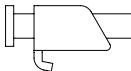# FP-3710T Series Installation Guide

Caution
Be sure to read the "Warning/Caution Information" on the attached sheet before using the product.

Package Contents

■FP unit (1)

■ Installation Guide (1) (this manual)   ■ Warning/Caution Information (1)

■ Installation Gasket (1)(attached to the FP unit)   ■ AC Power Cord (1)

■ Installation Brackets (4/set, 2sets)   ■ USB Cable Clamp(1)

■AC Power Connector (1) (attached to the FP unit)

This unit has been carefully packed, with special attention to quality. However, should you find anything damaged or missing, please contact your local FP distributor immediately.

IMPORTANT
- The Power Cord included in the FP unit's package is designed only for AC100V or AC115V use. Any other voltage will require a different cord.
- Note that the Power cord is not an appliance complying with the Electrical Appliance and Material Safety Law.
- The AC Power cord can only be used for the FP units. Note that the specification of the cord doesn't guarantee to fit any other electrical appliances.

Required software/Reference manual

An FP-3710T series unit needs the following software for operation. As FP user manual, provided by PDF media, describes its details, download the manual below and get the further information. Visit our website below and get both software and reference manual. (URL:http://www.pro-face.com/otasuke/)
• Software : Mouse Emulation Software
• Manual : FP-3710T series User Manual

UL/c-UL/CSA Application Notes

The FP-3710T Series is a UL/c-UL/CSA listed product. (UL File No.E220851,CSA File No.219866)

This unit conforms as a product to the following standards:
■UL508 Industrial Control Equipment

■CSA C22.2 No.142-M1987 Process Control Equipment

Model Type	UL/c-UL/CSA Registration Model No.
FP3710-T41-U	3580406-01
FP3710-T41	

<Cautions>
Be aware of the following items when building the FP into an end-use product:
• The FP must be used as a built-in component of an end-use product.
• This unit should be installed in the front face of a metal panel.
• If this unit is installed so as to cool itself naturally, be sure to install it in a vertical panel. Also, be sure that the FP unit is mounted at least 100 mm away from any adjacent structures or equipment. If these requirements are not met, the heat generated by the FP unit's internal components may cause the unit to fail to meet UL/c-UL standard.
• For use in Pollution Degree 2 environment.
• For use on a flat surface of a Type 1 Enclosure.

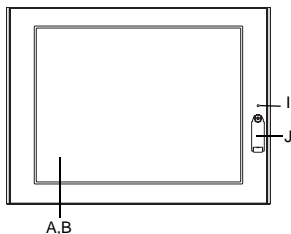# CE Marking Notes

The FP-3710TSeries is a CE marked product that conforms to EMC directives and Low Voltage directives EN55011 Class A, EN61000-6-2 and EN60950-1 First Edition.
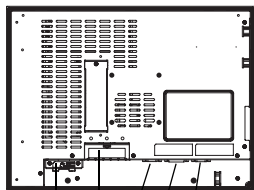* *For detailed CE marking information, please contact your local FP distributor.*
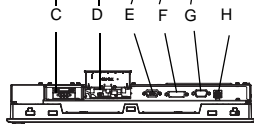
1　Part Names

Front View

A,B

Rear View

C D E F G H

Bottom View

A: TFT Color LCD
　Acts as a display monitor for your host.

B: Touch Panel
　Allows you to switch screens or write data to the host.

C: Power Connector (Socket)
　Provides the input and ground terminals for a power cable.

D: Setting Switch
　By opening the cover, the Dip switches and slide switch are seen. Each switch can set a operation mode.

E: Analog RGB Connector
　Connector for analog RGB interface

F: DVI-D Interface Connector
　Connector for DVI-D interface

G: Serial Connector
　Connector for serial (RS-232C) interface. Used for sending touch panel data to the host.

