CEC Continuing Education Center

DesignNews

Prototyping and Programming ESP32 Wearable Devices

DAY 2 : M5Core IoT Starter Kit Overview

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Dr. Don Wilcher

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Course Kits

Starter Kit M5GO IoT V2.6

Core2 ESP32 For AWS IoT EDUKIT

Agenda:

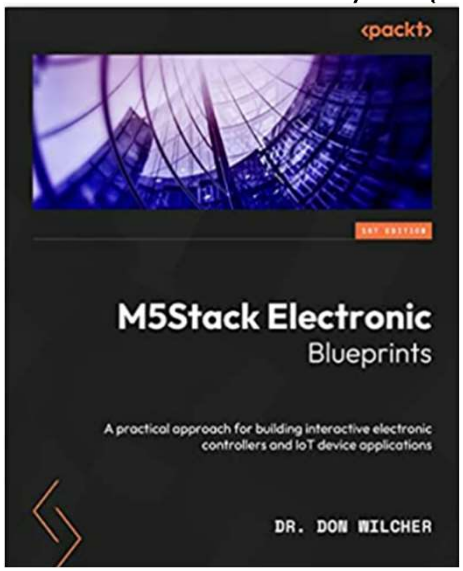
- M5Go Starter Kit Overview
- M5Stack Units
- M5Stack Unit Mini Activities
- Lab: Programming an Electronic Flashlight Wearable

Wearable Technologies :

"Progress in wearable technologies for monitoring is driven by the same factors that were behind the transition from desktop computing and communication tools to portable devices providing processing and ubiquitous connectivity, namely changes in social and economical factors" (Bonfiglio & De Rossi, 2011).

M5 Core ESP32 IoT Controller Architecture

The following information is from my upcoming book title:



https://www.amazon.com/M5Stack-Electronic-Blueprints-interactive-applications/dp/1803230304/ref=sr_1_1?crid=OVYB3O0IQ5OU&keywords=dr.+don+wilcher&qid=1667169860&sprefix=%2Caps%2C191&sr=8-1

M5Go Starter Kit Overview

What Is the M5Go Starter kit?

- M5Go Starter Kit is an electronics platform that allow IoT devices to be rapidly developed.
- M5Go Starter kit allows interactive devices to be created in an engaging manner.
- M5Go Starter kit allows learning electronic sensors quite effectively.
- M5Go Starter kit has a programmable Thin Film Transistor (TFT) LCD to create aesthetically appealing wearables devices.

M5Go Starter Kit Overview

What Is the M5Go Starter kit?

- M5Go Starter Kit has electronic sensors to explore environmental and motion detection applications.
- M5Go Starter kit allows coding applications using blockly code blocks or high-level programming languages.
  a) C/C++
  b) Micropython

M5Go Starter Kit Overview. . .

What Is the M5Go Starter kit?

Question 1

M5Go Starter Kit has a programmable Thin Form Transistor(TFT) LCD to create aesthetically appealing wearable devices.

a) True

b) False

M5Stack Units

The M5Stack Unit is a small electronic input sensor or electrical output device that extends the interactive use of the M5Stack Core.

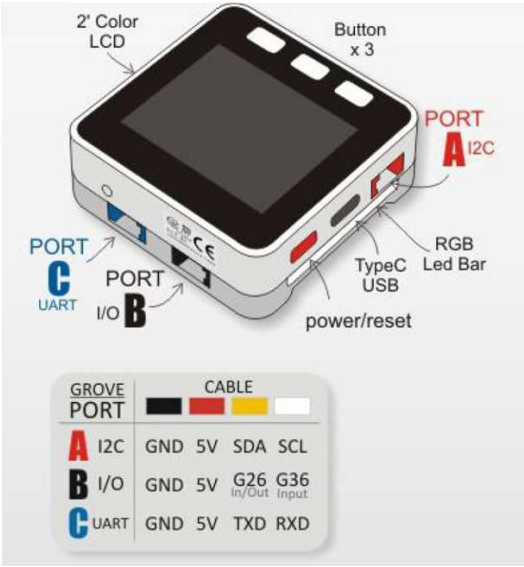
M5Go Starter kit includes the following Units

- M5 Stack Core ESP32 based controller
- Angle Sensor
- Environmental (Env) Sensor
- Motion Sensor
- Grove Hub
- IR Remote
- RGB LED

M5Stack Units . . .

