IPC Series

FLAT PANEL DISPLAY
Aluminium-Face Type
(AC Wide,10.4"-TFT,Analog)

FPD-M21VT-AC

(AC Wide,12.1"-TFT,Analog)

FPD-L21ST-AC

(AC Wide,15.0"-TFT,Analog)

FPD-H21XT-AC

User's Manual

CONTEC CO.,LTD.

Check Your Package

Thank you for purchasing the CONTEC product.
The product consists of the items listed below.
Check, with the following list, that your package is complete. If you discover damaged or missing items, contact your retailer.

Product Configuration List

	FPD-M21VT-AC	FPD-L21ST-AC	FPD-H21XT-AC
Name	Pcs.	Pcs.	Pcs.
Flat panel display	1	1	1
Three-point sems screws (M3 x 6)	1	1	1
Cable fixed clamp	3	3	3
The attachment fittings	6	6	8
Warranty Certificate	1	1	1
EU Declaration of Conformity	−	−	1
IPC Precaution List	1	1	1
Ferrite Core	1	1	3
Ferrite Core fixed clamp	−	−	2
Product guide (this sheet)	1	1	1
SerialNumberLabel	1	1	−

*1 Purchase user's manual and individual connection cables as they are not bundled with this equipment.
For more details on the latest information of user's manual, refer to the CONTEC's Web site.

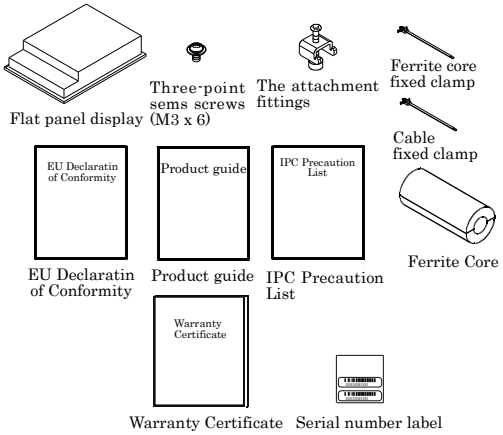

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Table of Contents

1. Introduction

About the Product

This product is a panel-mounted, analog RGB input type flat panel display for use with host computers such as the CONTEC IPC series and SBCs (single board computers).

Uses a high-intensity LCD with a wide viewing field and touch panel operation via either RS-232C or USB.

Features include an auto-scaling function and on-screen display setup screen. Front structure with IP65-compliant ingress protection

As there is compatibility in terms of panel mounting with the existing IPC-DT/x6x series, allowing an easy changeover of the existing system.

Features

- Standard analog RGB input for screen. RS-232C and USB interfaces for touch panel

Supports standard analog RGB input and touch panel operation via either RS-232C or USB. The LCD is high-intensity with a wide field of view and can display either 16,777,216 colors (15 inch model) or 262,144 colors (10.4 inch and 12.1 inch models). The front on the display is made from lightweight aluminum. The display features an analog touch panel that can emulate mouse operation via the driver software.

- Auto-scaling feature that resizes the input screen to the LCD dot configuration

Auto-scaling feature that resizes the input screen to the LCD dot configuration

- On-screen display setup menu facilitating screen adjustment

The on-screen display setup screen can be used to set parameters such as the brightness, contrast, and display position adjustment.

- Front structure with IP65-compliant ingress protection

Front structure with IP65-compliant ingress protection

- Panel attachment dimensions are compatible with the IPC-DT/x6x series.

The compatibility of the panel attachment fitting with the previous IPC-DT/x6x model facilitates replacement.

- USB multiple touch panel

This function can be used in the case when the RGB signal from the host computer is split for connecting to multiple displays via a splitter. The function permits touch panel operation to be used at all the displays. A maximum of eight touch panel displays can be connected.

- Input connector allows the backlight to be switched on or off externally.

The unit features an input connector that allows the backlight to be switched on or off externally.

* Fore more details on the host computer and option of this product, please contact your retailer.

Customer Support

CONTEC provides the following support services for you to use CONTEC products more efficiently and comfortably.

Web Site

Japanese http://www.contec.co.jp/
English http://www.contec.com/
Chinese http://www.contec.com.cn/

Latest product information

CONTEC provides up-to-date information on products.
CONTEC also provides product manuals and various technical documents in the PDF.

Free download

You can download updated driver software and differential files as well as sample programs available in several languages.

Note! For product information

Contact your retailer if you have any technical question about a CONTEC product or need its price, delivery time, or estimate information.

Limited One-Year Warranty

CONTEC Products are warranted by CONTEC CO., LTD. to be free from defects in material and workmanship for up to one year from the date of purchase by the original purchaser.
Repair will be free of charge only when this device is returned freight prepaid with a copy of the original invoice and a Return Merchandise Authorization to the distributor or the CONTEC group office, from which it was purchased.
This warranty is not applicable for scratches or normal wear, but only for the electronic circuitry and original products. The warranty is not applicable if the device has been tampered with or damaged through abuse, mistreatment, neglect, or unreasonable use, or if the original invoice is not included, in which case repairs will be considered beyond the warranty policy.

How to Obtain Service

For replacement or repair, return the device freight prepaid, with a copy of the original invoice. Please obtain a Return Merchandise Authorization Number (RMA) from the CONTEC group office where you purchased before returning any product.

* No product will be accepted by CONTEC group without the RMA number.

Liability

The obligation of the warrantor is solely to repair or replace the product. In no event will the warrantor be liable for any incidental or consequential damages due to such defect or consequences that arise from Safety Precautions. Understand the following definitions and precautions to use the product safely.

Safety Precautions

Understand the following definitions and precautions to use the product safely.

Safety Information

This document provides safety information using the following symbols to prevent accidents resulting in injury or death and the destruction of equipment and resources. Understand the meanings of these labels to operate the equipment safely.

⚠ DANGER	DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.