H: USB Connector (Type B)
　Connector for USB interface. Used for sending touch panel data to the host or used as an upstream port for USB-HUB.
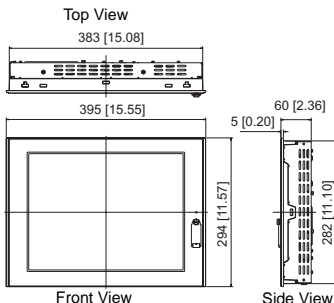
I: Front LED
　Used to indicate the condition of the power supply, a backlight burnout or image signal input.

J: Front USB Connector (Type A)(FP3710-T41-U only)
　A downstream port for embedded USB-HUB in conformity with USB2.0/1.1 standard, which is used for connecting USB devices. Connect the upstream port of the USB-HUB (H:USB connector) to the Host PC for Front USB connector use.

2   Dimensions

Unit: mm [in]

Top View

383 [15.08]

395 [15.55]

5 [0.20]

60 [2.36]

294 [11.57]

282 [11.10]

Front View

Side View

3   Dip Switches and Slide Switch

The Dip Switches and Slide Switch are located in the bottom of the FP unit. Only the settings when the power supply is turned on is effective to the Dip Switches and the Slide Switch. After changing the settings of the Dip Switches and the Slide Switch, be sure to restart your FP unit.

Bottom View
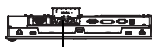
Dip Switches(SW1)
Slide Switch(SW2)

■ SW1

Switch	Setting
SW1 ON 1 8	SW1-1 Reserved (Always OFF)
	SW1-2 Display/Hide the OSD
	SW1-3 Reserved (Always OFF)
	SW1-4 Reserved (Always OFF)
	SW1-5 Reserved (Always OFF)
	SW1-6 Reserved (Always OFF)
	SW1-7 Reserved (Always OFF)
	SW1-8 Reserved (Always OFF)

• SW1-2 Dip Switch SW1-2 is used to display or hide the OSD.
To hide the OSD, set the switch to ON. To display the OSD, set the switch to OFF.
The default setting is OFF. (OSD is displayed.)

■ SW2

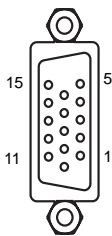| Switch	Setting
232 ◀ ┊ ▶ USB	Slide Switch is used to switch the data input/output (command control) method on the touch panel between USB and RS-232C (Serial). The default setting is RS-232C.

4 Interfaces

■ Analog RGB Interface

Input signal type	Analog RGB
Input signal characteristic	Image signal : analog RGB Synchronous signal :TTL level, negative true or positive true Scanning type : non-interlace
Setting by OSD (On Screen Display)	•CONTRAST •BRIGHTNESS •H-POSITION •V-POSITION •H-size •PHASE •DIMMER(BACKLIGHT) •SHARPNESS •ALL RESET (DEFAULT)

The number of dots (pixels) displayed are as follows:

Size	H Sync. (kHz)	V Sync. (Hz)	Dot Clock (MHz)	Screen Resolution Expansion (H: Horizontal)(V: Vertical)	Display Resolution
640x400	24.827	56.000	21.053	x1.6 (H) x1.92 (V)	1024x768
640x400	31.469	70.000	25.175		
640x480	31.469	59.992	25.175		
640x480	37.500	75.000	31.500	x1.6	1024x768
640x480	35.000	66.667	30.240		
720x400[*1]	31.469	70.000	28.320	x1.42 (H) x1.92 (V)	1024x768
800x600	37.879	60.317	40.000	x1.28	1024x768
800x600	46.875	75.000	49.500		
1024x768	48.363	60.004	65.000		
1024x768	56.476	70.069	75.000	x1.0	1024x768
1024x768	60.023	75.029	78.750		

[*1.] When you use this resolution, set "ON" for "720 × 400 Mode" in the OSD (On Screen Display) "System Settings".

