

M2I Corporation

Industrial Monitor

MDP-SC

User Manual



Thank you for purchasing the industrial HMI touch panel series of M2I corporation.

Please read this manual carefully to know installing, wiring, operating this equipment for safe use of this product.

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Chapter 1 Safety Precautions

■ Before using the product

To use the product safely and effectively, please read the contents of this manual thoroughly before use. Please keep to the safety precaution, for it is to prevent accidents and potential danger from occurring. Safety precaution is classified into 'Warning' and 'Caution' and their meanings are as follows. Also, the indicated illustrations on the product and in the manual have the following meanings.

 Warning	Violating the instruction may result in serious personal injury or death.
 Caution	Violating the instruction may result in slight personal injury or product damage.
	Be cautious, for danger may be present.
	Be cautious, for there is a possibility of an electric shock.

■ General Precautions **Caution**

-  Do not press the screen with a hard or sharp object (awl, screwdriver, pen) with too strong a force.
-  Do not use or store in an environment with high vibration.
-  Do not allow foreign objects such as water, liquids, or metal powders to enter the product. This may cause breakage or electric shock.
-  Use the radio or mobile phone at least 30cm away from the main unit.
-  Two or fewer bright spots may appear on the LCD screen, and certain areas may appear brighter, but this is not a defect in LCD characteristics.
-  Do not store or operate in direct sunlight. Direct sunlight can change the properties of the LCD.
-  During the product is stored in long-term without use, avoid a direct sunlight and keep dry condition.

■ Design Precautions **Warning**

-  For protecting whole control system from outer power input or malfunction of product, protection circuit must be installed outside of product.
-  Input/output signals or communication cables must have at least 100mm(3.94inch) distance from power cable or high-tension wire. Especially HDMI cables must be set apart from power cables.

■ Wiring Precautions **Warning**

-  Be sure the wiring is done correctly by checking the product's rated voltage and the terminal layout. Incorrect wiring could result in fire, damage or malfunctions.
-  Tighten the terminal screw with the specified torque. If the screws of terminal are loose, it could result in short circuit, fire, malfunctions.
-  FG Terminal must be used a dedicated ground. Not doing so could result in malfunctions.
-  a. Grounding should be the Class 3 grounding. The cable for grounding should be more than 2mm².
-  b. Grounding point be closed to the products and make short the distance to the ground cable if possible.

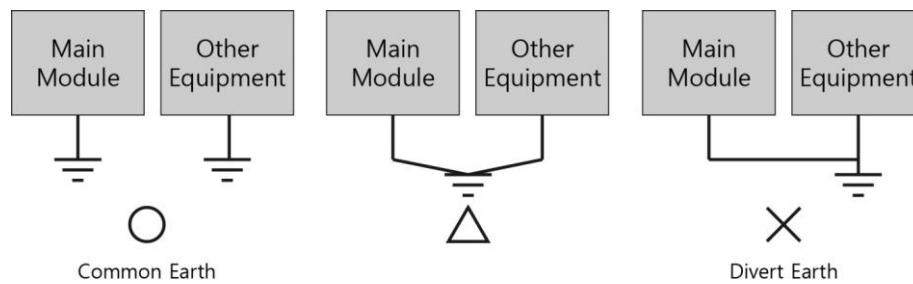


Fig. Grounding Example Diagram

■ Installation Precautions Caution

-  The equipment shall only be used in an area of at least pollution degree 2, as defined in IEC/EN 60664-1.
-  Do not install the location which exceeds allowed temperature. Product can be damaged or shorten the life. Especially Install environment as below should be avoided.
-  Do not Install product to the place which the ambient temperature is out of limits, from -10°C to 50°C or on the surface of control board which high pressure equipment is installed.
-  Do not install to the place where strong shock or vibration continuously have impacted on product.
-  Use the product under 2000M altitude.
-  Indoor use only.

■ Disposal Precautions Caution

When you dispose of product and battery, please treat it as industrial waste. It can create poisonous substances or explosion.

■ All field-wiring connections to this unit shall be from Limited Voltage / Limited Current, below 24Vdc isolated secondary source with an output fuse, or Class 2.

Chapter 1 Consignes de sécurité

■ Avant d'utiliser le produit

Pour utiliser le produit en toute sécurité et de manière efficace, veuillez lire attentivement le contenu de ce manuel avant toute utilisation. Veuillez respecter les consignes de sécurité afin de prévenir les accidents et tout danger potentiel. Les consignes de sécurité sont classées en « Avertissement » et « Attention », dont les significations sont les suivantes. De plus, les illustrations indiquées sur le produit et dans ce manuel ont les significations suivantes.

 Warning	Le non-respect de cette consigne peut entraîner des blessures graves voire mortelles.
 Caution	Le non-respect de cette consigne peut entraîner des blessures légères ou des dommages matériels.
	Soyez prudent, un danger potentiel peut être présent..
	Soyez prudent, un risque de choc électrique est possible.

■ Précautions générales Caution

-  Ne pas appuyer sur l'écran avec un objet dur ou pointu (poinçon, tournevis, stylo) avec une force excessive.
-  Ne pas utiliser ou stocker dans un environnement à forte vibration.
-  Ne laissez pas entrer d'objets étrangers tels que de l'eau, des liquides ou des poudres métalliques dans le produit. Cela pourrait entraîner des cassures ou des chocs électriques.
-  Utilisez le radio ou le téléphone mobile à au moins 30 cm de l'unité principale.
-  lumineuses, mais cela ne constitue pas un défaut des caractéristiques de l'écran LCD.
-  Ne pas stocker ou faire fonctionner l'appareil en plein soleil. La lumière directe du soleil peut modifier les propriétés de l'écranLCD.
-  Lorsqu'il est stocké pendant une longue période sans être utilisé, évitez la lumière directe du soleil et conservez le produit dans un endroit sec.