Handling Precautions

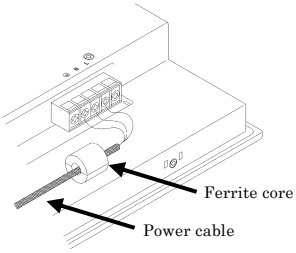
⚠ CAUTION

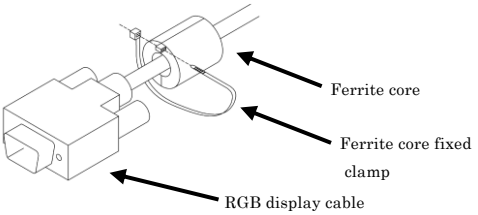
- As this product contains precision electronic components, do not use or store in environments subject to shock or vibration.
- This product is not intended for use in aerospace, space, nuclear power, medical equipment, or other applications that require a very high level of reliability. Do not use the product in such applications.
- If you utilize this product in such usages where high reliability and safety are required as on the trains, vessels, automotives or crime- or disaster-prevention devices, contact your retailer.
- Do not use or store the product in a location such as extremely high or low temperature, rapid temperature changes, and the place which receives a strong ultraviolet ray.
  Example: - Exposure to direct sun
  - In the vicinity of a heat source
- Do not use or store the equipment in a dusty or humid place.
- Do not perform key operations with the touch panel to implement a process that might endanger life or result in serious damages. Design a system that can cope with incorrect key input operations.
- Do not use a sharp-edged object, such as a mechanical pencil, to operate the touch panel in order to prevent scratching or malfunctions.
- Protect the touch panel against shock to prevent damage.
- CONTEC is not liable for a product that has been modified by the user.
- When the surface or frame of the touch panel has become dirty, wipe it with neutral detergent. Do not wipe the touch panel with thinner, alcohol, ammonia, or a strong chlorinated solvent.
- Do not plug or unplug the connector with the equipment powered on. as doing so may result in a malfunction or fault.
- Some products require configuration settings. Always check these requirements before use. Also, never set switches or jumpers to other than the specified settings as this may cause a fault.

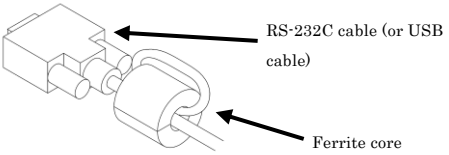
- A characteristic of analog touch panels is that the detected position may vary due to changes in the ambient environment (temperature and humidity) and changes in resistance values over time. In such cases, the touch panel should be recalibrated and the calibration data updated.
- Regular maintenance is necessary for the backlight on the touch panel and the display for the longevity parts.
- If you discover damaged or missing items, contact your retailer.
- The socket-outlet shall be installed near the equipment and shall be easily accessible.
- VCCI Class A, EMC Instruction Class A Notice(only FPD-H21XT-AC)

  To ensure complies with the above standard, fit the supplied ferrite cores to the AC power supply cable, RGB display cable, and RS-232C cable (or USB cable) (use the SEIWA E04SR200935A or equivalent for the AC power cable and the SEIWA E04SR301334 or equivalent for the RGB display cable and RS-232C cable).

  When attaching the ferrite core, coil it near the connector while leaving it open, and then close it. (When attaching the RS-232C cable (or USB cable), coil it around once near the connector while leaving it open, and then close it.)







Use environment

This product operates under the following operating systems:
Windows XP/2000/NT 4.0/98SE/95OSR2

* The touch panel USB interface is only supported on Windows XP/2000/98SE.

Life expectancy of components

(1) Backlight--- Display brightness decreases over time with use. The operating life of the backlight (brightness reduced to 50% of original) is 50,000 hours for all models. (Assuming continuous operation at 25 degrees centigrade.)

(2) Touch panel--- The operating lifetime of the touch panel is at least 1 million touches (as tested by mechanical touching under 300g of force at a rate of two presses per second).

(3) Power supply--- Expected life is six years for continuous operation at 40°C (when mounted horizontally). However, this life may be reduced depending on the operating temperature (in the case of higher temperatures).

* CONTEC accepts your request for replacing each consumable in the PANECON-PC as a request for repair (at an additional cost). Contact your local retailer or CONTEC sales office.

LCD Display Pixel Drop

LCD display may have some pixels being dropped (bright and black spots) below a certain threshold. Note that this is not a failure or a defect.

Burn-in on TFT Display

"Burn-in" may occur if the same display is retained for a long time. Avoid this by periodically switching the display so that the same display is not maintained for a long time.

* Burn-In: Phenomenon characterized by a TFT display as a result of long-time display of the same screen where a shadow-like trace persists because electric charge remains in the LCD element even after the patterns are changed.

Connecting to a host with an existing touch panel function such as a CONTEC panel computer.

This touch panel cannot be used with a touch panel mounted in the host computer. In this case, the touch panel function will be unavailable but screen display will still work normally.
However, on the following CONTEC panel computers, multiple touch panels can be used together when connected via the USB interface.

- IPC-PT/6x0 Series : IPC-PT/x6x0x(PCW)x
- IPC-PT700 Series : IPC-PT700xx-xxAC

2. Specifications

Function Specifications

Table 2.1. Function Specifications

Item			Specification		
			FPD-M21VT-AC	FPD-L21ST-AC	FPD-H21XT-AC
Screen					
	Assembly type		Panel mounted		
	Screen size		10.4 inches	12.1 inches	15 inches
	Number of pixels		640 x 480 dots	800 x 600 dots	1024 x 768 dots
	Display type		TFT Color LCD		
	Number of colors		262,144 colors	262,144 colors	16,777,216 colors
	Screen adjustment		Automatic adjustment (display positioning and scaling) and manual adjustment using the front switches		
	Brightness control		Adjustment using the front switch or software control from the host computer		
	Backlight control		Can be turned ON/OFF by front panel switch, software control from host computer, or rear connector input.		
	Display interface		Analog RGB input HD-SUB 15 pin (Female) connector		
	Cable length which recommends		5mm or less *1		
	Incoming signal specification	Image signal	Separate RGB, analog, positive polarity 0.7Vp-p/75Ω		
		Sync signal	Separate V/H, TTL, positive/negative polarity		
		Horizontal scan frequency	31 - 38kHz	31 - 48kHz	31 - 60kHz
		Vertical scan frequency	60 - 72Hz	56 - 72Hz	56 - 75Hz
Touch panel					
	Resolution		4096 x 4096		
	Detection method		Resistive-layer analog method		
	Touch life expectancy		One million repeated touches (as tested by mechanical touching under 300g of force at a rate of two presses per second)		
	Touch panel interface		Connect to the host computer using either USB *2 or RS-232C. USB: USB1.1-compliant, TypeB Connector RS-232C: 9pin D-SUB (Male) Connector		
	Touch panel driver (option)		For Windows: IPC-SLIB-01		
Power supply input part					
	Power supply connector		3-pin terminal for AC power supply		
	Input power supply voltage		85 - 132VAC/170 - 265VAC(47 - 63Hz) Input automatic operation switch		
	Consumption current		32VA(Max.)	35VA(Max.)	40VA(Max.)
	Consumption current (power save mode)		14VA (Max.)		

