

M2I Corporation



Industrial HMI Touch Panel

TOPR Series (Display Module)

Hardware 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. It may cause malfunction of touch due to damage of the front sheet.
-  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.
-  Do not allow foreign objects such as water, liquids, or metal powders to enter into the front(screen) protective sheet. The screen may be invisible or may cause a malfunction of the touch.
-  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.

■ Design Precautions Warning

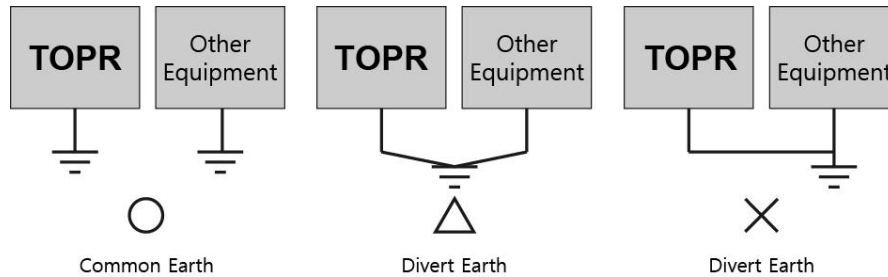
Install protection circuit on the outside of Products to protect the entire control system when external power supply or Products have problems.

-  As the malfunction & incorrect result of Products could damage the stability of the entire systems and human body, you must install damage preventing interlock circuit such as emergency stop, Protective circuits, positioning upper and lower limit switch and interlock for forward/reverse operation.
-  When computer or other controllers communicate and exchange data with products or change operation mode of products, set up protective sequence program in PC or Controller for protecting system from communication error.
-  The output signal or communication lines should be separated from the power line or high tension wire. They should be installed 100mm (3.94 Inch) or more from each other.

■ 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 4mm²
 - ❗ b. Grounding point be closed to the products and make short the distance to the ground cable if possible.

Please see below.



■ Installation Precaution Caution

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 0°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.
- ❗ The space between back of product and back of control board must be more than 100mm for maintenance and ventilation.
- ⊘ In order to improve water retention and ventilation, the space between the back of the main body and the console box should be 100mm or more, and install the cooling fan when installed in an enclosed space.
- ⊘ Use the product under 2000M altitude.

■ Disposal Precaution Caution

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

Chapter 2. Overview

2.1 Introduction of Products

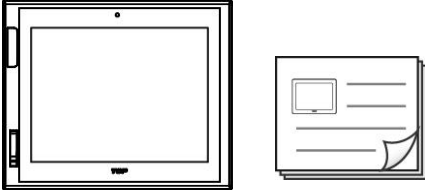




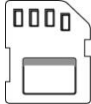

This industrial HMI touch panel is an industrial control device required in industrial field. It is a device based on RS-232C and RS-422/485, Ethernet which is used for the basic purpose of communication with another device (PLC).

The TOPR series consists of a Process module(TOPRP□□□) and a Display module(TOPRD□□□□□). This user manual is for a Display Module(TOPRD□□□□□).

2.2 Package Contents

The components of the product are as follows.

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

Item	Figure	Quantity	
Display Module and Manual		1	
Gasket		1	
Mounting Clamp		TOPRD08	6
		TOPRD10	8
		TOPRD12	10
		TOPRD15	10
Accessories (Sold separate)	 USB Memory	User Options	
	 USB Cable		
	 SD Card		
	 Front Protect Sheet		

2.3 Explanation of Model name

TOPR	T	□□	□□	□	□	-	Ex
Series	Type	Screen Size	Option	Resolution	Power	-	Explosion proof
	P : Process	08 : 8.4"	10 : Standard	Q : QVGA(320*240)	D : DC		Ex : Explosion proof or special model
	D : Display	10 : 10.4"	20 : Premium	V : VGA(640*480)	A : AC		Blank: Non-explosion proof or general model
	T : P + D	12 : 12.1"	30 : Premium	S : SVGA(800*600)			
		15 : 15.0"	31 : Premium	X : XGA(1024*768)			
			32 : Premium	* "S" for Ex model: XGA			
			40 : Premium				

2.3.1 Process Module (Main Unit)

TOPR	P	□□	□
Series	Type	Option	Power
	P : Process	10 : Standard	D : DC
	T : P + D	20 : Premium	A : AC

2.3.2 Display Module (Accessory Unit)

Series	Type	Screen Size	Option	Resolution
	D : Display	08 : 8.4"	10 : Standard	Q : QVGA(320*240)
		10 : 10.4"	20 : Premium	V : VGA(640*480)
		12 : 12.1"	30 : "20" Premium + Extended auxiliary options	S : SVGA(800*600)
		15 : 15.0"	31 : "30" Premium + Capacitive touch sensor	X : XGA(1024*768)
			32 : "30" Premium - NFC and Camera	
			40 : "30" Premium + Extended auxiliary options 2	

Chapter 3. General Specifications

3.1 Electrical Specifications

Input Voltage	By Process Module	12V, 3.3V	
Consumption	Process Module only	6W or less	
	Process Module + Display Module included	TOPRD08 Series	12W or less
		TOPRD10 Series	15W or less
		TOPRD12 10 / 20 / 30 / 31 / 32	15W or less
		TOPRD12 40	30W or less
		TOPRD15 Series	18W or less

3.2 Display Specifications

Color	16M Colors
Brightness Level	10 Level(by software)
Backlight Type	LED
Backlight Life	50,000 hours
Display Font	MS Windows Vector font possible Image font
Front LED Indicate	Built in

3.3 Touch Specifications

	Specification	Model
Touch Type	Built-in, Analog resistive touch sensor	TOPRD□□ 10 / 20 / 30 / 32 / 40
	Built-in, capacitive touch sensor	TOPRD□□ 31

3.4 Sub Function Specifications (*Premium models only)

Functional	Specification	Model
Front Camera	Built-in, Resolution: VGA(640*480)	TOPRD□□ 20 / 30 / 31 / 40
Proximity Sensor	Built-in, Sensing Distance 0.7M	TOPRD□□ 20 / 30 / 31 / 32 / 40
Brightness Sensor	Built-in, brightness controls automatically as 10 level	TOPRD□□ 20 / 30 / 31 / 32 / 40
Infrared communication(IrDA)	Built-in, 0.7M working distance, communication with dedicated equipment	TOPRD□□ 30 / 31 / 32 / 40
NFC	Built-in, Near field communication 13.56MHz, Receive only	TOPRD□□ 30 / 31 / 40
Iris Sensor	Built-in, working distance up to 0.8M	TOPRD□□ 40

