



M2I Corporation

Industrial HMI Touch Panel

TOPRT40-Ex Series

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.





Index

Index.....	2
Chapter 1 Safety Precautions.....	3
Chapter 1 Consignes de sécurité.....	6
Chapter 2 Overview.....	9
2.1 Introduction of Products.....	9
2.2 Components.....	9
2.3 Model Name Description.....	10
Chapter 3 General Specifications.....	10
3.1 Electrical Specifications.....	10
3.2 Display Specifications.....	10
3.3 Touch Specifications.....	10
3.4 Sub Function Specifications.....	10
3.5 Memory Specifications.....	11
3.6 Environment Specifications.....	11
3.7 Structure Specifications.....	11
Chapter 4 Parts Identification and Specifications.....	12
4.1 TOPRT1040SD-Ex.....	12
4.2 TOPRT1240XD-Ex.....	14
4.3 TOPRT1540XD-Ex.....	16
4.4 Rear Section Components and Specifications (Common).....	17
4.5 Side Section Components and Specifications (Common).....	18
4.6 Top Section Components and Specifications (Common).....	18
4.7 Bottom Section Components and Specifications (Common).....	18
Chapter 5 Interface.....	19
5.1 Serial Interface.....	19
5.2 Ethernet Interface.....	20
5.3 USB Interface.....	21
Chapter 6 Installation.....	21
6.1 Installation Requirement.....	21
6.2 Installation Procedure.....	22
6.3 Front USB.....	24
Chapter 7 Wiring.....	25
7.1 Power Cable Wiring.....	25
7.2 Ground Cable Wiring.....	26
7.3 Cable Clamp Installation.....	26
Chapter 8 Maintenance.....	27
8.1 Cleaning of a Display.....	27
8.2 Periodic Check Points.....	27
8.3 Device Troubleshooting.....	27
8.4 Setting System Recovery Mode.....	28
Chapter 9 Warning Label.....	28
Chapter 10 Product Label.....	29

Chapter 1 Safety Precautions









■ Before using the product

To ensure the safe and efficient use of the product, please read this manual thoroughly and completely before use. The safety precautions must be followed to prevent accidents and hazards. These precautions are divided into "Warning" and "Caution" sections. The meanings of each category are as follows.







 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.

■ Explosion proof(Ex) Precautions **Warning**



THIS EQUIPMENT IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C AND D OR NON-HAZARDOUS LOCATIONS ONLY.

-  Do not open the product when explosive gas is around.
-  Do not open, maintain or service in an area where an explosive atmosphere.
-  Do not change SD Card when the power is connected to product.
-  All cables connected with the product should not be connected or disconnected when the power of product is on.
-  EXPLOSION HAZARD - DO NOT DISCONNECT OR CHANGE BATTERY UNLESS THE AREA IS KNOWN TO BE NON-HAZARDOUS. or equivalent.
-  RISQUE D'EXPLOSION. NE PAS BRANCHER NI DEBRANCHER SOUS TENSION.
-  LES BATTERIES NE DOIVENT ETRE REMPLACEES QUE DANS UN EMPLACEMENT EXEMPT DE CONCENTRATIONS
-  Touch the device after wiping the front panel with a damp cloth or wearing anti-static gloves, to avoid the electrostatic charges.

■ 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.
-  Use the radio or mobile phone at least 30 cm 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.
WARNING – DO NOT CONNECT OR DISCONNECT WHEN ENERGIZED. or equivalent.
AVERTISSEMENT – NE PAS CONNECTER OU DÉCONNECTER LORSQUE L'ÉQUIPEMENT EST SOUS TENSION.

■ Specific Condition of Use

-  The equipment shall only be used in an area of at least pollution degree 2, as defined in IEC/EN 60664-1.
-  Equipment shall be installed in a back enclosure with tool removable door or cover that provides a degree of protection not less than IP 54 in accordance with IEC/EN 60079-0.

- ⊘ The equipment shall only be installed in locations where there is a low risk of mechanical damage.
- ⊘ External connections to the equipment, including the front USB port must not be inserted or removed unless either the area in which the equipment is installed is known to be non-hazardous, or the circuits connected have been de-energized.
- ⊘ External connections to the equipment must be secured using the mechanical securing devices provided adjacent to connection to prevent unintentional separation.
- ⊘ Provisions shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 140%.

■ 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 100 mm (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 2 mm².
 - ⚠ b. grounding point be closed to the products and make short the distance to the ground cable if possible.

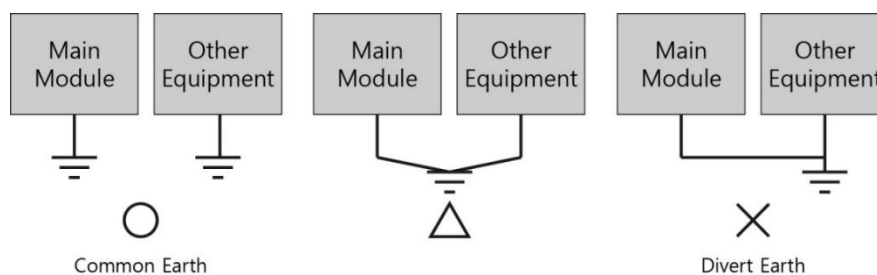


Fig. Grounding Example Diagram

■ Installation Precautions

- ⊘ 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.

- ⊘ For indoor use only.
- ⊘ Use the product under 2000 m altitude.

■ Disposal Precaution  **Caution**

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

■ Cell Type Battery Specification

Mounted on mainboard Battery is not replaced by the user. If the battery has run out of service, please contact our Customer Support Center for replacement and inspection.

Item	Content
Battery Voltage	DC 2.3 V, 7.7 mAh
Battery Model	CTL920F (lithium Rechargeable / non-exchangeable)
Battery Lifetime	Permanent (In case of ambient temperature 25 °C)





* The specifications are subject to change depending on the model.

- All field-wiring connections to this unit shall be from Limited Voltage / Limited Current, below 20 ~ 28 Vdc isolated secondary source with an output fuse, or Class 2 secondary circuits.











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 liées à la protection contre les explosions Warning

-  Tous les câbles connectés au produit ne doivent pas être branchés ou débranchés dans une atmosphère explosive.
-  Ne pas ouvrir, entretenir ou intervenir sur l'appareil dans une zone présentant une atmosphère explosive.
-  Ne pas changer la carte SD lorsque le produit est sous tension.
-  Tous les câbles connectés au produit ne doivent pas être branchés ou débranchés lorsque l'alimentation est activée.
-  Toucher l'appareil uniquement après avoir essuyé la façade avec un chiffon humide ou en portant des gants antistatiques afin d'éviter toute charge électrostatique.
-  Cet équipement convient uniquement à une utilisation en Classe I, Division 2, Groupes A, B, C et D ou dans des emplacements non dangereux.
-  Cet équipement est un dispositif de type ouvert et l'arrière de l'équipement doit être installé dans un boîtier adapté à l'environnement, de manière à ce que l'équipement ne soit accessible qu'à l'aide d'un outil.
-  Les batteries ne doivent être remplacées que dans une zone exempte de concentrations inflammables.
-  Ne pas retirer ou remplacer lorsque le circuit est sous tension, à moins que la zone ne soit exempte de concentrations inflammables.
-  Ne pas déconnecter lorsque le circuit est sous tension, à moins que la zone ne soit exempte de concentrations inflammables.

■ Précautions générales Caution

-  Ne pas appuyer sur l'écran avec un objet dur ou pointu (poinçon, tournevis, stylo) avec une force excessive. It may cause malfunction of touch due to damage of the front sheet.
-  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'écran LCD.

AVERTISSEMENT – NE PAS CONNECTER OU DÉCONNECTER LORSQUE L'ÉQUIPEMENT EST SOUS TENSION. Ou équivalent.



