

# Circular Buffer demo

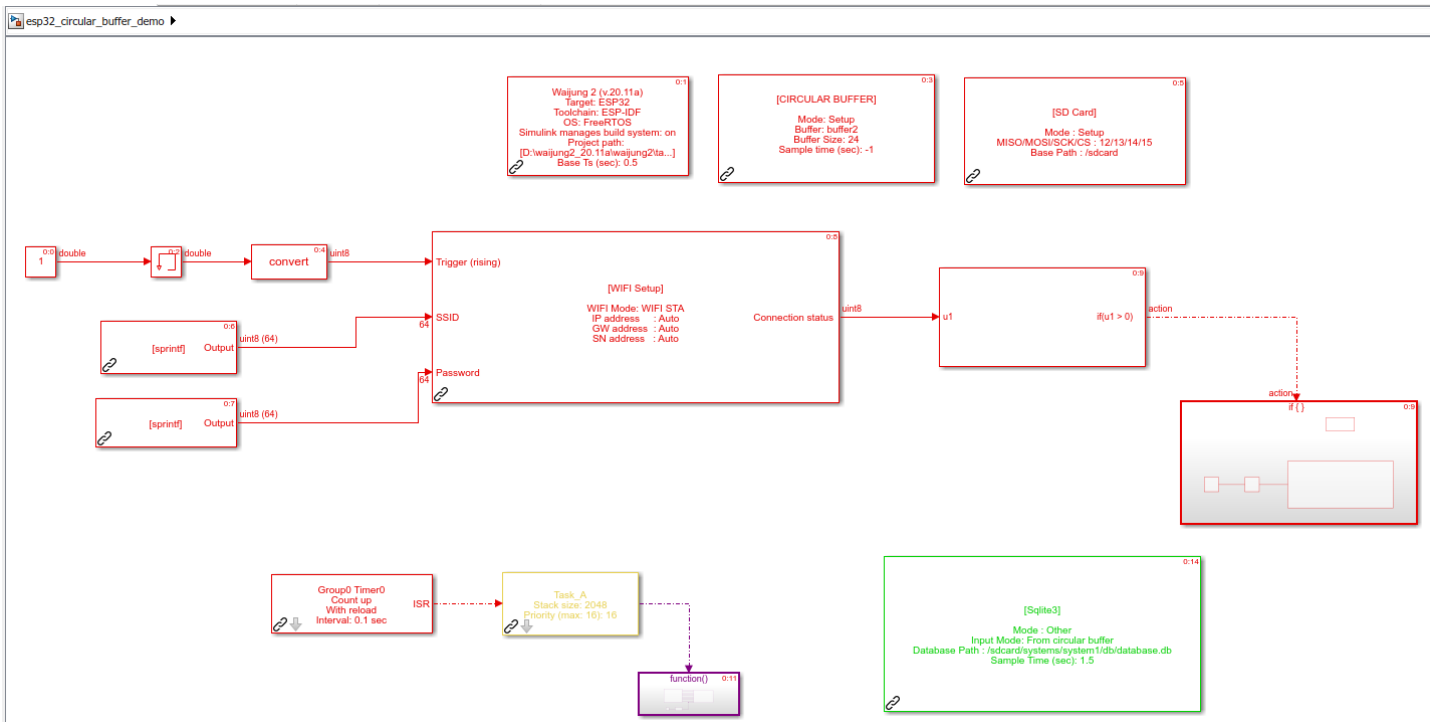
[View table of content.](#) [View table of content.](#)

