Smart Panlee

Rotary Switch Screen

ZX2D10GE01R-V4848

Features:

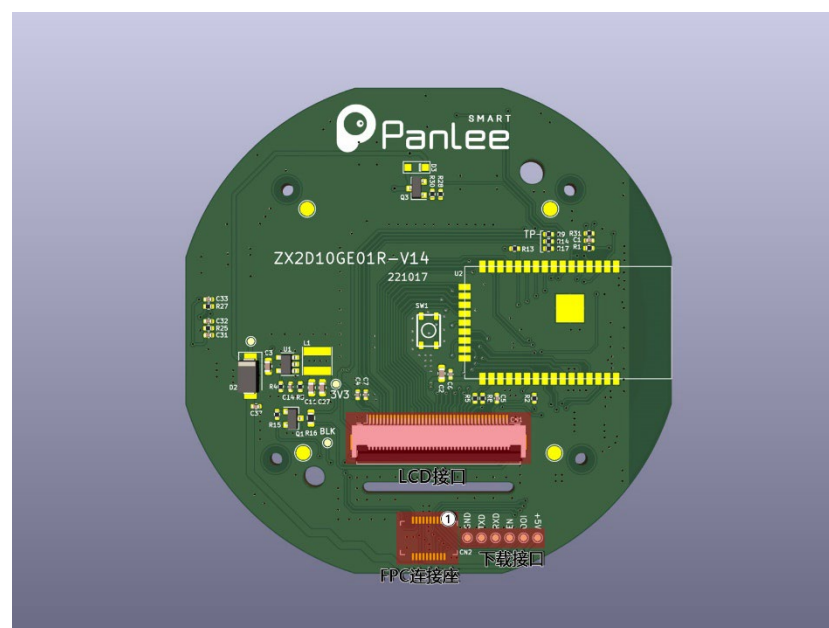1. Support rapid prototyping

Core Materials (Tab. 0):

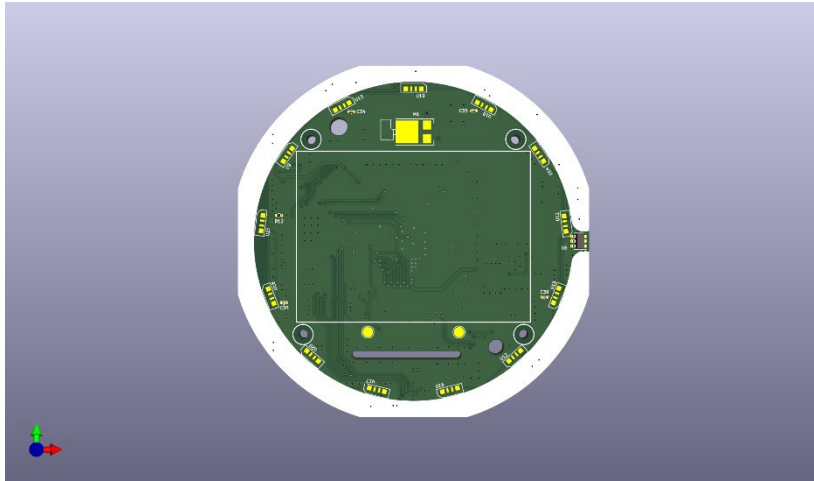| No.	Name	Model	Remark
1	ESP32-S3 module	WT32-S3-WROVER-N16R8	
2			
3			

Hardware Interface:

Hardware Interface Diagram:

Fig.1 Hardware Interface

Interface Description:

[1] LCD Interface (Tab.1)