3.5 Environment Specifications

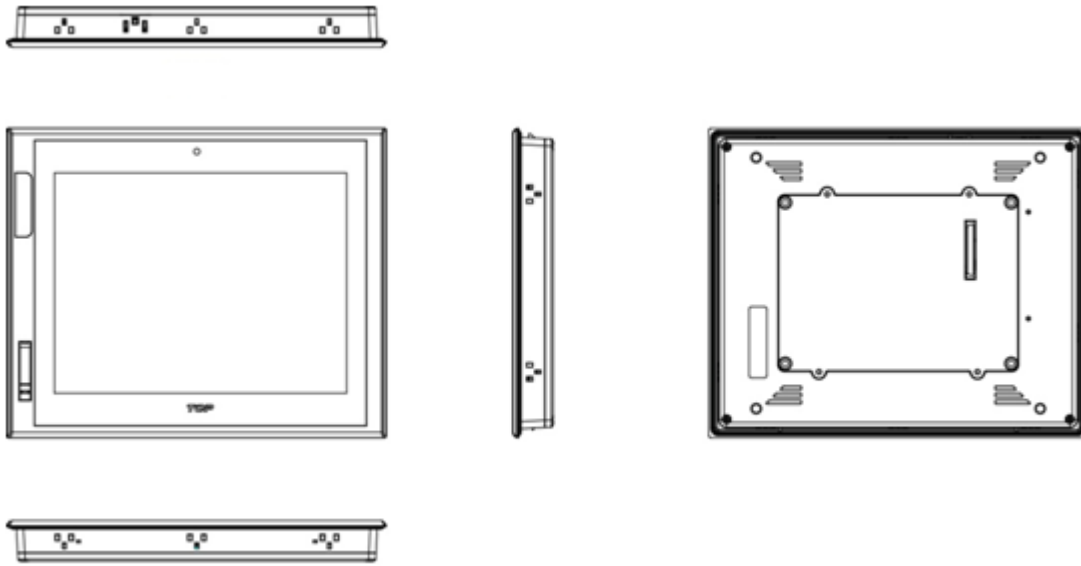
Operation Temperature (°C)	-10 ~ +50
Storage Temperature (°C)	-20 ~ +60
Operation Humidity (%RH)	0 ~ 90 (No dew)
Atmosphere	No corrosive gas
Protection Classification	Conform to IP65 (Process Module: IP2X)

3.6 Structure Specifications

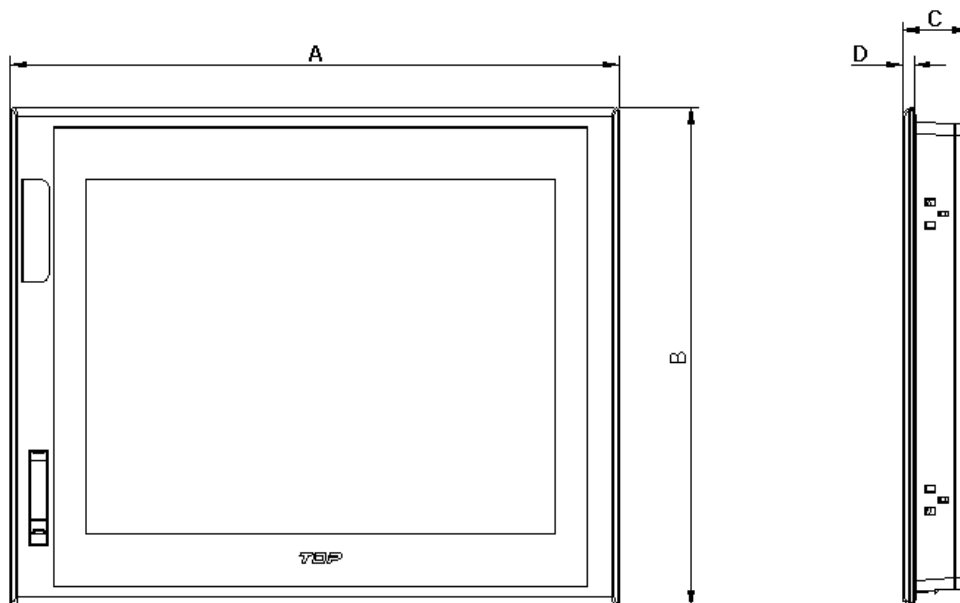
Cooling System	Natural air circulation
Case Material	AL(Aluminium)