■ Précautions de conception Warning

-  Pour protéger l'ensemble du système de commande contre une entrée de puissance externe ou un dysfonctionnement du produit, un circuit de protection doit être installé à l'extérieur du produit.
-  Les signaux d'entrée/sortie ou les câbles de communication doivent être maintenus à une distance d'au moins 100 mm (3,94 pouces) des câbles d'alimentation ou des lignes à haute tension. En particulier, les câbles HDMI doivent être séparés des câbles d'alimentation.

■ Précautions de câblage Warning

-  Assurez-vous que le câblage est effectué correctement en vérifiant la tension nominale du produit et la disposition des bornes. Un câblage incorrect pourrait provoquer un incendie, des dommages ou des dysfonctionnements.
-  Serrez les vis des bornes avec le couple spécifié. Si les vis des bornes sont desserrées, cela pourrait entraîner un court-circuit, un incendie ou des dysfonctionnements.
-  La borne FG doit être utilisée comme une mise à la terre dédiée. Ne pas le faire pourrait entraîner des dysfonctionnements.

- ❗ a. La mise à la terre doit être de classe 3. Le câble de mise à la terre doit avoir une section d'au moins 2 mm².
- ❗ b. Le point de mise à la terre doit être proche des produits et réduire autant que possible la distance jusqu'au câble de mise à la terre.

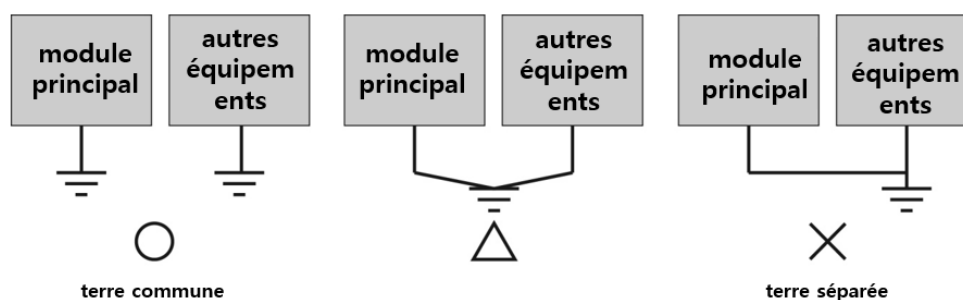


fig. : exemple de schéma de mise à la terre

■ Précautions d'installation ⚠ Caution

- ⊘ L'équipement doit uniquement être utilisé dans une zone ayant un degré de pollution 2, comme défini dans la norme IEC/EN 60664-1.
- ⊘ N'installez pas l'équipement dans un endroit où la température dépasse la limite autorisée. Le produit peut être endommagé ou voir sa durée de vie réduite. En particulier, l'environnement d'installation suivant doit être évité.
- ⊘ N'installez pas le produit dans un endroit où la température ambiante dépasse les limites autorisées, soit de -10 à 50°C, ou sur une surface de panneau de contrôle où des équipements à haute pression sont installés.
- ⊘ N'installez pas le produit dans un endroit où des chocs ou des vibrations fortes et continues affectent l'équipement.
- ⊘ Utilisez le produit à une altitude inférieure à 2000 m.
- ⊘ Utilisation en intérieur uniquement.

■ Précautions de mise au rebut ⚠ Caution

Lorsque vous vous débarrassez du produit et de la batterie, veuillez les traiter comme des déchets industriels. Cela peut créer des substances toxiques ou provoquer des explosions.

- Toutes les connexions de câblage de terrain à cette unité doivent provenir d'une source secondaire à faible tension / faible courant, inférieure à 24 Vcc, avec un fusible de sortie, ou des circuits secondaires de classe 2.

Chapter 2 Overview

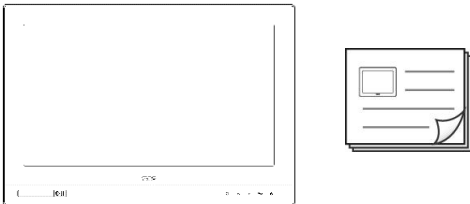
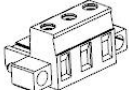
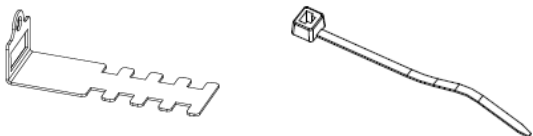
2.1 Introduction of Products

This Industrial Monitor is required in an industrial field. It displays demanded screen features from multiple devices through HDMI connection, and a touch sensor can be connected to outer device by USB.

2.2 Components

The components of the product are as follows.

Before using the product, please check that all of the following components are included.

