TC041C12W00 / U00

Features:

- **Based on T5L1, running DGUS II system.**

- **4.1 inch, 720*720 pixels resolution, 16.7 M colors, IPS-TFT-LCD, wide viewing angle.**

- **In-cell full lamination Capacitive Touch Panel, beautiful appearance and reliable structure.**

- **RS485 communication, 4Pin_2.0mm interface; proximity sensor, no temperature**

  detection, wire controller.

1 Hardware and Interface

1.1 Hardware and Interface Description

No.	Name	Description
1	T5L1 ASIC	Developed by DWIN. Mass production in 2019,1MBytes Nor Flash on the chip, 512KBytes used to store the user database. Rewrite cycle: over 100,000 times
2	LCM interface	FPC40_0.5mm,MIPI interface
3	CTP interface	FPC2_1.25mm,IIC interface
4	User Interface	For power supply and serial communication, 4Pin_ 2.0mm seat
5	Flash	16MBytes NOR Flash, for fonts, pictures and audio files. Rewrite cycle: over 100,000 times
6	Speaker	On-board speaker. Rated power: 1W
7	RTC	Super-capacitor for power supply. Accuracy: ±20ppm @25℃. It can work normally for 7 days after power failure.
8	WIFI Module	TC041C12W00:Built-in WIFI-10 module TC041C12U00:None
9	SD card interface	FAT32. Download files by SD card interface can be displayed in statistics. Download rate: 4Mb/s

2 Specification Parameters

2.1 Display Parameters

LCD Type	IPS, TFT LCD
Viewing Angle	Wide viewing angle, 85°/85°/85°/85° (L/R/U/D)
Resolution	720*720 pixels (0°/90°/180°/270°)
Color	24-bit 8R8G8B
Active Area (A.A.)	74mm (W) * 74mm (H)
Backlight Mode	LED
Backlight Service Life	>20000 hours (Time of the brightness decaying to 50% on the condition of continuous working with the maximum brightness)
Brightness	300nit
Brightness Control	0~100 grade (When the brightness is adjusted to 1%~30% of the maximum brightness, flickering may occur and is not recommended to use in this range)
Note: You can use dynamic screen saver wallpapers to avoid afterimages caused by fixed page display for a long time.	

2.2 Touch Parameters

Touch Type	CTP (Capacitive Touch Panel)
Structure	In-cell (Without Cover Lens)
Touch Mode	Finger, up to 2 touches simultaneously.
Light Transmittance	Over 90%
Life	Over 1,000,000 times touch

2.3 Interface Parameters

Mode	RS485				
Voltage Level	Test Condition	Min	Typ.	Max	Unit
	Output 1	2.5	5.0	-	V
	Output 0	-	-5.0	-2.5	V
	Input 1	0	2.5	-	V
	Input 0	-	-2.5	-0.2	V
Baud Rate	3150~3225600bps, typical value of 115200bps				
Interface Cable	4Pin_2.0mm				

2.4 Electrical Specifications

Rated Power	<5W
Operating Voltage	6.5~36.5V, typical value of 12V
Operating Current	270mA	VCC=12V, max backlight
	200mA	VCC=12V, backlight off
Recommended power supply: 12V 0.5A DC	

2.5 Environment

Operating Temperature	-10℃~60℃
Storage Temperature	-20℃~70℃
Operating Humidity	10%~90%RH, typical value of 60% RH

3 Reliability Test

Before mass production of smart screens, a series of procedural reliability tests need to be conducted according to actual application requirements and product specification control standards to ensure product quality.

3.1 ESD Test

Test temperature: 25°C

Test process: the product was placed on the test bench to perform contact and air discharge in turn of the serial screen iron frame and display area. During the experimental process, it was observed whether the screen is dead, black, white, splash, or reboot. According to the experiment results, the performance is in line with the criteria GB/T 17626.2 B level and above.

Discharge Type	Discharge Value	Result
Contact discharge	±4KV	Normal operation
Air discharge	±4KV	Normal operation

3.2 High and Low Temperature Test

Test temperature:-10~60℃

Test process: the product will be placed obliquely in the high and low temperature test chamber for 12h for 20 on and off cycles. Then it will be check at room temperature after power on for the appearance and function, CTP offset situation, jumping point, page random switching and failure.