Pin Assignments and Signal Names for Analog RGB

Pin No	Signal Name	Condition	Pin Location
1	Analog R	R signal input	
2	Analog G	G signal input	
3	Analog B	B signal input	
4	Reserved	NC (spare for input)	
5	Digital grounding	Digital signal GND	
6	Return R	R signal GND	
7	Return G	G signal GND	
8	Return B	B signal GND	
9	Reserved	NC (spare for input)	
10	Digital grounding	Digital signal GND	
11	Reserved	NC (spare for input)	
12	DDC DATA	DDC Data	
13	H. SYNC	Horizontal synchronous signal input	
14	V. SYNC	Vertical synchronous signal input	
15	DDC CLOCK	DDC Clock	

Connector................. Mini Dsub 15 pin male

Connector set screw.. Inch type (4-40)

Cable........................ RGB cable manufactured by Pro-face.
FP-CV02-45 <4.5m> (VGA standard)

IMPORTANT
• If a cable other than the specified RGB cable is used, product performance cannot be guaranteed due to the possibility of noise interfering with the FP unit's operation.
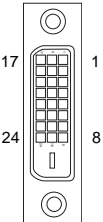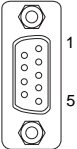
■ DVI-D Interface

Input signal type	DVI-D	
Setting by OSD (On Screen Display)	•CONTRAST •DIMMER(BACKLIGHT) •ALL RESET (DEFAULT)	•BRIGHTNESS •SHARPNESS

Display Area (FP-3710T series)

Size	H Sync. (kHz)	V Sync. (Hz)	Dot Clock (MHz)	Screen Resolution Expansion (H: Horizontal) (V: Vertical)	Display Resolution
640x400	24.827	56.000	21.053	x1.6 (H) x1.92 (V)	1024x768
640x400	31.469	70.000	25.175		
640x480	31.469	59.992	25.175	x1.6	1024x768
640x480	37.500	75.000	31.500		
640x480	35.000	66.667	30.240		
720x400[*1]	31.469	70.000	28.320	x1.42 (H) x1.92 (V)	1024x768
800x600	37.879	60.317	40.000	x1.28	1024x768
800x600	46.875	75.000	49.500		
1024x768	48.363	60.004	65.000	x1.0	1024x768
1024x768	56.476	70.069	75.000		
1024x768	60.023	75.029	78.750		

*1. When you use this resolution, set "ON" for "720 × 400 Mode" in the OSD (On Screen Display) "System Settings".

Pin Assignments and Signal Names for DVI-D

Pin No	Signal Name	Pin No	Signal Name	Pin Location
1	TMDS DATA2-	13	NC	
2	TMDS DATA2+	14	NC	
3	TMDS DATA2 SHIELD	15	GND	
4	NC	16	Hot Plug Detect	
5	NC	17	TMDS DATA0-	
6	DDC Clock	18	TMDS DATA0+	
7	DDC Data	19	TMDS DATA0 SHIELD	
8	NC	20	NC	
9	TMDS DATA1-	21	NC	
10	TMDS DATA1+	22	TMDS CLOCK SHIELD	
11	TMDS DATA1 SHIELD	23	TMDS CLOCK+	
12	NC	24	TMDS CLOCK-	

Connector.................. DVI-D 24-pin male
Connector set screw.. Inch type (4-40)
Cable .... DVI-D cable manufactured by Pro-face.
(FP-DV01-50 <5 m>, FP-DV01-100 <10 m>)

IMPORTANT
- If a cable other than the specified DVI-D cable is used, product performance cannot be guaranteed due to the possibility of noise interfering with the FP unit's operation.
- The FP-DV01-100 can be used only when connected to a PS-2000B unit. When using the FP-DV01-100, be sure to turn the PS-2000B's internal dipswitch 4 ON.
(When using the FP-DV01-50, turn this switch OFF.)