Components	Figure	Quantity
Product and User Manual		1 Each
Power Connector		1
Mounting Clamp		12
Cable Clamp and Cable Tie		HDMI: 1 DP: 1 USB: 1

2.3 Explanation of Model Name

Series	Display Input	Screen Size	Option and Resolution	Power	Explosion proof
MDP-	SC: 1 Port	12: 12.1" 15: 15.6" 19: 18.5"	00W: FHD, 1920 x 1080, Wide	A: AC D: DC	-Ex: Explosion proof or special model Blank: Non-explosion proof or general model

Chapter 3 General Specifications

3.1 Power Specifications

Normal Voltage	DC 24V, Class 2	
Input Voltage Range	DC 20~28V, Class 2	
Consumption Power	MDP-SC1900WD	40W
Voltage endurance	DC 24V, 10ms 이내	
Insulation Resistance	500V DC, 10MΩ	

3.2 Display Specifications

Display Color	16M Color
Backlight Type	LED
Backlight Life	Minimum 50,000 Hours
Resolution	Max. 1920 x 1080
Scaling	Up / Down Scaling Supported

3.3 Touch Specifications

Operating Method	Integrated, Capacitive Touch Sensor
Connection Method	USB Type A to Type A Cable

3.4 OSD Button (Screen Menu)

Operation Method	Integrated, Capacitive Touch Sensed Button
Buttons	Switch of Screen Inputs, Up/Down, Menu Call, Power

* OSD(On Screen Display): Screen Menu

3.5 Speaker Specifications

Output Power	1.2W + 1.2W
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3.6 USB Specifications

USB	Front 1 port
Speed	USB 2.0

* If you want to use front USB port, rear USB port should be connected to USB Source.

3.7 Environment Specifications

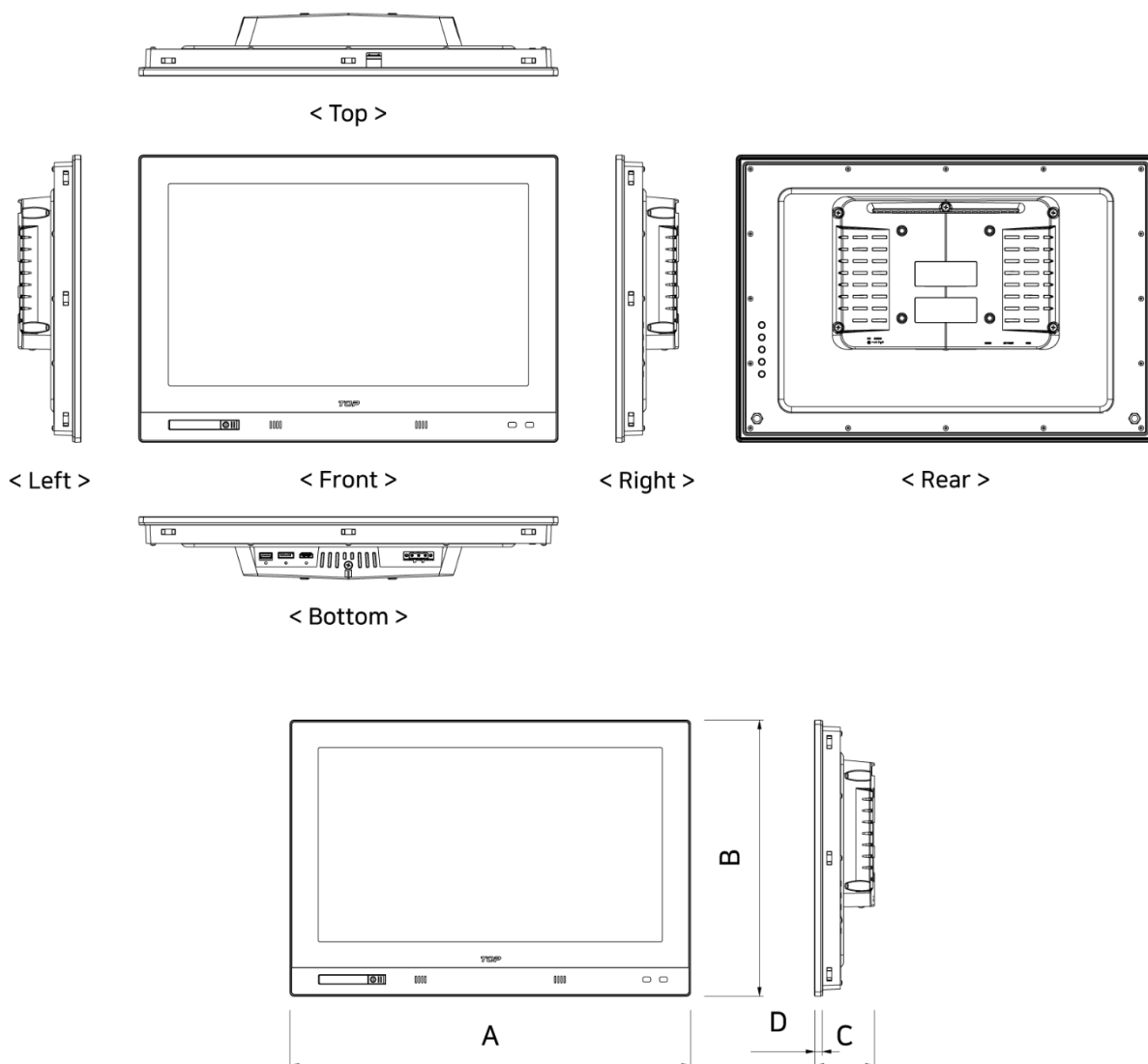
Operation Temperature (°C)	-10 ~ +50
Storage Temperature (°C)	-20 ~ +60
Operation Humidity (%RH)	0 ~ 90 (No Dew)
Atmosphere	No corrosive gas
Vibration Endurance	Amplitude: $10 \leq F < 25$ Hz(2G) X,Y,Z each direction(for 30 minutes)
Noise Immunity	1000Vp-p(Pulse width 1 μ s)
Static Electricity Discharge	Connective discharge from EN61000-4-2: ± 4 kV
Shock Endurance	10G X,Y,Z each direction(for 3 times)
Surge Voltage	500V(Line-Line)
Ground Connection	Class 3(100 Ω or under)
Protection Classification	Front IP65
Insulation Coordination	Overvoltage category II

