

Contents in this document may change without prior notice.
Please obtain the delivery specification for the final design.



7.0" Wide (WVGA)

Projected Capacitive Touchscreen Module with LCD

Simple Set Plus

TK-S Series

Model: TK-SPA07BWV-01A4

Product Specification

DMC Co., Ltd.

<https://www.dush.co.jp/english/>

Table of Contents

1	Summary	3
2	Product Model	3
3	Components	3
4	Packaging Specification	4
4-1	Grouped packaging	4
4-2	Individual Packaging	6
5	Module Specification	7
5-1	Function	7
5-2	General Specification	7
5-3	Environment	8
5-4	Mechanical Specification	8
5-5	Touchscreen Controller	8
5-6	Touchscreen Driver	8
5-7	HDMI Board Specification	9
5-7-1	Model	9
5-7-2	External Dimension	9
5-7-3	Support Timing	10
5-7-4	Part Names (HDMI Board)	10
5-7-5	Image Input (HDMI) I/F	11
5-7-6	12VDC Power Input I/F	11
5-7-7	LCD Backlight Control I/F	12
5-7-8	LCD (LVDS) Output I/F	12
6	Product Label	13
7	Compliant Standards	13
7-1	RoHS	13
8	Appearance inspection standard	13
9	Option Items	14
10	Connecting Method	14
10-1	Connecting Diagram	14
10-2	Connecting Image Cable to LCD	14
10-3	Connecting Touchscreen FPC to Touchscreen Controller	15
10-4	Connecting Image Cable to HDMI Board	16
10-5	Connecting USB Cable to Touchscreen Controller	16
10-6	Connecting Each Cable to User I/F of HDMI Board	17
11	Touchscreen Calibration	18
11-1	Projected Capacitive Touchscreen	18
12	Terms of Use	19
12-1	Installing Module	19
12-2	Precautions for Use of LCD	19
12-3	Precautions for Projected Capacitive Touchscreen	19
12-4	Precautions for Static Electricity	20
12-5	Operating Precautions	20
12-6	Storing Precautions	20

12-7	Handling Precautions	20
13	Warranty	21
14	Production Discontinuance	21
15	Other	22

Appendix

- Outline Drawing (SM3-002529-10)
- Touch Screen Controller Specification: DUS1000 Product Specification (DEC-S0102A)
- 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)

1 Summary

This is a "TK series Simple Set Plus" with 7.0" Wide projected capacitive touchscreen sensor, controller, and LCD (Liquid Crystal Display) plus HDMI Board.

2 Product Model

Model	Specification			
	LCD size (Resolution)	Touchscreen Type	Bonding Method	Set Type
TK-SPA07BWV-01A4	7.0" Wide (WVGA)	Projected Capacitive*1	Air-bonding *2	Simple Set Plus

*1. After installing the device, be sure to run the touch panel adjustment tool TPOffset (capacitance value offset) the first time you use it.
There is no need to run it from the second time onwards.
Run TPOffset again if the usage environment has changed or if you feel that the operation feel has changed from before.

For instructions on how to run TPOffset, please refer to "[11.Touchscreen Calibration](#)".

*2. Bonding of LCD and touchscreen with double-sided tape.

3 Components

Components	Name	Specification	Manufacturer	Model
TS+LCD	Touchscreen (TS)	Projected Capacitive	DMC	DUS-N070WA060B-C01
	LCD	7.0" Wide	INNOLUX	G070ACE-L01
Accessories	Touchscreen controller	-	DMC	DUS1000
	HDMI board	HDMI input	DMC	SWAD-A4
	Image cable (L: 200mm)	-	DMC	24E3E4-00012

4 Packaging Specification

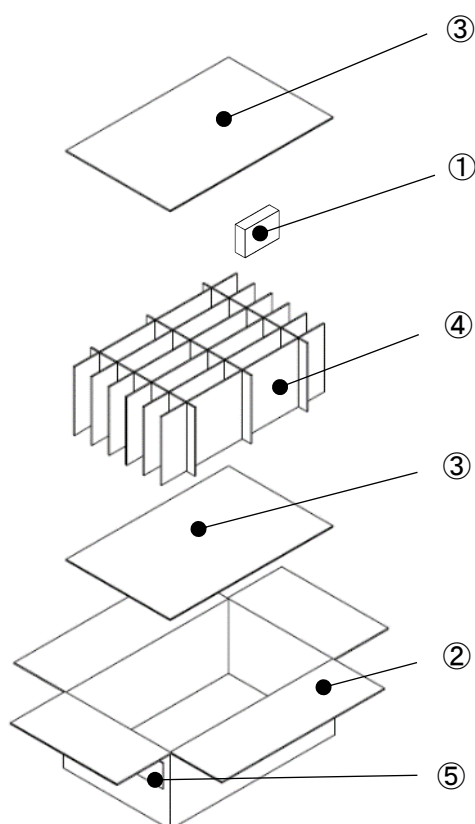
Depending on the number of shipments, individual packaging may be used instead of grouped packaging.

4-1 Grouped packaging

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

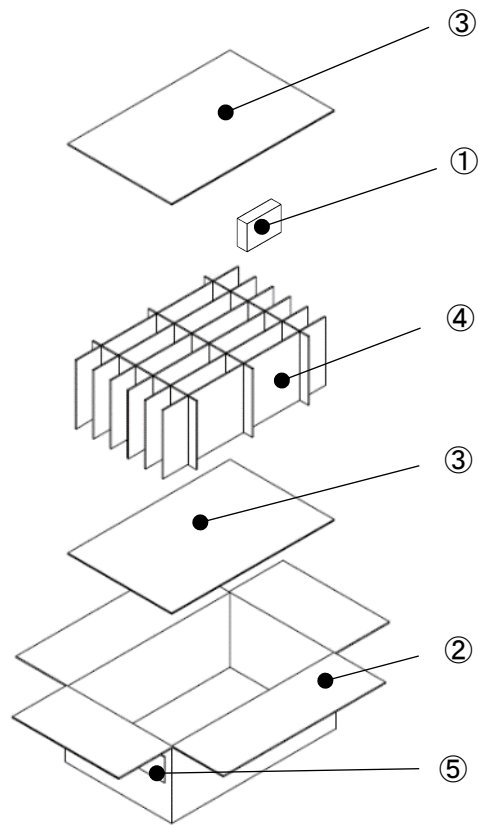
※May not be as specified according to the quantity shipped.

• Grouped Packaging Configuration (A)



No.	Name		Qty
①	TS+LCD (placed inside antistatic bag, placed inside air-cushion bag)		10
②	Outer box		1
③	Top/Bottom pad		2
④	Partition Set	Partition A	3
		Partition B	6
⑤	Grouped packaging label		1

• Grouped Packaging Configuration (B)



No.	Name		Qty
①	HDMI board (placed inside antistatic bag, placed inside air-cushion bag)		10
	Touchscreen controller (placed inside antistatic bag, placed inside air-cushion bag)		
	Image cable (placed inside antistatic bag, placed inside air-cushion bag)		
②	Outer box		1
③	Top/Bottom pad		2
④	Partition Set	Partition A	3
		Partition B	6
⑤	Grouped packaging label		1

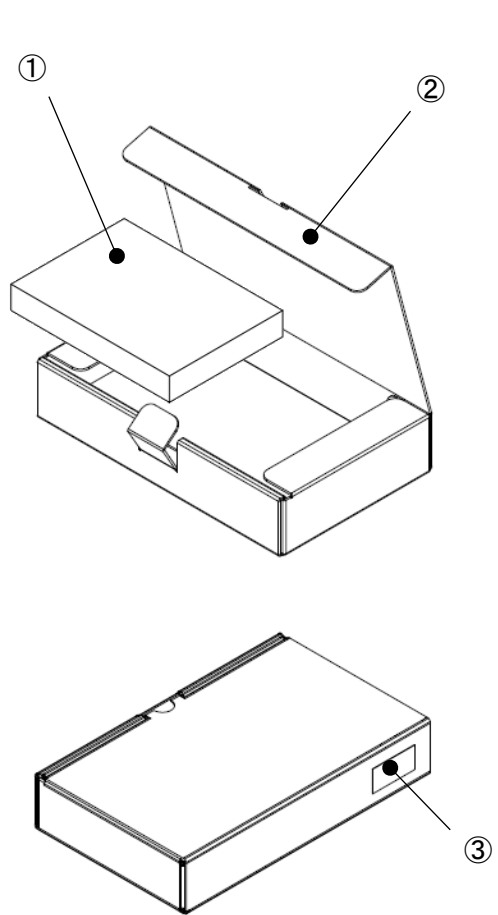
4-2 Individual Packaging

Box	Contents	Specification	Size (W x D x H)
C	TS+LCD, Accessories	Individual packaging (1unit/box)	External Dimension: 287 x 176 x 55

※One box includes TS+LCD and accessories.