Chapter 4. Part Names and General Specifications

4.1 TOPRD□□10 / □□20

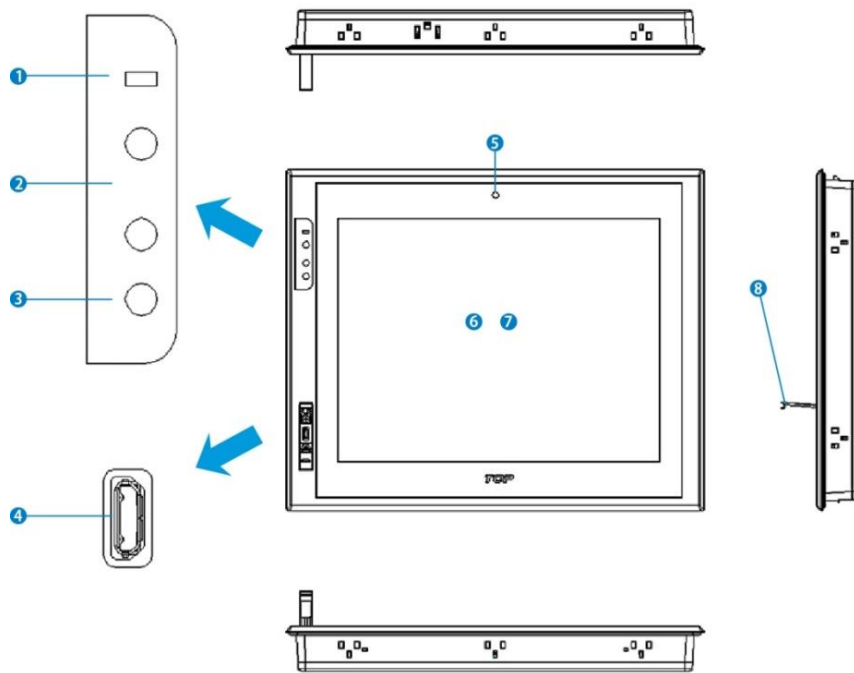


4.1.1 External Dimension



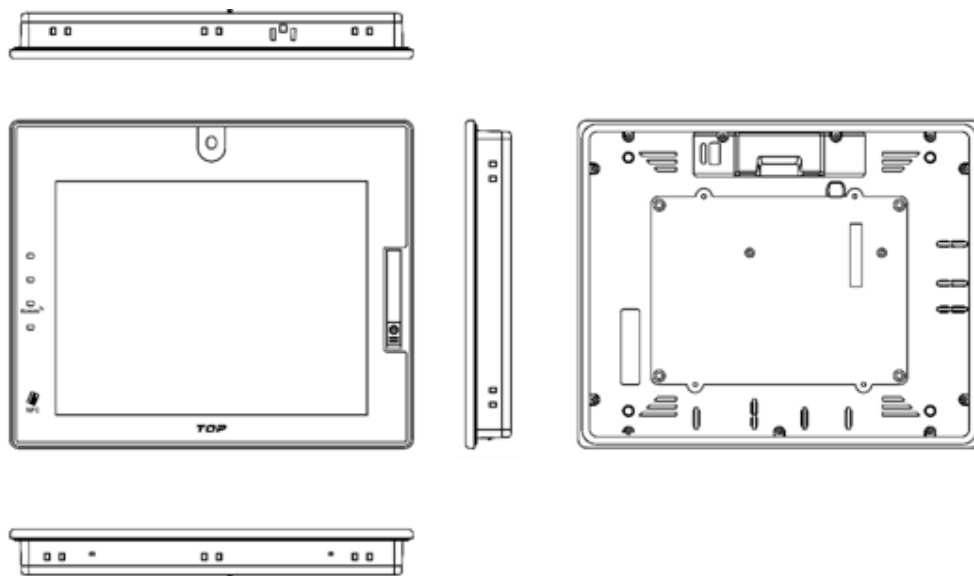
Products	A(mm)	B(mm)	C (mm)	D (mm)
TOPRD08 Series	237	183	32.7	5
TOPRD10 Series	276	219.5	32.6	
TOPRD12 Series	320	261	34.2	
TOPRD15 Series	370	301	36.7	

4.1.2 Front Part Names and Specifications

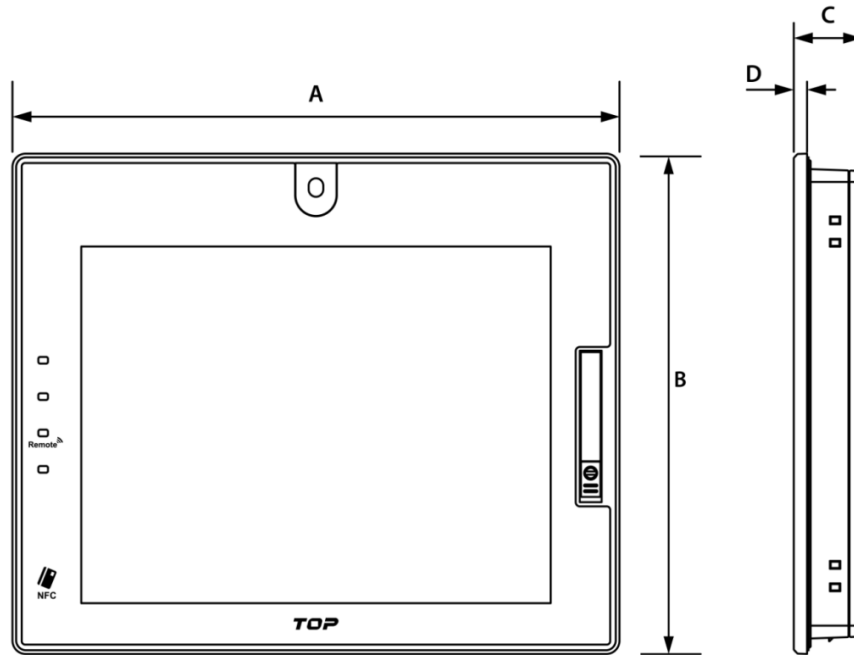


No.	Title	Description	Support Model
①	Power LED	System Power Status LED	All
②	Proximity Sensor	Automatically backlight ON/OFF by sensing object coming	TOPRD□□20
③	Brightness Sensor	Automatically brightness controls by ambient brightness	TOPRD□□20
④	USB OTG	UP/Down load project file	All
⑤	Camera	Resolution VGA(640*480)	TOPRD□□20
⑥	LCD Panel	TFT 16M Color LCD	All
⑦	Touch Panel	Analog resistive touch sensor	All
⑧	USB OTG Cover	Front USB OTG cover hole	All

