions (Unit: mm)

DM-F Series Monitor

1.9.6 DM-F19A Physical Dimensions

The physical dimensions of the DM-F19A are shown in Figure 1-11.

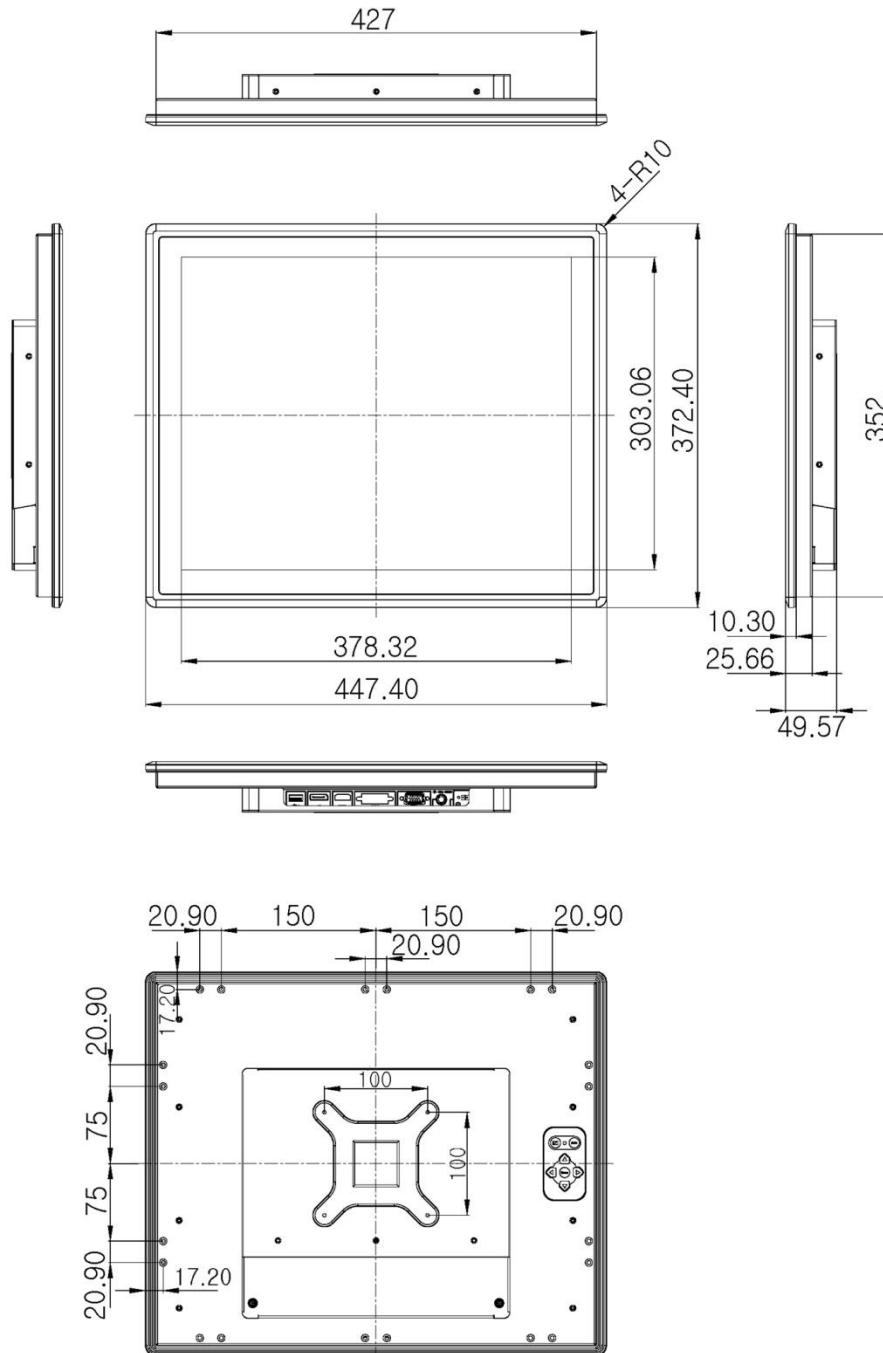


Figure 1-15: DM-F19A Physical Dimensions (Unit: mm)

1.9.7 DM-FW19A Physical Dimensions

The physical dimensions of the DM-FW19A are shown in **Figure 1-11**.

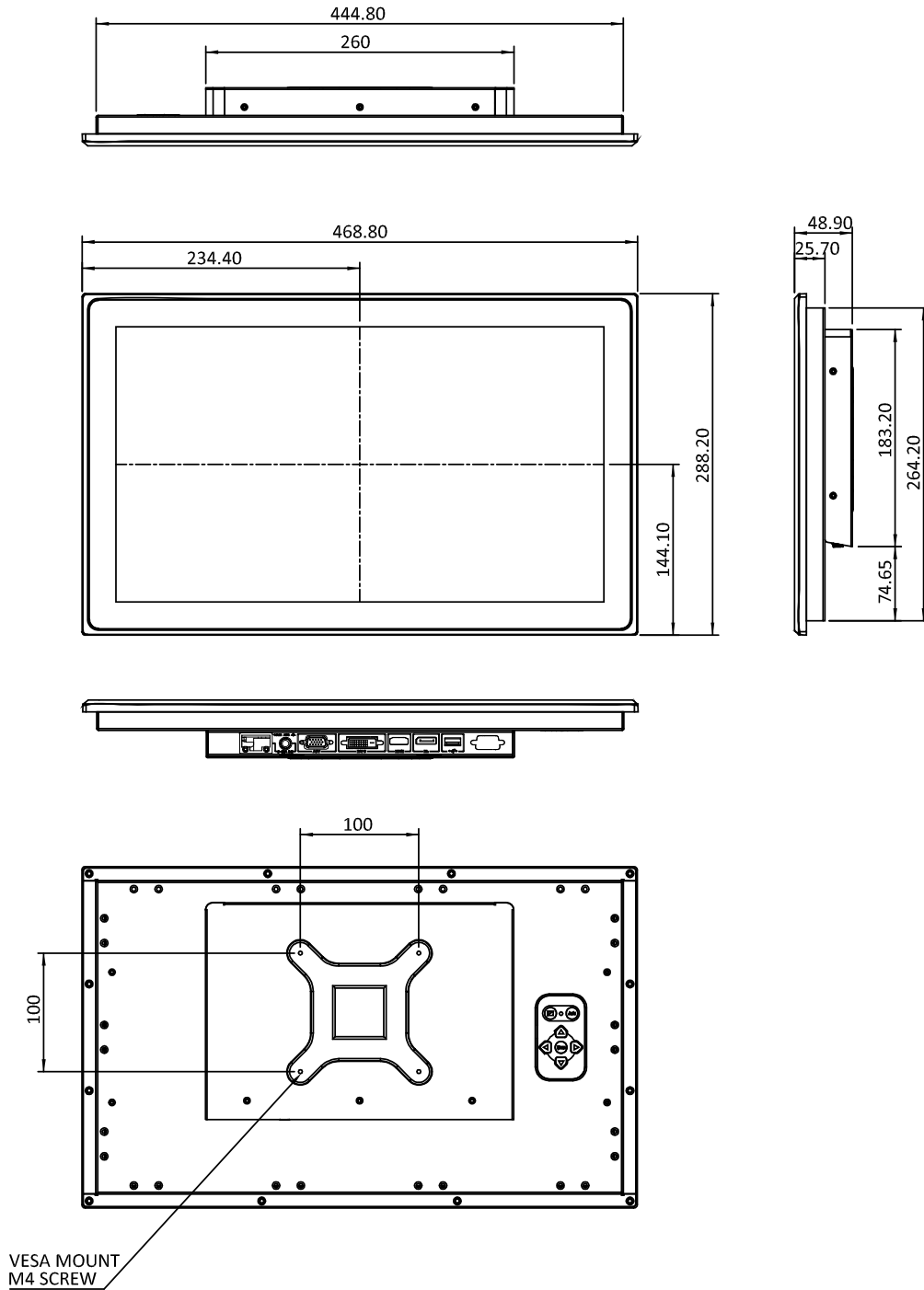


Figure 1-16: DM-FW19A Physical Dimensions (Unit: mm)

DM-F Series Monitor

1.9.8 DM-F22A Physical Dimensions

The physical dimensions of the DM-F22A are shown in Figure 1-17.

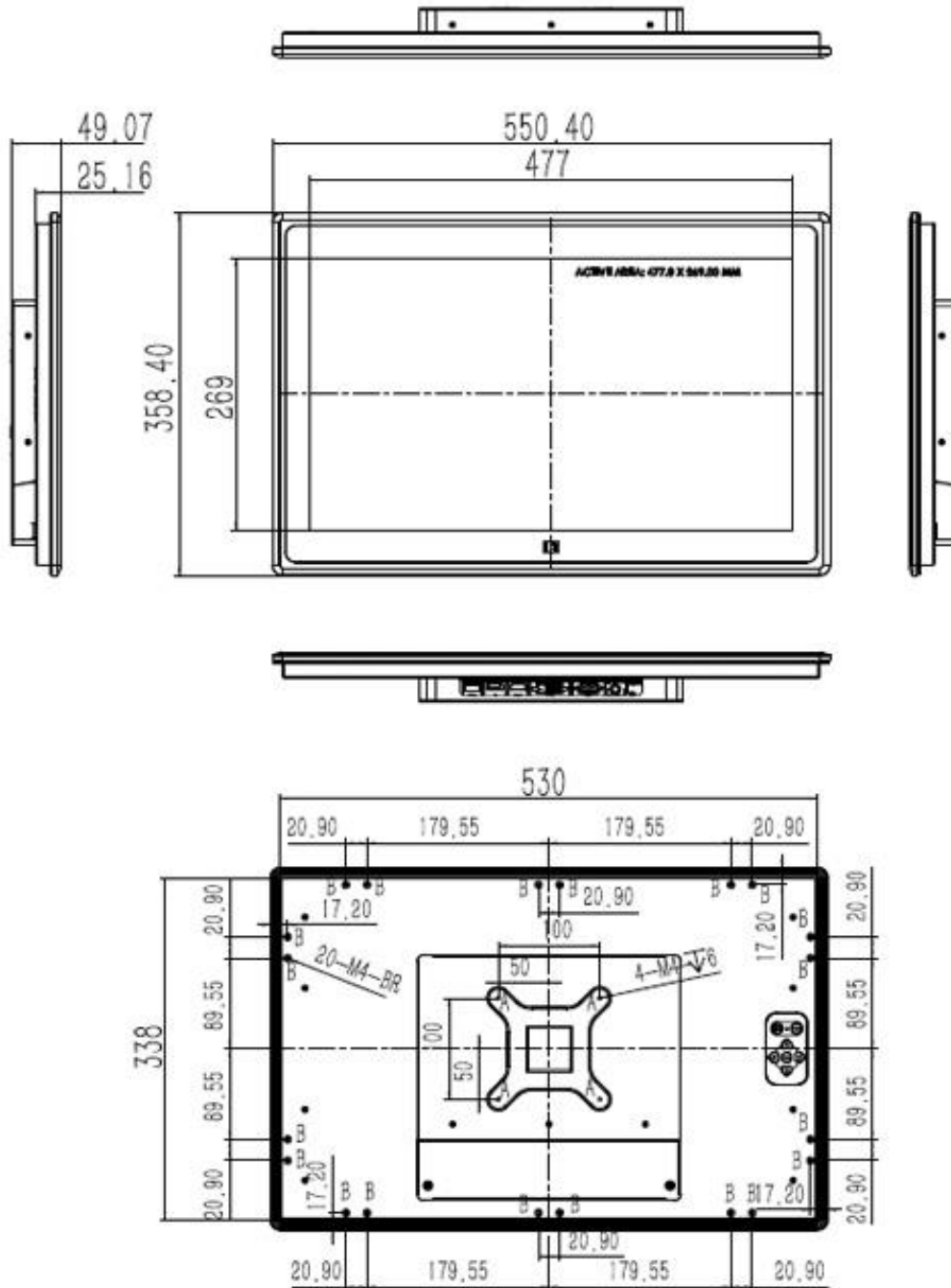


Figure 1-17: DM-F22A Physical Dimensions (Unit: mm)

1.9.9 DM-F24A Physical Dimensions

The physical dimensions of the DM-F24A are shown in **Figure 1-18**.

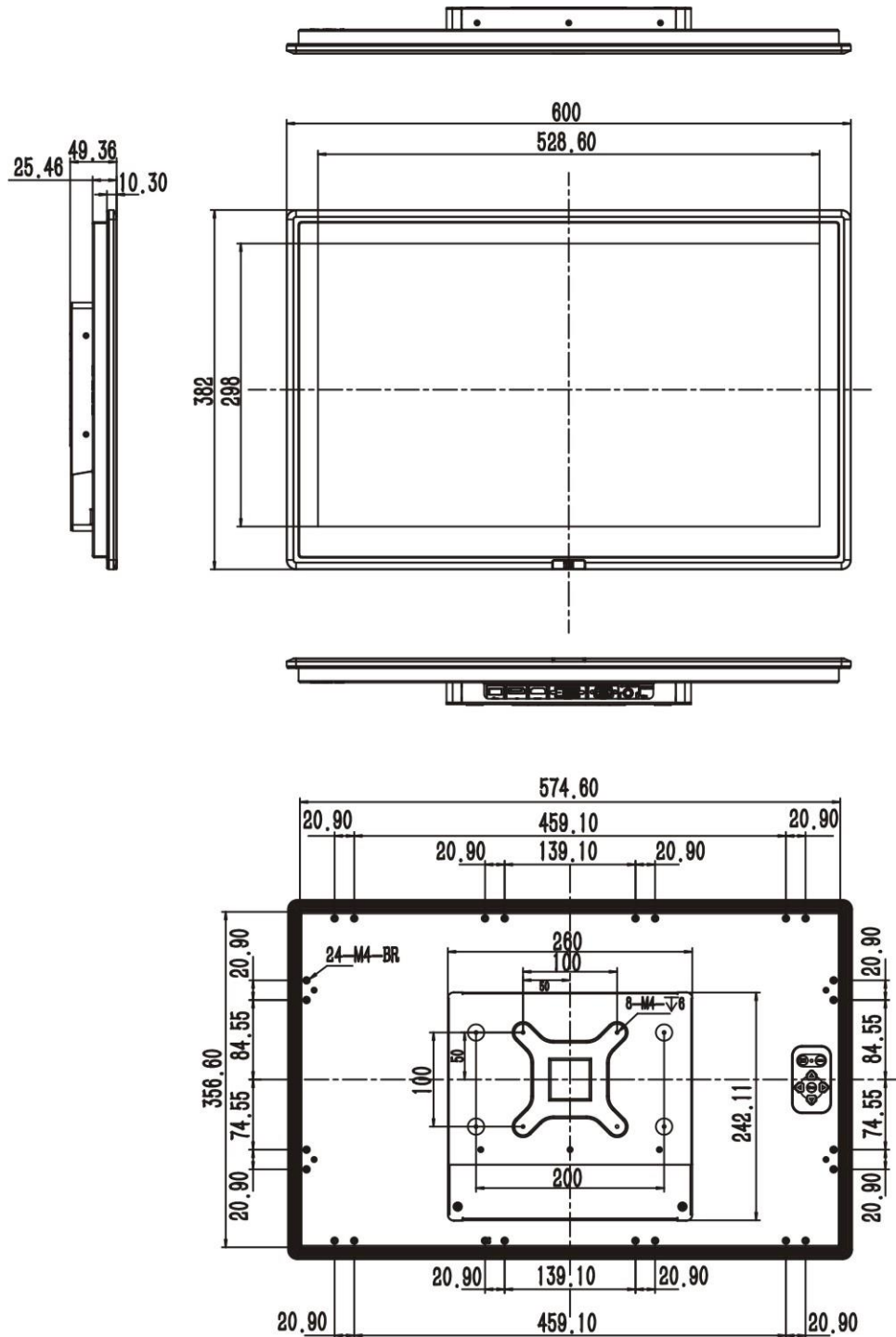


Figure 1-18: DM-F24A Physical Dimensions (Unit: mm)

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.