■ Conditions spécifiques d'utilisation

- ⊘ L'équipement doit uniquement être utilisé dans une zone ayant un degré de pollution d'au moins 2, comme défini dans la norme IEC/EN 60664-1.
- ⊘ L'équipement doit être installé dans une enceinte arrière avec une porte ou un couvercle amovible à l'aide d'un outil, offrant un degré de protection d'au moins IP 54 conformément à la norme IEC/EN 60079-0.
- ⊘ L'équipement doit uniquement être installé dans des endroits où le risque de dommage mécanique est faible.
- ⊘ Les connexions externes à l'équipement, y compris le port USB avant, ne doivent pas être insérées ou retirées à moins que la zone dans laquelle l'équipement est installé ne soit non dangereuse, ou que les circuits connectés aient été mis hors tension.
- ⊘ Les connexions externes à l'équipement doivent être sécurisées à l'aide des dispositifs de fixation mécanique fournis à proximité de la connexion pour empêcher toute séparation involontaire.
- ⊘ Des mesures doivent être prises pour éviter que la tension nominale ne soit dépassée par des perturbations transitoires de plus de 140 %.

■ Précautions de conception Warning

Installez un circuit de protection à l'extérieur des produits afin de protéger l'ensemble du système de contrôle en cas de problème avec l'alimentation externe ou les produits.

- ⓘ Comme un dysfonctionnement ou un résultat incorrect des produits pourrait nuire à la stabilité de l'ensemble du système et à la sécurité des personnes, vous devez installer un circuit d'interverrouillage préventif, tel qu'un arrêt d'urgence, des circuits de protection, des fins de course supérieur et inférieur, et un interverrouillage pour les opérations avant/arrière.
- ⓘ Lorsque l'ordinateur ou d'autres contrôleurs communiquent et échangent des données avec les produits ou modifient le mode de fonctionnement des produits, configurez un programme de séquence de protection dans le PC ou le contrôleur afin de protéger le système contre les erreurs de communication.
- ⓘ Les lignes de signaux d'entrée/sortie ou de communication doivent être séparées de la ligne d'alimentation ou des câbles haute tension. Elles doivent être installées à au moins 100 mm (3,94 pouces) les unes des autres.

■ 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.

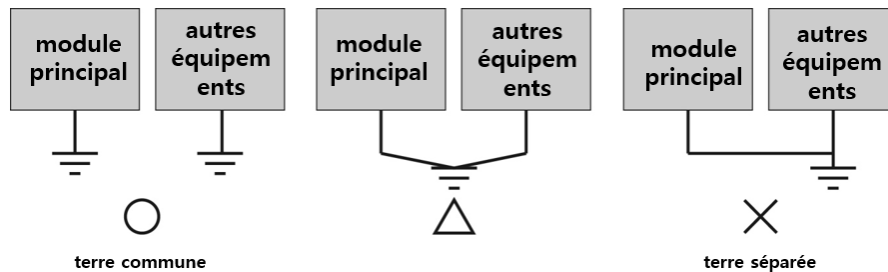







fig. : exemple de schéma de mise à la terre


■ Précautions d'installation Caution

-  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.

■ Spécifications de la batterie Caution

-  Une batterie interne CR2032 sur la carte mère ne peut être remplacée que dans un endroit non explosif. Veuillez vérifier les informations ci-dessous pour effectuer le remplacement correctement.

Élément	Informations
Tension et capacité	DC 3.0V, 225mAh
Nom du modèle et fabricant	CR2032(Lithium Battery), Panasonic
Durée de vie	Plus de 2 ans (à une température ambiante de 25°C)

* Les spécifications sont susceptibles de changer en fonction du modèle.

- Toutes les connexions de câblage sur le terrain à cette unité doivent provenir d'une source secondaire isolée à ****tension limitée / courant limité****, inférieure à 20 ~ 28 VDC avec un fusible de sortie, ou de circuits secondaires de Classe 2.

Chapter 2 Overview

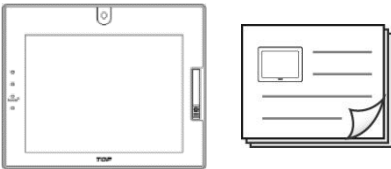


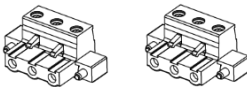
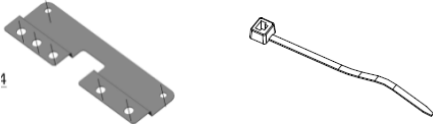




2.1 Introduction of Products

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).

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
Gasket		1
Mounting Clamp		10
Power Connector and COM3 connector		1 each
USB Cable Clamp Cable Tie		1 each
Accessories (Sold separate)	 USB Memory  USB Extension Cable  SD Card  Front Protection Sheet	User Options

2.3 Model Name Description

TOPRT	□□	□□	□	□	-Ex	□□□
Series	Screen	Option	Resolution	Power	-	*Reserve
	08: 8.4"	40: Premium	Q: QVGA (320 * 240)	D: DC	Ex: Explosion proof or special model	Customer option: No relate to Explosion proof. Can be states as Alphabet, Digits, or blank space.
	10: 10.4"		V: VGA (640 * 480)	A: AC	Blank: Non-explosion proof or general model	
	12: 12.1"		S: SVGA (800 * 600)			
	15: 15"		X: XGA (1024 * 768)			

* Reserve [01] option model: No Front Camera, SD Card Slot Blocked

* Reserve [02] option model: With Front Camera, SD Card Slot Open

* Reserve [03] option model: No Front Camera, SD Card Slot Open

Chapter 3 General Specifications

3.1 Electrical Specifications

Part	Specifications	
Rated voltage	DC 24 V, Class 2	
Input Voltage Range	DC 20 ~ 28 V, Class 2	
Power Consumption	TOPRT1040SD-Ex	20 W
	TOPRT1240XD-Ex	25 W
	TOPRT1540XD-Ex	25 W
Voltage endurance	DC 24 V, 10 ms within	
Insulation Resistance	500 V DC, 10 MΩ	

3.2 Display Specifications

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

3.3 Touch Specifications

Part	Specifications
Touch Type	Built-in, Analog resistive touch sensor

3.4 Sub Function Specifications

Part	Specifications
Front Camera	Built-in, Resolution: VGA (640 * 480)
Proximity Sensor	Built-in, Sensing Distance 0.7 m
Illuminance Sensor	Built-in, Automatic control by 10 levels
IrDA	Built-in, Sensing Distance 0.7 m, communicate with dedicated devices

3.5 Memory Specifications

Part	Specifications
Screen Memory	128 MB
Backup Memory	512 KB: System buffer (10 K Word),Including Alarm / Log / Recipe
Backup Period	Permanent
Real Time Clock	Built in (by Battery)

3.6 Environment Specifications

Part	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	1000 Vp-p (Pulse width 1 μ s)
Electrostatic Discharge	Connective discharge from EN61000-4-2: ± 4 kV
Shock Endurance	10G X, Y, Z each direction (for 3 times)
Withstand	500 V (Line-Line)
Ground Connection	Class 3 (Under 100 Ω)
Protection Classification	Front IP54
Insulation Coordination	Overvoltage category II