• Individual Packaging Configuration(C)

No.	Name	Qty
①	TS+LCD (placed inside antistatic bag, placed inside air-cushion bag)	1
	HDMI board (placed inside antistatic bag, placed inside air-cushion bag)	
	Touchscreen controller (placed inside antistatic bag, placed inside air-cushion bag)	
	Image cable (placed inside antistatic bag, placed inside air-cushion bag)	
②	Outer box	1
③	Packaging label	1



5 Module Specification

5-1 Function

Item		Specification	units
LCD	Display device	7.0" Wide TFT LCD	-
	Display area (Active area)	152.4(W) ×91.44(H)	mm
	Pixels	800(W) ×480(H)	-
	Pixel pitch	0.1905(W) ×0.1905(H)	mm
	Color	16.7M	colors
	Brightness (Typ.)	445	cd/m ²
	View angle (Typ.)	Vertical (Upper/Lower)	deg.
		Horizontal (Left/Right)	
	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	2 points	-
	Operating life (Continuous Typing)	50 million times (finger input)	-
	Communication Method	USB 2.0	-
	Supporting OS	*2	-
	FPC Bending Resistivity	1mm≤R *3	-
HDMI board	Input image port	HDMI (does not support HDCP)	-
	Input Signal	Digital	-
		Horizontal scan cycle	30K - 80K
		Vertical scan cycle	50 - 75

*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. Please refer to the "Touchscreen Controller OS Compatibility Table".

(<https://www.dush.co.jp/english/download/driver-app/>) (Touchscreen controller referenced: DUSx000)

*3. Do not bend if R<1mm as it may break.

5-2 General Specification

Item		Specification
Power	Input power voltage	12VDC±5%
	Power consumption	Max. 4.0W

Note: 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.

5-3 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

5-4 Mechanical Specification

Item	Specification	
Mass	TS (Touchscreen) + LCD	Approx. 290 g
	Touchscreen controller	Approx. 9 g
	HDMI board	Approx. 30 g
External Measurements (TS (Touchscreen)) + LCD, excluding protruding parts)	170(W)×110(H)×12.41(D) mm	

5-5 Touchscreen Controller

Please refer to the attached touchscreen controller specification for details.

5-6 Touchscreen Driver

To obtain the touchscreen driver (DMT-DD), 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.

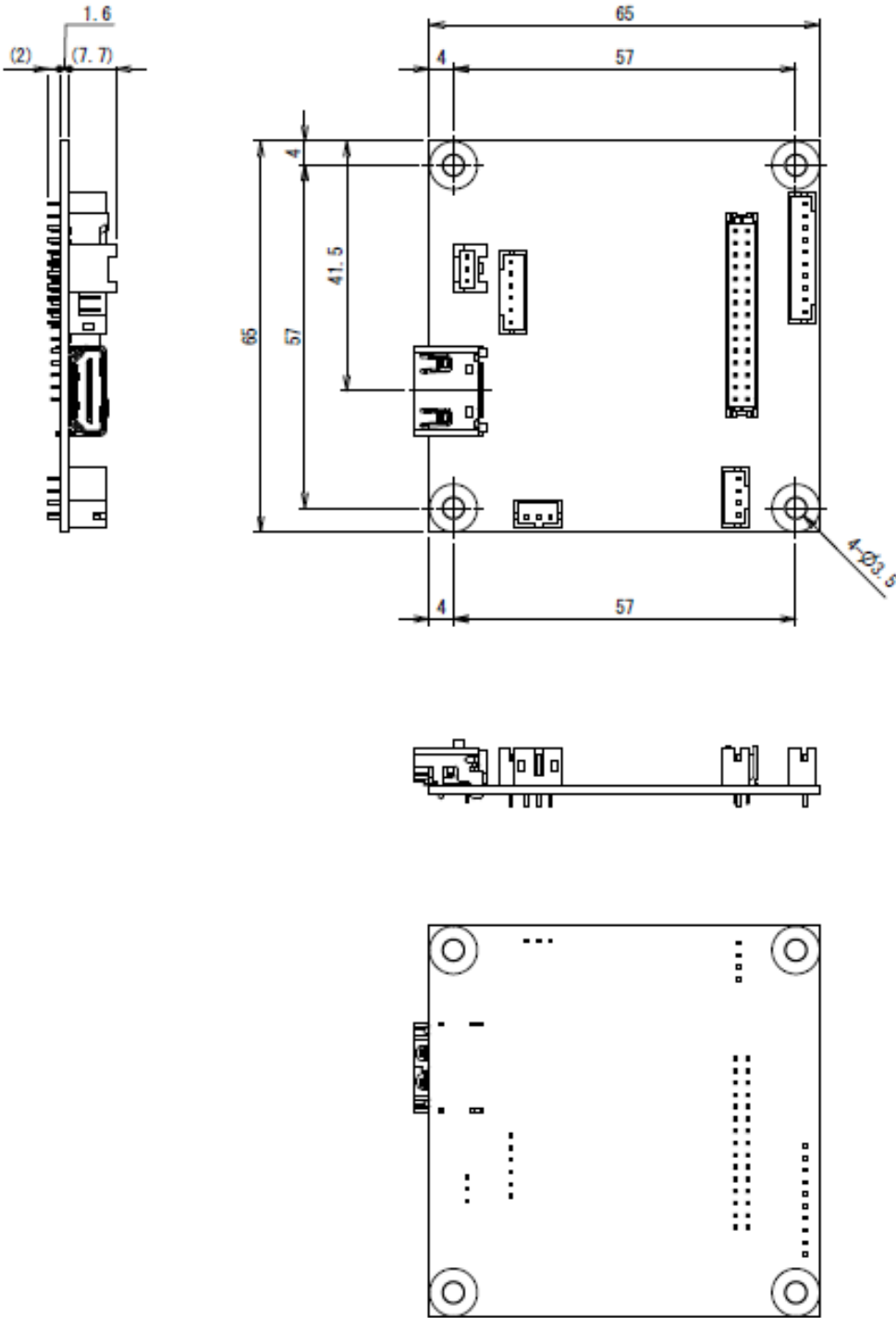
5-7 HDMI Board Specification

5-7-1 Model

Model	Image Input Port
SWAD-A4	HDMI ×1

5-7-2 External Dimension

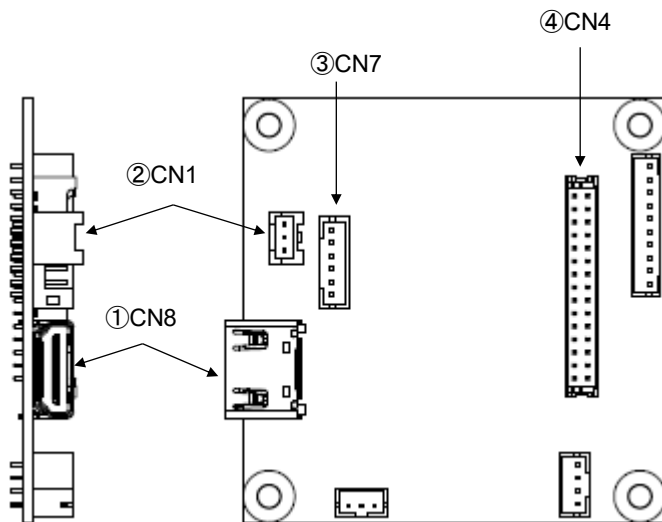
Item	Measurement
PCB outline (excluding connector)	65mm x 65 mm



5-7-3 Support Timing

No	Resolution	Refresh Rate
1	640×480p	60/75Hz
2	800×480p	60/75Hz

5-7-4 Part Names (HDMI Board)



No.	Interface Name
①	Image input (HDMI)
②	12VDC Power input (Nylon connector)
③	LCD Backlight control
④	LCD Image output (LVDS)

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

5-7-5 Image Input (HDMI) I/F

Connector No.: HDMI Board CN8

Interface: HDMI Type A

Note: 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+	-	-	

* Pin 2 has the function of TMDS Data 2 Shield and the role of detecting a PC connection. Please make sure that PCs whose HDMI Pin 2 has the role of detecting a monitor connection as well as this product cannot be connected.

