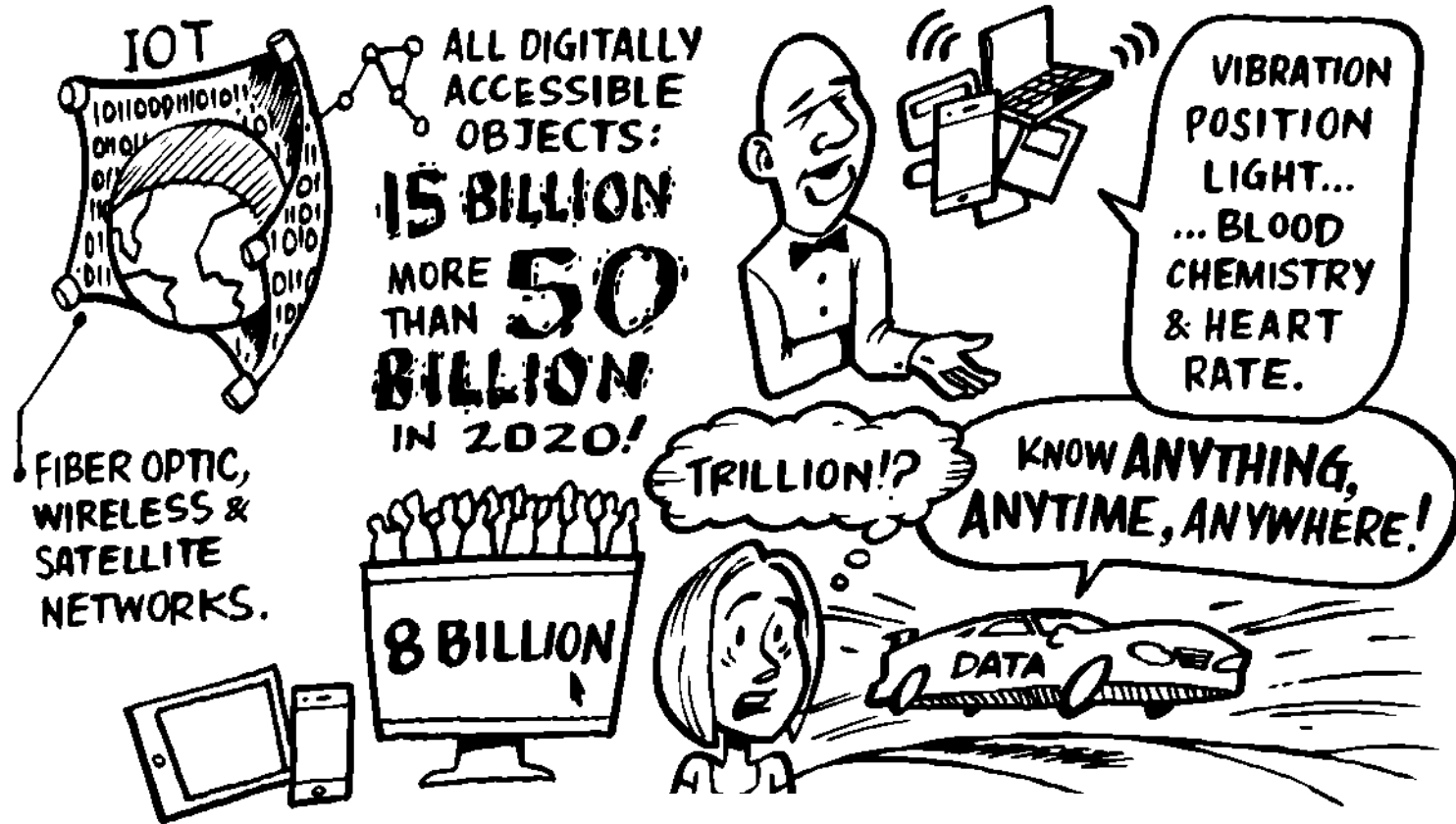


Connecting LoRa[®] devices everywhere

'Fourth industrial revolution' ... but how big?



How does the satellite technology work?



