

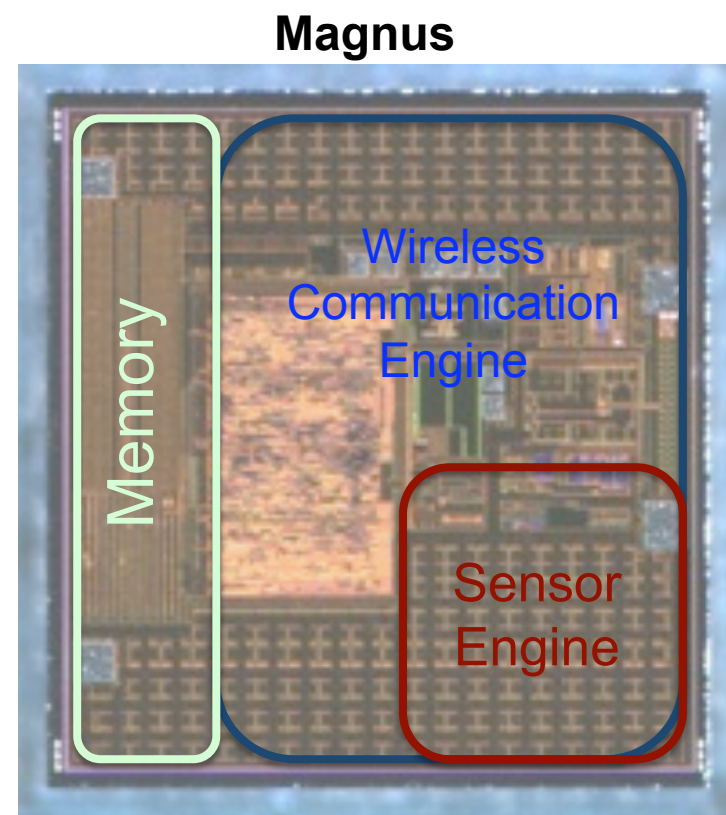
Passive Wireless Sensor



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CEO & President

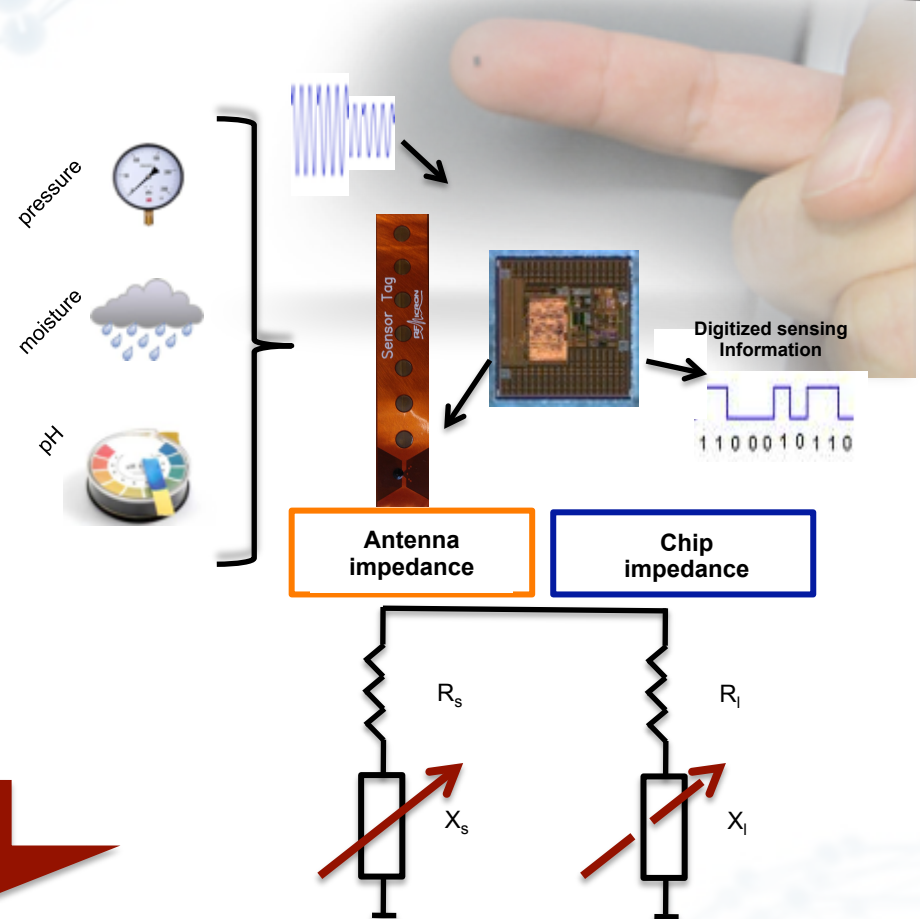
Wireless Passive Sensor – A Fully CMOS Solution