*1 Using a cable longer than 5 m may reduce the image quality. The cable should be as short as possible as degradation. in image quality may result even when the cable is 5 m or shorter depending on the type of host computer or cable.

*2 The touch panel USB interface is only supported on Windows XP/2000/98SE.

General Specifications

Table 2.2. General Specifications

Item			Specification		
			FPD-M21VT-AC	FPD-L21ST-AC	FPD-H21XT-AC
Environment					
	Operating temperature		0 - 50°C		
	Storage temperature		-10 - 60°C		
	Operating humidity		10 - 90%RH (No condensation)		
	Floating dust		Normal		
	Corrosive gas		None		
	Noise resistance	Line noise	AC line: 2 kV, Signal line: 1 kV (IEC1000-4-4Level3, EN61000-4-4Level3) (HOST : When using the IPC-BX700-AC4)		
		Electrostatic withstanding voltages	Contact/4kV (IEC1000-4-2Level2, EN61000-4-2Level2) Airborne/8kV (IEC1000-4-2Level3, EN61000-4-2Level3) (HOST : When using the IPC-BX700-AC4)		
	Vibration resistance	Sweep durability	10 - 57 Hz/Single-side amplitude or 0.075mm 57 - 150 Hz/1.0 G in the X/Y/Z directions for 40 minutes each (Conforming to JIS C0040 and IEC68-2-6)		
	Shock resistance		10G in the X/Y/Z directions for 11 ms; Half-sine wave (Conforming to JIS C0041 and IEC68-2-27)		
Structure					
	Major dimension (mm)		305(W) x 51.5(D) x 240(H)	316(W) x 54.5(D) x 256(H)	373(W) x 54(D) x 304(H)
	Panel cut dimensions (mm)		292.0(W) x 227.0(H)	303.0(W) x 243.0(H)	358.0(W) x 289.0(H)
	Mountable panel thickness		1.6mm - 7mm		
	Weight		3.0kg	3.2kg	4.5kg
	Ingress protection		Front part conforming to IP65		

Optical Display Specifications

Table 2.3. Optical Display Specifications

Item	Condition			Specifications (25°C Typ. Value)		
				FPD-M21VT-AC	FPD-L21ST-AC	FPD-H21XT-AC
Visual angle (vertical)	CR≥10	ϕ=180°	Display in monochrome	88deg	65deg	50deg
		ϕ=0°		88deg	75deg	70deg
Visual angle (horizontal)		ϕ=+90°		88deg	80deg	70deg
		ϕ=-90°		88deg	80deg	70deg
Surface brightness (at center)	Display in white			500cd/m^2	450cd/m^2	250cd/m^2

*1 Surface brightness is a numerical value in a display simple substance.
The brightness that let the touch panel pass serves as about 77% of the above-mentioned numerical value.

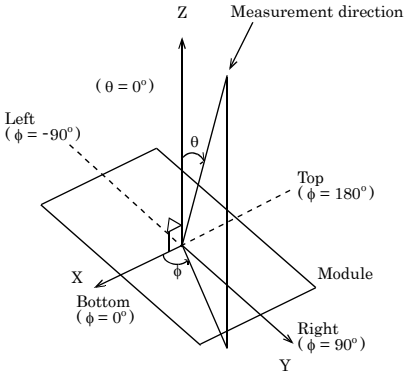


Figure 2.1. Viewing Range Definition

⚠ CAUTION

The above optical specification data shows optical characteristics of the liquid crystal in the display; the data does not represent the actual view on the display or its viewing angles.

3. Outside Dimensions and Part Names

Outside Dimensions

FPD-M21VT-AC

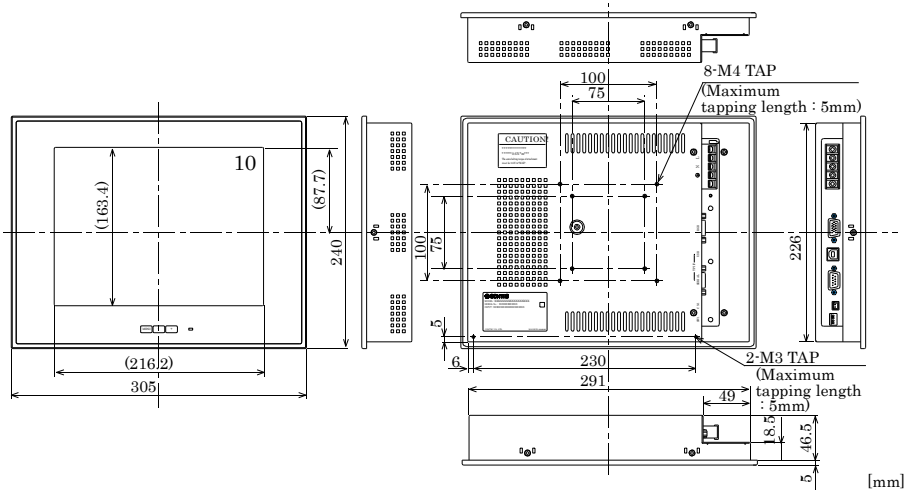


Figure 3.1. Outside Dimensions of Main Unit (FPD-M21VT-AC)

FPD-L21ST-AC

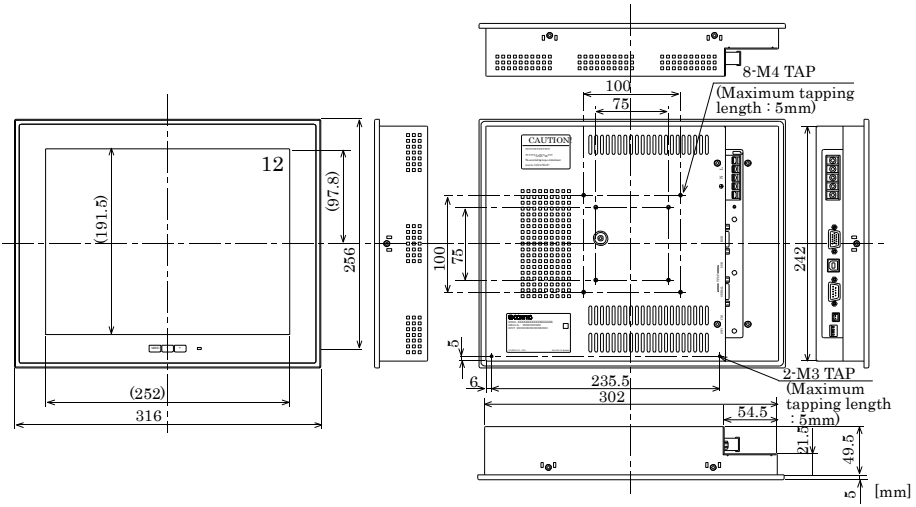


Figure 3.2. Outside Dimensions of Main Unit (FPD-L21ST-AC)