- 1 Battery powered devices direct to satellite – no gateway required
- 2 Satellites in low earth orbit collect and store received messages
- 3 Messages are relayed to ground station when satellite goes overhead
- 4 Data relayed to The Lacuna Network for distribution
- 5 Distributed to Lacuna Space customers or other operators as appropriate

Semtech Collaboration



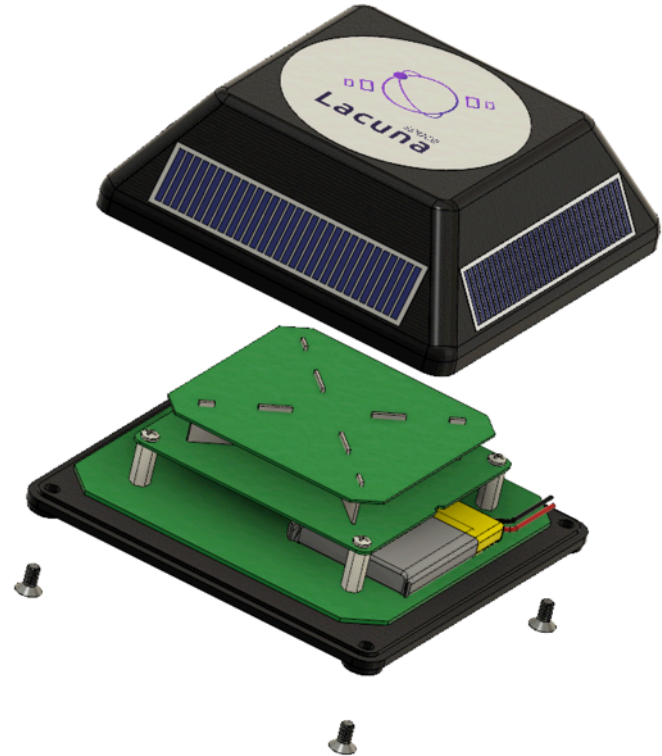
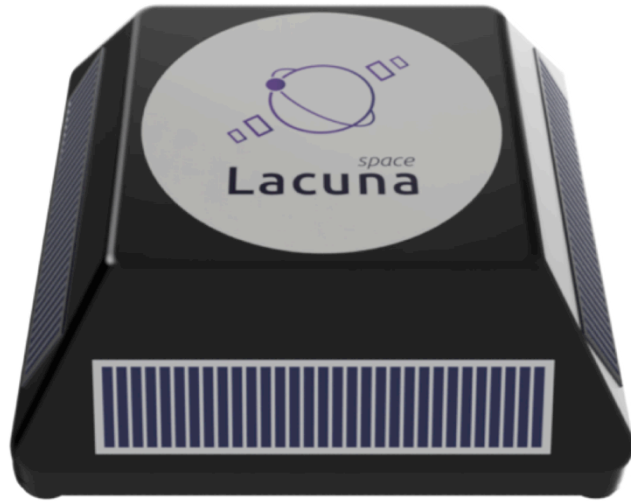
Semtech and Lacuna Receiving Messages from Space

Lacuna Space extends LoRaWAN network global coverage with satellite connectivity

CAMARILLO, Calif., Feb. 15, 2018 – **Semtech Corporation** (Nasdaq: SMTC), a leading supplier of high performance analog and mixed-signal semiconductors and advanced algorithms, and **Lacuna Space** announced its collaboration with key industry leaders, including the European Space Agency (ESA) and Parametric GmbH, to extend a LoRaWAN™ network by providing satellite connectivity to fill voids between the terrestrial gateways out of cellular reach and give continuous global coverage.