4.2 TOPRD12 30 / 31 / 32

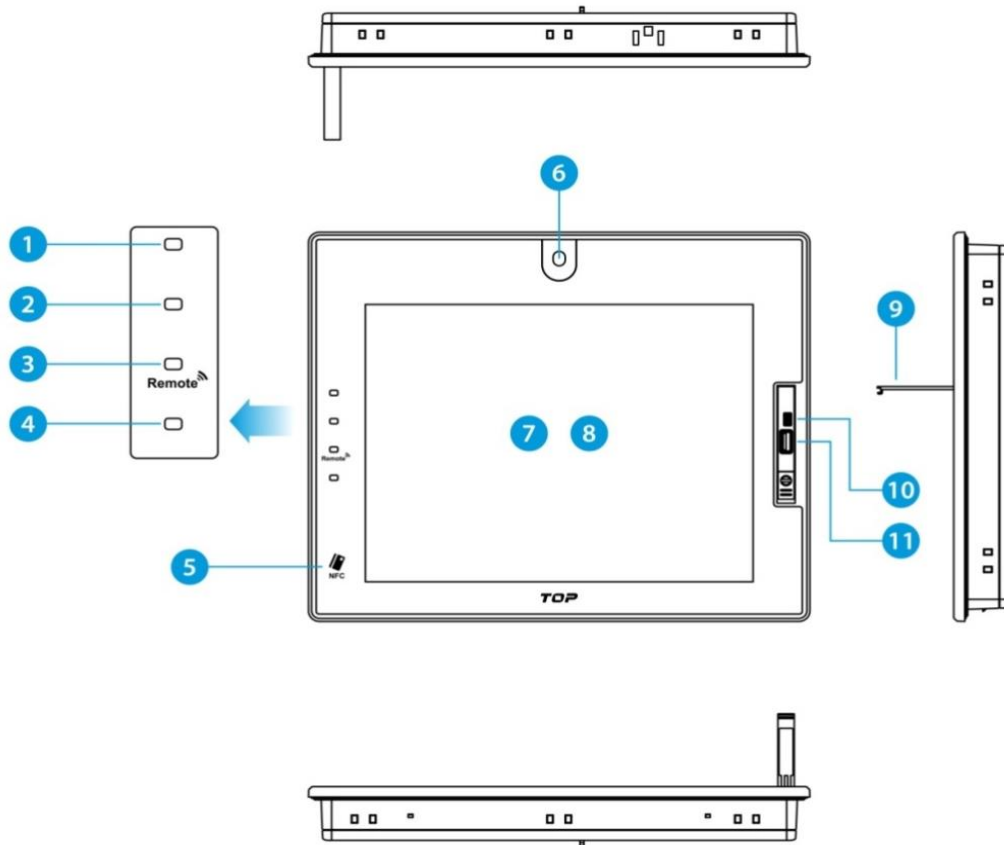


4.2.1 External Dimension



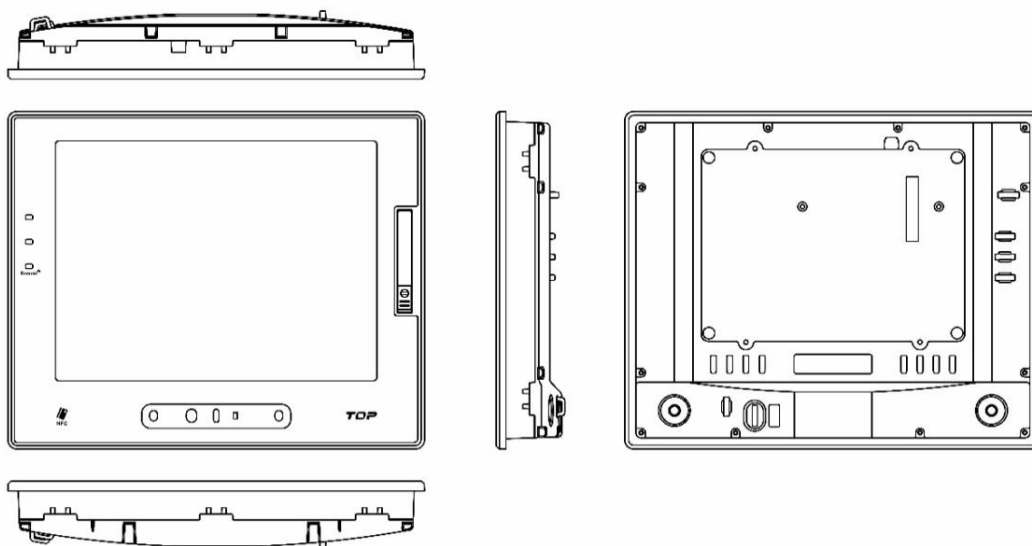
Products	A(mm)	B(mm)	C (mm)	D (mm)
TOPRD12 Series	320	261	34.2	5

4.2.2 Front Part Names and Specifications

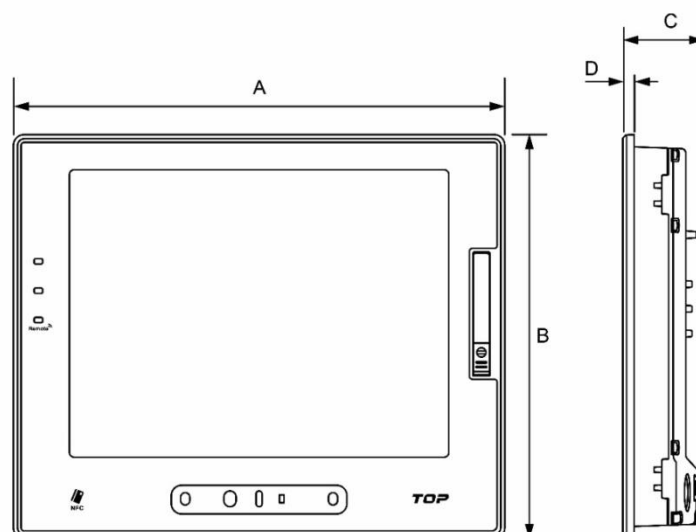


No.	Title	Description	Support Model
①	Power LED	System power status LED	All
②	Proximity Sensor	Automatically backlight ON/OFF by sensing object coming	All
③	IR Sensor	Device for communication with dedicated equipment	All
④	Brightness Sensor	Automatically brightness controls by ambient brightness	All
⑤	NFC	Device for receiving near field communication (NFC)	TOPRD12 30 / 31
⑥	Camera	Resolution VGA (640*480)	TOPRD12 30 / 31
⑦	LCD Panel	TFT 16M Color LCD	All
⑧	Touch Panel	Analog resistive touch sensor	TOPRD12 30 / 32
		Capacitive touch sensor	TOPRD12 31
⑨	USB OTG Cover	Front USB OTG cover hole	All
⑩	USB OTG	Program upload or download	All
⑪	USB HOST	USB Port	All

