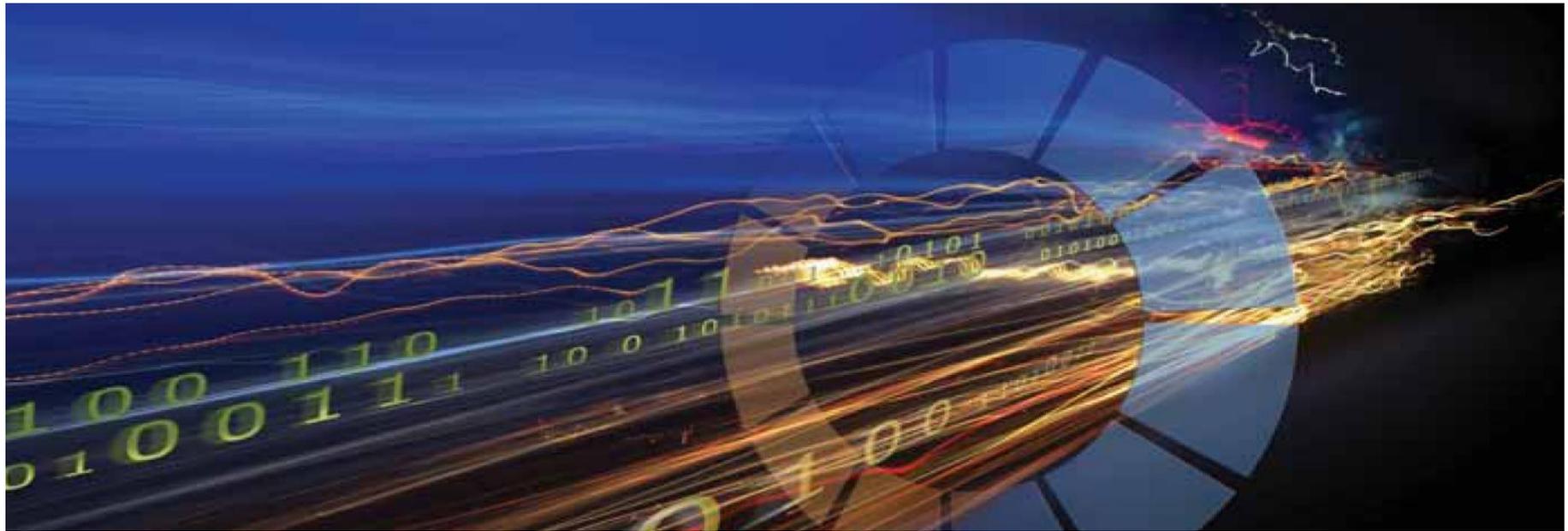
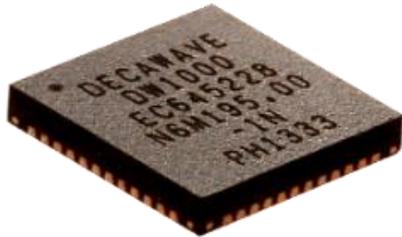


Decawave:
Paving the way for game changing applications



Who we are



Fabless Semiconductor company
We designed a single chip UWB Xceiver
Our chip is in Full production
We will ship 1Mu in 2014 & 5Mu in 2015



35 employees, 30 engineers
SLT & Board with strong background in
Automotive, Consumer, Industrial & Mobile



3 essential patents around 802.15.4-2011
5 implementation patents (10 in progress)
10 years of algorithm development