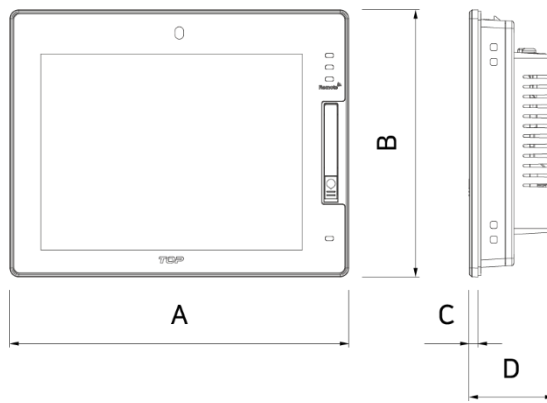
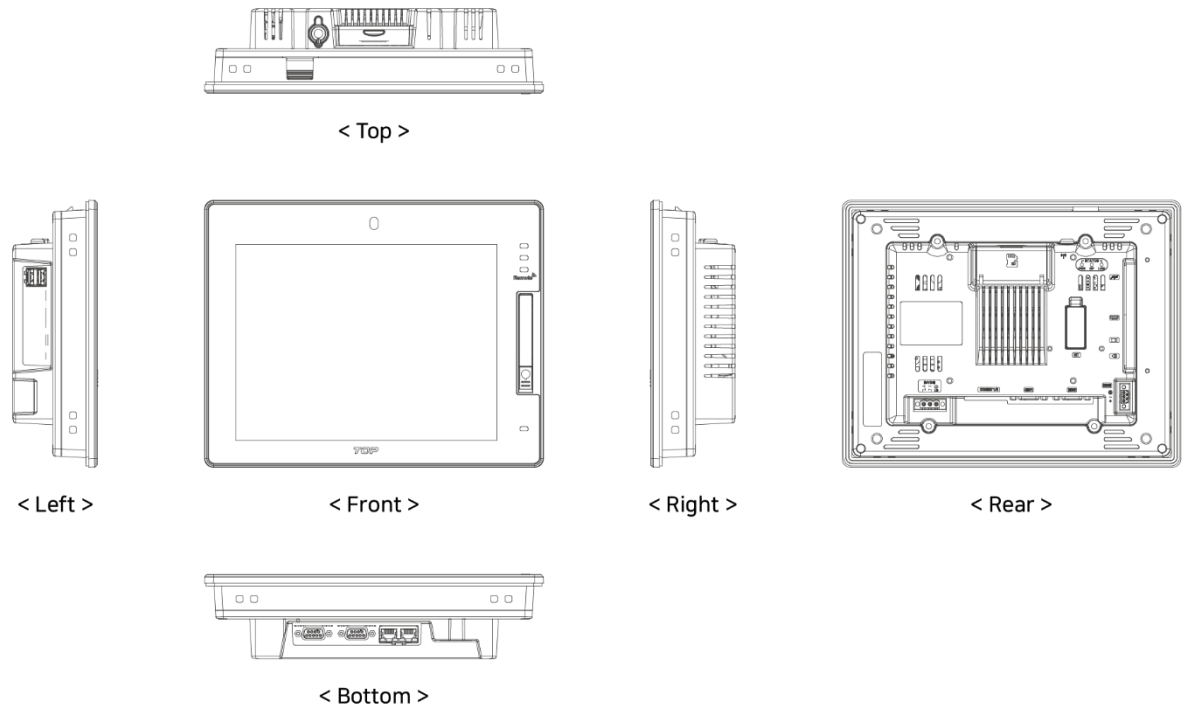
3.7 Structure Specifications

Model	TOPRT1040SD-Ex	TOPRT1240XD-Ex	TOPRT1540XD-Ex
Weight (Kg)	2.7	3.6	5.2
Cooling System	Natural air circulation		
Case Material	Aluminum		

Chapter 4 Parts Identification and Specifications

4.1 TOPRT1040SD-Ex

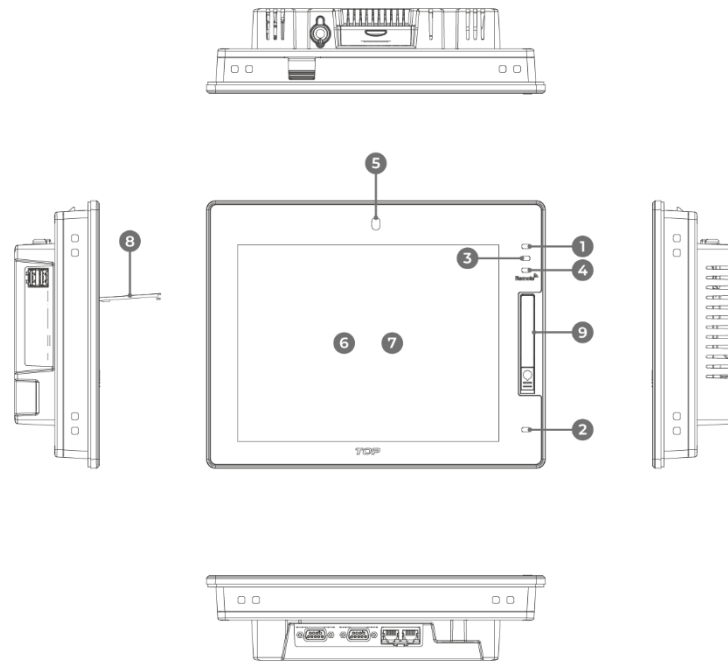
4.1.1 Overall Appearance and Dimensions



Model	A	B	C	D
TOPRT1040SD-Ex	275	217	7	68

(mm)

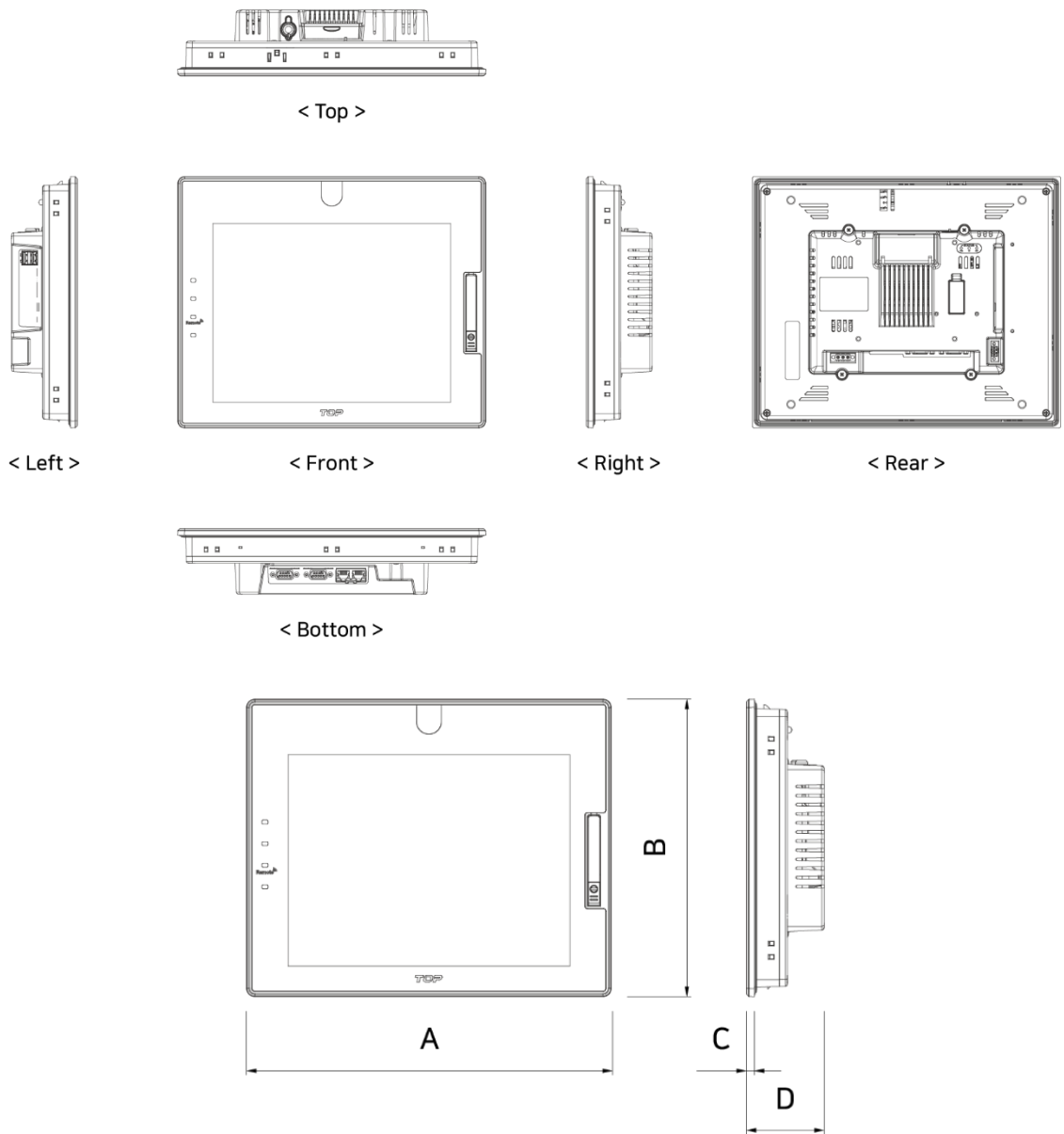
4.1.2 Front Section Components and Specifications