■ Serial Interface

	Baud rate : 9600 bps
	Data length : 8 bits
RS-232C Serial Interface	Parity : None
	Stop bit : 1
	Flow Control: None

Pin Assignments and Signal Names for Serial Interface

Pin No.	Signal Name	Condition	Pin Location
1	CD	Carrier Detect[*1]	
2	RD	Receive Data (FP->Host)	
3	SD	Send Data (FP<-Host)	
4	DTR	Data Terminal Ready[*1]	
5	GND	Ground	
6	DSR	Data Set Ready[*1]	
7	RS	Request to Send (FP<-Host)	
8	CS	Clear to Send (FP->Host)	
9	NC	(Used internally)	

7

[1] The CD, DTR, and DSR are connected together inside of the FP.

Connector................. Dsub 9 pin female

Connector set screw.. Inch type (4-40)

Cable .... SIO cable for FP manufactured by Pro-face.

(FP61V-IS00-O)

Concerning Signal Names

Signal names used for the serial interface on FP units are designed to match the pin order used on most PC serial interfac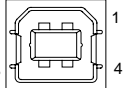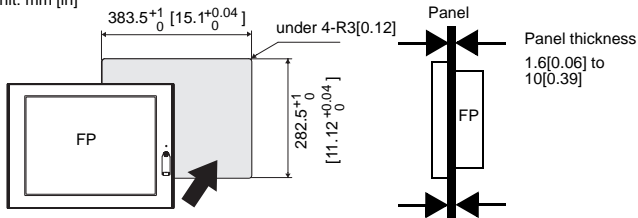es, so that a straight cable can be used to connect the two. Therefore, connect each pin's signal to the same signal name on the PC side.

For example, pin #2 'RD' should be connected to the 'RD' input terminal on the PC's connector.

Refer to the FP-3710T series User Manual's section "Cable Diagrams" for each signal's direction.

■ USB Interface (Type-B connector : Up-Stream Port)

Pin Assignments and Signal Names for USB Interface

Pin No.	Signal Name	Condition	Pin Location
1	USB1-5V	+5VIN	
2	USBD1(-)	USB data(-)	
3	USBD1(+)	USB data(+)	
4	GND	Ground	

Cable .... USB cable manufactured by Pro-face.

(FP-US00)

IMPORTANT • If a cable other than the specified USB cable is used, product performance cannot be guaranteed due to the possibility of noise interfering with the FP unit's operation.

5 Instllation

(1) According to the Panel Cut size, make instllation holes on the panel.

Unit: mm [in]

383.5^{+1}_{0} [$15.1^{+0.04}_{0}$]

under 4-R3[0.12]

282.5^{+1}_{0} [$11.12^{+0.04}_{0}$]

FP

Panel

Panel thickness 1.6[0.06] to 10[0.39]

FP

(2) Check that FP has instllation fastners. Insert the FP from the front.

> IMPORTANT • Installation gasket must be used even though it is not necessary for its environment. For installation, refer to the FP-3710T series User Manual.

(3) The following figures show the eight(8) fastener insertion slot locations. Insert each fastener's hook into the slot and tighten it with a screwdriver.
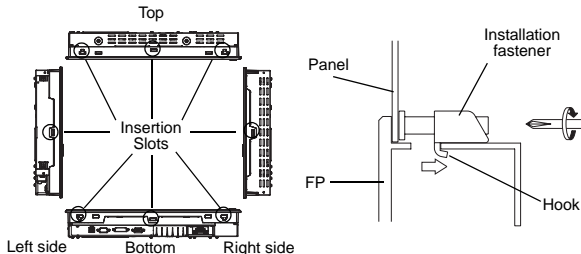
> IMPORTANT • Tightening the screws with too much force can damage the FP unit's case.
> • The necessary torque is 0.5N•m.

6 Wiring

⚠ WARNING

- To avoid an electric shock, when connecting the FP's power cord terminals to the power terminal block, confirm that the FP's power supply is completely turned OFF, via a breaker, or similar unit.
- To avoid the dangers of fire, electric hazards and equipment damage, be sure to use only the specified voltage when operating the FP.
- Since there is no power switch on the FP unit, be sure to attach a breaker-type switch to its power cord.