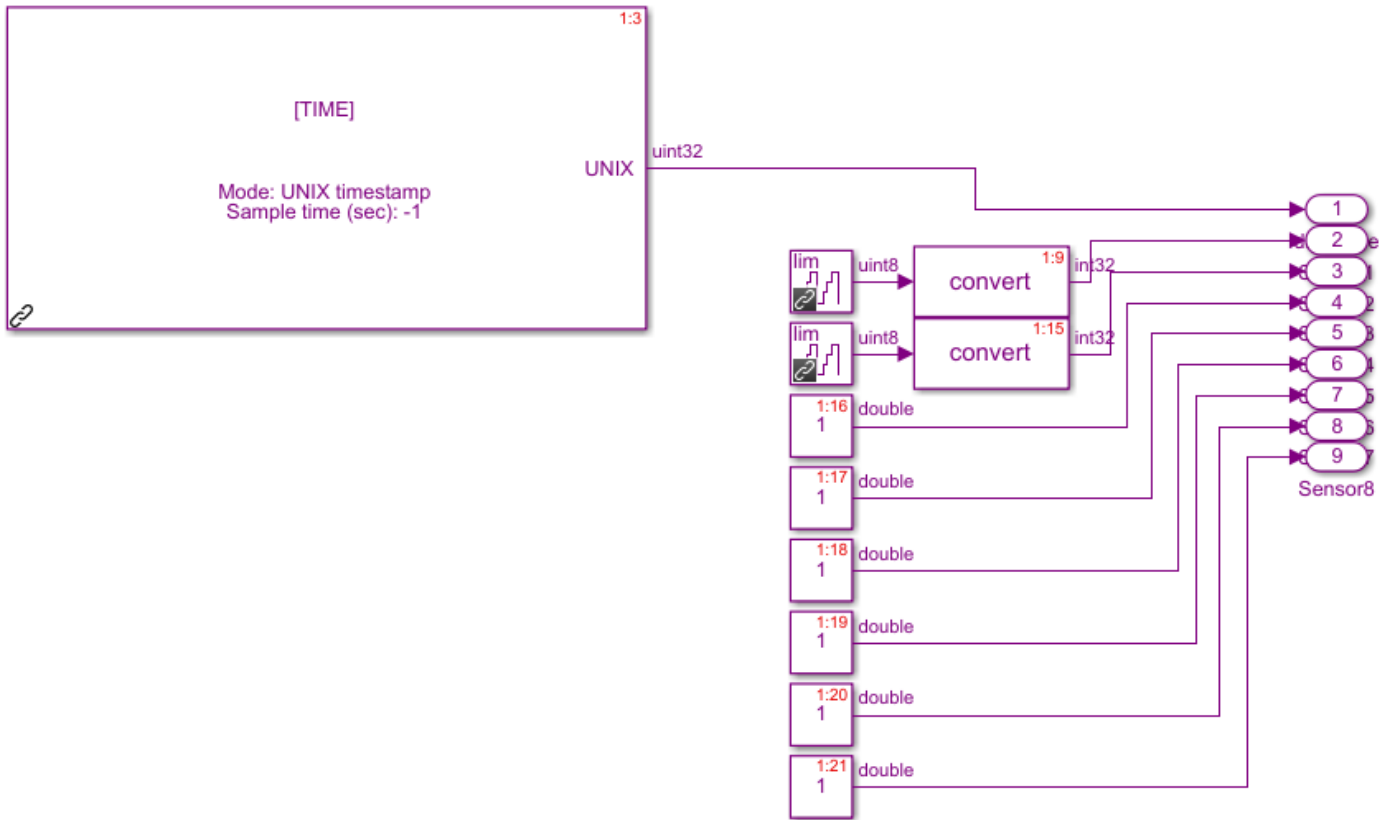
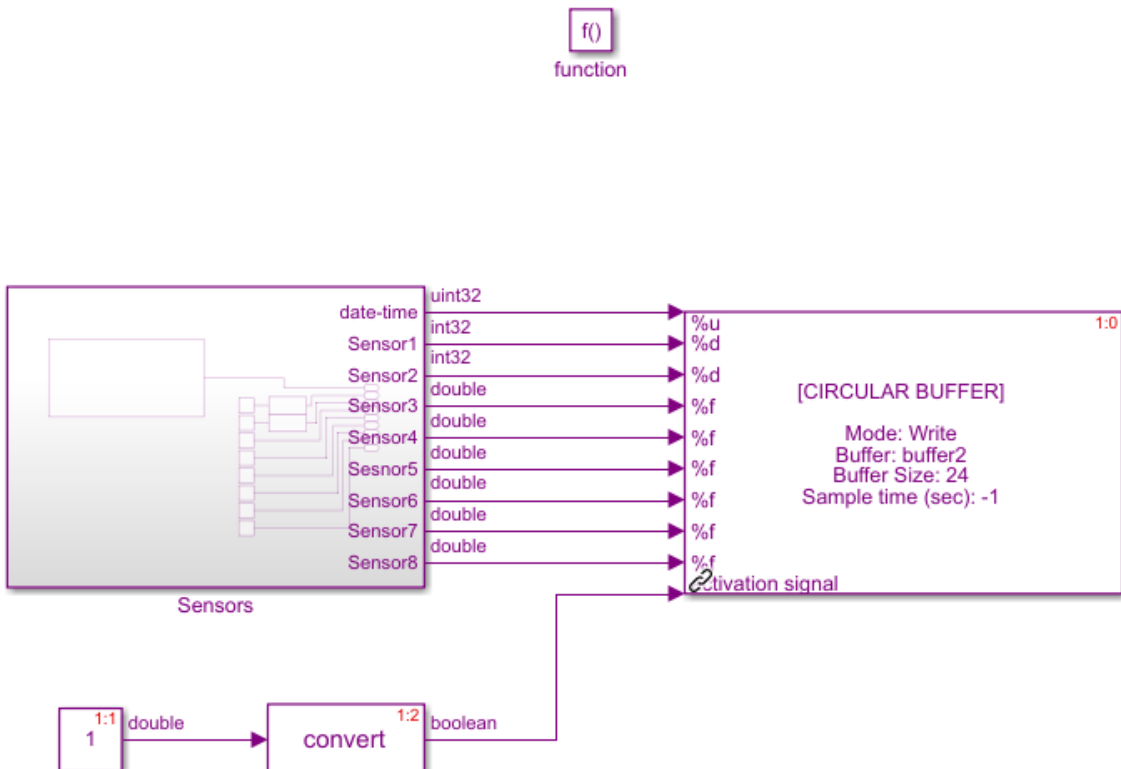
## Prerequisites

