Main Module Users Manual

XTOP15/12/10 SERIES

M2I TOP
Man·Machine·Interface
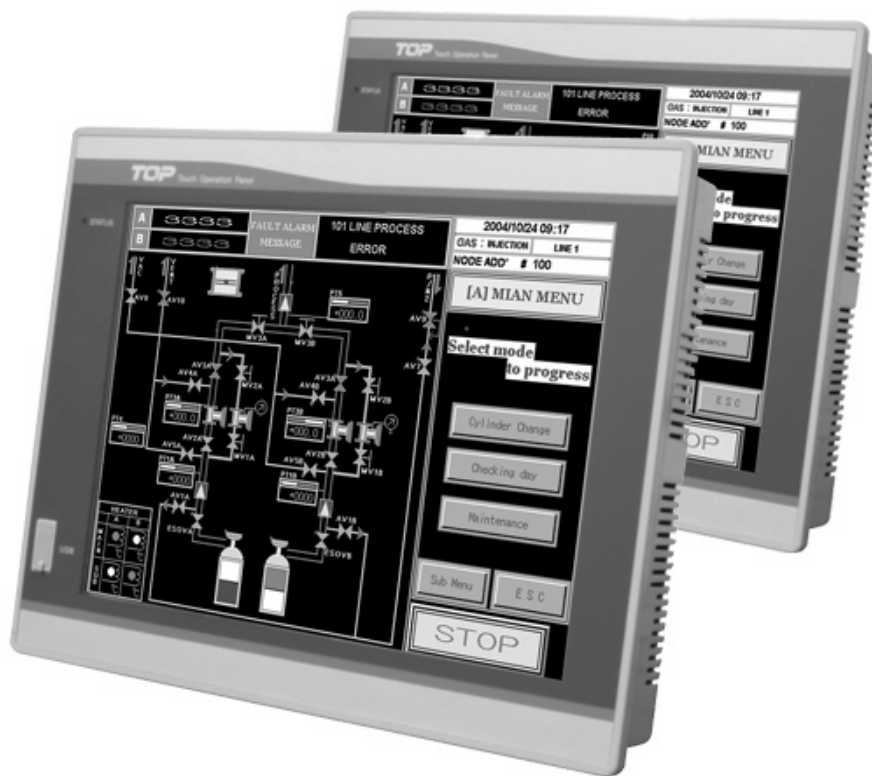
— When using M2I equipment, thoroughly read this datasheet and associated manuals introduced in this datasheet. Also pay careful attention to safety and handle the module properly.

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

► **Safety precautions are for using the product safely and correctly in order to prevent the accidents and danger, so make sure to follow all directions in safety precautions.**

► **The precautions are divided into 2 sections, 'Warning' and 'Caution'. Each of the meaning is represented as follows**

⚠ **Warning**   **Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.**

⚠ **Caution**   **Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage.**

► **The symbols which are indicated in the TOP and User's Manual mean as follows;**

⚠ **This symbol means paying attention because of danger in specific situations.**

⚠ **This symbol means paying attention because of danger of electrical shock.**

► **Store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.**

Installation Precautions

⚠ **Caution**

▶ **Use the TOP in an environment that meets the general specification contained in this manual or datasheet.**

Using the TOP in an environment outside the range of the general
specifications could result in electric shock, fire, erroneous operation,
and damage to or deterioration of the product.

▶ **Completely turn off the power supply before loading or unloading the module**.

Not doing so could result in electric shock or damage to the product.

▶ **Make sure all modules of TOP are loaded correctly and securely.**

Not doing so could cause a malfunction, failure or drop.

▶ **When install the TOP in environment of much vibration, be sure to insulate the TOP from direct vibration.**

Not doing so could cause electric shock, fire, and erroneous operation.

▶ **Be sure to there are no foreign substances such as conductive debris inside the module.**   Conductive debris could cause fires, damage, or erroneous operation.

Design Precautions

▸ Install a safety circuit external to the TOP that keeps the entire system safe even when there are problems with the external power supply or the TOP module. Otherwise, serious trouble could result from erroneous output or erroneous operation.

   Outside the TOP, construct mechanical damage preventing interlock circuits such as emergency stop, protective circuits, positioning upper and lower limits switches and interlocking forward/reverse operation.

▸ Setup protective sequence program in controller for protecting system from communication error in case of communicating TOP to PC or external controller or changing operation mode of controller by TOP.