No	Part	Description
①	Power LED	System power status LED
②	Proximity Sensor	Automatically backlight ON / OFF by sensing object coming
③	Illuminance Sensor	Automatic brightness change by ambient illumination
④	IrDA Sensor	Communication device for dedicated product
⑤	Camera	Resolution: VGA (640 * 480)
⑥	LCD Panel	TFT 16 M Color LCD
⑦	Touch Panel	Analog resistive touch sensor
⑧	USB Cover	Front USB cover
⑨	USB OTG	Project file upload / download (*Internal program managing purpose)

4.2 TOPRT1240XD-Ex

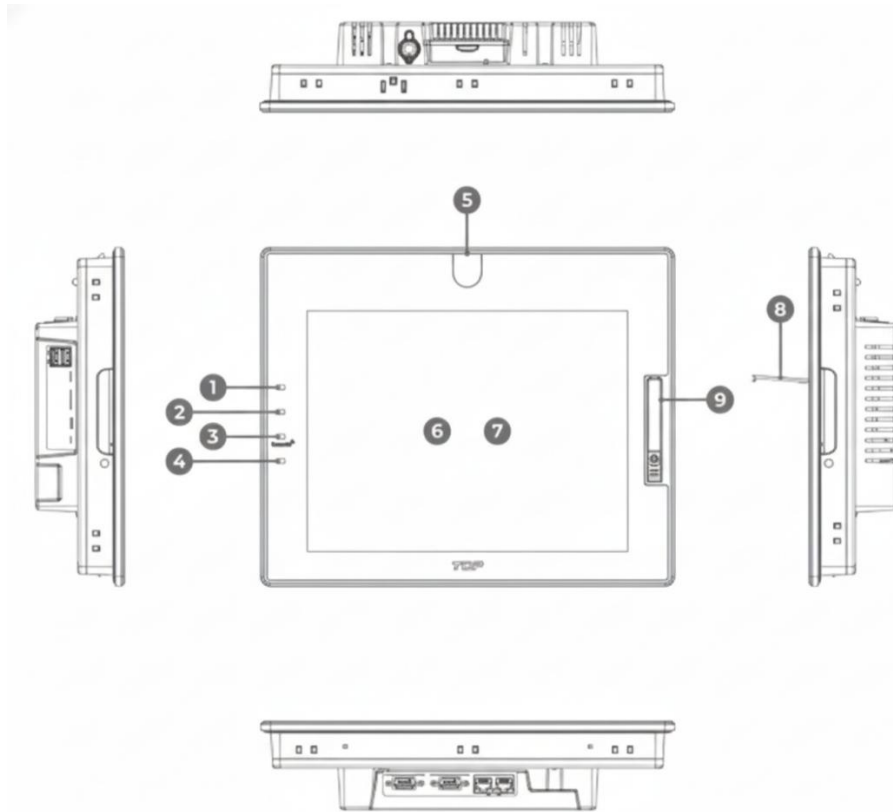
4.2.1 Overall Appearance and Dimensions



(mm)

Model	A	B	C	D
TOPRT1240XD-Ex	320	261	5	66.5

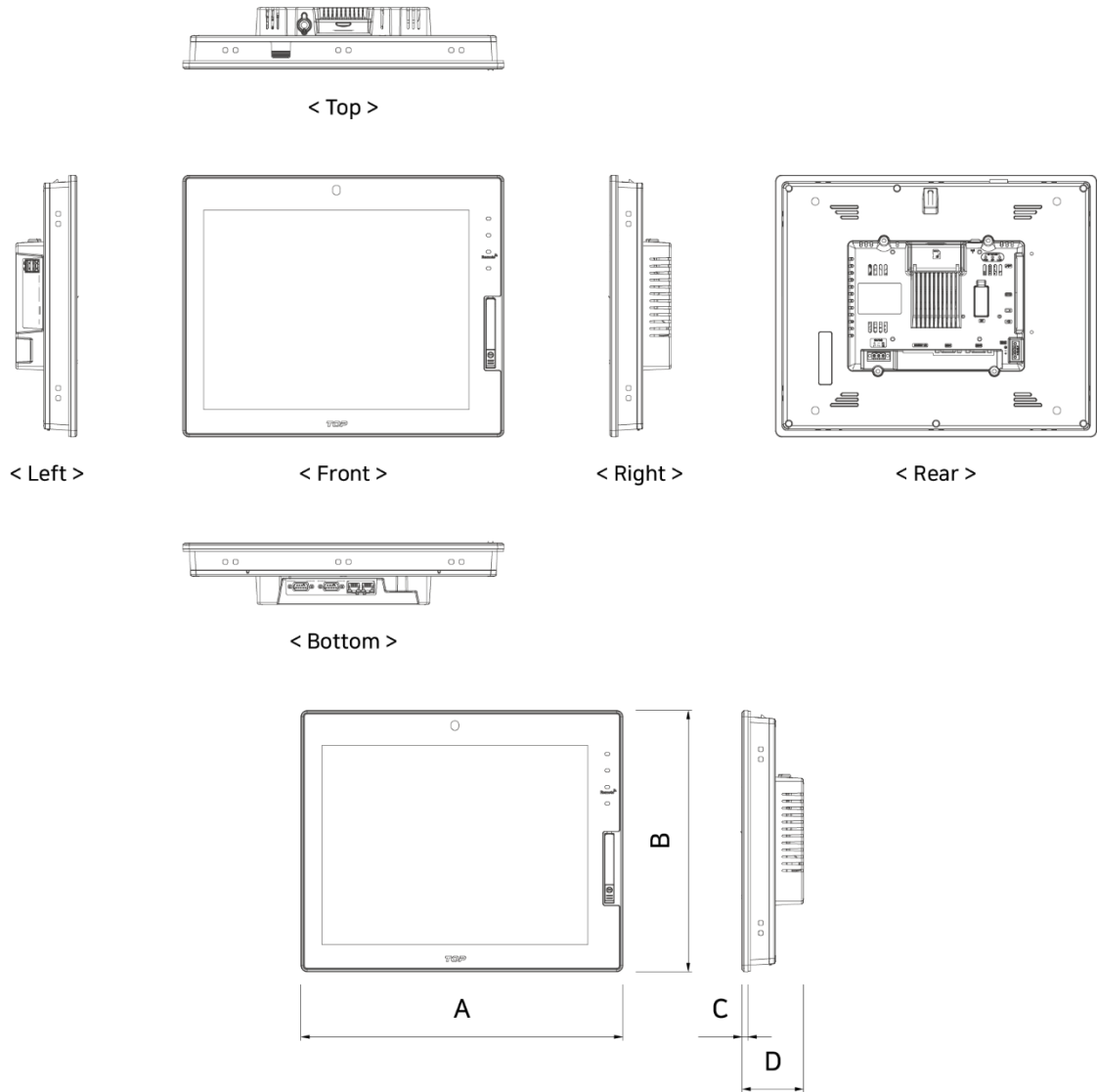
4.2.2 Front Section Components and Specifications



No	Part	Description
①	Power LED	System power status LED
②	Proximity Sensor	Automatically backlight ON / OFF by sensing object coming
③	Illuminance Sensor	Automatic brightness change by ambient illumination
④	IrDA Sensor	Communication device for dedicated product
⑤	Camera	Resolution: VGA (640 * 480)
⑥	LCD Panel	TFT 16 M Color LCD
⑦	Touch Panel	Analog resistive touch sensor
⑧	USB Cover	Front USB cover
⑨	USB OTG	Project file upload / download (*Internal program managing purpose)

4.3 TOPRT1540XD-Ex

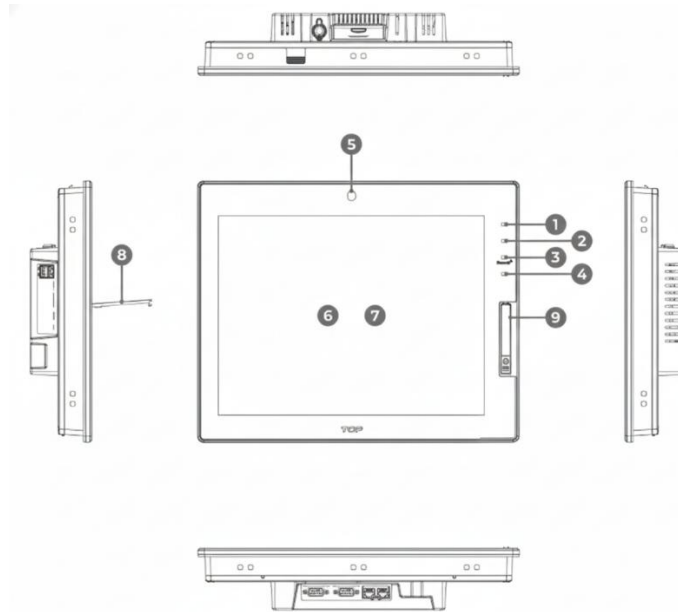
4.3.1 Overall Appearance and Dimensions



(mm)

