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

21.5" Wide (FHD)

Resistive Touchscreen Module with LCD

Basic Set

TK-B Series

Model: TK-BRA215FH-02A3

Product Specification

DMC Co., Ltd.
https://www.dush.co.jp/english/

24A4A7-00004E-1

Table of Contents

Appendix

- Outline Drawing (SM3-002522-10)
- Appearance inspection standard
  (LCD Modules with Resistive Touchscreen) (22G4GX-00001E)

Downloads：https://www.dush.co.jp/english/download/

- Resistive Touch Screen Mounting Guidance (LST-series)
- Touch Screen Controller Specification: TSC-52/U User's Guide

1 Summary

This is a “TK series Basic Set” with 21.5" Wide resistive touchscreen sensor, controller, LCD(Liquid Crystal Display), and HDMI board put together in a sheet metal chassis.

2 Product Model

Model	Specification			
	LCD size (Resolution)	Touchscreen Type	Bonding method	Set Type
TK-BRA215FH-02A3	21.5" Wide (FHD)	Resistive	Air-bonding *1	Basic Set

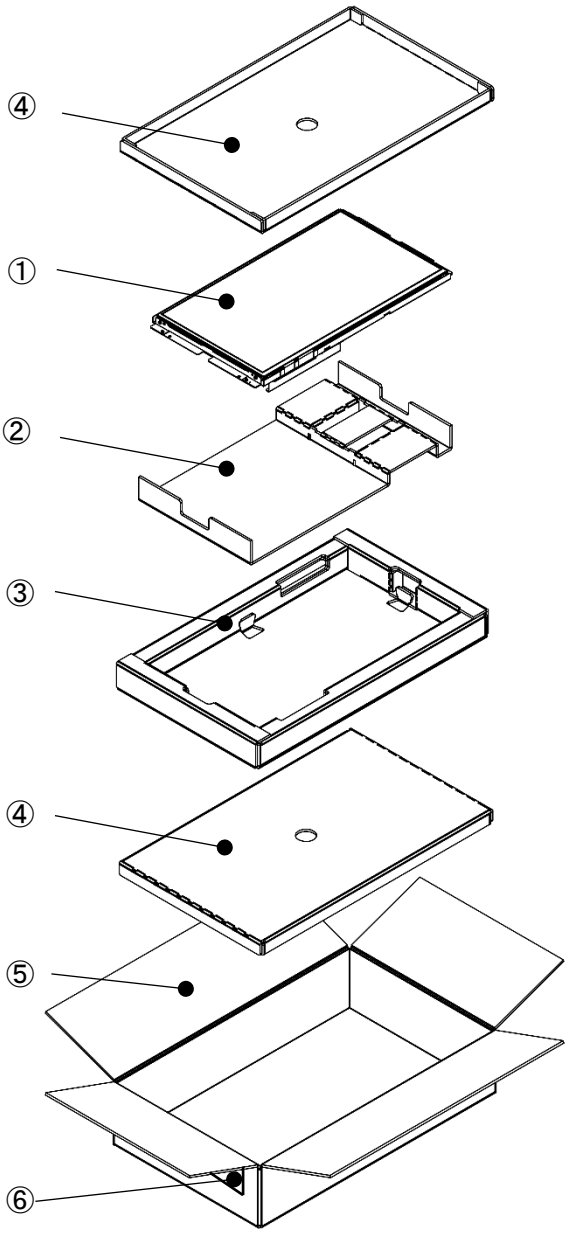
*1. Bonding of LCD and touchscreen with double-sided tape.

3 Packaging Specification

Contents	Specification	Size (W x D x H) mm
TK-BRA215FH-02A3	Individual Packaging (1unit/box)	External Dimension: 640 x 400 x 159

・Individual Packaging Configuration

No.	Name	Qty
①	TK-BRA215FH-02A3 (placed inside anti-static bag) * Touchscreen with protective sheet	1
②	Pad	1
③	Center Pad	1
④	Top/Bottom Pad	2
⑤	Outer box	1
⑥	Packaging label	1



