

# **AAEON EUROPE**

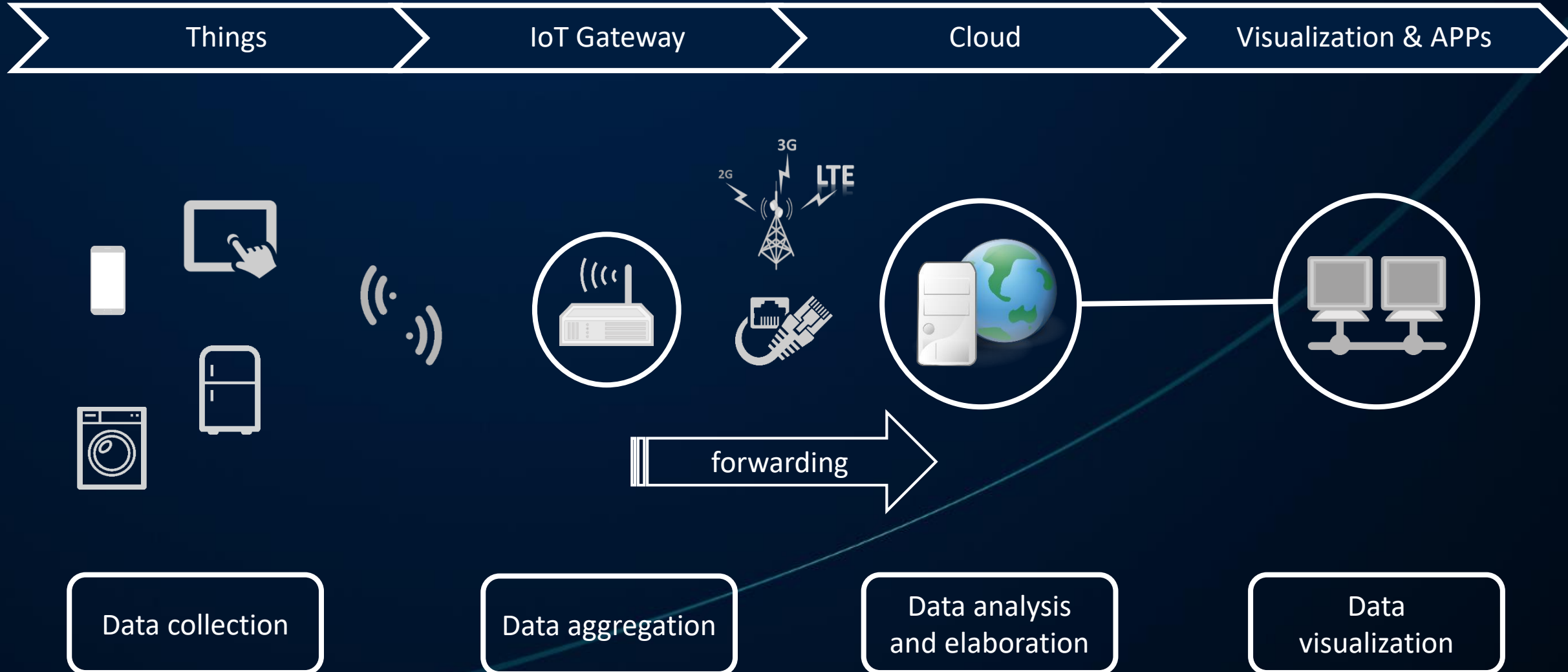
# **Industrial IoT Solution line**

**Artificial Intelligence on the edge**

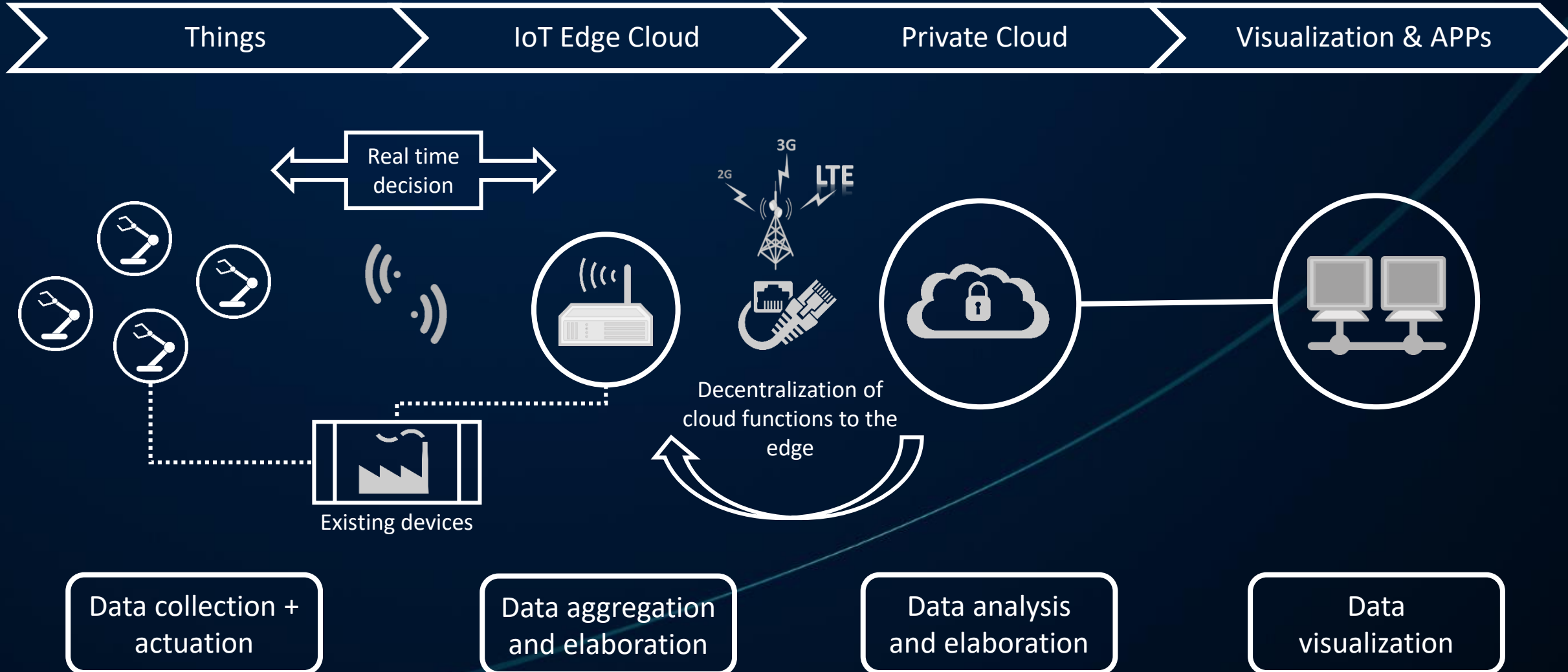


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# Classic IoT application pattern



# IIoT application pattern



# Why needed a different approach?



**“Need faster, cheaper and smarter approach than the traditional one”**

**“Inefficiencies can be eliminated only if readily detected  
identified”**

**“Need to contain this “data deluge”, transferring only the information that matters instead of raw streams of sensor data”**

**“want to keep customer’s sensitive data into a  
controlled private environment”**

# Bring Cloud to the edge for Industry 4.0

- **More efficiency:**
  - Reduce unplanned downtime
  - Improve work safety
  - Improve assets performances
- **Cheaper and more robust network:**
  - Reduce bandwidth usage
  - Overcome network latency problem
  - Mitigate network outage issues
  - Reduce the risk of losing predictive maintenance and process optimization functions
- **More security**
  - Operate offline into a private and closed network
  - Select and Secure data before sending them out (Local authentication and cryptography)



# IIoT Edge Cloud benefits

- **Able of advanced on-device processing beyond the data storage, buffering and communication**
- **Real time operations/reactions into perimeter network allows to dynamically apply tactical decisions and modification into the process**
- **Availability first and immediate analysis of massive amount of data, which grows with the grow of available sensing solutions**
- **Artificial intelligent and machine learning functions at the edge**

**Decentralized decision, a design principle of Industrie 4.0 concept**

# IIoT Edge Cloud: outlooks and predictions

- According to Gartner's analysis dated October 2017, 10% of enterprise generated data is processed on the edge. It will reach 50% by 2022.
- IDC™ research of Nov.2017 forecasted the IT depts. To spend up to 18% of total budget on edge infrastructure by 2020
