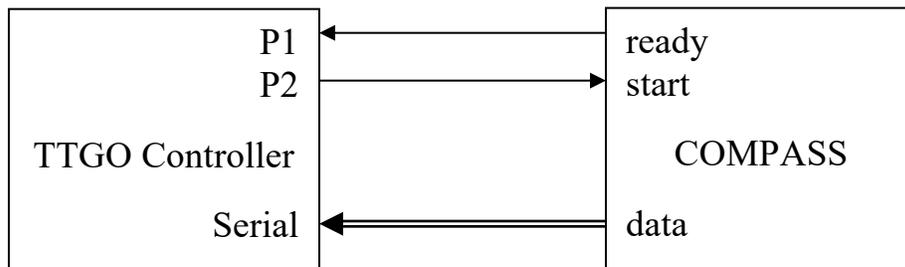


## Tutorial 7 – Sensors and Communication in C

### SENSOR CONNECTION

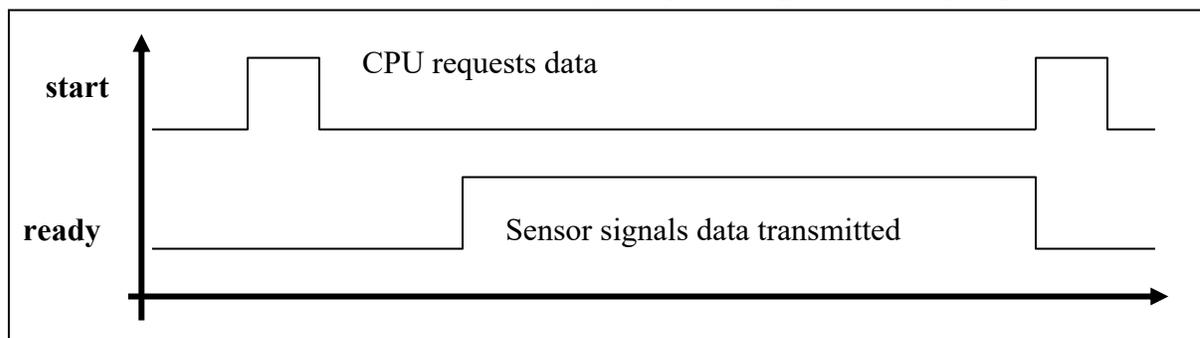
An external digital compass has been connected to the TTGO controller in the following way:

- Pin 2 (output) is connected to the compass Start line
- Pin 1 (input) is connected to the compass Ready line
- The compass' 8-bit data output has been connected to a serial input



### TIMING DIAGRAM

The CPU can request a data value from the compass sensor by raising and subsequently lowering the **Start** signal. The compass will indicate that a valid sensor value is available at its output by raising the **Ready** signal.



Write a **C subroutine** to do a single data request/ wait / read cycle. Assume that "start" and "ready" are active high.

## TTGO Solution Sensor Connection

```
int ReadCompass ()
{ ...
  // generate start signal
  digitalWrite(2, 1); // set pin 2 to high
  ... // wait
  digitalWrite(1, 0); // set pin 1 to low

  do
  { ready = digitalRead(1);
    } while (!ready);

  // do serial data transfer
  ...
}
```

## SERIAL CONNECTION BETWEEN 2 TTGOs

Set 2 pins on each TTGO as transmit (TX, e.g. pin 1) and receive (RX, e.g. pin 2). Then link the two ports across (1→2 and 2→1) between the two TTGOs.

Code (RX1 and TX1 are pin numbers):

```
Serial1.begin(115200, SERIAL_8N1, RX1, TX1);
```

Reading data from serial port:

```
while (!Serial1.available()); // Wait for input
a = Serial1.read(); // read 1 byte
```

Writing data to serial port:

```
Serial1.write(x); // send 1 byte
```