# COMPOSITION
# Condition Monitoring and Asset Tracking for Industry 4.0

Tracy Brennan, James McCarthy, Bobby Bornemann and Peter Haigh

Boston Scientific  Tyndall National Institute

Tyndall National Institute
Institiúid Náisiúnta

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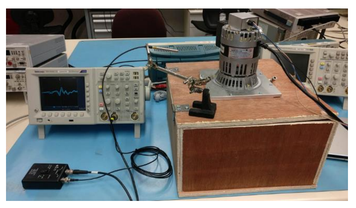
## Use Case 1 Condition Monitoring

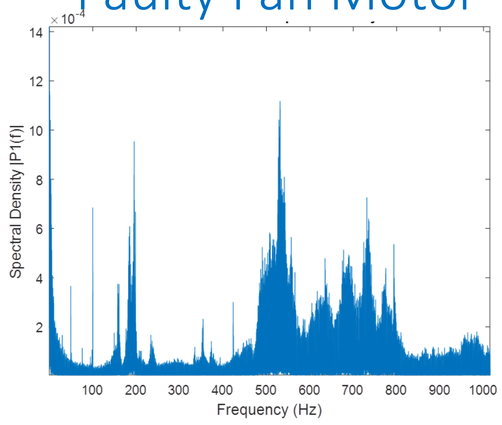
- When the fans in the Reflow oven break down the high value material in the oven has to be scrapped.
- This is achieved by gathering sensed data to enable predictive maintenance
- Acoustic sensing provides clear and early detection of a fan going faulty and is easily retrofitted without modification.
- Prototype system deployed that gathers acoustic data to predict fan failure using a raspberry Pi based acoustic sensor system.

### Prototype Acoustic Sensor

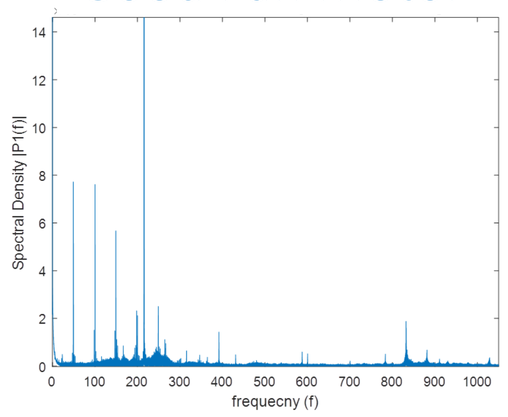

### Reflow Oven Condition Monitoring

### Faulty Fan Motor




### Good Fan Motor




## Use Case 2 Asset Tracking

- Tracking material to maintain workflow efficiencies and recover lost material has a significant cost saving in manufacturing facilities.
- Small size, very low power “location devices” (tags) are required to track the location of high value material.
- No ideal technology, UWB and BLE selected with developmental challenges

### UWB and BLE Technology Selected

| Technology | Power | Accuracy | Maturity |
|---|---|---|---|
| BLE | 👍 | 👎 | 👊 |
| UWB | 👎 | 👍 | 👎 |

### High Value Material Examples

## Impact

- Savings in the region of €10 to €20K are possible with early detection of faulty fans in a solder flow oven
- Material tracking throughout its production life time can save in the order of €100K

## Next Steps

- Focus on Energy Harvested Condition monitoring by adopting low power embedded sensor techniques enabling easy deployed, maintenance free sensing.
- Focus on Energy Harvested BLE asset tracking. Technologies under investigation include, Indoor solar, Vibrational, Thermoelectric, Inductive charging, etc.

COMPOSITION

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