Description	Module Pin	Remark
TP_SCL	*GPIO 6*	*Touch IIC bus clock, reused with external interface, no touch at present*
TP_SDA	*GPIO 5*	*Touch IIC bus data, reused with external interface, no touch at present*
TP_INT	*GPIO 7*	*Touch interrupt, no touch at present*
LCD_RST	EN	-
LCD_CS	GPIO 21	LCD SPI bus CS
LCD_SCLK	GPIO 47	LCD SPI bus SCLK
LCD_MOSI	GPIO 41	LCD SPI bus MOSI
RGB_PCLK	GPIO 45	LCD RGB interface PCLK
RGB_DE	GPIO 39	LCD RGB interface DE
RGB_VS	GPIO 48	LCD RGB interface VS
RGB_HS	GPIO 40	LCD RGB interface HS
RGB_D0	GPIO 47	LCD RGB interface D0
RGB_D1	GPIO 41	LCD RGB interface D1

RGB_D2	GPIO 0	LCD RGB interface D2
RGB_D3	GPIO 42	LCD RGB interface D3
RGB_D4	GPIO 14	LCD RGB interface D4
RGB_D5	GPIO 8	LCD RGB interface D5
RGB_D6	GPIO 13	LCD RGB interface D6
RGB_D7	GPIO 18	LCD RGB interface D7
RGB_D8	GPIO 12	LCD RGB interface D8
RGB_D9	GPIO 11	LCD RGB interface D9
RGB_D10	GPIO 17	LCD RGB interface D10
RGB_D11	GPIO 10	LCD RGB interface D11
RGB_D12	GPIO 16	LCD RGB interface D12
RGB_D13	GPIO 9	LCD RGB interface D13
RGB_D14	GPIO 15	LCD RGB interface D14
RGB_D15	GPIO 46	LCD RGB interface D15
LCD_BL	GPIO 38	LCD backlight control, active high

[2] FPC Connector Interface (Tab.2)

Pin	Description	Module Pin	Voltage Range	Remark
1	ESP_TXD	TXD0	3.3V TTL	Download serial port TXD
2	EXT_IO4	GPIO 1	0~3.3V	Output interface 4
3	ESP_RXD	RXD0	3.3V TTL	Download serial port RXD
4	EXT_IO3	GPIO 2	0~3.3V	Output interface 3
5	EN	EN	0~3.3V	Chip enable
6	EXT_IO2	GPIO 20	0~3.3V	Output interface 2, multiplexed with USB
7	BOOT	GPIO 0	0~3.3V	Boot mode select

8	EXT_IO1	GPIO 19	0~3.3V	Output interface 1, multiplexed with USB
9~12	GND	-	0V	Ground
13、14	USB_DP	GPIO 20	0~3.3V	USB pin, which can be used as general IO
15、16	USB_DN	GPIO 19	0~3.3V	USB pin, which can be used as general IO
17、19	ICCInterface	-	-	Not connected in the current version
18、20	+5V	-	+5V±5%	5V power supply

[3] Download Interface (Tab.3)

Pin	Description	Module Pin	Voltage Range	Remark
1	+5V	-	+5V±5%	5V power supply
2	BOOT	GPIO 0	0~3.3V	Boot mode select
3	EN	EN	0~3.3V	Chip enable
4	ESP_RXD	RXD0	3.3V TTL	Download serial port RXD
5	ESP_TXD	TXD0	3.3V TTL	Download serial port TXD
6	GND	-	0V	Ground

接口封装 Interface Encapsulation ：

接口描述	接口封装	备注
FPC 连接座 接口	2×10P BTB	
下载接口	2.54mm 6Pin test point	探针连接

Hardware Peripherals:

Peripheral	Description	Related IO
Button	The button is pulled up, grounded when pressed	GPIO 3
LCD	LCD with RGB interface, no touch, 480 * 480	-

LED	Single bus LED, 13 in total	GPIO 4
Hall encoder	Hall encoder is used for rotating operation in human-computer interaction, and orthogonal encoder is adopted.	GPIO 5、6
Vibrating motor	Feedback for human-computer interaction	GPIO 7

Schematic：

POWER SUPPLY

VBUS
VBUS TP18
U1 SY8089
L1 2R2_NR4018
TP21 3V3
+3.3V
C3 106/16V
VIN LX
EN GND FB
3V3_FB
C11 226/6.3V
R3 91K
R4 20K
C14 20p
GND