3.8 Structure Specifications

	MDP-SC1900WD
Weight (Kg)	4.7
Cooling System	Natural Air Circulation
Case Material	Aluminum + Plastic

Chapter 4 Part Names and General Specifications

4.1 External Dimension

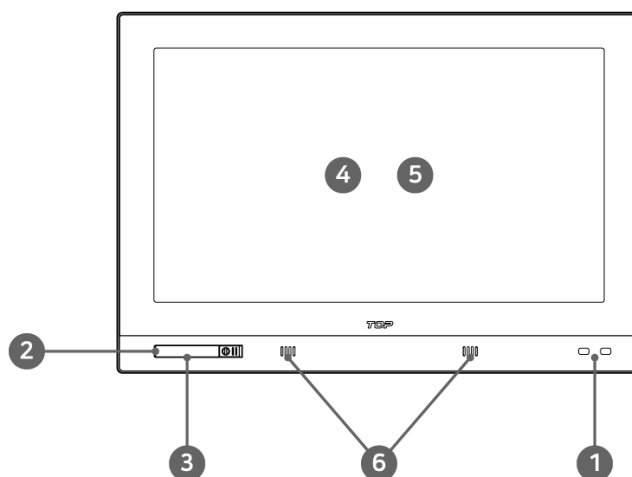


(mm)

Model	A	B	C	D
MDP-SC1200WD	321.4	252.4	67.5	7
MDP-SC1500WD	406.4	286.4	N/A	
MDP-SC1900WD	477.4	328.4	71.4	

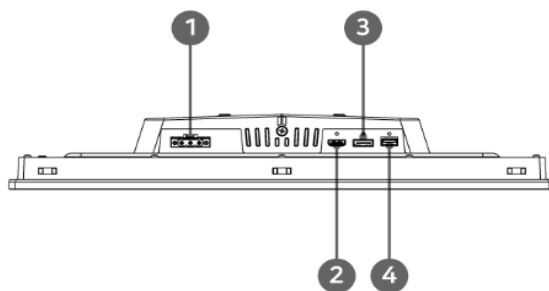
4.2 Part Names and Specifications

4.2.1 Front



No.	Name	Description
①	LED	Status LED
②	USB HOST	USB Connector to use Mouse or Keyboard, Output Power 5V/0.5A
③	Front USB Cover	Front USB Cover
④	Touch Panel	Capacitive Touch Sensor
⑤	LCD	TFT 16M Color LCD
⑥	Speaker	1.2W output

4.2.2 Bottom

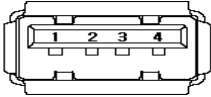


No.	Name	Type	Description
①	Power Terminal	TB 7.6mm 3P	Power Supply of Product
②	HDMI Port	Standard HDMI	HDMI Input
③	DP Port	DP	DP Input
④	USB Port	USB Type A	Connecting Outer Devices for Touch Sensor

Chapter 5 External Device Interface

In order for the main unit to communicate with an external device, it is necessary to connect the two devices by referring to the following.

5.1 USB Specifications

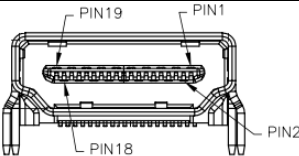
Type	Item	Specification
	USB Interface	USB 2.0
	Comm. Method	Control/Bulk
	Transfer Speed	Max. 480Mb/s
	Support Device	USB Storage, Mouse/Keyboard (FAT16/FAT32 File Format Available)
	Connector Type	USB Type A

5.2 HDMI Input Specifications

Type	Item	Specification
 HDMI (FEMALE)	HDMI	HDMI V1.4a
	Supported Resolution	Max. 1920 x 1080
	Connector Type	HDMI Type A

* This port is not working as output.

5.3 DP Input Specifications

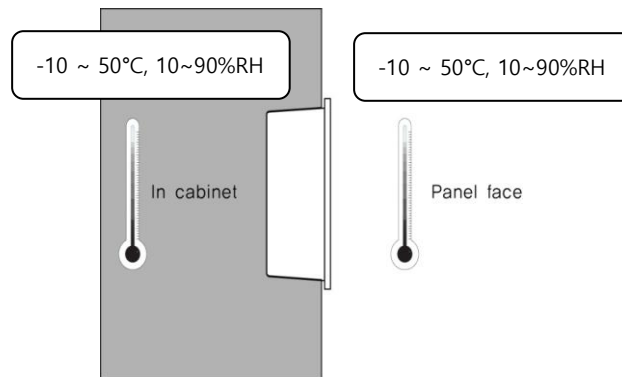
Type	Item	Specification
	DP	DP V1.1
	Supported Resolution	Max. 1920 x 1080
	Connector Type	Standard Display Port, 1 Port

* This port is not working as output.

Chapter 6 Installation Warning

6.1 Installation Requirements

- (1) It should be installed within $-10 \sim 50^{\circ}\text{C}$ and 10~90%RH relative-humidity, otherwise the screen may be changed or cause malfunction and damage.
- (2) Be sure that heat from surrounding equipment does not cause product to exceed its standard operating temperature.
- (3) In order to minimize external mechanical hazards, please control the mechanical hazards of the surrounding environment.

