DMC Co., Ltd.   DUSH

10.1" Wide (WSVGA)

Projected capacitive Touchscreen Module with LCD

Simple Set Plus

TK-S Series

Model: TK-SPA101WS-11A3

Product Specification

23A4A7-10002E-4

Table of Contents

23A4A7-10002E-4

Appendix
- Outline Drawing (SM3-002370-10)
- Appearance inspection standard
  (LCD Modules with Capacitive Glass Sensor Touchscreen) (22G4GX-00002E)

Downloads : https://www.dush.co.jp/english/download/
- Glass/Glass Structure Projected Capacitive Touch Screen, Mounting Guidance
  (DUS-N-series)
- Touch Screen Controller Specification: DUS1200 Product Specification

23A4A7-10002E-4

1   Summary

This is a "TK series Simple Set Plus" with 10.1" Wide projected capacitive touchscreen sensor, controller, and LCD(Liquid Crystal Display) plus HDMI Board.

2   Product Model

Model	Specification		
	LCD size (Resolution)	Touchscreen Type	Set Type
TK-SPA101WS-11A3	10.1" Wide (WSVGA)	Projected capacitive	Simple Set Plus

3   Components

Components	Name	Specification	Manufacturer	Model
TS+LCD	Touchscreen (TS)	Projected capacitive	DMC	DUS-N101WA060A/WS
	LCD	10.1" Wide	AUO	G101STN01.D
Accessories	Touchscreen controller	-	DMC	DUS1200
	HDMI board	HDMI input	DMC	SWAD-A3
	Image cable (L: 200mm)	-	DMC	23E3E4-00004
	Board-to-Board USB cable(L: 130mm)	-	DMC	23E3E4-10005

4 Packaging Specification

Depending on the number of shipments, individual packaging may be used instead of grouped packaging.

4-1 Grouped Packaging

Box	Contents	Specification	Size (W x D x H)
A	TS+LCD	Grouped packaging (10units/box)※	External dimension: 382×272×292
B	Accessories	Grouped packaging (10pcs/box)※	External dimension: 457×295×151

※May not be as specified according to the quantity shipped.

・Grouped Packaging Configuration (A)
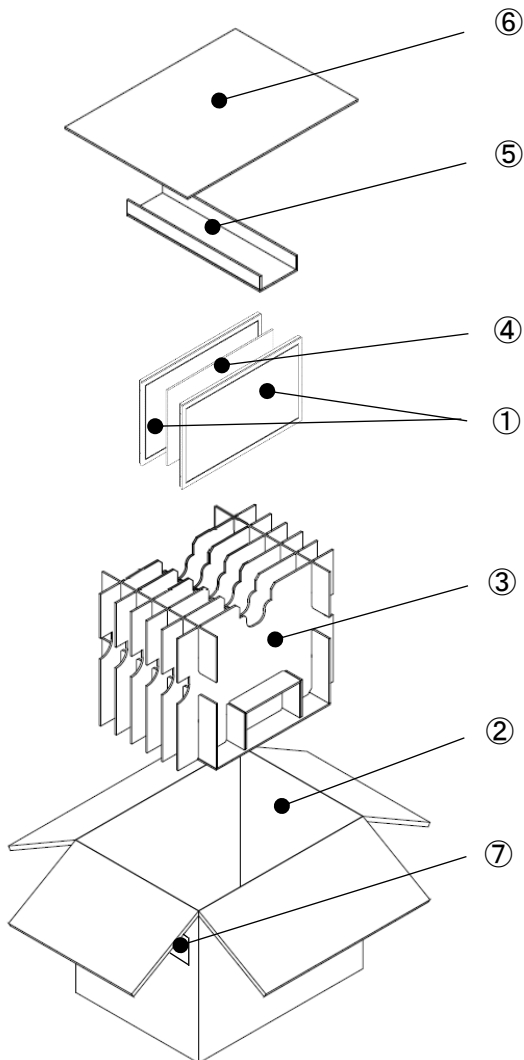
No.	Name		Qty
①	TS+LCD (placed inside antistatic bag)		10
②	Outer Box		1
③	Partition Set	Partition 1	6
		Partition 2	2
		Bottom Supporter	1
		Frame Divider	1
④	Pad between products		5
⑤	Top Supporter		1
⑥	Top Pad		1
⑦	Grouped packaging label		1

・Grouped Packaging Configuration (B)
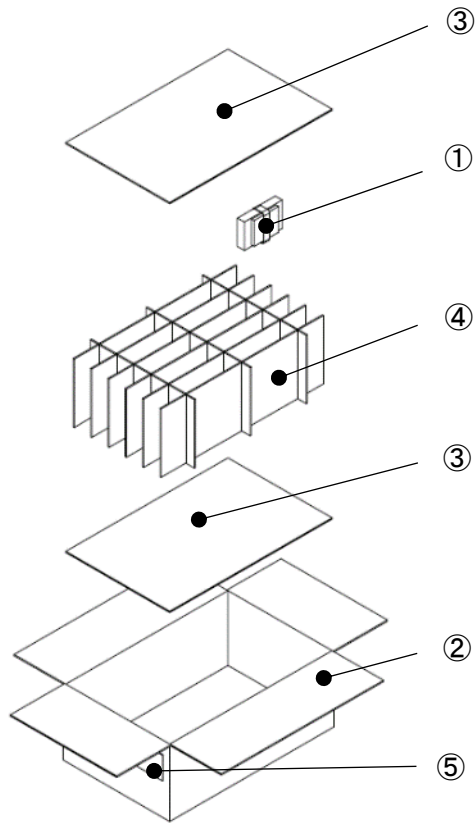
No.	Name		Qty
①	SWAD-A3 (placed inside air-cushion bag)		10
	DUS1200 (placed inside antistatic bag)		
	23E3E4-00004 (placed inside antistatic bag)		
	23E3E4-10005 (placed inside antistatic bag)		
②	Outer box		1
③	Top/Bottom pad		2
④	Partition Set	Partition A	3
		Partition B	6
⑤	Grouped packaging label		1

23A4A7－10002E－4

4-2 Individual Packaging

Box	Contents	Specification	Size (W x D x H)
C	TS+LCD, Accessories	Individual packaging (1unit/box)	External dimension 371×271×114

※One box includes TS+LCD and accessories.

・Individual Packaging Configuration (C)

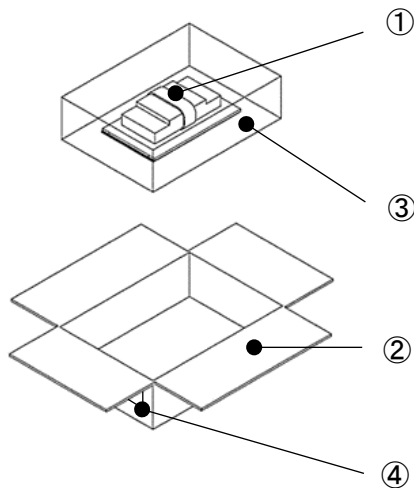| No.	Name	Qty
①	TS+LCD (placed inside antistatic bag)	1
	SWAD-A3 (placed inside air-cushion bag)	
	DUS1200 (placed inside antistatic bag)	
	23E3E4-00004 (placed inside antistatic bag)	
	23E3E4-10005 (placed inside antistatic bag)	
②	Outer box	1
③	Air cushion	-
④	Packaging label	1

5 Module Specification

5-1 Function

Item			Specification	units
LCD	Display device		10.1" Wide TFT LCD	-
	Display area (Active area)		222.72(W) ×125.28(H)	mm
	Pixels		1024(W) ×600(H)	-
	Pixel pitch		0.2175(W) ×0.2088(H)	mm
	Color		16.7M	colors
	Brightness (Typ.)		400	cd/m^2
	View angle (Typ.)	Vertical (Upper/Lower)	60 / 60	deg.
		Horizontal (Left/Right)	70 / 70	
	Interface		LVDS	-
	Backlight method		LED, with backlight driver	-
	Backlight life[1]		Min. 50,000	hours
Touchscreen	Touchscreen type		Projected Capacitive	-
	Input method		Finger	-
	Maximum simultaneous input point		5 point[2]	-
	Operating life(Continuous Typing)		50 million times(finger input)	-
	Communication Method		USB 2.0	-
	Supporting OS		※3	-
HDMI board	Input image port		HDMI (does not support HDCP)	-
	Input Signal	Digital	HDMI 1.3b	-
		Horizontal scan cycle	30K - 80K	Hz
		Vertical scan cycle	50 - 60	Hz
Module	Bonding method		Air-bonding (Bonding of LCD and touchscreen with double-sided tape.)	-
	Input power voltage[4]		12±5%	V
	Power consumption(Max.)		6	W

※1 Time until the backlight brightness declines by 50% from the initial value when continuously turned on at maximum brightness at the ambient temperature of 25°C.

※2 Operation may become unstable depending on the environment installed. Please perform calibration according to the instructions in "Section 10. Touchscreen Calibration" .

※3 Please refer to the "Touchscreen Controller OS Compatibility Table". (https://www.dush.co.jp/english/download/driver-app/) (Touchscreen controller referenced: DUSx200)

※4 If the capacity of the power supply used is large, the drop in voltage when it is turned off will be gradual. When restarting, please turn on the power again after the power supply voltage becomes 0V.

23A4A7-10002E-4

5-2 Environment

Item	Specification
Ambient operating temperature (Inside cabinet and display side)	0°C to 55°C
Ambient storage temperature	-20°C to 70°C
Ambient operating humidity	10%RH to 85%RH (Non-condensing. Wet-bulb temperature is 39 °C or less)
Ambient storage humidity	10%RH to 85%RH (Non-condensing. Wet-bulb temperature is 39 °C or less)
Dust	0.1mg/m^3 or under (Conductive dust is prohibited)
Corrosive Gas	Corrosive gas is prohibited
Pollution Degree	Pollution Degree 2, for indoor use

5-3 Mechanical Specification

Item	Specification	
Mass	TS (Touchscreen) + LCD	Approx. 400 g
	Touchscreen controller	Approx. 9 g
	HDMI board	Approx. 50 g
	Cables	Approx. 5 g
External Measurements (TS (Touchscreen)) + LCD, excluding protruding parts)	236.86(W) × 143.73(H) × (8.67)(D) mm	

5-4 Touchscreen Controller

For details, please refer to the downloadable document "Touch Screen Controller Specification : DUS1200 Product Specification" in the table of contents.

