THERMAL

Description

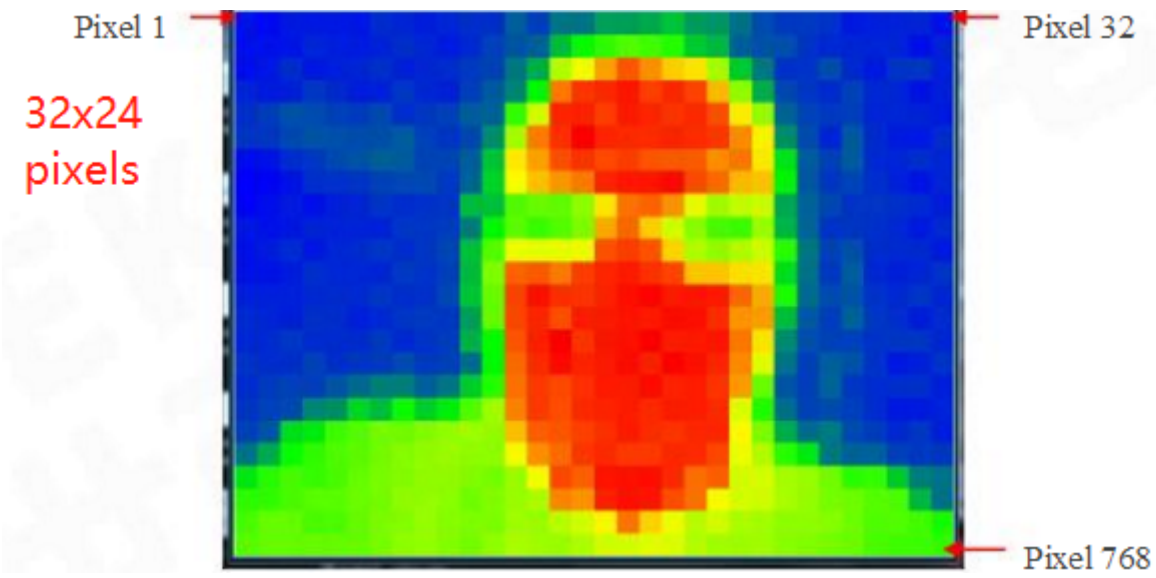
THERMAL is a thermal imager Unit contains a thermopile sensors named **MLX90640**. It can be used to measure the surface temperature of an object and form a thermographic image by a temperature gradient composed of different surface temperatures. The image resolution is **32 x 24**.

The MLX90640 Infrared (IR) sensor array combines high resolution and reliable operation in harsh enviroments providing a cost-effective alternative to more expensive high-end thermal imaging cameras.

Unlike the case of a microbolometer, the sensor does not require frequent recalibration, ensuring continuous monitoring and reducing system cost.

The field of view (FoV) option includes a standard 55° x 35° version and a wide angle version of 110° x 75° for distances up to 7m. This Unit is **110°×75° FoV**, also known as the BAA package.

The Unit communicates with the M5Core through the Grove A interface, IIC address is **0x33**



Product Features

- Operating Voltage: 3V ~ 3.6V
- Current Consumption: 23mA
- Field of View: 110°×75°
- Measurement Range: -40°C ~ 300°C
- Resolution: ±1.5°C
- Refresh Rate: 0.5Hz-64Hz
- Operating temperature: -40°C ~ 85°C
- Two Lego-compatible holes
- Product Size：32.2mm x 24.2mm x 8.7mm
- Product weight：5.3g

Include

- 1x THERMAL Unit
- 1x Grove Cable

Applications

- High precision non-contact temperature measurements
- Intrusion / Movement detection
- Visual IR thermometers

Related Link

- **MLX90640 Datasheet**

EasyLoader

1.EasyLoader is a simple and fast program burner. Every product page in EasyLoader provides a product-related case program. It can be burned to the master through simple steps, and a series of function verification can be performed. .

2. After downloading the software, double-click to run the application, connect the M5 device to the computer through the data cable, select the port parameters, click **"Burn"** to start burning. (**For M5StickC burning, please Set the baud rate to 750000 or 115200**)

3. Currently EasyLoader is only suitable for Windows operating system, compatible with M5 system adopts ESP32 as the control core host. Before installing for M5Core, you need to install CP210X driver (you do not need to install with M5StickC as controller)