- **RFMicron introduces Magnus**
 - World's first fully passive, wireless smart sensor chip solution
- **Magnus is a multi purpose, CMOS silicon which consists of**
 - An ultra low power wireless communication engine
 - ISO 18000C (UHF band)
 - A sensor dubbed Chameleon™ Engine, capable of sensing a change in the environment
 - A Proximity sensor, capable of sensing the proximity of the Magnus chip to a location
 - Non volatile memory capable of storing information and data
 - Fully programmable through the air



Wireless Passive Sensor – Sensing Agent

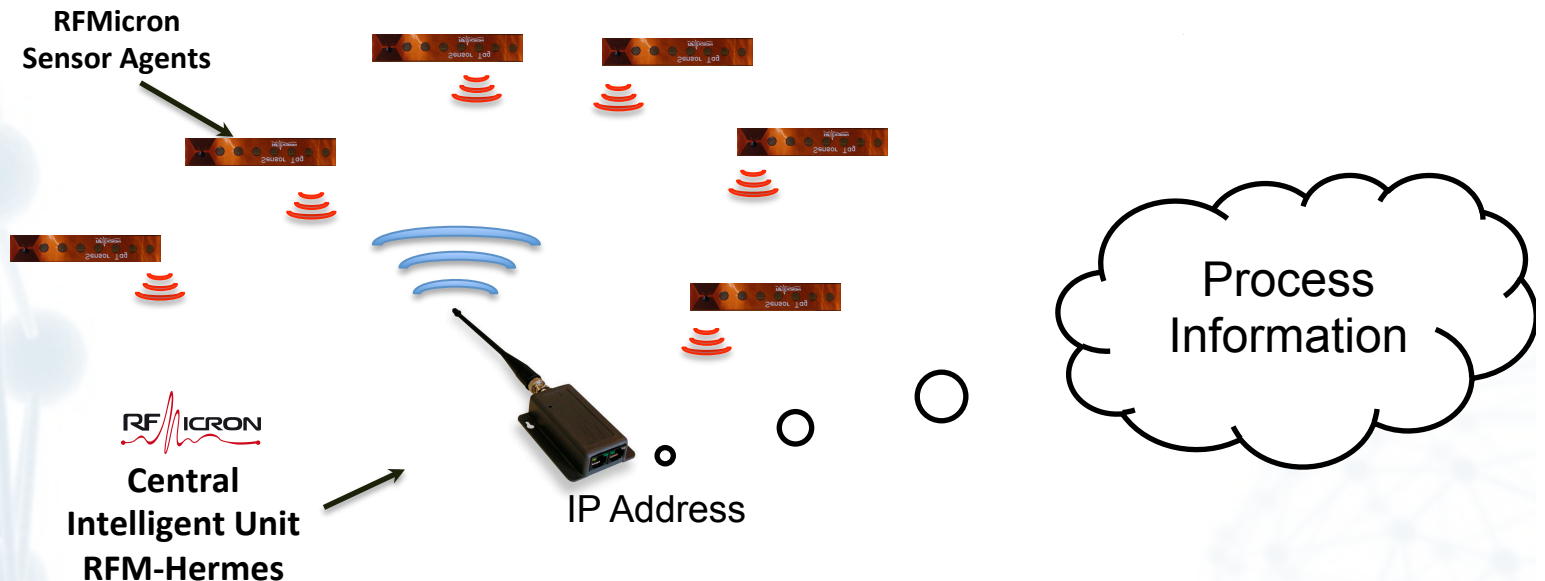
- RFMicron's smart sensors products are built using Magnus chip connected to a printable antenna
- Sensing environment is achieved by monitoring a change in the impedance of an antenna, reflecting a change in the environment
- The sensed information is digitized and wirelessly communicated for further data processing