4 Module Specification

4-1 Function

Item			Specification	units
LCD	Display device		21.5” Wide TFT LCD	-
	Display area (Active area)		476.064(W) ×267.786(H)	mm
	Pixels		1920(W) ×1080(H)	-
	Pixel pitch		0.248(W) ×0.248(H)	mm
	Color		16.7M	colors
	Brightness (Typ.)		310	cd/m^2
	View angle (Typ.)	Vertical (Upper/Lower)	89 / 89	deg.
		Horizontal (Left/Right)	89 / 89	
	Interface		LVDS	-
	Backlight method		LED, with backlight driver	-
	Backlight life *1		Min. 50,000	hours
Touchscreen	Touchscreen type		Analog 4-wire resistive	-
	Input method		Finger or R0.8 Polyacetal pen	-
	Maximum simultaneous input point		1 point (gesture function supported)	-
	Operating life	Continuous input (finger)	10 million times	-
		Continuous input (pen)	100,000	characters
	Communication Method		USB 2.0	-
	Supporting OS		*2	-
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

*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: TSC-52)

4-2 General Specification

Item		Specification
Power	Input power voltage	12VDC
	Voltage tolerance	12VDC±5%
	Power consumption	Max. 25.6W

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.

4-3 Environment

Item	Specification
Ambient operating temperature (Inside cabinet and display side)	0°C to 55°C
Ambient storage temperature	-20°C to 60°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

4-4 Mechanical Specification

Item	Specification
Mass	Approx. 4190 g
External dimensions (excluding protruding parts)	530(W)×297(H)×48.4(D) mm

4-5 Touchscreen Controller

This is the Touchscreen controller with flick operation and 2-finger gesture (pinch-in/pinch-out and rotation)* functions.
For details, please refer to the downloadable document "Touch Screen Controller Specification: TSC-52/U User's Guide" in the table of contents.

* Two-finger touch input is a function to realize gesture operation, and position (coordinate) data at two-finger touch should not be used.
* When operating gestures, please keep a small distance between fingers.

4-6 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/

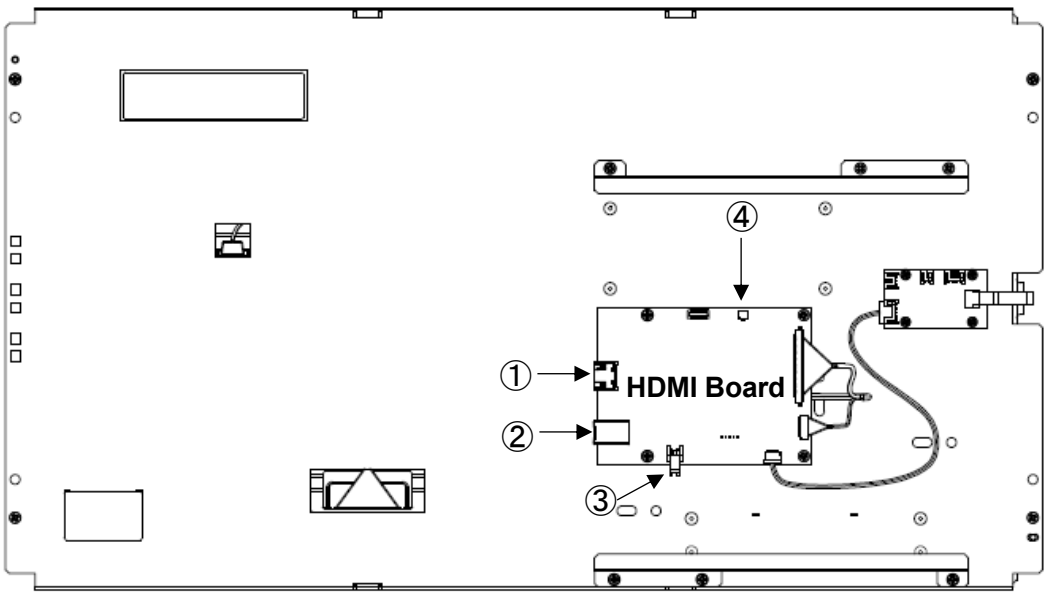
For DMT-DD installing directions, please refer to the User's Guide included in the downloaded files.

4-7 HDMI Board

4-7-1 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

4-7-2 **Part Names (HDMI Board)**



No.	Interface Name
①	Image input (HDMI)
②	Touchscreen control USB (USB 3.0 Type-B) *1
③	12VDC Power input (Nylon connector)
④	Pilot lamp LED control

*1 USB2.0 Type-B can be connected.