   It could result in erroneous output or erroneous operation.

▸ Make sure all external load connected to output does NOT exceed the rating of output module.

   Overcurrent exceeding the rating of output module could cause fire, damage or erroneous operation.

▸ Build a circuit that turns on the external power supply After the TOP main module power is turned on.

   If the external power supply is turned on first, it could result in erroneous output or erroneous operation.

▸ Make air ventilation hole in TOP mounting external panel case for preventing TOP from over temperature.

   Over temperature could result in erroneous operation.

▸ Be careful not to damage the front surface of TOP.
  This may cause malfunctions or failure in touch operation.

   Over temperature could result in erroneous operation.

Design Precautions

▸ Do not bunch the connection wires or communication cables with the main circuit or power circuit, or install them close to each other. They should be installed 100mm (3.94inch) or more from each other.

Not doing so could result in noise that would cause erroneous operation.

▣ Installation

1. Caution

- Please keep 100mm distance between main module and enclosure structure for maintenance and well-ventilation.
- Please avoid installation on the area as follows.
  . Locations where the temperature changes drastically and condensation occurs
  . Locations where the main unit is exposed to direct sunlight, vibration or impact.
  . Locations where strong electrical or magnetic fields are generated.

2. Power Cable Wiring

- Input AC Voltage : 85VAC ~ 264VAC
- Please use noise-cut transformer in case that power source includes noise.
- Please separate power source cable from controller's power cable or in/out cable.
- Please separate power source cable from communication cable

3. Earth Connection

- The FG and LG port of the TOP main module should always be grounded using the Class 3 Ground
  Failing to ground these ports sufficiently could cause electrical shock and malfunction.
- The cable for earth should be more than 2 ㎟
- The earth point be close to the TOP main module and earth cable be short if possible.
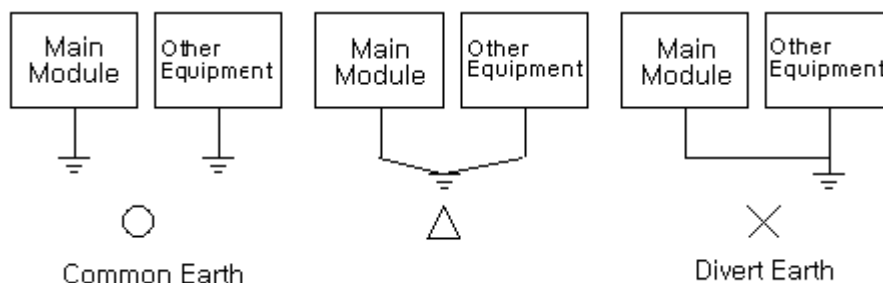
Main Module Menu Summary

1. Main Menu

- Functions : Controller Type, Communication Protocol, Version Info., Language Setting and Time Setting

  * Time Data is retained minimum 1year by battery without input power voltage.

2. Communication Setting

- Functions : Baud Rate, Data Bit, Parity Bit, Stop Bit, Communication Level, Station Num, Serial Timeout, Send Wait, 2Port Communication Setting, N:1 Setting and Ethernet setting.

3. Initial Setting

- Functions : Power On Mode, Screen off Time, Buzzer Sound, Latch Start Buf., Latch End Buf., Alarm, Printer, Security Password, Touch sensitivity, USB setting, LCD Brightness and Default Setting

4. Diagnosis

- Functions : Print Test, Memory Test, Touch Key, Display Test, Communication Diagnosis, Port Diagnosis and CF-card setting.

5. System Information

- Excluding Time data, you can have data of internal system buffer memory at the time of quitting running. (* Data type is 16bit HEX)
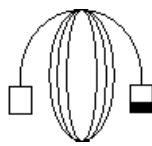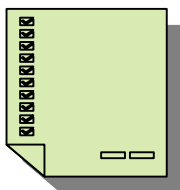
Package Contents

◾ Main Module 1set

◾ USB Download Cable 1pcs,
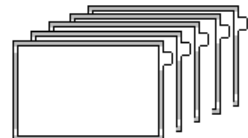 Bracket 4pcs, Protection sheet 1pcs

◾ Main Module H/W Manual
  Communication Cable Connection

◾ CF-Card / USB (option)
  Protection sheet 1set(5pcs) (option)

Installation Precautions

⚡ **Caution**

▸ **Use the TOP in an environment that meets the general specification contained in this manual or datasheet.**

  Using the TOP in an environment outside the range of the general specifications could result in electric shock, fire, erroneous operation, and damage to or deterioration of the product.