BUTTON

+3.3V
R13 10K
SW1
BTN_IO
SW_Push
GND

ESP32 SERIAL DEBUG
5V +5V
RXD ESP_RXD
TXD ESP_TXD
EN EN
IO0 ESP_IO0
GND GND

R2 20K ESP_IO0 +3.3V

ESP32 MODULE

U2 WT32-S3-WROVER
GND 1 GND
ESP_IO4 2 IO004
ESP_IO5 3 IO005
ESP_IO6 4 IO006
ESP_IO7 5 IO007
EN 6 EN
ESP_IO15 7 IO015
ESP_IO16 8 IO016
ESP_IO17 9 IO017
ESP_IO18 10 IO018
ESP_IO8 11 IO008
ESP_IO3 12 IO003
ESP_IO46 13 IO046
ESP_IO19 14 IO019
ESP_IO20 15 IO020
ESP_IO9 16 IO009

41 GND GND
40 IO001 ESP_IO1
39 IO002 ESP_IO2
38 IO042 ESP_IO42
37 IO041 ESP_IO41
36 GND GND
35 IO040 ESP_IO40
34 TXD ESP_TXD
33 RXD ESP_RXD
32 IO039 ESP_IO39
31 IO038 ESP_IO38
30 IO037
29 IO036
28 IO035
27 IO045 ESP_IO045
26 VCC +3V3

OSPI do not use

+3.3V R1 20K TP_RST LCD_RST EN
C1 105/25V
GND

+3.3V +3.3V
C2 226/6.3V C6 104/16V
GND GND

IO010 IO011 IO012 IO013 IO014 IO00 IO021 IO047 IO048
ESP_IO010 ESP_IO011 ESP_IO012 ESP_IO013 ESP_IO014 ESP_IO00 ESP_IO021 ESP_IO047 ESP_IO048

LCD POWER BYPASS

R8 20K LCD_CS +3.3V

+3.3V +3.3V
C27 226/6.3V C5 104/16V
GND GND

BACKLIGHT CONTROL
LCD_BL = 1 BL ON

LCD_BL TP22 BLK LEDK
R15 2K Q1 S8050
GND

+3.3V
C4 104/16V
GND

LCD_RST
C7 104/16V
GND

LCD DRIVER

R16 2R2 +3.3V
CN1 FPC_CONN_0.5_40P

LEDA 1
LEDK 2
LEDK 3
GND 4
VDDIO 5 +3.3V
RST 6
7
8
SDA 9
SCK 10
CS 11
PCLK 12
DE 13
VSYNC 14
HSYNC 15
GND 16
B_DB1 17
B_DB2 18
B_DB3 19
B_DB4 20
B_DB5 21
G_DB0 22
G_DB1 23
G_DB2 24
G_DB3 25
G_DB4 26
G_DB5 27
R_DB0 28
R_DB1 29
R_DB2 30
R_DB3 31
R_DB4 32
R_DB5 33
GND 34
TP_INT 35
TP_SDA 36
TP_SCL 37
TP_RST 38
TP_VCI 39
GND 40

LCD_RST
LCD_SDA
LCD_SCL
LCD_CS R5 100R
RGB_PCLK
RGB_DE
RGB_VS
RGB_HS
RGB_D0 ... RGB_D15
TP_INT TP_SDA TP_SCL TP_RST
+3.3V GND

EXT_CONN

CN2 MBAC201_20P
TP_SDA TP_SCL USB_DN USB_DP GND ESP_IO0 ESP_RXD ESP_TXD
+5V
USB_DN USB_DP EXT_IO1 EXT_IO2 EXT_IO3 EXT_IO4