FPD-H21XT-AC

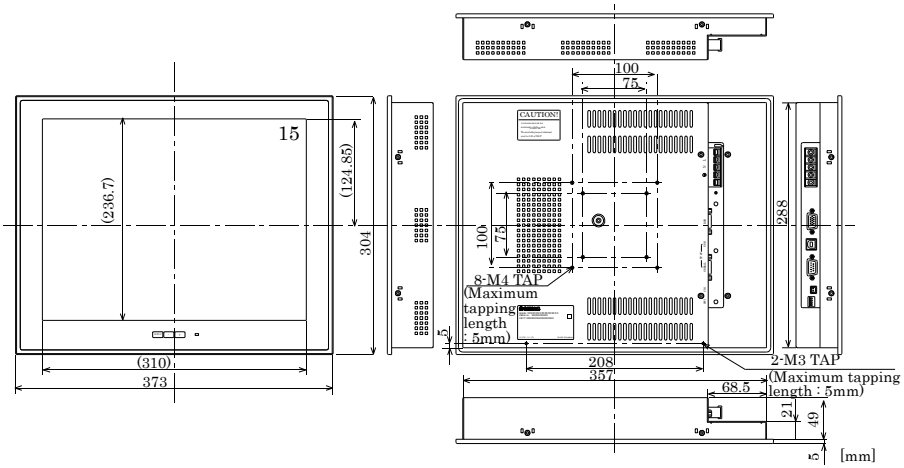


Figure 3.3. Outside Dimensions of Main Unit (FPD-H21XT-AC)

Part Names

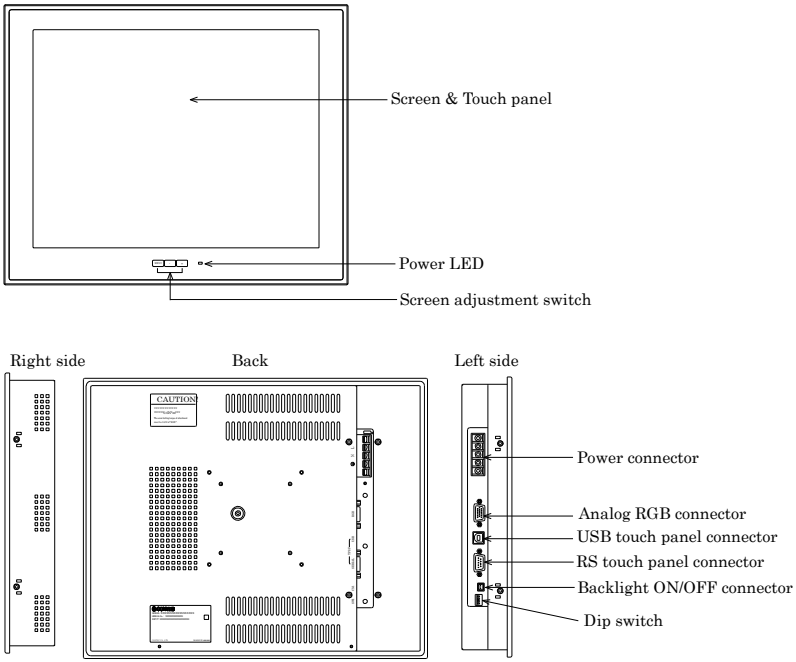


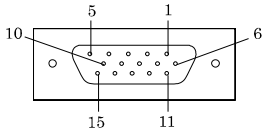
Figure 3.4. Part Names

Figure 3.5. Screen Adjustment Switch

Analog RGB Connector

Table 3.1. Analog RGB Connector

Connector type	15 pin HD-SUB (FEMALE)



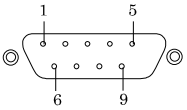
Pin No.	Signal name	Pin No.	Signal name
1	RED	9	N.C.
2	GREEN	10	GND
3	BLUE	11	N.C.
4	N.C.	12	DDC DATA
5	GND	13	HSYNC
6	R-GND	14	VSYNC
7	G-GND	15	DDC CLK
8	B-GND		

RS Touch Panel Connector

This connector is RS-232C compliant to be used for touch panel data communication with the host computer.

Table 3.2. RS Touch Panel Connector

Connector type	9 pin D-SUB (MALE)

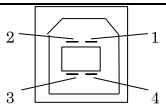


Pin No.	Signal name	Pin No.	Signal name
1	N.C.	6	Reserved
2	TxD	7	N.C.
3	RxD	8	N.C.
4	Reserved	9	N.C.
5	GND		

USB Touch Panel Connector

The USB connector for communication between the host computer and touch panel.

Table 3.3. USB Touch Panel Connector

Connector type	USB Type B(Receptacle)		
			
Pin No.	Signal name	Pin No.	Signal name
1	+5V	3	DATA+
2	DATA-	4	GND

Dip Switch

A DIP switch is located on the left side of the unit.
Switches 1 to 3 are used as the ID setting when connecting multiple touch panels via USB. See Chapter 9 for details on connecting multiple touch panels via USB.

⚠ CAUTION

- When connecting via RS-232C or a single USB connection, set switches 1 to 3 to OFF. (The default factory setting)
- Ensure that the power is turned OFF before changing the DIP switch settings.

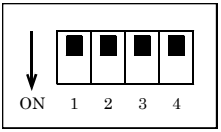


Figure 3.6. Dip Switch

Table 3.4. Setting a Dip Switch

No.	Setting	Setting description	Factory setting
1	USBID0	Setting the USB touch panel ID	OFF
2	USBID1	Setting the USB touch panel ID	OFF
3	USBID2	Setting the USB touch panel ID	OFF
4	Reserved	Reserved (Leave this at OFF.)	OFF

The USB ID0, 1 and 2 settings specify the ID when connecting multiple touch panels via USB.

Table 3.5. Setting a USB ID

USB ID	USBID0	USBID1	USBID2
7	OFF	OFF	OFF
6	ON	OFF	OFF
5	OFF	ON	OFF
4	ON	ON	OFF
3	OFF	OFF	ON
2	ON	OFF	ON
1	OFF	ON	ON
0	ON	ON	ON

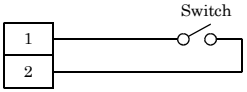
Backlight ON/OFF Connector

The equipment has a backlight ON/OFF connector on the back. Given below are the pin assignment of the connector and its applicable example.

