Renesas and Altran team up to deploy the first social distancing wristband using a UWB LRP chipset

February, 2021
The Challenge:

• Social distancing is a cornerstone of COVID-19 mitigation, reducing the risk of exposure and spread.
• Renesas & Altran worked together to adapt existing embedded platform technology into a prototype for a social distancing wearable (wristband form factor) using Renesas MCU & UWB chips
The new platform is first to use ultra-wideband (UWB) with low-rate pulse (LRP) to get social distancing solutions to market faster

Social Distancing Platform

How it works
• Device detects presence of 2nd device (BLE), measures distance (UWB), compares to user-selected ‘safe’ distance
• Alerts wearer when unsafe distance detected via blinking LEDs and programmable haptic feedback

Benefits
• Improves social distancing awareness
• Early warning of possible exposure
• Helps foster safe return to work, school, activities, etc.

Alert
More than 2 meters / 6 feet

Less than 2 meters / 6 feet
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Social Distancing Platform

- Prototype: wristwatch/wearable
- Low-power Renesas Synergy™ S128 MCU
  - 36-pin LGA
  - Running Threadx RTOS & device application

- BLE and UWB LRP for optimal power utilization
  - 3-dB Access UWB LRP for distance measurement accurate up to 10 cm
  - Telink BLE 5.0 IC to configure user-defined parameters, BT pairing, etc.
  - User-accessible SPT3 ON/OFF switch to control device and BT pairing

- Dual-color LEDs
  - Power & charging status: green/yellow
  - Bluetooth ON and distance alert: blue/red

- Battery subsystem
  - 350mAH rechargeable Lithium ion
  - Onboard battery charger and battery gauge
  - Micro USB port for charging internal battery and field programming MPU

- Vibration motor
  - 3V 10,000 RPM ERM
  - Onboard programmable haptic driver

- Android app for configuring device and displaying collected data
Wristband prototype & social distancing demo

Wristband Prototype

Social distancing usecase/demo: monitors distance and alerts user if unsafe distance detected

Details & history in Android app
Altran Electronics System Design Capabilities
From concept to launch to maintenance for over 100 turnkey projects

**Design**
- Feasibility study & architecture
- Product conceptualization
- Circuit design
- PCB layout
- DFM
- Component engineering

**Simulation**
- High-speed signal integrity, power integrity simulations
- Thermal simulation
- Structural simulation
- Mechanical design
- Cable design

**Embedded Software**
- Boot software
- Board bring up
- Board support package
- Device driver, firmware
- Diagnostics software

**Prototyping, NPI**
- NPI prototyping boards, DFM requirements
- DFT requirements
- ICT, functional test
- Manufacturing/test engineering

**Validation & Compliance**
- Design validation testing
- Functional validation testing
- Environmental testing
- ICT, functional vest
- Manufacturing/vest engineering
- EMC/EMI regulatory certification

**Sustenance & Maintenance**
- Value engineering
- Obsolesce management & cost reduction
- Sustenance & maintenance
- Environmental testing
- Post launch support & repair management field return