M5Go Starter kit includes the following Units

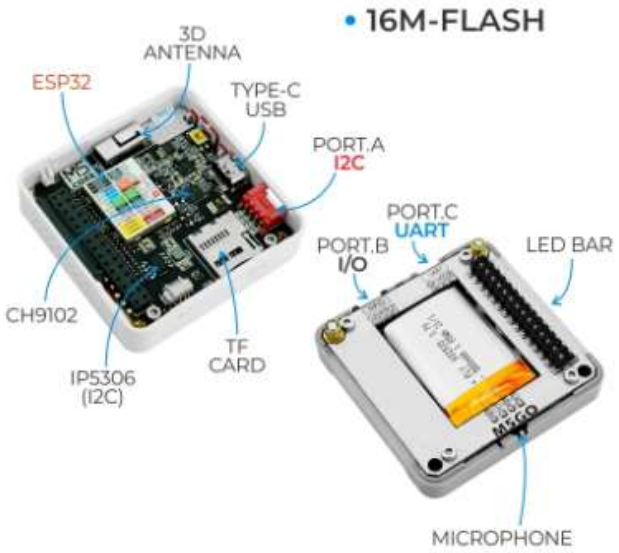
M5 Stack Core ESP32 based controller



M5Stack Units . . .

M5Go Starter kit includes the following Units

M5 Stack Core ESP32 based controller



M5Stack Units. . .

M5Go Starter kit includes the following Units

Angle Sensor

M5Stack Units. . .

M5Go Starter kit includes the following Units

Env Sensor (Temperature and Humidity Sensors)

M5Stack Units. . .

M5Go Starter kit includes the following Units

Motion Sensor

Question 2

The angle sensor uses this basic electronic component for angular rotation.

a) capacitor
b) variable capacitor
c) potentiometer
d) none of the above

M5Stack Units. . .

M5Go Starter kit includes the following Units

Grove Hub

M5Stack Units. . .

M5Go Starter kit includes the following Units

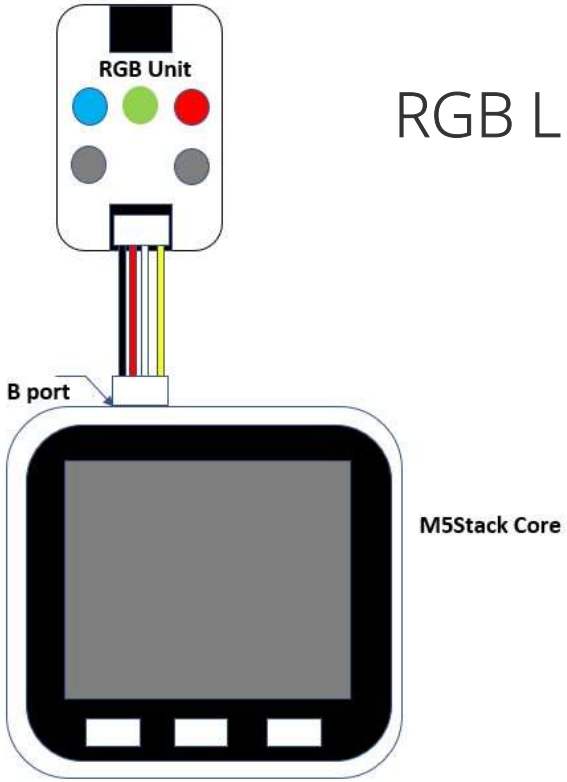
IR Remote

M5Stack Units. . .