A low cost, wireless, fully passive sensor which can be deployed / embedded where existing solution can not be used

Wireless Passive Sensor Network – A Plug and Play Solution

- **RFMicron's passive sensor network is consistent of**
 - Passive sensor tags
 - Each sensor has its unique identification number
 - Deployed as smart sensors / agents to collect relevant data to send back to the central intelligent unit for data processing
 - Central intelligent unit, a UHF Gen 2 commercially available reader
 - Receives the sensed information
 - Collects, computes and manages information

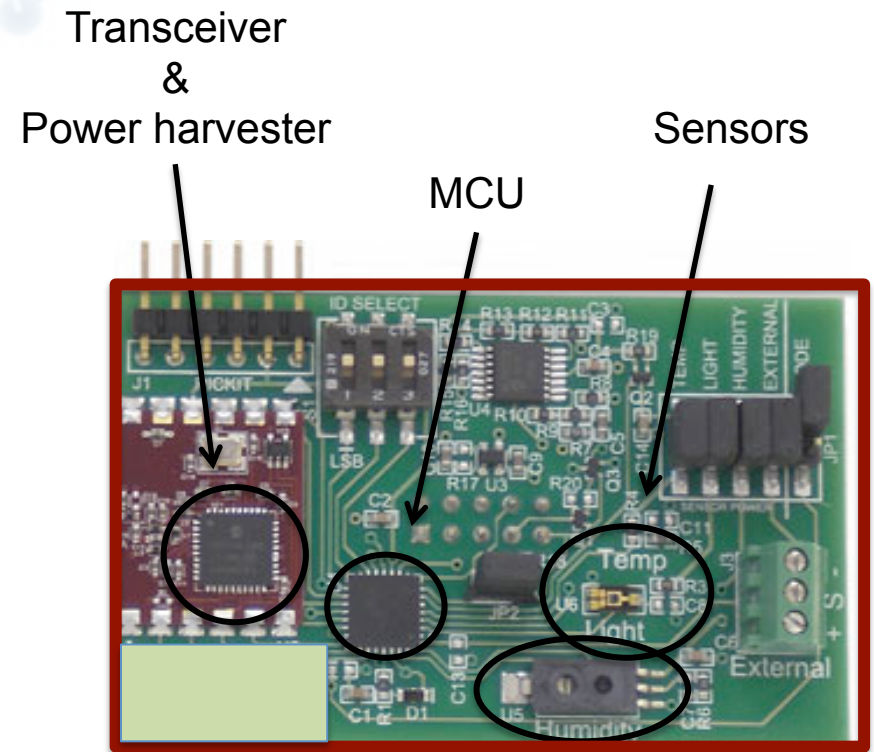


Current Sensor Implementations –

- **Sensors include**
 - Microcontroller
 - Transceiver
 - Sensor chip
 - Power supply / power harvester
 - Additional peripheral circuits
- **All of the data processing are done locally**
 - A need for a computation engine such as microcontrollers