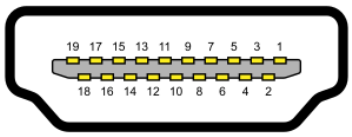
Note: Use of other connectors not listed is prohibited. These are only internal adjustments for the manufacturer and may be excluded without prior notice.

4-7-3 **Image Input (HDMI) I/F**

Connector No.: CN7

Interface: HDMI Type A

Note: HDMI standard compliant

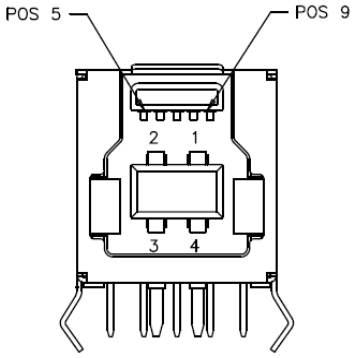
PIN No	Signal Name	PIN No	Signal Name	Schematic Diagram
1	TMDS Data2+	11	TMDS Clock Shield	
2	TMDS Data2 Shield	12	TMDS Clock-	
3	TMDS Data2-	13	CEC (NC)	
4	TMDS Data1+	14	Reserved	
5	TMDS Data1 Shield	15	DDC Clock	
6	TMDS Data1-	16	DDC Data	
7	TMDS Data0+	17	DDC GND	
8	TMDS Data0 Shield	18	+5V Power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

4-7-4 **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	 View from connector inserting side
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		

* USB port for touchscreen control (can be connected to USB2.0 Type-B).

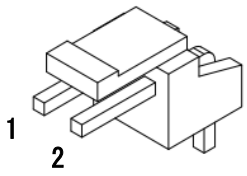
4-7-5 **12VDC Power Input I/F**

Connector No.: CN1

Interface: +12VDC Input

Connector: A3963WR2-2P(JWT)

Note: Equivalent to S2P-VH(JST)

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

4-7-6 **Pilot Lamp LED Control I/F**

Connector No.: CN10

Connector: 1010-SMTR-03P(JWT)

Note: Equivalent to SM03B-SRSS-TBT (JST)

PIN No.	Signal Name
1	LED_G
2	GND
3	LED_R

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

4-7-7 **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.

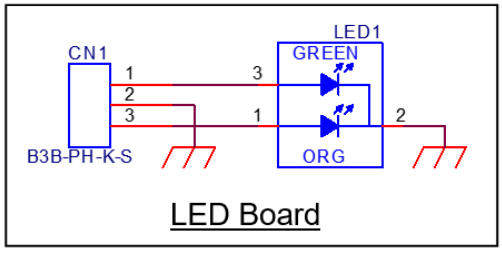
- **Status Indicating LED (Example)**

  Green light up: Power ON, with image input signal

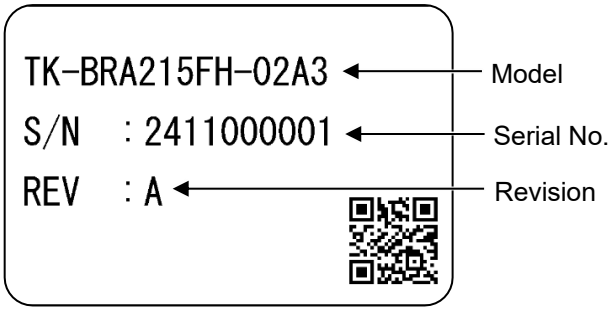
  Orange light up: Power ON, without image input signal.

  LED off: Power OFF

- **Circuit diagram (Example)**



5 Product Label



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

6 Compliant Standards

6-1 RoHS

Compliant with EU RoHS directives.