M5Go Starter kit includes the following Units

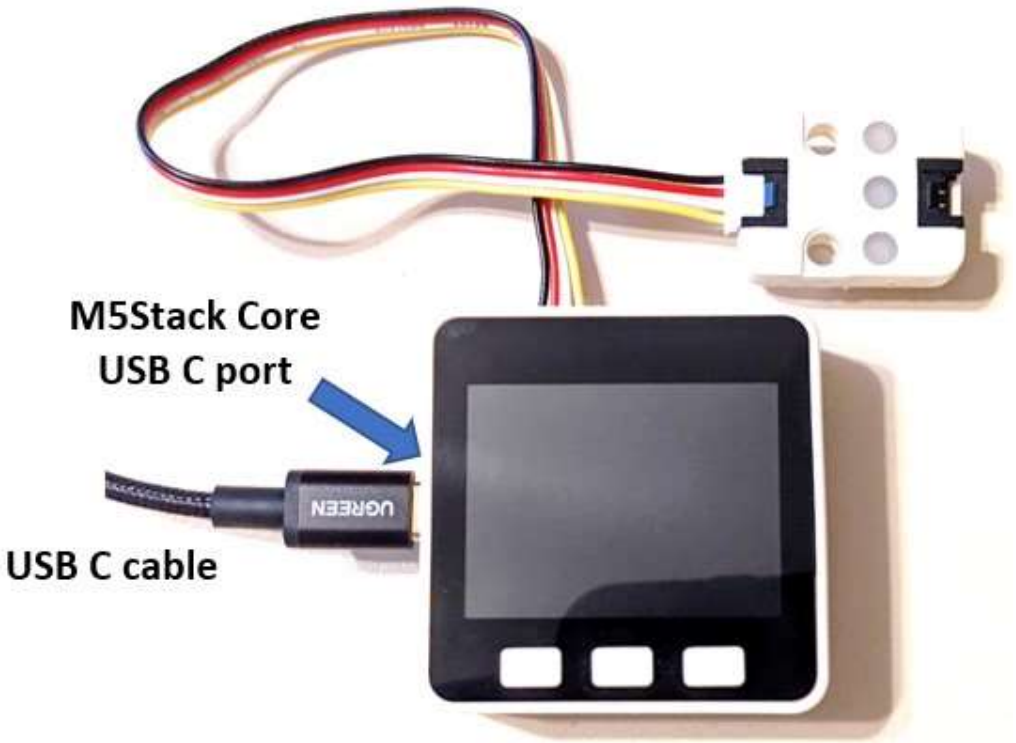
RGB LED

M5Stack Mini Activities



RGB LED

M5Stack Mini Activities. . .



RGB LED

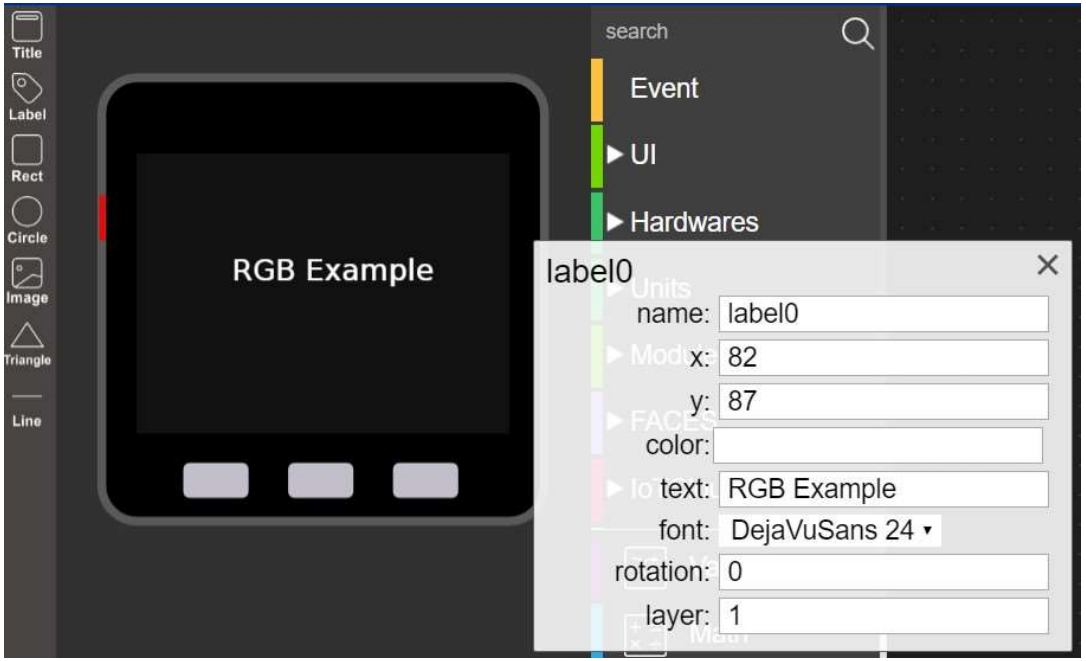
M5Stack Mini Activities. . .