RGB LED

P2
LED_DI RGB_DIN
+3.3V VDD
GND GND
XT1063 * 13
File: RGB_LED.kicad_sch

POGOPIN

GND GND GND GND GND GND

HALL SENSOR

GND
C32 104/16V +3.3V
U6 MT8901-SS
GND GND VDD
SP1 NC SP2
C31 102 C33 102
R25 10K R27 10K
GND SP1 SP2 GND
+3.3V

MOTOR

VBUS
D3 1N4148WS M1 Motor_DC
R28 2K Q3 AO3400A
MOTO_IO R30 20K
GND GND

如果有触摸屏，则空贴编码器和电机

power in

C37 105/16V +5V D2 SS34 VBUS
GND

IO MAP

LCD_BL ESP_IO38
LCD_CS ESP_IO21
RGB_PCLK ESP_IO45
RGB_DE ESP_IO39
RGB_VS ESP_IO48
RGB_HS ESP_IO40
LCD_SCL ESP_IO47
LCD_SDA
RGB_D0 ESP_IO41
RGB_D1 ESP_IO00
RGB_D2 ESP_IO42
RGB_D3 ESP_IO014
RGB_D4 ESP_IO8
RGB_D5 ESP_IO013
RGB_D6 ESP_IO012
RGB_D7 ESP_IO018
RGB_D8 ESP_IO011
RGB_D9 ESP_IO010
RGB_D10 ESP_IO017
RGB_D11 ESP_IO010
RGB_D12 ESP_IO016
RGB_D13 ESP_IO9
RGB_D14 ESP_IO015
RGB_D15 ESP_IO46

BTN_IO ESP_IO3
LED_DI ESP_IO4

MOTO_IO ESP_IO7
SP2 ESP_IO6
SP1 ESP_IO5

USB_DN ESP_IO19
USB_DP ESP_IO20
EXT_IO1 ESP_IO2
EXT_IO3 ESP_IO02
EXT_IO4 ESP_IO01

N.C.

R9
SP2 NC TP_SCL
SP1 NC TP_SDA
R14
MOTO_IO NC TP_INT
R17

如果有触摸屏，则空贴编码器和电机，改贴这三个电阻

Specification Parameters:

[1] LCD Parameters (Tab.5)

Display Type	IPS
Driver IC Model	ST7701S
Viewing Angle	Full Veiw
Resolution	480*480
Interface	RGB
Color	RGB565

[2] Touch Parameters (Tab.6)

Touchscreen Type	-
Driver IC Model	-
Interface	-
Touchscreen Structure	-
Touch Mode	-
Surface Hardness	-
Light Transmittance	-

Outline Dimensional Drawing (Fig.2)

版本	图纸名称	物料编码	备注

φ80.19
φ75
φ50.4
M3
22.67
16.8

未标注公差标准	
0 ~ 30	± 0.1
30 ~ 120	± 0.3
120 ~ 400	± 0.5
400 ~ 1000	± 0.8
1000 ~ 2000	± 1.2
2000 ~ 4000	± 2
未注角度公差	± 0.5°