5-5 Touchscreen Driver

In order to use the touchscreen, you will need to install a touchscreen driver (DMT-DD).

To obtain the driver, please download it from the following site.

URL: https://www.dush.co.jp/english/download/driver-app/

For DMT-DD installing directions, please refer to the User's Guide included in the downloaded files.

5-6 HDMI Board

5-6-1 Model

Model	Image Input Port
SWAD-A3	HDMI ×1

5-6-2 External Dimension

Item	Measurement
PCB outline (excluding connector)	110mm x 80 mm
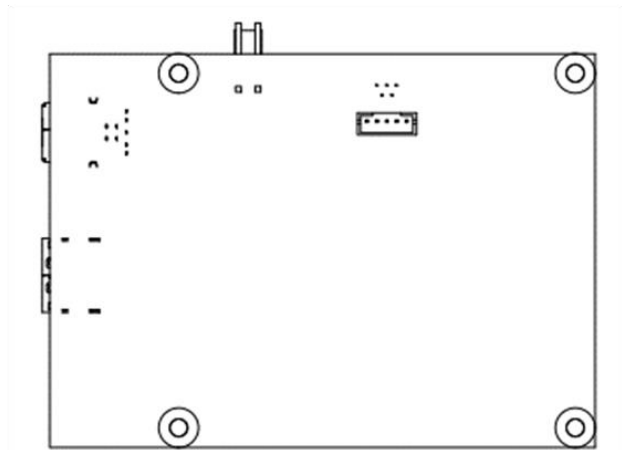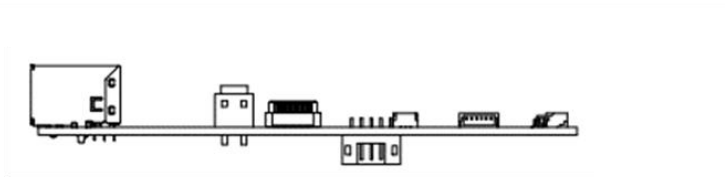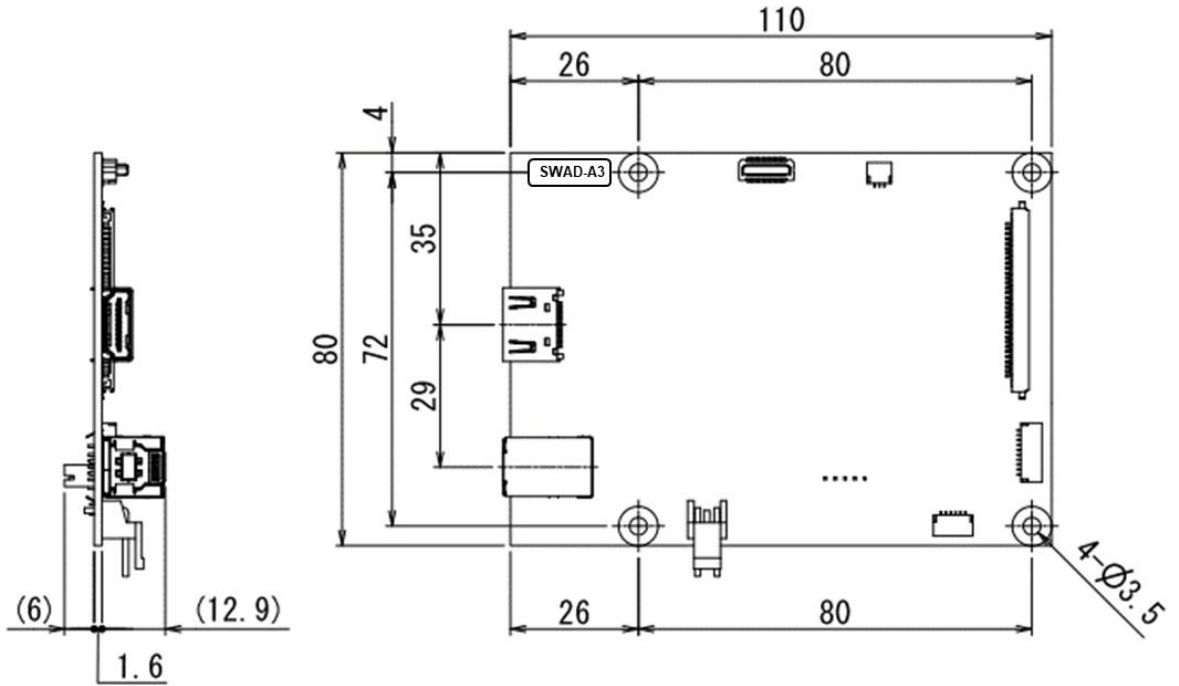
5-6-3 Support Timing

No	Resolution	Aspect Ratio	Refresh Rate
1	640×480p	4: 3	60Hz
2	720×480p	4: 3	60Hz
3	800×600p	4: 3	56Hz
4	800×600p	4: 3	60Hz
5	1024×768p	4: 3	60Hz
6	1280×720p	16: 9	60Hz
7	1280×960p	4: 3	60Hz
8	1280×1024p	5: 4	60Hz
9	1600×900p	16: 9	60Hz
10	1600×1200p	4: 3	60Hz
11	1680×1050p	16: 10	60Hz
12	1920×1080p	16: 9	60Hz

23A4A7-10002E-4

5-6-4 Part Names (HDMI Board)

⑦CN10

①CN7

②CN4

⑥CN8

④CN3

③CN1

⑤CN6

⑧CN9
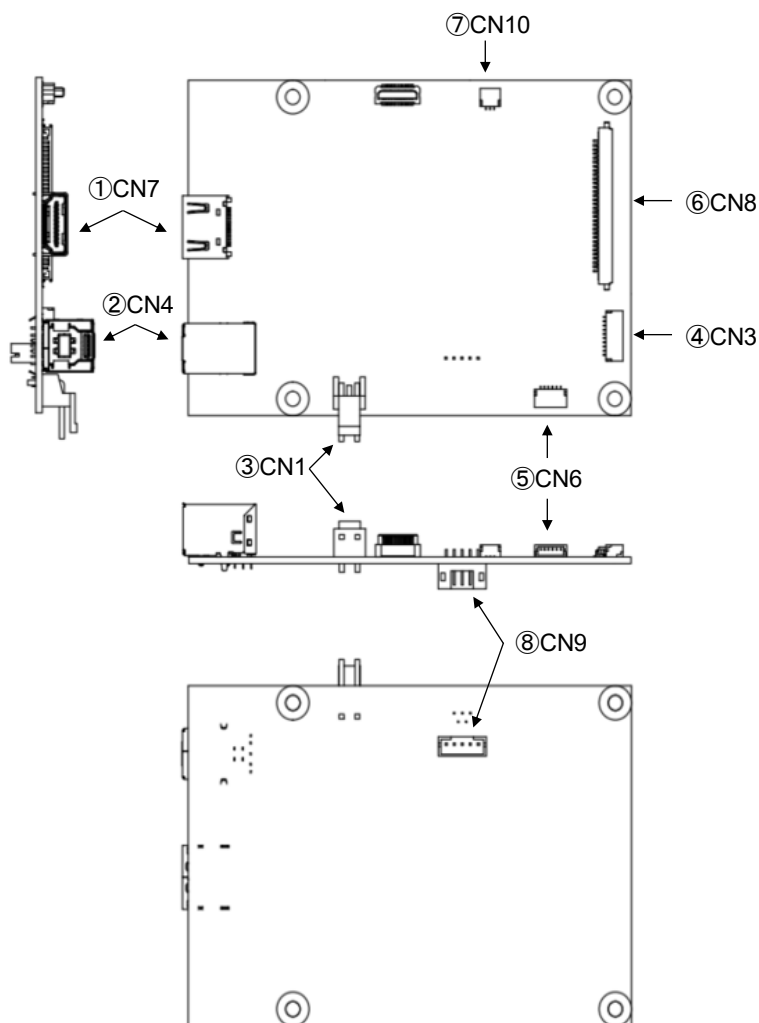
No.	Interface Name
①	Image input (HDMI)
②	Touchscreen control USB (USB 3.0 Type-B)
③	12VDC Power input (Nylon connector)
④	LCD Backlight control
⑤	Touchscreen controller connecting I/F※1 (USB 2.0, Nylon connector)
⑥	LCD Image output (LVDS)
⑦	Pilot lamp LED control
⑧	OSD control I/F(Nylon connector)

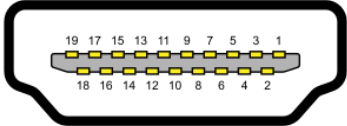※1 Connector for connecting the HDMI board and touchscreen controller.

※2 Use of other connectors not listed is prohibited. These are only internal adjustments for the manufacturer and may be excluded without prior notice.