Temperature	Result
High temperature(60℃)	Normal operation
Low temperature(-10℃)	Normal operation

4 Packing Capacity & Dimension

Dimension	
Dimension	88(W) *88(H) * 16.1(T) mm
Net Weight	111g

Packing Capacity				
Model	**Dimension**	**Layer**	**Quantity/Layer**	**Quantity (Pcs)**
Carton1:	220mm(L)*160mm(W)*47mm(H)	1	2	2
Carton2:	250mm(L)*200mm(W)*80mm(H)	2	2	4
Carton3:	320mm(L)*270mm(W)*80mm(H)	2	4	8
Carton4:	450mm(L)*350mm(W)*300mm(H)	-	-	-
Carton5:	600mm(L)*450mm(W)*300mm(H)	1	56	56

Professional, Creditable, Successful

Name	Definition	Type	Description
1	VIN	P	Power Input
2	A	485+	485+
3	B	485-	485-
4	GND	P	GND

1. Location hole is used as position reference.

2. Unmarked Tolerance is +/-0.3mm

Active area is marked in Dash lines

Model		TC041C12W00/U00				DWIN Technology Co., Ltd
Drawing	A 4	Drawn	DWIN	Date		
Scale		Date	Date			
Unit	MM					
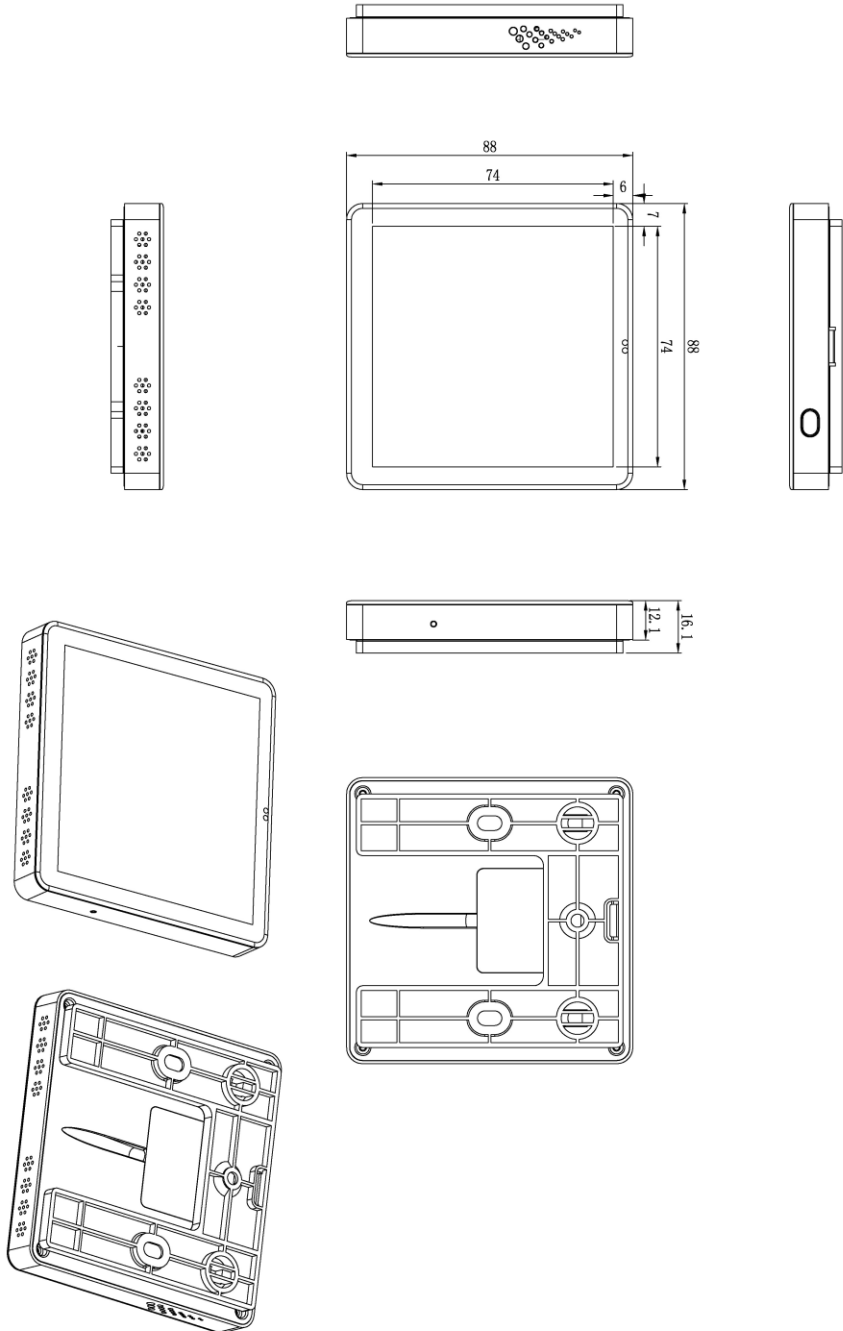
5 T5L series IC features

(1)Mature and stable 8051 core which is the most widely used with the maximum operating frequency of T5L is up to 250MHz, 1T(single instruction cycle)high speed operation.