DM-F Series Monitor

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 touchscreen)	
1	VGA cable	
1	Touch pen (resistive touch only)	
1	36W 12V DC adapter with lockable connector (6.5" and 8" models only)	

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:

	DM-F08A	DM-F12A	DM-F15A	DM-FW15A	DM-F17A
Arm	ARM-11-RS	ARM-11-RS	ARM-31-RS	ARM-31-RS	ARM-31-RS
Stand	STAND-B08	STAND-C12-R10	STAND-C19-R10 STAND-A21-R10	STAND-C19-R10 STAND-A21-R10	STAND-C19-R10 STAND-A21-R10
Wall Mount Kit	AFLWK-12	WK-190MS-R10	WK-190MS-R10	WK-190MS-R10	WK-190MS-R10
Panel Mount Kit	FPK-07-R10	FPK-01-R10	FPK-01-R10	FPK-01-R10	FPK-01-R10
Rack Mount Kit	FRK08-R10	FRK12-R10	FRK15-R10	FRKW15D-R10	FRK17-R10
Cable Cover	N/A	N/A	DM-F-CC01-R10	N/A	DM-F-CC01-R10
RS-232 Touch Cable Kit	DM-F-COMKIT-R10	DM-F-COMKIT-R10	DM-F-COMKIT-R10	N/A	DM-F-COMKIT-R10
Power Adapter	N/A	63040-010060-211-RS	63040-010060-211-RS	63040-010060-211-RS	63040-010060-211-RS
	DM-FW19A	DM-F19A	DM-F22A	DM-F24A	
Arm	ARM-31-RS	ARM-31-RS	ARM-31-RS	ARM-31-RS	
Stand	STAND-C19-R10 STAND-A21-R10	STAND-C19-R10 STAND-A21-R10	STAND-C19-R10 STAND-A21-R10	STAND-C19-R10 STAND-A21-R10	
Wall Mount Kit	WK-190MS-R10	WK-190MS-R10	WK-190MS-R10	WK-190MS-R10	
Panel Mount Kit	FPK-02-R10	FPK-02-R10	FPK-02-R10	FPK-03-R10	
Rack Mount Kit	FRKW19D-R10	FRK19D-R10	N/A	N/A	
Cable Cover	N/A	DM-F-CC02-R10	DM-F-CC02-R10	DM-F-CC02-R10	
RS-232 Touch Cable Kit	N/A	DM-F-COMKIT01-R10	N/A	N/A	
Power Adapter	63040-010060-211-RS	63040-010060-211-RS	63040-010060-211-RS	63040-010060-211-RS	

Chapter

3

Installation

3.1 Installation Precautions



CAUTION:

Some SKUs of the DM-F series have more than one power supply connection point. To reduce the risk of electric shock, disconnect all power sources before installing or servicing the DM-F series.

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 8 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. 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. Ensure to connect the power cord to a socket-outlet with earthing connection.
- **Anti-static Discharge:** The rear panel of the monitor must to be removed to configure the monitor's AD board. When doing so, be sure the monitor is disconnected from its power source and take all necessary safety precautions to

DM-F Series Monitor

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 External Peripheral Device Connection

The external I/O connector pinouts of the DM-F series industrial monitors are described in the following sections.

3.2.1 DC-in Jack

The lockable power connector connects to the power adapter and provides power to the monitor. Supported power voltage is varied among models as described below:

- **DM-F08A:** 12 V
- **DM-F12A/15A/W15A/17A/19A/W19A/22A/24A:** 9 V–36 V



Figure 3-1: DC Jack

3.2.2 9 V – 36 V Terminal Block (Optional)

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

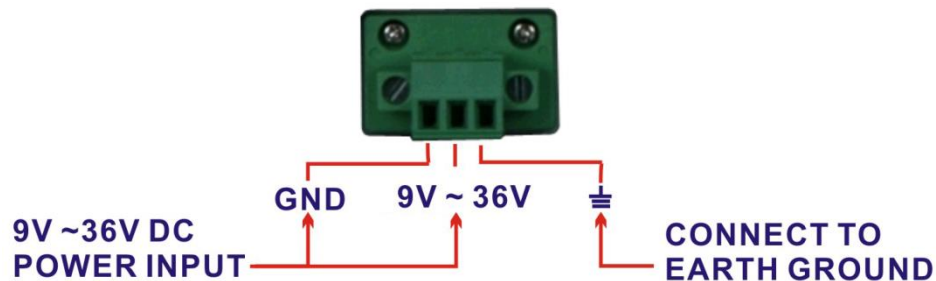


Figure 3-2: 3-pin Terminal Block

3.2.3 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 3-1: USB Touch Panel Connector Pinouts



Pin 1

Figure 3-3: USB Touch Panel Connector

3.2.4 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 3-2: VGA Connector Pinouts

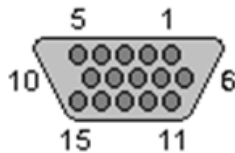


Figure 3-4: VGA Connector

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3.2.5 DVI-D Connector (F08A and F19A Only)

The 24-pin Digital Visual Interface (DVI) connector connects to high-speed, high-resolution digital displays. The DVI-D connector supports only digital signals.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TMDS Data2-	13	NC
2	TMDS Data2+	14	PVDD1
3	GND	15	GND
4	N/C	16	GND
5	N/C	17	TMDS Data0-
6	DDC Clock [SCL]	18	TMDS Data0+
7	DDC Data [SDA]	19	GND
8	Analog vertical sync	20	NC
9	TMDS Data1-	21	NC
10	TMDS Data1+	22	GND
11	GND	23	TMDS Clock +
12	NC	24	TMDS Clock -

Table 3-3: DVI-D Connector Pinouts



Figure 3-5: DVI-D connector

3.2.6 DisplayPort Connector (F12A ~ F24A Only)

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 3-4: DisplayPort Connector Pinouts

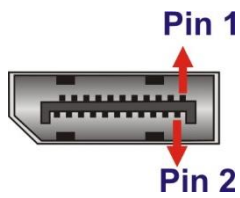


Figure 3-6: DisplayPort connector

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3.2.7 HDMI Connector (F12A, F(W)15A, F17A, FW19A, F22A, F24A Only)

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

PIN	DESCRIPTION	PIN	DESCRIPTION
1	HDMI_TMDS_C_DATA2	2	GND
3	HDMI_TMDS_C_DATA2#	4	HDMI_TMDS_C_DATA1
5	GND	6	HDMI_TMDS_C_DATA1#
7	HDMI_TMDS_C_DATA0	8	GND
9	HDMI_TMDS_C_DATA0#	10	HDMI_TMDS_C_CLK
11	GND	12	HDMI_TMDS_C_CLK#
13	NC	14	NC
15	HDMI_DDC_SCLK	16	HDMI_DDC_SDATA
17	GND	18	+5V_HDMI
19	HDMI_HPD		

Table 3-5: HDMI Connector Pinouts

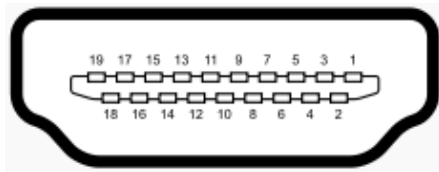


Figure 3-7: HDMI Connector

3.2.8 RS-232 Port for Touch Panel (Reserved for Resistive Touch)

Use the side 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 3-6: RS-232 Touch Panel Connector Pinouts

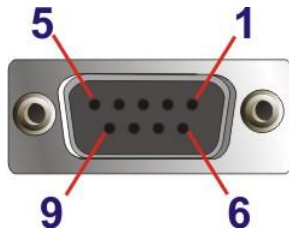


Figure 3-8: RS-232 Touch Panel Connector

3.2.8.1 Installing RS-232 Connector

If the DM-F series doesn't have the RS-232 connector on the side panel, the user can purchase the RS-232 Touch Cable Kit (DM-F-COMKIT-R10 or DM-F-COMKIT01-R10) and install the RS-232 connector onto the system. Please note that the RS-232 port is only available for the resistive type models of the 6.5"–19" monitors.

Step 1: Remove the rear cover retention screws and lift the rear panel off the monitor.



Figure 3-9: Rear Panel Retention Screw Removal (DM-F08A)

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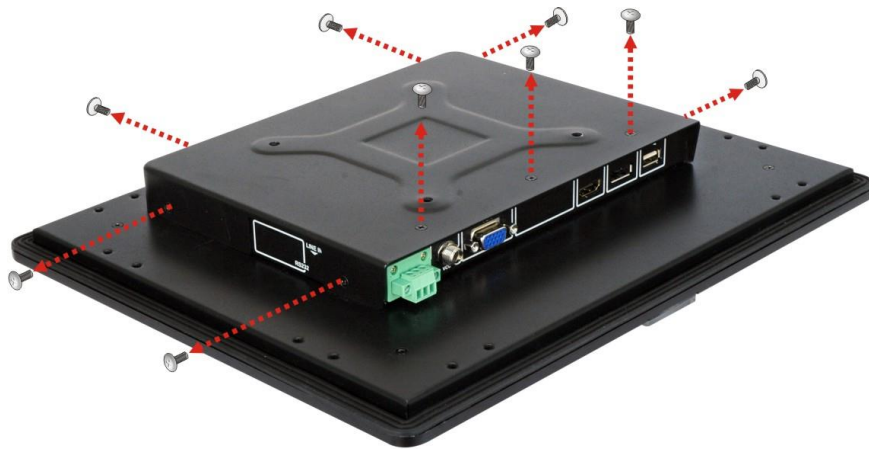


Figure 3-10: Rear Panel Retention Screw Removal (DM-F12A ~ DM-F24A)

Step 2: Remove the RS-232 knockout hole on the side panel.

Step 3: Connect the RS-232 flat cable to the internal RS-232 connector (1x9 pin, RS232_1) on the AD board. See Figure 3-11.

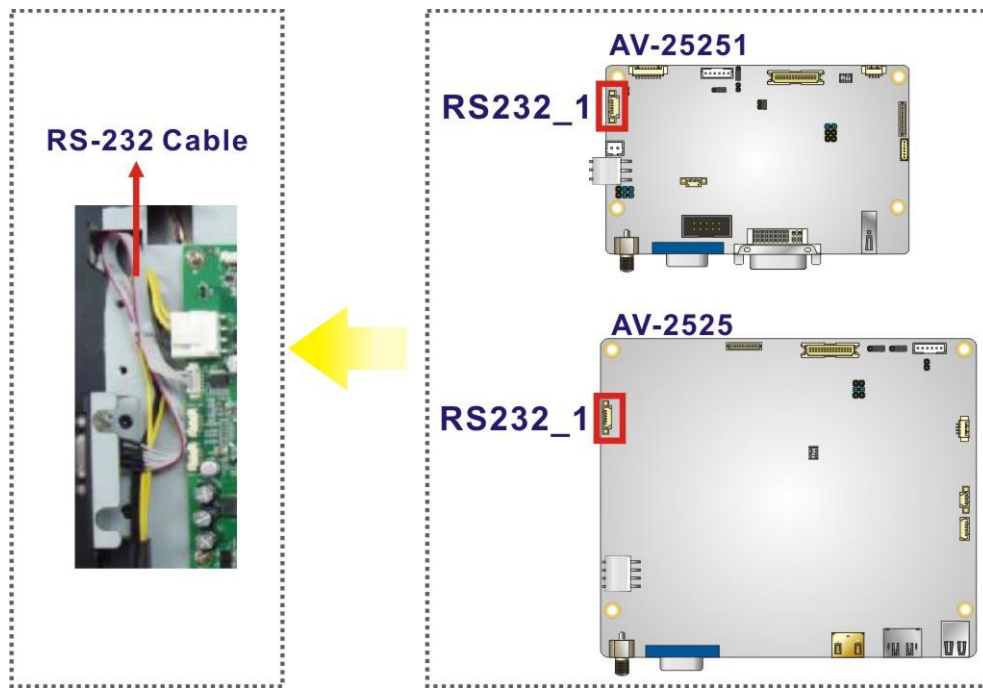


Figure 3-11: Connecting RS-232 Cable

Step 4: Insert the D-sub 9 connector of the RS-232 flat cable into the hole and secure the connector with two hex jack screws.

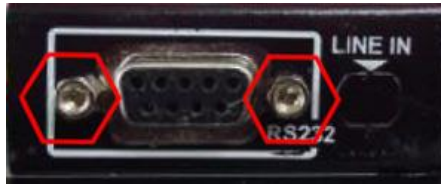


Figure 3-12: Hex Jack Screws for Securing RS-232 Connector

Step 5: Re-install the rear panel.

3.3 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.

3.3.1 Panel Mounting

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

Table 3-7 lists the number of mounting clamps and holders required to mount the monitor to a panel.

Model	Mounting Clamps	Clamp Holders
DM-F08A	4	N/A
DM-F12A	9	9
DM-F15A/FW15A	9	9
DM-F17A	9	9

DM-F Series Monitor

DM-F19A/FW19A	10	10
DM-F22A	10	10
DM-F24A	12	12

Table 3-7: Panel Mounting Clamps

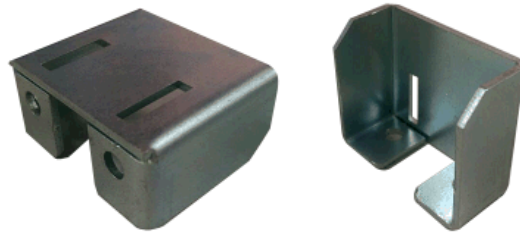


Figure 3-13: Mounting Clamps Holder



Figure 3-14: 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.

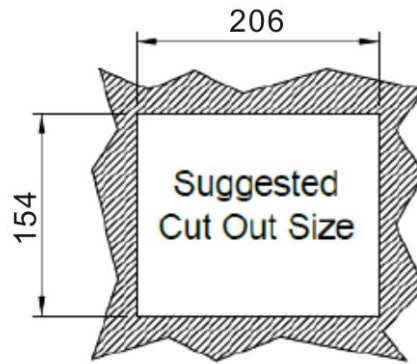


Figure 3-15: DM-F08A Cutout Dimensions (Unit: mm)

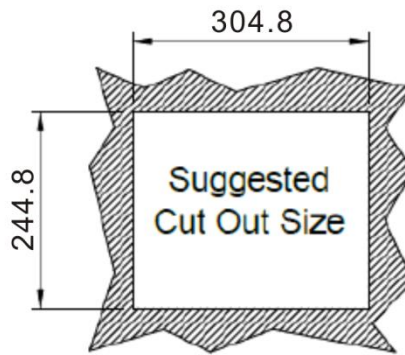


Figure 3-16: DM-F12A Cutout Dimensions (Unit: mm)

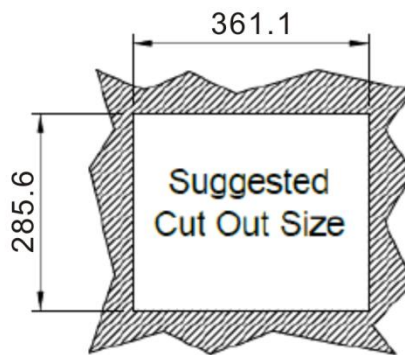


Figure 3-17: DM-F15A Cutout Dimensions (Unit: mm)

DM-F Series Monitor

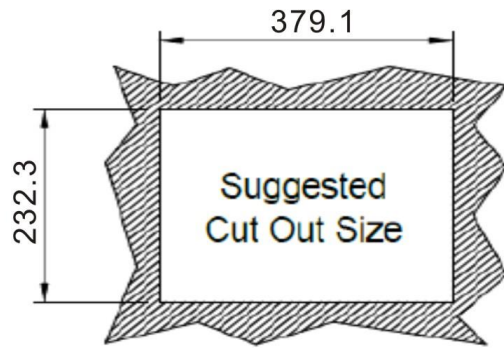


Figure 3-18: DM-FW15A Cutout Dimensions (Unit: mm)

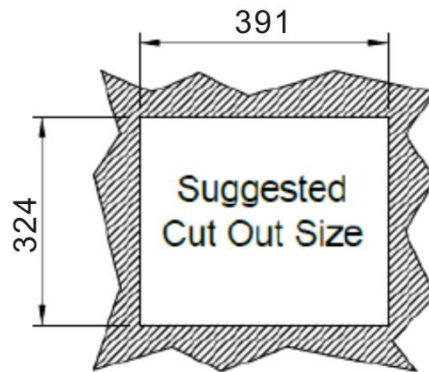


Figure 3-19: DM-F17A Cutout Dimensions (Unit: mm)

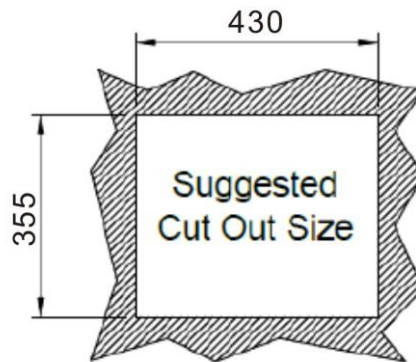


Figure 3-20: DM-F19A Cutout Dimensions (Unit: mm)

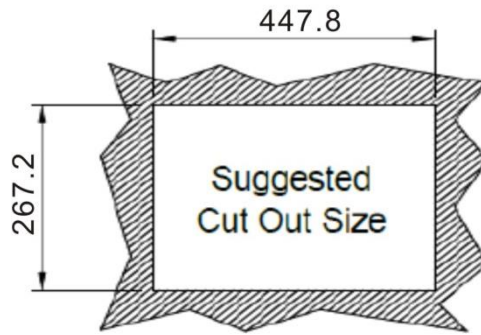


Figure 3-21: DM-FW19A Cutout Dimensions (Unit: mm)

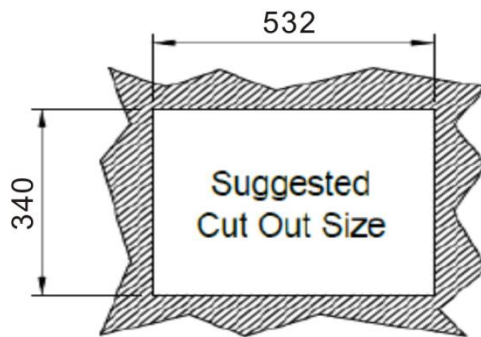


Figure 3-22: DM-F22A Cutout Dimensions (Unit: mm)

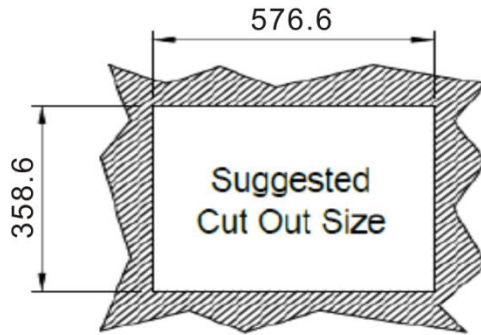


Figure 3-23: DM-F24A Cutout Dimensions (Unit: mm)

Step 3: Secure the mounting clamps holders to the corresponding holes on the rear of the monitor (**Figure 3-24**).