23A4A7-10002E-4

5-6-5 Image Input (HDMI) I/F

Connector No.: CN7
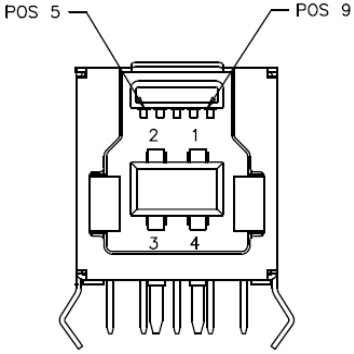
Interface: HDMI Type A

※HDMI standard compliant

PIN No	Signal Name	PIN No	Signal Name	Schematic Diagram
1	TMDS Data2+	11	TMDS Clock Shield	
2	TMDS Data2 Shield	12	TMDS Clock-	
3	TMDS Data2-	13	CEC (NC)	
4	TMDS Data1+	14	Reserved	
5	TMDS Data1 Shield	15	DDC Clock	
6	TMDS Data1-	16	DDC Data	
7	TMDS Data0+	17	DDC GND	
8	TMDS Data0 Shield	18	+5V Power	
9	TMDS Data0-	19	Hot Plug Detect	
10	TMDS Clock+	-	-	

5-6-6 Touchscreen Control USB I/F

Connector No.: CN4

Interface: USB3.0

Connector: USB3.0 Type-B

PIN No.	Signal Name	Description	Schematic Diagram
1	VBUS (5V)	Power	
2	D-	USB 2.0	
3	D+		
4	GND	GND for power return	
5	StdB_SSTX-	SuperSpeed transmitter	
6	StdB_SSTX+		
7	GND_DRAIN	GND for signal return	
8	StdB_SSRX-	SuperSpeed receiver	
9	StdB_SSRX+		
10	Shield		View from connector inserting side

* USB port for touchscreen control (can be connected to USB2.0 Type-B).
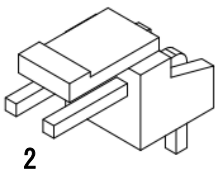
23A4A7-10002E-4

5-6-7　12VDC Power Input I/F

Connector No.: CN1

Interface: +12VDC Input

Connector: A3963WR2-2P(JWT)

※Equivalent to S2P-VH(JST)

PIN No.	Signal Name	Schematic Diagram
1	+12V	
2	GND	

5-6-8　LCD Backlight Control I/F

Connector No.: CN3

Connector: 1010-SMTR-10P(JWT)

※Equivalent to SM10B-SRSS-TBT (JST)

PIN No.	Signal Name	Description
1	12V	Backlight power
2	12V	
3	12V	
4	12V	
5	GND	Ground
6	GND	
7	GND	
8	GND	
9	BL_EN	Backlight ON/OFF High level: Backlight ON. Low level: Backlight OFF.
10	BL_PWM	Backlight dimming input

※Specifications (signals used) vary according to the connected LCD.

23A4A7-10002E-4

5-6-9 Touchscreen Controller Connection I/F

Connector No.: CN6

Interface: USB 2.0

Connector: 1010-SMTR-06P(JWT)

※Equivalent to SM06B-SRSS-TBT (JST)

PIN No.	Signal Name
1	VBUS
2	D-
3	D+
4	GND
5	RESETn
6	GND

※Specifications (signals used) vary according to the connected touchscreen controller.

※Connector for connecting the HDMI board and the touchscreen controller.

5-6-10 LCD(LVDS) Output I/F

Connector No.: CN8

Interface: LVDS

Connector: 1058-HL-SMTR-30P(Well-lin)

※Equivalent to FI-X30SSLA-HF (JAE)

PIN No.	Signal Name	PIN No.	Signal Name
1	O-Link0-	16	E-Link1+
2	O-Link0+	17	GND
3	O-Link1-	18	E-Link2-
4	O-Link1+	19	E-Link2+
5	O-Link2-	20	E-CLK-
6	O-Link2+	21	E-CLK+
7	GND	22	E-Link3-
8	O-CLK-	23	E-Link3+
9	O-CLK+	24	GND
10	O-Link3-	25	Panel VCC 3.3V
11	O-Link3+	26	Panel VCC 3.3V
12	E-Link0-	27	Panel VCC 3.3V
13	E-Link0+	28	Panel VCC 5V
14	GND	29	Panel VCC 5V
15	E-Link1-	30	Panel VCC 5V

※Specifications (signals used) vary according to the connected LCD.

23A4A7-10002E-4

5-6-11 **Pilot Lamp LED Control I/F**

Connector No.: CN10

Connector: 1010-SMTR-03P(JWT)

※Equivalent to SM03B-SRSS-TBT (JST)

PIN No.	Signal Name
1	LED_G
2	GND
3	LED_R

※Power supply 3.3V, limiting resistance 220Ω (board built-in)

5-6-12 **Pilot Lamp LED**

By preparing a LED board (refer to following circuit board diagram), the power of the HDMI board and the status of the image input signal can be indicated by LED.
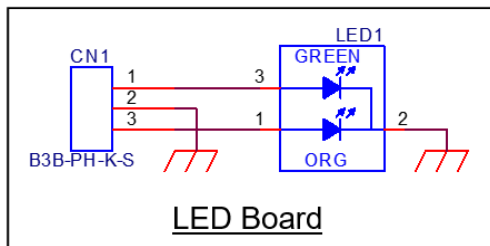
・**Status Indicating LED (Example)**

　　　Green light up: Power ON, with image input signal

　　　Orange light up: Power ON, without image input signal.

　　　LED off: Power OFF

・**Circuit diagram (Example)**

LED Board

23A4A7-10002E-4

5-6-13 OSD Operation I/F

Connector No：CN9

Connector：2000-WS-05P（JWT）

※Equivalent to B5B-PH-K-S (JST)

| PIN No.	Signal Name	Description
1	MENU_ENTER	By connecting to GND, the OSD menu can be displayed, and the set status can be fixed (ENTER function).
2	DOWN	By connecting to GND, shift leftward in the selection of icons on the top menu, shift upward in the selection of items on the submenu, change parameter of each item, and decrease the value of bar meter of each item.
3	UP	By connecting to GND, shift rightward in the selection of icons on the top menu, shift downward in the selection of items on the submenus, change parameter of each item, and increase the value of bar meter of each item.
4	GND	Ground
5	POWER_LCD ※1 ※2	By connecting to GND, turned ON/OFF the power of LCD.

※1 For continuous ON/OFF operation, please allow an interval of at least 5 seconds.

※2 The status is maintained even when the power to the HDMI board is turned on and off.

5-6-14 OSD Operation Switch Reference Circuit

6 Product Label

TK-SPA101WS-11A3 ← Model
S/N 2306000001 ← REV: A ← Revision
                              Serial No.
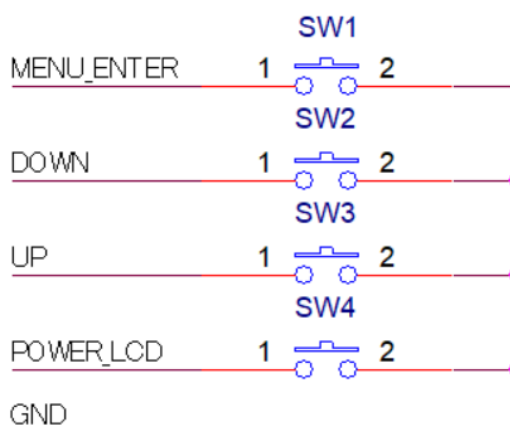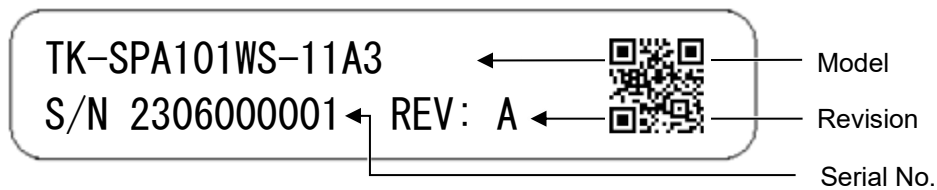
Above is an image example of the product label.

Below information will be indicated on the actual product.
・Model: Product Model
・Serial No.: 10 digit control number
・Revision: Alphabets (A to Z) according to the product revision
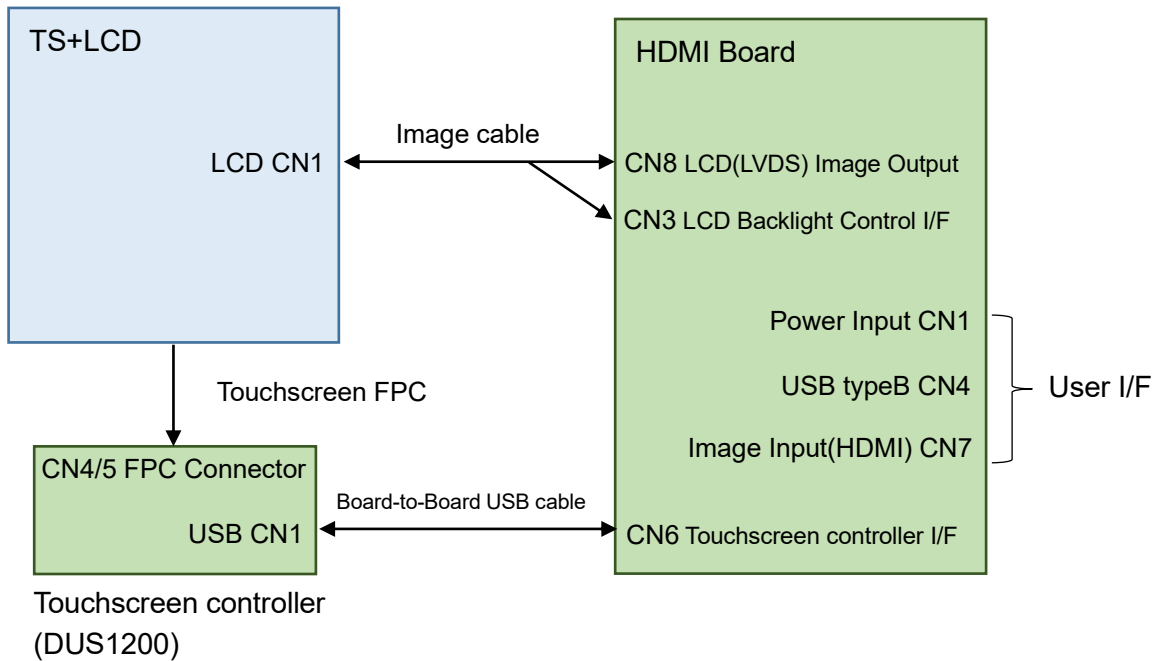
7 Compliant Standards

7-1 RoHS

Compliant to EU RoHS directives.