Establishing COM port communications

RGB LED

M5Stack Mini Activities. . .

RGB Sequencer:
User Interface (UI) LCD Layout



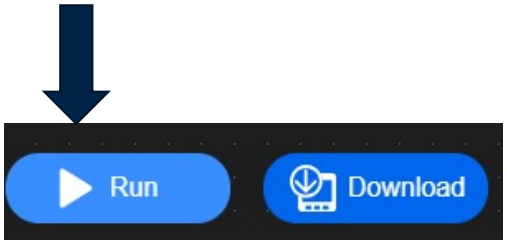
RGB LED

M5Stack Mini Activities. . .

RGB Sequencer: Blockly Code Blocks

RGB LED

Click Run Button to execute code blocks

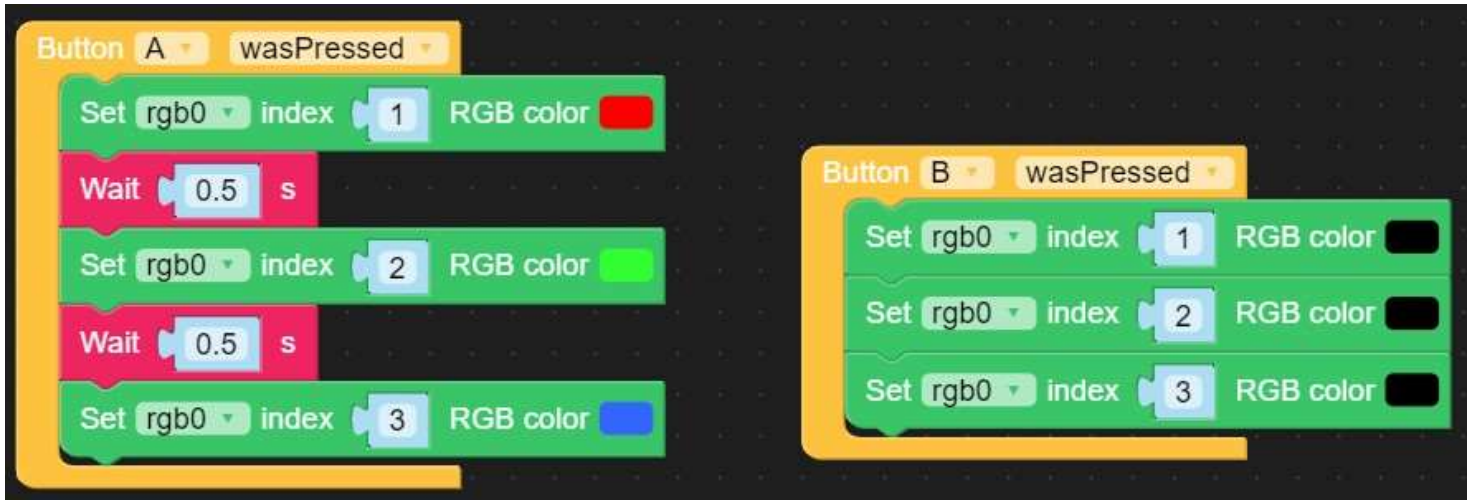


M5Stack Mini Activities. . .

RGB Sequencer:
Blockly Code Blocks

M5Stack Mini Activities. . .

Interactive RGB LED: Blockly Code Blocks



Click Run Button to execute code blocks

Question 3

The code block "set rgb0" refers to what M5 Stack unit?.

a) angle sensor
b) humidity sensor
c) motion sensor
d) RGB LED

M5Stack Mini Activities. . .

