



Augmented RFID

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RFID Today

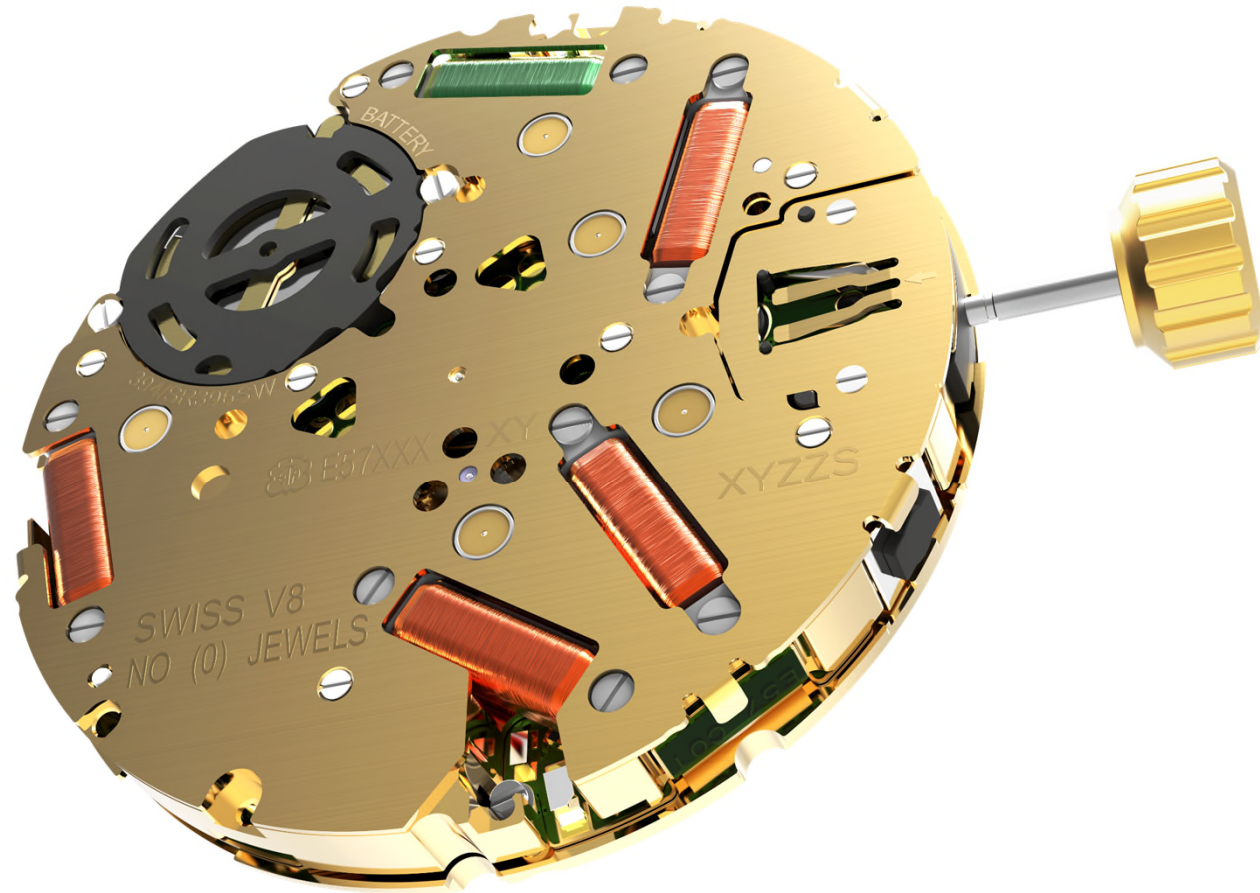


Nice & Good, but...