(2)Separate GUI CPU Core running DGUS II System:

- High-speed display memory, 2.4GB/S bandwidth.

- 2D hardware acceleration, the decompression speed of JPEG is up to 200fps@1280*800 and the UI with animation and icons as its main feature is extremely cool and smooth.

- Images and icons stored in JPEG format. Adopt Low-cost 16Mbytes SPI Flash.

- Support CTP or RTP with adjustable sensitivity and maximum 400 Hz touch frequency.

- 1-way 15bit 32Ksps PWM digital power amplifier driver loudspeaker, save power amplifier cost and achieve high signal-to-noise ratio and sound quality restoration.

- 128Kbytes variable storage space for exchanging data with OS CPU Core and memory.

- Support DGUS development and simulation on PC. Support background remote upgrade.

(3)Separate CPU (OS CPU) core runs user 8051 code or DWIN OS system and user CPU is omitted in practical application:

- Standard 8051 architecture and instruction set, 64Kbytes code space, 32Kbytes on-chip RAM.

- 64 bit integer mathematical operation unit (MDU), including 64 bit MAC and 64 bit divider.

- 28 IOs, 4-channel UARTs, 1-channel CAN, up to 8-channel 12-bit A/Ds and 2-channle 16-bit PWM of adjustable resolution.

- Support IAP on-line simulation and debugging with unlimited number of breakpoints.

- Upgrade code online through DGUS system.