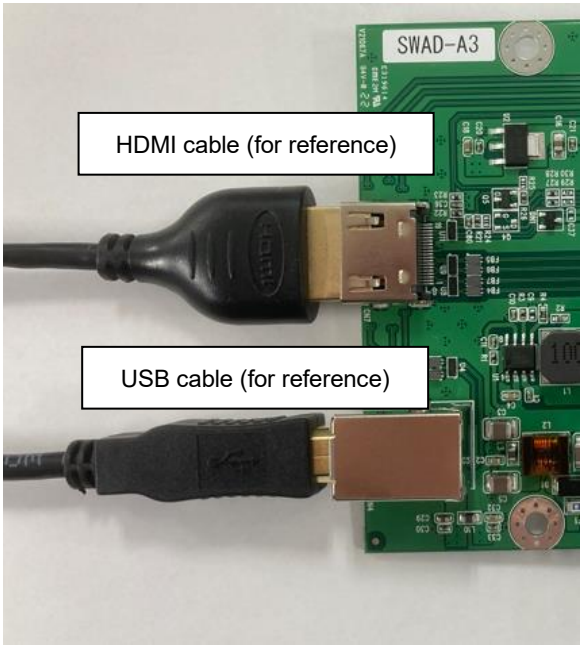
7 Appearance inspection standard

Please refer to “Appearance inspection standard (LCD Modules with Resistive Touchscreen)” (22G4GX-00001E) for standards.

8 Connecting Method

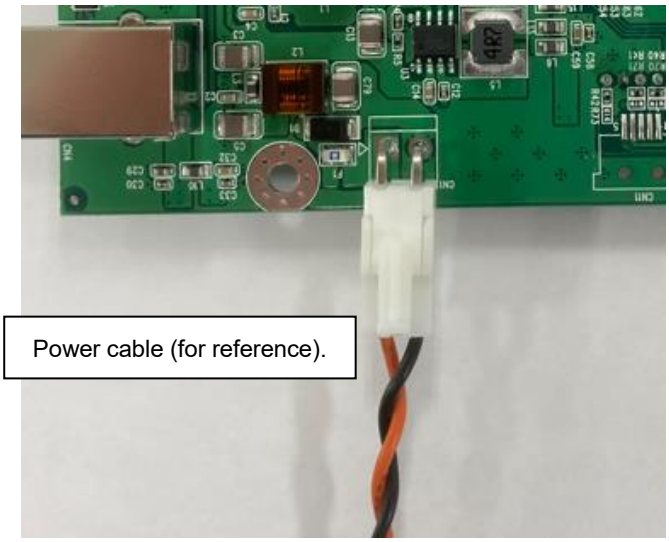
8-1 Connecting Each Cable to User I/F of HDMI Board

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



* Please insert securely.
* HDMI cable/ USB cable not included.

(2) Connecting the Power cable.



* Please insert securely.
* Power cable not included.

9 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 equipment.

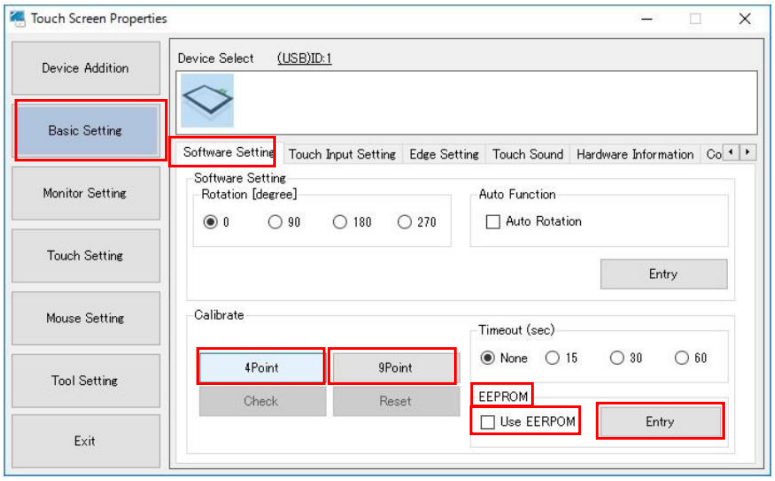
Install DMT-DD from “4.6. Touchscreen Driver” when calibrating.

9-1 Resistive Touchscreen

[4 Point] or [9 Point] calibration・・・Coordinate calibration.

(1) Start [DMT-DD].

(2) Choose the [Software Setting] via [Basic Setting]



(3) Put the check mark [Use EEPROM] under [EEPROM] and click [Entry].

When [4 Point] or [9 Point] calibration is performed with the check mark, the correction data will be stored in the EEPROM of the touchscreen controller.