Table 3.6. Remote Control Cable Connector

Connector type	S2B-XH-A (mfd. by JST)
	
Pin 1 - 2	Function
Open	Backlight ON
Short	Backlight OFF

Connector Applicable Example



Applicable connector type
Housing : XHP-2 (mfd. by JST)
Contact (two pieces used) : SXH-001T-P0.6 (mfd. by JST)

Figure 3.7. Connector Applicable Example

⚠ CAUTION

- Backlight ON/OFF cable is not bundled with this product; it must be prepared by the user.
- Backlight ON/OFF control can be implemented by means of software from the host computer. However, please do not use software control from the host computer when using this connector to control the backlight.

4. Setting the Display

Installation Requirements

Please mount the display with an upright orientation.
To maintain the ambient temperature within the installation environment requirement range, provide a gap of 30mm or more between the main unit and any adjacent equipment.

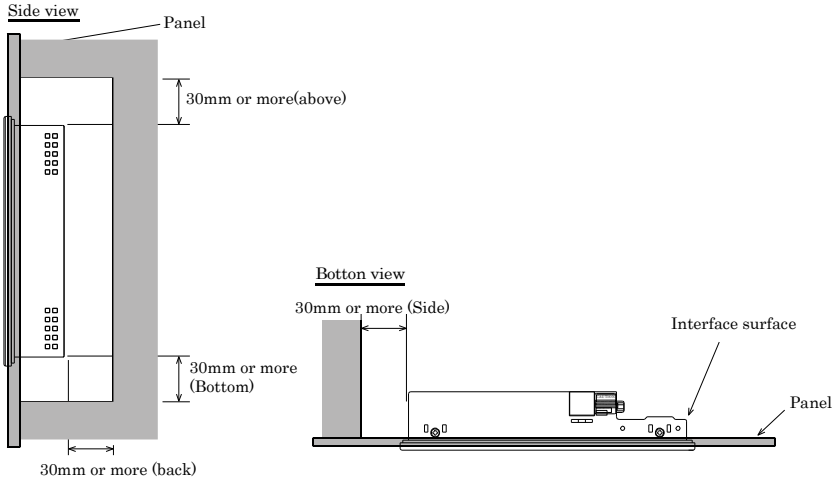


Figure 4.1. Distances between the FPD and Its Vicinity

Panel Cut

Cut the display mount panel in the following dimensions. The four corners of the solid-line rectangle define the panel cut dimensions.

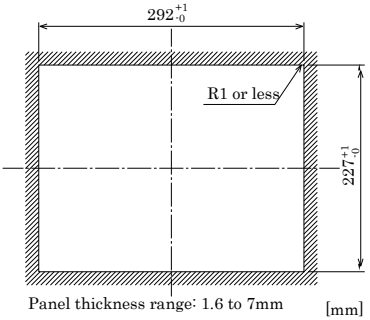


Figure 4.2. FPD-M21VT-AC [10.4inch] Panel Cut Dimensions

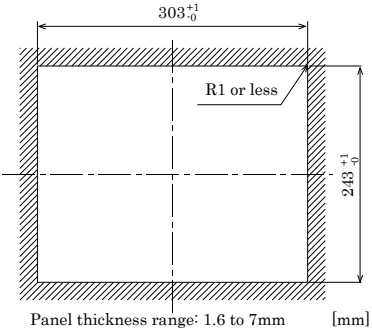


Figure 4.3. FPD-L21ST-AC [12.1inch] Panel Cut Dimensions and Stud Hole Positions

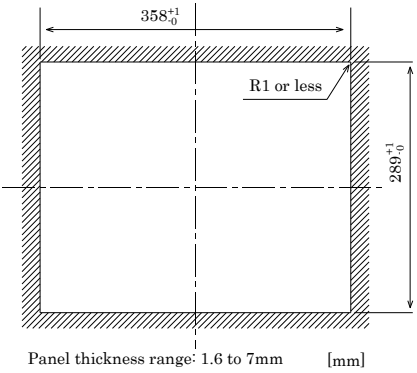


Figure 4.4. FPD-H21XT-AC [15inch] Panel Cut Dimensions and Stud Hole Positions

Attaching the Fitting Used to Attach to the Main Unit

(1) Hold the main unit from the outside of the panel.

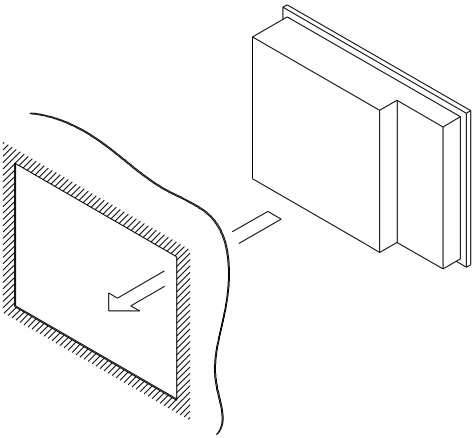


Figure 4.5. Attaching the Fitting Used to Attach to the Main Unit *< 1 / 2 >*

(2) Hold the attach from the inside of the panel.

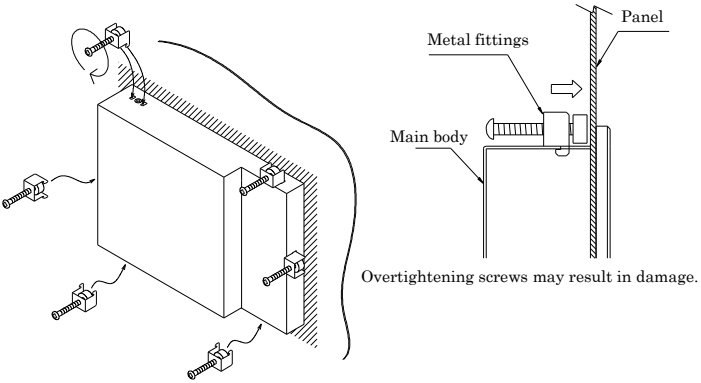


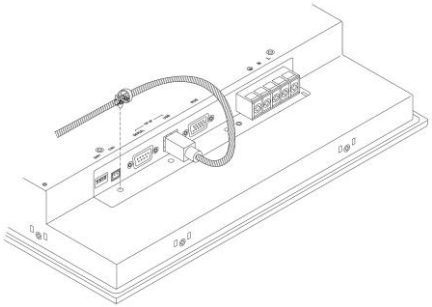
Figure 4.5. Attaching the Fitting Used to Attach to the Main Unit *< 2 / 2 >*

How to Mount the Attachment Fittings

The “Cable fixed clamp” is bundled with this product.