8 Appearance inspection standard

Please refer to "Appearance inspection standard(LCD Modules with Capacitive Glass Sensor Touchscreen)" (22G4GX-00002E) for standards.
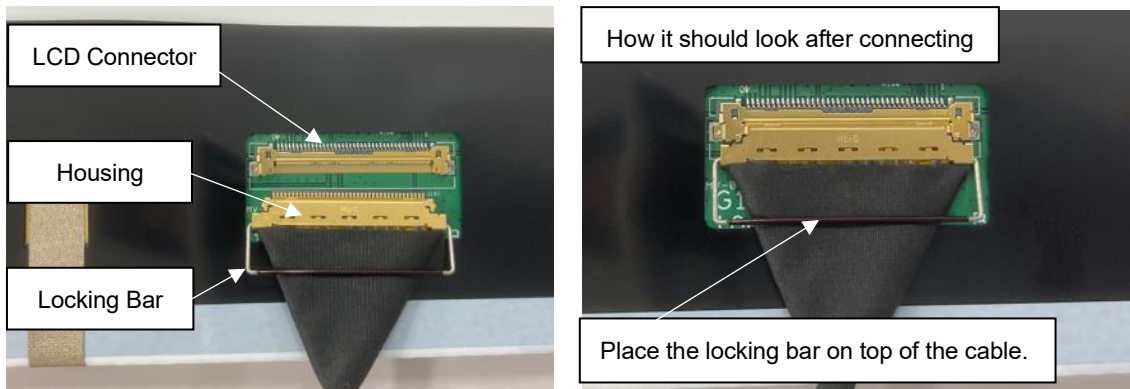
23A4A7-10002E-4
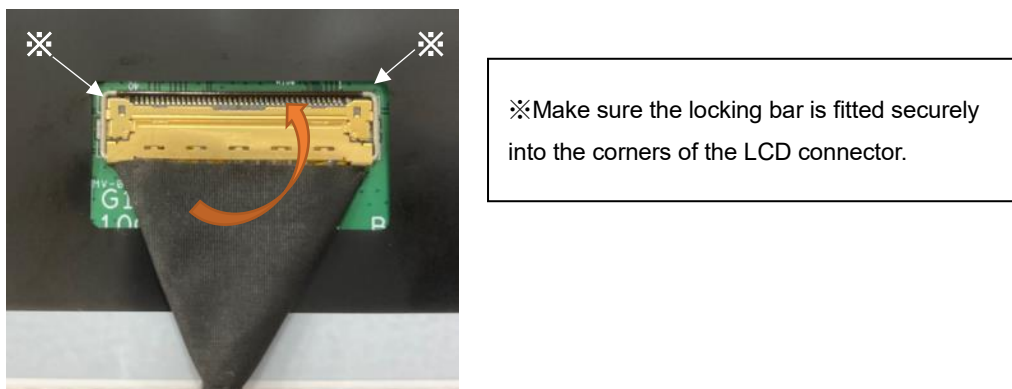
9 Connecting Method

## 9-1 Connecting Diagram

9-2 Connecting Image Cable to LCD

(1) Slide the housing of the image cable into the connector on the backside of the LCD in the direction shown below to mate.

(2) Fit the Locking bar into the LCD Connector (Locked)

※Make sure the locking bar is fitted securely into the corners of the LCD connector.

23A4A7-10002E-4

(3) Secure the locking bar with insulating tape so it will not come off (not required but recommended).
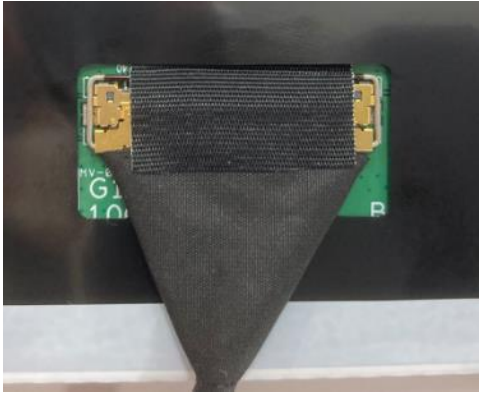
9-3 Connecting Touchscreen FPC to Touchscreen Controller

(1) Slowly pull the lock lever (actuator) with a fingernail or the like to unlock.

Locked state

Unlocked state

Unlocked state
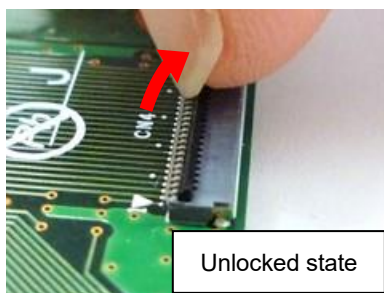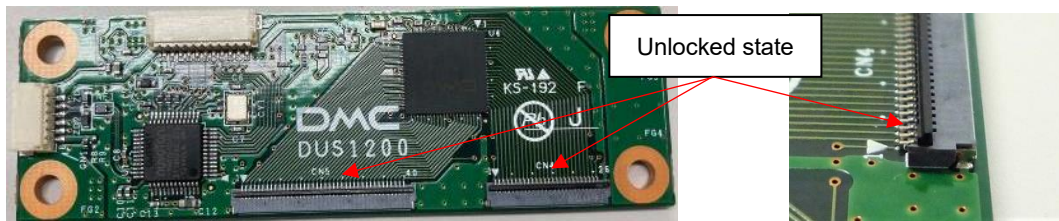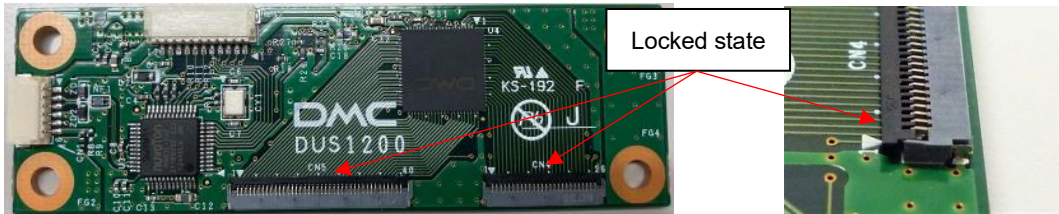
(2) Insert each of the touchscreen FPCs (face up the side where contacts are invisible) securely into each of the applicable connectors on the touchscreen controller, and push down the lock lever (actuator) to lock.

How it should look after connecting

Locked state

23A4A7-10002E-4
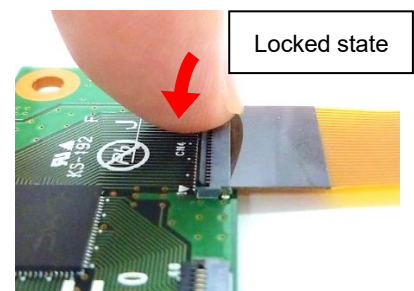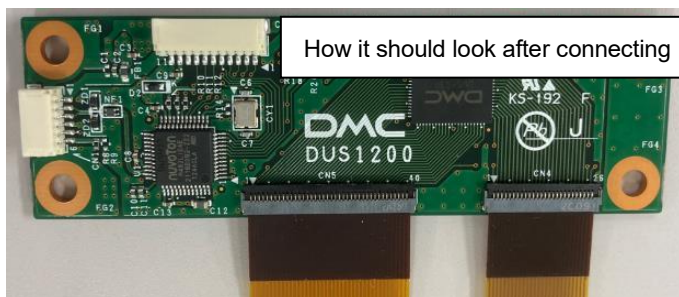
9-4 Connecting Image Cable to HDMI Board

(1) Insert the image cables securely into the connectors in the two locations of the HDMI board.

Insert with the connecting point facing up and visible.

How it should look after connecting

Insert with the connecting points facing down.

9-5 Connecting Board-to-Board USB Cable to HDMI Board

(1) Insert the board-to-board USB cable securely into the connector of the HDMI board as shown in the pictures below.

Insert with the connecting points facing down.

How it should look after connecting
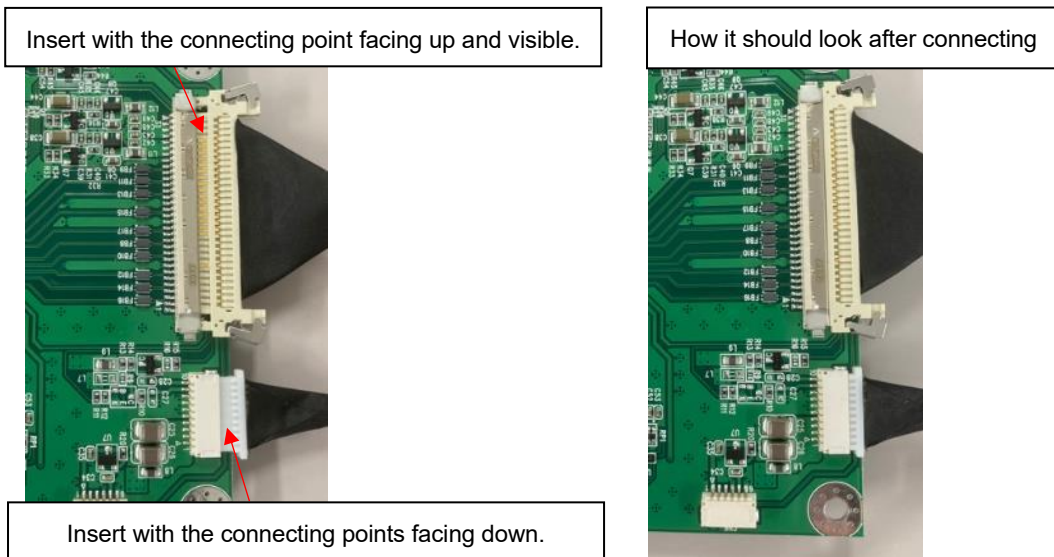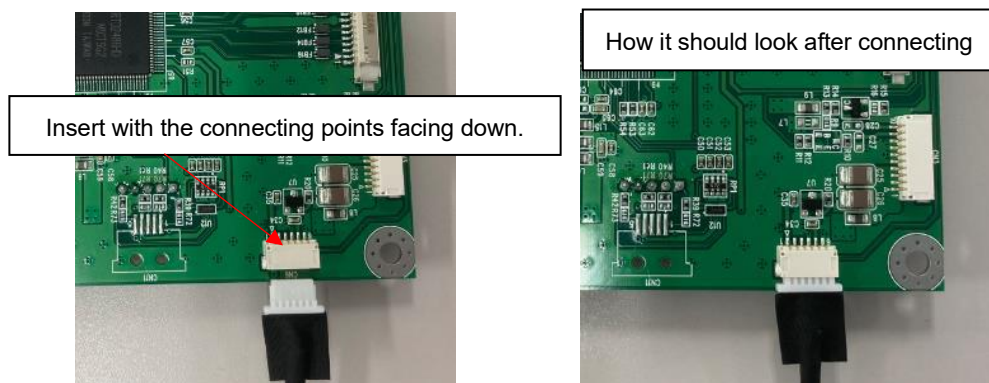
9-6 Connecting Board-to-Board USB Cable to Touchscreen Controller

(1) Insert the board-to-board USB cable securely into the connector of the touchscreen controller as shown in the pictures below.