Lacuna battery powered satellite relay



Applications



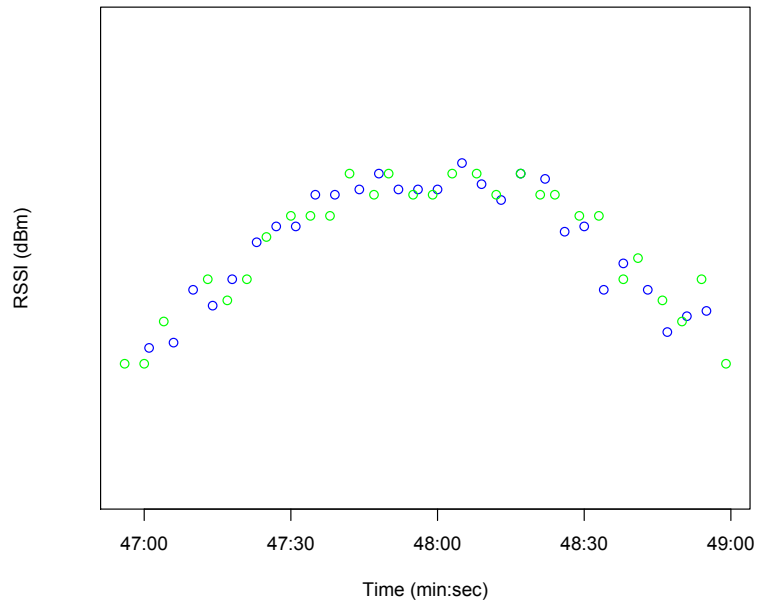


Proof of concept (LS-1) successful

De Bilt, The Netherlands 15th July

De Bilt, July 15

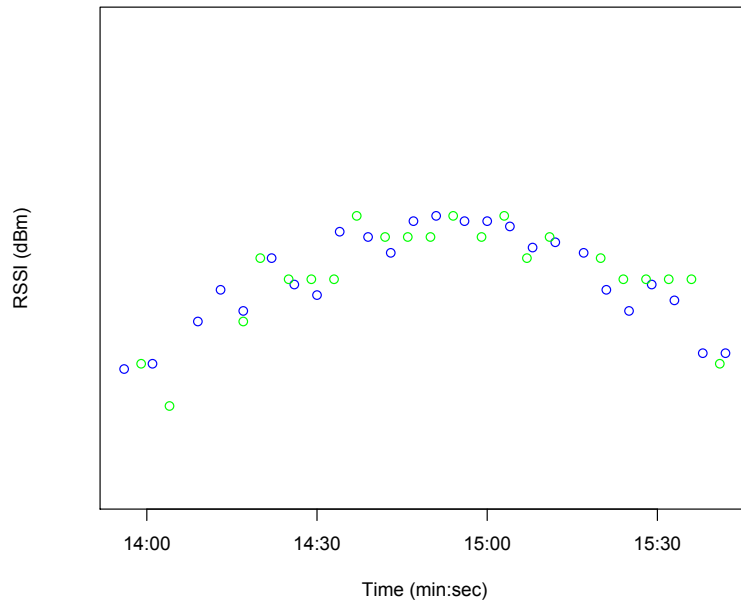
Confidential © 2019 Lacuna Space Ltd.



Harwell, UK 14th July

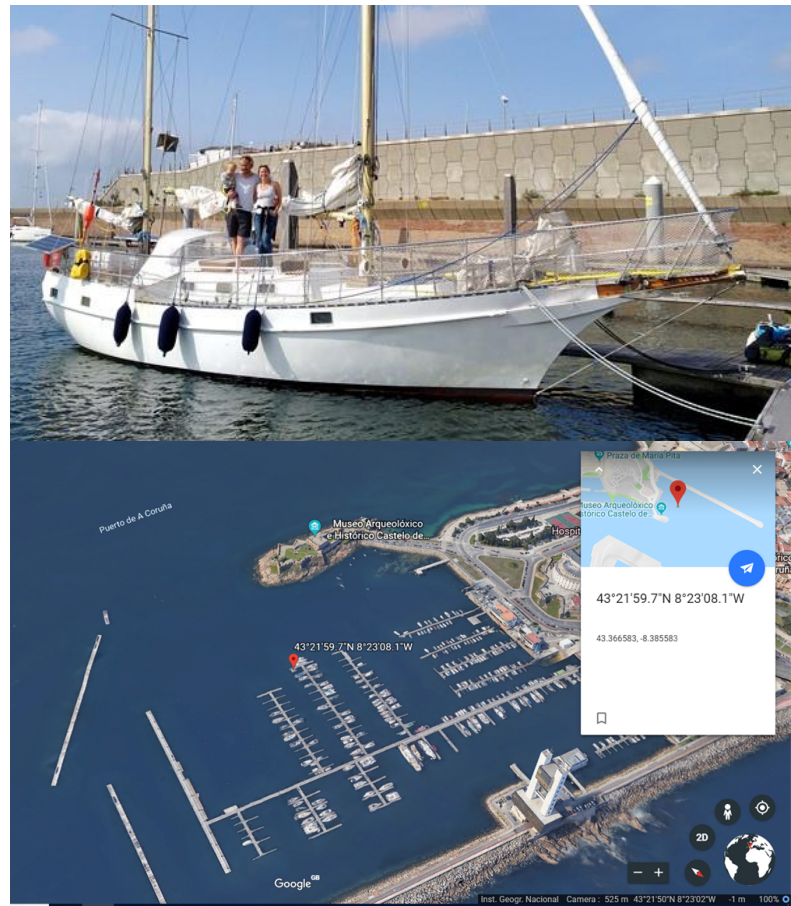
Harwell, July 14

Confidential © 2019 Lacuna Space Ltd.