▸ **Completely turn off the power supply before loading or unloading the module.**

  Not doing so could result in electric shock or damage to the product.

▸ **Make sure all modules of TOP are loaded correctly and securely.**

  Not doing so could cause a malfunction, failure or drop.

▸ **When install the TOP in environment of much vibration, be sure to insulate the TOP from direct vibration.**

  Not doing so could cause electric shock, fire, and erroneous operation.

▸ **Be sure to there are no foreign substances such as conductive debris inside**

Wiring Precautions

⚠ Warning
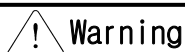
▸ **Completely turn off the external power supply when installing or placing wiring.**

  Not doing so could cause electric shock or damage to the product.

▸ **Make sure that wires are correctly connected to terminals.**

  Incorrect connection could result in electric shock or damages to the product.

⚡ **Caution**

▸ **Be sure that wiring is done correctly be checking the product's rated voltage and the terminal layout.** Incorrect wiring could result in fire, damage, or erroneous operation

▸ **Tighten the terminal screws with the specified torque.**

  If the terminal screws are loose, it could result in short circuits, fire, or erroneous operation.

▸ **Be sure to ground the FG or (LG) terminal to the protective ground conductor.**

Not doing so could result in erroneous operation.

▸ **Be sure there are no foreign substances such as sawdust or wiring debris inside the module.** Such debris could cause fire, damage, or erroneous operation.

Trial Running Repair Precautions

⚠ Warning

▶ Do not touch the terminals while power is on.

　Doing so could cause electric shock or erroneous operation.

▶ Switch all phases of the external power supply off when cleaning the module or retightening the terminal or module mounting screws.

　Not doing so could result in electric shock or erroneous operation.

▶ Do not charge, disassemble, heat, place in fire, short circuit, or solder the battery.

　Mishandling of battery can cause overheating or cracks which could result in injury and fires.

⚡ Caution

▶ Do not disassemble or modify the modules.

　Doing so could cause trouble, erroneous operation, injury, or fire.

▶ Switch all phases of the external power supply off before mounting or removing the module.

　Not doing so could cause failure or malfunction of the module.

▶ Use a cellular phone or walky-talky more than 30cm (11.81 inch) away from the TOP.

　Not doing so can cause a malfunction.

▶ **Do not strike the touch panel with a hard or pointed object (such as drill, fingernail, driver, pen, etc.)** or press on the touch panel with too much force.

　It may cause malfunction of touch panel by damage of front sheet.

▶ **Do not allow water, liquid, piece of metal or charged particles to enter between Protection sheet and front sheet when you install protection sheet in touch panel.**

　It may cause malfunction of touch panel and indistinct screen display.

Disposal Precaution

⚡ Caution

▶ When disposing of this product, treat it as industrial waste.

　Not doing so could cause poisonous pollution or explosion.

Project File Up/Download

Meaning of 'Download' is transferring projection file data from computer to TOP main module.

And 'Upload' is transferring data from TOP Main module to computer.

Main module data will be saved up forever on flash memory of TOP main module   unless overwriting.

It is possible to transfer data on the main menu, communication setup menu, initial setup menu, diagnosis menu, and system information menu after connecting download cable between computer and TOP main module.

it is possible to transfer data on running state

O/S and Font Download

There's two method for downloading of O/S and Font

The first is **Serial Downloading**:

- Connect download cable between 9-pin serial port and download port of TOP
     main module.
- Short circuit between 2nd pin and 3rd pin of 9pin COM2 D-Sub connector.
- Turn off the power of main module and restart.
- After TOP main module is in the download ready mode, remove the short
     circuit connect 9pin D-sub connector to serial port of computer.
- In O/S and Font download mode of TOP Designer on PC, download them to
     TOP main module.
- After finishing downloading, TOP main module will be reset automatically.
- Downloadable fonts are bellows.
   8X8, 8X16, 16 X 16 dot, 16 X 32dot, 32 X 32 dot font