5-7-6 12VDC Power Input I/F

Connector No.: HDMI Board CN1

Interface: +12VDC Input

Connector: MK242151P3(ZONE TECH TECHNOLOGY)

Note: Equivalent to B03B-PASK-1 (JST)

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

5-7-7 LCD Backlight Control I/F

Connector No.: CN7

Connector: C1U20-060V-R (TACT PRECISION INDUSTRIAL)

Note: Equivalent to B6B-PH-K-S(LF)(SN) (JST)

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

5-7-8 LCD(LVDS) Output I/F

Connector No.: CN4

Interface: LVDS

Connector: CI0130P1VDL-01-NH (CviLux)

PIN No.	Signal Name	PIN No.	Signal Name
1	Panel VCC 3.3V	16	GND
2	Panel VCC 3.3V	17	RXE0-
3	RXO0-	18	RXE0+
4	RXO0+	19	RXE1-
5	RXO1-	20	RXE1+
6	RXO1+	21	RXE2-
7	RXO2-	22	RXE2+
8	RXO2+	23	GND
9	GND	24	GND
10	GND -	25	RXEC-
11	RXOC-	26	RXEC+
12	RXOC+	27	RXE3-
13	RXO3-	28	RXE3+
14	RXO3+	29	NC
15	GND	30	NC

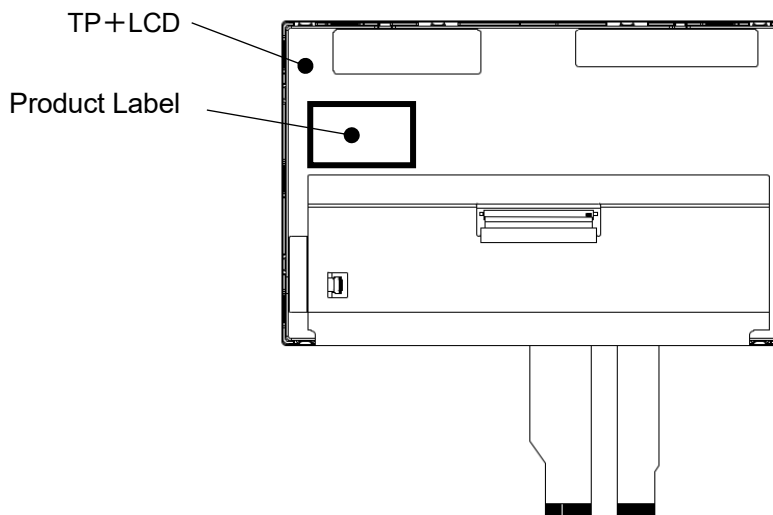
6 Product Label



Above is an image example of the product label.

The 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.

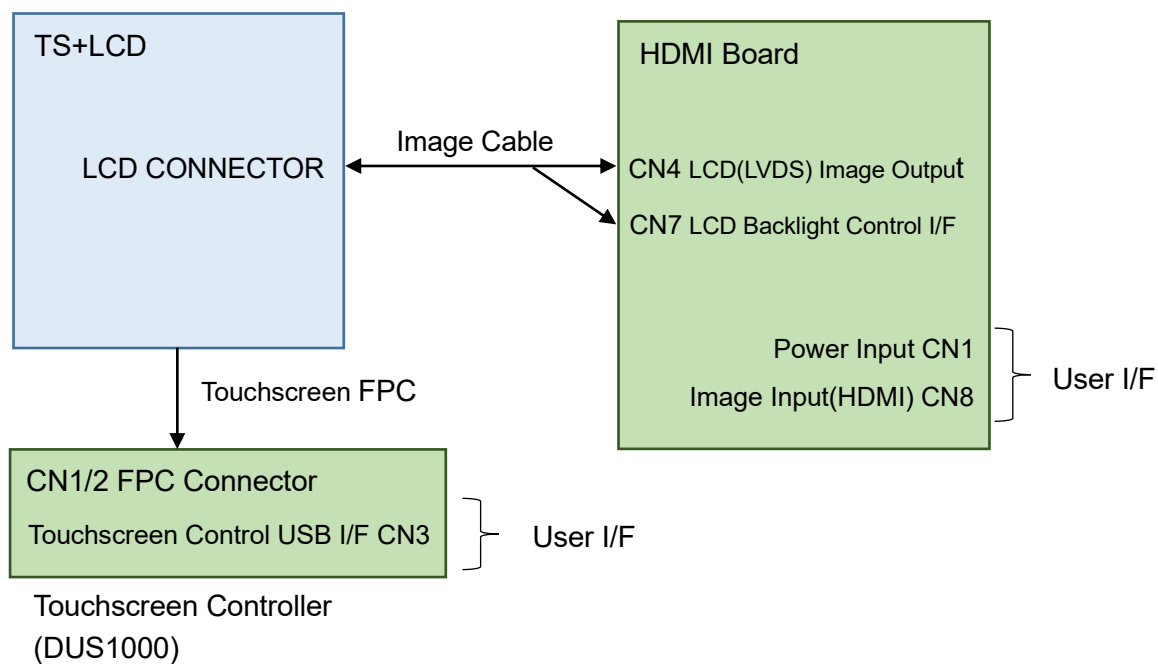
9 Option Items

■Controller Cable

Model	Specification
DUS-10USB	USB cable for connecting host (USB-TypeA) and touchscreen controller (L:1800mm).

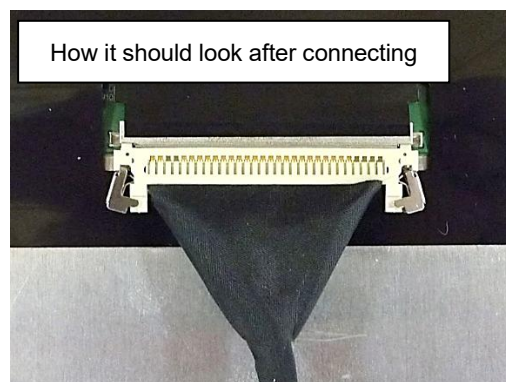
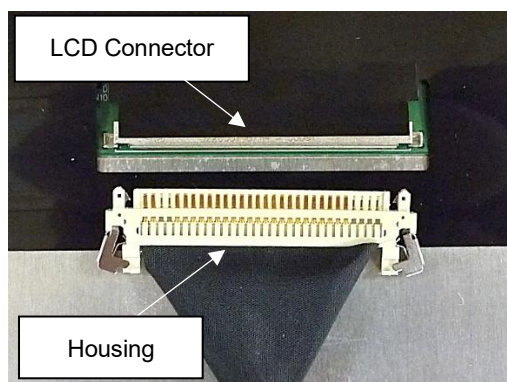
10 Connecting Method