Insert with the connecting points facing down.

How it should look after connecting

23A4A7-10002E-4
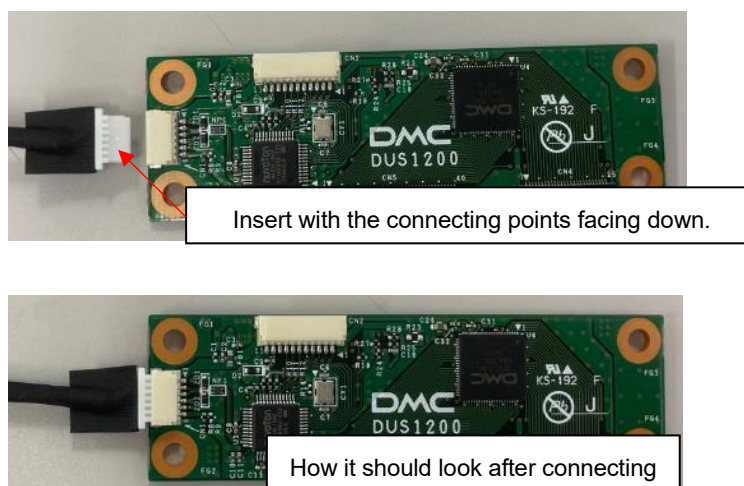
9-7 Connecting Each Cable to User I/F of HDMI Board

(1) Connecting the HDMI cable and the USB cable.

HDMI cable (for reference)

USB cable (for reference)
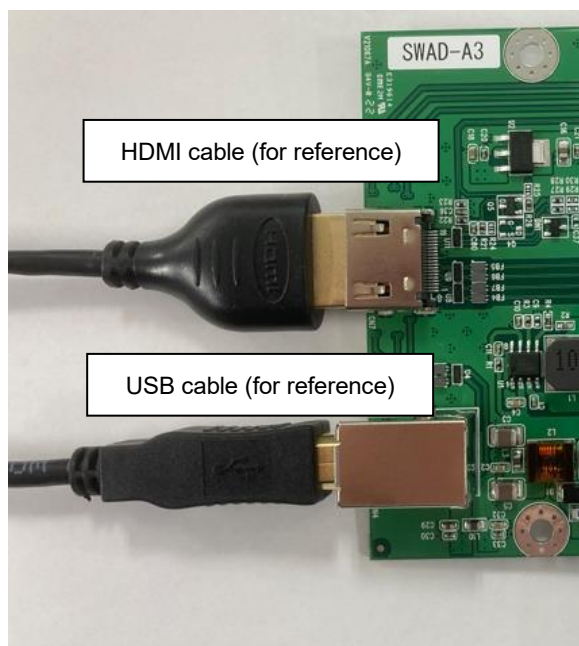
※Please insert securely.
※HDMI cable/ USB cable not included.

(2) Connecting the Power cable.

Power cable (for reference).
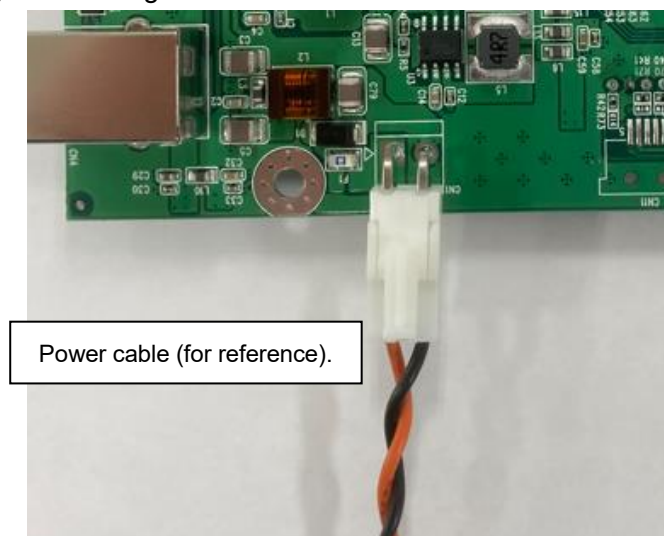
※Please insert securely.
※Power cable not included.

23A4A7-10002E-4

10 Touchscreen Calibration

Touchscreen operations may become unstable depending on the installation environment due to its characteristics. To use it correctly, please perform calibration when building into a device.

Install DMT-DD from"5-5. Touchscreen Driver" when calibrating.

10-1 Projected Capacitive Touchscreen

[TPOffset] …Sensitivity calibration.

(1) Start DMT-DD.
(2) Open [Touchscreen Maintenance] via [Basic Setting] > [Hardware Setting] and click [Open].
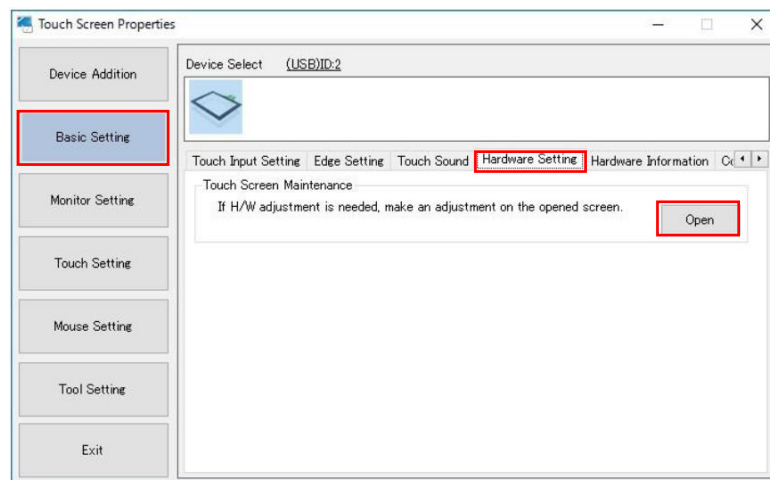
(3) Hardware calibration is complete when [Dev.0] [DONE] [0x00] turns green.

Maintenance Tool Screen (Example)
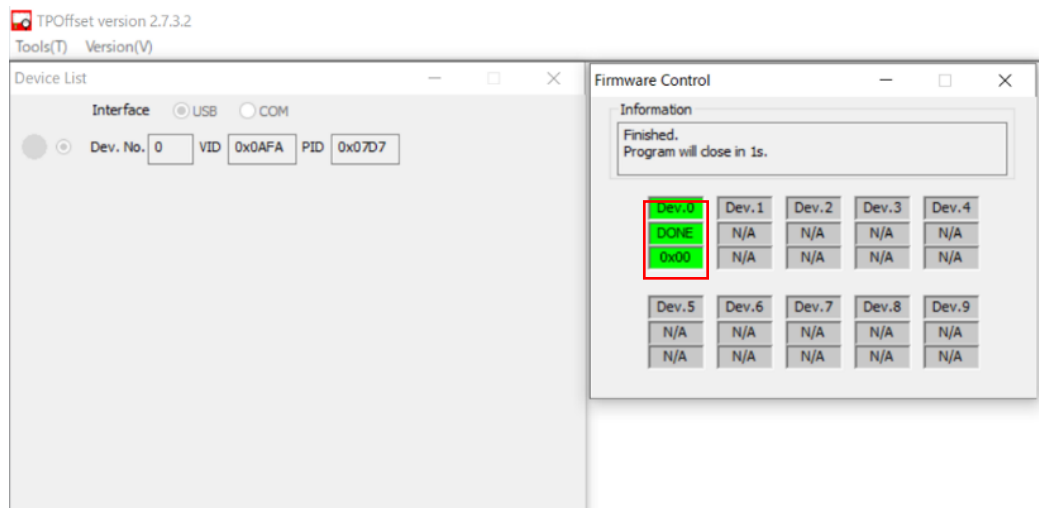
*[Setup Tool] cannot be operated while the [Maintenance Tool] is running.

*Please do not touch the touchscreen when calibration is being performed.

*This tool will automatically terminate after the calibration is completed.

23A4A7-10002E-4

11 OSD Function

Various configurations and adjustments can be made with the OSD (On Screen Display).

The OSD can be operated using the "MENU_ENTER" control and "UP" / "DOWN" control described in section "5-6-13 OSD Operation I/F (CN9)".

The value set once will be retained and will not be deleted when power is shut down.

11-1 OSD Menu

Top menu icons

Main Menu	Submenu	Adjustment range	Initial Value	Description
PICTURE	Brightness	0 ~ 100	100	Adjust brightness of display
	Contrast	0 ~ 100	50	Adjust contrast of display
	Sharpness	0 ~ 4	2	Adjust sharpness of display
	Exit	-	-	Go back to main menu
DISPLAY	Auto Adjustment	N/A (Analog RGB input operation is possible)		
	H Position	0 ~ 100	50	Adjust horizontal position of display.
	V Position	0 ~ 100	-	Adjust vertical position of display
	Pixel Clock	N/A (Analog RGB input operation is possible)		
	Phase	N/A (Analog RGB input operation is possible)		
	Exit	-	-	Go back to main menu
COLOR	Gamma	OFF 1.8 2.2 2.4	OFF	Adjust Gamma value
	Color Temp	5800K 6500K 7500K 9300K sRGB	User	Adjust color temperature ※The color temperatures (5800K to sRGB) are not adjusted. Please change the RGB in the User settings to adjust.
		User		R：G：B individually: 0 ~ 255 default value R:128, G:128, B:128
	Color Effect	Standard Dynamic Movie Photo Vivid	Standard	Adjust color effect
		User		R：Y：G：C：B：M individually: 0 ~ 100
	Auto Color	N/A (Analog RGB input operation is possible)		
	Exit	-	-	Go back to main menu

23A4A7-10002E-4

ADVANCE	Aspect Ratio	Full 16:9 4:3 5:4 Original	Full	Adjust aspect ratio
	Exit	-	-	Go back to main menu
INPUT	N/A (Only HDMI)			
AUDIO	N/A			
OTHER	Reset	-	-	Reset to initial value
	Menu Time	0 ~ 30	10	Set time display of OSD menu
	OSD H Position	0 ~ 100	50	Adjust horizontal position of OSD menu
	OSD V Position	0 ~ 100	50	Adjust vertical position of OSD menu
	Transparency	0 ~ 7	0	Adjust transparency of OSD menu
	Exit	-	-	Go back to main menu
INFOMATION (EXIT)	-	-	-	Exit OSD

11-2 OSD Menu Operation

11-2-1 System Configuration

Displaying the OSD

(1) Press "MENU_ENTER" switch to display the main menu of the OSD.