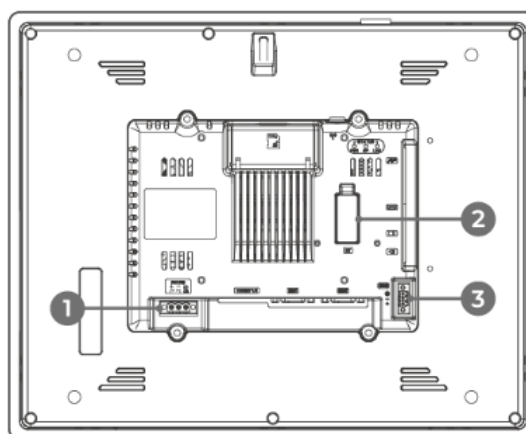
Model	A	B	C	D
TOPRT1540XD-Ex	370	301	7	71

4.3.2 Front Section Components and Specifications



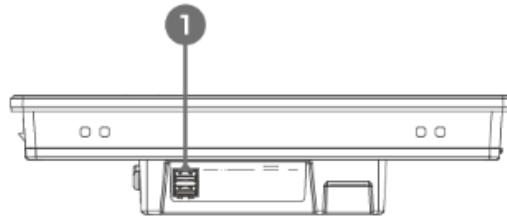
No	Components	Description
①	Power LED	System power status LED
②	Illuminance Sensor	Automatic brightness change by ambient illumination
③	IrDA Sensor	Communication device for dedicated product
④	Proximity Sensor	Automatically backlight ON / OFF by sensing object coming
⑤	Camera	Resolution: VGA (640 * 480)
⑥	LCD Panel	TFT 16 M Color LCD
⑦	Touch Panel	Analog resistive touch sensor
⑧	USB Cover	Front USB cover
⑨	USB OTG	Project file upload / download (*Internal program managing purpose)

4.4 Rear Section Components and Specifications (Common)



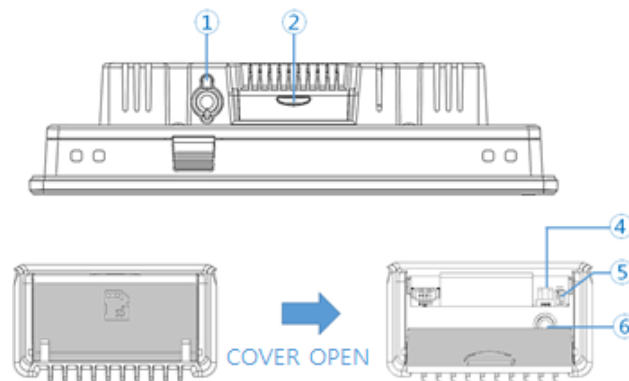
No.	Components	Type	Description
①	Power Connector	TB 5 mm 3P	Power Supply for Product (DC 20 ~ 28 V)
②	Extension Connector	-	Open the cover and insert an extension module
③	COM3 Connector	TB 3.5 mm 3P	RS-485 Serial Communication Connector

4.5 Side Section Components and Specifications (Common)



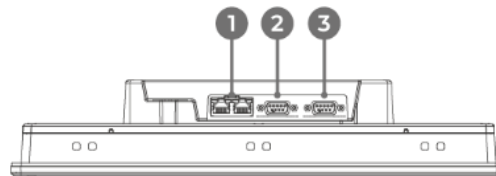
No.	Components	Type	Description
①	USB Host	Type-A x 2 port	Connector for option for USB storage. 5V / 0.5A limit

4.6 Top Section Components and Specifications (Common)



No.	Components	Type	Description
①	External antenna connector	-	No Use
②	Cover	Plastic Cover	Reset Switch, Mode Switch included
④	Cover Sensor	Photo coupler	Sensing Open / Close status of the cover
⑤	Mode Switch	DIP Switch 2P	Set Up System Mode
⑥	Reset Switch	Tact Switch	System reset Switch

4.7 Bottom Section Components and Specifications (Common)



No.	Components	Type	Description
①	Ethernet Connector	RJ-45 x 2ch	10BASE-T / 100BASE-Tx / 1000BASE-T, Auto-MDIX
②	Serial COM1 Connector	D-sub 9P	RS-232C / 422 / 485 communication port (Switchable the Comm. Software select)
③	Serial COM2 Connector	D-sub 9P	RS-232C / 422 / 485 communication port (Switchable the Comm. Software select)

Chapter 5 Interface

In order for the main unit to communicate with an external device, please check below contents.

5.1 Serial Interface

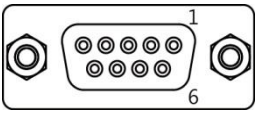
5.1.1 RS-232C

Items		Contents
Protocol		Full Duplex
Synch		Asynchronous
Communication Distance		About 15 m
Type of Connection		1:1
Control Code		ASCII Code or HEXA Code
Transmission Speed		2400, 4800, 9600, 19200, 38400, 57600, 76800, 115200, 187500 bps
Data Type	Data Bit	7, 8 bit
	Parity Bit	NONE, ODD, EVEN Parity
	Stop Bit	1, 2 bit
Connector		D-sub 9P

5.1.2 RS-422 / 485

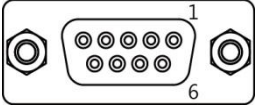
Items		Contents
Protocol		Full Duplex / Half Duplex
Synch		Asynchronous
Communication Distance		About 500 m
Type of Connection		1:N (N ≤ 31)
Control Code		ASCII Code or HEXA Code
Transmission Speed		2400, 4800, 9600, 19200, 38400, 57600, 76800, 115200, 187500 bps
Data Type	Data Bit	7, 8 bit
	Parity Bit	NONE, ODD, EVEN Parity
	Stop Bit	1, 2 bit
Connector		D-sub 9P

5.1.3 COM1 Connector pin number and Signal name

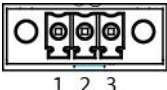
Type	Pin No.	Signal	Direction	Meaning
9Pin Female 	1	RDA (RD+)	Input	RS-422 / 485 Data Receive(+)
	2	RD (RxD)	Input	RS-232C Data Receive
	3	SD (TxD)	Output	RS-232C Data Send
	4	RDB (RD-)	Input	RS-422 / 485 Data Receive(-)
	5	SG	-	Signal Ground
	6	SDA (SD+)	Output	RS-422 / 485 Data Send(+)
	7	Power ^{*1)}	-	+5 V, 0.2 A
	8	N.C	-	N.C
	9	SDB (SD-)	Output	RS-422 / 485 Data Send(-)

^{*1)} If VCC is required for an external device, connect pin 7 (+ 5.0 V) and pin 5. (* 0.2 A output)

5.1.4 COM2 Connector pin number and Signal name

Type	Pin No.	Signal	Direction	Meaning
 <p>9Pin Female</p>	1	RDA (RD+)	Input	RS-422 / 485 Data Receive(+)
	2	RD (RxD)	Input	RS-232C Data Receive
	3	SD (TxD)	Output	RS-232C Data Send
	4	RDB (RD-)	Input	RS-422 / 485 Data Receive(-)
	5	SG	-	Signal Ground
	6	SDA (SD+)	Output	RS-422 / 485 Data Send(+)
	7	RTS	Output	RS-232C Send Request Signal
	8	CTS	Input	RS-232C Send Available Signal
	9	SDB (SD-)	Output	RS-422 / 485 Data Send(-)

5.1.5 COM3 Connector pin number and Signal name

Type	Pin No.	Signal	Direction	Meaning
	1	D+	Input / Output	RS-485 Data (+)
	2	D-	Input / Output	RS-485 Data (-)
	3	SG	-	Signal Ground

* Be sure to connect the RD and SD to the RS-232C communication line by crossing each other with a Twisted Pair Cable. Please connect SG directly.