The Second method for downloading is using of XTOP USB port: **USB downloading**

- Short circuit between 2nd pin and 3rd pin of 9pin COM2 D-Sub connector.
- Turn off the power of main module and restart.
- Connect PC and XTOP with USB A-B type cable.
- In USB Tab of TOP Anywhere on PC, Connect and download OS and Font

Changing Backup Memory Battery

- Open the case of XTOP main body.
- Change the coin battery (3V/SR2032) with new one.
- Close the case. The memory keeps the data during changing battery.
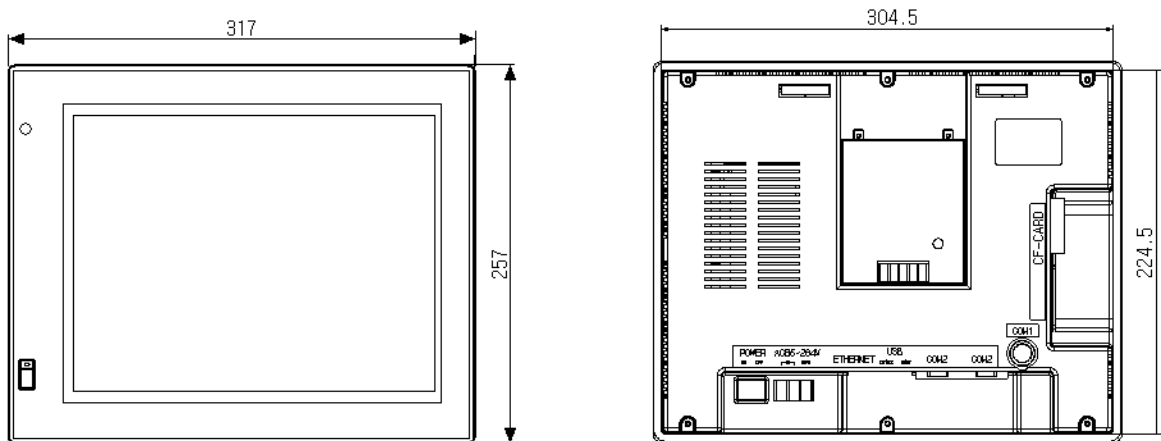
▣ Outer Dimension (Front, Rear, Side, Upper, Bottom)
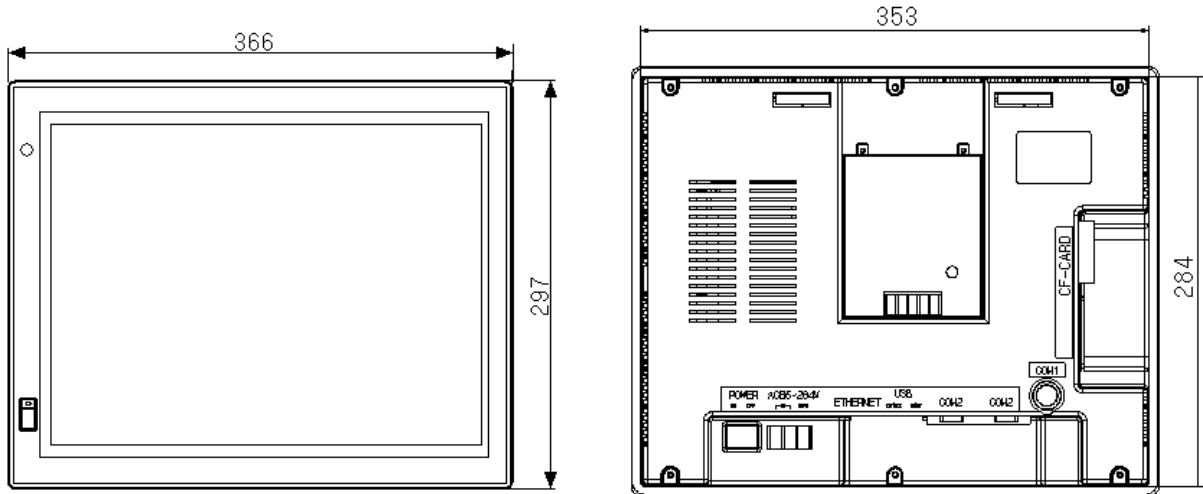
[Fig. 1]