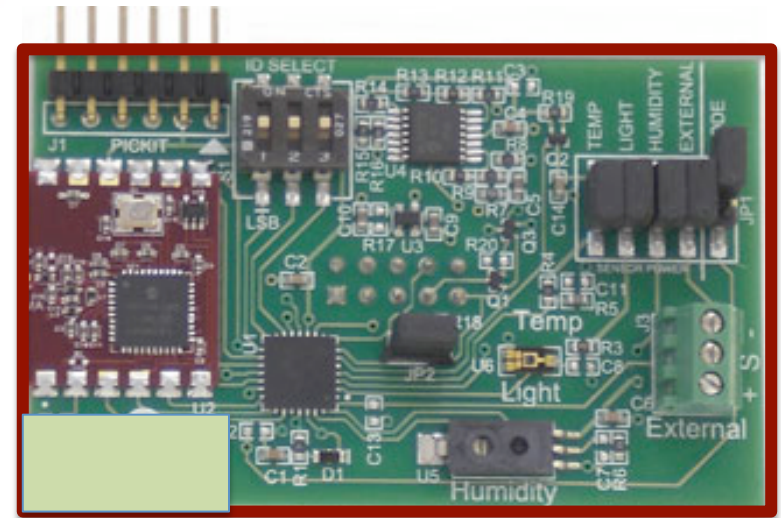


High ASP and not scalable



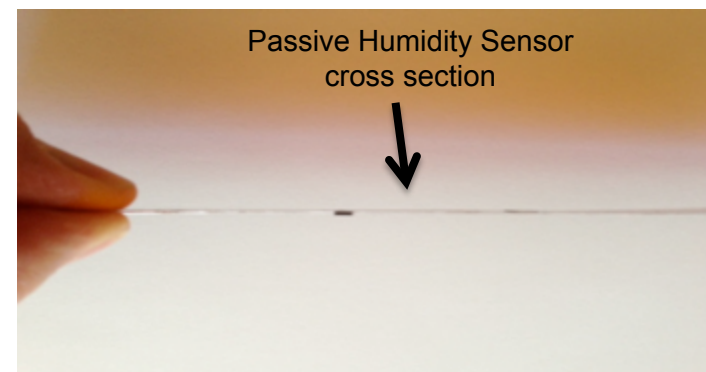
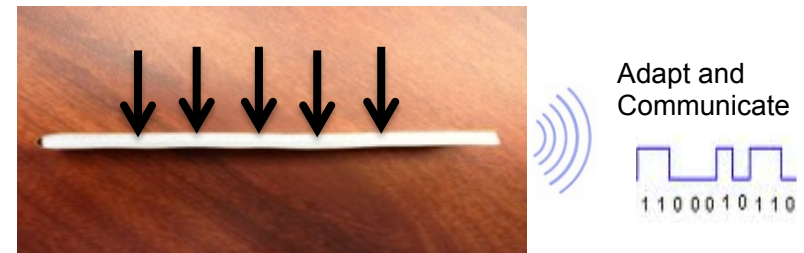
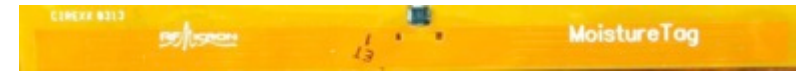
Passive Sensor – Accuracy

- **Not all sensing has to have high precision**
 - High precision sensors are expensive, hard to deploy in many applications and require batteries
- **RFMicron sensor**
 - Uses relative measurements
- **Deployed where active, semi-active sensors are not practical and are costly**
- **Expands available market**