DM-F Series Monitor



NOTE:

It is not required to install the clamp holders to the DM-F08A monitors for panel/rack mounting. After sliding the monitor through the panel, simply insert the panel mounting clamps into the pre-formed holes along the top and side panels of the monitors. Then, 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.

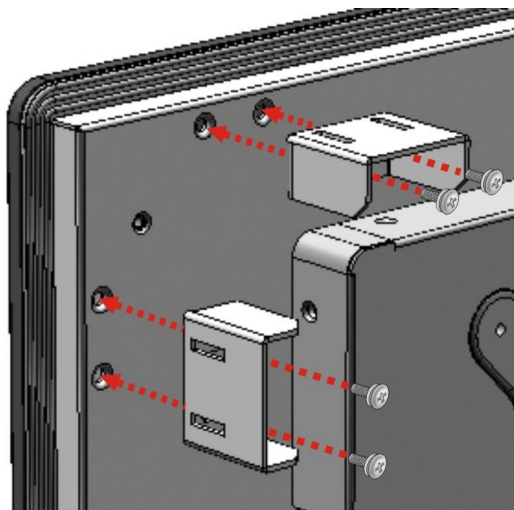


Figure 3-24: Secure the Mounting Clamp Holders

Step 4: Slide the monitor through the hole until the aluminum frame is flush against the panel (**Figure 3-25**).

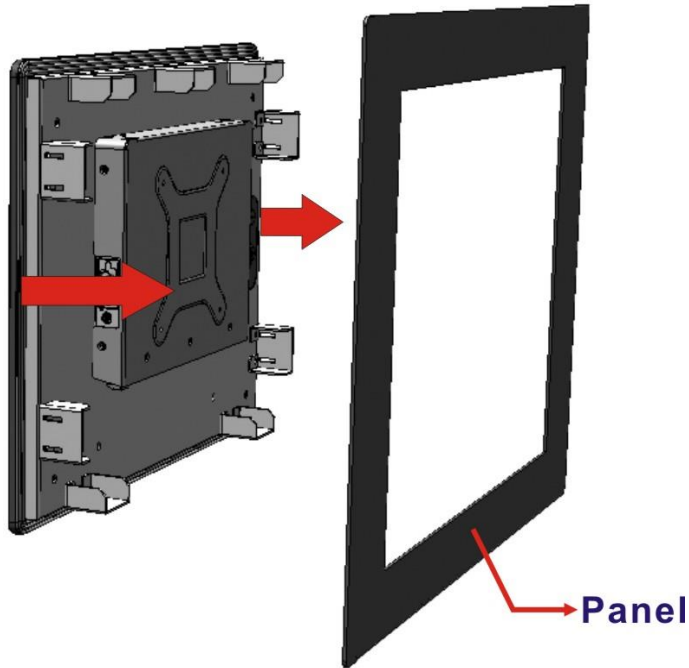


Figure 3-25: Slide into the Panel

Step 5: Insert the panel mounting clamps into the pre-formed holes of the clamp holders (Figure 3-26).

Step 6: 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 3-26).

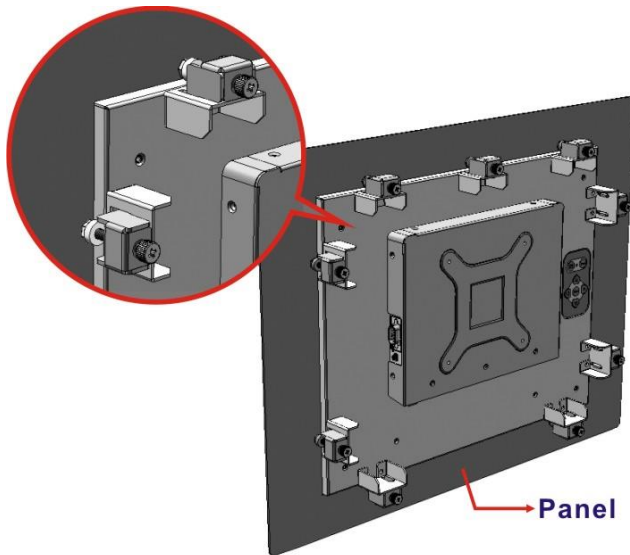


Figure 3-26: Panel Mounting Clamp Installation

DM-F Series Monitor

The dimensions of the clamp holder and the clamp are shown in the following diagrams.

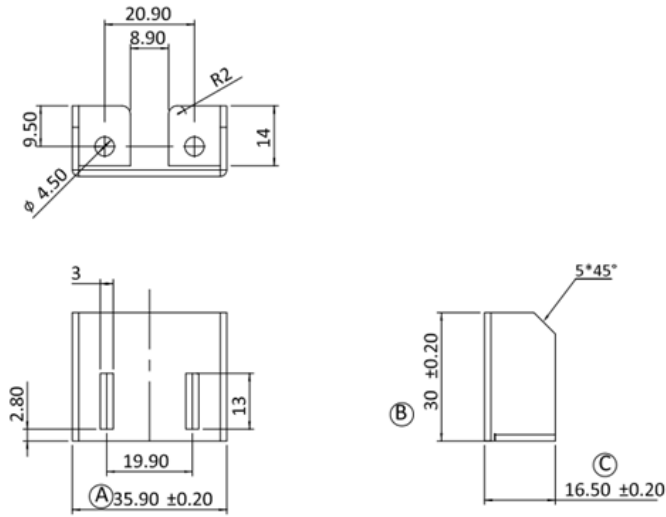


Figure 3-27: Mounting Clamps Holder Dimensions

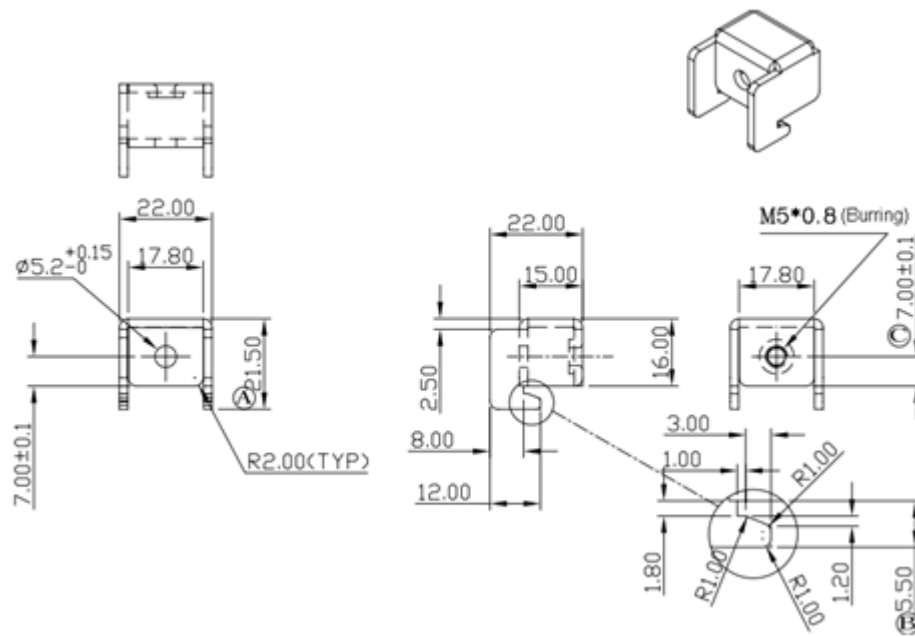


Figure 3-28: Ultra Set Plate Dimensions

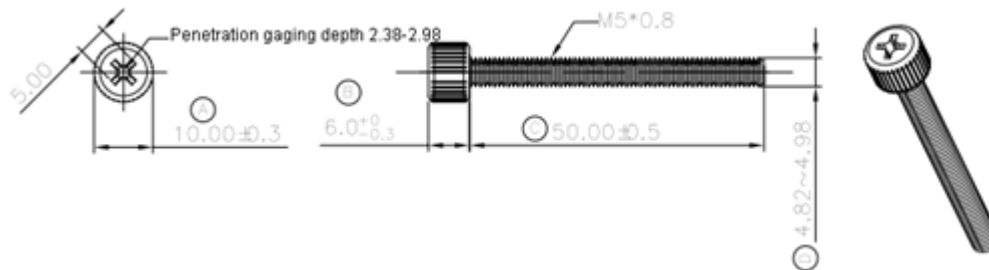


Figure 3-29: Bolt Dimensions

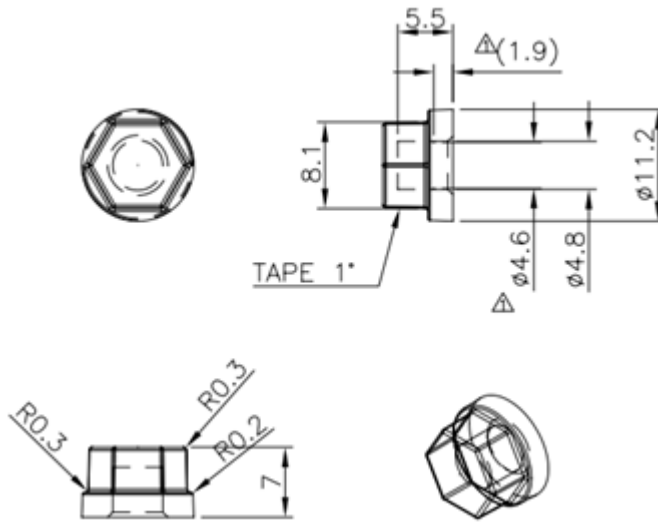


Figure 3-30: Steering Button Dimensions

3.3.2 Cabinet and Rack Installation (for F08A ~ F17A & FW19A)



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.

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:

- Step 1:** Secure the mounting clamps holders to the corresponding holes on the rear of the monitor (**Figure 3-31**).

DM-F Series Monitor



NOTE:

For DM-F08A

It is **not** required to install the clamp holders to the DM-F08A monitors for panel/rack mounting. After sliding the monitor through the panel, simply insert the panel mounting clamps into the pre-formed holes along the top and side panels of the monitors.

For DM-FW19A

It is only required to install the mounting clamps along the top and bottom panels of the DM-FW19A, four at each side.

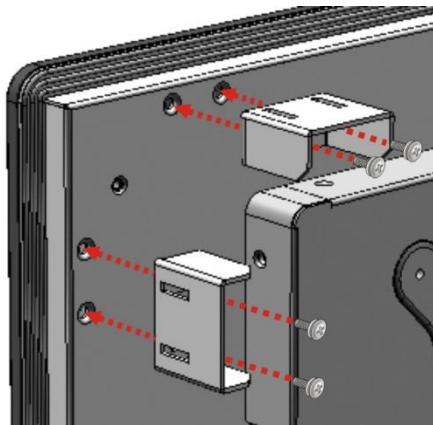
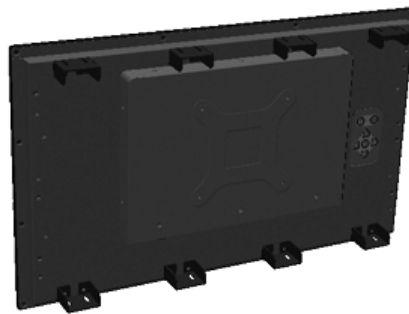


Figure 3-31: Secure the Mounting Clamp Holders

Step 2: 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 3-32**).

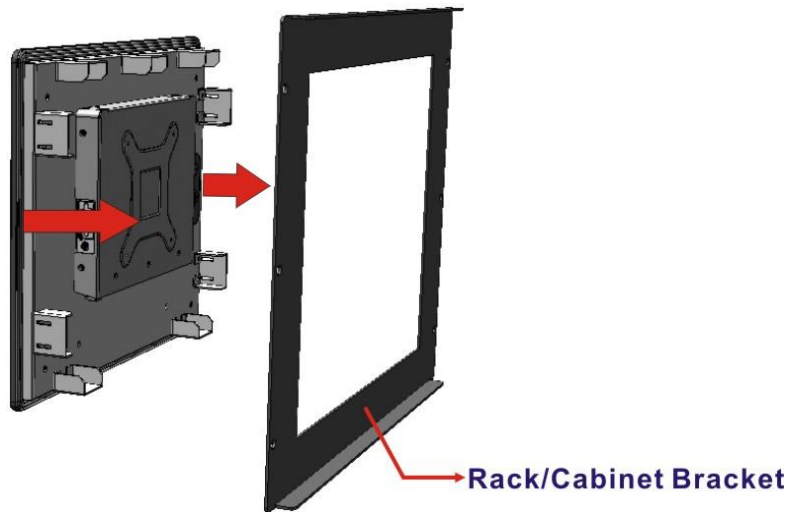


Figure 3-32: Slide into the Rack/Cabinet Bracket

Step 3: Insert the panel mounting clamps into the pre-formed holes of the clamp holders (Figure 3-33).

Step 4: 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 3-33).

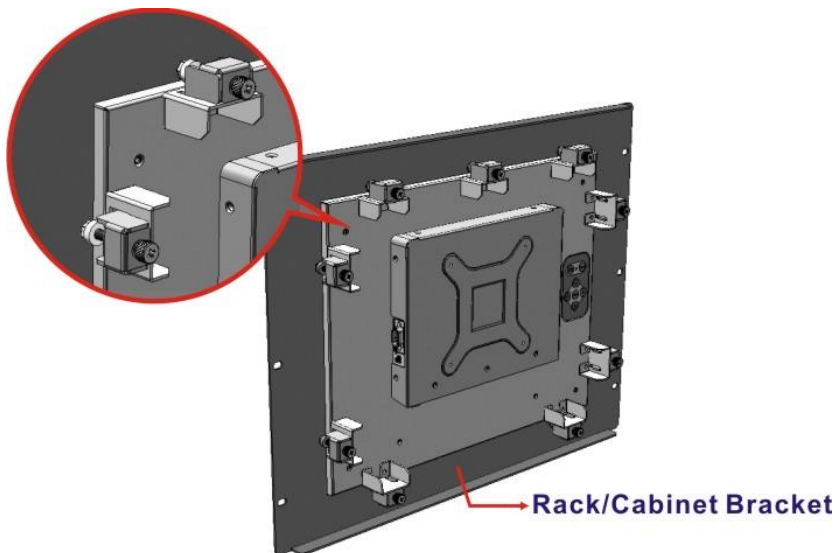


Figure 3-33: Secure the Rack/Cabinet Bracket

Step 5: Slide the LCD monitor with the attached rack/cabinet bracket into a rack or cabinet (Figure 3-34).

DM-F Series Monitor

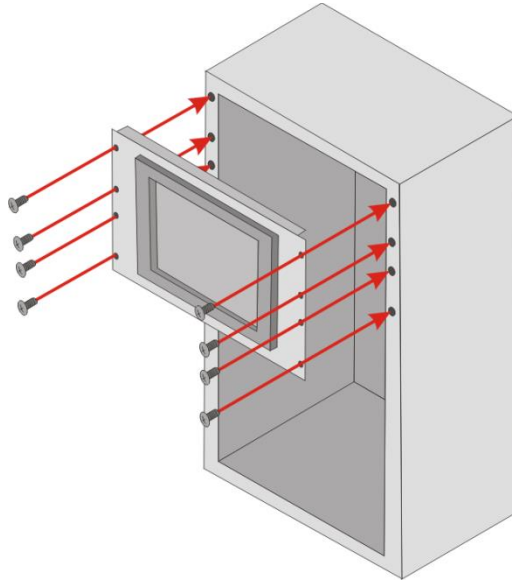


Figure 3-34: Install into a Rack/Cabinet

Step 6: 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 3-34**).

3.3.3 Cabinet and Rack Installation (for F19A)



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.

To install the DM-F19A to a cabinet or rack, please follow the steps below:

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 3-35**).

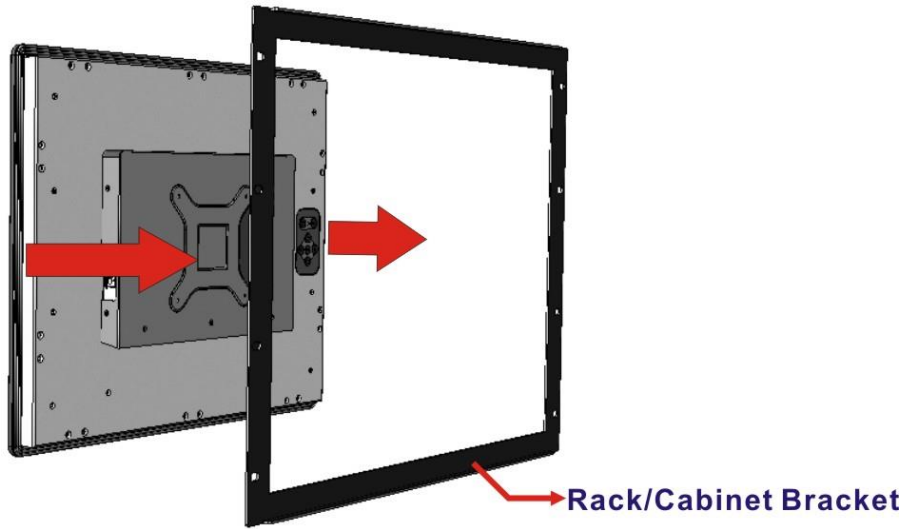


Figure 3-35: Slide DM-F19A into the Rack/Cabinet Bracket

Step 2: Secure the rack/cabinet bracket to the monitor. To do this, secure the 10 mounting brackets to the corresponding screw holes on the rear of the monitor using the provided retention screws (**Figure 3-36**).