■ Electrical Specification

Item		Specification
Power Supply	Input Voltage	AC100 ~ 240V
	Rated Voltage	AC85V ~ AC264V
	Rated Frequency	50 / 60HZ
	Allowable Frequency Range	40Hz - 72Hz
	Allowable Voltage Drop	1 cycle (Max.)
	Current Consumption	AC100V 1.1A or less (TYP 0.75A) AC240V 0.7A or less (TYP 0.44A)
	In-Rush Current	60A (Max.)
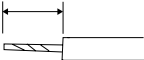
Voltage Endurance	AC1500V 20mA for 1 minute (between charging and FG terminals)
Insuration Resistance	DC500V 10MΩ (Min.) (between charging and FG terminals)

■ Environmental Specification

Item	Specification
Surrounding Air Temperature	0~50ºC (The panel should not incline more than 30º)
Storage Temperature	-20 ~ +60ºC
Ambient Humidity	10~90%RH
Storage Humidity	(No condensation, Wet bulb temperature: 39ºC max.)
Air Purity (Dust)	0.1mg/m^3 (Max.) (No electrically conductive dust is allowed)
Pollution Degree	Pollution Degree 2
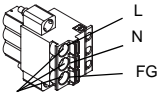
■ Power Cord Specifications

Use copper conductors only.

Power Cord Diameter	0.2mm^2 to 2.5mm^2 [0.0001 to 0.0097inch^2] (24AWG to 12 AWG)
Conductor Type	Simple or Twisted Wire[*1]
Conductor Length	10mm [0.39 in.]

*1 If the Conductor's end (individual) wires are not twisted correctly, the end wires may either short against each other, or against an electrode.

■ Power connector specification

L	AC Input Terminal-live line
N	AC Input Terminal-neutral line
FG	Ground Terminal connected to the FP chassis

NOTE
• Kind of power cord is FKC 2,5/3-STF-5,08 which are Phoenix Contact products.

Use the following wiring for FP. Those are Phoenix Contact products.

Recommended Drivers	SZS 0.6X3.5 (1205053)	
Recommended stick end terminal	AI 0.34-12TQ(3200645)	AI 0.5-10WH(3201275)
	AI 0.75-10GY(3201288)	AI 1-10RD(3200182)
	AI 1.5-10BK(3200195)	AI 2.5-12BU(3200962)
Crimp tool for recommended stick end terminal	CRIMPFOX ZA 3 (1201882)	

■ Connecting the Power Cord

When connecting the AC type power cord, be sure to follow the procedures given below.

(1) Confirm that the power cord is unplugged from the power supply.
(2) Push the Opening button by a small and flat screw driver to open the desired pin hole.
(3) Insert each pin terminal into its each hole. Release the Opening button to clamp the pin place.

AC power supply cord

Black
White
Green/Yellow

Opening Button

L
N
FG
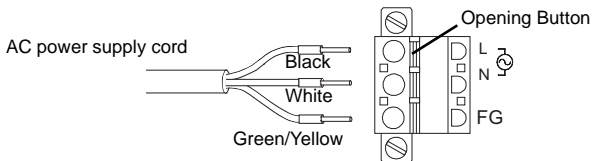
(4) After inserting all three pins, insert the Power Plug into the Power Connector at FP. Fix the plug with two(2) minus screws.

IMPORTANT
- Confirm that all wires are connected correctly.
- The torque required to tighten these screws is 0.5N•m to 0.6N•m.
- To prevent the possibility of a terminal short, use a pin terminal that has an insulating sleeve.

7   Using the USB Cable Clamp

■ USB Cable Clamp Attachment Procedure
◆ Installation to USB cable

(1) Connect the USB cable to the connector.
(2) Tighten the clamp until the cable is secured in place and insert the convex of cable clamp into the USB fixing hole to fix both as shown in the following figure.