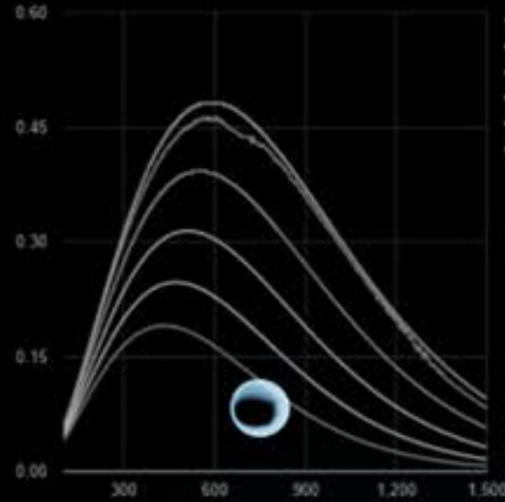
... at EM Micro, we think that the technology can do more

What if, instead of RFID being the end node, it was the pipe?

Remember, our DNA is Watchmaking



A raindrop can power a watch for 10 minutes



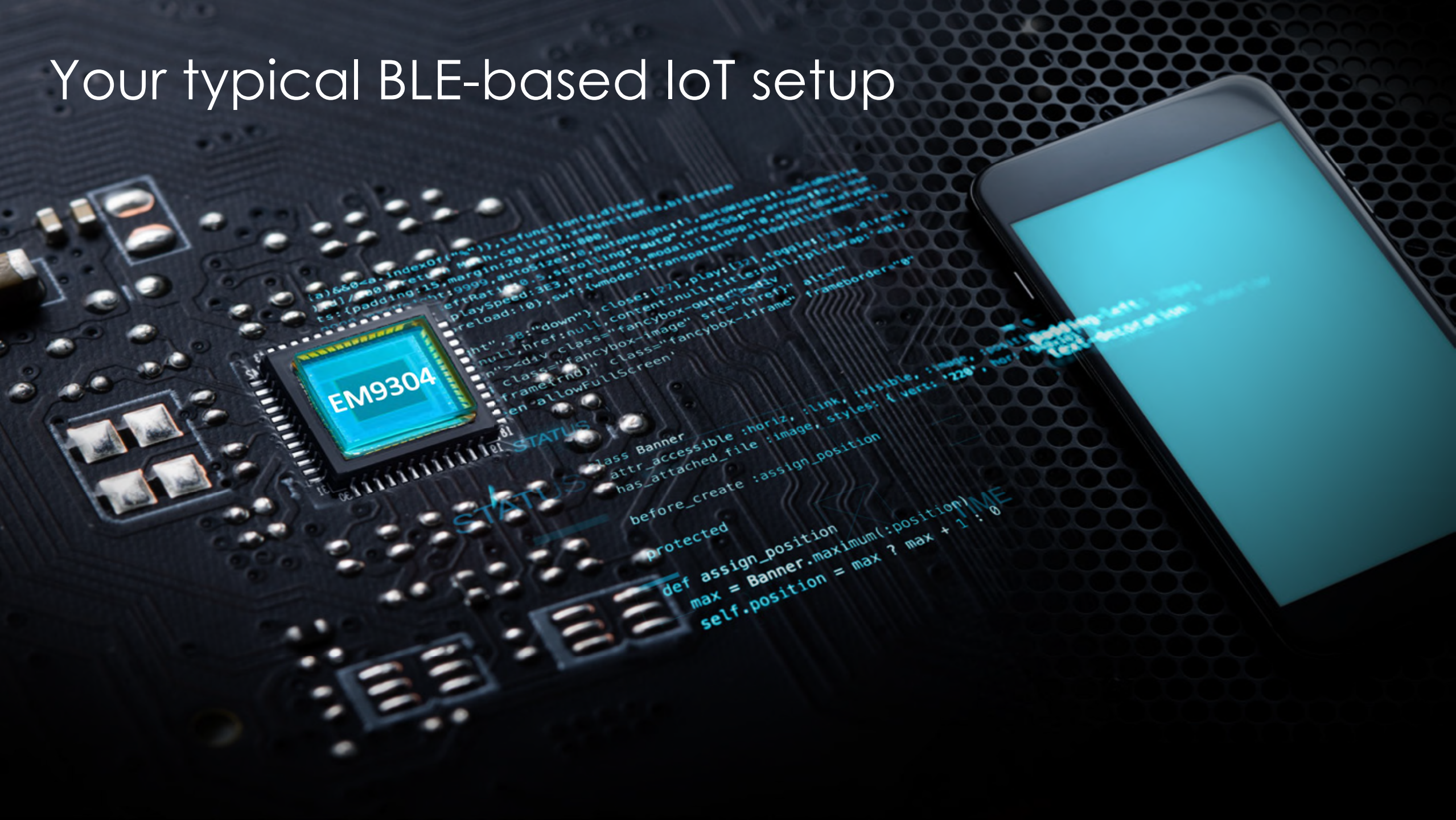


We're bringing our watchmaking DNA into RFID



Think Radios, Sensors and Displays