Selecting with the OSD

(1) Choose the icon on the OSD main menu by pressing "UP" / "DOWN" switch while OSD is displayed.

   The icon in yellow is the icon in the selected state.

(2) Press "MENU_ENTER" switch to choose icon.

(3) Choose the item on the OSD sub menu by pressing "UP" / "DOWN" switch while OSD is displayed.

   The item in white is the item in the selected state.

(4) Press "UP" / "DOWN" switch to change the value of "Bar Meter" and "Parameter", and press "MENU_ENTER" switch to set.

※ The set value will be retained in the Scaler Board. It will not change even after the power is turned OFF.

Exiting the OSD

(1) After making the adjustments, select [EXIT] of the sub menu to go back to the main menu.

(2) Select [INFORMATION] of the main menu to end the OSD.

※ If an operation is aborted, the OSD will automatically close at the auto close Time (Menu Time).

   Refer to "11-2-4　Setting Auto close Time (Menu Time) of OSD Menu"for details on how to set the OSD Timer.

11-2-2 **Adjusting Brightness**

(1) Open the OSD menu.

(2) Select [PICTURE] (main menu icon) > [Brightness] (submenu item).

(3) Adjust the bar meter of [Brightness], brightness of the LCD can be changed in real time.

(4) Set your preferable brightness.

(5) End the OSD menu.

11-2-3 **Changing Color Temperature**

(1) Open the OSD menu.

(2) Select [COLOR] (main menu icon) > [Color Temp] (submenu item).

(3) Set your preferable color temperature.

(4) Select [User] ,individual colors "R"(Red),"G"(Green),"B"(Blue) can be adjusted.

(5) End the OSD menu.

※Depending on the LCD you prepared, it may not be possible to set the color temperature
correctly.

11-2-4 **Setting Auto Close Time (Menu Time) of OSD Menu**

Set the auto close time (Menu Time) to automatically close the OSD menu.

The auto close time of the OSD menu can be set 0 ~ 30 seconds.

Set the value "0", the OSD menu will not be closed.

Please note that even if the value is not set ("MENU_ENTER" switch is not pressed), the value
you lastly adjusted will be set when the timing of the OSD menu close.

(1) Open the OSD menu.

(2) Select [OTHER] (main menu icon) > [Menu Time] (submenu item).

(3) Press "UP" / "DOWN" switch, change the value (0 ~ 30s) of the "Bar Meter".

(4) Set your preferable auto close time.

(5) End the OSD menu.

11-2-5 **Return to Initial Values**

Return the values of the OSD to the initial state.

(1) Open the OSD menu.

(2) Select [OTHER] (main menu icon) > [Reset] (submenu item).

23A4A7-10002E-4

12 Terms of Use

12-1 Installing Projected Capacitive Touchscreen

❶ If surrounding environment changes or materials to alter the electrical field (a large capacitor, power-supply unit, LCD panel, or materials with high dielectric constant) is near, these external factors will adversely affect the function of the touch screen to detect the correct input positions.

❶ At structure design, please refer to the mounting guidance below and ensure enough gap distances among each component in order to avoid the external factors described above.

(1) When placing the panel and touchscreen on the same surface

- Place keep a distance of at least 2mm or more between panel and touchscreen and 1mm or more from the FPC tail.

2mm or more
1mm or more
Touchscreen
Panel
LCD
FPC tail
Keep at least 1 mm away from the LCD and Panel.
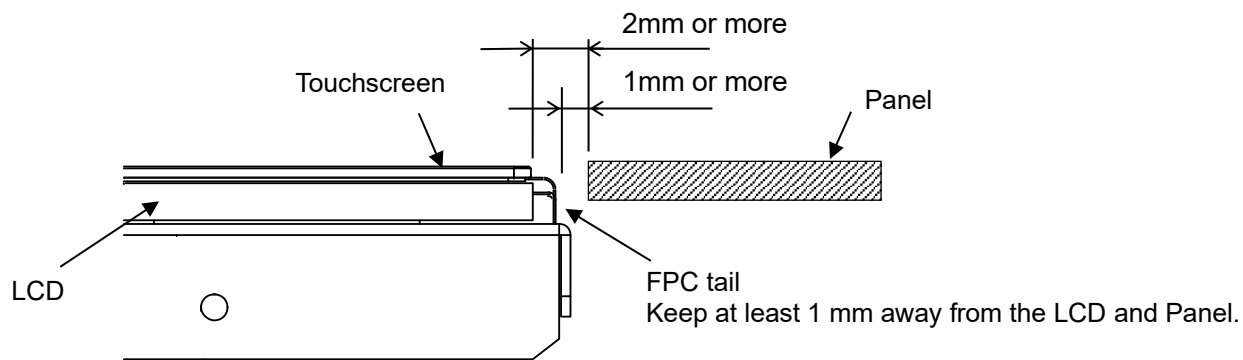
(2) When bezel comes on top of touchscreen surface

- It is recommended that the bezel placed on the top of the touchscreen be made of insulating resin. Please make sure to keep a distance (L1) between the touchscreen and the bezel as seen in the below diagram.
- When a sheet metal bezel is used, capacitive coupling with the sheet metal may occur at the outer periphery of the active area. When designing the bezel with metal materials such as sheet metal, ensure that the cap L2 between the touchscreen and the bezel is 2 mm or more.
- Please keep the FPC tail of the touchscreen as far as possible form the metal.

Cushion
Bezel
Touchscreen
L1
L2
LCD
FPC tail
Keep at least 1 mm away from the LCD.
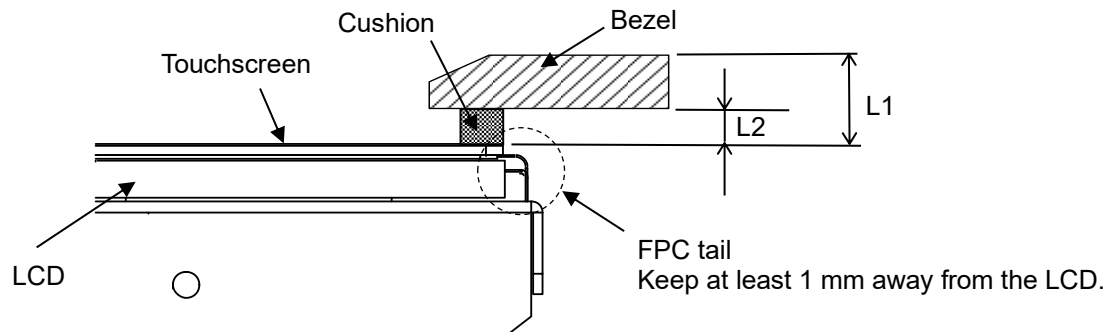
Please make sure the below dimensions are kept to prevent the touchscreen from malfunctioning.

L1 $\geqq$ 2mm : Distance between bezel surface/ touchscreen.

L2 $\geqq$ 2mm : When using a sheet metal bezel, it is recommended that a distance of more than 2mm be secured between the touchscreen and the back side of the bezel.

23A4A7-10002E-4

12-2 Installing Module

(1) For stable brightness and display, connect the GND via the mounting hole on the LCD.

(2) Install the module so that no external pressure is applied to the LSI mounting area.

(3) Make sure there are no warping and twisting when installing.

(4) Make sure the specified temperature and humidity between the module and other structures or parts are taken into consideration to secure ventilation.

(5) Take anti-static measures such as wearing grounding arm bands during assembly.

(6) To prevent malfunction or damage, please insert each cable and touchscreen FPCs completely and securely to the connector.

(7) Be sure to fix the LCD when mounting the module to a chassis. For the touchscreen with a cover glass, please also consider how to fix the touchscreen. Since the LCD and the touchscreen are attached with double-sided tape, the LCD may fall off if only the touchscreen side is fixed.

12-3 Precautions for Use of LCD

(1) The LCD contains irritants inside. If by any chance the liquid should flow out due to damages and come in contact with the skin, wash immediately under running water for more than 15 minutes and consult a physician.

(2) LCD may have uneven brightness depending on the contents displayed. Please note that this is not a malfunction.

(3) LCD elements may have spots (black spots/ bright spots). This is a characteristic of the LCD and not a malfunction.

(4) When the screen is viewed outside the viewing angle, the color displayed may appear to change. This is a basic characteristic of the LCD and not a malfunction.

(5) When the same image is displayed for a certain long period of time, the image may remain as an afterimage. This is a basic characteristic of the LCD.
In order to avoid afterimages, use a screensaver or other similar functions to periodically change the displayed image and avoid displaying the same image for a long period of time.

12-4 Precautions for Projected Capacitive Touchscreen

(1) If there are changes in the ambient environment or some elements that change electric fields (capacitors with large capacity, power units, and materials with high permittivity such as metals) are close to the product, they might affect the coordinate detection. Make sure to keep a good distance from the above unstable elements as much as possible when designing.

(2) Due to the characteristics of the touchscreen, its functions might become unstable according to the environment where it is installed. For correct operations, perform sensitivity sensor calibration when building into a device. Also if at any time the touchscreen operation becomes unstable due to changes in the installation environment or installation conditions, perform sensitivity sensor calibration.