变更位置					
项目			深圳市启明智显科技有限公司		
设计	康鹏飞	日期	2022.04.29		
审核		日期		材料	图纸名称 ZX液晶屏结构尺寸图
				表面处理	
批准		日期		颜色	物料编码
联系电话:				比例 1:2 单位 mm 版本 A 共 页 第 页	
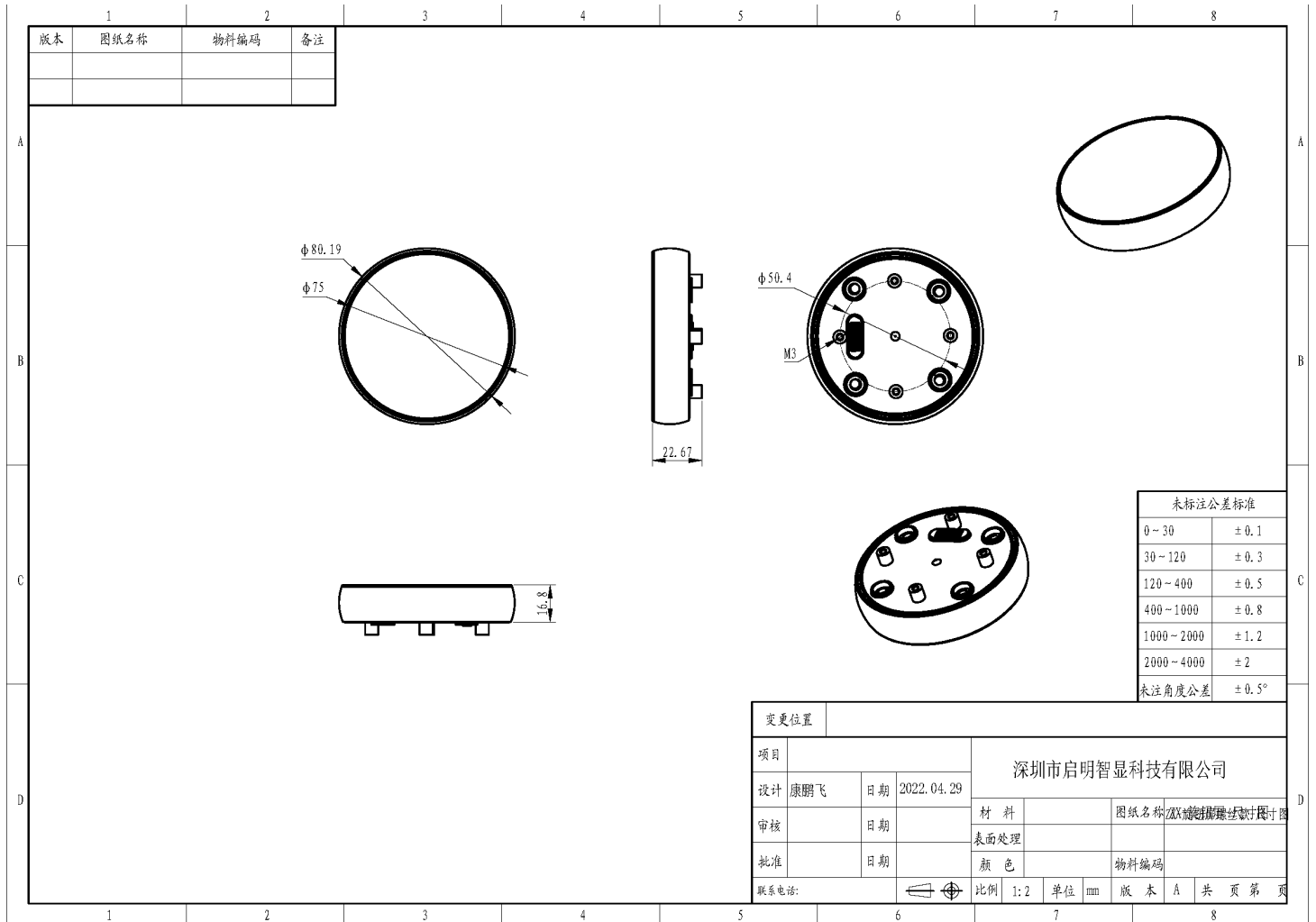
Firmware Burning:

1. Connect the downloader (ZXACC-ESPDB) via a USB-Type C cable. And then connect the ZX2D10GE01R board with the downloader (ZXACC-ESPDB) through an MX1.25-7P cable. As the downloader (ZXACC-ESPDB) has automatic data flow processing capabilities, the firmware can be downloaded automatically through the ESP32 Flash Download Tools.
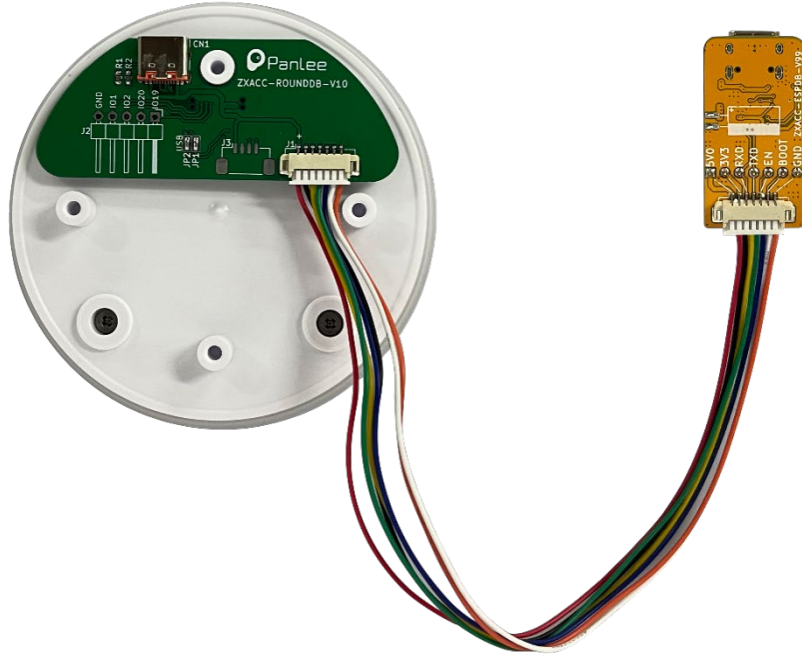

Fig.3

2. As shown in Fig. 4: Select the firmware path at mark 1, and then fill in the burning address, usually 0X00. Note that this checkbox must be checked; Set the crystal frequency to be 40MHz at mark 2; Select 32Mbit for Flash size at mark 3; Select DIO for SPI MODE at mark 4; Select the COM port number recognized by the computer at mark 5; Select the baud rate at mark 6 (the higher the value is, the faster the firmware will be downloaded. Max. 1152000bps).

3. After the previous configuration, click START at mark 7 to start burning the firmware.

4. Complete the above steps, and then press the reset button on the back of the development board to start running the firmware you just burned.
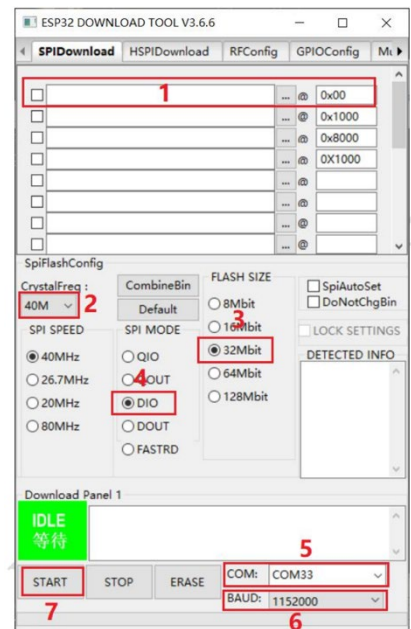

Fig.4

Software design reference：

URL：https://www.espressif.com.cn/en/support/documents/technical-documents

Online GUI Designer:

Users can use our online GUI designer platform, which is similar to MIT APP Inventor, to realize the rapid GUI development with building blocks. Currently, the platform has perfected the graphic interface development, and more driver code blocks will be further improved in the future.