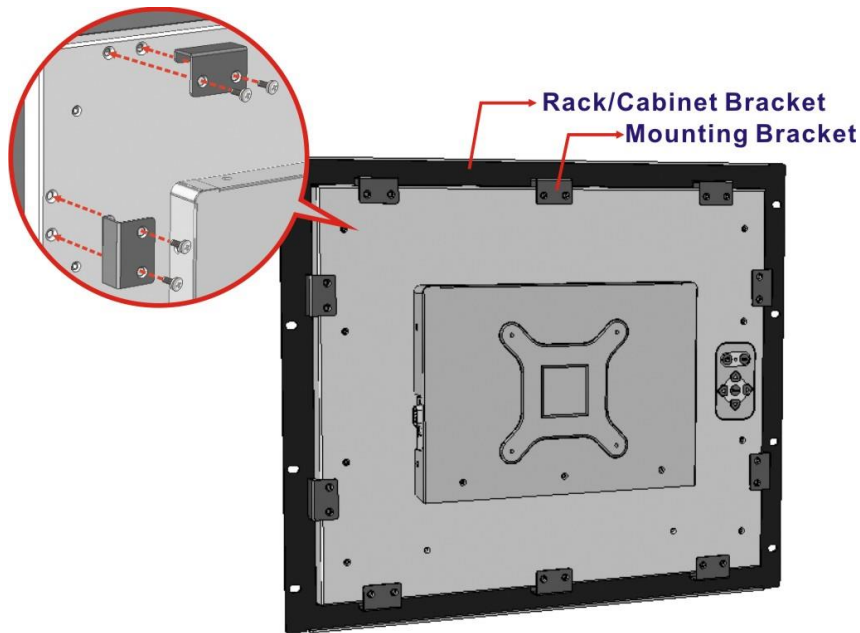


Figure 3-36: Secure the Mounting Brackets

DM-F Series Monitor

Step 3: Slide the LCD monitor with the attached rack/cabinet bracket into a rack or cabinet (**Figure 3-37**).

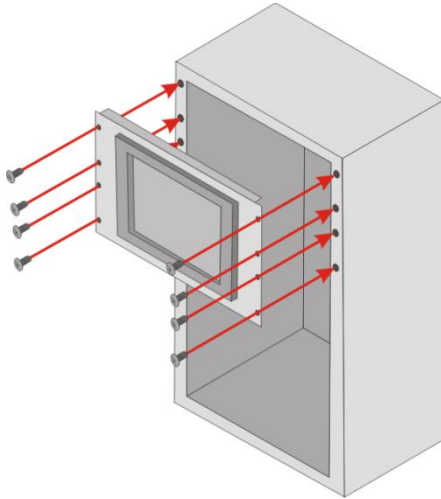


Figure 3-37: Install DM-F19A into a Rack/Cabinet

Step 4: 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 3-34**).

3.3.4 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 1:** Attach the wall mounting kit to the mounting surface with the included screws. Make sure it is attached securely (Figure 3-38).

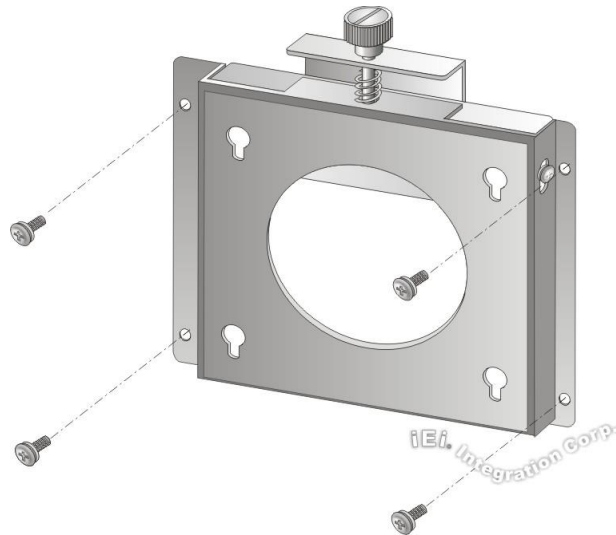


Figure 3-38: Attach Wall Mounting Kit to the Wall

- Step 2:** Screw the mounting screws to the mounting holes on the rear of the DM-F series (Figure 3-39).
- Step 3:** Hook the DM-F series into the mounting holes on the wall mounting kit (Figure 3-39).

DM-F Series Monitor

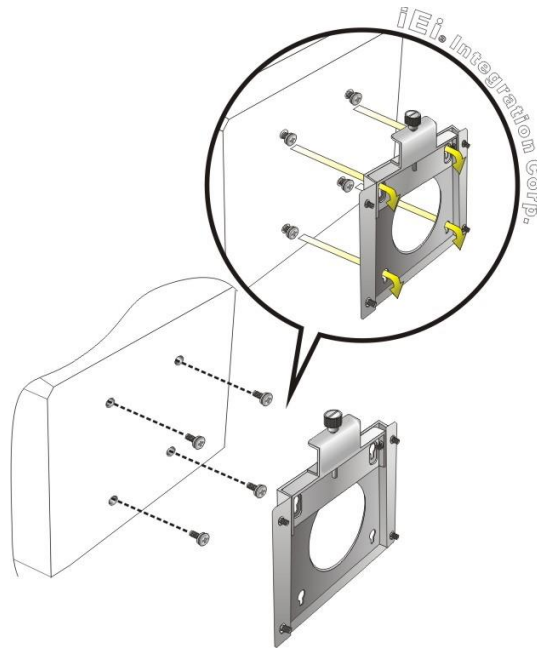


Figure 3-39: Hook Onto Wall Mounting Kit

Step 4: Tighten the top screw on the wall mounting kit to securely hold the DM-F series in place. After this screw is tightened, the DM-F series should not be able to move.

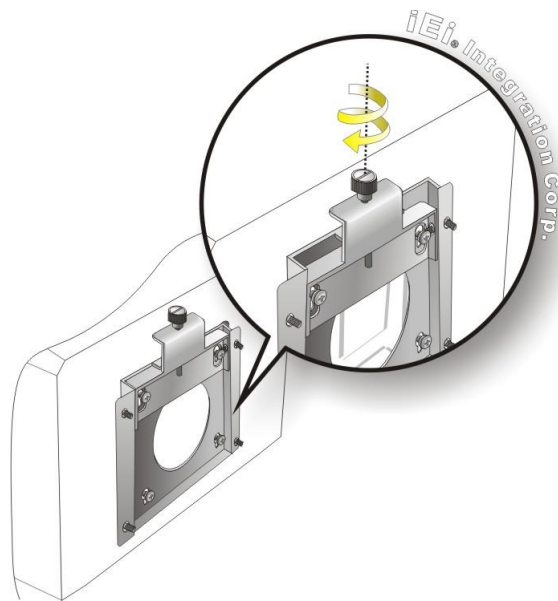


Figure 3-40: Tighten Retention Screw

3.3.5 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 75 mm x 75 mm or 100 mm x 100 mm apart (Figure 3-41 and Figure 3-42).

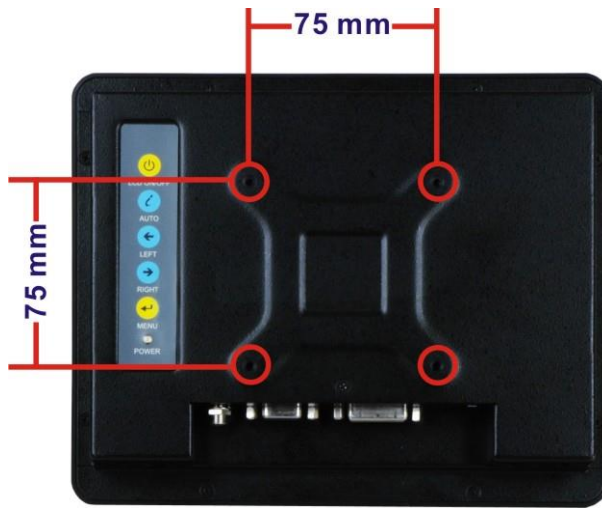


Figure 3-41: VESA Mounting Holes (DM-F08A)

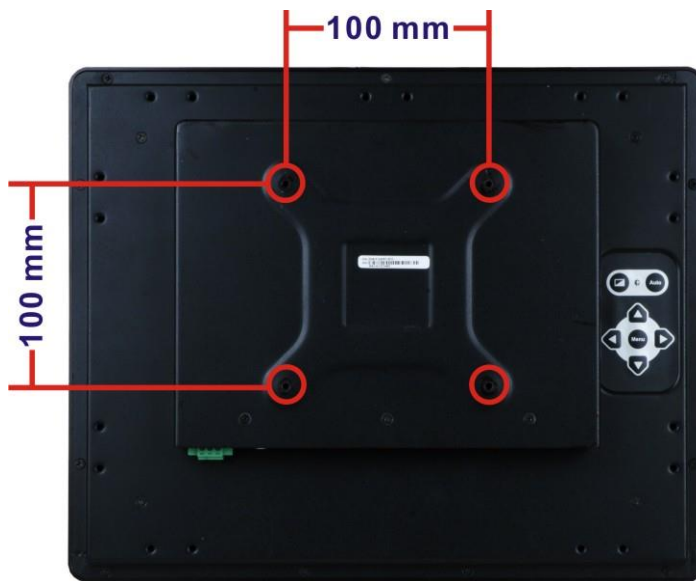


Figure 3-42: VESA Mounting Holes (DM-F12A ~ DM-F24A)

DM-F Series Monitor

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 3-43).

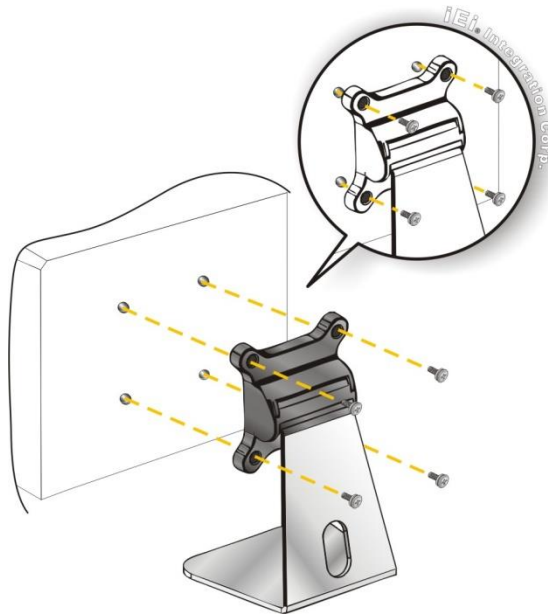


Figure 3-43: Monitor Stand Mounting

3.3.6 Arm Installation

The DM-F series LCD monitor has VESA standard mounting holes tapped into the rear panel. The standard holes are M4 set at 75 mm x 75 mm or 100 mm x 100 mm apart (Figure 3-41 and Figure 3-42). 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 3-44).

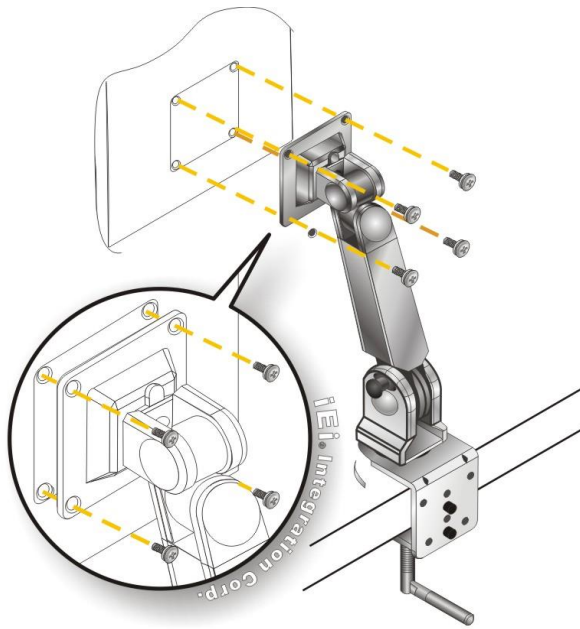


Figure 3-44: Monitor Arm Mounting

Chapter

4

On-Screen-Display (OSD) Controls

4.1 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 5-key membrane OSD keypad of the DM-F08A LCD monitors.

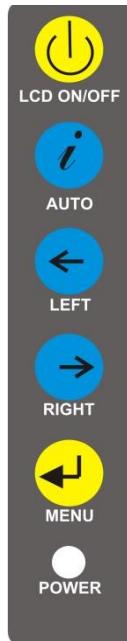


Figure 4-1: OSD Keypad for DM-F08A

The function of each button is described in the following table.

LCD ON/OFF	Turn on or turn off the LCD screen.
AUTO	Automatically adjust the screen. Exit the main menu or the submenu.
LEFT	Select item in the menu; increase the value.
RIGHT	Select item in the menu; decrease the value.
MENU	Open the OSD window. Enter the submenu or save the setting of the item.

Table 4-1: OSD Control Buttons for DM-F08A

DM-F Series Monitor

Figure 4-2 shows the 7-key membrane OSD keypad of the DM-F12A ~ DM-F24A.

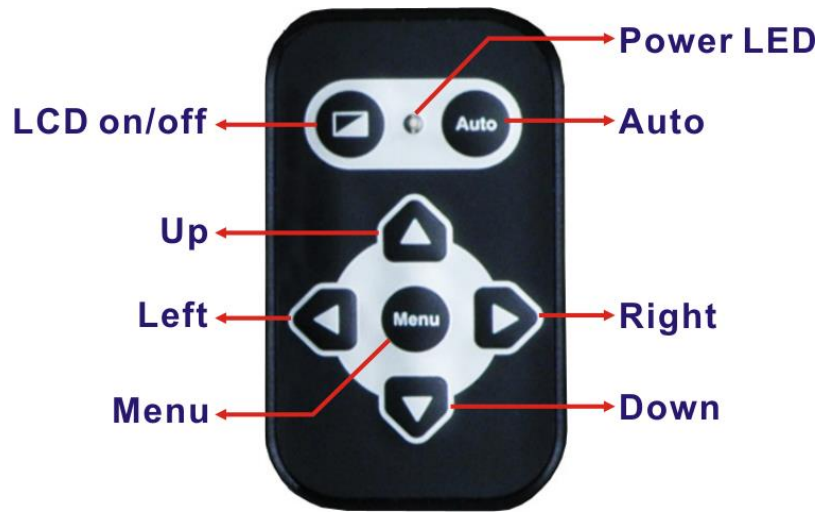


Figure 4-2: OSD Keypad for DM-F12A ~ DM-F24A

The function of each button is described in the following table.

LCD on/off	Turn on or turn off the LCD screen.
Auto	Automatically adjust the screen.
Menu	Open the OSD window.
Up	Exit the main menu or the submenu.
Down	Enter the submenu or save the setting of the item.
Left	Select item in the menu; increase the value.
Right	Select item in the menu; decrease the value.

Table 4-2: OSD Control Buttons for DM-F12A ~ DM-F24A

4.2 OSD Menu Structure

The following table shows the OSD menu structure for all models of the DM-F series LCD monitor.

Level 1	Level 2	Value	Default Value
Picture	Backlight	0 to 100	100
	Brightness	0 to 100	50
	Contrast	0 to 100	50
	Sharpness	1 to 5	3
Display*	Auto Adjust		
	H Position	0 to 100	50
	V Position	0 to 100	50
	Clock	0 to 100	
	Phase	0 to 100	
Color	Gamma	OFF, 2.2	OFF
	Temperature	9300K, 7500K, 6500K, User	6500K
Input	Auto Select		Auto Select
	VGA		
	DP		
	HDMI(DVI)		
Other	Reset		
	Menu Time	10 to 60	10
	OSD H Position	0 to 100	50
	OSD V Position	0 to 100	50
	Transparency	0 to 7	0
Information			

*The "Display" menu is only available when using VGA connection.

Table 4-3: OSD Menu Structure

DM-F Series Monitor

4.3 Using the OSD

OSD menu options are described below.

4.3.1 Picture Menu

Image menu features are shown in **Figure 4-3**.

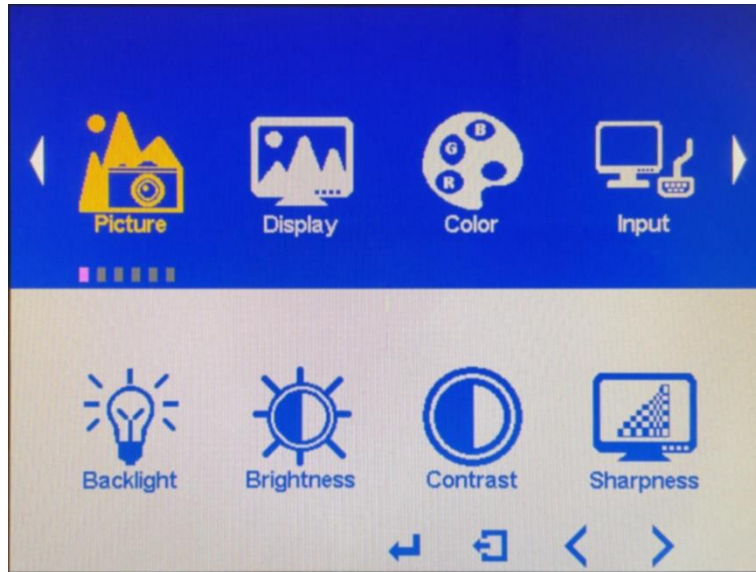


Figure 4-3: Picture Menu

Backlight	Adjusts the intensity of the LCD backlight.
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.