When [4 Point] or [9 Point] calibration is performed without the check mark, the correction data will be stored inside the computer.

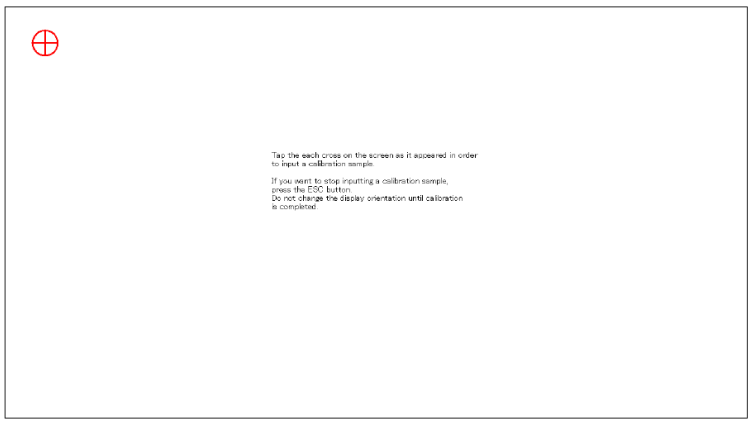
[4 Point] calibration is performed on this product at the factory shipment and the correction data is already stored in the EEPROM.

Another calibration will not be necessary because putting the check mark [Use EEPROM] recalls the stored correction data from the EEPROM.

Please perform the coordinate calibration according to the following procedure in case touch coordinates are out of alignment.

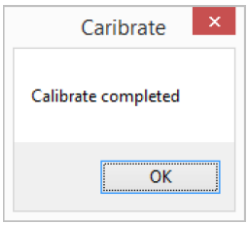
When using this product without the check mark [Use EEPROM], the stored correction data at the factory shipment will not be reflected, and accurate touch operations may not be possible.

(4) The below calibration image will be displayed when [4 Point] or [9 Point] calibration is clicked.



(5) Touch the center of the marker displayed on the screen. Another marker will be displayed one after another. Do the same for all.

(6) After all markers have been touched, adjustment is completed, and the following screen will be displayed.

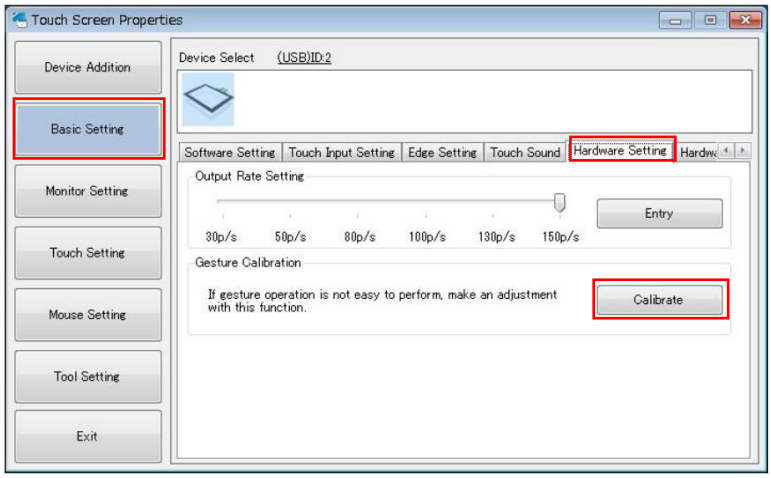


(7) Click [OK] to finish the adjustment.

9-2 Gesture Correction (DO NOT PERFORM)

The gesture calibration is already performed at the factory shipment, and the users do not need to perform it.

If the gesture calibration is performed, the touch operations may not work properly.



10 Terms of Use

10-1 Installing Module

(1) GND should be taken at the chassis mounting holes, etc., to stabilize brightness and display.
(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) Remove the protection sheet on the touchscreen when installing.

10-2 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.