Our Vision: the micro location revolution



2000-2010: The GPS revolution



2010-2015: The start of indoor navigation



2015- xxx: The micro location revolution



... and the IoT revolution



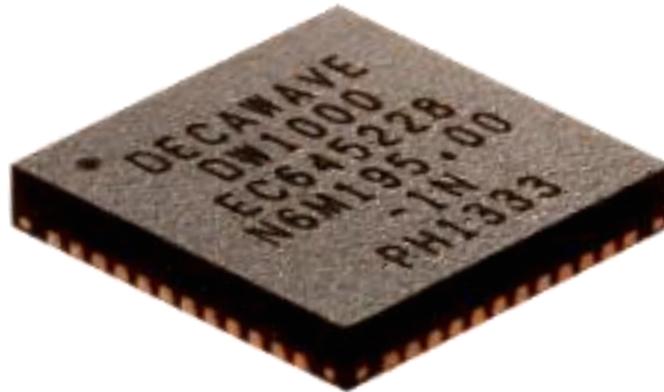
DW1000: A game changer



>99% reliability



10cm accuracy



Up to 6.8Mb/s



Cost effective

What we are already enabling*



Automotive

Secure Passive Entry/Start



Building Control & Smart Lighting

Wireless lighting control.



Healthcare

Tagging babies and Mothers



ePOS

Secure way of authenticating. DW1000 used for geo-fencing and data communication.



Factory Automation

Real time view of all operations, stock and component levels



Robotics

Warehouse automation robots. Drones. Home Robots.



Sports

Real time Sports statistics.



Retail

Geofencing & micro-location for context aware services.

*Design ongoing

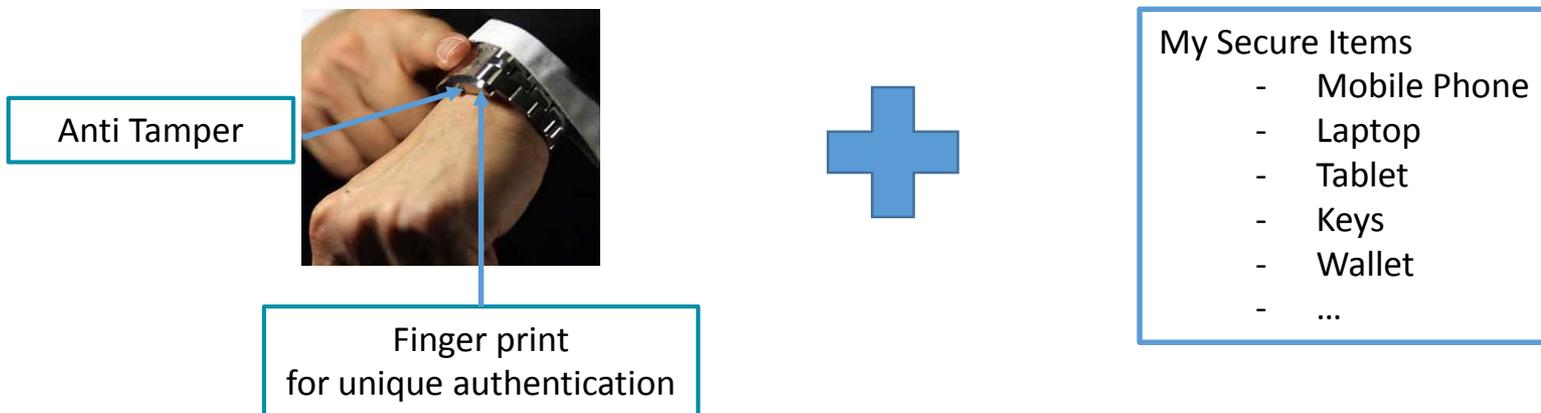


What we will enable



The secure bubble to protect my valuables

Step 1: Authentication



Step 2: My Secure Bubble



Accurate & Reliable distance measurement
+
Anti-relay Attack
=
Secure Bubble



The secure bubble for next generation payment



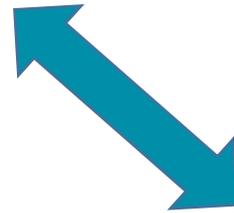
With the secure bubble:

- No more credit cards
- No more unfriendly proximity requirement

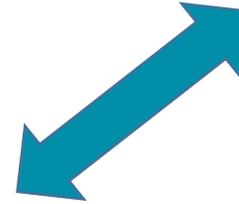
Find my stuff & don't forget them



Where's my bag?
3 m, Front Left
On the desk!