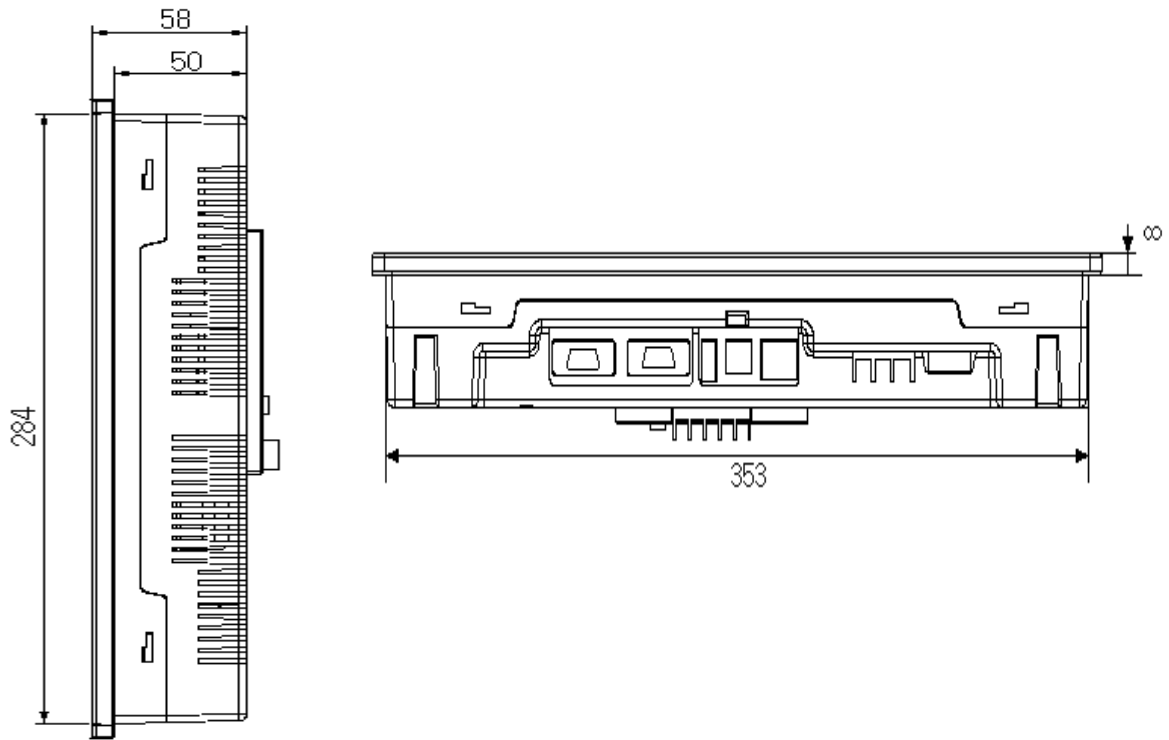[Fig. 1]   XTOP15 series → Front Outer and Rear Outer Dimension]

* XTOP15 series panel cut size   : 357(W) X 286.5(H) mm
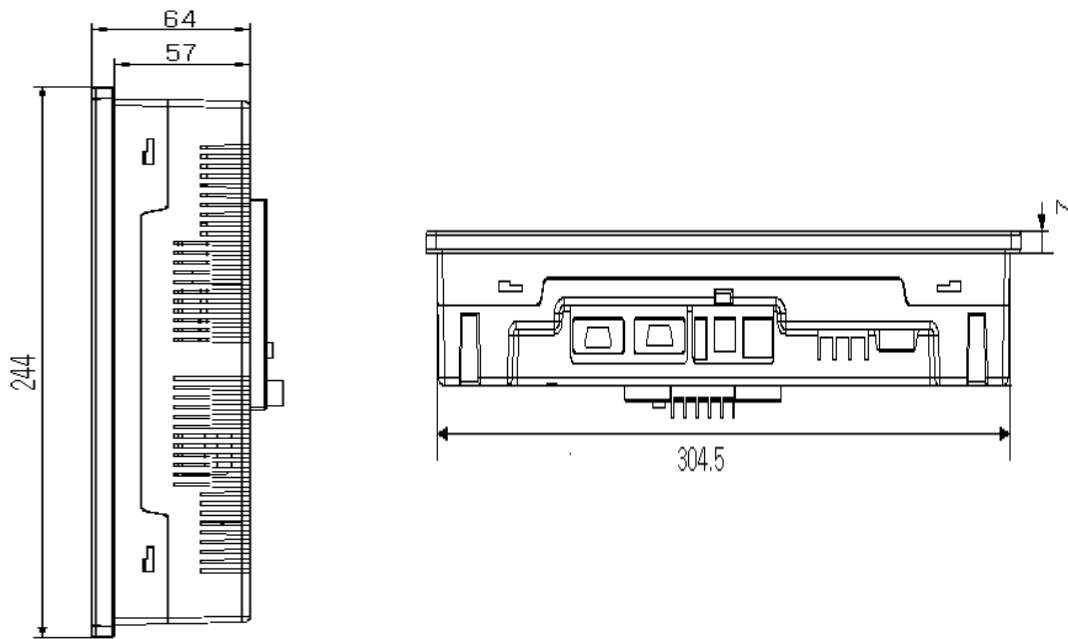
[Fig. 2]