4.3 TOPRD1240

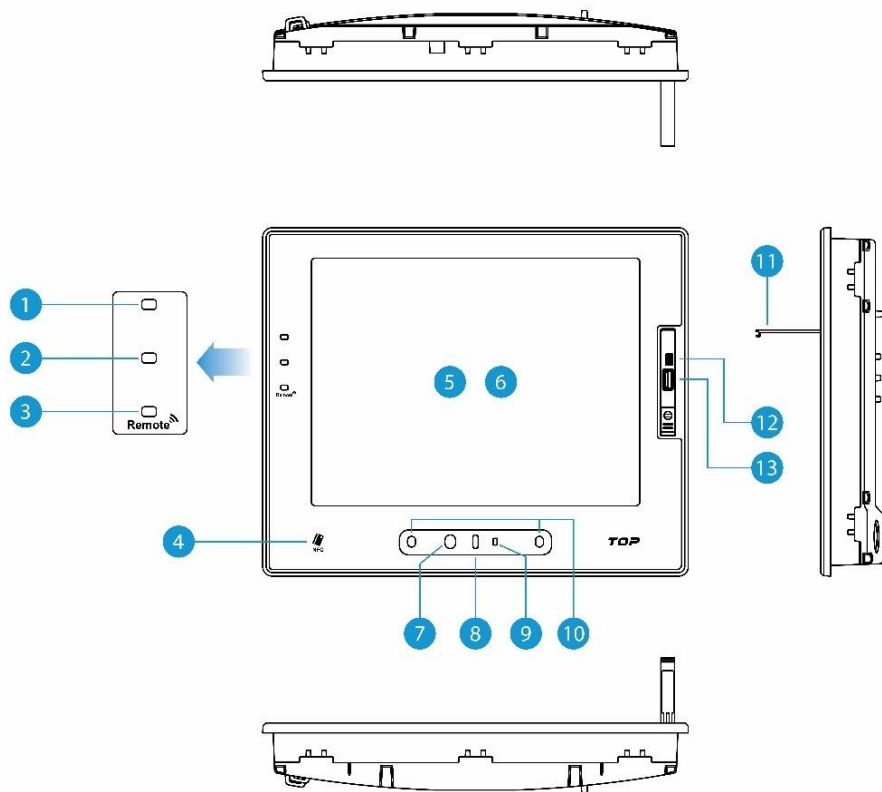


4.3.1 External Dimension



Products	A(mm)	B(mm)	C (mm)	D (mm)
TOPRD1240X	320	261.5	52.9	7.5

4.3.2 Front Part Names and Specifications

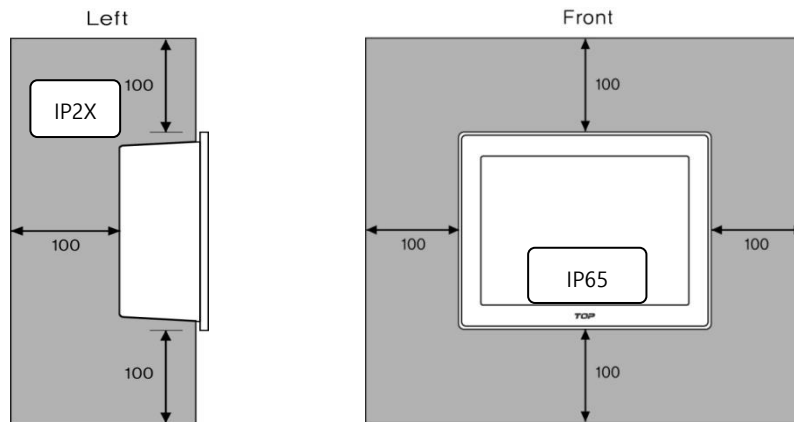


No.	Title	Description	Support Model
①	Power LED	System power status LED	All
②	Proximity Sensor	Automatically backlight ON/OFF by sensing object coming	All
③	IR Sensor	Device for communication with dedicated equipment	All
④	NFC	Device for receiving near field communication (NFC)	All
⑤	LCD Panel	TFT 16M color LCD	All
⑥	Touch Panel	Analog resistive touch sensor	All
⑦	Iris Sensor	Personal authentication function	All
⑧	Camera	Resolution VGA (640*480)	All
⑨	Brightness Sensor	Automatically brightness controls by ambient brightness	All
⑩	IR LED	Infrared light for iris recognition	All
⑪	USB OTG Cover	Front USB OTG cover hole	All
⑫	USB OTG	Program upload or download	All
⑬	USB HOST	USB Port	All

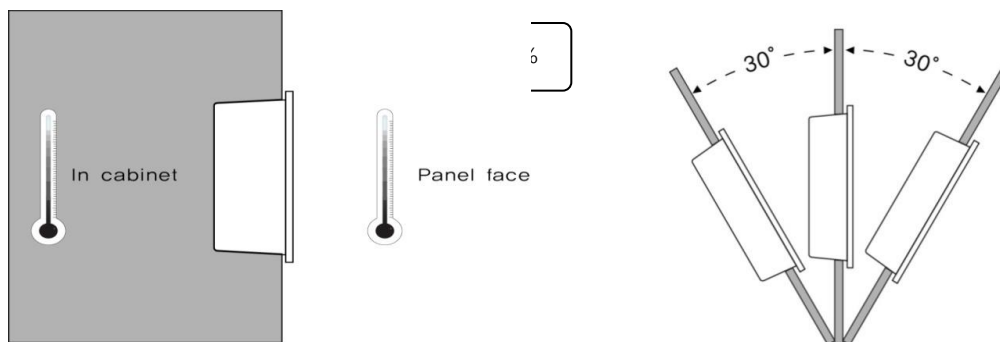
Chapter 5. Installation Warning

5.1 Installation Requirements

- (1) For the performance, ventilation and safe use of the equipment, keep the distance between the back of the main unit and each wall of the container at least 100mm and install the cooling fan when installed in an enclosed space.



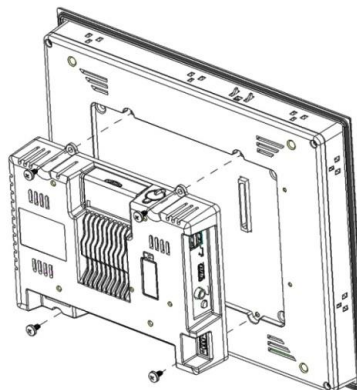
- (2) It should be installed within $-10 \sim 50^{\circ}\text{C}$ and 10~80% relative-humidity, otherwise the screen may be changed or cause malfunction and damage.
- (3) Be sure that heat from surrounding equipment does not cause product to exceed its standard operating temperature.
- (4) When you don't see within 30° , you may not see clearly. When installing the product in a slanted position, the product screen should not incline more than 30° .
- (5) In order to minimize external mechanical hazards, please control the mechanical hazards of the surrounding environment.



