acconeer

Smart Presence

User Guide

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Author: Acconeer AB

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1 Smart Presence

1.1 Source Code

ref_app_smart_presence.c

1.2 Description

The smart presence reference application shows how an application can be woken up by movement and then start to track that movement. It does this by combining usage of Acconeer's Presence Detector in two ways.

The first thing that happens is that the reference application configures and creates the Presence Detector for low power consumption and low update rate. Then it activates the detector and starts to detect any type of movement in front of the sensor.

```
if (!execute_wakeup(handle))
{
    /* Handle error */
}
```

The above function returns when a movement is detected. Now the Presence Detector is configured and created for higher performance and higher update rate. It then starts to track the distance to the movement.

```
if (!execute_movement_tracking(handle))
{
    /* Handle error */
}
```

When no movement is detected anymore the application goes back to the low power and low update rate execution of the Presence Detector.

1.3 Configuration

As mentioned above, the Smart Presence reference application uses the Acconeer Presence Detector, see Read-the-Docs for a detailed description and acc_detector_presence.h for the API. The Presence Detector is built on top of the Sparse Service, see Read-the-Docs for a detailed description and acc_service_sparse.h for the API.

To be able to easier test similar use cases using the RSS API or the Python Exploration Tool, the configuration used in the Reference Application can be seen in the tables below.

A value of '-' in the 'Tracking' column means that the same value as for 'Wakeup' is used.

Service Parameter	**Wakeup**	**Tracking**
sweeps_per_frame	16	-
asynchronous_measurement	true	-
downsampling_factor	1	-
gain	0.5	-
hw_accelerated_average_samples	10	-
maximize_signal_attenuation	false	-
sweep_rate	0.0	-
power_save_mode	off	sleep
profile	3	-
start	0.18	-
length	2.00	-
end	2.18	-
repetition_mode	On Demand	-
tx_disable	false	-
sampling_mode	B	-

Presence Detector Parameter	**Wakeup**	**Tracking**
start	0.18	-
length	2.00	-

Presence Detector Parameter	Wakeup	Tracking
end	2.18	-
detection_threshold	2.0	-
update_rate	2.0	20.0
sweeps_per_frame	16	-
inter_frame_deviation_time_const	0.5	-
inter_frame_fast_cutoff	20.0	-
inter_frame_slow_cutoff	0.2	-
intra_frame_time_const	0.15	-
intra_frame_weight	0.6	-
output_time_const	0.0	-
power_save_mode	off	sleep
profile	3	-
gain	0.5	-
downsampling_factor	1	-
hw_accelerated_average_samples	10	-
vector_output_mode	false	-

1.4 Testing

1.4.1 Test Setup

1. XM132 With holder
2. Sensor is placed on a height of approximately 125cm
3. Default testing with 5 zones
4. First zone (zone 0) 18 - 58cm
5. 40cm between each zone
6. Last zone (zone 4) 178 - 218cm

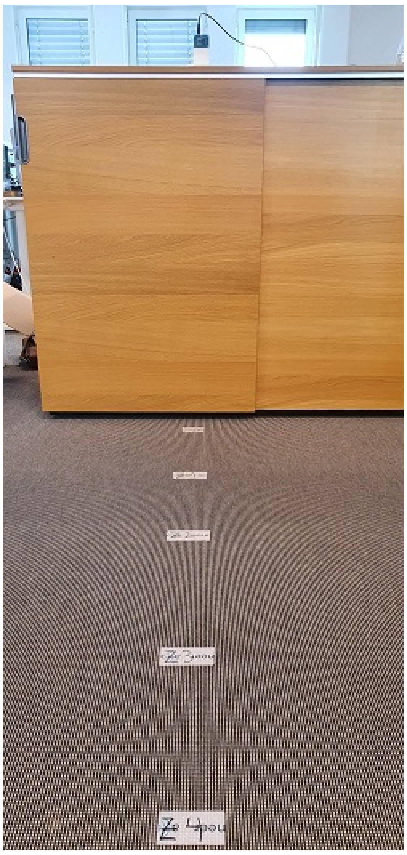

Figure 1: Test setup

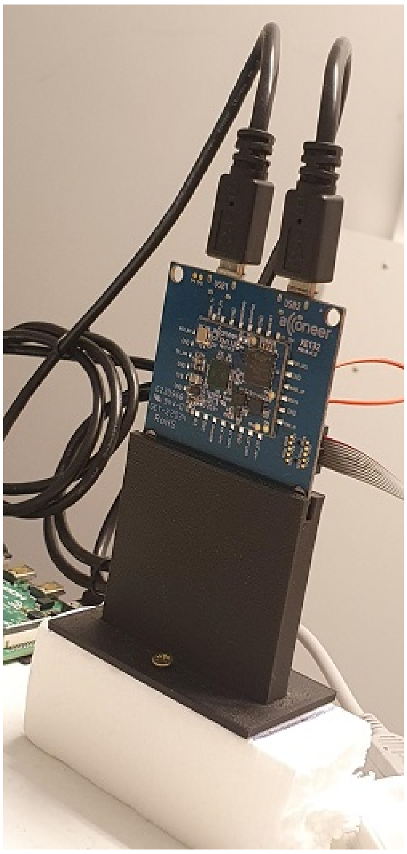

Figure 2: XM132 holder

1.4.2 Test Execution

The test is performed by a person walking towards and from the sensor, making sure detection is successful in each zone and that the correct zone is reported. False detection is also tested in that case a person should stand outside of the range (no zone) and make sure no detections are reported.

1.4.3 Test Results

Table 3: All 5 zones were detected successfully when walking in both directions. No false detections were given when standing outside of the range.

Zone	Walk Towards	Walk Away	No Presence
0	X	X	
1	X	X	
2	X	X	
3	X	X	
4	X	X	

Table 4: Memory Usage for Reference Application Smart Presence on XM132.

	Memory Usage [kB]
Flash	60
Static memory	7
Stack	1.3
Heap	6

Table 5: Power Consumption for Reference Application Smart Presence on XM132.

Executing	Mean current [mA]	Voltage [V]	Power [mW]
Wake up	5	1.8	9
Movement Tacking	10	1.8	18

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