4.3.2 Display Menu

Display menu features are shown in **Figure 4-4**. The Display menu is only available when using VGA connection.

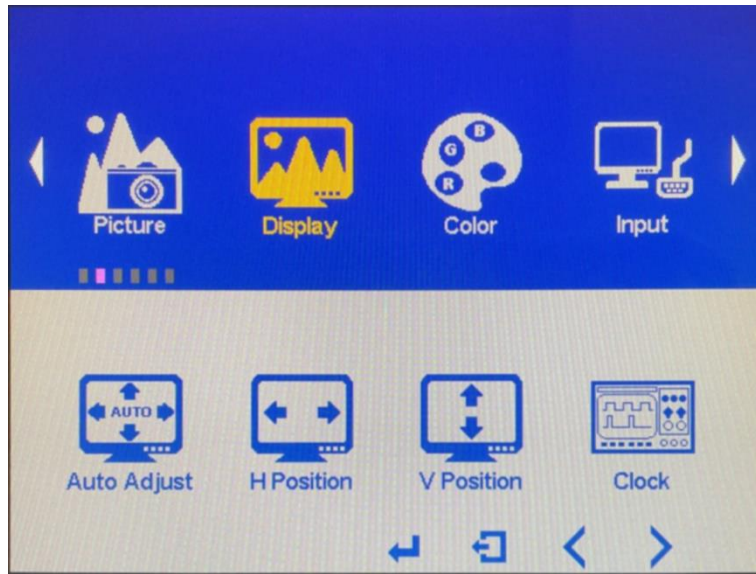


Figure 4-4: Display Menu

- | | |
|--------------------|---|
| Auto Adjust | Automatically adjusts the LCD screen position. |
| H Position | Adjusts the horizontal position of the display screen |
| V Position | Adjusts the vertical position of the display screen |
| Clock | Adjusts frequency to fill display |
| Phase | Adjusts the phase control of image |

DM-F Series Monitor

4.3.3 Color Setting

Color settings are shown in **Figure 4-3**.

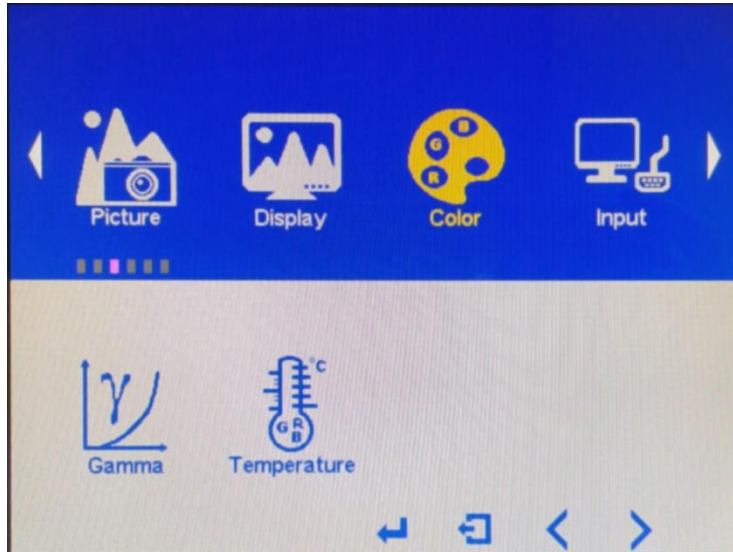


Figure 4-5: Color Menu

- | | |
|-------------------|--|
| Gamma | This item allows adjustment of the Gamma. |
| Color temp | This item allows adjustment of the following items. <ul style="list-style-type: none">▪ 9300k – NTSC standard Kelvin▪ 7500k – NTSC standard Kelvin▪ 6500k – NTSC standard Kelvin▪ User – This item allows fine-tuning the balance among Red, Green, and Blue color hues if images look garish or unrealistic. |

4.3.4 Input Menu

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

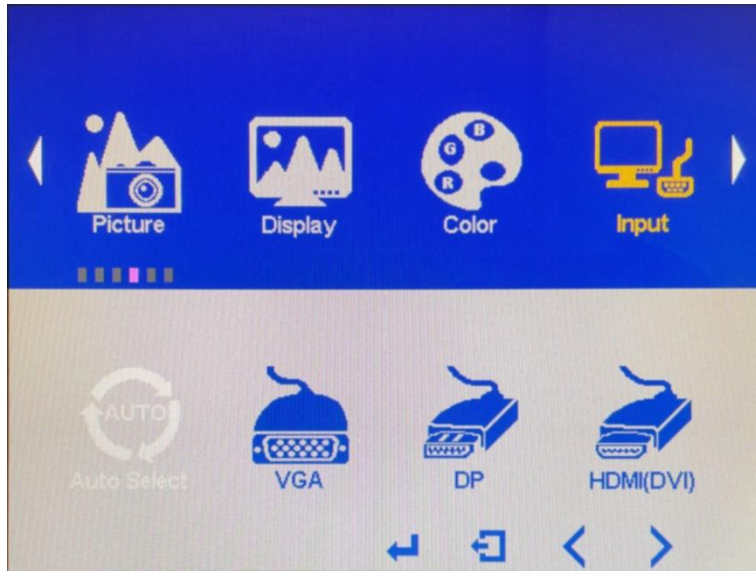


Figure 4-6: Input Menu

Input options are described below.

- | | |
|--------------------|---|
| Auto Select | Selects the input device to use automatically. |
| VGA | This item sets the input device to VGA. |
| DP | This item sets the input device to DisplayPort. |
| HDMI(DVI) | This item sets the input device to HDMI or DVI. |

DM-F Series Monitor

4.3.5 Other Menu

The Other options are shown in **Figure 4-7**.

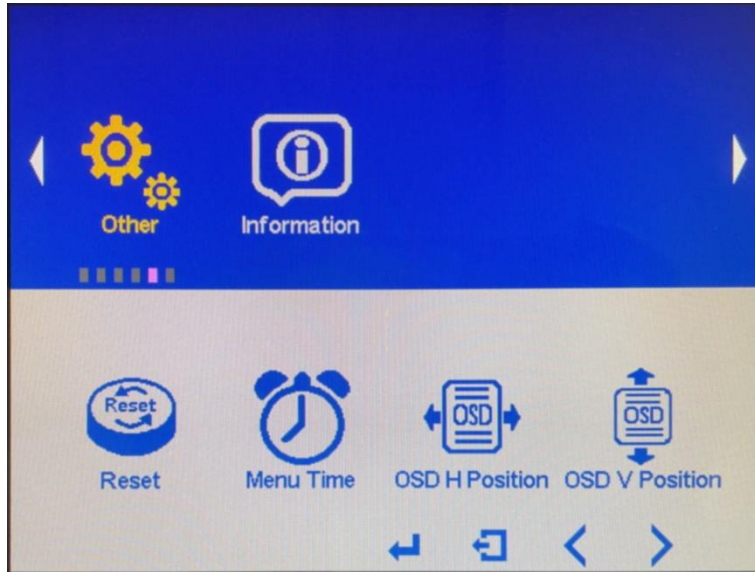


Figure 4-7: Other Menu

The options are described below.

Reset	Restores the default OSD settings. Note that this will restore all default display settings.
Menu Time	Determines how many seconds the OSD screen stays on screen before it disappears when OSD is left unattended.
OSD H Position	Adjusts the OSD horizontal position on the screen.
OSD V Position	Adjusts the OSD vertical position on the screen.
Transparency	Adjust the transparency of the OSD menu background.

4.3.1 Information Menu

The Information menu provides information on the LCD monitor, such as firmware version, input type and input resolution.

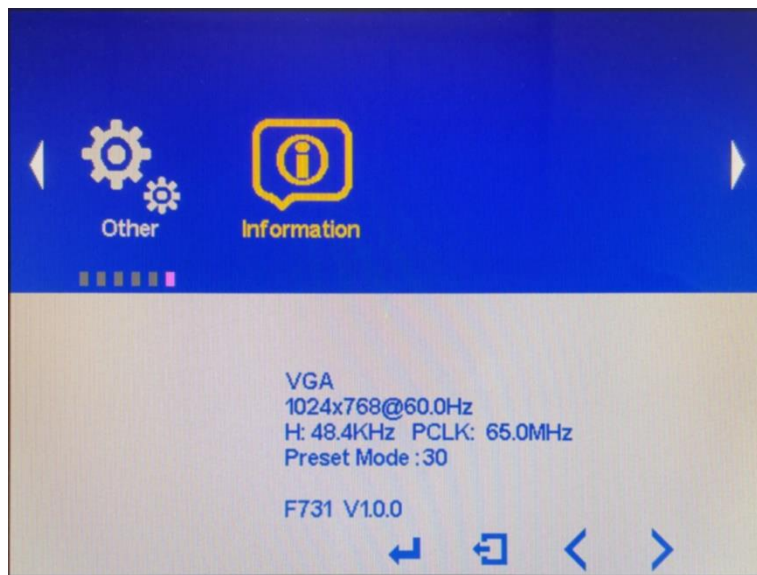


Figure 4-8: Information Menu

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® 10
- 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 Touchscreen

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

DM-F Series Monitor



NOTE:

The default touchscreen interface for the DM-F series monitor is USB interface. The RS-232 interface is only reserved for the models with resistive type touchscreen.

- **RS-232 Interface:** If the touchscreen 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 touchscreen 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:

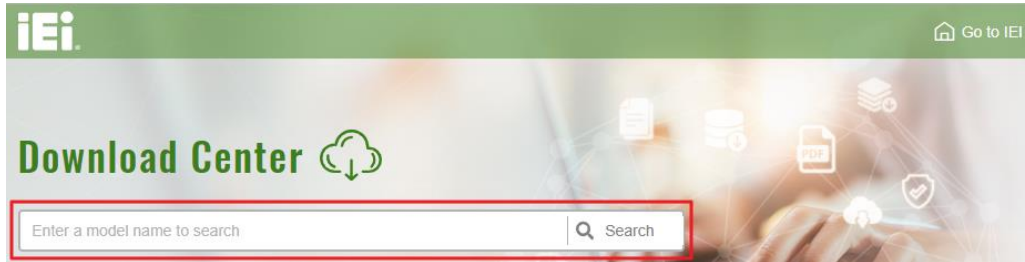
Before the touchscreen driver is installed, make sure the system is connected to the monitor with a USB cable or an RS-232 null cable. Also, make sure the VGA connector on the system is connected to the VGA connector on the bottom of the monitor.

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

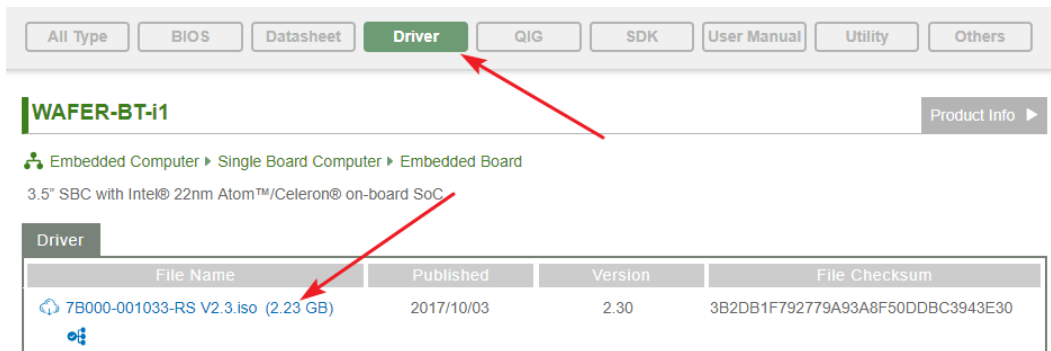
Step 1: Connect the DM-F series monitor to the single board computer. See above.

Step 2: Download the touch driver from IEI website. Go to

<https://download.ieiworld.com>. Type the model name of the DM Series and press Enter.

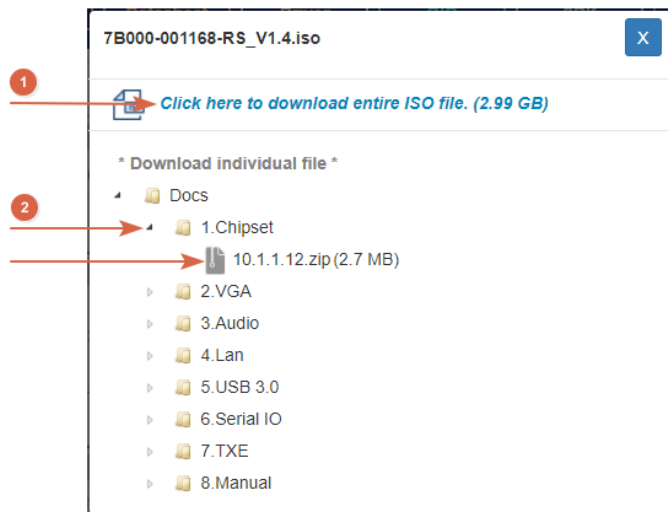


Step 3: All product-related software, utilities, and documentation will be listed. You can choose **Driver** to filter the result.



Step 4: Click the driver file name on the page and you will be prompted with the following window. You can download the entire ISO file (❶), or click the small arrow to find an individual driver and click the file name to download (❷).

DM-F Series Monitor



Step 5: Select the **PenMount Touch Driver** folder. Double click the setup icon in the folder.

Step 6: The Welcome screen in **Figure 5-1** appears.



Figure 5-1: Welcome Screen

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

Step 8: The license agreement in **Figure 5-2** appears. Accept the terms of the agreement by clicking **I Agree**.

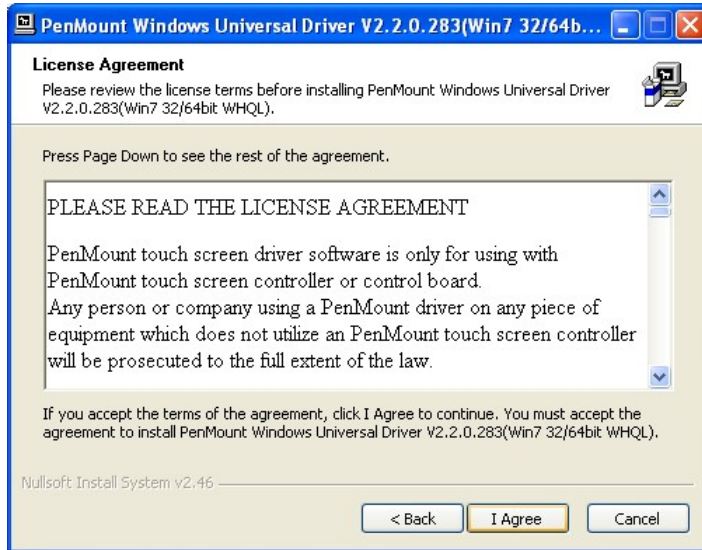


Figure 5-2: License Agreement

Step 9: The installation destination screen appears. See **Figure 5-3**. Click **Install**.

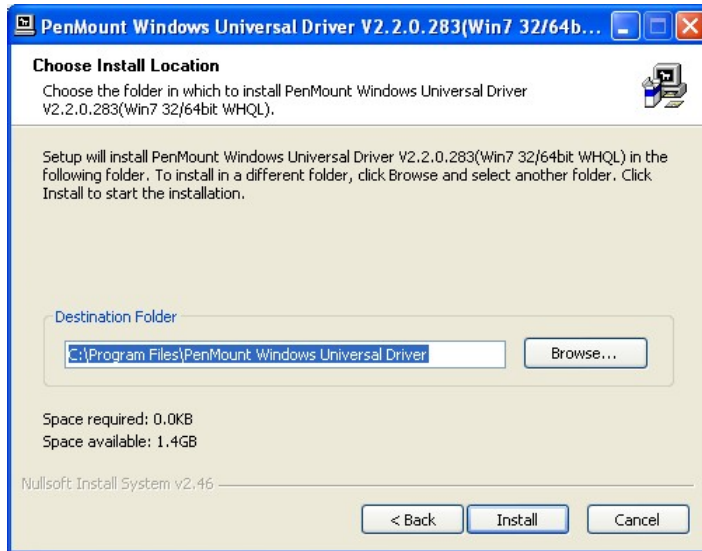


Figure 5-3: Initiate Install

Step 10: The installation of the program begins. See **Figure 5-4**.