Your typical BLE-based IoT setup



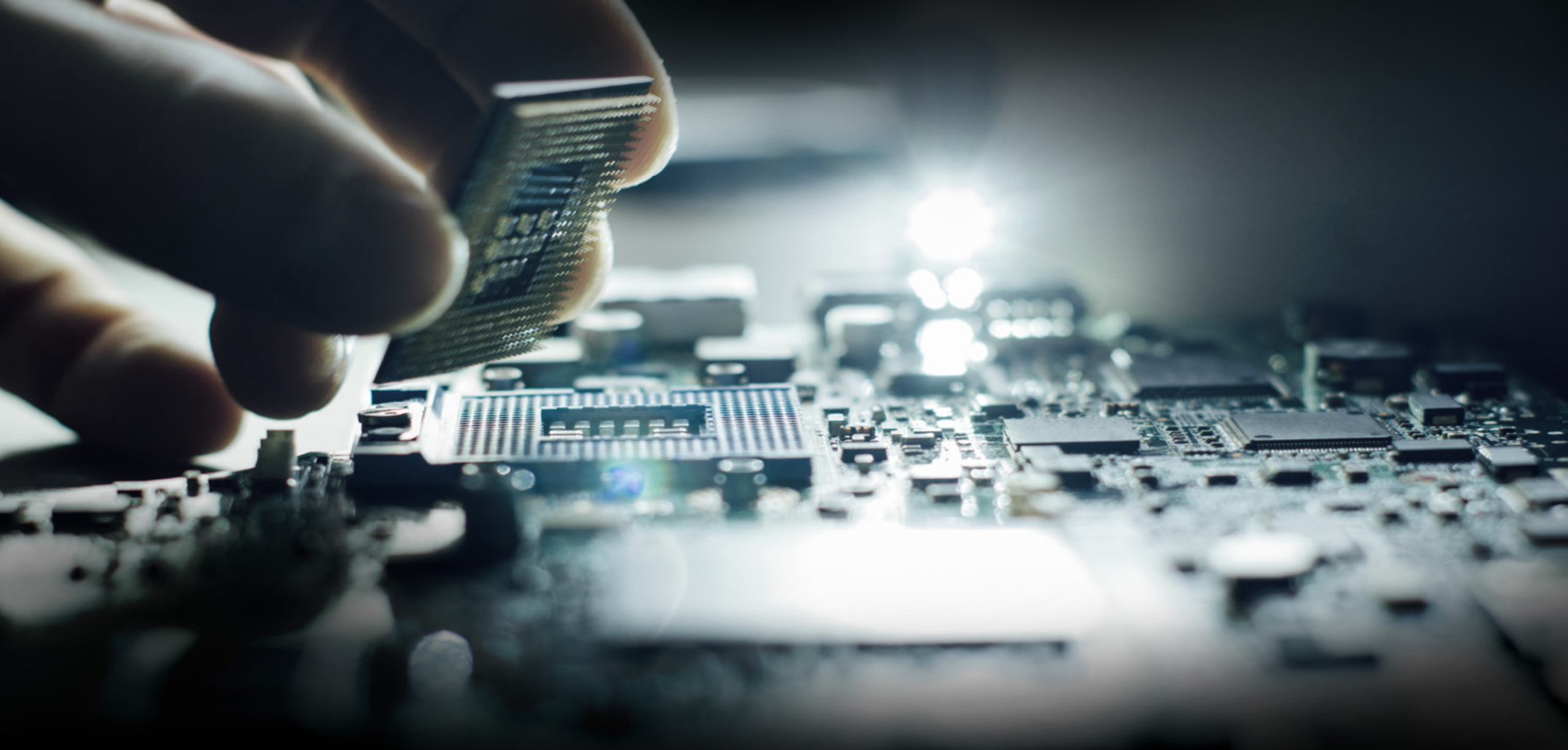
EM9304

STATUS

```
class Banner
  attr_accessible :horiz, :link, :visible, :image, :position
  has_attached_file :image, styles: { vert: '220', hor: '1000' }
  before_create :assign_position
  protected
  def assign_position
    max = Banner.maximum(:position)
    self.position = max ? max + 1 : 0
  end
end
```