[Fig. 2]   XTOP12/10 series → Front Outer and Rear Outer Dimension]

* XTOP12/10 series panel cut size   : 307(W) X 247(H) mm

[Fig. 3]
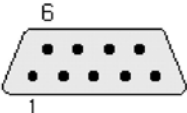[Fig. 3]　XTOP15T → Up/Down/Left/Right Outer Dimension

[Fig. 4]
[Fig. 4]　XTOP12/10 series → Up/Down/Left/Right Outer Dimension]
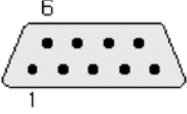
■ Serial Interface (RS-232C)

I.   Feature

Item		Contents
Protocol		Half Duplex
Synch.		Asynchronous
Communication Distance		About 15M
Type of Connection		1:1
Control Code		ASCII Code or HEXA Code
Baud Rate		9600, 19200, 38400, 57600, 76800, 115200bps
Data Type	Data Bit	7,8bit
	Parity Bit	None, Odd, Even Parity

II.   COM2 RS-232 Connector Pins and Signals

Type	Pin Number	Signal	Direction	Contents
9Pin Female	1	NC		Not Used
	2	RD(RxD)	Input	Data Receive
	3	SD(TxD)	Output	Data Send
	4	DTR	Output	Data Terminal Ready
	5	SG		Signal Ground
	6	DSR	Input	Data Set Ready
	7	RTS	Output	Send Request Signal
	8	CTS	Input	Send Enable Signal
	9	NC		Not Used

III.   COM2 RS422 Connector Pins include RS232 Connector Pins and Signals

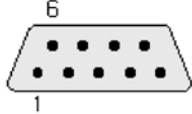| Type	Pin Number	Signal	Direction	Contents
9Pin Female	2	RD (RxD)	Input	Data Receive
	3	SD (TxD)	Output	Data Send
	5	SG		RS422Signal Ground

▪ Serial Interface (RS-422/485)

Connect main module to controller by RS-422/485 for communication.

IV.   Feature

Item		Contents
Protocol		Half Duplex, 5wires
Synch.		Asynchronous
Communication Distance		About 500M
Type of Connection		1:N(N≤31)
Control Code		ASCII Code or HEXA Code
Baud Rate		9600, 19200, 38400, 57600, 76800, 115200bps
Data Type	Data Bit	7,8bit
	Parity Bit	None, Odd, Even Parity
	Stop Bit	1,2bit

V.   COM2 RS-422/485 Connector Pins and Signals

Type	Pin Number	Signal	Direction	Contents
9Pin Female	1	RDA(RD+)		RS422Data Receive (+)
	4	RDB(RD-)		RS422Data Receive (-)
	5	SG		RS422Signal Ground
	6	SDA(SD+)		RS422Data Send (+)
	9	SDB(SD-)		RS422Data Send (-)

■ Title of Parts
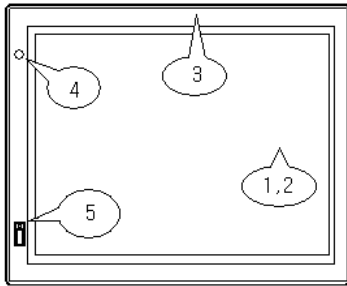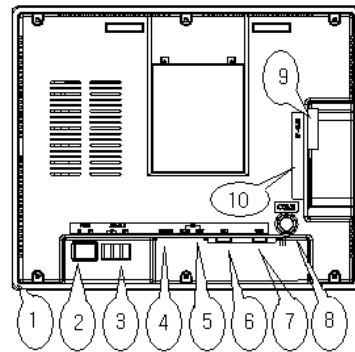
[Front View]   [Rear View]