10-3 Precautions for Resistive Touchscreen

(1) Applications that require to press the same point on the touchscreen for a long time may cause malfunction due to the structure of the touchscreen.
The touchscreen is made of glass. Glass is easily damaged when scratched.
Please handle the touchscreen so that glass does not come in contact with other glass or hard objects.
(2) The touchscreen is made of glass. Glass can easily break if scratched.
Please handle the touchscreen so that glass does not hit other glass or hard objects.
(3) Due to the characteristics of the touchscreen, the area slightly outside the display area may be detected as the coordinates of the edge of the touchscreen. Please design your application with this in mind.
(4) The coordinates of the touchscreen may shift over time or depending on the environment in which it is used. If the touchscreen coordinates get misaligned, please perform the coordinate calibration.
(5) Handle the edge of the glass with care as it may cause injuries.

10-4 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.

10-5 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.
(2) An acoustic noise may be generated from the components on the board, but this is not a malfunction. The sound pressure is less than 40 dB (Measurement distance: 30 cm) and is not considered to be a problem when using the product.
*40 dB = Quiet residential area (Daytime) / Inside a library

10-6 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.

10-7 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℃. 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.

11 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 damage that occurred during transport, transfer, or mishandling by the user after delivery.
(2) Any malfunctions, defects, and/or damage caused by natural or man-made disasters.
(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 damage 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.

12 Production Discontinuance

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

13 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

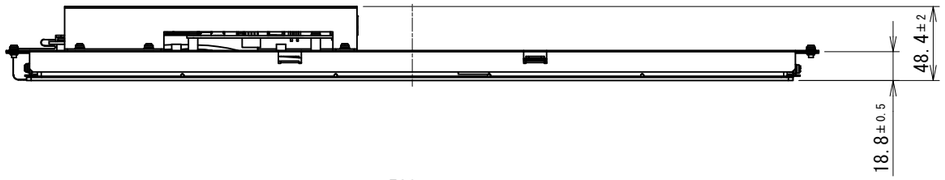
Europe, Middle East, Africa area
technical-global-eu@dush.co.jp

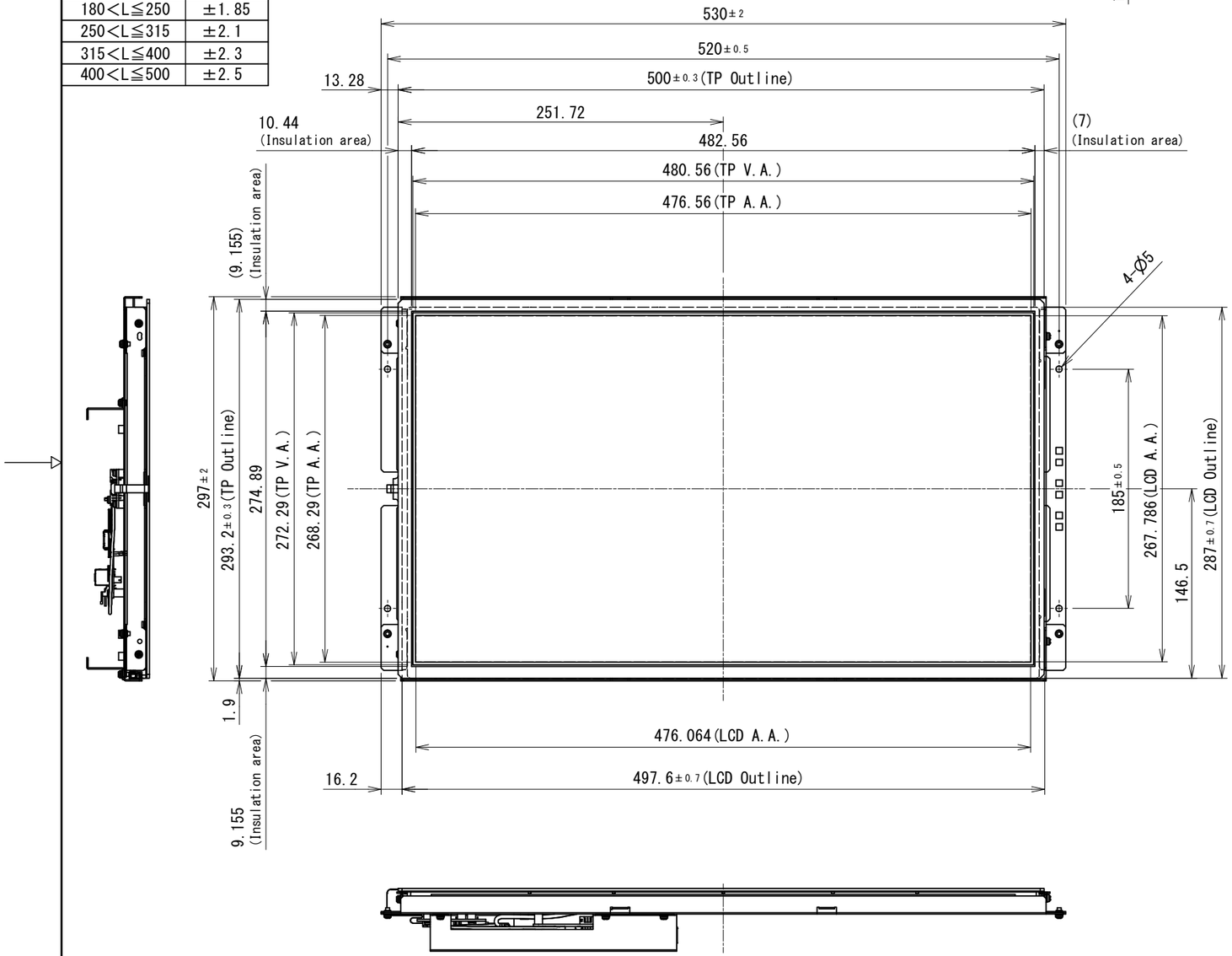
FAQ
https://www.dush.co.jp/english/support/faq/