5.2 TOPR Assemble

Insert Process Module to Guide of Rear of Display Module and Mount with Bolts included in Package.

(Bolt Size: M4 X 8L, Torque: 0.4N.m)

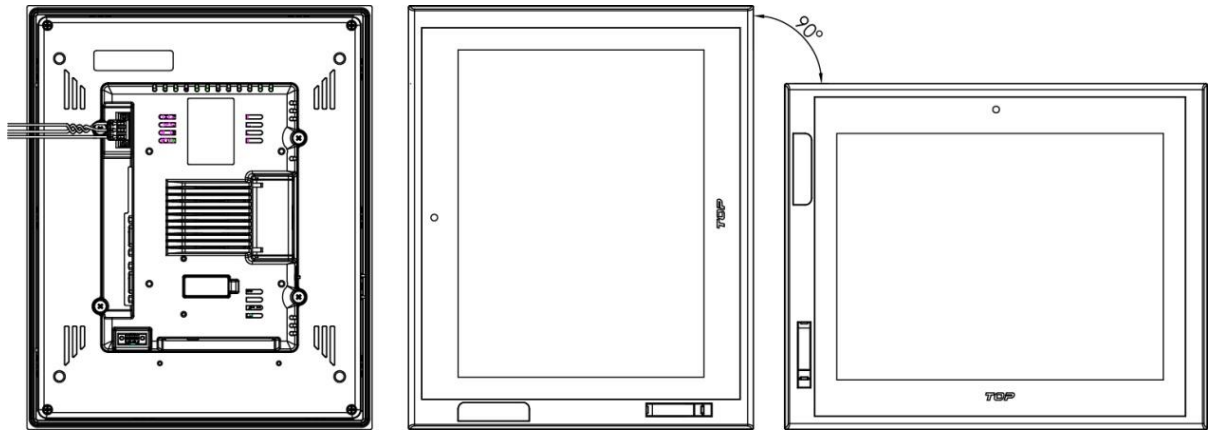


5.3 Installation Procedure Warning

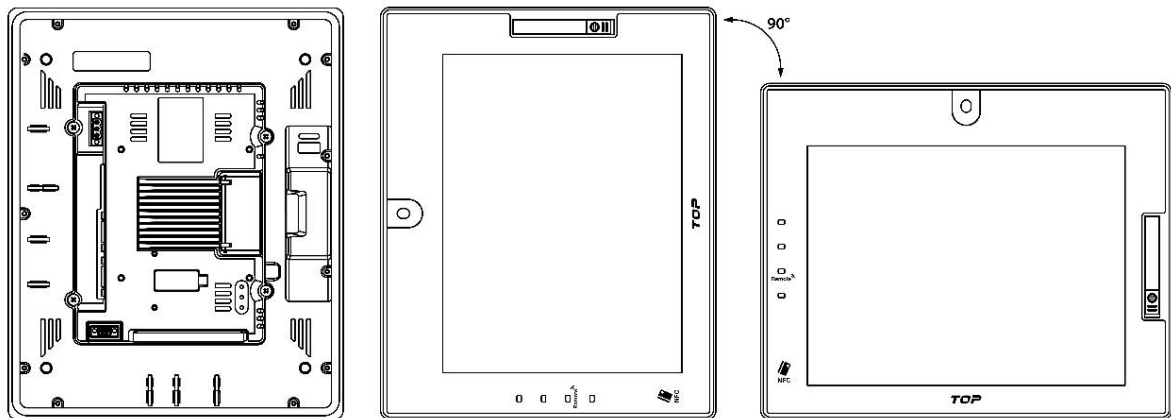
For mounting product to the control panel, it should be recommended following below items.

It is recommended that the power connector at the rear is located at the top for vertical installation.

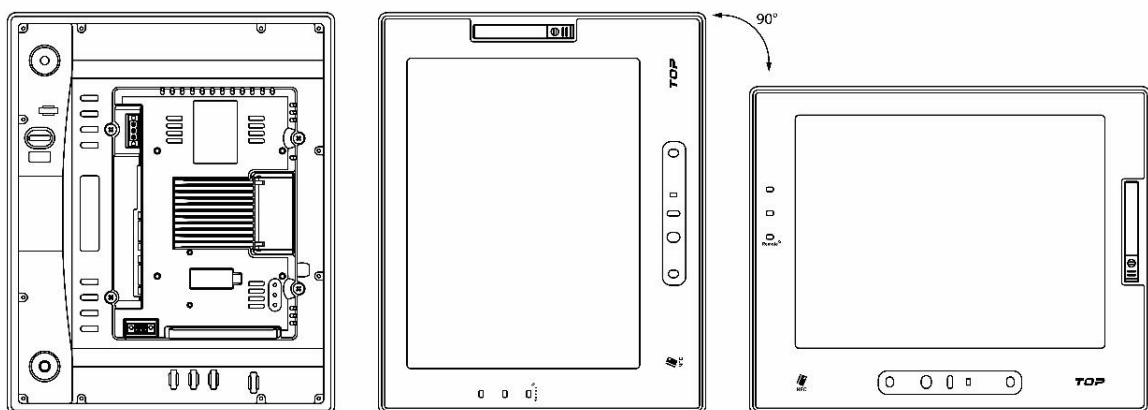
5.3.1 TOPRD□□10 / □□20



5.3.2 TOPRD12 30 / 31 / 32



5.3.3 TOPRD1240



5.4 Panel Cut-out

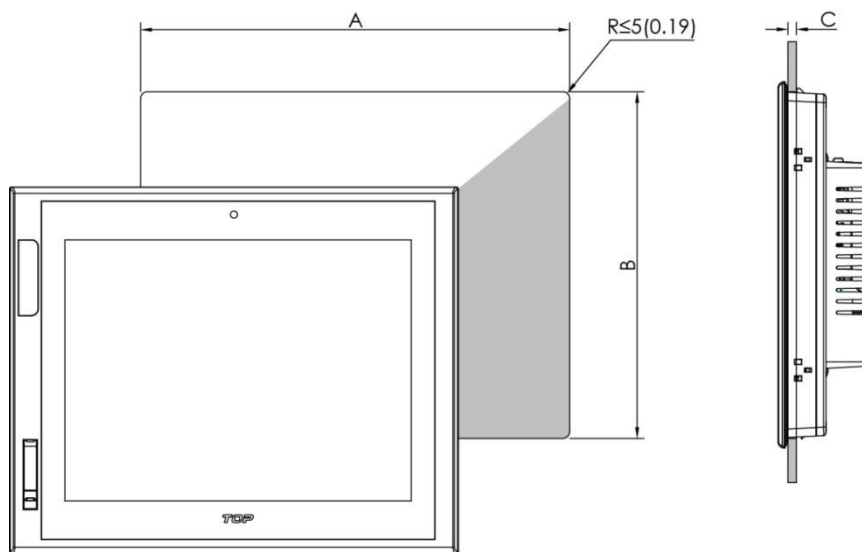
Make a panel cut which product is mounted and insert the TOPR to the panel from the front side.