DM-F Series Monitor

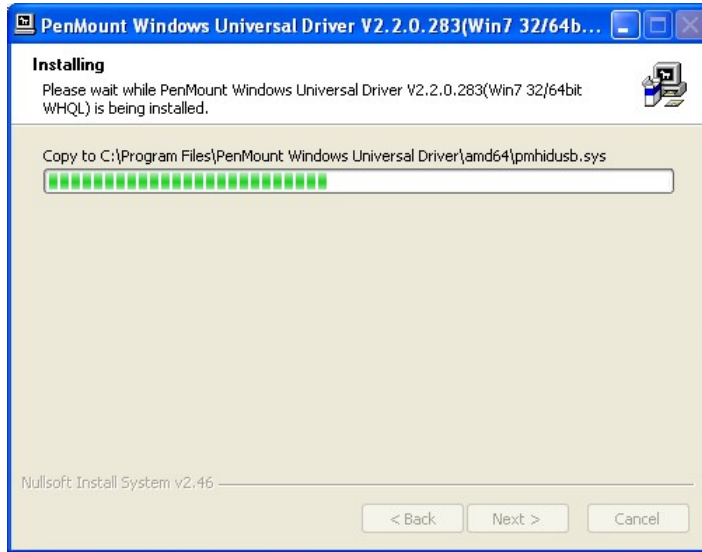


Figure 5-4: Installation Starts

Step 11: When the installation is complete, the complete screen appears. See Figure 5-5.

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

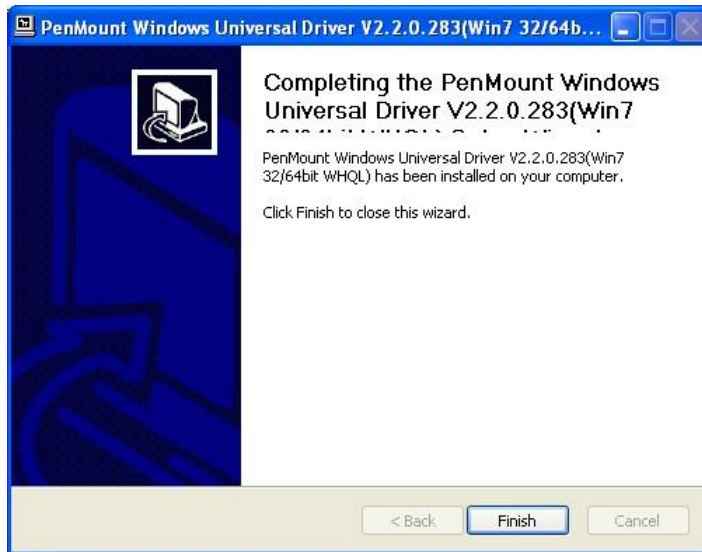


Figure 5-5: Finish Installation

5.4 Change the Touchscreen Interface

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

- Step 1:** Uninstall the touchscreen driver
- Step 2:** Remove the interface cable i.e. remove the USB cable or the RS-232 cable
- Step 3:** Install the new cable i.e. install the RS-232 cable or the USB cable.
- Step 4:** Reinstall the driver CD as described above.

5.5 Calibrating the Touchscreen

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

- Step 1:** Make sure the system is properly connected through a USB or an RS-232 interface to the DM-F series monitor.
- Step 2:** Make sure the touchscreen driver is properly installed.
- Step 3:** Locate the PenMount Monitor icon in the bottom right corner of the screen.



Figure 5-6: PenMount Monitor Icon

- Step 4:** Click the icon. A pop up menu appears. See **Figure 5-7**.

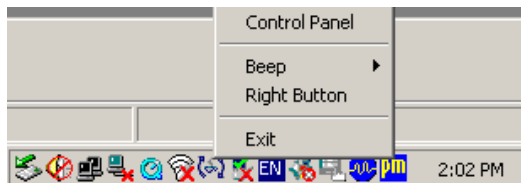


Figure 5-7: PenMount Monitor Popup Menu

DM-F Series Monitor

Step 5: Click Control Panel in the pop up menu shown in **Figure 5-7**.

Step 6: The configuration screen in **Figure 5-8** appears.

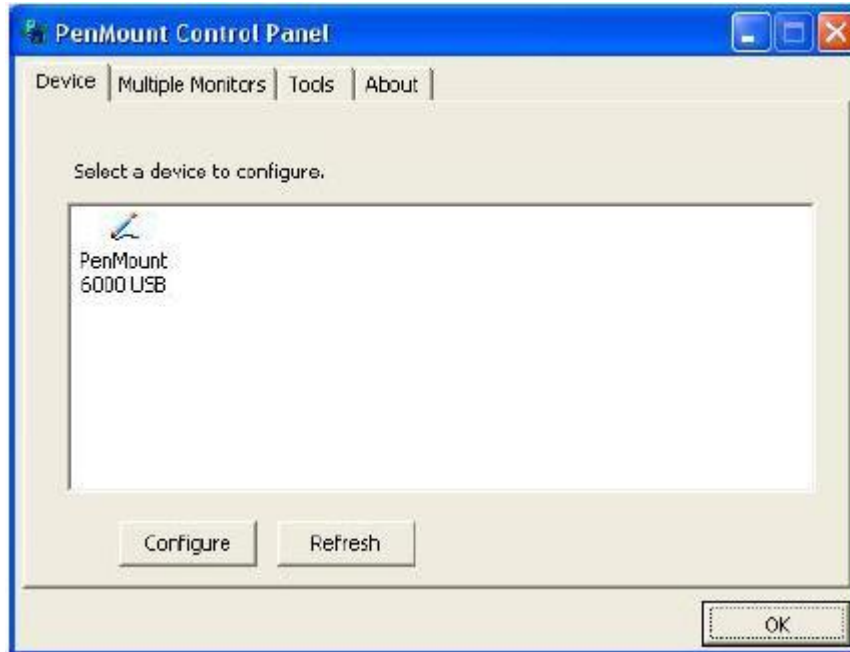


Figure 5-8: Configuration Screen

Step 7: Double click the PenMount 6000 icon as shown in **Figure 5-8**.

Step 8: The calibration initiation screen in **Figure 5-9** appears.

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



Figure 5-9: Calibration Initiation Screen

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



Touch the red square.

Figure 5-10: Calibration Screen

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

Chapter

6

AD Boards

6.1 AD Board Overview

The DM series LCD monitor AD board provides a wide variety of control interfaces. There are two AD boards used for the DM series monitors: AV-2525 and AV-25251. Refer to **Table 1-2** for a listing of DM series monitors and their associated AD board. The following sections describe each AD board in detail.

6.2 AV-2525 AD Board

The connector locations of the AV-2525 are shown in Figure 6-1. The Pin 1 locations of the on-board connectors are also indicated in the diagrams below. The connector pinouts for these connectors are listed in the following sections.

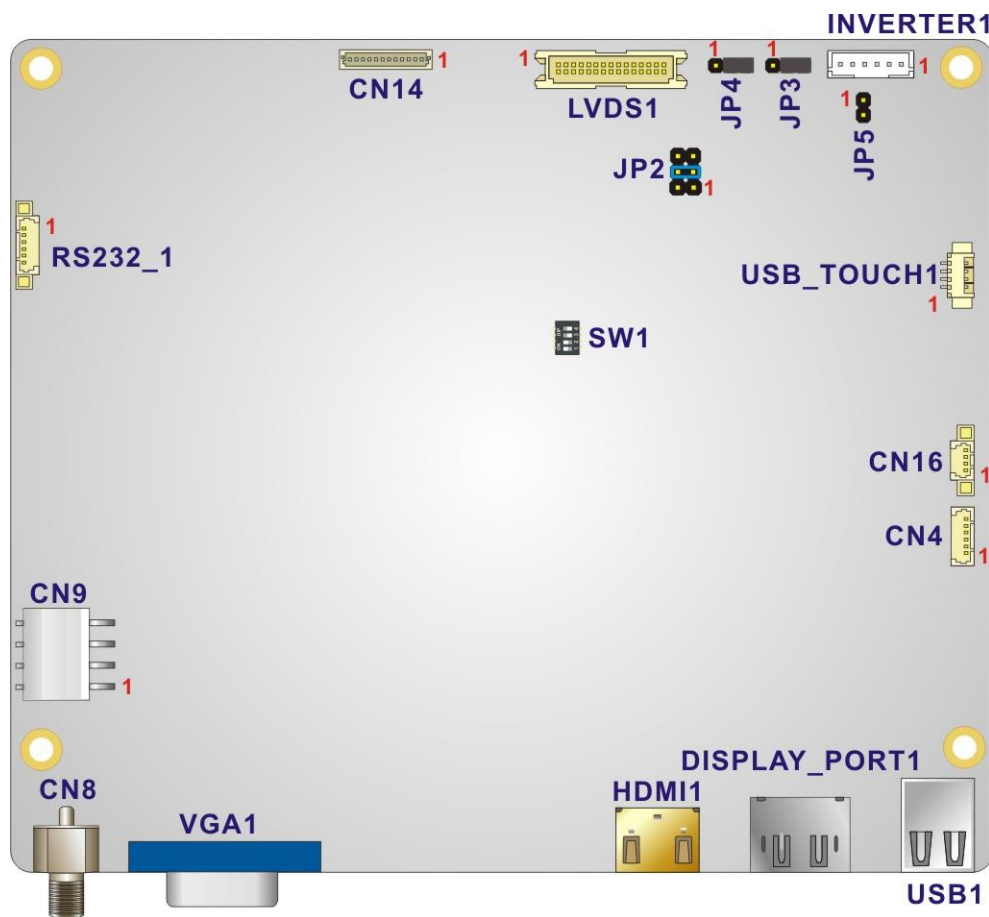


Figure 6-1: AV-2525 AD Board Layout Diagram

DM-F Series Monitor

6.2.1 AV-2525 Peripheral Interface Connectors

Table 6-2 shows a list of the peripheral interface connectors on the AV-2525 AD board. Pinouts of the connectors that are used in the DM-F series can be found in the following sections.

Connector	Type	Label
Backlight inverter connector	6-pin wafer, p=2.00 mm	INVERTER1
I ² C connector for debug	4-pin wafer, p=1.25 mm	CN16
Auto dimming connector	6-pin wafer, p=1.25 mm	CN4
LVDS connector	30-pin crimp, p=1.25 mm	LVDS1
OSD keypad connector	12-pin wafer, p=1.00 mm	CN14
Power input connector	4-pin wafer, p=3.96 mm	CN9
RS-232 connector for resistive touchscreen	6-pin wafer, p=1.25 mm	RS232_1
USB connector for PCAP touchscreen	4-pin wafer, p=1.25 mm	USB_TOUCH1
Resistive touchscreen connector	9-pin wafer, p=1.25 mm	J1

Table 6-1: Peripheral Interface Connectors (AV-2525)

Jumper	Type	Label
LCD resolution select switch	6-pin DIP switch	SW1
LVDS panel voltage select jumper	6-pin header, p=2.54 mm	JP2
LVDS inverter power control jumpers	3-pin header, p=2.00 mm	JP3, JP4
	2-pin header, p=2.00 mm	JP5
NOTE: These jumpers are preconfigured for the DM-F series. Users should not change these jumpers.		

Table 6-2: Preconfigured Jumpers (AV-2525)

6.2.2 Backlight Inverter Connector (INVERTER1)

PIN NO.	DESCRIPTION
1	12V
2	12V
3	ON/OFF
4	ADJ
5	GND
6	GND

Table 6-3: Backlight Inverter Connector (INVERTER1) Pinouts

6.2.3 LVDS Connector (LVDS1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	A0P_C	4	A0M_C
5	A1P_C	6	A1M_C
7	A2P_C	8	A2M_C
9	CLK1P_C	10	CLK1M_C
11	A3P_C	12	A3M_C
13	GND	14	GND
15	A4P_C	16	A4M_C
17	A5P_C	18	A5M_C
19	A6P_C	20	A6M_C
21	CLK2P_C	22	CLK2M_C
23	A7P_C	24	A7M_C
25	GND	26	GND
27	VCC	28	VCC
29	VCC	30	VCC

Table 6-4: LVDS Connector (LVDS1) Pinouts

DM-F Series Monitor

6.2.4 OSD Keypad Connector (CN14)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V_OSD	2	+12V
3	OSD1	4	OSD2
5	OSD3	6	OSD4
7	OSD5	8	OSD6
9	OSD7	10	KEYPAD_GLED
11	GND	12	SC_3V3

Table 6-5: OSD Keypad Connector (CN14) Pinouts

6.2.5 Power Input Connector (CN9)

PIN NO.	DESCRIPTION
1	GND
2	GND
3	VCC
4	VCC

Table 6-6: Power Input Connector (CN9) Pinouts

6.2.6 RS-232 Connector for Touchscreen (RS232_1)

PIN NO.	DESCRIPTION
1	NDSR
2	NRX
3	NRTS
4	NTX
5	NDTR
6	GND

Table 6-7: RS-232 Connector for Touchscreen (RS232_1) Pinouts

6.2.7 USB Connector for Touchscreen (USB_TOUCH1)

PIN NO.	DESCRIPTION
1	VCC_TOUCH
2	D2F-
3	D2F+
4	GND

Table 6-8: USB Connector for Touchscreen (USB_TOUCH1) Pinouts

6.2.8 Resistive Touchscreen Connector (J1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	X+	2	X-
3	Y+	4	SENSE
5	X+	6	X-
7	Y+	8	Y-
9	GND		

Table 6-9: Resistive Touchscreen Connector (J1) Pinouts

DM-F Series Monitor

6.3 AV-25251 AD Board

The connector locations of the AV-25251 are shown in Figure 6-1. The Pin 1 locations of the on-board connectors are also indicated in the diagrams below. The connector pinouts for these connectors are listed in the following sections.

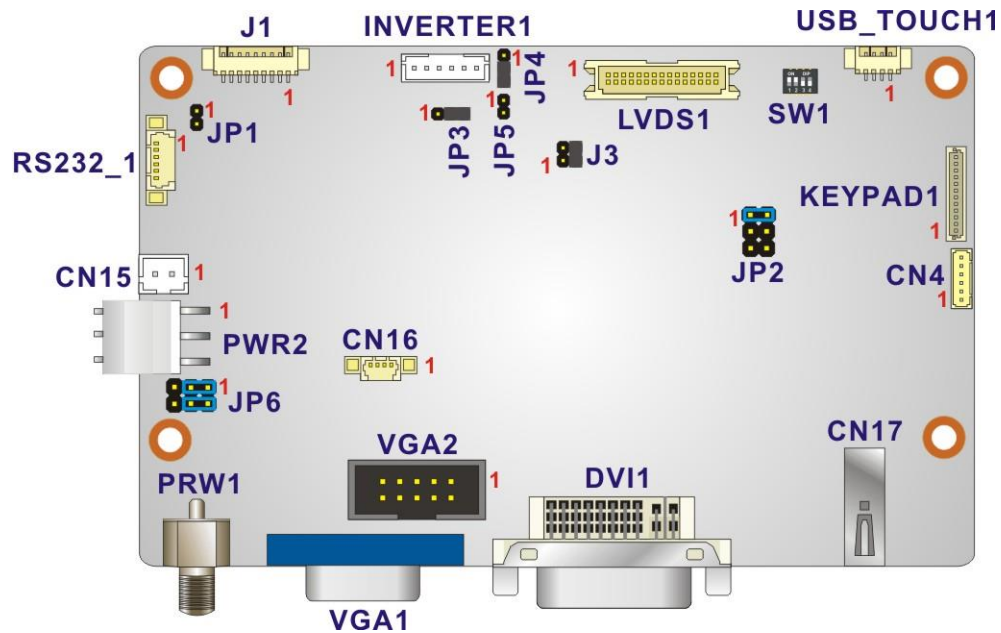


Figure 6-2: AV-25251 AD Board Layout Diagram

6.3.1 AV-25251 Peripheral Interface Connectors

Table 6-11 shows a list of the peripheral interface connectors on the AV-25251 AD board. Pinouts of the connectors that are used in the DM-F series can be found in the following sections.

Connector	Type	Label
Auto dimming connector	6-pin wafer, p=1.25 mm	CN4
Backlight Inverter connector	6-pin wafer, p=2.00 mm	INVERTER1
I ² C connector for debug	4-pin wafer, p=1.25 mm	CN16
LVDS connector	30-pin crimp, p=1.25 mm	LVDS1
OSD keypad connector	12-pin wafer, p=1.00 mm	KEYPAD1

Power input connector	3-pin wafer, p=3.96 mm	PWR2
Power input connector (+12 V)	2-pin wafer, p=2.50 mm	CN15
RS-232 connector for touchscreen	6-pin wafer, p=1.25 mm	RS232_1
USB connector for touchscreen	4-pin wafer, p=1.25 mm	USB_TOUCH1
Touchscreen connector	9-pin wafer, p=1.25 mm	J1
VGA connector	10-pin box header, p=2.00 mm	VGA2

Table 6-10: Peripheral Interface Connectors (AV-25251)

Jumper	Type	Label
LCD resolution select switch	6-pin DIP switch	SW1
Touchscreen type select jumper	2-pin header, p=2.00 mm	JP1
LVDS panel voltage select jumper	6-pin header, p=2.54 mm	JP2
LVDS inverter power control jumpers	3-pin header, p=2.00 mm	JP3, JP4
	2-pin header, p=2.00 mm	JP5
Power input setting jumper	6-pin header, p=2.54 mm	JP6
NOTE: These jumpers are preconfigured for the DM-F series. Users should not change these jumpers.		