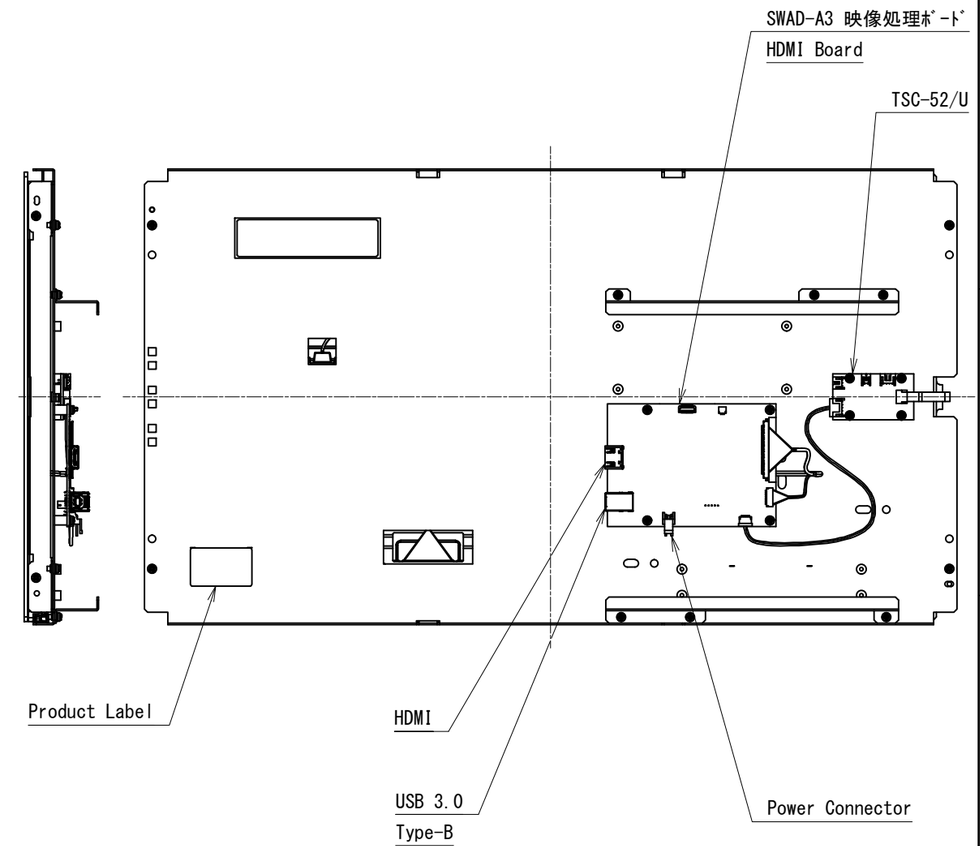
1st Edition, January 2025
DMC Co., Ltd.
Business hours: 9:00a.m.～5:00p.m. (JST)
URL: https://www.dush.co.jp/english/