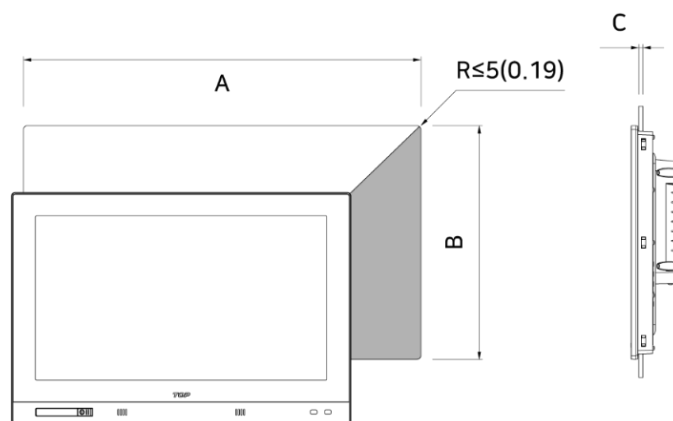


6.2 Installation Procedure

In order to install this product, please follow the following procedure.

6.2.1 Panel Cut

Make a panel cut which product is mounted and insert the product to the panel from the front side.
Making the Panel Cut (Mounting Size) per each product as below Table, Before Installation.



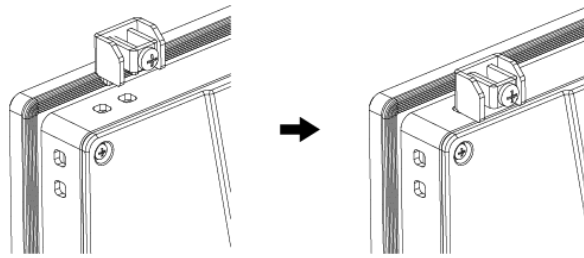
(mm)

Model	A	B	C
MDP-SC1200WD-Ex	307	238	1.6~5.0(+1.0/0)
MDP-SC1500WD-Ex	392	272	
MDP-SC1900WD-Ex	463(+0.5/0)	314(+0.5/0)	

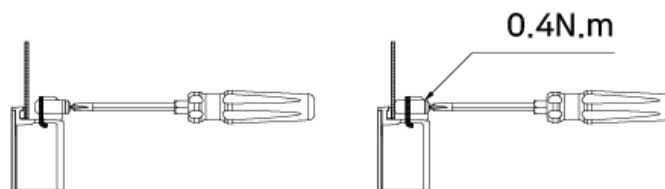
6.2.2 Clamp Fixing Warning

Install clamps with this product should be installed as follows to maintain the IP performance of the device.

(1) Insert the clamp into the slot of the product.

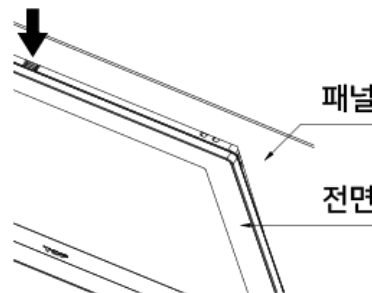


(2) Screw the unit into the panel cut with a screwdriver.



If the screw is over tightened, it may cause the front deformation, thus resulting the touch sensor can't work properly. Tighten the screws to a torque of 0.4N.m.

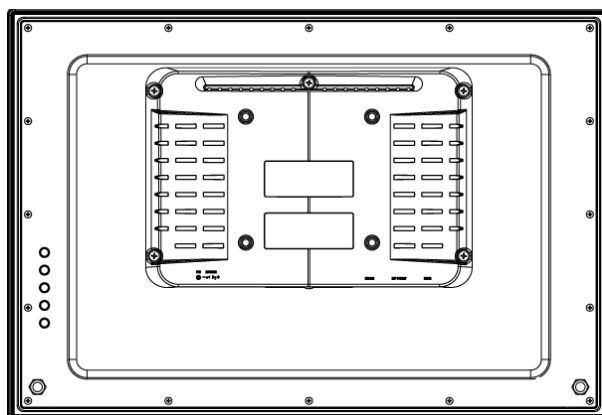
* Caution: If the torque of screwing is not 0.4N.m, IP specification will not be secured.  Warning



When you detach the product from a panel, please use tools like driver to push a lock part and detaching should be done slowly.

6.2.3 VESA Bracket Mount

Use M4 x 10mm screw to connect the monitor with VESA bracket.



Please refer to user manual with VESA bracket.

- (1) Put the monitor on stable and flat ground with spread cotton or cushion.
- (2) Assemble a VESA bracket on rear side of the monitor.

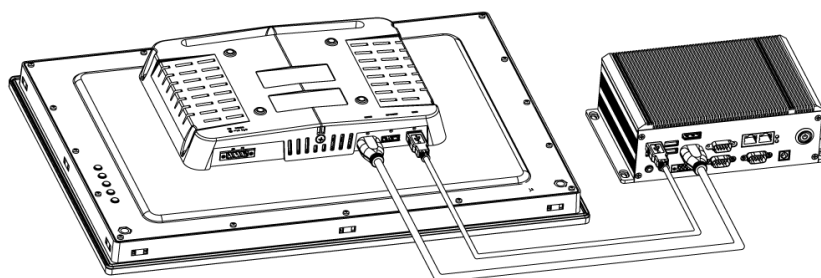
6.3 Front USB

- (1) Slide the cover to open the USB Cover.
- (2) This cover can be locked and unlocked by making rotation of lock rotary switch.



6.4 Connecting with Outer Devices

- (1) Connect the outer device to HDMI port or DP port on rear side of the product. Select HDMI or DP screen by screen change button on rear side.
- (2) Connect the cable to rear USB port for operation of touch sensor.
- (3) When keyboard and mouse are needed, they can be connected to front USB port.