(3) The touchscreen surface is made of glass. Glass becomes easy to break if scratched. Please handle with care and avoid glass from hitting other glass and hard objects.

(4) Touchscreen may not operate correctly when there is moisture on the surface.
When moisture is detected on the touchscreen surface, please wipe it dry before use.

23A4A7-10002E-4

(5) Due to the characteristics of the touchscreen, a position slightly outside the displayed area might be recognized as a coordinate position. Please give adequate consideration to it and design applications.

(6) Be careful when handling the end face of the glass as operators easily get injured.

12-5 Precautions for Static Electricity

(1) Static Electricity may cause damages. Please take sufficient measurements when handling.

(2) Operators handling the product should take antistatics measures. Wearing grounding bands is recommended.

12-6 Operating Precautions

(1) When used outside the specification standards, it may significantly affect product quality and service life, such as degradation of display quality and generation of air bubbles. Please be sure to use it within the specifications.

12-7 Storing Precautions

(1) When storing the module, please avoid areas of high temperature and humidity. Especially when storing for a long period of time, make sure to store in a place that is not exposed to direct sunlight and/or fluorescent lighting.

(2) Please store the module in a condition where it is not subject to excessive load.

12-8 Handling Precautions

(1) Do not leave the product in an environment with high temperatures for a prolonged period. Make sure to avoid high humidity especially when the temperature is above 40℃. Failing to do so may cause polarizing plate deterioration, peeling, and/or bubbles to form.

(2) If the surface of the polarizing plate becomes dirty, wipe it lightly with a soft material such as cotton cloth moistened with a small amount of ethyl alcohol.

(3) Make sure to wipe off immediately any form of liquids to avoid deformation, discoloration, or fading of the polarizing plate.

(4) Condensation on the polarizing plate during testing is prohibited to prevent staining, discoloration, or spots to form on the plate.

(5) Disassembling the module and/or changing the volume of the module are prohibited. Doing so may cause malfunction and failure to perform correctly.

(6) This product is intended for use in general electronic equipment and is not intended for use in special environments such as corrosive gas atmosphere. If use in a special environment is anticipated, please evaluate the product thoroughly or take precautions not to expose the LCD to corrosive gases, etc.

(7) This product is intended for use in standard applications (office equipment, industrial, communication, and household equipment, etc.). Do not use the products for special applications that require extremely high reliability (e.g., aerospace, nuclear power control, medical applications for life support, etc.) or where malfunctions or failures may directly cause injuries to the human body.

(8) Do not rub or press the product with hard or sharp objects.

(9) Keep away from flames/fire.

(10) Avoid wiping the product with excessive pressure.

(11) Avoid locally rubbing the product with strong pressure. It may cause damage to the function of the touchscreen.

(12) When operating the product, please avoid striking it with a hard object.

(13) Do not forcibly fold or bend the product.

(14) When storing the product, use the packing box and keep it within the specified storage temperature and humidity and in an environment where it is free of excessive pressure and loads.

(15) Avoid using and storing the product where it can be exposed to or come in contact with liquids, organic solvents, and an acidic atmosphere.

(16) Avoid using the product in direct sunlight.

(17) Do not pull off or disassemble the product.

(18) When handling the product, hold the main unit and not the touchscreen FPC (tail).

(19) EMC (EMS, EMI) evaluation is not conducted at shipment. Please conduct overall evaluation and confirmation after the product has been installed in your equipment.

13 Warranty

The warranty period is limited to12 months (1 year) from the date of shipment. Any defects that occur upon normal use under conditions specified herein will be repaired (factory repair) free of charge. (Warranty for any repair needed to the same repaired part of the same product is three months.)

You will be liable for all repair fees even within the warranty period for any conditions listed below.

(1) Any malfunctions, defects, and/or damages that occurred during transport, transfer, or mishandling by the user after delivery.

(2) Any malfunctions, defects, and/or damages caused by natural or man-made disaster.

(3) If the product is used under any condition, environment, or method other than those specified in the specifications, catalogs, manuals, notes, and/or other documents.

(4) Any malfunctions, defects, and/or damages caused by connected equipment and/or usage of inappropriate consumables and media.

(5) If the product is repaired, remodeled, modified, or disassembled by a party other than DMC Co., Ltd, or if a serial number label cannot be verified.

(6) Any failure, damage, or malfunction is deemed to be caused on your behalf.

This warranty covers only the product itself. Any damages, on-site repairs and replacement driven by the failure of the product will be decided upon discussion by both parties as necessary. This product is structurally not repairable. All damaged parts are subject for replacement and freight will be charged.

14 Production Discontinuance

In the event of production discontinuance, an announcement will be made six months prior to the last possible order reception date.

23A4A7-10002E-4

15 Other

For comments or queries, feel free to contact us.

North South America area
technical-global@dush.co.jp

Asia Pacific area
technical-global-asia@dush.co.jp

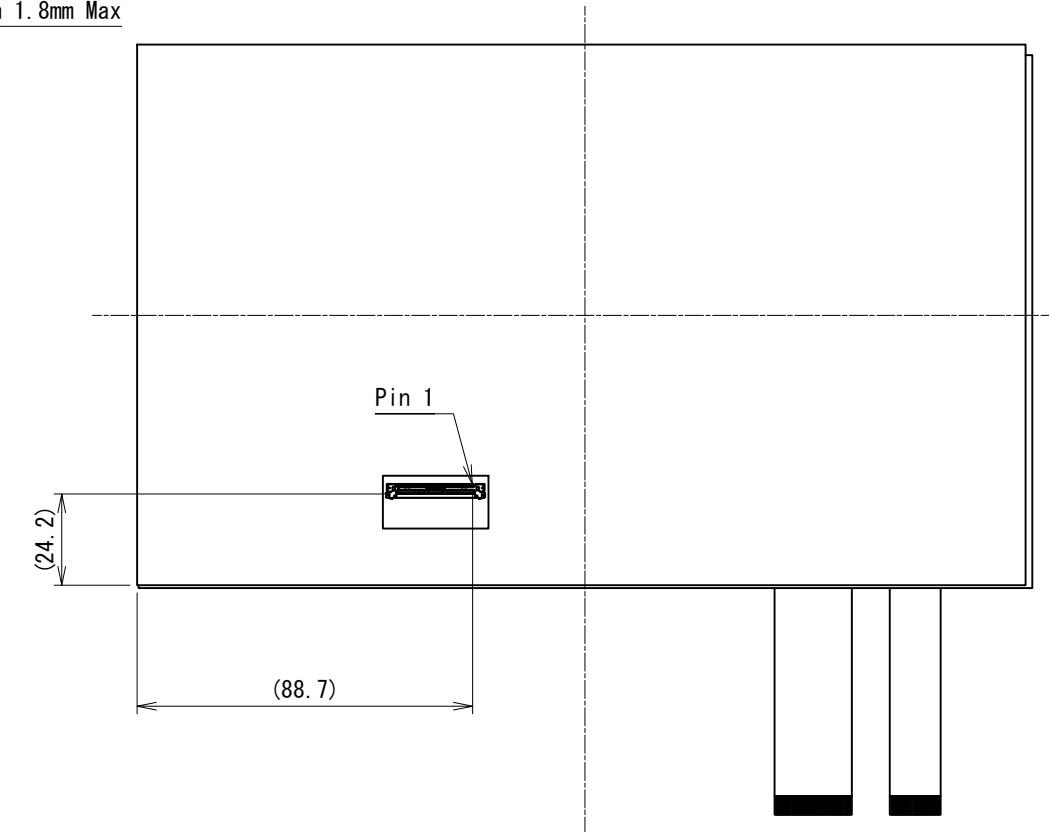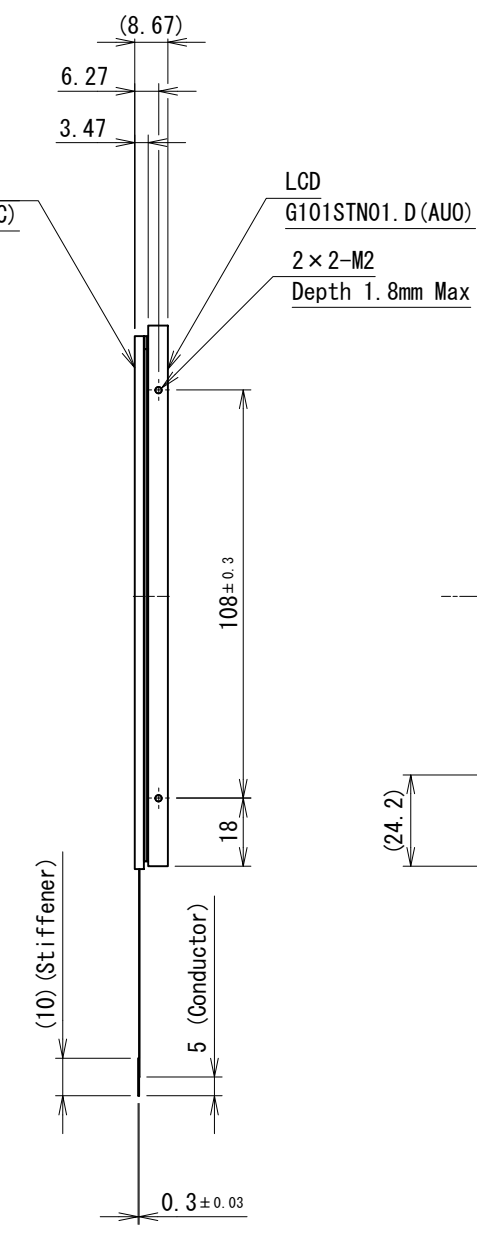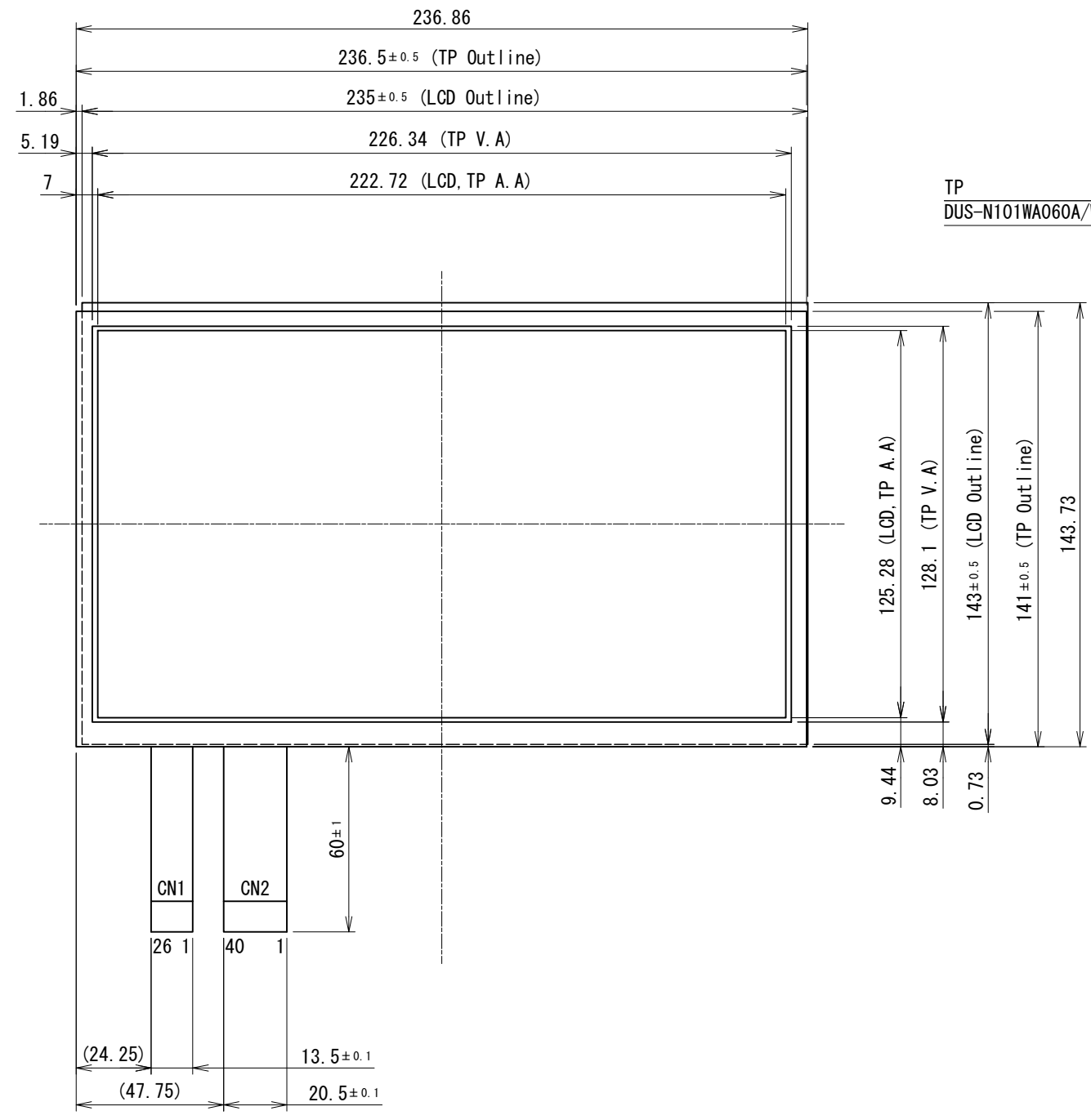Europe, Middle East, Africa area
technical-global-eu@dush.co.jp