10-1 Connecting Diagram



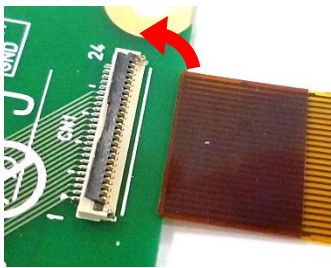
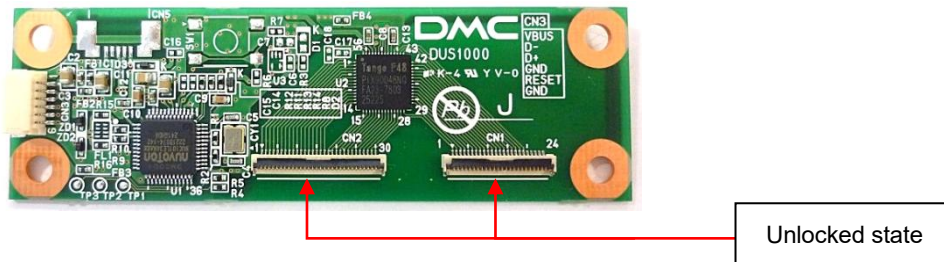
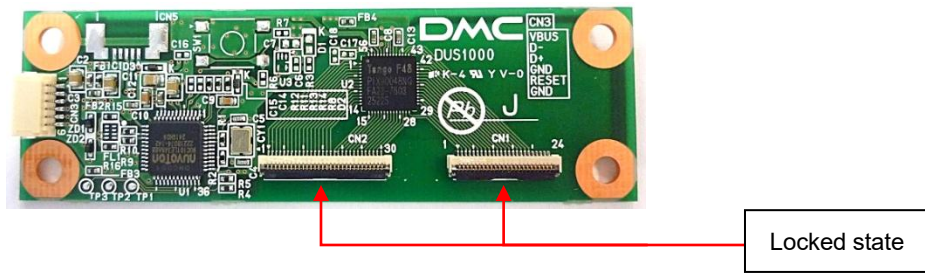
10-2 Connecting Image Cable to LCD

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



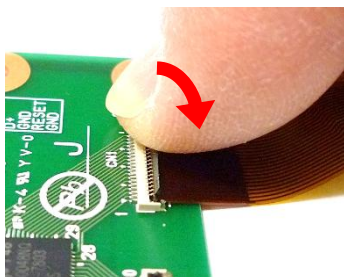
10-3 Connecting Touchscreen FPC to Touchscreen Controller

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



Unlocked state

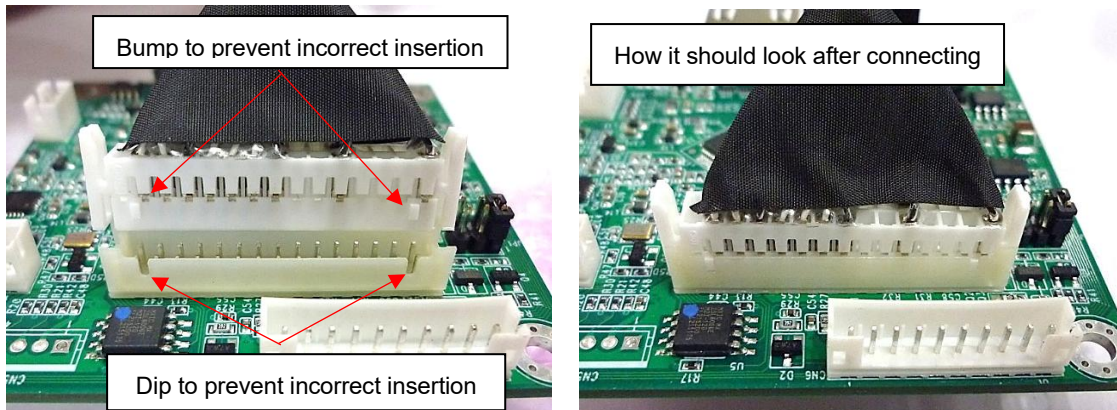
- (2) Insert each of the touchscreen FPCs (face up the side where contacts are invisible) securely into each of the applicable connectors on the touchscreen controller and push down the lock levers (actuators) to lock.



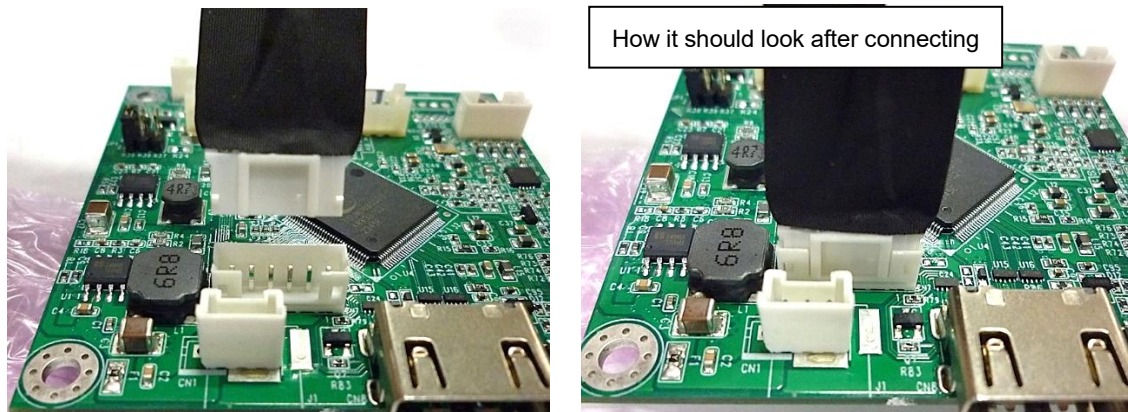
Locked state

10-4 Connecting Image Cable to HDMI Board

- (1) Insert the image cables securely into the connector of the HDMI board while mating the Bump and Dip of each connector to prevent incorrect insertion, as shown in the pictures below.

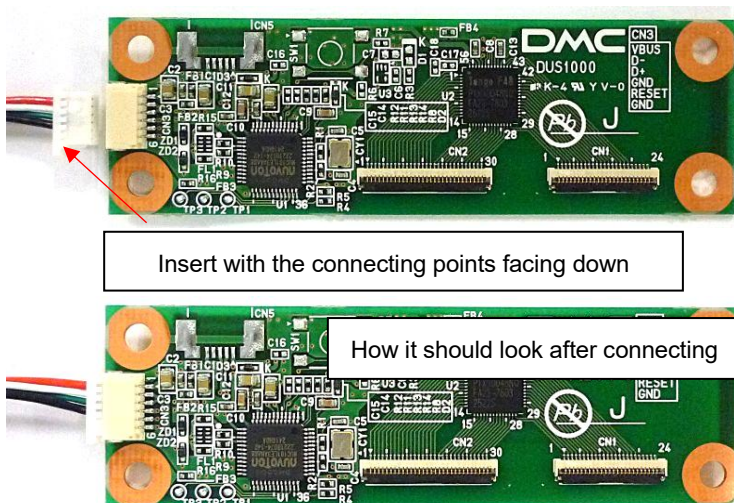


- (2) Insert the backlight cable securely into the connector of the HDMI board, as shown in the pictures below.



10-5 Connecting USB Cable to Touchscreen Controller

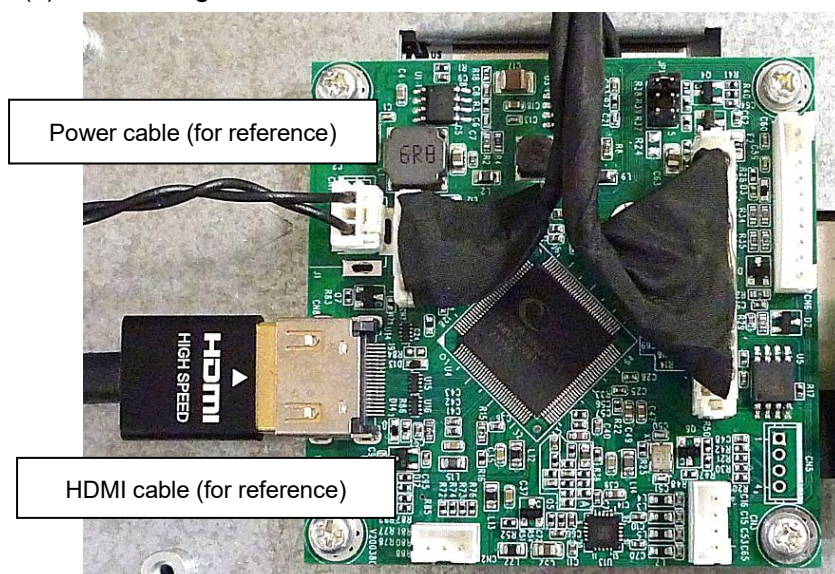
- (1) Insert the USB cable securely into the connector of the touchscreen controller as shown in the pictures below.