USB Cable

USB cable clamp

Stopper

USB cable clamp holder
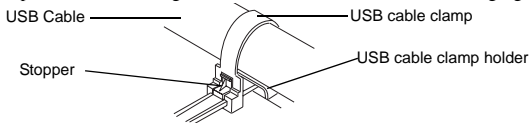
◆ USB Cable Clamp Removal Feature

(1) Push in the cable clamp's stopper with a standard flat-blade screwdriver until the cable clamp is unlocked, and remove it.
(2) Disconnect the USB cable.

8   Power Supply Cautions

Please pay special attention to the following instructions when connecting the power cord terminals to the FP unit.

- If the power supply voltage exceeds the FP unit's specified range, connect a voltage transformer.
- Between the line and the ground, be sure to use a low noise power supply. If there is still an excessive amount of noise, connect a noise reducing transformer.
- Input and Output signal lines must be separated from the power control cables for operational circuits.
- The FP unit's power supply cord should not be bundled with or kept close to main circuit lines (high voltage, high current), or input/output signal lines.
- Connect a surge absorber to handle power surges.
- To reduce noise, make the power cord as short as possible.
- The temperature rating of field installed conductors: 75 ºC only.

9   Grounding Caution

When attaching a wire to the FP unit's rear face FG terminal, (on the AC Connector), be sure to create an exclusive ground.
(Use a grounding resistance of 100Ω, a wire of 2mm^2 or thicker, or your country's applicable standard.)

10   Input/Output Signal Line Cautions

- All FP Input and Output signal lines must be separated from all operating circuit (power) cables.
- If this is not possible, use a shielded cable and ground the shield.

11   Calibration of OSD Display Position

■ OSD Functions

You can operate the FP screen menus via the touch panel, and even if FP is operating, adjust screen image display to a minute level. The feature is called OSD (On Screen Display). The items that can be set with OSD and the functions are shown.

Example of OSD screen   "Ver.*.**" indicates the version of the OSD.
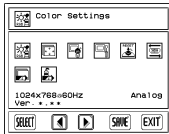
	Item	Function
	Color Settings	Adjusts the contrast and the brightness.
	Screen Settings	Adjusts the display position of the screen. (Analog RGB only)
	Custom Display	Adjusts Sharpness and the backlight brightness.
	System Settings	Changes settings such as activating the click sound.
	All Reset	Resets the current OSD value to the default value.
	Input Source	Switches Analog RGB and DVI-D.
	Auto Adjust	Automatically adjusts the display position of the screen. (Analog RGB only)
	Auto Gain	Automatically adjusts the contrast and the brightness. (Analog RGB only)
	ESC	Cancels the setting and returns to the upper level.
	SET	Applies the setting and returns to the upper level.
	Arrow KEY	Changes the selection.
	SELECT	Selects icons or items.
	SAVE	Saves the current value and quits the OSD.
	EXIT	Quits the OSD.

■ Starting the OSD

To start the OSD and enter OSD mode, press the three corners of the touch panel in turn (upper left, upper right, and lower right) within 5 seconds. In OSD mode, the setting screen is displayed in the center of the screen. In this mode, the touch panel cannot be used to export data to external devices unless the settings for the OSD are completed.

NOTE
• OSD is not displayed when a SW 1-2 is ON.

■ Using the OSD

Icons on the screen are used to operate the OSD. After the OSD start-up, the top menu displays. Touching the icon you want to adjust displays its submenu or setting change screen. In the setting change screen, ◀▶ icons are used to change the setting. To apply the setting, press the SET button. Press the SAVE button to save the defined settings.

■ Quitting the OSD

To quit the OSD, press the SAVE or EXIT button in the top menu or leave the OSD as it is for at least 30 seconds.