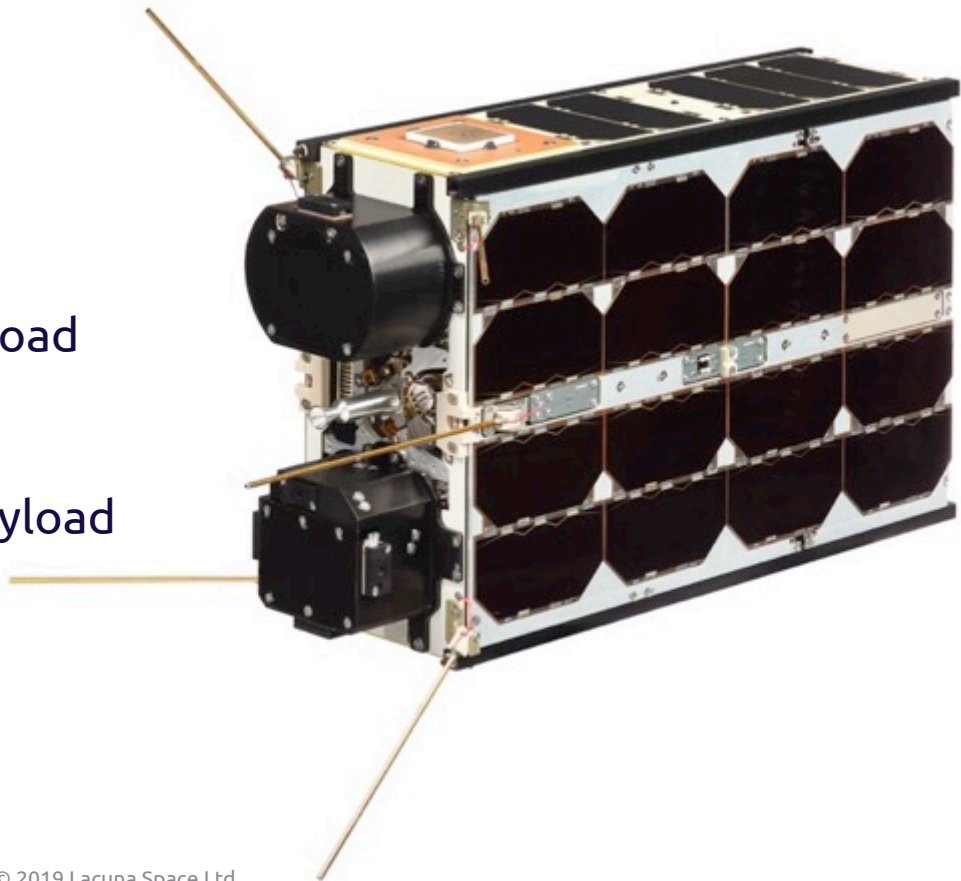
Use case demonstration: vessel tracking

- Device with GPS installed and tracking sailing boat
- Travelling across the Atlantic from The Netherlands via Falmouth, Spain, Portugal and Canary Islands.
- Device works seamlessly with local LoRa networks in harbours (via *The Things Network*)
- Telemetry received in LoRa messages from the boat:
 - Device telemetry: tri-axis accelerometer, latitude, longitude, altitude, ambient pressure, temperature, humidity
 - Radio data: time, data rate, coding rate, RSSI, SNR, frequency, air time, etc.



Status: Space Gateway Deployment

- 1** April: LacunaSat 1
India, version 2.0 payload
- 2** November: LacunaSat 2a
New Zealand, version 3.1 payload
- 3** December: LacunaSat 2b
French Guyana, version 3.2 payload
- 4** November: LacunaSat 2c
India, version 3.2 payload



Roadmap

- Proof of concept extremely successful
- Use case demos underway
- Additional three sats before end 2019
- Early 2020: customer demos planned
- By end 2020 will deploy two further clusters totaling 24 satellites
- Complete constellation will be 240 satellites serving 50 million sensors





Lacuna