The system unit has three holes for accepting cable ties. Using a cable clamp for a cable with lock-less connector, such as the USB cable, prevents the connector from being unplugged.
Use the cable ties and cable clamps appropriately according to the connecting states and wiring directions of cables.

The photo below shows an example of using a cable clamp. Fix the cable with a clamp without applying stress to the connector.



5. Connection to the Host Computer

Purchase individual connection cables as they are not bundled with this equipment.

Analog RGB Connection

This connection inputs analog RGB display signals to the equipment. Connect the cable to the analog RGB connector on the host computer.

Table 5.1. Recommendation Display Cable

Model	Maker	Cable length
KC-V2	SANWA SUPPLY INC.	2m
KC-V5	SANWA SUPPLY INC.	5m

If you use any other cable, select a shielded cable the wire carrying the RGB and H/Vsync signals and the grounded wire in a twisted pair. Note that a non-twisted-pair cable may degrade image quality, in particular, which is longer than 2 m.

Touch Panel Data Communications

These connections are used to send touch panel data to the host computer via the USB or RS-232C serial port. Connect to the USB port or serial port (COM port) on the host computer.

Table 5.2. Example of a USB connection cable (USB Type A(Host) ⇔ Type B(Display)cable)

Model	Maker	Cable length
KU20-2H	SANWA SUPPLY INC.	2m
KU20-5H	SANWA SUPPLY INC.	5m

Table 5.3. RS-232C Option Cable (RS-232C Straight Cable)

Model	Maker	Cable length
IPC-CBL3-2	CONTEC	2m
IPC-CBL3-5	CONTEC	5m

⚠ CAUTION

- Touch panel driver software is required to use the touch panel. Purchase optional driver software [IPC-SLIB-01 for windows] or download one from the CONTEC's web site (http://www.contec.co.jp/download/).
- Please use the driver for "IPC-DT/M20V(PC)T, IPC-DT/L20S(PC)T, IPC-DT/H20X(PC)T" when using it with V1.49 or less of IPC-SLIB-01. Moreover, please use it with V1.20 or more of IPC-SLIB-01 when you use the touch panel driver software for USB.
- The USB connection can only be used on Windows XP, 2000, or 98SE. Connect via the RS-232C interface if using a different OS.
- Use either USB or RS-232C for connecting the touch panel. The touch panel cannot be connected via both interfaces at the same time.
- When using the USB connection, the screen image may disappear momentarily when the USB cable is connected or disconnected and when the computer power is turned ON or OFF.
- When using the USB connection via a hub, the unit may not operate correctly in some cases depending on the other USB devices connected to the hub. Please check the operation before using in practice.

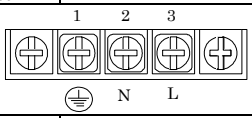
6. Power Supply Connection

This product operates from an AC power supply. The unit includes a terminal block for connecting the power supply.

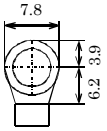
Please connect a black line of the AC power cable with L, connect the white line in N similarly, and connect a green line with FG.

Power Supply Connector

Table 6.1. Power Supply Connector

Connector type	AC input terminal
	
Pin No.	Signal name
1	FG(Frame Gnd)
2	N
3	L

- Screw diameter : M3.5, Pitch between pins : 9.5mm
- Applicable pin



[mm]

(Notes) This product has no AC power ON/OFF switch.

7. Screen Adjustment and a Setup

The equipment has screen adjustment switches [MENU], [+], and [-]. Use these switches to adjust the screen. (For the locations of the switches, see “Outside Dimensions and Part Names” in Chapter 3.) When using the equipment for the first time or after changing the output screen mode of the host computer, execute AUTO ADJUST first on the menu screen. Use these switches also to adjust the screen brightness and contrast and to make settings for the touch panel.

Menu Screen

Pressing the [MENU] switch displays the main menu screen. Use the [+] and [-] switches to select individual items, adjust them, then press the [MENU] to save the settings.

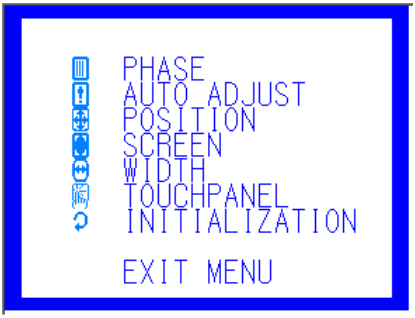


Figure 7.1. Main Menu Screen

PHASE : Adjust this item when the screen is partly blurred or flickering. Press [+] or [-] while checking the screen to optimize the item.

AUTO ADJUST : Select AUTO ADJUST when using the equipment for the first time or when the screen cannot be displayed normally due to a change made to the display mode. Select this item and press [MENU] to accept your selection, and the equipment starts performing automatic adjustment.

⚠ CAUTION

AUTO ADJUST may fail to adjust the screen correctly depending on the host computer or the display screen (mostly black screen such as in the DOS text mode). In such a case, adjust POSITION and WIDTH to manually optimize the screen.

POSITION : Even when AUTO ADJUST fails to position the screen correctly, you can adjust the horizontal and vertical positions of the display screen. Select this item to invoke the submenu, select a desired item using [+] or [-], then press [MENU] to accept the setting made.

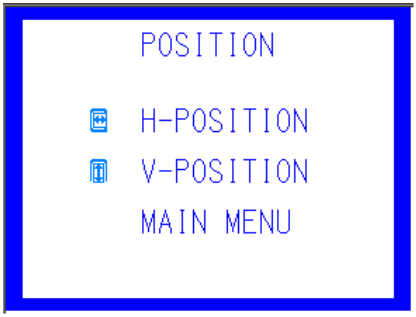


Figure 7.2. POSITION Submenu

H-POSITION : Select this item to adjust the horizontal position of the screen. Press [+] or [-] while checking the screen to optimize the item.

V-POSITION : Select this item to adjust the vertical position of the screen. Press [+] or [-] while checking the screen to optimize the item.

MAIN MENU : Select this item to return to the main menu.

SCREEN : Select this item to adjust the display status of the screen. Select this item to invoke the submenu, select a desired item using [+] or [-], then press [MENU] to accept the setting made.

Figure 7.3. SCREEN Submenu

CONTRAST : Select this item to adjust the contrast of the screen. Press [+] or [-] to optimize the item.

BRIGHTNESS : Select this item to adjust the brightness of the backlight. Press [+] or [-] to optimize the item. The brightness can also be adjusted by pressing the [+] and [-] keys without the MENU screen displayed, as the direct brightness control keys.