- * USB cable not included.
- * USB cable in the photos is the option item

10-6 Connecting Each Cable to User I/F of HDMI Board

(1) Connecting the HDMI cable and the Power cable



※Please insert securely.

※HDMI cable/ Power cable not included.

11 Touchscreen Calibration

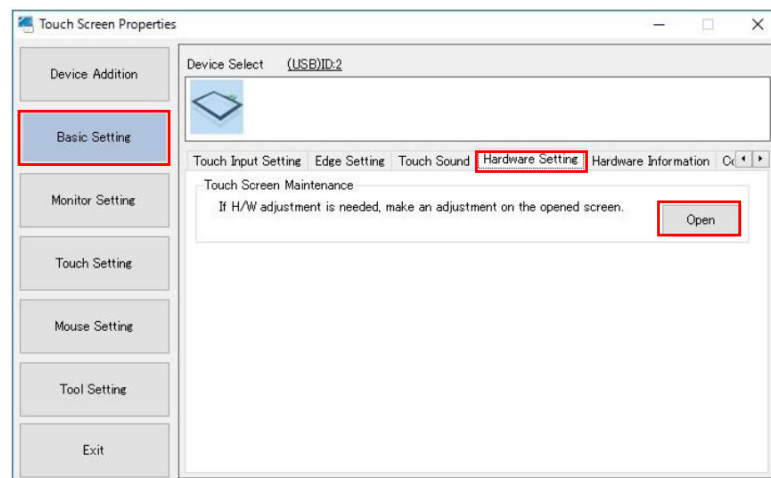
Touchscreen operations may become unstable depending on the installation environment due to its characteristics. To use it correctly, please perform calibration when building into a device.

Install DMT-DD from "[5-6. Touchscreen Driver](#)" when calibrating.

11-1 Projected Capacitive Touchscreen

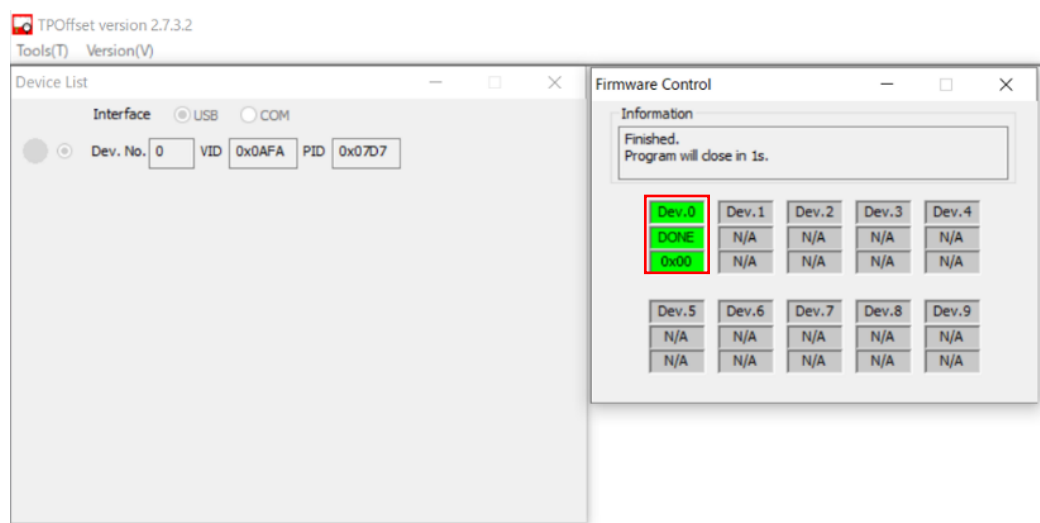
[TPOffset] ...Sensitivity calibration.

- (1) Start DMT-DD.
- (2) Click [Basic Setting] > Click [Hardware Setting] > Click [Open] of the [Touch Screen Maintenance].



- (3) Sensitivity calibration is complete when [Dev.0] [DONE] [0x00] parts of the other window [Firmware Control] turn green as shown in the following picture.

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.

12 Terms of Use

12-1 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 earthing bands for grounding during assembly.
- (6) To prevent malfunction or damage, make sure the connectors of the connecting cables are inserted securely.
- (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.

12-2 Precautions for Use of LCD

- (1) The LCD contains irritants inside. If by any chance the liquid should flow out due to damage 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.

12-3 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.

- (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.

12-4 Precautions for Static Electricity

- (1) Static Electricity may cause damage. Please take sufficient measurements when handling.
- (2) Operators should take anti-static measures such as wearing earthing bands for grounding.

12-5 Operating Precautions

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

12-6 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 it 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.

12-7 Handling Precautions

- (1) Do not leave the product in an environment with high temperature for a prolonged period. Make sure to avoid high humidity especially when the temperature is above 40°C. 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) Condensation on the polarizing plate during testing is prohibited to prevent staining, discoloration, or forming spots on the plate.
- (4) Disassembling the module and/or changing the volume of the module are prohibited. Doing so may cause malfunction and failure to perform correctly.
- (5) This product is intended for use in general electronic equipment and is not intended for use in special environments such as a corrosive gas atmosphere. If use in a special environment is anticipated, please evaluate thoroughly or take precautions not to expose the LCD to corrosive gases, etc.
- (6) This product is intended for use in standard applications (office equipment, industrial, communication, 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.
- (7) Do not rub or press the product with hard or sharp objects.
- (8) Keep away from flames/fire.
- (9) Avoid wiping the product with excessive pressure.
- (10) Avoid locally rubbing the product with strong pressure. It may cause damage to the function of the touchscreen.
- (11) When operating the product, please avoid striking it with a hard object.

- (12) Do not forcibly fold or bend the product.
- (13) When storing the product, use the packing box and keep the product within the specified storage temperature and humidity and in an environment where it is free of excessive pressure and loads.
- (14) Avoid using and storing the product where it can be exposed to or come in contact with liquids, organic solvents, and an acidic atmosphere.
- (15) Avoid using the product in direct sunlight.
- (16) Do not pull off or disassemble the product.
- (17) When handling the product, hold the main unit and not the touchscreen FPC (tail).
- (18) EMC (EMS, EMI) evaluation is not conducted at shipment. Please conduct an overall evaluation and confirmation after the product has been installed in your equipment.

13 Warranty

The warranty period is limited to 12 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. No warranty is provided for damage, on-site repair, or replacement resulting from product failure.

14 Production Discontinuance

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

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/>

1st Edition, April 2025

DMC Co., Ltd.