Table 6-11: Preconfigured Jumpers (AV-25251)

DM-F Series Monitor

6.3.2 Backlight Inverter Connector (INVERTER1)

PIN NO.	DESCRIPTION
1	BKL_POWER1
2	BKL_POWER1
3	ENABKL
4	BRIGHTNESS
5	GND
6	GND

Table 6-12: Backlight Inverter Connector (INVERTER1) Pinouts

6.3.3 LVDS Connector (LVDS1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	A0P_C	4	A0M_C
5	A1P_C	6	A1M_C
7	A2P_C	8	A2M_C
9	CLK1P_C	10	CLK1M_C
11	A3P_C	12	A3M_C
13	GND	14	GND
15	A4P_C	16	A4M_C
17	A5P_C	18	A5M_C
19	A6P_C	20	A6M_C
21	CLK2P_C	22	CLK2M_C
23	A7P_C	24	A7M_C
25	GND	26	GND
27	VCC	28	VCC
29	VCC	30	VCC

Table 6-13: LVDS Connector (LVDS1) Pinouts

6.3.4 OSD Keypad Connector (KEYPAD1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V_OSD(NC)	2	+12V(NC)
3	Left	4	Auto
5	Right	6	Power
7	Menu	8	Led_GREED (UP)
9	Down (NC)	10	Led_RED
11	GND	12	+3.3V_DVDD(NC)

Table 6-14: OSD Keypad Connector (KEYPAD1) Pinouts

6.3.5 Power Input Connector (PWR2)

PIN NO.	DESCRIPTION
1	+9 V ~ +36 V to external power module
2	GND
3	+12 V input

Table 6-15: Power Input Connector (PWR2) Pinouts

6.3.6 RS-232 Connector for Touchscreen (RS232_1)

PIN NO.	DESCRIPTION
1	NDSR
2	NRX
3	NRTS
4	NTX
5	NDTR
6	GND

Table 6-16: RS-232 Connector for Touchscreen (RS232_1) Pinouts

DM-F Series Monitor

6.3.7 USB Connector for Touchscreen (USB_TOUCH1)

PIN NO.	DESCRIPTION
1	VCC_TOUCH
2	D2F-
3	D2F+
4	GND

Table 6-17: USB Connector for Touchscreen (USB_TOUCH1) Pinouts

6.3.8 Touchscreen Connector (J1)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	X+	2	X-
3	Y+	4	SENSE
5	X+	6	X-
7	Y+	8	Y-
9	GND		

Table 6-18: Touchscreen Connector (J1) Pinouts

6.3.9 VGA Connector (VGA2)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED	2	SMCLK
3	GREEN	4	SMDATA
5	BLUE	6	GND
7	H-SYNC	8	GND
9	V-SYNC	10	GND

Table 6-19: VGA Connector (VGA2) Pinouts

Appendix

A

Regulatory Compliance

DM-F Series Monitor

DECLARATION OF CONFORMITY



This equipment has been tested and found to comply with specifications for CE marking. If the user modifies and/or installs other devices in the equipment, the CE conformity declaration may no longer apply.

FCC WARNING



This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Appendix

B

Safety Precautions

DM-F Series Monitor



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.

B.1 Safety Precautions

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

B.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

B.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 anti-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.

DM-F Series Monitor

B.1.3 Product Disposal



CAUTION:

Risk of explosion if the battery is replaced by an incorrect type;

Replacement of a battery with an incorrect type that can defeat a safeguard (for example, in the case of some lithium battery types);

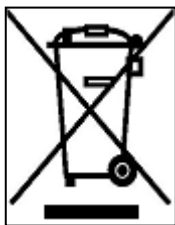
Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery, that can result in an explosion;

Leaving a battery in an extremely high temperature surrounding environment that can result in an explosion or the leakage of flammable liquid or gas;

A battery subjected to extremely low air pressure that may result in an explosion or the leakage of flammable liquid or gas;

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union–If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union–The device that produces less waste and is easier to recycle is classified as electronic device in terms of the European Directive 2012/19/EU (WEEE), and must not be disposed of as domestic garbage.



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your display products, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

B.2 Maintenance and Cleaning Precautions

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

B.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.

B.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.

DM-F Series Monitor

- Cotton swabs - Cotton swabs 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

C

smartOSD

DM-F Series Monitor

C.1 IEI smartOSD Quick Installation Guide

**NOTE:**

The host computer must have a VGA port to best support smartOSD.

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 VGA video cable.

C.2 Pre-installation Notice

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

- Windows 2000
- Windows 2003
- Windows XP
- Windows Vista
- Windows 7
- Windows 10

C.3 smartOSD Installation

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.

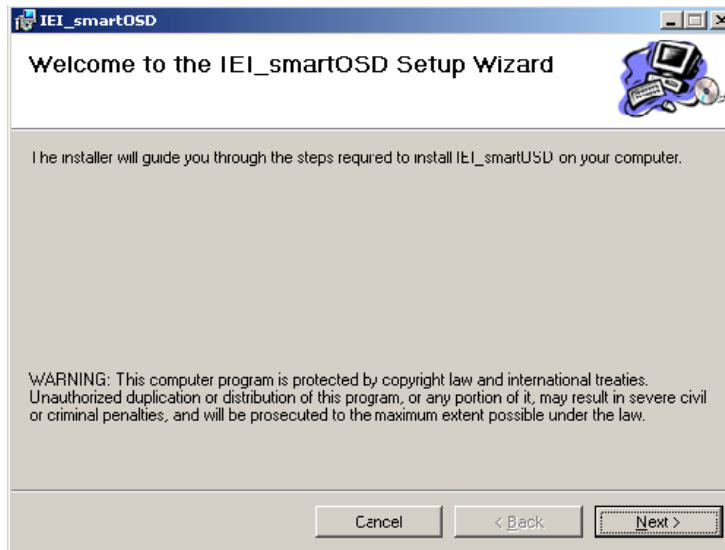


Figure C-1: smartOSD Welcome Screen

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

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

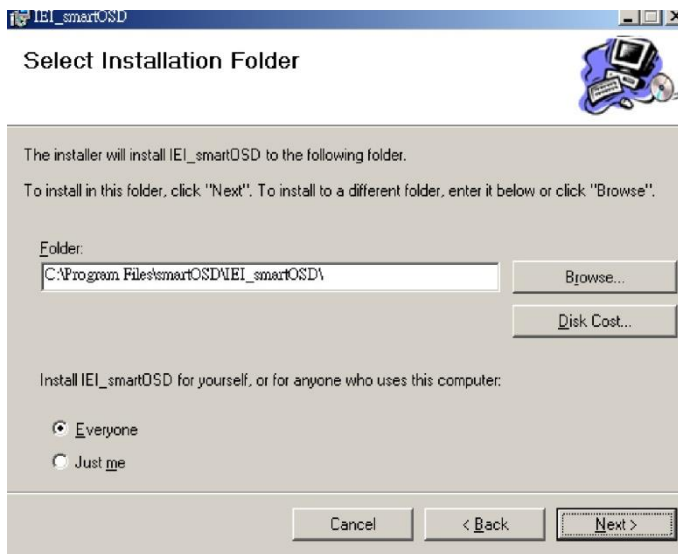


Figure C-2: smartOSD Folder Select Screen

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.

DM-F Series Monitor

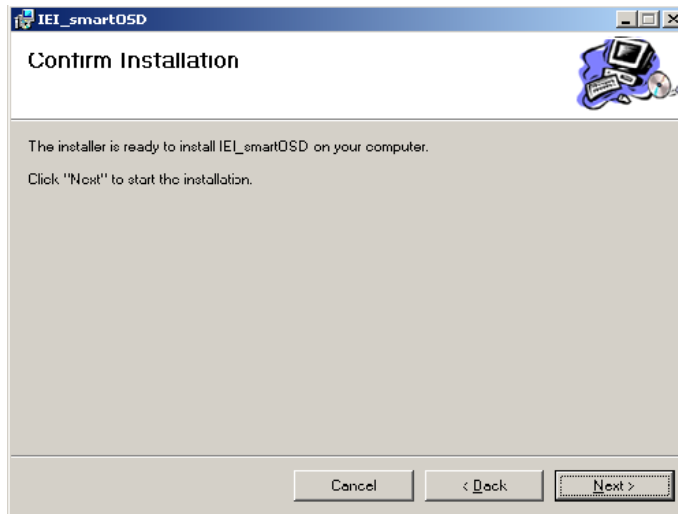


Figure C-3: smartOSD Confirm Installation

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.

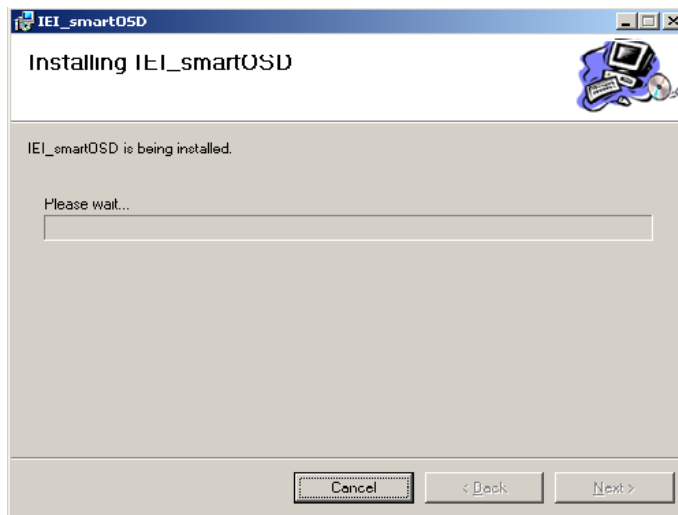


Figure C-4: smartOSD Installation Progress

Step 11: When the installation is complete the "Complete Installation" screen in .

Figure C-5 appears.

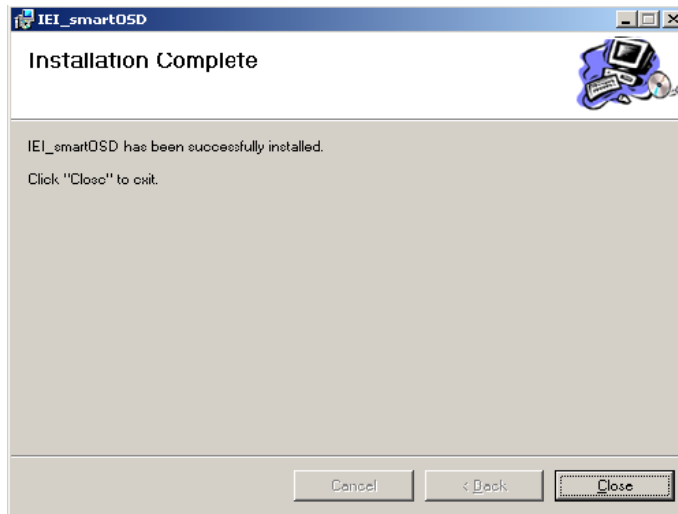
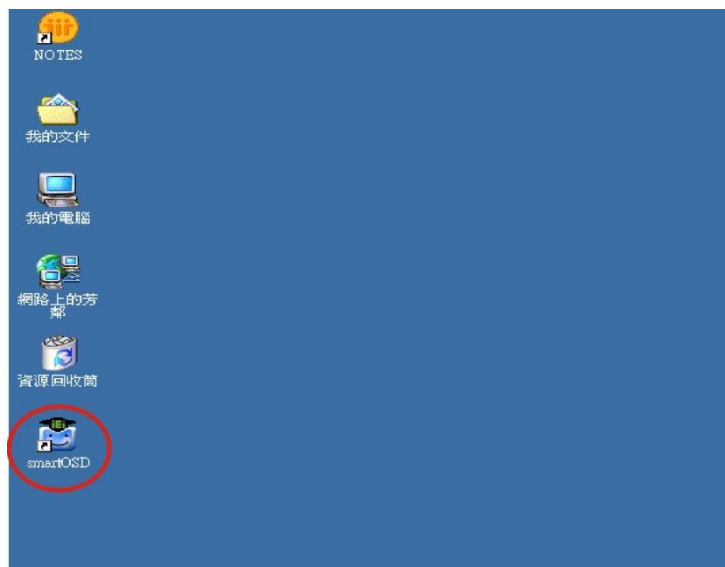


Figure C-5: smartOSD Installation Complete

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.



DM-F Series Monitor

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.

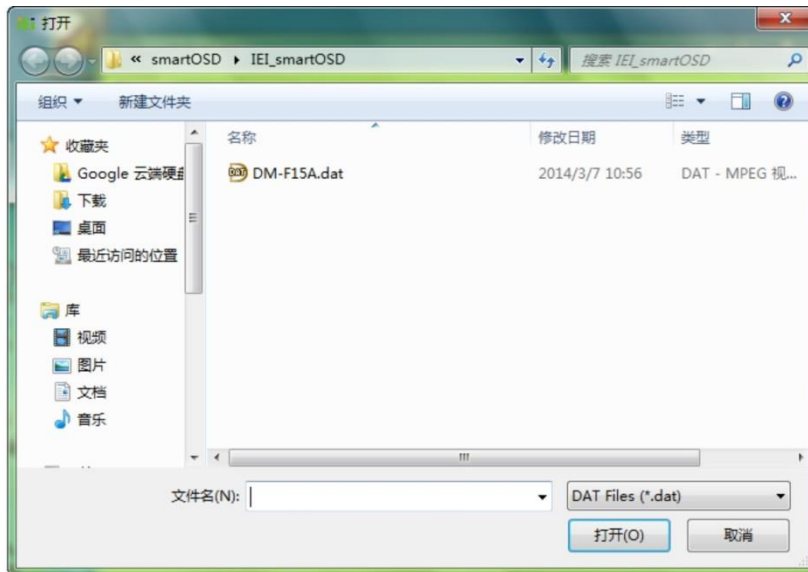
Item	Elements
Management	Save/Load File
	Power Management
EDID	EDID contains basic information about the monitor and its capabilities.
Image	Brightness
	Contrast
	Sharpness
Display	Auto Adjust
	Phase
	Clock
Color	Auto Color
	User Red Gain
	User Green Gain
	User Blue Gain
	Color Temperature
	Gamma (disabled 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

DM-F Series Monitor

C.4.1 Manage Page



Save the preferred settings of all the OSD functions as .dat files and load the settings.

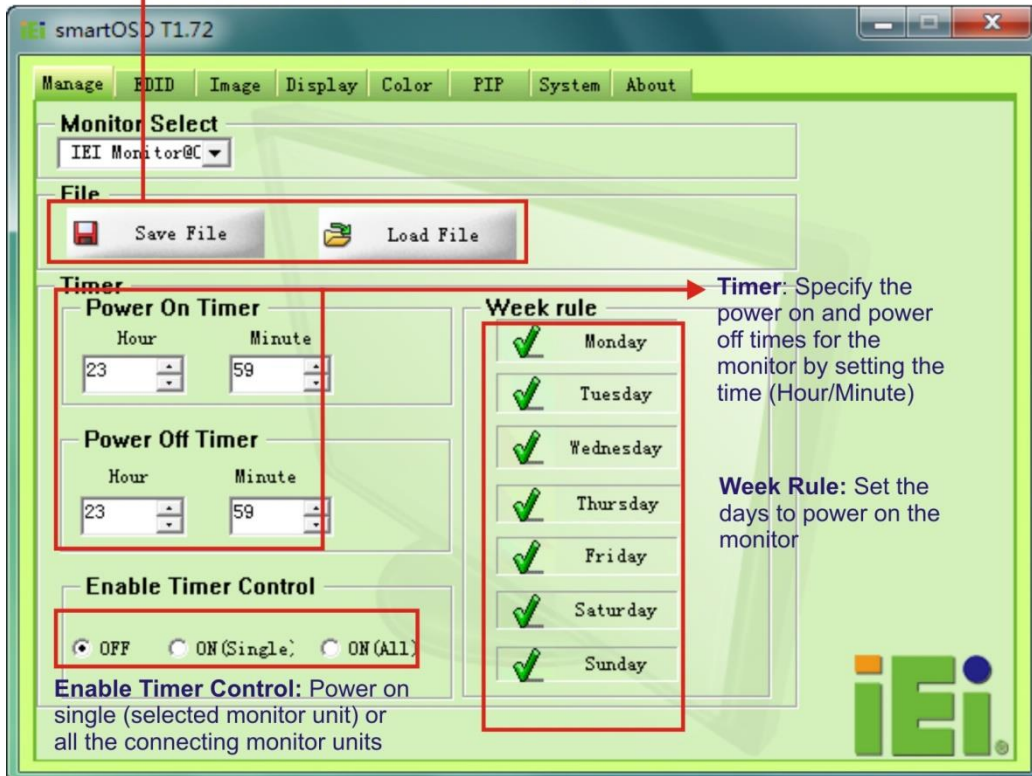


Figure C-6: Manage Page

C.4.2 EDID Page

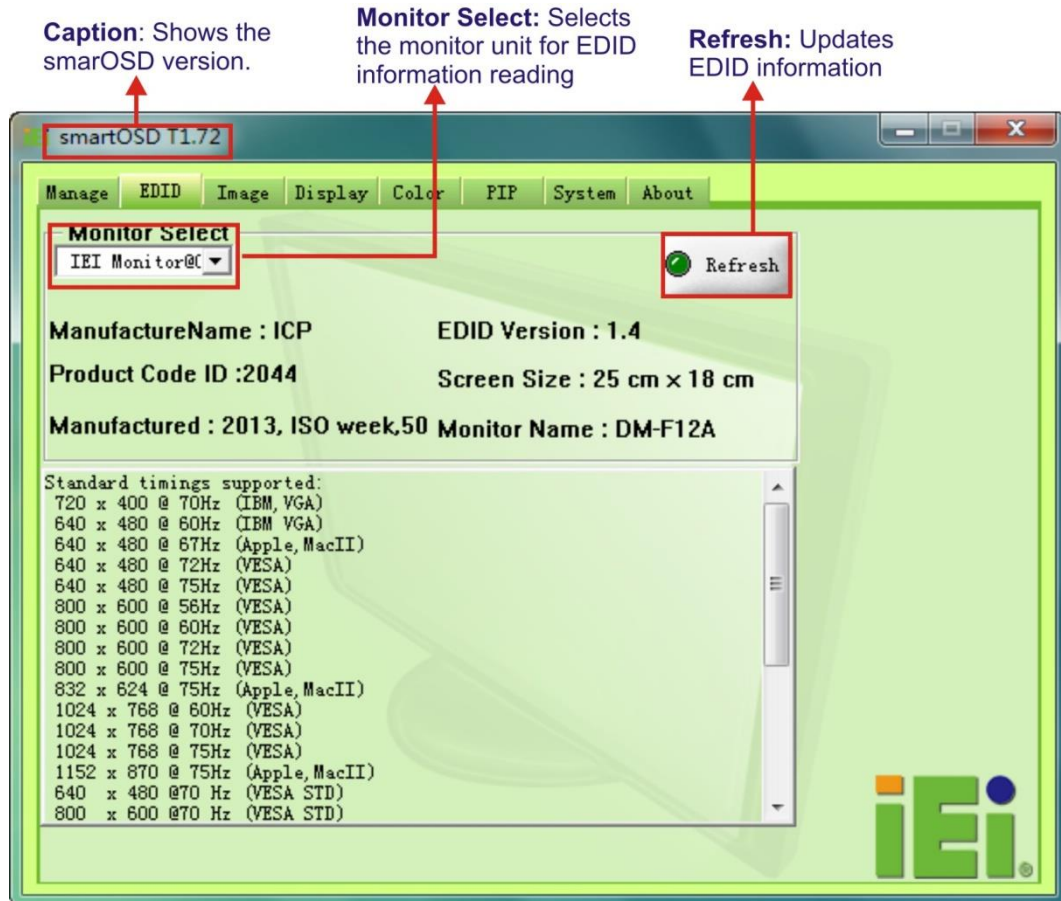


Figure C-7: EDID Page

DM-F Series Monitor

C.4.3 Image Page

Monitor Select: Selects the monitor unit for which the image parameters will be adjusted