Chapter 7 OSD Setup

7.1 Rear OSD Setup Buttons

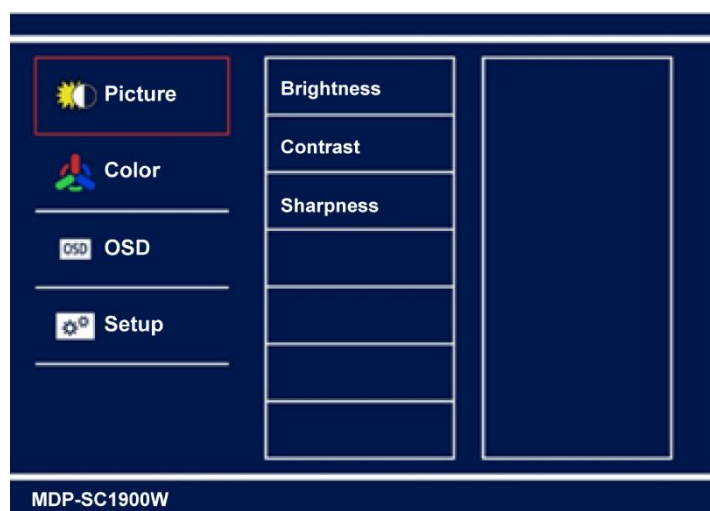
Screen settings of this product can be done by rear OSD Menu Buttons.

No	Button Shape	Name	Description
1	 SELECT	Screen Change Switch	Screen change between HDMI and DP
2	 MENU	Menu Switch	Call display menu and select options
3	 UP	Menu Move Switch	Move the contents of menu to up or right side
4	 DOWN	Menu Move Switch	Move the contents of menu to down or left side
5	 POWER	Power Switch	Power ON/OFF

7.2 OSD Settings

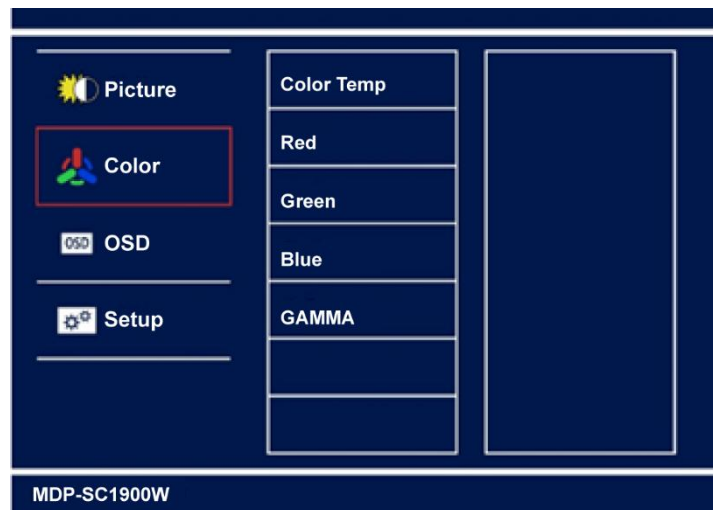
OSD settings are configured as below.

7.2.1 Picture



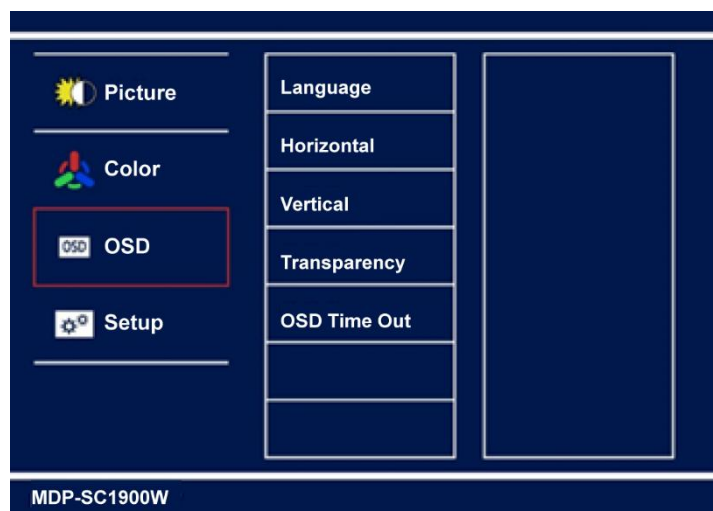
- Brightness [0 ~ 100]: Setting a brightness of screen.
- Contrast [0 ~ 100]: Setting a contrast of screen.
- Sharpness [0 ~ 4]: Setting a sharpness of screen.

7.2.2 Color



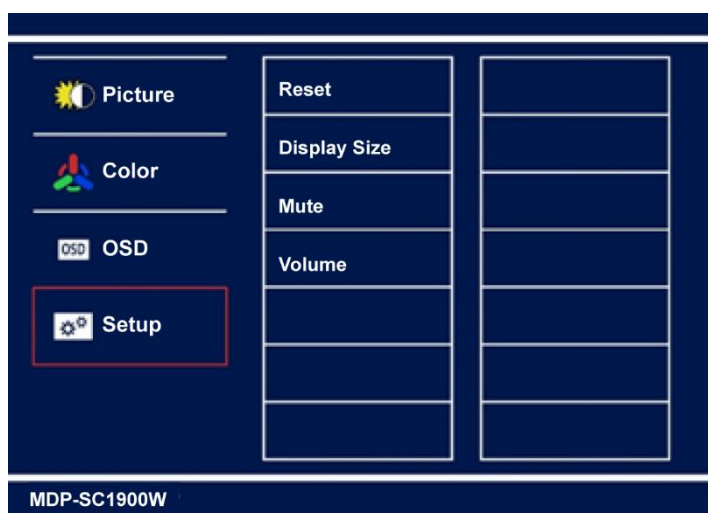
- Color Temp: Setting a temperature level of screen. (6500K, 7500K, 9300K, User Define)
- Red [0 ~ 100]: Setting a level of red color.
- Green [0 ~ 100]: Setting a level of green color.
- Blue [0 ~ 100]: Setting a level of blue color.
- GAMMA [Off, 1.8, 2.0, 2.2, 2.4]: Setting a GAMMA level of screen. Only selective in user define status.