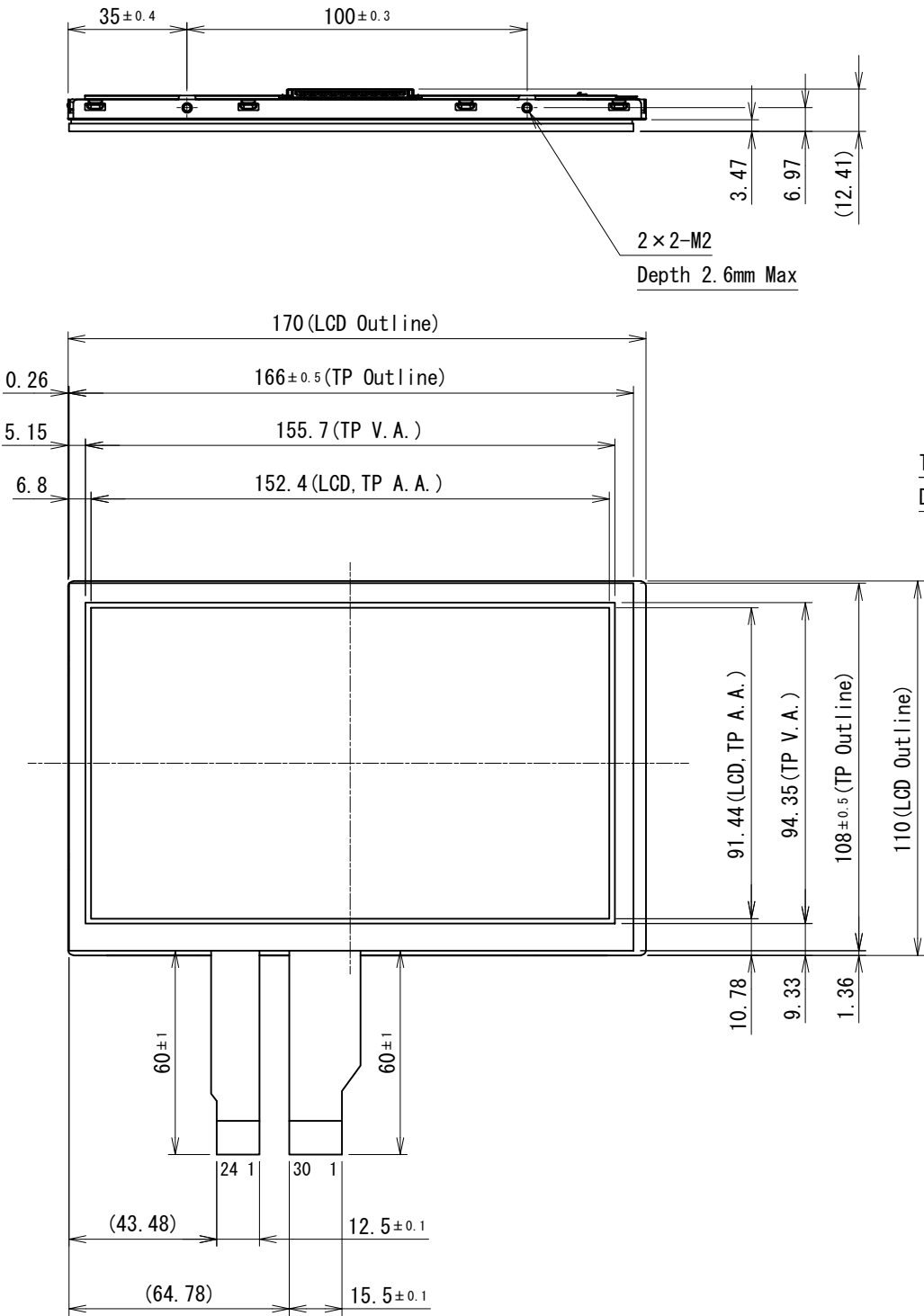
Business hours: 9:00a.m.~5:00p.m. (JST)

URL: <https://www.dush.co.jp/english/>

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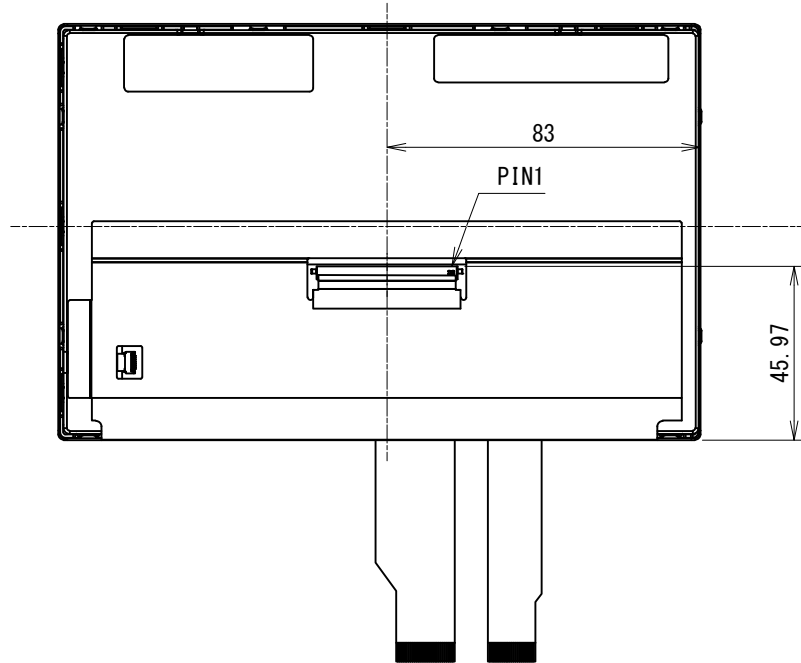
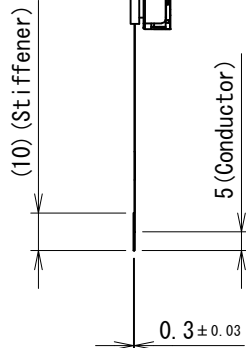
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SYM	改訂日 DATE	改訂内容 DESCRIPTION	ページ PAGE	担当 DESIGNED
	2025. 01. 29	新規図面登録	—	S. Takada




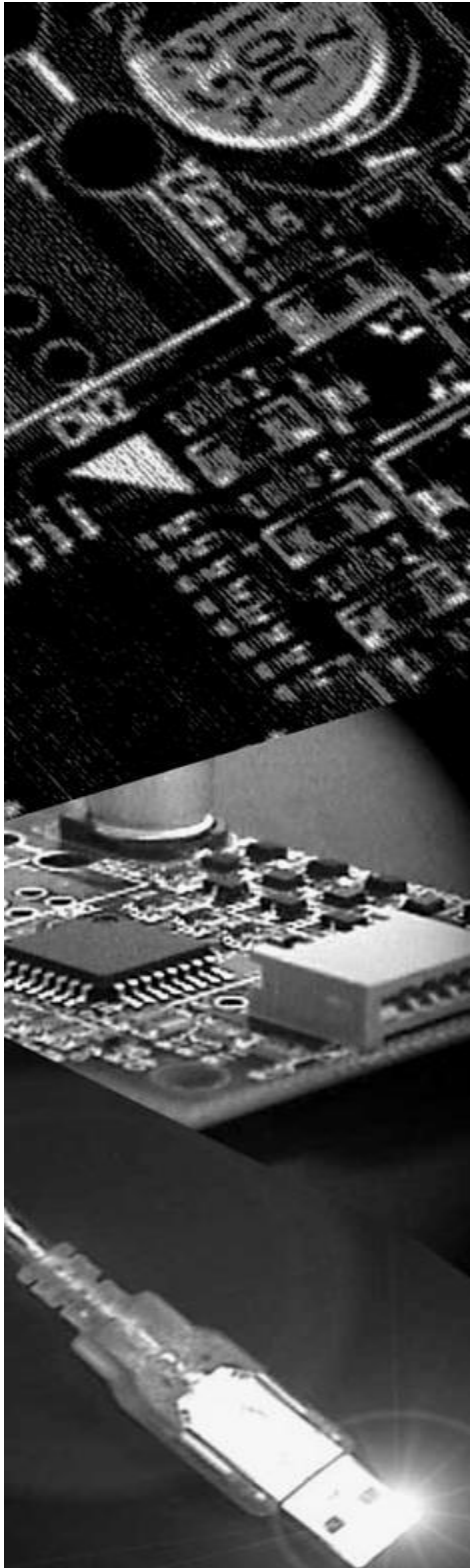
TP
DUS-N070WA060B (DMC)

LCD
G070ACE-L01 (Innolux)



- NOTES
- タッチ方式：投影型静電容量方式
Type: Projected Capacitive Touchscreen
 - ITOガラス：厚さ2.35mm
ITO Glass: thickness 2.35mm
 - LCD Connector：093G30-B0001A (STARCONN)
 - 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	2025, 01, 29	部署 SECTION	Technical Dept.	尺度 SCALE	CAD登録名 CAD FILE NAME	OUTLINE_TK-SPA07BWV-01		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-SPA07BWV-01			
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.	SM3-002529-10			



DMC Co., Ltd.

**Controller Board for Projected Capacitive Touch Screen
DUS1000 Product Specification**

Table of Contents

1. Applicable Product.....	2
2. Product Specification	2
2-1. Touch Screen Board Specification	2
2-2. Host Interface	3
2-3. Electrical Specification.....	3
2-3-1. Maximum Absolute Rating.....	3
2-3-2. DC Characteristics.....	3
2-4. Connector Pin Assignment	5
2-4-1. Connector Information.....	5
2-4-2. Connector Terminal.....	5
2-4-3. Input Equivalent Circuit of Reset Signal	6
3. Precautions	7
4. Change History.....	7
5. Warranty.....	10
5-1. Warranty Period.....	10
5-2. Warranty Target.....	10
5-3. Warranty Exceptions.....	10
6. Precautions for Use	11
6-1. General Handling.....	11
6-2. Others.....	11

Outline Dimensional Drawing

1. Applicable Product

This specification sheet is applied to DUS1000 touch screen controller board.