Where are my keys?
40 cm, Front Right
In my jacket!



Where's my laptop?
20 m, Back Left
Forgot it in the car!



Accurately find your valuables
Create list of items not to forget when on the go
Alerts when leaving a valuable behind

Beacons 2.0: from Zoning to accurate indoor micro location



What 10cm accuracy & ms latency enable

Customer Guidance...

...even to the smallest stores

Location aware services...

...even on the fly



Beacons 2.0: a new level of services for the retail industry



Promotion:
85% visitors
3mn 17s average time spent

New jeans arrival:
35% visitors
17s average time spent

New shirts arrival:
65% visitors
47s average time spent

Micro location in the home: What is needed, what are the capabilities?



4 receivers for 4000 square feet (scalable for larger areas)

Up to 300m in LOS

Up to 40m NLOS

Below 10cm 3D accuracy in LOS

Below 30cm 3D accuracy in NLOS

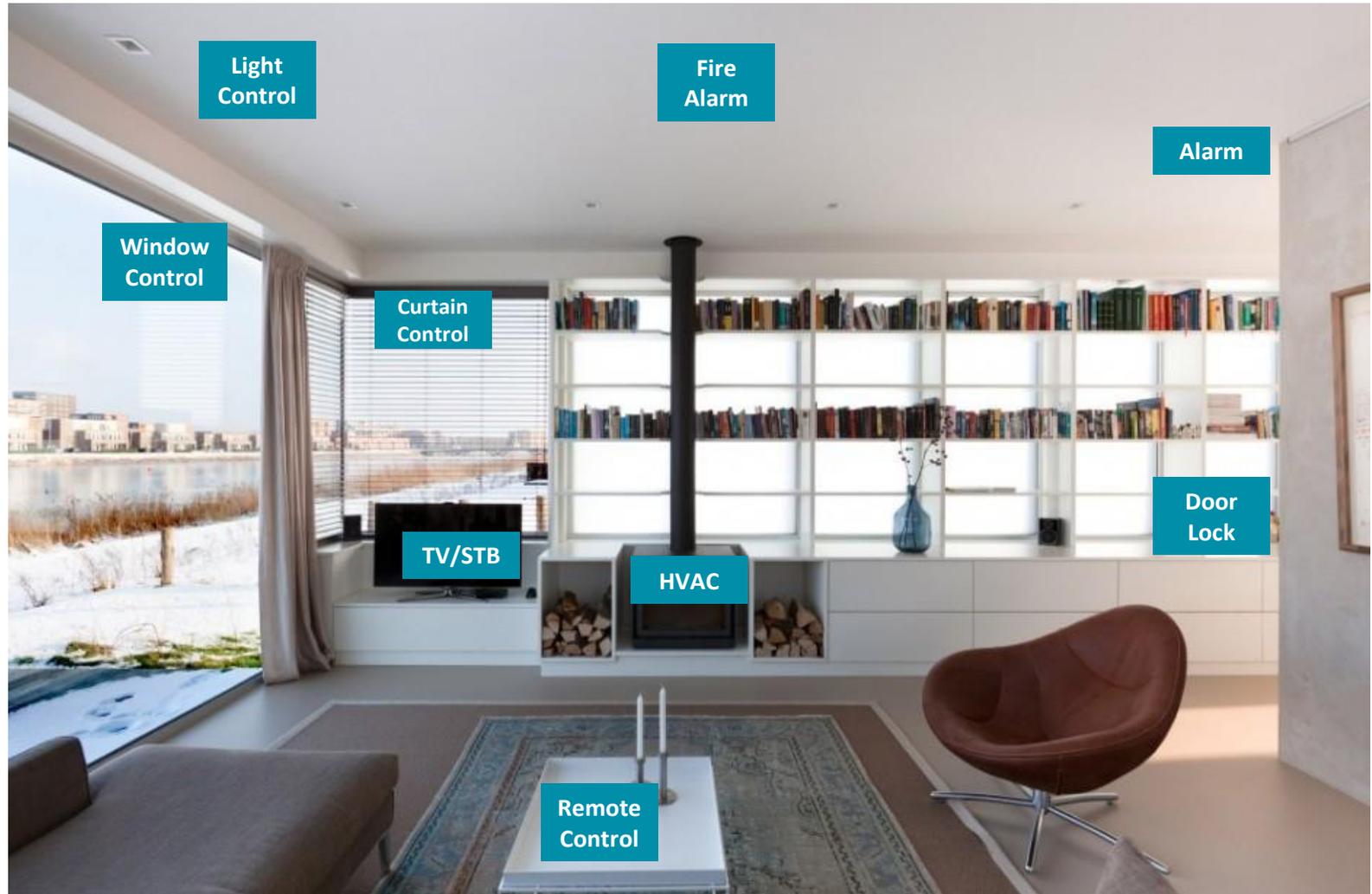
■ Receivers



■ Tag



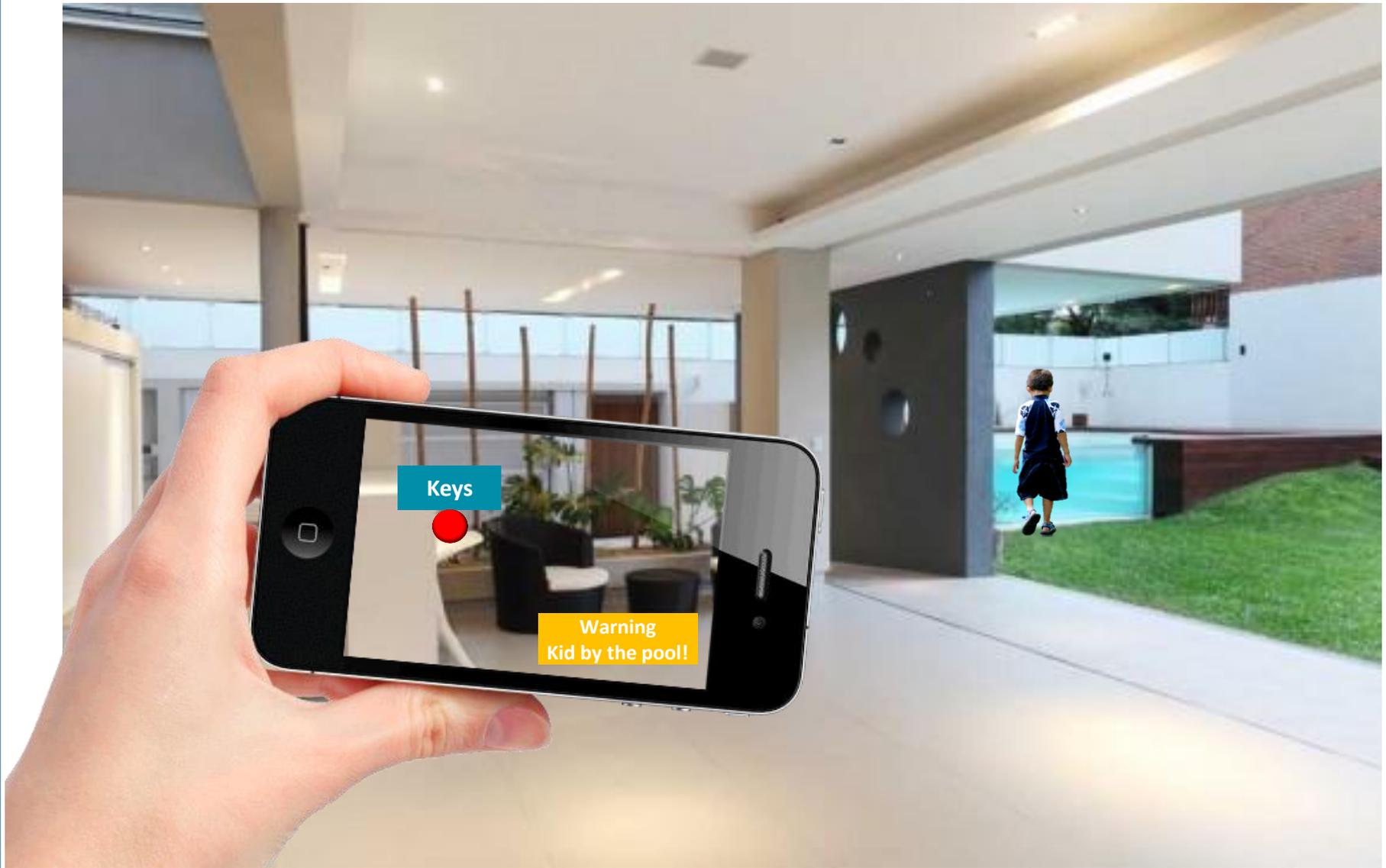
User presence based Home Automation



Accurate control of home robots

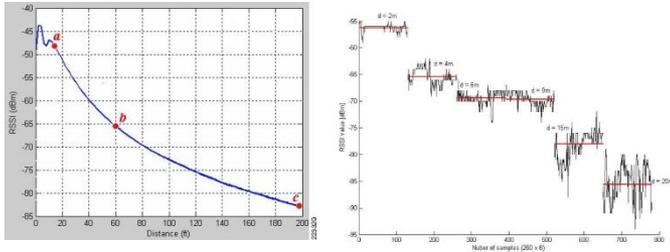


Geo-fencing, find my stuff, ...

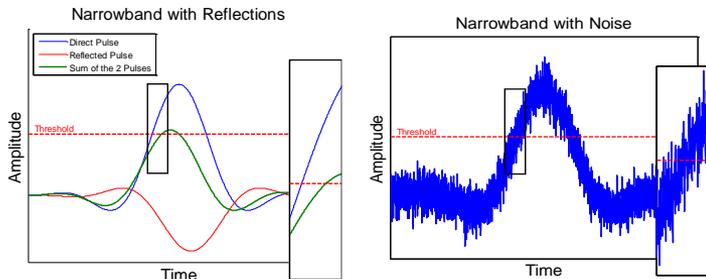


Why we outperform other technologies? This is Physics!