FAQ
https://www.dush.co.jp/english/support/faq/

23A4A7-10002E-4

SYM	改訂日 DATE	改 訂 内 容 DESCRIPTION	ページ PAGE	担当 DESIGNED
	2023.05.22	新規図面登録	－	S. Takada

236.86
236.5±0.5 (TP Outline)
235±0.5 (LCD Outline)
226.34 (TP V.A)
222.72 (LCD, TP A.A)
1.86
5.19
7

(8.67)
6.27
3.47

TP
DUS-N101WA060A/WS(DMC)

LCD
G101STN01.D(AUO)

2×2-M2
Depth 1.8mm Max

125.28 (LCD, TP A.A)
128.1 (TP V.A)
143±0.5 (LCD Outline)
141±0.5 (TP Outline)
143.73

108±0.3
18

Pin 1
(24.2)
(88.7)

9.44
8.03
0.73

(10) (Stiffener)
5 (Conductor)
0.3±0.03

CN1
CN2
26 1
40 1
60±1

(24.25)
(47.75)
13.5±0.1
20.5±0.1

NOTES
1. タッチ方式：投影型静電容量方式
   Type：Projected Capacitive Touchscreen
2. ITOガラス：厚さ2.35mm
   ITO Glass：thickness 2.35mm
3. LCD Connector：IPEX 20455-040E-12R (IPEX or compatible)
4. 指示無き寸法公差は、±0.5mmとする。
   Tolerance shall be of ±0.5mm Unless specified otherwise.

製図日 ISSUED	2023.05.22	部署 SECTION	Technical Dept.	尺度 SCALE		CAD登録名 CAD FILE NAME	OUTLINE_TK-SPA101WS-11A3	RoHS対応品 RoHS compliant	
承認 APPROVED	検図 CHECKED	製図 DRAWN	設計 DESIGNED	1:2		製品名 MODEL	TK-SPA101WS-11A3		
T.Okada	S.Yoshimoto	S.Takada	S.Takada	単位 UNIT mm		図名 TITLE	OUTLINE	ページ PAGE	1/1
DMC Co., Ltd.				A3		図番 DWG No.	SM3-002370-10		

Appearance inspection standard

LCD Modules with Capacitive Glass Sensor Touchscreen

Document No.	22G4GX-00002E	Page (Cover Excluded)	2

Revision history				
Revision	Date	Person in charge	Page	Description
0	2023/3/10	Imada	—	Initial Preliminary

Appearance inspection standard (1   )

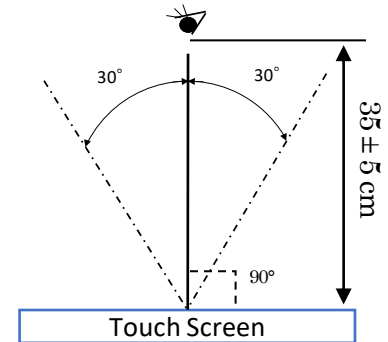## 1.1 Inspection condition

Inspection Distance : 35 ± 5 cm

View Angle : Inspection under non-operating condition : ± 30°

Ambient Illumination :   500~2000 lux

Inspection time : 3~5 seconds

1.2 Scratch, dust (W = width, L = length, D = average diameter = (longest + shortest) /2))

Total defects on each panel.
【 14 inches ＜ Size ≦ 22 inches 】   Within 10 pcs / panel
【   ＜ Size ≦   14 inches 】   Within 7 pcs / panel

Item	Width(mm)	Length(mm)	Acceptable Numbers
Linear (Foreign substance/scratch/ transparent defects) *1 Defects over 0.2mm in diameter will be judged in circular.	0.15＜W≦0.2	L≦10	Up to 4pc per product
	0.1＜W≦0.15	L≦20	Up to 6pc per product
	W≦0.1	Acceptable	Acceptable
Circular (Foreign substance/scratch/ transparent defects) *1	0.5＜D≦0.7		Up to 1pc per product
	0.3＜D≦0.5		Up to 6pc per product
	D≦0.3		Acceptable

*1   Transparent defects mean, e.g. bubble , lint etc…
(Lint is the defect that is different transparent from other part due to the elevating surface by printing over foreign substance.)
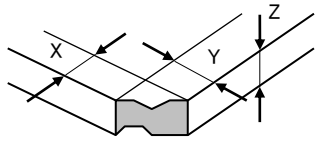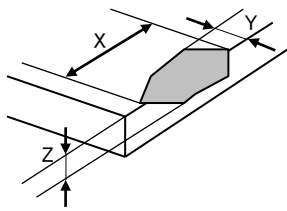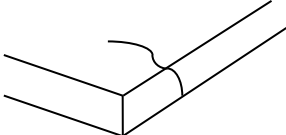
・Stains are acceptable as long as they are not clearly outlined and are not noticeable.
・Applied only in the Viewing Area.
 Scratches or dusts in the outside of the Viewing Area are acceptable unless the electrical characteristics are affected.

Product	LCD Modules with Capacitive Glass Sensor Touchscreen	Document No.	22G4GX-00002E-0

Appearance inspection standard （ 2 ）

1.3 Chip(cover glass , touch panel)　(t = Glass thickness)

Item	Size(mm)			Acceptable Numbers
Corner		X	1.0≦X≦2.0	Up to 2pc per product. X・Y＜1.0mm is acceptable But, if the chip reaches to color printing,it is unacceptable.
		Y	1.0≦Y≦2.0	
		Z	≦t	
Other than at corners		X	≦5.0	Up to 8 defects per product, but each defects must be 15mm away from each other at each side. Y<1.0mm is acceptable. But, if the chip reaches to color printing,it is unacceptable.
		Y	1.0≦ Y ≦2.0	
		Z	≦t/2	
Progressive Crack				Not acceptable

1.4 Appearance criteria for color-printed area of covering glass (judged from surface view)

Item	Defect contents	Acceptable range	
Color Peeling	Color print coming off	Unacceptable	
Color Lacking	Color print partly missing	Unacceptable	
Color Running	Ink bleed	The defect should not be over edge face	
Scratch	Scratch on color-printed part	Base glass should not be exposed	
Color Unevenness	Color thickness is uneven	Should be no color unevenness that can be easily detected. (should not be detectable by gaze for 4‐6 seconds)	
Pinhole through to the base glass,Adhering foreign substance which is different color from the printing	a：0.2 mm< D ≦ 0.3mm b：D ≦ 0.2mm	Acceptable quantity	Total acceptable quantity
		a：2pcs in φ30mm b：Acceptable	Up to 5pc per product
Tilt/Misalignment	―	Should be within tolerances indicated by the drawing	

Product	LCD Modules with Capacitive Glass Sensor Touchscreen	Document No.	22G4GX-00002E-0