2. Product Specification

2-1. Touch Screen Board Specification

Item		Spec	Remark
Touch Detection Principle		Projected Capacitive	
Host Interface		USB Full-Speed UART	
Input Power-supply Voltage		5[V]±5[%]	
Operating Temp		-20 [°C] to 85 [°C]	No dew condensation
Storing Temp		-40 [°C] to 85 [°C]	No dew condensation
Main IC		MCU 1 [pcs]	
		Sensor IC 1 [pcs]	
Number of Electrodes	Electrode (X)	28	
	Electrode (Y)	18	
Coordinate Performance	Maximum Coordinate Number to Output	2 [Finger]	
	Report rate (1 finger)	100 [Hz]	*2
	Report rate (2 fingers)	100 [Hz]	*2
	Report rate (2 fingers at same axis)	100 [Hz]	*2
	Electrode resolution	256 [1/Electrode]	
	2 fingers minimum distance (X)	3.5 [Electrode]	21[mm]@6[mm]◇
	2 fingers minimum distance (Y)	3.5 [Electrode]	21[mm]@6[mm]◇
	Coordinate Accuracy (1 finger: high accuracy area)	max ±2%	*1
	Coordinate Accuracy (2 fingers: high accuracy area)	max ±4%	*1
	Coordinate Accuracy (1 finger: low accuracy area)	max ±5%	*1
	Coordinate Accuracy (2 fingers: low accuracy area)	max ±8%	*1
	Low accuracy area	3 [Electrode]	Specify area from the edge
Low Power Mode		Active / Suspend	
Calibration	Calibration function	Support	
	Calibration Time	10 - 15 [sec]	*3

*1 Touch contact size: φ10. The indicated coordinate accuracies are performances under a noise-free environment. The accuracy may significantly drop due to extrinsic noises.

*2 Report rate depends on CR values of the sensor glass. This specification is of the operation by 250KHz clock scan.

*3 Calibration Time varies according to size of the touch screen.

2-2. Host Interface

USB Interface

Item	Value	Note
Host Interface	USB 2.0 Full speed 12[Mbps]	
Power supply	Bus-powered	
Power type	Low power device	Under 100mA
VendorID/ProductID	0x0AFA / 0x07D2, or 0x0AFA / 0x07D3 (At firmware update: 0x0AFA / 0x07D0)	
Power save mode	USB Suspend mode (compliant to USB specification)	

Serial Interface

Item	Value	Note
Host Interface	UART Baud Rate 57.6[Kbps]	
Data bits	8	
Stop bit	1	
Parity check	None	

2-3. Electrical Specification

2-3-1. Maximum Absolute Rating

Item	Specifications			Unit	Note
	Min.	Typ.	Max.		
Touch Panel Power Supply	-0.3		6	V	

2-3-2. DC Characteristics

Board Consumption Current

Test Condition : TA = 25°C, VCC = 5V

Item	Specifications			Unit	Note
	Min.	Typ.	Max.		
Touch Panel Power Supply	4.75	5	5.25	V	
Normal operation mode		40		mA	
Suspend mode		500		uA	

IO Signal (TX, RX) DC Characteristics

Parameter	Specifications			Unit	Note
	Min.	Typ.	Max.		
Input High Voltage	2.0		VDD +0.2	V	VDD=5.25V
Input Low Voltage	-0.3		0.8	V	VDD=4.75V
Output High Voltage	2.4		-	V	VDD=4.75V
Output Low Voltage	-		0.45	V	VDD=5.25V

USB Signal (D+, D-) DC Characteristics

Parameter	Specifications			Unit	Note
	Min.	Typ.	Max.		
Input High Voltage	2.0		-	V	
Input Low Voltage	-		0.8	V	
Output High Voltage	2.8		3.6	V	
Output Low Voltage	0		0.3	V	

IO Signal (Reset) DC Characteristics

Item	Specifications			Unit	Note
	Min.	Typ.	Max.		
Input High Voltage	0.7VDD	5	5.25	V	
Input Low Voltage	-0.5		0.3VDD	V	

2-4. Connector Pin Assignment

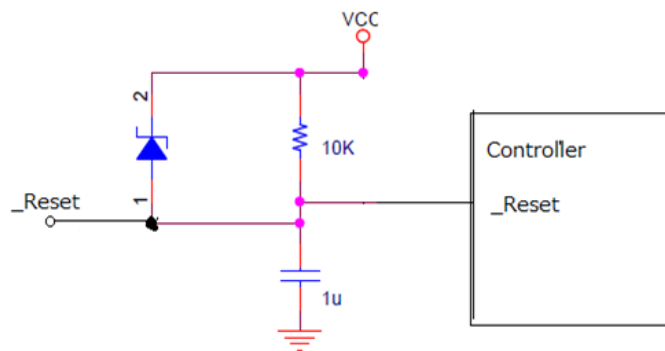
2-4-1. Connector Information

Connector Number	Model Number	Maker
CN1	FH19SC-24S-0.5SH(0.5)	HIROSE
CN2	FH19SC-30S-0.5SH(0.5)	HIROSE
CN3	SM06B-SRSS-TB	JST
CN4	SM11B-SRSS	JST

2-4-2. Connector Terminal

Connector Number	Terminal Number	Terminal Name	Description
CN1			Connector for touch sensor, 24 pins
CN2			Connector for touch sensor, 30 pins
CN3	1	Vbus	USB power input
	2	D-	USB D-
	3	D+	USB D+
	4	GND	USB GND
	5	RESET	Reset Terminal Active L Minimum Pulse Width 100μS
	6	GND	Reset GND
CN4	1	ICE_CK	Unused
	2	ICE_DAT	Unused
	3	RSTn	Reset Signal Active L Minimum Pulse Width 100μS
	4	Tx	UART Communication (5VTTL Level) DUS Board → Host Computer
	5	Rx	UART Communication (5VTTL Level) Host Computer → DUS Board
	6	SCL	Unused
	7	SDA	Unused
	8	GPIO1	Unused
	9	Vcc_IN	DC Power Input
	10	ICE_Vcc	Unused
	11	GND	Power Ground

2-4-3. Input Equivalent Circuit of Reset Signal



3. Precautions

Operation may become unstable, depending on the surrounding environment.

Do not use the controller under environments that affect capacitance values (The affecting factors are such as power-supply noises).

The application tool, TPOffset must be executed before operating DMC's touch screens of capacitive multi-touch type (EXC series and DUS series) with the DUS series controller.

TPOffset is the application software executable on Windows. It can be downloaded from the DMC's website below.

DMC's website: TPOffset download page

<http://www.dmccoltd.com/english/download/tpoffset.asp>

4. Change History

Ver0.1 (June 12, 2012)

Provisional product specification was issued.

Ver0.2 (June 29, 2012)

2-1. Touch Screen Board Specification Main IC : Changed a description.

2-1. Touch Screen Board Specification Number of Electrodes (Y) : Fixed 17 to 18

2-5-1. Connector Information : (No Mount) is added.

Ver1.0 (October 1, 2012)

First Release

Changes from the Ver0.2 are as follow.

2-1. Touch Screen Board Specification....Interface UART was added.

2-1. Touch Screen Board Specification....Operating / Storing Temp was added.

2-1. Touch Screen Board Specification....Calibration Time Max was changed to TYP.

2-1. Touch Screen Board Specification....(Max) was deleted from Number of Electrodes.

2-1. Touch Screen Board Specification....The Item "DFU" was deleted.

Outline Dimensional Drawing was moved to the last page.

2-4. Connector Pin Assignment CN5 was deleted.

2-4-2. Connector Terminal....Clerical mistakes under Terminal Name and Description were corrected.

2-4-2. Connector Terminal...The descriptions for the unused terminals on CN4 was changed to "Unused".

Ver1.1 (November 2, 2012)

Changes from ver1.0

2-1. Touch Screen Board Specification.....Electrode resolution 512 → 256 (Clerical mistake was corrected.)

2-2. Host Interface.....USB Interface VendorID/Product ID was changed (Specification changed).