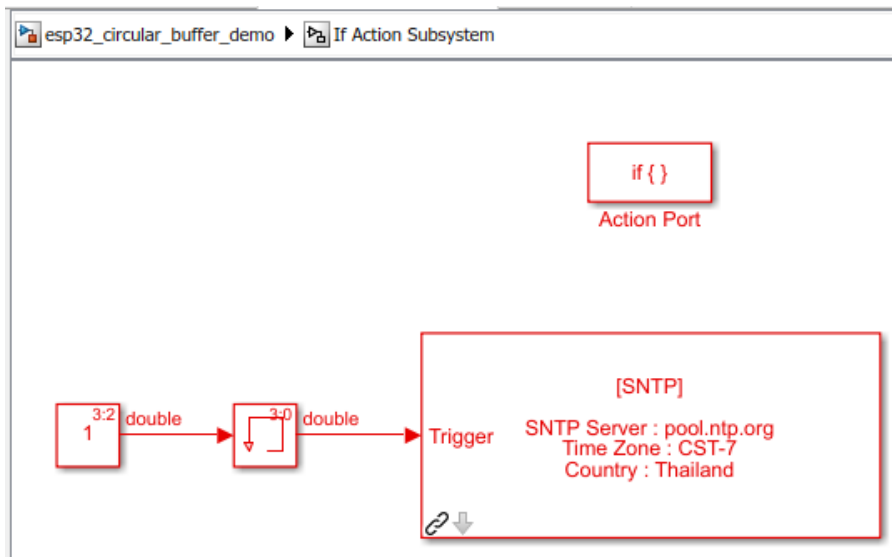
Create a database in the SD card using an [Database browser](#). The following query can be used.

```
CREATE TABLE "smc_4_20mA_data" (
  "timestamp" INTEGER,
  "CH1_raw" TEXT,
  "CH1_conv" TEXT,
  "CH2_raw" TEXT,
  "CH2_conv" TEXT,
  "CH3_raw" TEXT,
  "CH3_conv" TEXT,
  "CH4_raw" TEXT,
  "CH4_conv" TEXT
);
```

Demo file : esp32\_circular\_buffer\_demo.slx







## Description

This demo shows a simple use case scenario for the circular buffer block. In this example data of 8 sensors (not actual sensors, Matlab Simulink blocks were used to mimic sensors) along with the UNIX timestamp needs to be inserted to the database. Inserting large amounts of data to a database could be a blocking process. Thus to ensure sensor readings are recorded every 1 second a circular buffer is used to hold the sensor data as an intermediate before writing to the database using the SQLite block.