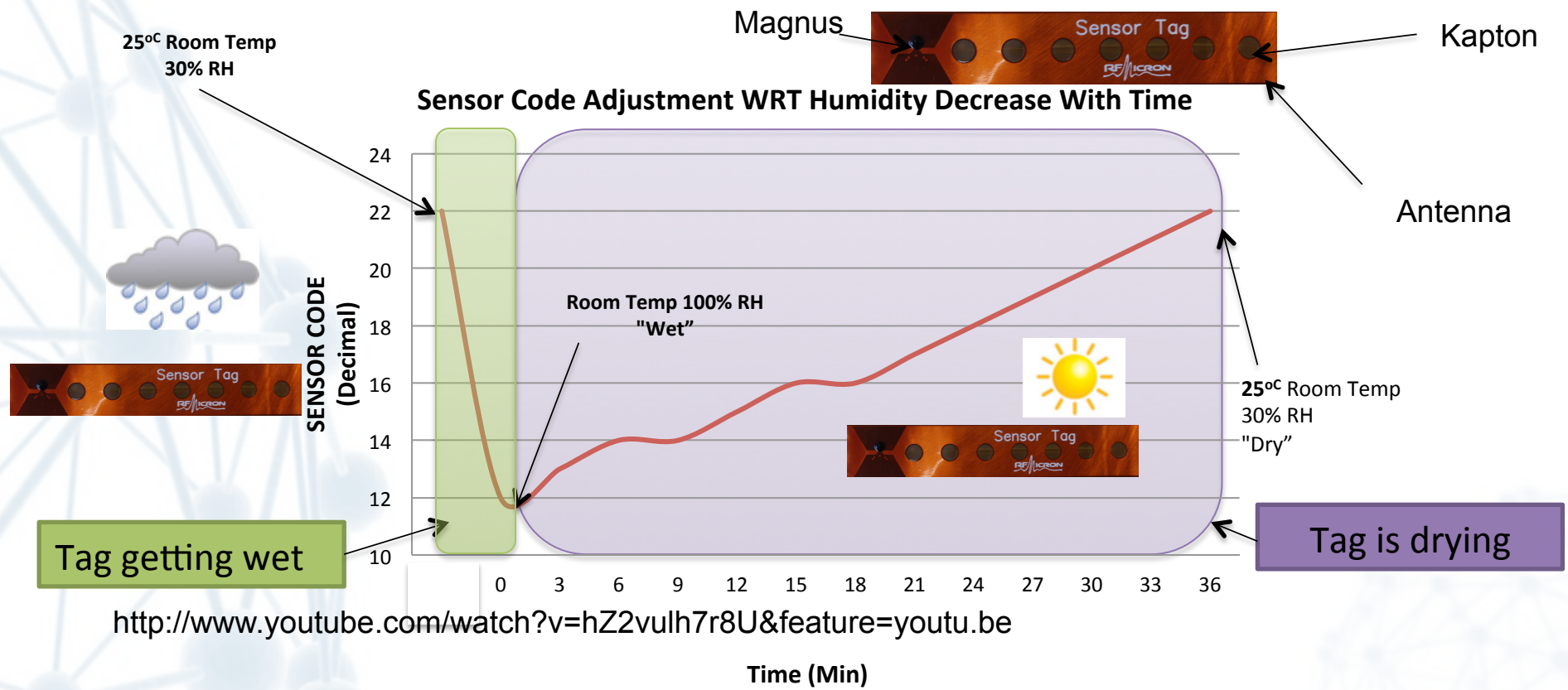
Wireless Passive Sensor Portfolio –

- **Magnus is a single product proliferated into several sensing markets by simply repackaging**
 - Humidity sensor
 - Senses several wetness levels
 - Pressure sensor
 - Low cost Wet/Dry sensor
 - Reliably communicates deep inside water
 - Proximity sensing
 - Temperature sensing