7.2.3 OSD Settings



- Language [English, Korean]: Change the language of OSD
- Horizontal [0 ~ 100]: Adjust a horizontal point of OSD.
- Vertical [0 ~ 100]: Adjust a vertical point of OSD.
- Transparency [0 ~ 100]: Setting a transparency of OSD.
- OSD Time Out [0 ~ 100]: Setting a time of OSD OFF. Increasing 1 in setting make 0.5sec.

7.2.4 Setup

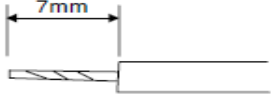


- Reset [Off, On]: Reset settings of OSD.
- Display Size [16:9, 4:3]: Force adjustment of screen ratio.
- Mute [Off, On]: Mute the audio or cancel the mute.
- Volume [0 ~ 100]: Setting the volume level.

Chapter 8 Wiring Warning

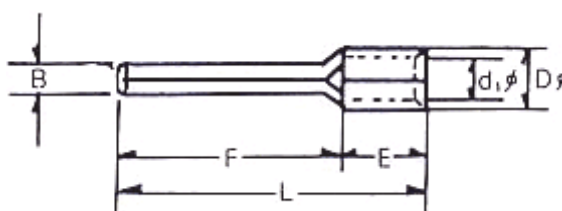
8.1 Power Cable Wiring Warning

(1) The Power cable should have the following specification.

Power Cable Specification	0.75~2.5mm ² (18~13AWG)
F.G Cable Specification	2mm ² (14AWG) or more
Conductor Type	Simple or Standard Wire (Use Copper Wire)
Bolt tightening force	0.6N.m  Warning
Conductor Length	
Temperature rating of the field installed conductors	65°C

(2) Wiring of power cable and ground cable is as follows.  Caution

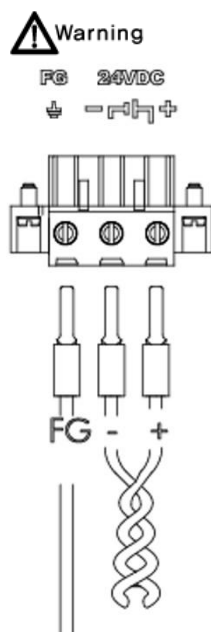
Use the pin terminal to prevent the wear of cable and improve electronic transmission.



(mm)

B	L	F	E	D	d
1.8~2.0	14~22	8~14	5	3.3~3.8	2~2.5

(3) Wiring of power is as follows.



8.2 Ground Wiring Warning

- (1) The product has enough anti-noise measure, so except that there are many noises. Specially, the ground is not needed. When doing ground, please refer to the followings.
- (2) The ground should be the exclusive ground. The ground should be type Class 3 ground. (Ground resistor is less than 100Ω .)
- (3) When you cannot do the exclusive ground, do common ground like below image.
- (4) Use the cable more than 2mm^2 . Put the point of the ground near product and shorten ground line.

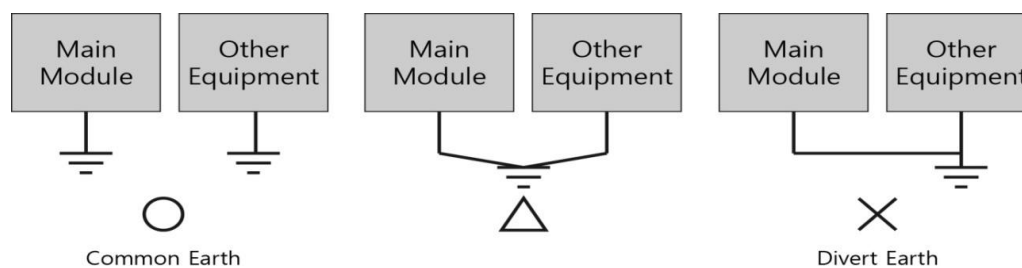
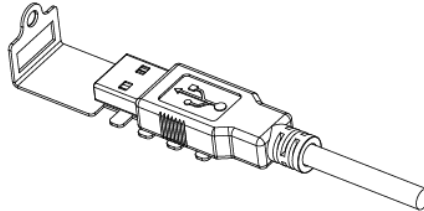


Fig. Grounding Example Diagram

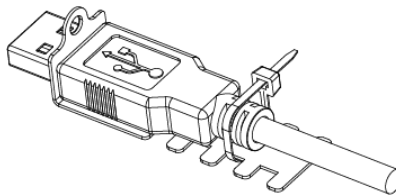
8.3 Fixing Communication Cable Caution

Caution: To prevent a disconnection or spark when USB cable gets away from the port, the cable must be fixed. User must be well-informed about below process.