5.4.1 The Size of Panel Cut (Mounting Place)

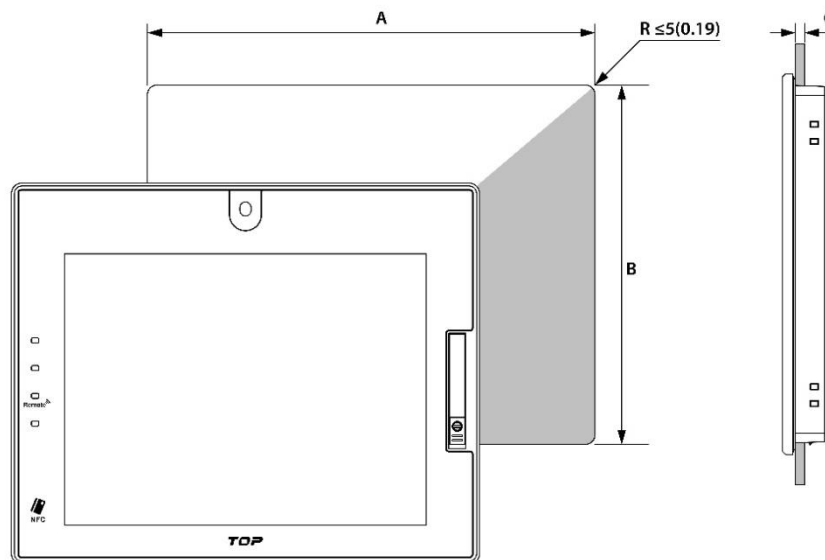
Making the Panel Cut (Mounting Size) per each TOPRD Series as below Table, Before Installation.

Product	A(mm)	B(mm)	C (mm)
TOPRD08 Series	222(+1.0/0)	168(+1.0/0)	1.6~5.0(+1.0/0)
TOPRD10 Series	260(+1.0/0)	202(+1.0/0)	
TOPRD12 Series	306(+1.0/0)	247(+1.0/0)	
TOPRD15 Series	355(+1.0/0)	286(+1.0/0)	

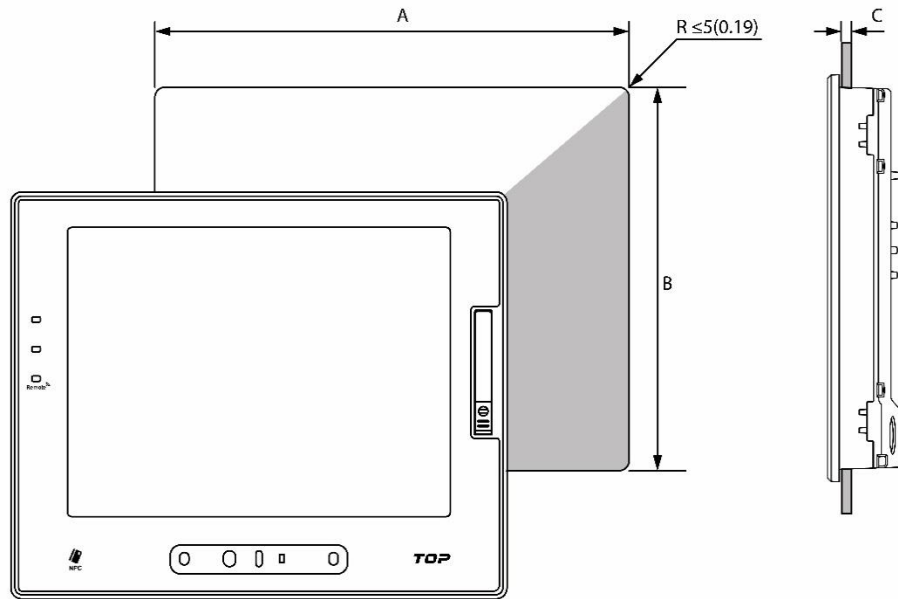
5.4.2 TOPRD□□10 / □□20



5.4.3 TOPRD12 30 / 31 / 32



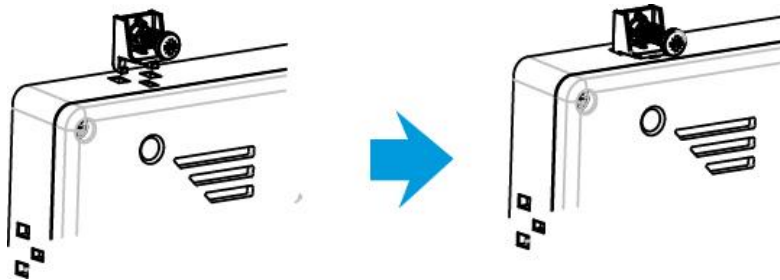
5.4.4 TOPRD □□40



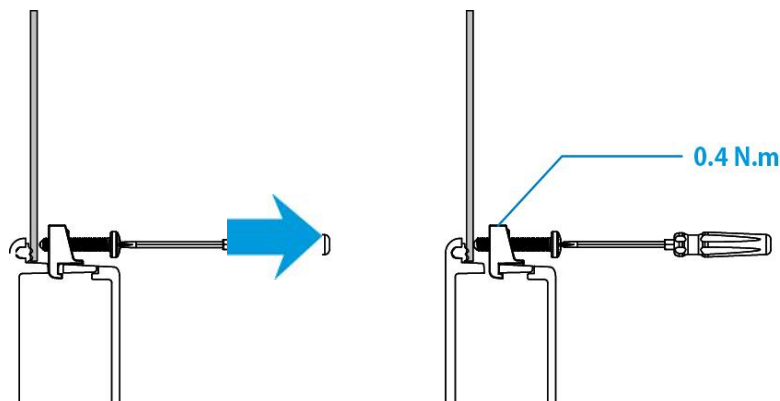
5.5 Fixation

Installation methods should be following by using the supplied installation clamps.

a. Insert the clamp into the slot of the product.



b. Screw the unit into the panel cut with a screwdriver.