TIME

```
(a)&&0<a.IndexOf("s"),&function(a,d){var
  )d)/00)ret in Math.ceil(e)},&function(a,b){return
  ts:{padding:15,margin:20,width:800,
  eftRate:0.5,scrolling:"auto",wrapCSS:"&arrange",l:au
  playSpeed:3E3,preload:3,modal:1,loop:10,ajax:{dat:all:
  preload:10},swf:{wmode:"transparent",allowFullscreen:"tr
  ht",38:"down"},close:[27],play:[32],toggle:[29]},directi
  null,href:null,content:null,title:null,title:null,tpl:{wrap:"div
  n"><div class="fancybox-outer"><div
  class="fancybox-image" src="{href}" alt=""
  frame{rnd}" class="fancybox-iframe" frameborder="0
  en-allowFullscreen"
```

Now replace BLE with RFID as the data pipe

Drop the battery and power
using the RFID field



What do we get ?

Augmented RFID



Use Case 1 – Healthcare

➤ Body temperature monitoring



➤ Pharmaceuticals – Tamper Proof Medication



Use Case 2 – Smart Agriculture



Sensing

- Moisture
- Temperature
- pH
- Light intensity
- ...

Read-out through

- Smartphones (NFC lab)
- Fixed readers (RAIN greenhouse)
- Drone-mounted readers (RAIN outdoors)