[Front View]

No.	Title	Feature			
1		XTOP15TX	XTOP12TS	XTOP10TS	XTOP10TV
	LCD	TFT LCD 256 Color			
	Display Resolution	1024 X 768	800 X 600		640 X 480
	Screen Size	15 inch	12 inch	10.4 inch	
	Brightness	250cd/m^2	350cd/m^2	400cd/m^2	
2	Touch Panel	Analog			
3	Front Sheet	Front Vinyl Cover Sheet for Dampproof and Dustproof			
4	Status LED	Display of Power, Communication and CPU status.			
5	USB Port	USB memory option port			

[Rear View]

No.	Title	Num. of Pin	Feature
1	Rubber Packing		Shock Absorber for Panel Mounting
2	Power Switch		
3	Power Input Terminal	3	Input Voltage
4	Ethernet Connector		Ethernet Communication Connector
5	USB Connector		USB Memory Option Connector
6	RS-232C Connector	9	COM2 9pin RS-232C Connection
7	RS-422C Connector	9	COM2 9pin RS-422C Connection
8	PS/2 Connector	6	COM1 Down Load and Serial Comm.
9	CF-Card Connector		CF-Card Memory Option Connector
10	AnyBus Connector		Extension-Card Connector

■ General Specification

Item	Specification	
Input Voltage	AC type	
	Free Voltage AC85V~ 264V	
Power Consumption	XTOP15TX	XTOP12T/X10TS/10TS
	Minimum 25W	Minimum 20W
Noise Immunity	Impulse Noise 1200Vp-p, Pulse width 1 μs	
Insulation Resistance	Above 10 ㏁ at DC 500V	
	Between Power Terminal and Grounding Terminal	
Operating Temperature	0 ~ 50℃	
Storage Temperature	-10 ~ 60℃	
Humidity	40℃, 85%RH	
Grounding	Class 3 Grounding Resistance Under 100Ω	
Atmosphere	No Corrosive Gas	

■ USB Hardware Specification

USB Host   (Fig. 1)

| Item	Specification
USB Interface	OHCI Specification Version 1.0
Communication method	Control/Bulk
Transfer Speed	500Kb/s –10Mb/s
Support Device	USB Storage (Only M2I OPTION Product, Only used FAT file Format.)
	USB Printer (HP PCL Level 3)
Cable length	1.5m

USB Device (Fig. 2)

Item	Specification
USB Interface	USB Specification Version 1.1
Communication method	Control/Interrupt/Bulk
Transfer Speed	500Kb/s –10Mb/s
Support OS	Windows 98SE/2000/XP
Cable length	1.5m
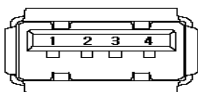
[Fig.1 : USB Host Port]
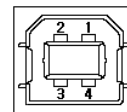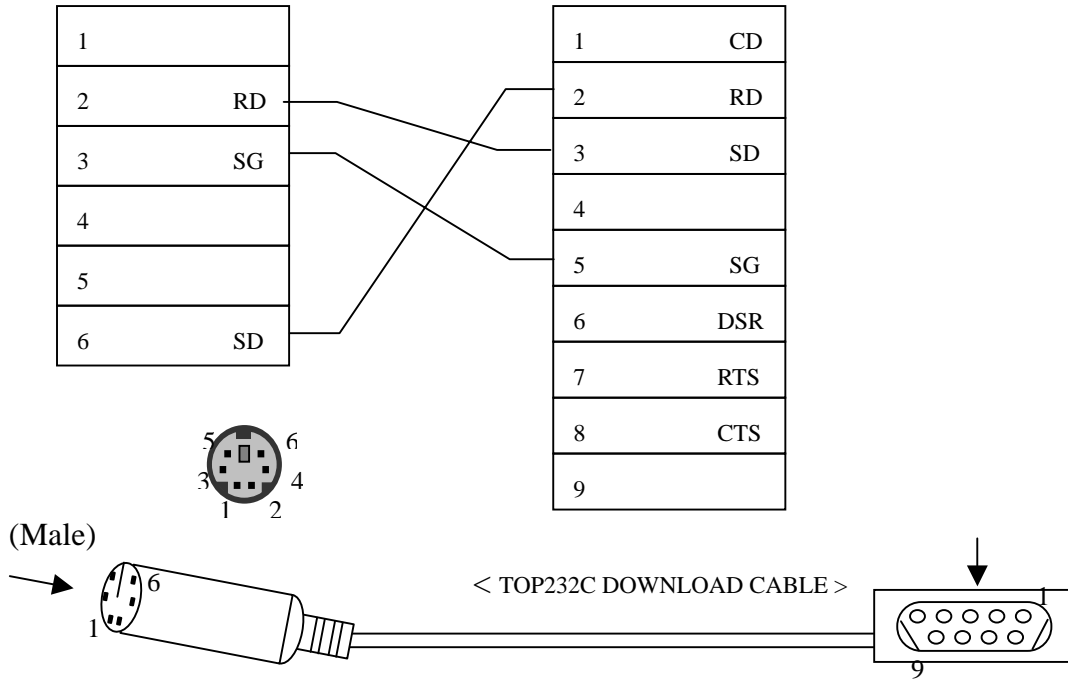
[Fig.2 : USB Device Port]