Change the following configuration parameters in the model file.

In the [WiFiBlock](#)

- SSID: Any WiFi SSID with internet access
- Password: Password of the selected WiFi SSID

In the [SQLite.NonRetrieveData](#)

- Database Path: Path to the database created in prerequisites.

## Hardware Setup

1. ESP32 module with SD card reader
2. WiFi connection with internet access

## What should be happening?

When running the user could monitor INSERT commands to the database using a serial monitor. After a while the user could connect the SD card to a PC and check the sensor readings using a [Database browser](#).

DB Browser for SQLite - E:\systems\system1\db\database.db

File Edit View Tools Help

New Database Open Database Write Changes Revert Changes Open Project Save Project Attach Database Close Database

Database Structure Browse Data Edit Pragas Execute SQL

Table: smc\_4\_20mA\_data Filter in ...

|    | timestamp  | CH1_raw | CH1_conv | CH2_raw | CH2_conv | CH3_raw | C   |
|----|------------|---------|----------|---------|----------|---------|-----|
| 1  | 1603715085 | 3       | 3        | 1.0     | 1.0      | 1.0     | 1.0 |
| 2  | 1603715086 | 4       | 4        | 1.0     | 1.0      | 1.0     | 1.0 |
| 3  | 1603715087 | 5       | 5        | 1.0     | 1.0      | 1.0     | 1.0 |
| 4  | 1603715088 | 6       | 6        | 1.0     | 1.0      | 1.0     | 1.0 |
| 5  | 1603715089 | 7       | 7        | 1.0     | 1.0      | 1.0     | 1.0 |
| 6  | 1603715090 | 8       | 8        | 1.0     | 1.0      | 1.0     | 1.0 |
| 7  | 1603715091 | 9       | 9        | 1.0     | 1.0      | 1.0     | 1.0 |
| 8  | 1603715092 | 10      | 10       | 1.0     | 1.0      | 1.0     | 1.0 |
| 9  | 1603715093 | 11      | 11       | 1.0     | 1.0      | 1.0     | 1.0 |
| 10 | 1603715094 | 12      | 12       | 1.0     | 1.0      | 1.0     | 1.0 |
| 11 | 1603715095 | 13      | 13       | 1.0     | 1.0      | 1.0     | 1.0 |
| 12 | 1603715096 | 14      | 14       | 1.0     | 1.0      | 1.0     | 1.0 |

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Edit Database Cell

Mode: Text

1 1603715085

Type of data currently in cell: Text / Numeric  
10 character(s)

Apply

Remote

Identity Public

| Name | Commit | Last modified | Size |
|------|--------|---------------|------|
|      |        |               |      |

SQL Log Plot DB Schema Remote

UTF-8

Previous : [HTTP Server demo](#)

Next : [LEDC demo](#)

#### Files

|                         |         |             |                             |
|-------------------------|---------|-------------|-----------------------------|
| circular_buffer_4.PNG   | 17.1 KB | 11 Nov 2020 | Dhanika Mahipala (ดანი๊ก้า) |
| circular_buffer_3.PNG   | 44.5 KB | 11 Nov 2020 | Dhanika Mahipala (ดანი๊ก้า) |
| circular_buffer_2.PNG   | 41.5 KB | 11 Nov 2020 | Dhanika Mahipala (ดანი๊ก้า) |
| circular_buffer_1.PNG   | 65.1 KB | 11 Nov 2020 | Dhanika Mahipala (ดანი๊ก้า) |
| circular_buffer_out.PNG | 50.9 KB | 11 Nov 2020 | Dhanika Mahipala (ดანი๊ก้า) |