Use case 3 – Shock Sensing

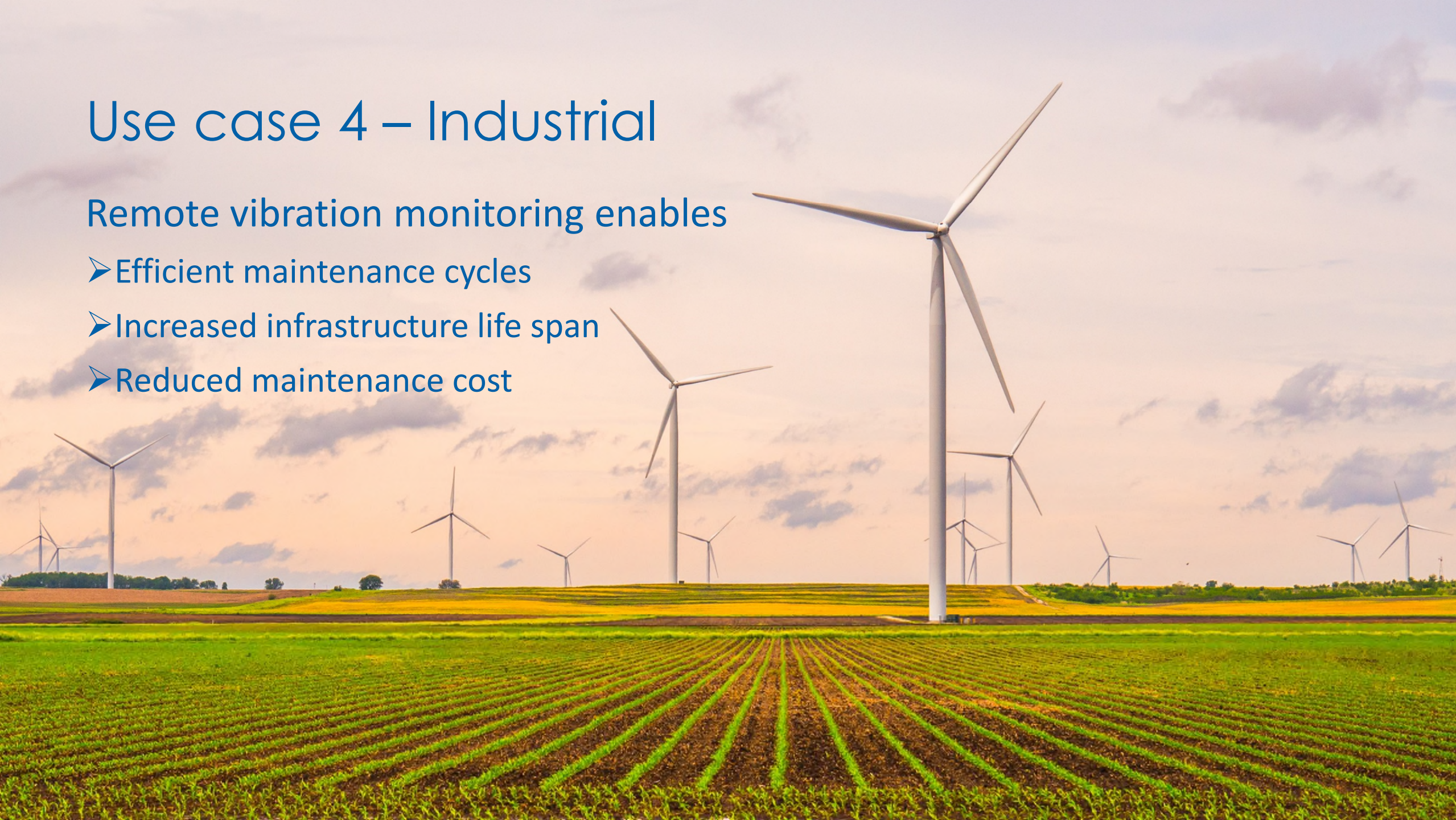


- Monitoring throughout logistics delivery (RAIN)
- Should you accept this delivery? (NFC)
- When does your child need a new helmet?

Use case 4 – Industrial

Remote vibration monitoring enables

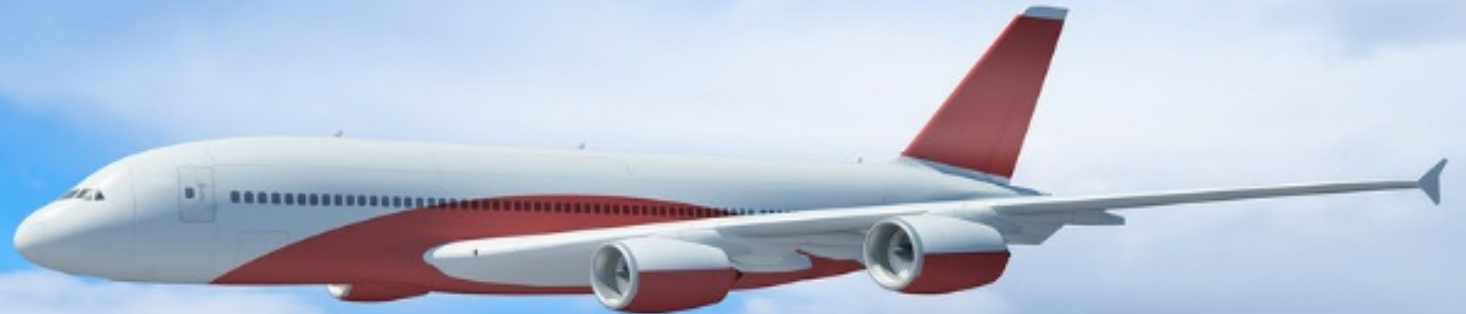
- Efficient maintenance cycles
- Increased infrastructure life span
- Reduced maintenance cost



Use case 5 – Embedded Equipment

Planes and other high-scale infrastructure contains significant amount of embedded equipment that requires regular checking

- Presence of life vests
- Availability of breathing masks
- Status of buried battery-supplied equipment



How?

By combining passive RAIN or NFC RFID with

- On-chip temperature measurement 🌡️
- Tamper detection
- External permanent state sensors 📱
- Non-volatile storage of sensor events
- Energy harvesting
- ...



Conclusion

Augmented RFID is all about enabling a new set of use cases, from industrial to healthcare to smart homes...

...deploying the battery-less IoT that our industry has been promising to the world for many years.