* RS-422 / 485 communication line must use RDA and RDB as Twisted Pair Cable, SDA and SDB as Twisted Pair Cable.

5.2 Ethernet Interface

5.2.1 Ethernet

Item	Description
Ethernet Method	IEEE 802.3i / IEEE 802.3u / IEEE 802.3ab, 10BASE-T / 100BASE-Tx / 1000BASE-T
Speed	10 / 100 / 1000 Mbps
Communication Method	baseband
Switching Method	Auto-MDIX
Maximum Segment Length	100 M (Hub between products)
Communication Cable	UTP (Unshielded Twisted Pair)
Modular Jack	RJ-45 x 2ch

5.2.2 RJ-45 Pin Layout

Type	Pin No.	Color	10 / 100 MHz	1 GHz
	1	Orange / White	TD+	BI_DA+
	2	Orange	TD-	BI_DA-
	3	Green / White	RD+	BI_DB+
	4	Blue	Unused	BI_DC+
	5	Blue / White	Unused	BI_DC-
	6	Green	RD-	BI_DB-
	7	Brown / White	Unused	BI_DD+
	8	Brown	Unused	BI_DD-

* When HUB is used, Straight cable should be used.

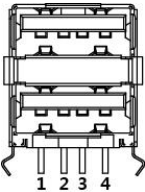
Ex) Straight Cable Wiring: Connect 1:1 according to the wiring diagram above.

* In case of connected directly without HUB, Cross Cable should be used.

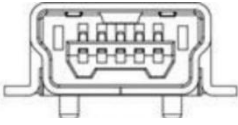
Ex) Cross Cable Wiring: In the above wiring diagram, TD+ and RD+ are changed, and TD- and RD- are exchanged.

5.3 USB Interface

5.3.1 USB Host

Type	Items	Specifications
	USB Interface	EHCI / OHCI Specification Version 1.0, USB 3.0 / 2.0 / 1.1 Compatible
	Communication Method	Control / Bulk
	Transfer Speed	Max. 5 Gb/s
	Support Device	USB Storage (FAT16 / FAT32 Format Available)
	Connector Type	USB Type-A x 2 port

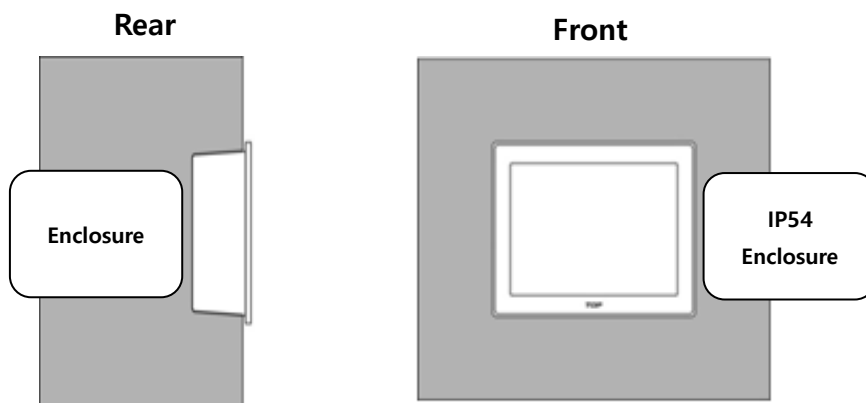
5.3.2 USB Device

Type	Items	Specifications
	USB Interface	USB 2.0
	Communication Method	Interrupt / Bulk / Isochronous
	Transfer Speed	Max. 480 Mb/s
	Supported OS	Windows 98SE / 2000 / XP / VISTA / 7 / 10 (32 / 64bit)
	Cable Length	Recommended: 3 m cable (manufacturer). Use ≤ 1.5 m if purchased separately.
	Connector Type	USB Mini-B (Female) x 1 port
	Connection Method	Connected via USB device

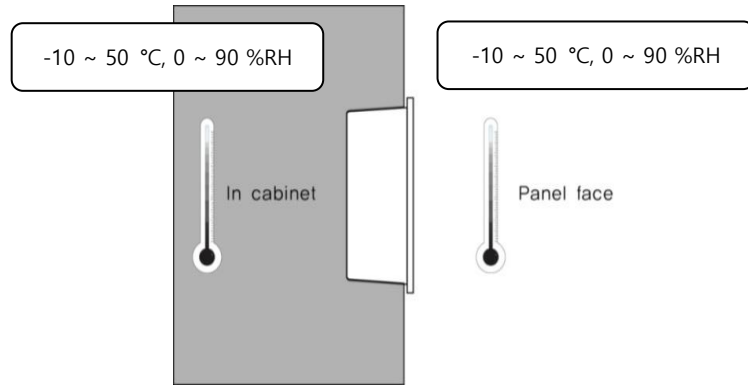
Chapter 6 Installation Warning

6.1 Installation Requirement

- (1) It should be installed within $-10 \sim 50 \text{ }^{\circ}\text{C}$ and $10 \sim 90 \text{ \%RH}$, otherwise the screen may be changed or cause malfunction and damage.
- (2) The degrees of protection should be made sure IP54 of Front.
- (3) Be sure that heat from surrounding equipment does not cause product to exceed its standard operating temperature.



- (4) In order to minimize external mechanical hazards for maintaining Explosion proof performance, please control the mechanical hazards of the surrounding environment.

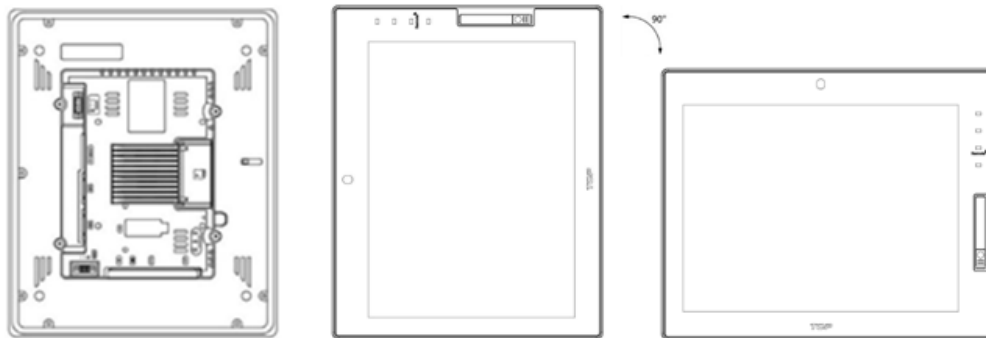


6.2 Installation Procedure  Warning

Please follow to below instructions to install the product.

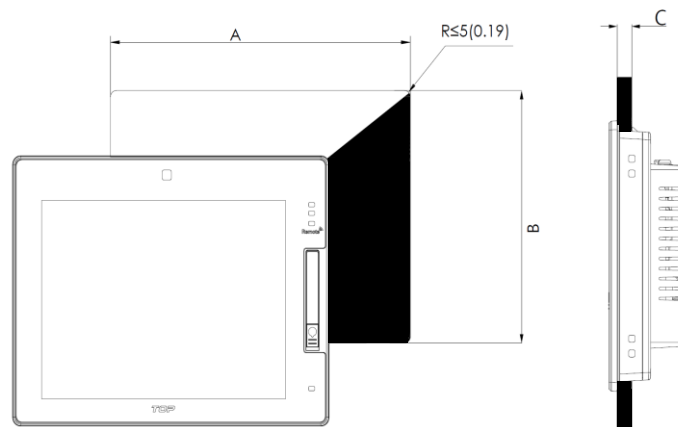
6.2.1 Direction

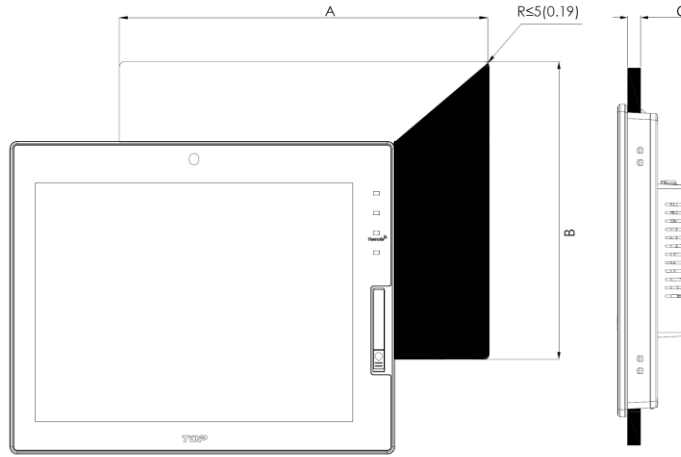
It is recommended that the power connector at the rear is located at the top for vertical installation.