Example

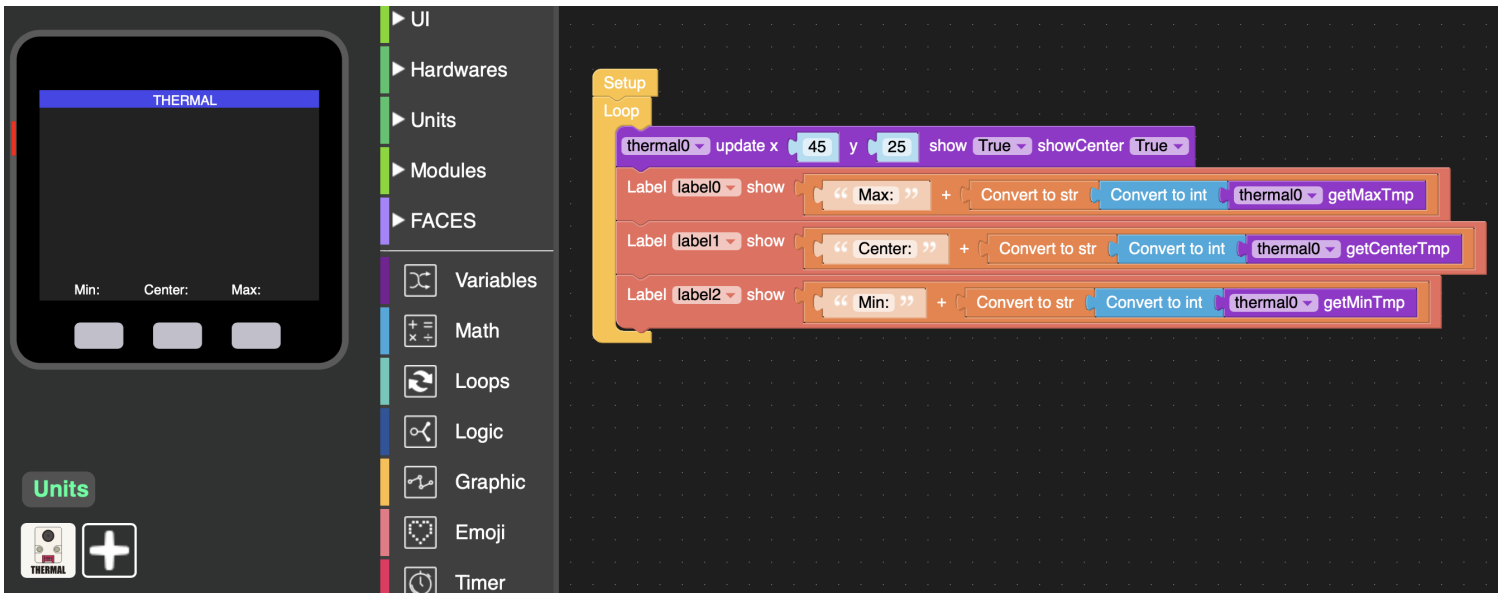
1. Arduino IDE

The code below is incomplete.

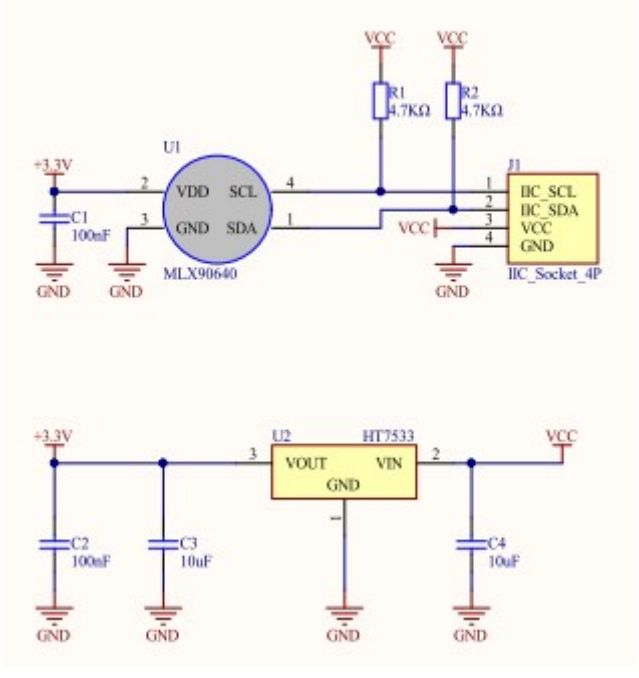
```
    MLX90640.ino
*/
#include <M5Stack.h>
#include <Wire.h>
#include "MLX90640_API.h"
#include "MLX90640_I2C_Driver.h"

// declaration
uint16_t eeMLX90640[832];//32 * 24 = 768
int SetRefreshRate;

// initialization
/* load system parameter */
MLX90640_DumpEE(MLX90640_address, eeMLX90640);
/* load extraction parameter */
MLX90640_ExtractParameters(eeMLX90640, &mlx90640);
SetRefreshRate = MLX90640_SetRefreshRate(0x33, 0x05);

M5.Lcd.fillScreen(TFT_BLACK);
          infodisplay();
 // display heat map
        M5.update();
infodisplay();
interpolate_image(reversePixels,ROWS,COLS,dest_2d,\
                  INTERPOLATED_ROWS,INTERPOLATED_COLS);
```

2. UIFlow

To get complete code, please click here.



Schematic



PinMap

M5Core (GROVE A)	GPIO22	GPIO21	5V	GND
THERMAL Unit	SCL	SDA	5V	GND