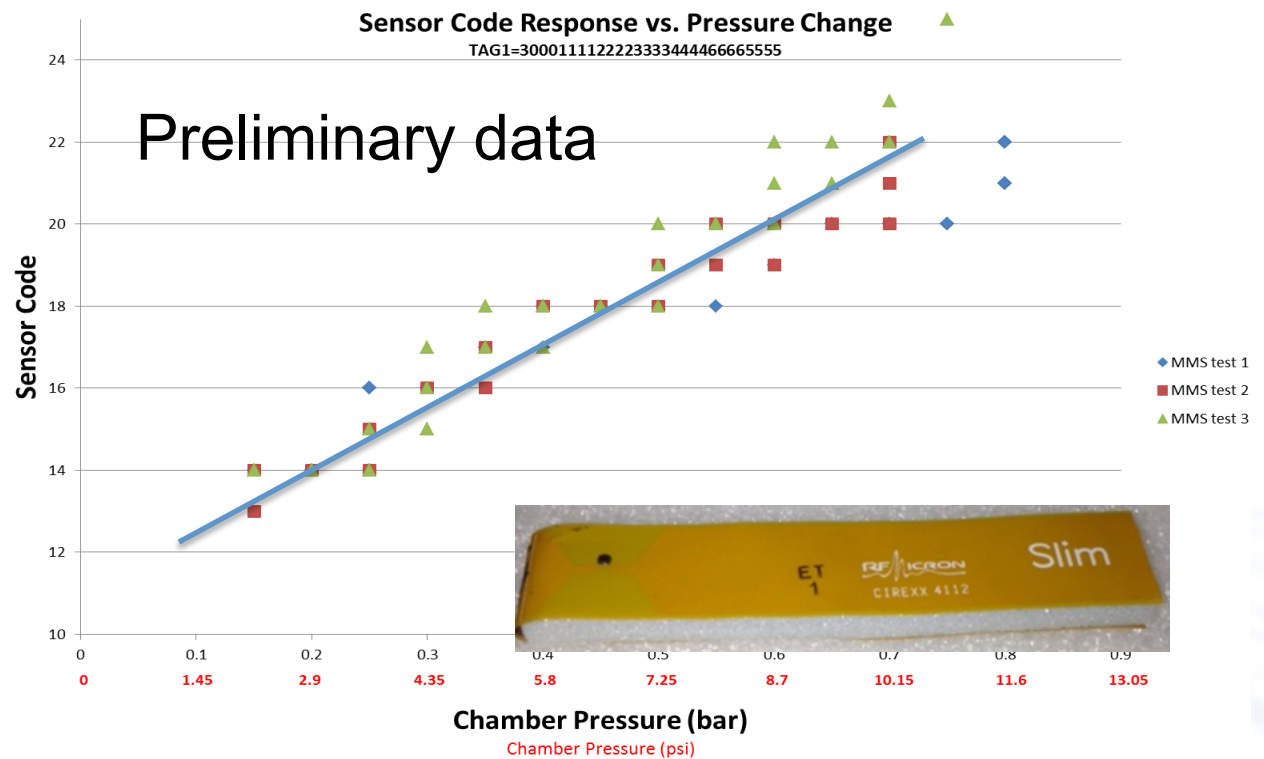
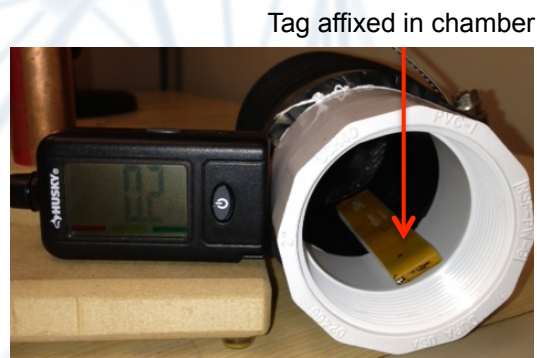
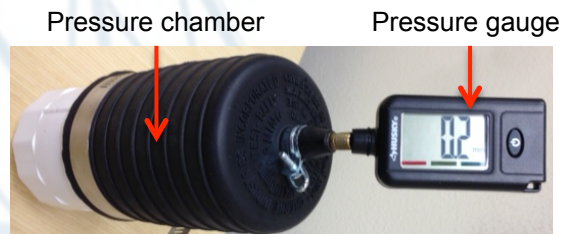
Sensing Humidity Level – Moisture Tag

- **Fully passive wireless humidity sensor with fine resolution**
 - Senses several levels of wetness
 - Wetness level along with the calibrated information already stored in the Magnus' memory is used to calculate relative humidity