■ Download Interface (RS232C)

Download Connection RS232C

In case of connecting Main Module COM1 (6P) Connector and PC 9P Connector
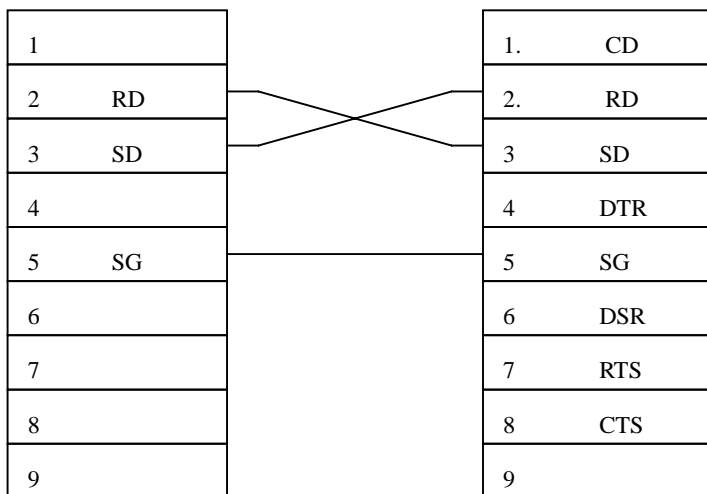
Main Module(6P Male)   PC(9P Female)

1			1	CD
2	RD		2	RD
3	SG		3	SD
4			4	
5			5	SG
6	SD		6	DSR
			7	RTS
			8	CTS
			9	

(Male)

< TOP232C DOWNLOAD CABLE >

In case of connecting Main Module COM2 (9P) Connector and PC 9P Connector

Main Module(9P Male)   PC (9P Female)

1			1.	CD
2	RD		2.	RD
3	SD		3	SD
4			4	DTR
5	SG		5	SG
6			6	DSR
7			7	RTS
8			8	CTS
9			9	

■ Ethernet communication and connection

Item	Specification
Ethernet method	10BaseT / 100BaseT
Speed	10M / 100Mbps
Communication method	Base Band
Maximum segment length	100m (Hub between Node(TOP))
Communication cable	UTP (Unshielded Twisted Pair)

RJ – 45 Pin

Connector Front

①   ⑧   Connector Back
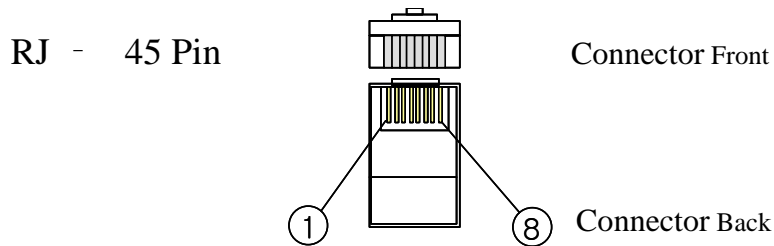
Pin NO.	color	Signal
1	Orange/White	TD+
2	Orange	TD-
3	Green/White	RD+
4	Blue	Not used 10BaseT
5	Blue/White	Not used 10BaseT
6	Green	RD-
7	Brown/White	Not used 10BaseT
8	Brown	Not used 10BaseT