Ver1.2 (April 23, 2013)

Changes from the ver1.1

3. Precautions The description about the TPOffset software tool was added.

Address: Nisseki Takanawa Bldg., → Takanawa Sengakuji Bldg.,(The building name was changed).

Ver1.3(August 28, 2013)

Changes from the ver. 1.2

2-1. Touch Screen Board Specification

2 finger minimum distance (X): 18[mm]@6[mm]◇ was corrected to 21[mm]@6[mm]

2 finger minimum distance (Y): 18[mm]@6[mm]◇ was corrected to 21[mm]@6[mm]

Calibration Time: TYP 5 [sec] was changed to 10 - 15 [sec]

Calibration Time: [*3 Calibration Time varies according to size of the touch screen.] was added.

2-2. Host interface

USB Interface

VendorID/ProductID :

changed to 0x0AFA / 0x07D2, (At firmware update: 0x0AFA / 0x07D0)

2-4-2. Connector Terminal

CN3 RESET: [Active L] and [Minimum Pulse Width 100μS] were added.

CN4 RSTn: [Active L] and [Minimum Pulse Width 100μS] were added.

CN4 Tx: [DUS Board → Host Computer] was added.

CN4 Rx: [DUS Board → Host Computer] was added.

2-4-3. Input Equivalent Circuit of Reset Signal was added.

Dimensional Drawing

Updated from Rev.1 to Rev.2 (Changed content is as below)

“FG” notations were added.

Ver1.4(April 9, 2014)

Changes from the ver. 1.3

2-2. Host interface: VendorID/ProductID (0x0AFA / 0x07D2) was added.

2-3-2.DC Characteristics: IO Signal (Tx ,Rx, Reset) was changed to (Tx, Rx)

2-3-2.DC Characteristics: IO Signal (Tx ,Rx) The numerical value was corrected. (Clerical mistake was corrected.)

2-3-2.DC Characteristics: IO Signal (Reset) was added.

2-4-2.Connector Terminal: CN4 Rx: Fixed [DUS Board → Host Computer] to [Host Computer →DUS Board]

Ver1.5 (October 27, 2014)

Dimensional Drawing Updated from Rev.2 to Rev.3 : Tolerances were added.

Ver1.6 (June 25, 2015)

Change from ver1.5

2-1Touch Screen Board Specification Description of the Coordinate Accuracy changed.

Ver1.7 (December 24, 2015)

Change from ver1.6

3. Precaution

The application tool, TPOffset must be executed before operating DMCng on the surrounding environment. The accuracy may significantly drop due to extrinsic controller.

→ The application tool, TPOffset must be executed before operating DMC's touch screens of capacitive multi-touch type (EXC series and DUS series) with the DUS series controller.

(Correction of literal error)

Ver1.8 (April 26, 2019)

Change from ver1.7

2-1Touch Screen Board Specification General Tolerances were added.

5. Warranty

5-1. Warranty Period

- § The warranty period is limited to 1 year from the date of shipping. The warranty for the initial defection such as appearance defection is limited to 1 month.
- § Any defected parts under proper use will be examined by the supplier and replaced by the new parts if the defection is considered to be caused by the supplier.
- § The replacement is subject to be included in the next lot.

5-2. Warranty Target

- § The warranty only covers the product itself and does not cover any damage to others caused by using this product. Onsite repair or replacement is not supported.
- § We will do our best for delivery problem and product defections, but the warranty for the production line is not covered.

5-3. Warranty Exceptions

- Following conditions are not covered with the warranty and subject to charge.
- § Any malfunctions and damages during transportation and transfer by the user.
 - § Any malfunctions and damages caused by a natural disaster or a fire.
 - § Any malfunctions and damages caused by static electricity
 - § Any malfunctions and damages caused by the failure of the associated equipment.
 - § If the product is remodeled, disassembled or repaired by the user.
 - § If the product is glued onto the equipment and uninstalled.
 - § Any malfunctions and damages caused by an improper usage and handling against the specifications and notes.

6. Precautions for Use

6-1. General Handling

- § Keep the product away from any conductive objects while in use.
- § Do not touch the conductive part of the product to avoid being damaged by the electrostatic discharge. Follow the proper procedure for handling.
- § Keep the product in the proper storing environment and avoid any load to the product.
- § Do not use or store the product in the severe condition like following:
 - Wet environment or a condition where the product is likely to get wet. Where dew condensation is likely to occur. Near solvent or acid.
- § Do not take apart or alter the product.

6-2. Others

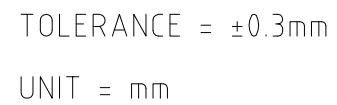
- § The contents of this document are subject to change without notice.
- § The manufacturer or sales representatives will not be liable for any damages or loss arising from use of this product.
- § This product is intended for use in standard applications (computers, office automation, and other office equipment, industrial, communications, and measurement equipment, personal and household devices, etc.) Please avoid using this product for special applications where failure or abnormal operation may directly affect human lives, or cause physical injury or property damage, or where extremely high levels of reliability are required (such as aerospace systems, vehicle operating control, atomic energy controls, medical devices for life support, etc.).
- § Any semiconductor devices have inherently a certain rate of failure. The user must protect against injury, damage, or loss from such failures by incorporating safety design measures into the user's facility and equipment.

DUS1000 Product Specification
Ver1.8 issued on December 24, 2019
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DMC Co., Ltd.
<http://www.dmccoltd.com/english/>
11F Takanawa Sengakuji Ekimae Bldg., 2-18-10 Takanawa, Minato-ku, Tokyo 108-0074, Japan
Phone: +81-3-6721-6731 (Japanese), 6736 (English) Fax: +81-3-6721-6732



Date	P/N
December 9, 2016	DUS1000
Name	
Dimensional Drawing	Rev.4
DMC Co., Ltd.	

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)

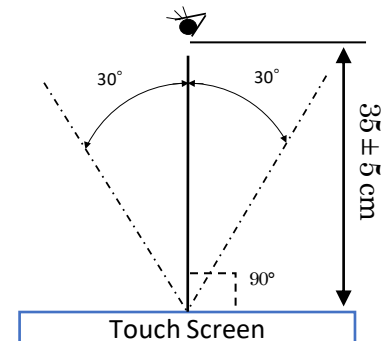
1.1 Inspection condition

Inspection Distance : 35 ± 5 cm

View Angle : Inspection under non-operating condition : $\pm 30^\circ$

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 \leq 22 inches 】 Within 10 pcs / panel
 【 < Size \leq 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.	$0.15 < W \leq 0.2$	$L \leq 10$	Up to 4pc per product
	$0.1 < W \leq 0.15$	$L \leq 20$	Up to 6pc per product
	$W \leq 0.1$	Acceptable	Acceptable
Circular (Foreign substance/scratch/transparent defects) *1	$0.5 < D \leq 0.7$		Up to 1pc per product
	$0.3 < D \leq 0.5$		Up to 6pc per product
	$D \leq 0.3$		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.)

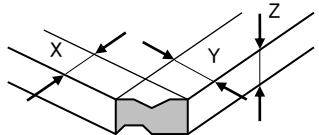
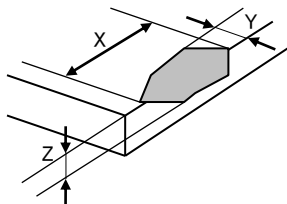
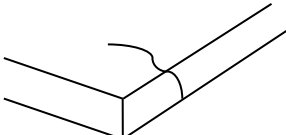
- Stains are acceptable as long as they are not clearly outlined and are not noticeable.
- Applied only in the Viewing Area.

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
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Appearance inspection standard (2)

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

Item	Size(mm)		Acceptable Numbers
Corner		X	$1.0 \leq X \leq 2.0$
		Y	$1.0 \leq Y \leq 2.0$
		Z	$\leq t$
Other than at corners		X	≤ 5.0
		Y	$1.0 \leq Y \leq 2.0$
		Z	$\leq t/2$
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 : $0.2 \text{ mm} < D \leq 0.3 \text{ mm}$ b : $D \leq 0.2 \text{ mm}$	Acceptable quantity	Total acceptable quantity
		a : 2pcs in $\phi 30 \text{ mm}$ 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
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