IMPORTANT

- In the OSD, pressing the 🔲 SET button applies the set value and enables the setting. The set value won't be canceled unless the power is turned OFF or the value is reset.
  If the power is turned OFF without saving the set value, that data will disappear. The last saved data will be read into the system when the FP starts. To enable the changed value, be sure to press the 🔲 SAVE button.
- All the setting values, even though in process of the OSD settings, will be retained in condition of letting the OSD leave more than 30 seconds or by pressing the 🔲 EXIT button. The OSD will keep those values and make them effective until power-off or a Reset command input.

■ Top Main

Color Settings

     🔲 SELECT   Selection of the change item   🔲🔲 Adjustment button

          ► Contrast
          ► R.Contrast
          ► G.Contrast
          ► B.Contrast
          ► Brightness

     🔲 SET   Applies the setting and then returns to the top menu.

     🔲 ESC   Cancels the setting and then returns to the top menu.

Screen Settings (Analog RGB only)

     🔲 SELECT   Selection of the change item   🔲🔲 Adjustment button

          ► H.Position
          ► V.Position
          ► H.size
          ► Phase

     🔲 SET   Applies the setting and then returns to the top menu.

     🔲 ESC   Cancels the setting and then returns to the top menu.

Custom Display

     🔲 SELECT   Selection of the change item   🔲🔲 Adjustment button

          ► Sharpness
          ► Dimmer
          ► Auto Adjust Enable
          ► OSD Transparent

     🔲 SET   Applies the setting and then returns to the top menu.

     🔲 ESC   Cancels the setting and then returns to the top menu.

□ System Settings

SELECT Selection of the change item ◄ ► Adjustment button

Click Tone — Enables/disables the click sound. With this parameter, the sound level can also be adjusted.
(Default value: OFF <Click sound disabled>)

720x400 Mode — When an input data resolution of 720 x 400 is used in the VGA text mode, set this parameter to ON. For other resolutions, set this parameter to OFF.
(Default: OFF)

Auto off Disp — Enables/disables the screen display Auto OFF function and sets the time when the Auto OFF function is enabled.
(Default: OFF <Auto OFF function disabled>)

The Auto OFF function automatically turns off the display to prevent the screen from burning out when the touch panel is not used for some period of time. With this parameter, you can set the time interval to turn off the screen display (how much time passes before the screen display is turned off) when the touch panel is not used. If the touch panel is not touched over the set time, the backlight will automatically turns off.

Select the time period from 1 min, 3 min, 5 min, 10 min, and OFF (Auto OFF function disabled).

BL Alarm — Enables/disables the Backlight burnout detect function.
(Default: ON)
When a burned-out backlight is detected, the status LED flashes alternately green and red, or a steady orange. Touch-operation will be disabled when the backlight burns out, which prevents the FP from sending input signals to the PLC.

IMPORTANT   • Normally, the FP unit detects a backlight burnout by monitoring the backlight's current flow, however, the FP may fail to detect this condition, depending on the type of backlight problem.

SET Applies the setting and then returns to the top menu.

ESC Cancels the setting and then returns to the top menu.

All Reset

→ **SET** Resets all the settings and then returns to the top menu.

→ **SET** Cancels the setting and then returns to the top menu.

Input Source

→ **SET** Applies the setting and then returns to the top menu.

→ **SET** Cancels the setting and then returns to the top menu.

Auto Adjust (Analog RGB only)

→ **SET** Applies the setting and then returns to the top menu.

→ **SET** Cancels the setting and then returns to the top menu.

> **IMPORTANT**
> • Be sure to perform the auto adjust while things except that black are shown on sides of the display.

Auto Gain (Analog RGB only)

→ **SET** Applies the setting and then returns to the top menu.

→ **SET** Cancels the setting and then returns to the top menu.

> **IMPORTANT**
> • Be sure to perform the auto gain control when the screen has both 100% black and 100% white areas displayed.

SELECT Icon decision

◀ ▶ Icon selection

SAVE Saves the setting and quits the OSD. Saves all the adjusted settings in the EEPROM.

EXIT End of OSD