SYNC RANGE :The detection accuracy of Synchronous Idle is adjusted. Please adjust a set value when the screen changes frequently, and it doesn't display it normally though Synchronous Idle changed. Press [+] or [-] to optimize the item. (The default value is 20.)

MAIN MENU : Select this item to return to the main menu.

WIDTH : When vertical stripes have gone out to the screen, it adjusts it. Press [+] or [-] while checking the screen to optimize the item.

TOUCHPANEL : Select this item to adjust the status of the touch panel. Select this item to invoke the submenu, select a desired item using [+] or [-], then press [MENU] to accept the setting made.

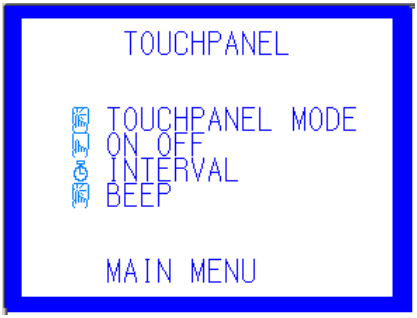


Figure 7.4. TOUCHPANEL Submenu

TOUCHPANEL MODE :
Select the touch panel mode (WINDOWS or DOS) depending on the host OS. (Factory setting:WINDOWS)

ON OFF : Select this item to turn ON (enable) or OFF (disable) the touch panel operation. (The equipment is started always with this item set to OFF.)

Usually, this item does not have to be set as the touch panel is turned ON (enabled) automatically upon startup of the touch panel driver. Note, however, that the touch panel does not work when the equipment is connected to the host with the touch panel driver already up and running or when the power to the equipment is recycled. In such cases, set this item to ON (enabled).

INTERVAL : Select this item to adjust the scan timing of the touch panel. Press [+] or [-] to increase or decrease the response of the touch panel. (Factory setting:10)

BEEP : Select this item to turn on or off the click tone of the touch panel. (Factory setting:OFF)

ON/OFF setting on the touch panel driver (host side) is also available. See also the driver setting when you change the setting.

MAIN MENU : Select this item to return to the main menu.

INITIALIZATION :
Select this item to reset all items to the factory defaults If the screen has become blank or displayed abnormally, use this item to initialize the equipment. The initialization is executed by selecting “YES” and pressing [MENU]. It can also be executed by turning on the equipment while holding down the [MENU] key as the direct initialization key.

Direct Key

BRIGHTNESS : The brightness of the backlight can be adjusted by pressing the [+] and [-] keys without the menu screen displayed.

INITIALIZATION : All the settings can be reset to the factory defaults by turning on the equipment while holding down the [MENU] key.

Power save mode : You can place the equipment in the power save mode by depressing both of the [+] and [-] keys at the same time without the menu screen displayed. This can force the screen display and backlight to be turned off.
Release the buttons when "!POWERSAVE MODE" appears on the screen.
You can recover the screen from the power save mode by pressing any of the front switches. The power consumption of the equipment in the power save mode is about 1/5 of that during normal operation. Turning off the backlight when not required the backlight to extend its life.

* Recycling the power to the equipment in the power save mode recovers it to the normal display state.
* The POWER LED on the front face remains blinking in green in the power save mode.

Memory of a Setting Value

The equipment retains its settings even when the power is turned off.

Note, however, that the following settings are reset to their defaults without being retained.

- The power save mode setting made by the direct key is reset to the normal state when the power is turned on.
- The TOUCH PANEL ON/OFF setting is set to OFF when the power is turned on.

8. LED Indicators

The POWER LED on the front face indicates each state of the display as follows:

Table 8.1. LED Indicators

LED status	Description
OFF	The power supply off or the equipment not started normally
Green(ON)	Normal operation
Green(Flashing)	Power save mode
Orange(Flashing)	Unsupported signal input *1
Orange(Flashing)	No signal input *2

*1 The LED looks like this when the equipment cannot process the input signal to provide normal display, for example, when the horizontal/vertical sync signal frequency is exceeding the supported frequency. See Chapter 10 "Display mode" for the display modes supported by this equipment.

*2 The LED looks like this also when the horizontal or vertical sync signal is turned off by the power management function of the host computer. The equipment enters the power save mode automatically when no signal has been input for about two seconds.

9. Touch Panel

This equipment has a touch panel that enables keyboard-less, mouse-less operations by communication with the host computer using the RS-232C cable.

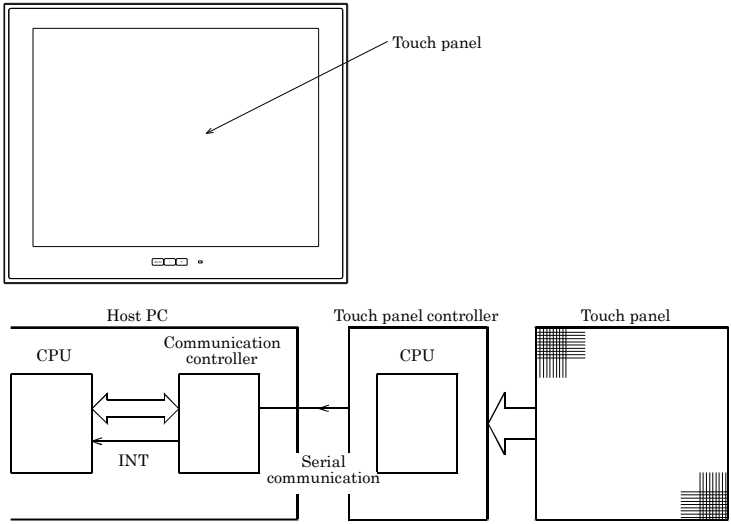


Figure 9.1. Touch Panel and Block Diagram

Data input at the touch panel is processed by the touch panel controller and passed to the host PC via the serial port on the CPU in the controller.
Before the touch panel can be used, touch panel driver software must be installed. Note that the driver software is not bundled with this product. Purchase the one separately or download it from the CONTEC's web site.
For further details, refer to the READ_ME file for each driver.

< Option touch panel driver >
Windows XP/2000/NT 4.0/98SE/95OSR2 : IPC-SLIB-01

⚠ CAUTION

- The USB touch panel driver software requires V1.20 or later of IPC-SLIB-01.
- The USB connection can only be used on Windows XP, 2000, or 98SE. Connect via the RS-232C interface if using a different OS.
- Use either USB or RS-232C for connecting the touch panel. The touch panel cannot be connected via both interfaces at the same time.
- When using the USB connection, the screen image may disappear momentarily when the USB cable is connected or disconnected and when the computer power is turned ON or OFF.