Interactive RGB LED

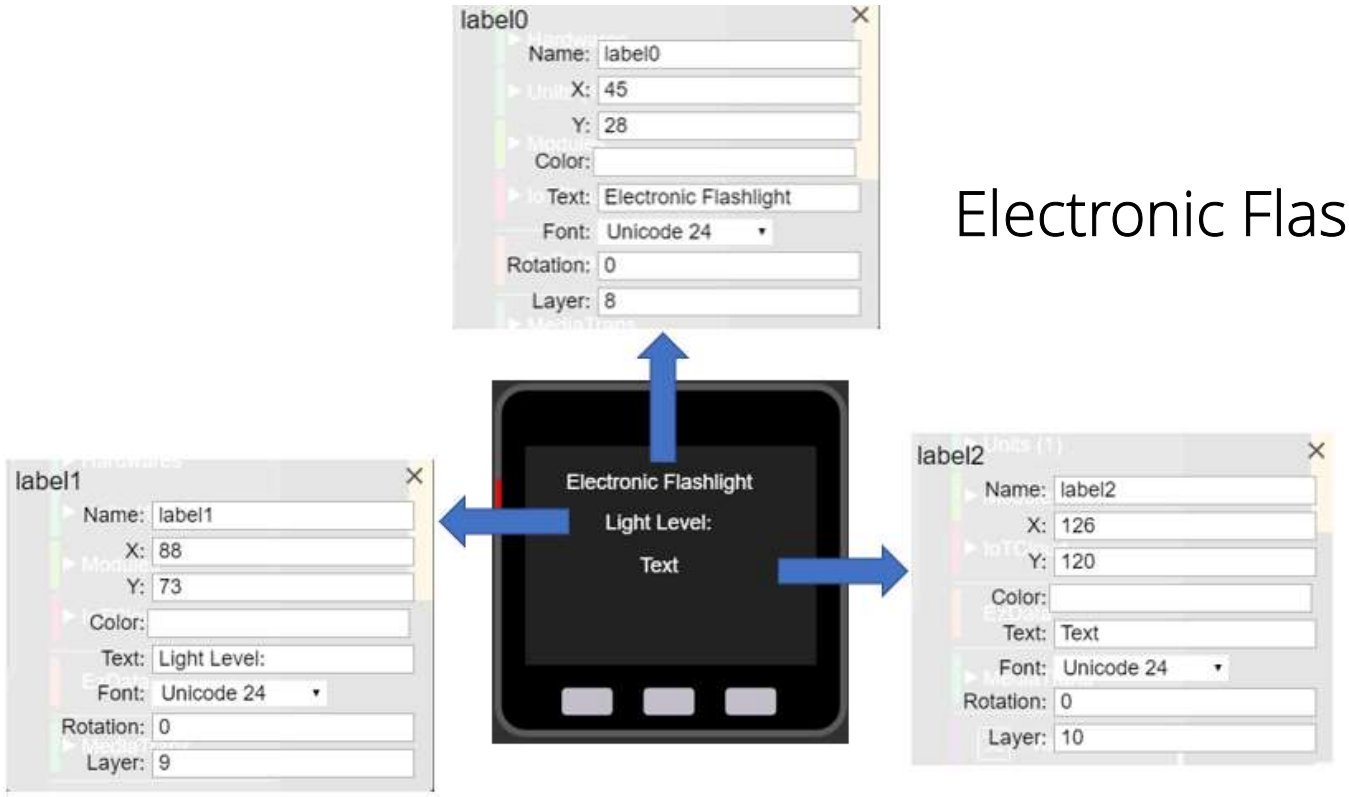
Lab: Programming an Electronic Flashlight Wearable

Lab: Programming an Electronic Flashlight Wearable. . .

Big IDEAS (Learning Objectives):

1. The participant will be able to develop Blockly Code software for the M5Core ESP32 controller.
2. The participant will be able to program add an electronic unit to a blockly code project.
.
3. The participant will be able to setup communication with the M5 Core ESP32 controller.
4. The participant will be able to build a Programming an Electronic Flashlight Wearable.

Lab: Programming an Electronic Flashlight Wearable. . .



Electronic Flashlight UI

Lab: Programming an Electronic Flashlight Wearable. . .

Adding an Angle Sensor to Block Code project

Angle Sensor Unit Added

Click to add Angle Angle Sensor

Angle Sensor

Lab: Programming an Electronic Flashlight Wearable. . .

