

Social Distancing Tag System

GENERAL INFORMATION

The social distancing tag reference design showcases Chirp’s CH101 ultrasonic Time-of-Flight (ToF) sensor for social distancing and proximity detection applications. Using Pitch-Catch mode operation, the distance between multiple users can be measured accurately, and any encroachments within the ‘safe distance’ boundary can be flagged as an alert. These tags, which use two CH101 sensors to achieve 360° field-of-view, will send out an alarm (via haptic and visual feedback) when another user wearing a tag approaches within the configurable boundary distance (2.4m max). The self-contained tag communicates via Bluetooth Low Energy (BLE) for sending Tag ID information to enable contact tracing when the perimeter is breached between two or more tags.

REFERENCE DESIGN DESCRIPTION
Ultra-low power, low latency, 360FoV Social Distancing Solution



Figure 1. Conceptual View of a Social Distancing Tag

APPLICATIONS

- Social Distancing per CDC/WHO Guidelines (COVID-19)
- Interpersonal Presence Detection
- Industrial Safety Proximity Detection

FEATURES

- System Features
 - Pre-Alert Detection (10m) via BLE
 - Social distance breach alarm
 - Unique tag identification for contact tracing
 - Multi-tag detection
- Fast, accurate range-finding
 - Accurate (± 3 cm) range finding between tags up to 2.4m apart
 - Detection latency 1 sec
 - Low power consumption for long battery life up to 10 days
 - Field of view (FoV): 360° (using 2 sensors: front & back human body position)
 - Works in sunlight and any other lighting conditions
 - Haptic and visual indicators for proximity alarm
- Easy System Integration
 - Standard low-energy BLE communication
 - Internal power supply
 - Rugged enclosure design

SOCIAL DISTANCING APPLICATION

The reference design is a social distancing system with front and back sensor components connected by a thin cable into two small housings. The larger housing is placed on a person’s chest area, and the smaller housing is placed on the person’s back to get 360-degree coverage. The larger housing in the front can be placed on either the right or left chest area. The sensor components can be securely attached to a person’s clothing using the supplied clips. See Figure 2 for reference.

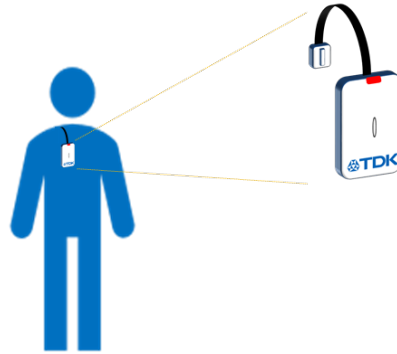


Figure 2. Right-side body placement example.

These tags can accurately measure the range between each other up to a distance of 2.4m for any proximity breaches, giving adequate warning to users before crossing the 6-foot social distancing guidelines (per CDC/WHO Guidelines for COVID-19 Social Distancing). Upon a distancing breach, the tag identification can be used to perform contact tracing. The BLE system can be used as an early warning system, indicating that another tag is within 10m (33 feet). See Figure 3 for reference.

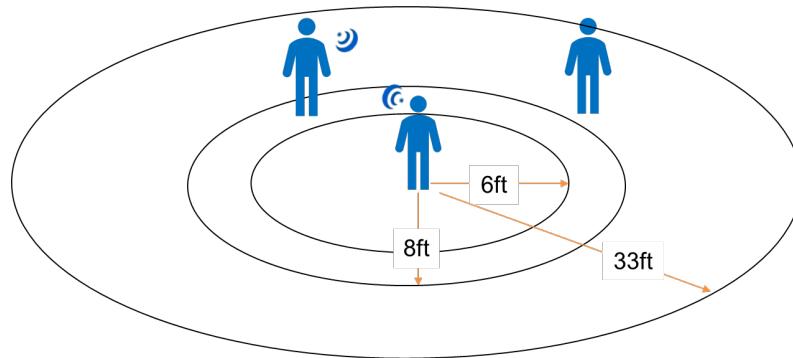


Figure 3. Social Distancing Tag System Coverage

COMPLETE REFERENCE DESIGN AVAILABILITY

The tag reference design will be available for purchase Early Fall 2020.

An evaluation solution is currently available demonstrating two-user operation using Chirp’s DK-CH101 SmartSonic development boards. The DK-CH101 can be purchased from various distributors. Please contact Chirp Microsystems for further information about obtaining associated firmware and sensor hardware.