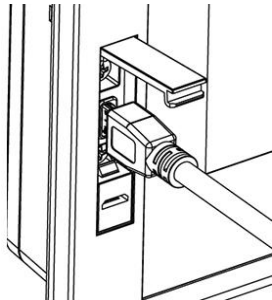
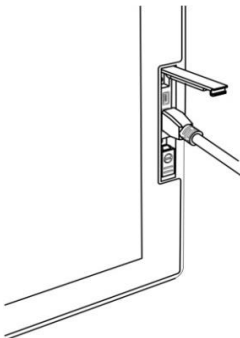
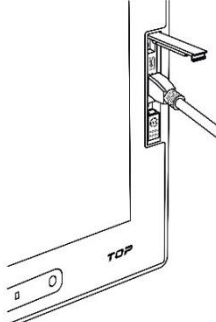
Note: If the clamping screw below is over-tightened, the touch sensor may stop working or malfunction. Tighten to 0.4N.m screwdriver torque.

Caution: IP performance cannot be secured if the clamp is not tightened with a tightening force of 0.4 N.m.

5.6 Front USB

5.6.1 Data Upload and Download

You can download or Upload Project file data Via USB interface.

TOPRD □□10 / □□20	TOPRD12 30 / 31 / 32	TOPRD1240
		

Chapter 6. Maintenance Warning

6.1 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.

6.2 Periodic Check Points

Check the followings periodically for best condition of the device.

(1) Environment

- Is the operating temperature within the allowable range (-10°C~50°C)?
- Is the operating humidity within the allowable range (10%~80%RH)?
- Is the Surrounding pollution no corrosive gas?

(2) Power

Is the input voltage within the change Range (-15%~+10%)?

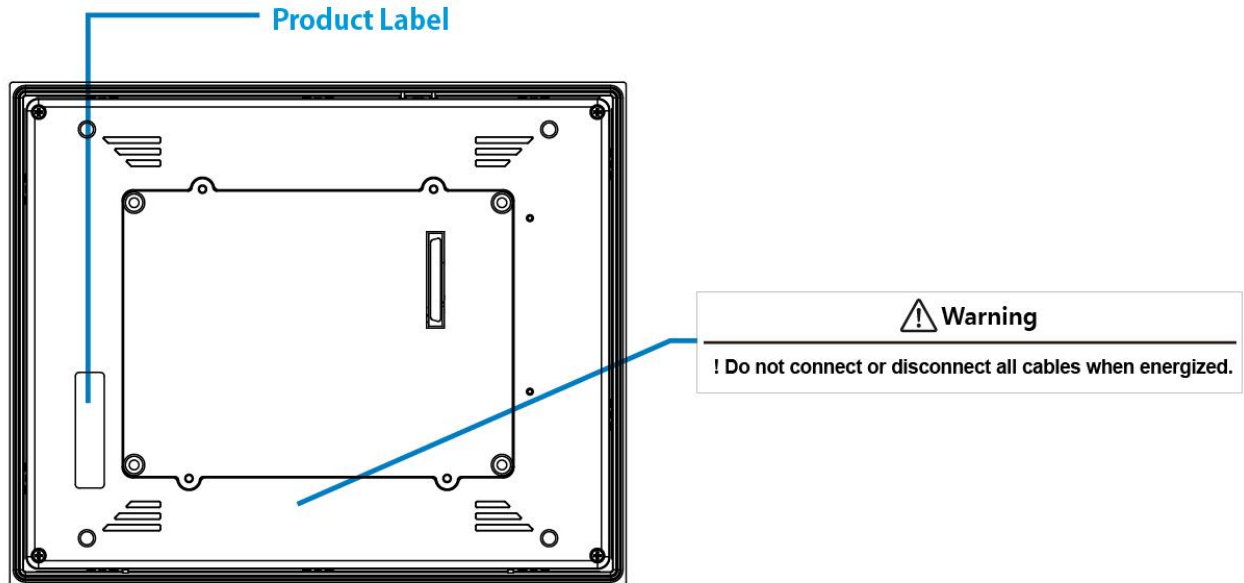
(3) Related Items

- Check the battery when is exchanged and voltage drop is indicated.
- Check the guarantee duration of LCD Backlight by eye.
- Check the touch pad there is no damage, scratch or pollution by eye.

6.3 Problems with the Device Warning

- If there is a problem during operation, stop using it and contact the A/S department of M2I Corporation, which is indicated on the product label.
- Only the authorized worker from M2I Corporation can check and repair problems related to malfunction of the machine.
- If the problem cannot be solved at the installation site, the equipment can be collected and moved to M2I Corporation.
- 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.

Chapter 7. Products and Warning Label Location



Chapter 8. Products Label



Manufacture (AS): M2I Corporation

11-35, Simin-daero 327beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do 14055, Korea

Tel: 82-31-465-3366

Product Name: Industrial HMI Touch Panel

Model Name: TOPRD□□□□□

Operating Temp: $-10\text{ }^{\circ}\text{C} \leq T_a \leq +50\text{ }^{\circ}\text{C}$

Power specification: TOPRD08 Series: 12Vdc, 3.3Vdc, 6W or less,

TOPRD10 Series: 12Vdc, 3.3Vdc, 9W or less,

TOPRD12 10 / 20 / 30 / 31 / 32: 12Vdc, 3.3Vdc, 9W or less,

TOPRD12 40: 12Vdc, 3.3Vdc, 24W or less,

TOPRD15 Series: 12Vdc, 3.3Vdc, 12W or less

Certificate Number:

Serial Number:

Copyright: M2I corporation 2021.5

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- When using M2I equipment, thoroughly read this datasheet and associated manuals introduced in this datasheet, also pay careful attention to safety and handle the module properly.

- Store this datasheet in a safe place so that you can take it out read it whenever necessary.