Refresh: To update image information which has been affected by the hardware OSD settings

Apply All: Delivering the image parameters settings to all the connecting monitors

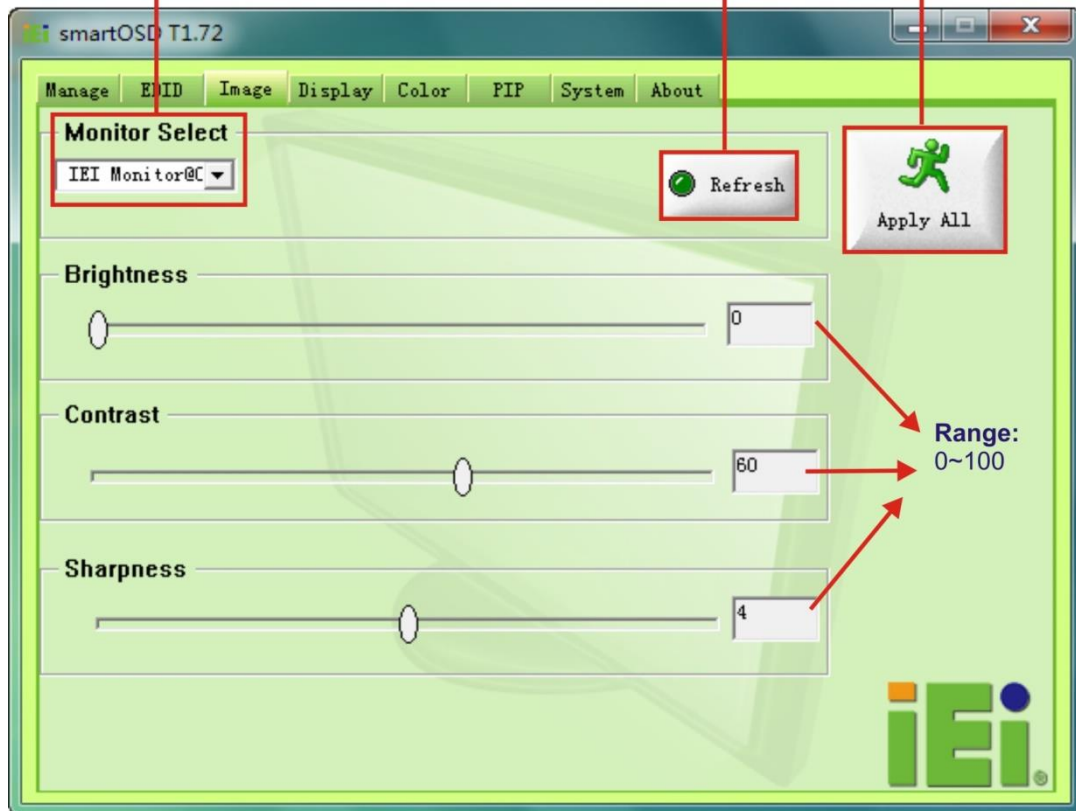


Figure C-8: Image Page

C.4.4 Display Page (for analog signal)

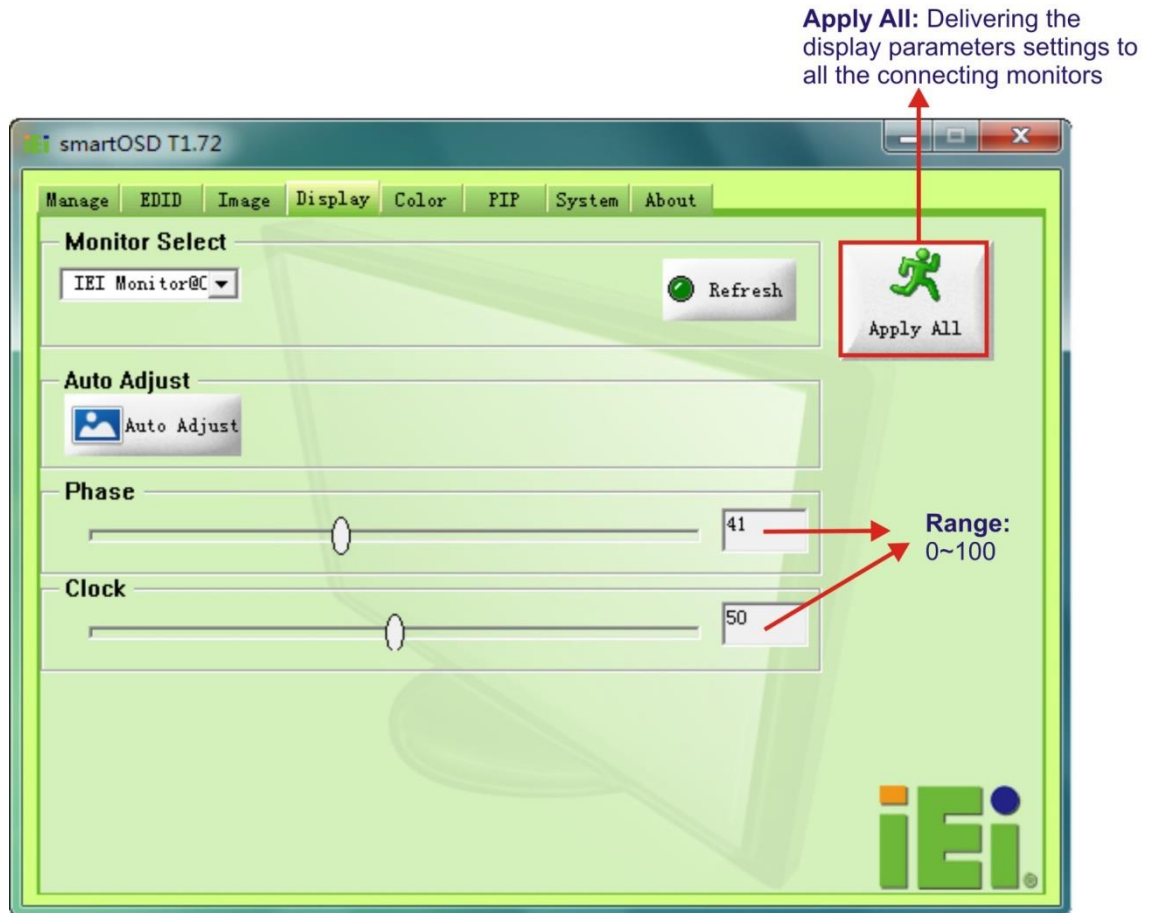


Figure C-9: Display Page

DM-F Series Monitor

C.4.5 Color Page

Monitor Select: Selects the monitor unit for which the image parameters will be adjusted

Refresh: To update image information which has been affected by the color OSD settings

Apply All: Delivering the color parameters settings to all the connecting monitors

Auto Color: For analog (VGA) signal to adjust white balance

Range: 0~100 (Values can only be adjusted if user is selected for the Color Temperature)

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

DM-F Series Monitor

C.4.7 System Page

Monitor Select: Selects the monitor unit for which the system parameters will be adjusted

Apply All: Delivering the system parameter settings to all the connecting monitors

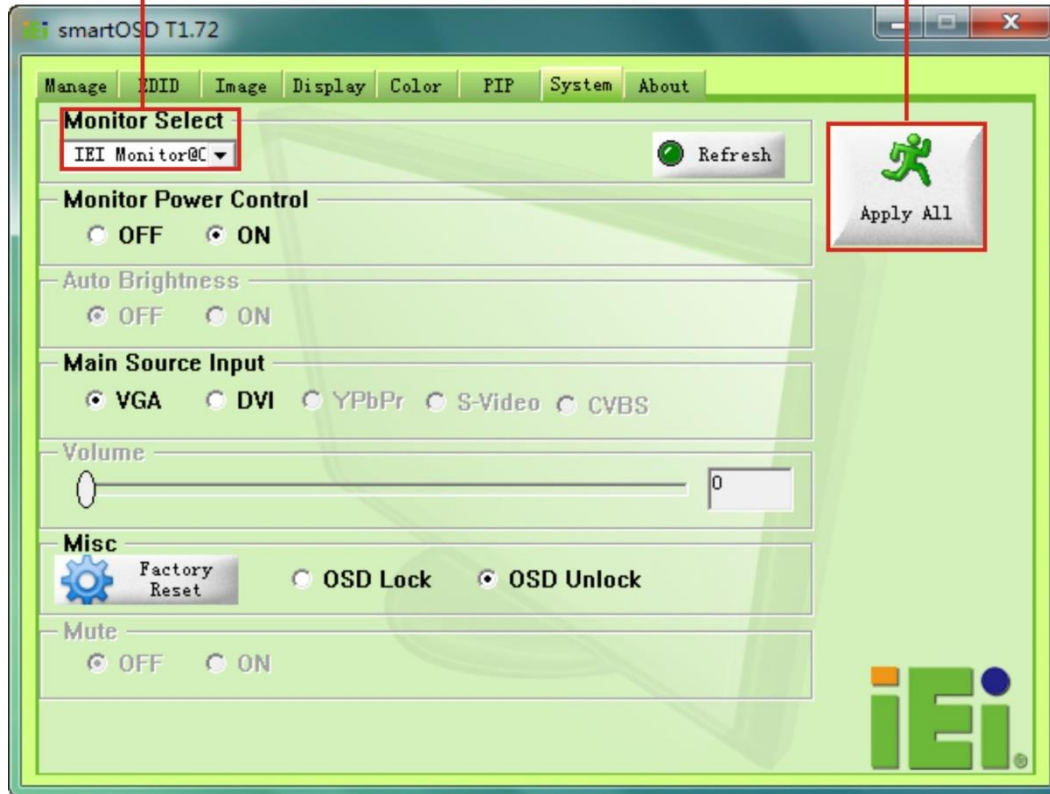


Figure C-12: System Page



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

DM-F Series Monitor

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:

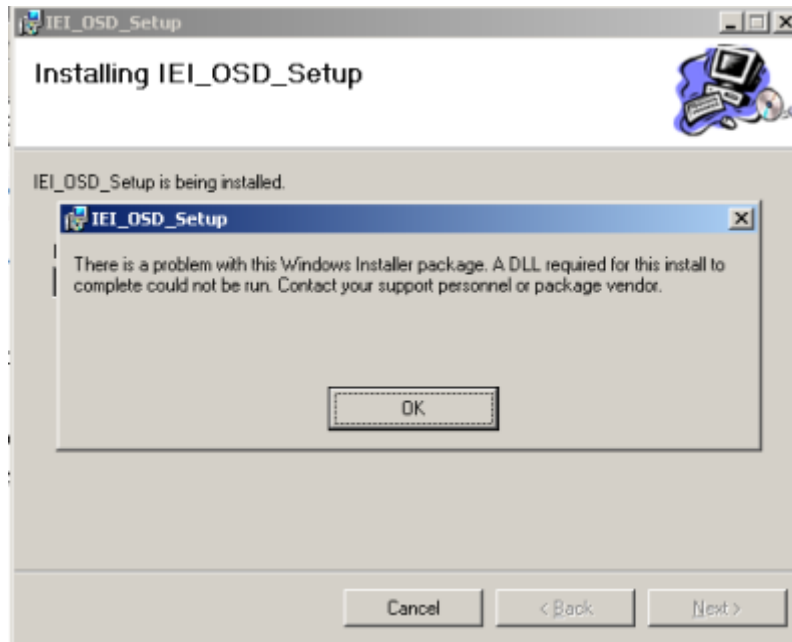


Figure C-14: DLL Missing

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

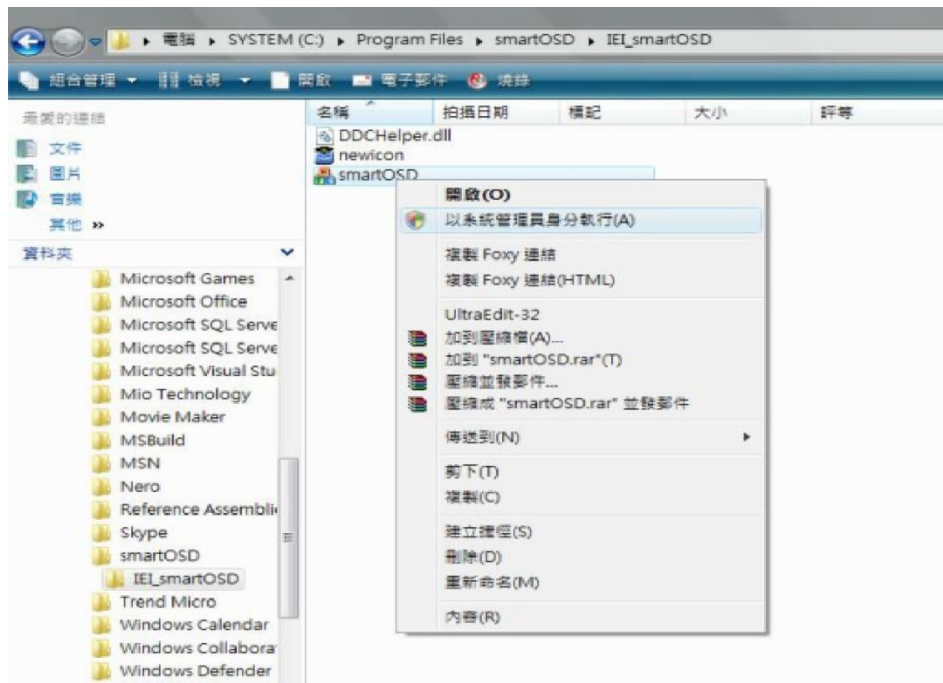


Figure C-16: Install as Administrator

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.

DM-F Series Monitor

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 HDMI 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.

Appendix

D

Hazardous Materials Disclosure

DM-F Series Monitor

D.1 RoHS II Directive (2015/863/EU)

The details provided in this appendix are to ensure that the product is compliant with the RoHS II Directive (2015/863/EU). The table below acknowledges the presences of small quantities of certain substances in the product, and is applicable to RoHS II Directive (2015/863/EU).

Please refer to the following table.

Part Name	Toxic or Hazardous Substances and Elements									
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)	Bis(2-ethylhexyl) phthalate (DEHP)	Butyl benzyl phthalate (BBP)	Dibutyl phthalate (DBP)	Diisobutyl phthalate (DIBP)
Housing	O	O	O	O	O	O	O	O	O	O
Display	O	O	O	O	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O	O	O	O	O
Battery	O	O	O	O	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in Directive (EU) 2015/863.

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in Directive (EU) 2015/863.

D.2 China RoHS

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有“环境友好使用期限”的标签，此期限是估算这些物质“不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	○	○	○	○	○	○
显示	○	○	○	○	○	○
印刷电路板	○	○	○	○	○	○
金属螺帽	○	○	○	○	○	○
电缆组装	○	○	○	○	○	○
风扇组装	○	○	○	○	○	○
电力供应组装	○	○	○	○	○	○
电池	○	○	○	○	○	○

○: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11364-2014 與 GB/T26572-2011 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11364-2014 與 GB/T26572-2011 标准规定的限量要求。