6.2.2 Panel Cut-out

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





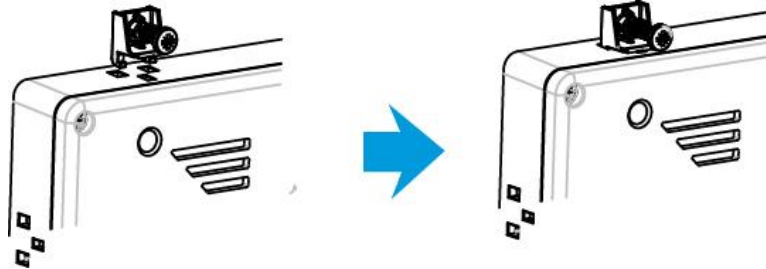
Model	A	B	C
TOPRT1040SD-Ex	260 (+1.0 / 0)	202 (+1.0 / 0)	1.6 ~ 5.0 (+1.0)
TOPRT1240XD-Ex	306 (+1.0 / 0)	247 (+1.0 / 0)	1.6 ~ 5.0 (+1.0)
TOPRT1540XD-Ex	355 (+1.0 / 0)	286 (+1.0 / 0)	1.6 ~ 5.0 (+1.0)

(mm)

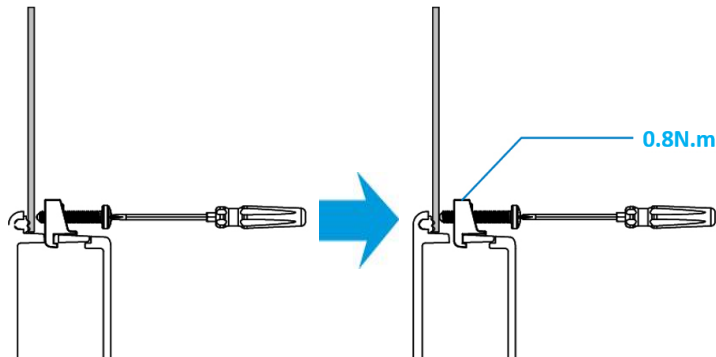
6.2.3 Fixation  Warning

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

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



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



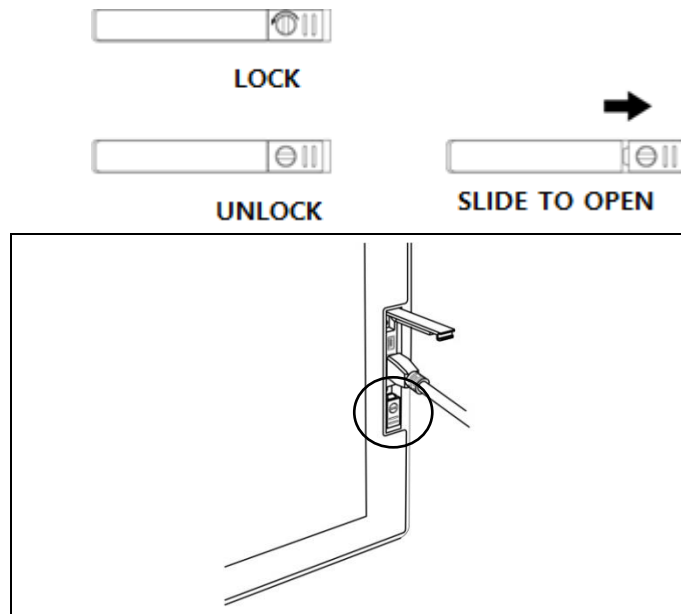
Note: If the clamping screw below is over-tightened, the touch sensor may stop working or malfunction. Tighten to 0.8 N.m screwdriver torque.

Caution: IP performance cannot be secured if the clamp is not tightened with a tightening force of 0.8 N.m.

6.3 Front USB

6.3.1 Front USB Cover Open/Close

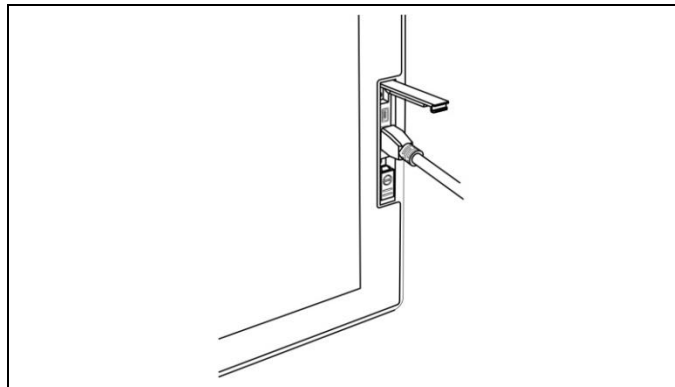
Turn left or right the locking screw on the USB cover.



6.3.2 Data Upload and Download Warning

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


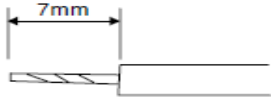
※ Do not use USB in explosive circumstances. There can be an explosion during operation.




Chapter 7 Wiring Warning

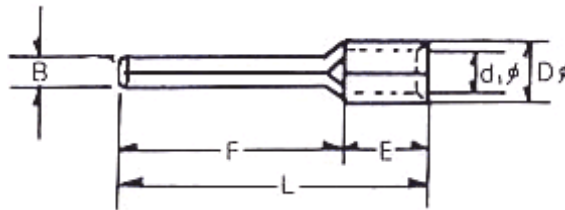
7.1 Power Cable Wiring Warning

(1) The power and ground cable should have the following specification.

Power Cable Specification	0.75 ~ 2.5 mm ² (18 ~ 12 AWG)
F.G Cable Specification	2 mm ² (14 AWG)
Conductor type	Simple or Stranded wire
Bolt torque	0.6 N.m  Warning
Conductor length	
Temperature rating of the field installed conductors	65 °C


(2) The power and ground terminal to be following specifications.  Caution

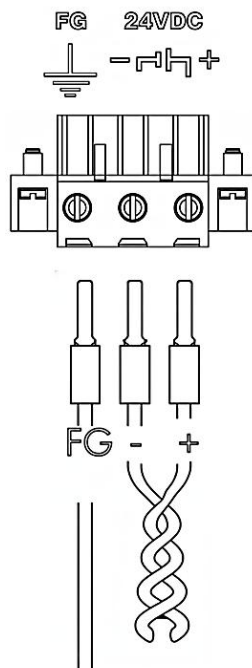
Caution: The use of pin terminals during the installation of power and grounding connections is critical to maintaining the explosion-proof performance of the device. Failure to use pin terminals (such as ferrule pins or equivalent terminals) that comply with the specifications below may result in abnormal cable wear, which can generate sparks and lead to a risk of explosion. Therefore, users must thoroughly understand and follow the proper usage of the pin terminals as described above.



(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 cable is as follows.  Warning



7.2 Ground Cable Wiring Warning

- (1) The product has enough anti-noise measure, so except that there are many noises. Especially, 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 100 Ω)
- (3) When not doing the exclusive ground, do common ground like below image.