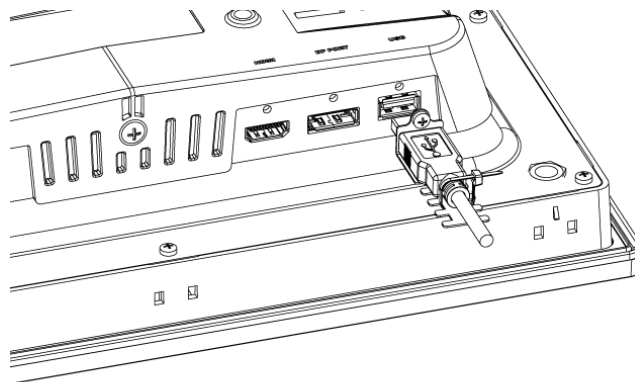
- (1) Insert a cable connector into a cable clamp as below image.



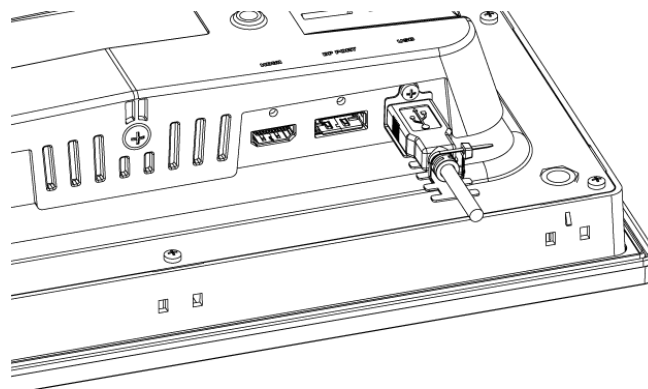
- (2) Fix the cable connector inserted into the cable clamp as below image.



- (3) Put fixed cable connector into USB port.



- (4) Fix the cable clamp by a screw and check the fixing is normally done.



Chapter 9 Maintenance Warning

9.1 Cleaning the Display

When the surface or frame of the display become dirty, spray the cleaning solution onto a soft cloth and wipe the device. Do not spray the cleaning solution directly onto the device.

9.2 Periodic Check Points

Check the followings periodically for best condition of the device.

(1) Environment

- a. Is the operating temperature within the allowable range (-10°C~50°C)?
- b. Is the operating humidity within the allowable range (0%~90%RH)?
- c. Is the surrounding pollution no corrosive gas?

(2) Power

- a. Is the input power in right range?

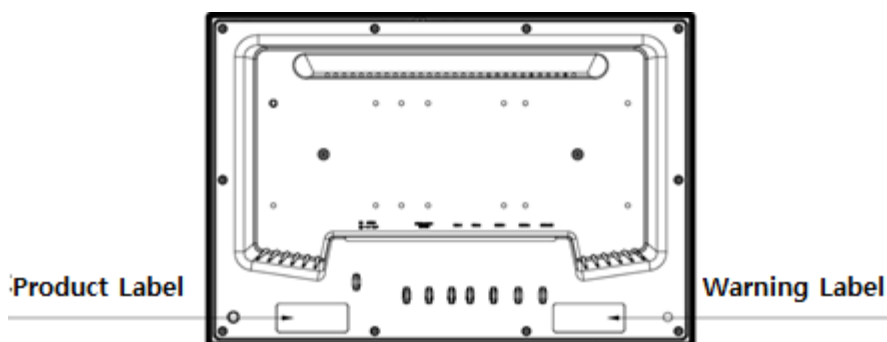
(3) Related Items

- a. Check the guarantee duration of LCD Backlight by eye.
- b. Check the touch pad there is no damage, scratch or pollution by eye.

9.3 Problems with the Device Warning

- (1) If there is a problem during operation, stop using it and contact the repair department of M2I Corporation, which is indicated on the product label.
- (2) Only the authorized worker from M2I Corporation can check and repair problems related to malfunction of the machine.
- (3) If the problem cannot be solved at the installation site, the equipment can be collected and moved to M2I Corporation.
- (4) The manufacturer, M2I Corporation, is not responsible for damage or malfunction of the equipment caused by the use conditions of the user beyond the installation and use standards described in the manual.
- (5) If there is a high electromagnetic noise, put ferrite core on main power cable and field cable. The noise of power cable and communication cables can be high under the installation circumstances.
- (6) Please put ferrite cores on each side's end when USB is not working by noise.

Chapter 10 Products and Warning Label



*1) Model
& Manufacture(AS) 

*2) Power 

Caution 

****Certificates**

& No. 

MDP- xCxx00WD	INDUSTRIAL MONITOR 工业显示器	M2 Corporation Made In Korea / 韩国制造
S / N (产品系列号) : IN(输入) : 20 ~ 28V  Class2, xxW Tamb (使用温度) : -10°C ≤ Ta ≤ +50°C Ingress Protection(入口保护) : IP65(Front/正面)  If you need change the inside battery please contact the A/S center Si vous devez remplacer la batterie interne, veuillez contacter le centre de service après-vente WARNING-POTENTIAL ELECTROSTATIC CHARGING HAZARD AVERTISSEMENT - RISQUE POTENTIEL DE CHARGE ÉLECTROSTATIQUE  See Instructions Voir les instructions.  For use on a flat surface of a Type 1 Enclosure À utiliser sur une surface plane d'un boîtier de type 1.		M2I Bldg, Simin-daero 327, Anyang-si, 14055 +82-31-465-3366 Service & Support www.m2i.co.kr V

*1), 2) Power Specifications by Model:

- MDP-SC1900WD: 20~28Vdc, 40W or less, Class 2 Power Only

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- Please read related contents in this manual when you use M2I product, and operate the product staying safe with appropriate handling.
- This manual should be stored in secured and appointed place so that it can be read in any needs.