寸法許容差 TOLERANCE	
呼び寸法 Nominal Dimensions	
L≦3	±0.4
3<L≦6	±0.48
6<L≦10	±0.58
10<L≦18	±0.7
18<L≦30	±0.84
30<L≦50	±1.0
50<L≦80	±1.2
80<L≦120	±1.4
120<L≦180	±1.6
180<L≦250	±1.85
250<L≦315	±2.1
315<L≦400	±2.3
400<L≦500	±2.5

SYM	改訂日 DATE	改 訂 内 容 DESCRIPTION	ページ PAGE	担当 DESIGNED
	2024.12.17	新規図面登録	—	S.Takada







NOTES
1. 指示なき寸法公差は寸法公差表の通りとする。
Tolerance shall be of dimensional tolerance table unless specified otherwise.

製図日 ISSUED	2024.12.17	部署 SECTION	Technical Dept.	尺度 SCALE	CAD登録名 CAD FILE NAME	OUTLINE_TK-BRA215FH-02A3	RoHS対応品 RoHS compliant
承認 APPROVED	検図 CHECKED	製図 DRAWN	設計 DESIGNED	1:4	製品名 MODEL	TK-BRA215FH-02A3	
T.Okada	S.Yoshimoto	S.Takada	S.Takada	単位 UNIT: mm	図名 TITLE	OUTLINE	ﾍﾟｰｼﾞ PAGE 1/1
DMC Co., Ltd.			A3		図番 DWG No.	SM3-002522-10	

Appearance Inspection Standard

LCD Modules with Resistive Touchscreen

Document No.	22G4GX-00001E	Page (Cover Excluded)	2

Revision history

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

Appearance Inspection Standard (1)

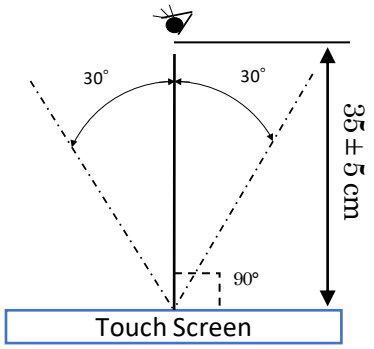
1.1 Inspection condition

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
【 10 inches ＜ Size ≦ 14 inches 】 Within 7 pcs / panel
【 Size ≦ 10 inches 】 Within 5 pcs / panel

Item	Width(mm)	Length(mm)	Acceptable Numbers
Linear(Scratch/Dust) Over 0.1mm in diameter refer to the Circular.	0.05＜W≦0.1	L≦4	1pcs in φ30mm
	0.03＜W≦0.05	L≦10	2pcs in φ20mm
	W≦0.03	L≦20	Acceptable
Circular(Scratch/Dust)	0.3＜D≦0.4		1pcs in viewing area *1
	0.2＜D≦0.3		2pcs in φ30mm
	D≦0.2		Acceptable

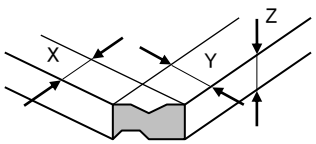
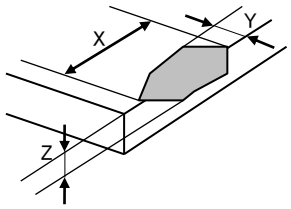
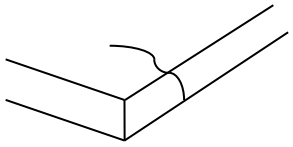
Applied only in the Viewing Area.
Scratches or dusts in the outside of the Viewing Area are acceptable unless the electrical characteristics are affected.

*1 Applied to 14 inches or larger panel.

・Acceptable if not noticeable on a black mat.

Appearance Inspection Standard (2)

1.3 Chip, crack (t = glass thickness) (applicable only for the glass)

Item	Size(mm)			Acceptable Numbers
Corner		X	≦3	2pcs /panel
		Y	≦3	
		Z	≦t	
Side		X	≦5	2 pcs /on one side
		Y	≦3	
		Z	≦t	
Crack				Not acceptable