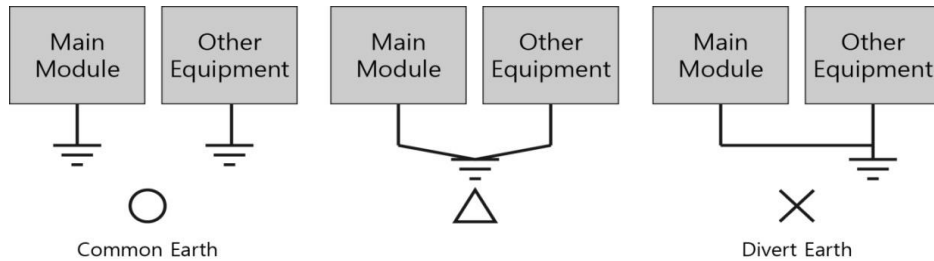


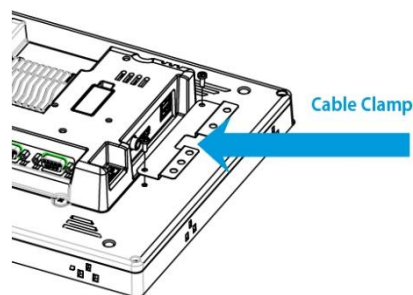
Fig. Grounding Example Diagram

- (4) Use the cable width more than 2 mm². Put the point of the ground near product and shorten Ground line.

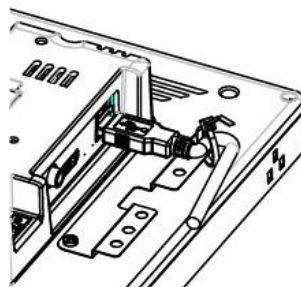
7.3 Cable Clamp Installation Caution

CAUTION: If you use an extension cable on the USB terminal block, install the cable clamp to prevent the USB connection from being disconnected or sparking because the cable is disconnected.

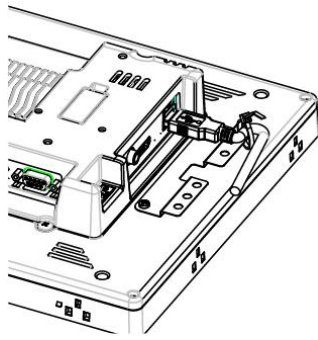
- (1) Place cable clamp at the screw hole on Rear of the product and turn the screw to fix it.



- (2) Pass the band through hole of cable clamp.



(3) Tighten the band of clamp sufficiently and check that the cable is not pulled out by external force.



Chapter 8 Maintenance Warning

8.1 Cleaning of a 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.

8.2 Periodic Check Points

Check the followings periodically for the best condition of the device.

(1) Environmental Check

- 1) Verify that the device is operating within the specified temperature range.
- 2) Verify that the device is operating within the specified humidity range.
- 3) Check for the presence of corrosive gases in the surrounding environment.

(2) Power Supply Check

- 1) Confirm that the input voltage is within the normal operating range.

(3) Related Items

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

8.3 Device Troubleshooting Warning

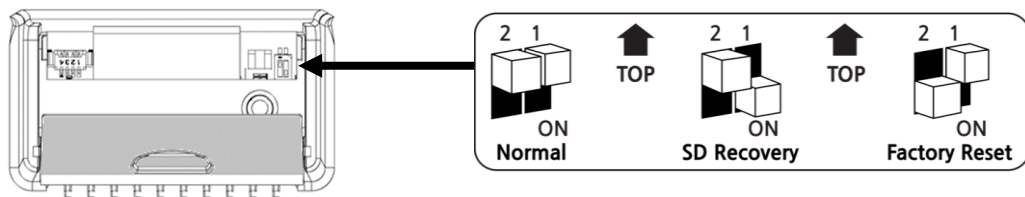
- (1) If there is a problem during operation, stop using it and contact the A/S department of M2I Corporation, which is indicated on the product label.
- (2) Only the authorized worker from M2I Corporation can check and repair problems related to malfunction of the machine.
- (3) If the problem cannot 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.
- (6) The noise of power cable and communication cables can be high under the installation circumstances.

8.4 Setting System Recovery Mode

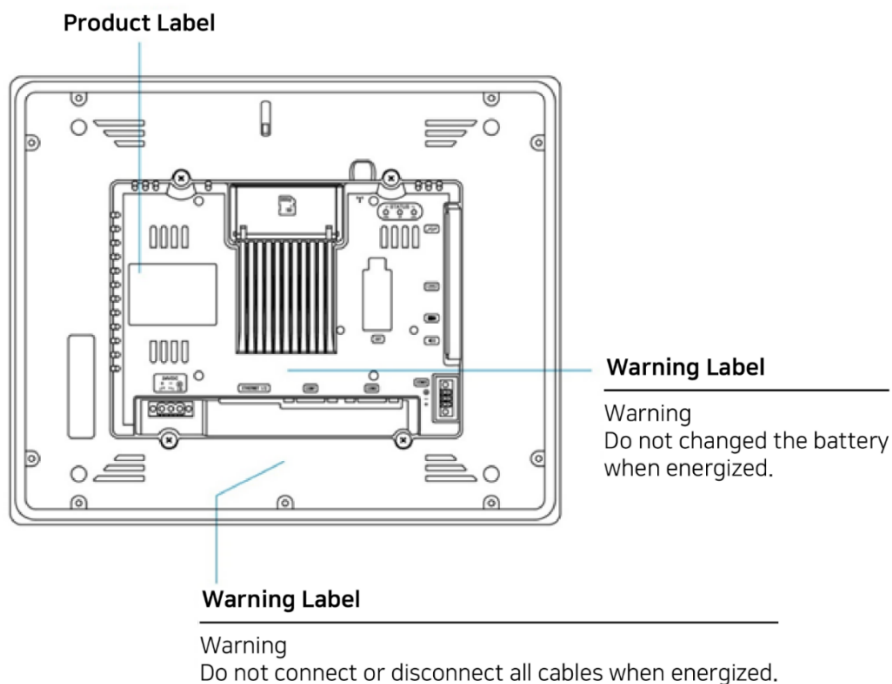
(1) If the device fails to boot properly due to an operational issue, system recovery can be performed using the setup switch on the rear of the product. System recovery boots from the recovery files stored in internal memory. If power is interrupted during the recovery process, recovery may not complete successfully. Most data will be reset during recovery; however, project data will be retained. Note that if the recovery version differs from the project version, the project may not execute correctly. In this case, resend the project using TOP Design Studio.

(2) Open the rear cover to access and adjust the setup switch. During normal operation, leave the switch in the "Normal" position. If system recovery is required, turn off the power, set the switch to "Factory Reset" and then turn on the power to start recovery mode.










(3) When recovery is complete, the buzzer will sound. At this point, turn off the power and return the setup switch to the "Normal" position.



Chapter 9 Warning Label



Chapter 10 Product Label

Industrial HMI Touch Panel	
Manufacturer	 M2I Corporation 工业操作终端 Service & Support www.m2i.co.kr
*1) Model	TOPRT1x40xD-Ex M2I Bldg, Simin-daero 327,
*2) Power	IN(输入): 20~28V  class2, xxW Anyang-si, 14055
Battery	Inside Cell(内部电池): CTL920F Made In Korea
Operation Temp.	S / N (产品系列号): - 韩国制造
Warning	Tamb (使用温度): $-10^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$ Ingress Protection(入口保护): IP54(Front/正面) V1 
	⚠ 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 ⚠ For use on a flat surface of a Type 1 Enclosure À utiliser sur une surface plane d'un boîtier de type 1. WARNING-POTENTIAL ELECTROSTATIC CHARGING HAZARD AVERTISSEMENT – RISQUE POTENTIEL DE CHARGE ÉLECTROSTATIQUE ⚠ See Instructions Voir les instructions.
**Certificates	 EXXXXX PROG. CNTRL. Class I Division 2 Group A,B,C,D T6 Haz.Loc
Protect Grade	 Ex ec IIC T6 XXXXXXXXXXXXXXXX
	 IIBG Ex ic ec IIC T6 Gc IECEx XXXXXXXXX
	 Ex ec IIC T6 Gc
	 
	R-R-M2I-ORX1x40xD

*1) Model name can be changed by each model.

*2) The power consumption can be changed by each model.

** Certificates or protection grade can be changed by each model.

10.1 Model Name and Power Specifications

- TOPRT1040SD-Ex: 20 ~ 28 Vdc, 20 W, Class 2
- TOPRT1240XD-Ex: 20 ~ 28 Vdc, 25 W, Class 2
- TOPRT1540XD-Ex: 20 ~ 28 Vdc, 25 W, Class 2

Copyright: M2I Corporation 2026.01

www.m2i.co.kr

Document No: TOPRT-D0009 Rev.1

- 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.