Electronic Flashlight Blockly Code Blocks

Question 4

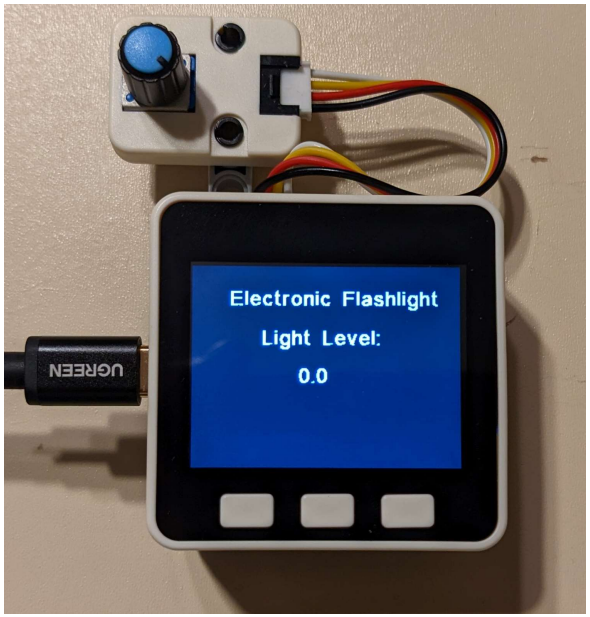
To the code block "Get angle_1 value" uses the humidity sensor to obtain its data.

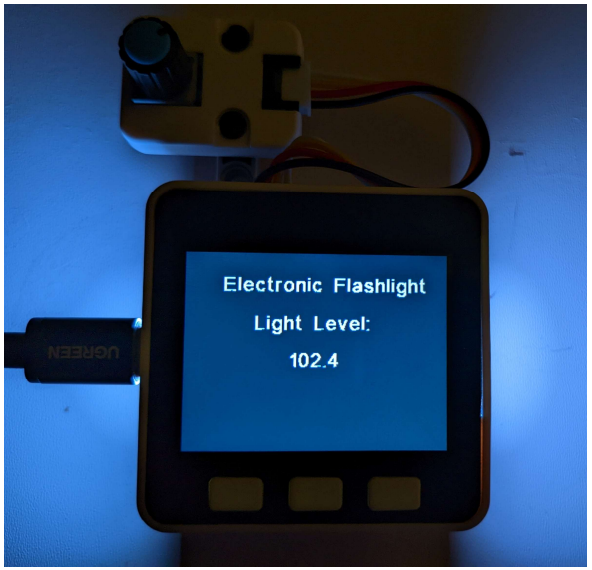
a) True

b) False

Lab: Programming an Electronic Flashlight Wearable. . .

An operational Electronic Flashlight Wearable





Lab: Programming an Electronic Flashlight Wearable. . .

Electronic Flashlight Wearable: YouTube Video

https://youtu.be/irsMY2busHU

Question 5

The angle sensor is used to _____ the RGB LED bar light level.

a) set
b) adjust
c) set or adjust
d) none of the above

Thank you for attending
Please consider the resources below:

Bonfiglio, A , & De Rossi, D.(Eds). (2011). *Wearable monitoring systems.* Springer

Grand View Research. (2022, October 30). *Wearable technology, market size, share & trends analysis reports by product*. https://www.grandviewresearch.com/industry-analysis/wearable-technology-market

Hartman, K. (2014). *Wearable electronics: Design, prototype, and wear your own interactive garments*. Maker Media.

Kanade, V. (2022, July 22). *What is hci (human-computer interaction)? Meaning, importance, examples, and goals*. https://www.spiceworks.com/tech/artificial-intelligence/articles/what-is-hci/

M5Stack Electronic Blueprints: https://www.amazon.com/M5Stack-Electronic-Blueprints-interactive-applications/dp/1803230304/ref=sr_1_1?crid=OVYB3O0IQ5OU&keywords=dr.+don+wilcher&qid=1667169860&sprefix=%2Caps%2C191&sr=8-1

Nash, M. (2017). Hci design and age groups. *HOHONU,15*, 39-43.

UiFlow Code download website: https://shop.m5stack.com/pages/download.

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