AN-023 Data Capture Synchronization

For some applications it's of interest to combine sensors to provide a smarter overall system. One case in point is combining a radar sensor with a camera to know not only the speed of the object in the field of view but what it is. When combining sensors, an important part of the system design is to be able to synchronize when the data is captured so the system knows it's looking at the same information from the same point in time. Fortunately, the OPS243 sensor makes this easy by providing an output signal to identify when it is capturing data for a speed or range measurement.

System Architecture

Some example data capture systems using an OPS243 radar sensor and camera are shown in Figure 1. One architecture (1a) may take the radar sensor data capture signal as an input to the camera to trigger a snapshot. The OPS243 GPIO signals are 3.3V and it may require a voltage level shifter to interface to the camera. An alternative system (1b) such as a License Plate Recognition (LPR) system utilizes a video fed into an embedded processor such as a Raspbery Pi or Nvidia Jetson. In this case, the embedded processor board detects the radar sensor data capture signal and timestamps it with the appropriate video frame.

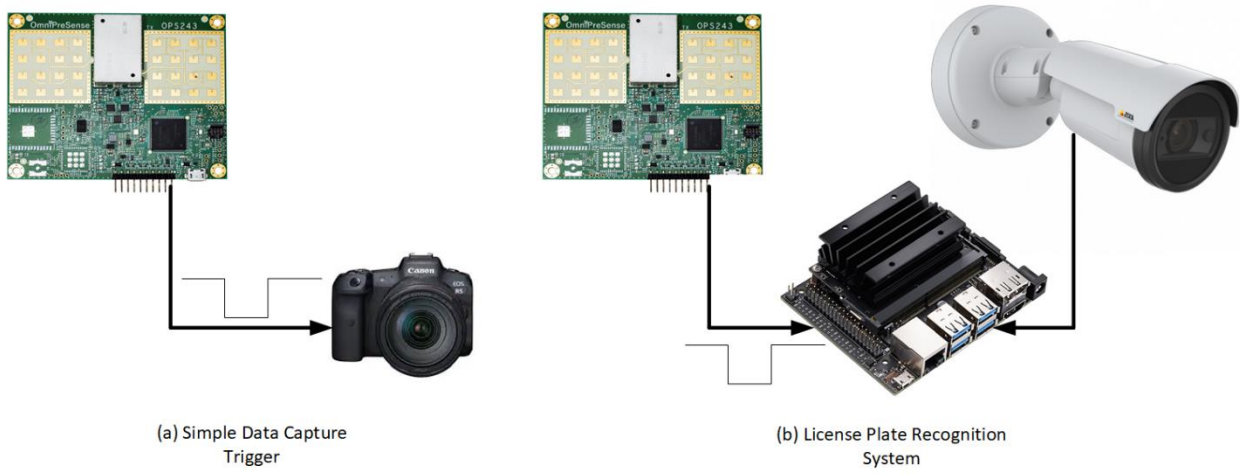

Figure 1. System Architectures

Sensor Interface

The data capture signal on the OPS243 is reflected out the GPIO_0 (pin 1) on the J3 header. The signal is 3.3V. If a 5V signal level is required, a simple logic level converter from Sparkfun or other can be added to the signal. The signals are active low and mirror the time the sensor is sampling the received signal (Figure 2). Adjusting the sample rate, buffer size, and FFT size will affect the timing of the data capture.

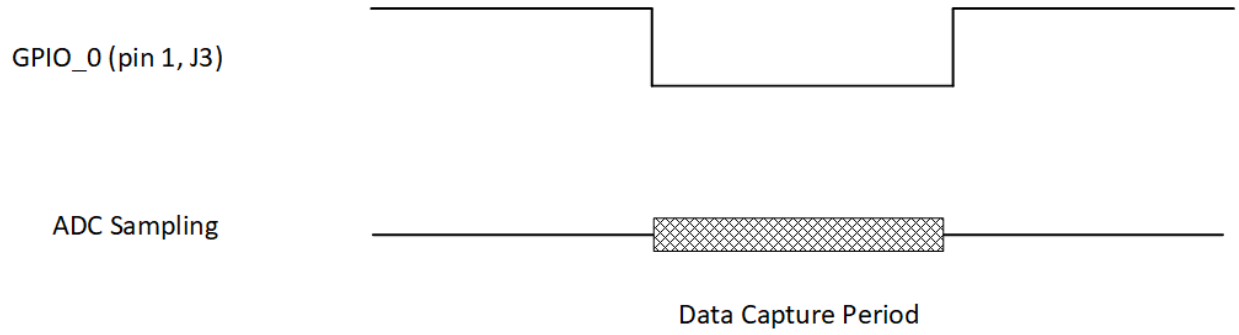

Figure 2. Signal Pin and Data Capture Timing

Revision History

Version	Date	Description
A	September 28, 2021	Initial release.