USB Multi-Touch Panel

This function can be used in the case when the RGB signal from the host computer is split for connecting to multiple displays via a splitter. The function permits touch panel operation to be used at all the displays. A maximum of eight touch panel displays can be connected.

Note that all touch panels must be connected via USB and, to allow the touch panel driver software on the host computer to identify each device, a different USB ID must be set on the DIP switch located on the side of each display unit.

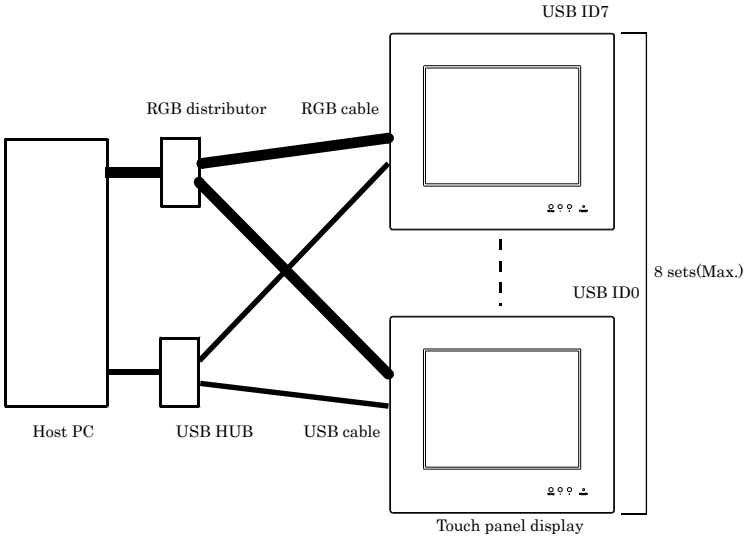


Figure 9.2. Example of connection of a USB multi-touch panel

You can use a CONTEC IPC-PT/600 series panel computer as the host PC.
In this case, the ID of the touch panel in the panel computer is fixed at ID7. Set the IDs of the external displays in the range
USB ID0 - USB ID6 (a maximum of seven external displays can be connected).

⚠ CAUTION

You cannot use multiple touch panels via the RS-232C interface.

10.Display Mode

This equipment supports the following display modes:

Table 10.1. FPD-M21VT-AC

Video mode	Number of pixels (dot)	Dot clock (MHz)	Horizontal frequency (kHz)	Vertical frequency (Hz)	
VGA	640 x 350	25.18	31.47	70	*1, *2
VGA	640 x 400	25.18	31.47	70	
VGA	640 x 480	25.18	31.47	60	
VESA	640 x 480	31.50	37.86	72	

*1 The vertical display size does not reach the full-screen display size.

*2 Since the aspect ratio is not 4:3, the screen display is extended vertically.

Table 10.2. FPD-L21ST-AC

Video mode	Number of pixels (dot)	Dot clock (MHz)	Horizontal frequency (kHz)	Vertical frequency (Hz)	
VGA	640 x 350	25.18	31.47	70	*1, *2
VGA	640 x 400	25.18	31.47	70	
VGA	720 x 400	28.32	31.47	70	*2
VGA	640 x 480	25.18	31.47	60	
VESA	640 x 480	31.50	37.86	72	
VESA	800 x 600	36.00	35.16	56	
VESA	800 x 600	40.00	37.88	60	
VESA	800 x 600	50.00	48.08	72	

*1 The vertical display size does not reach the full-screen display size.

*2 Since the aspect ratio is not 4:3, the screen display is extended vertically.

Table 10.3. FPD-H21XT-AC

Video mode	Number of pixels (dot)	Dot clock (MHz)	Horizontal frequency (kHz)	Vertical frequency (Hz)	
VGA	640 x 350	25.18	31.47	70	*1, *2
VGA	640 x 400	25.18	31.47	70	
VGA	720 x 400	28.32	31.47	70	*2
VGA	640 x 480	25.18	31.47	60	
VESA	640 x 480	31.50	37.86	72	
VESA	640 x 480	31.50	37.50	75	
VESA	800 x 600	36.00	35.16	56	
VESA	800 x 600	40.00	37.88	60	
VESA	800 x 600	50.00	48.08	72	
VESA	800 x 600	49.50	46.88	75	
VESA	1024 x 768	65.00	48.36	60	
VESA	1024 x 768	75.00	56.48	70	
VESA	1024 x 768	78.75	60.02	75	

*1 The vertical display size does not reach the full-screen display size.

*2 Since the aspect ratio is not 4:3, the screen display is extended vertically.

⚠ CAUTION

- The number of display pixels of the LCD is 640 x 480 dots on the FPD-M21VT-AC, 800 x 600 dots on the FPD-L21ST-AC, and 1024 x 768 dots on the FPD-H21XT-AC. When the input has a resolution lower than the number of display pixels of each model, the screen display is enlarged automatically. Note, in this case, that the display quality is therefore degraded in clearness compared to the screen displayed at the resolution that matches the number of display pixels of the LCD.
- The equipment cannot provide normal display at a resolution or frequency other than the supported display modes.
- The Windows full-screen MS-DOS window may not display correctly in some cases depending on the connected host computer.

11. Options

Double-sided screen protective sheets

- IPC-CV : 10-inch [IPC-DT/M20V(PC)T] screen protective sheets (10 sheets)
- IPC-CV12 : 12.1-inch [IPC-DT/L20S(PC)T] screen protective sheets (10 sheets)
- IPC-CV15 : 15-inch [IPC-DT/H21X(PC)T] screen protective sheets (10 sheets)

Optional cables

- IPC-ACCODE3 : AC power cable (For 2m 125VAC)
- IPC-CBL3-2 : RS-232C cable for touch panels (2m)
- IPC-CBL3-5 : RS-232C cable for touch panels (5m)

Driver

- IPC-SLIB-01 : Driver & Utility Soft Set(CD-ROM version)

Recommendation Cable (Maker: SANWA SUPPLY INC.)

- KC-V2 : RGB display cable (2m)
- KC-V5 : RGB display cable (5m)
- KU20-2H : USB cable for touch panel (2m)
- KU20-5H : USB cable for touch panel (5m)

Manual

- FPD-21-HMJ : User's manual (Japanese) for FPD-M21VT-AC, FPD-L21ST-AC, FPD-H21XT-AC series
- FPD-21-HMU : User's manual (English) for FPD-M21VT-AC, FPD-L21ST-AC, FPD-H21XT-AC series

FPD-M21VT-AC
FPD-L21ST-AC
FPD-H21XT-AC
User's Manual

FPD-21-HMU

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