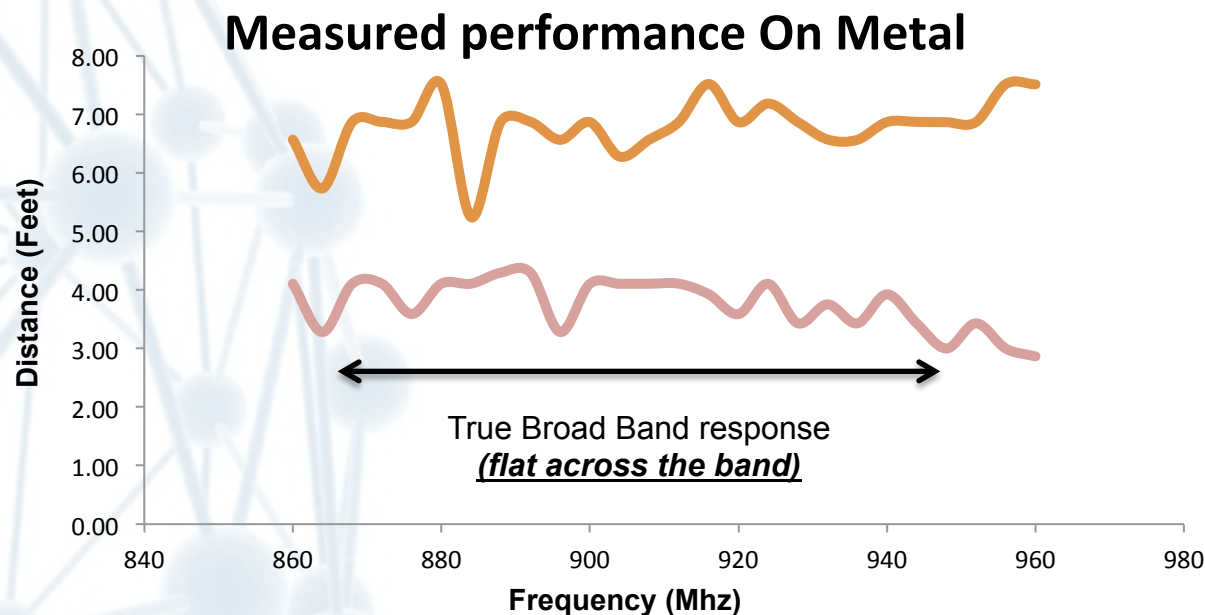
Sensing Pressure – Prototype Data

- **Fully passive wireless pressure sensor with fine resolution**
 - Capable of measuring fine levels of pressure asserted onto the tag
 - Pressure level along with the calibrated information already stored in the Magnus' memory is used to calculate accurate pressure



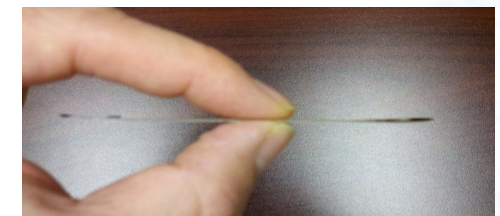
Sensing Metal – On Metal Slim Tag

- **Magnus-based tag**
 - Senses that it is on metal
 - Is thinnest on-metal tag in the market (0.6 mm)
 - Does NOT get detuned
 - Is consistent, broadband despite proximity to metal



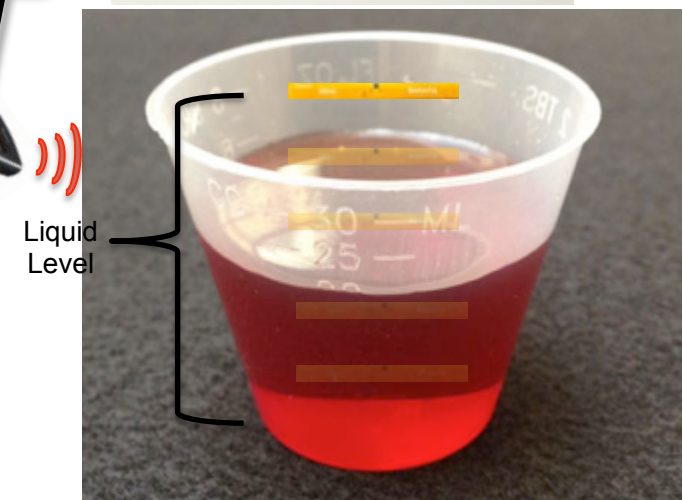
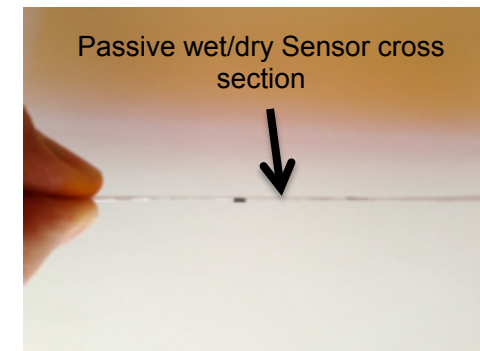
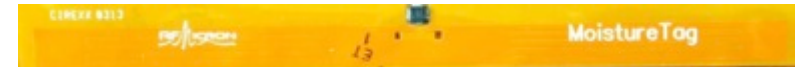
40mils (1mm) tag

25mils (0.6mm) tag



Passive Sensor – Other Capabilities

- **Low cost Wet/Dry sensor**
 - Communicates with the interrogator whether surrounded by liquid or free space
 - Reliably communicates deep inside water up to 8 feet
- **Fully passive wireless temperature sensor with fine resolution**
 - Magnus gets calibrated at a known temperature
 - The information stored in the Magnus' memory is used to calculate current temperature
 - Works up to 40 feet away



Single Product Proliferated Into Several Markets –



1- Special Tag RFID Market
On metal
In/on liquid

2- Wireless Passive Sensor Market

4- Active Wireless Sensor Market

3- Semi Active Wireless Sensor Market