Login Page: http://8ms.xyz/login
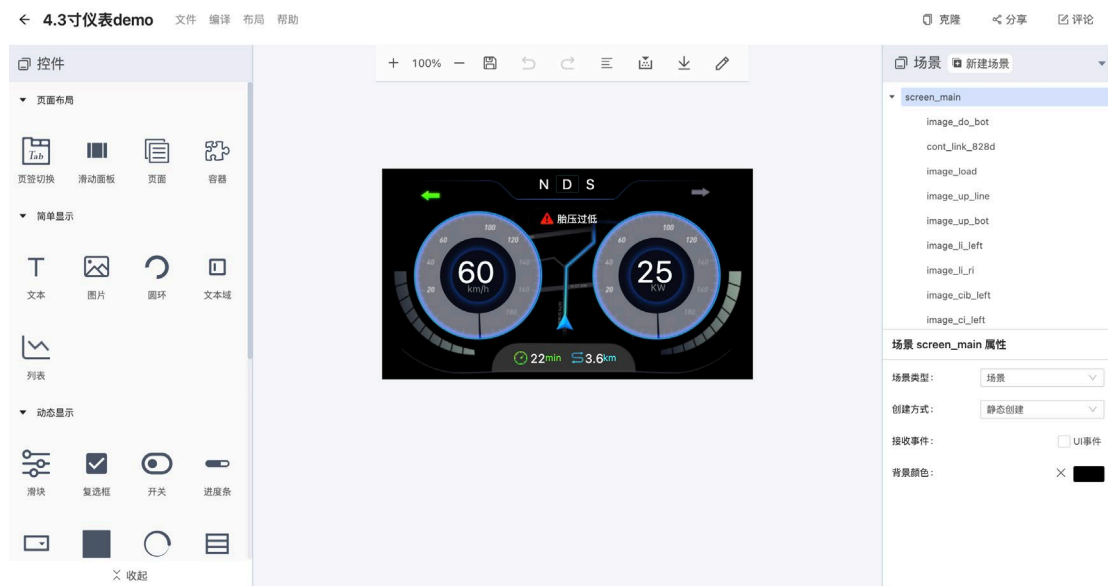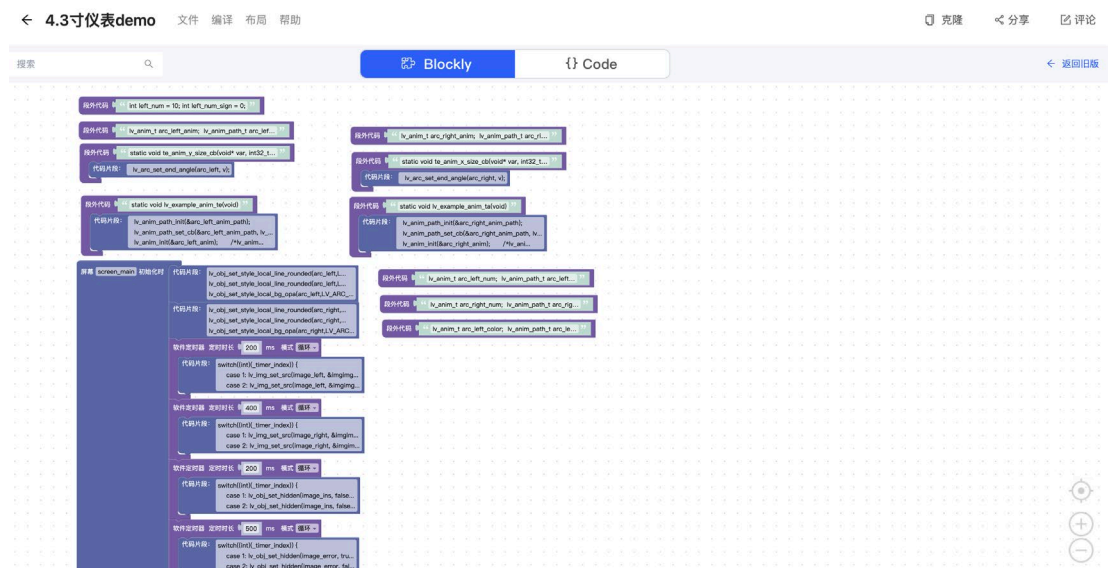
User Manual: https://doc.smartpanle.cn/ESP32-S3/index.html

Fig.5

Fig.6

Contact Us

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E-mail: panlee@smartpanle.com
Get Samples: https://shop212317088.taobao.com/

Wechat Official Account: Smartpanle