M5StickT

Description

M5StickTis an exquisite and compact infrared thermal imaging camera. It adopts the latest FLIR Lepton 3.0 long-wave infrared (LWIR) camera core with an effective resolution of 160 * 120 for a clear and stable image. As it is a large area non-contact infrared sensor, it is a good solution for temperature measurement. Its main control chip is Espressif's ESP32, which has built-in support for WI FI and Bluetooth connections, and computing speeds of up to 240Mhz. This provides a favorable guarantee for image output with a FPS reaching 7 and above. The screen is 1.14 inches and has a resolution of 135 * 240. The device comes with a rich variety of hardware resources: An on-board 6-axis Inertial Measurement Unit, a digital microphone and a power management chip and a built-in 300mAh battery, all embedded into the device. In terms of interactive operation, two programmable buttons and a rotary encoder are provided. In order to facilitate users to connect more peripherals, a 4 Pin PH2.0 interface with I2C support is provided at the bottom. The body is 3D printed from high quality Black Nylon filament. In addition, an M3 screw hole and a 1/4" screw hole are provided underside for easy mounting.

Product Features

ESP32-based
Case Material: Nylon 3D print
FLIR Lepton 3.0
Built-in 6-Axis IMU, microphone
Timer, and dial encoder
IPS LCD(1.14 inch)
built-in Li-po Battery
GROVE 4PPH2.0 Interface

Include

1x M5StickT
1x USB Type-C(20cm)

Applications

Car engine failure check
Building dehumidification insulation cooling leak
Industrial furnace inner wall refractory crack
Outdoor observation of animals at night

Lepton 3.0 Parameter

Effective Pixels	160*120
Field of view	56°
Half Imaging time	<500ms
Effective Frame Rate	8.7Hz
Input Clock	25MHz
Pixel Size	12um
Low operating power	150 mW (operating), 150 mW (during shutter event), 5 mW (standby)
Scene dynamic range	Low Gain Mode: -10 to 400°C, High Gain Mode: -10 to 140°C
Spectral Range	8 to 14 µm
Thermal Sensitivity	<50 mK@ 25°C
Operation Temperature Range	-10°C to +60°C

Notice:

M5StickT only supports WIN10 & Linux & MAC(>10.15) free drive, the rest of the operating system requires users to install the driver.

Installation steps: 1. Click the link below to download the driver installation package. 2. Connect the device and open the Computer Device Manager port option. 3. Right click on the unrecognized device and perform a manual update.

Driver download Link

Usage

Press the reset button to power on. The default display screen is RGB display mode.The left side is the temperature image, the upper right is the power display, and the lower right is the histogram and temperature range. The temperature range is automatically adjusted with the target temperature. The default bulls eye automatically tracks the maximum temperature. Press the right button A to switch the tracking mode (minimum / center / maximum value), press the button B to switch the image display mode (GRAY / COLDEN / RAINBOW / IRONBLACK / RGB). Dial encoder controls the display sensitivity (adjust the display temperature and color gamut), and long press the reset button for 6 seconds to turn off.

Specification

Resources	Parameter
ESP32	240MHz dual-core, 600 DMIPS, 520KB SRAM, Wi-Fi, dual-mode Bluetooth
Flash Memory	4MB
Power Input	5V @ 500mA
Port	Type-C x 1, GROVE(I2C+I/O+UART) x 1
LCD Screen	1.14 inch, 135*240 Colorful IPS, ST7789
Button	Custom button x 2
MPU6	MPU6886
MIC	SPM1423
Power Manager	AXP192
Battery	200 mAh @ 3.7V
Antenna	2.4G 3D antenna
Thermal	Lepton 3.0
Encoder	Dial encoder
Operating Temperature	32°F to 104°F (0°C to 40°C)
Size	48.3*24.7*20mm
Weight	36g
Case Material	Plastic (PC)

EasyLoader

> Easyl oader is a concise and fast program writer, which has a built-in case program related to the product. It can be burned to the main control by simple steps to perform a series of function verification. Please install the corresponding driver according to the device type. M5Core host. Please click here to view the CP210X driver installation tutorial. M5StickC/V/T/ATOM series can be used without driver)

PinMap

BUTTON A & BUTTON B

ESP32	G37(IN)	G39(IN)
BUTTON A	Button PIN	
BUTTON B	Button PIN	

IPS LCD

Driver IC：ST7789

Resolution：135 * 240

ESP32	GPIO15	GPIO13	GPIO23	GPIO18	GPIO5
IPS LCD	MOSI	CLK	DC	RST	CS

PH2.0 PORT

ESP32	G(G33)	G(G32)	5V	GND

Port B port	SCL	SDA	3V	GND

MIC (SPM1423)

ESP32	GPIO0	GPIO34
MICPHONE	SCL	SDA

6 Axis posture sensor (SH200Q/MPU6886) & power management IC (AXP192)

ESP32	GPIO21	GPIO22
6-Axis posture sensor	SCL	SDA
power management IC	SCL	SDA

AXP192

Microphone	RTC	TFT backlight	TFT IC	ESP32/3.3V MPU6886/SH200Q	5V GROVE
LDO0/3	LDO1	LDO2	LDO3	DC-DC1	IPSOUT

Dial Encoder

STM32	PA2	PA3	PA4
Encoder	SW	ENA_B	ENA_A

Related Link

datasheet

- ESP32-PICO
- MPU6886
- AXP192
- SPM1423
- Layout Datasheet
- Layout expansion datasheet
- Layout software interface description

3D Printer STL File

- STL

Example

Arduino IDE

If you want the complete code, please click here