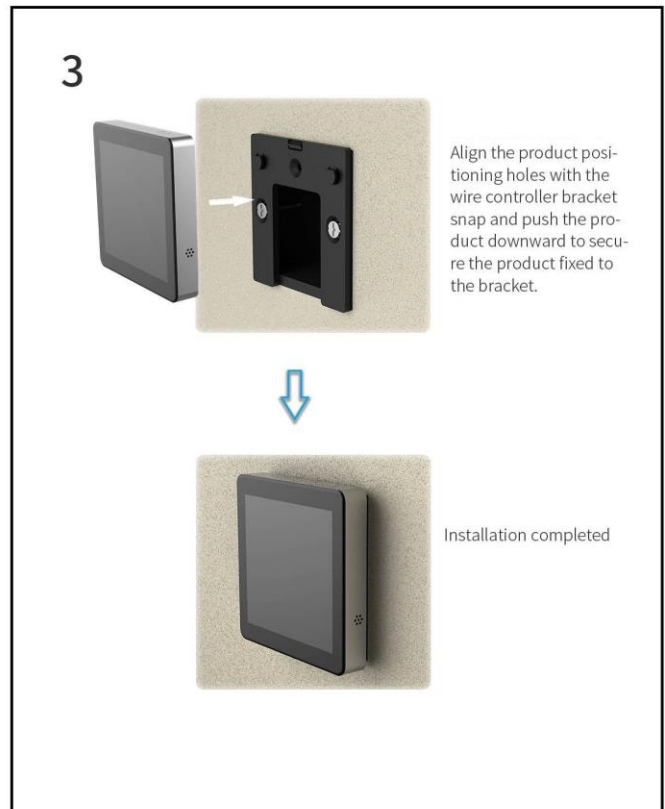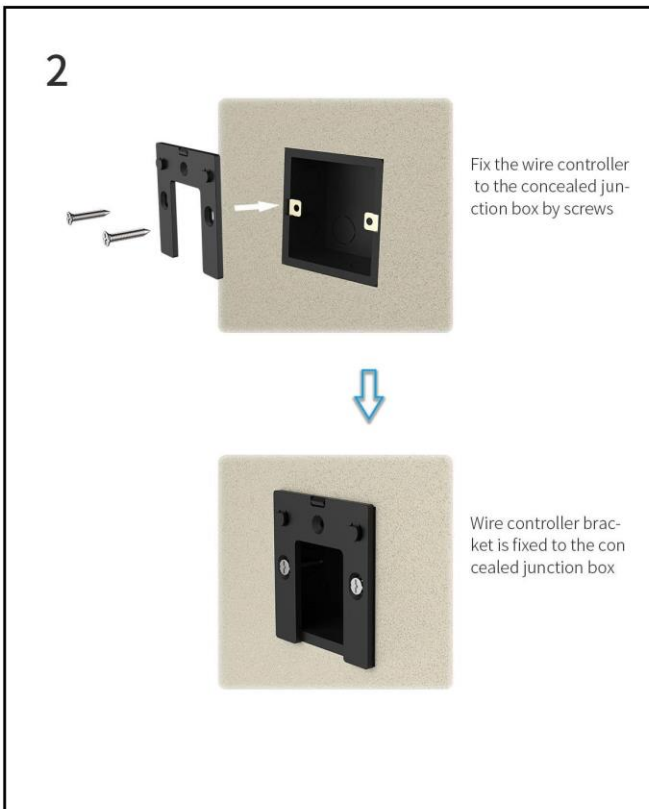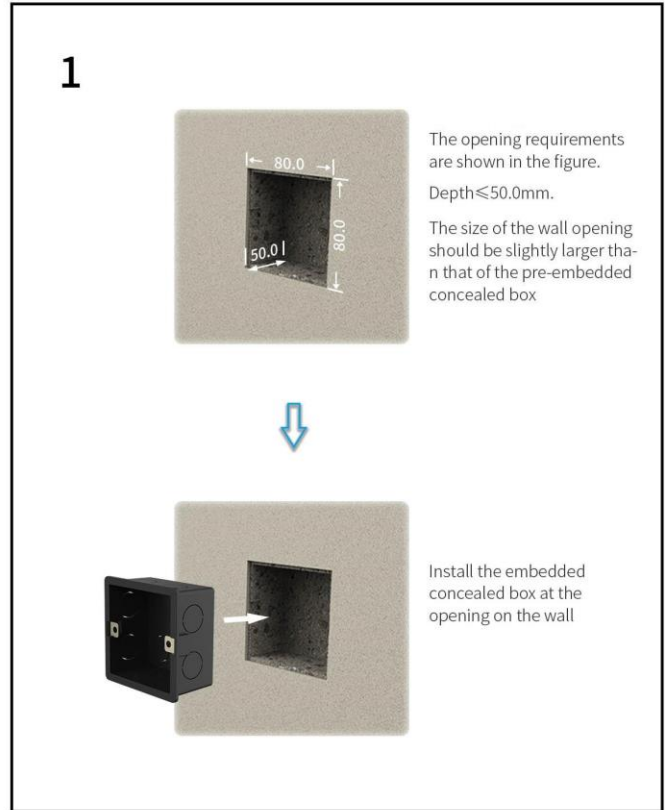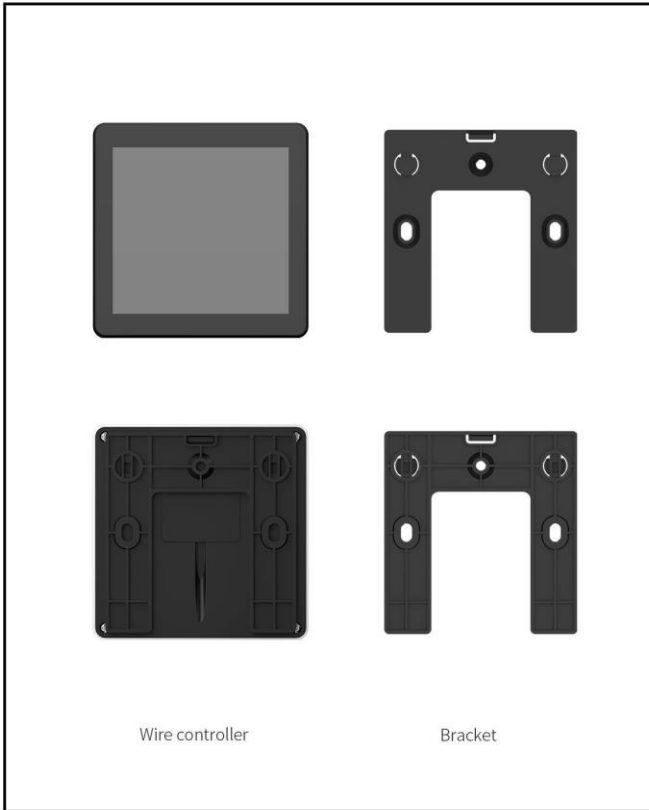(4)1Mbytes on-chip Flash with DWIN patent encryption technology ensure code and data security.

(5)Operating temperature ranges from -40℃ to +85℃ (IC operating temperature customizable from -55℃ to 105℃).

DWIN encourages users to design your own customized product based on T5L.

6 Installation Schematic

TC041C12W00 / TC041C12U00

Installation Schematic

Wire controller

Bracket

1

The opening requirements are shown in the figure.

Depth≤50.0mm.

The size of the wall opening should be slightly larger than that of the pre-embedded concealed box

Install the embedded concealed box at the opening on the wall

2

Fix the wire controller to the concealed junction box by screws

Wire controller bracket is fixed to the concealed junction box

3

Align the product positioning holes with the wire controller bracket snap and push the product downward to secure the product fixed to the bracket.

Installation completed

7 Record History

Rev	Date	Content	Editor
00	2023-07-10	First Edition	YML

Disclaimer: The product design is subject to alternation and improvement without prior notice.

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Thank you all for continuous support of DWIN, and your approval is the driving force of our progress!