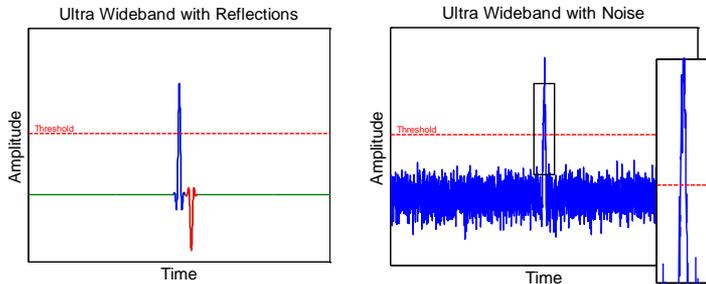
Measurement Method



RSSI based



Narrowband Time based



UWB Time based

Characteristics

Sensitive to Multi-Path
Sensitive to Interference
Sensitive to NW load

Sensitive to Multi-Path
Sensitive to Interference

Immune to Multi-Path
Immune to Interference

Performance

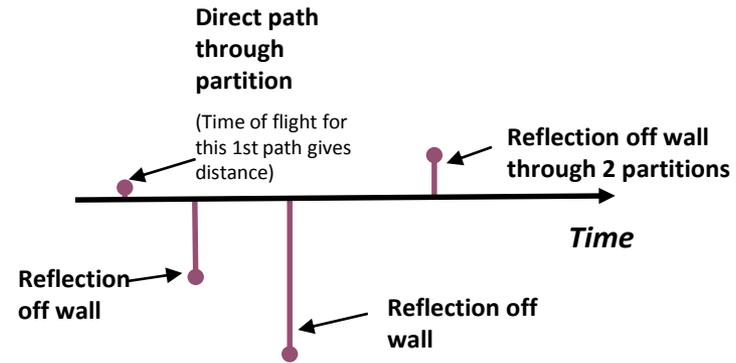
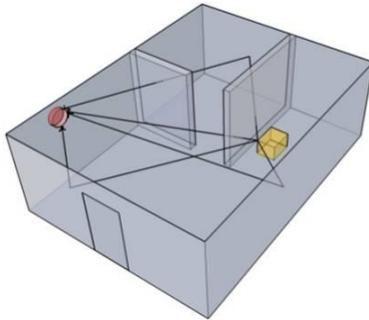
5m
70%

2m
70%

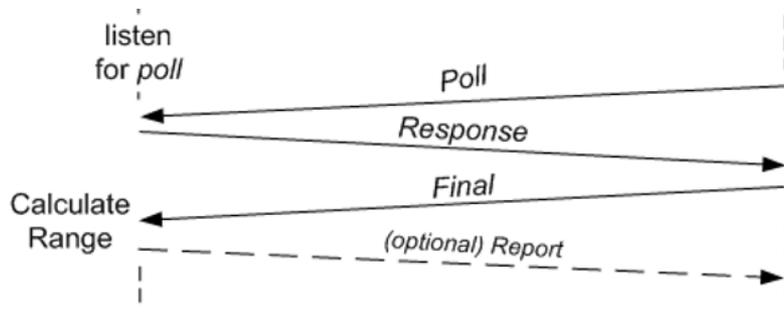
0.1m
99%

How it works

Ability to very **precisely measure the time of flight** of the radio signal

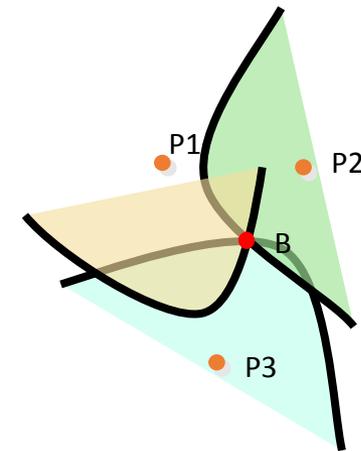


Two Way Ranging



Simple measurement of Time of Flight

Time Difference of Arrival



Multilateration

Start your design now

TWR Kit



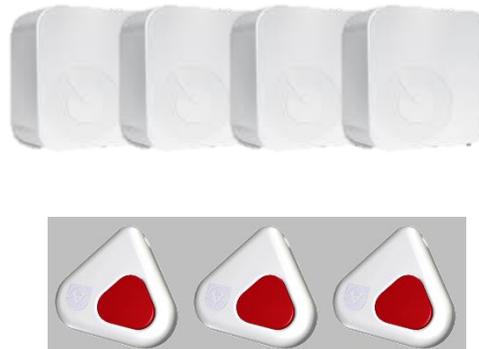
Evaluate:

- Range
- Accuracy
- Robustness

Availability:

- Now

Location Kit



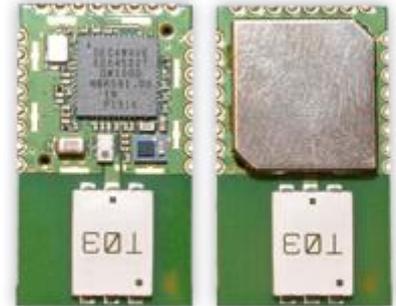
Evaluate:

- Micro location
- Accuracy
- Robustness

Availability:

- Demo: Now
- EVK: May 2014

Module



Prototype:

- No RF design
- Simple Integration

Availability:

- April 2014