- MarketsandMarkets™ research on Edge computing market revealed the global edge computing market is expected to reach USD 6.72 billion by 2022 at a compound annual growth rate of a whopping 35.4 percent.





# Edge cloud concepts when building a GW

- More computational power
- No constraints for SW development
- Low power consumption
- Limited resources (processing and costing)
- Decentralized cloud functions
- Real time decision at the edge
- Reliability and robustness



- Efficient ( Gflops/W)
- Reasonable Cost
- Industrial Grade Archit.



# AAEON Europe IIoT strategy

- Industrial IoT gateways for advanced edge computing
- Innovation oriented devices
- Technology-ready solutions
- Connection-ready edge gateways
- Robust and flexible platforms
- Multi service platforms able to link legacy with new applications
- Focused on verticals
- Scalable solutions



# AAEON Europe's Approach

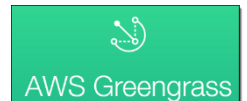
**Fast POC**  
(Starter kit)

**Market-in**  
(Standard GW)

**Serial MP**  
(ODM)

**Ecosystem  
partners**

**Technology  
&  
Vertical  
application  
driven**



# AAEON Europe's Approach to IIoT



# Radio Frequency based Technologies

# IQRF

- **What's is it:** IQRF is a platform (HW Transc+ SW+Cloud) for low power, low speed and low data volume wireless connectivity
- **Technology:** Radio 868MHz (916/433), license free
- **Features:** bit rate 20kb/s, ultra low power (SB <uA, 15uA RX), Mesh Network
- **Range:** tens and hundreds of meters
- **Number of devices:** Up to 65 000 devices in one network under OS, up to 240 devices under DPA
- **Applications:** telemetry, industrial control and automation of buildings and cities (street lights, parking etc.)
- **Learn more:** [www.iqrf.org](http://www.iqrf.org)

# LoRaWAN<sup>™</sup>

- **What's is it:** LoRaWAN<sup>™</sup> is a Low Power Wide Area Network (LPWAN) specification intended for wireless battery operated Things in a regional, national or global network.
- **Technology:** Radio 868MHz (916/433), license free
- **Features:** bit rate up to 38.4kb/s, ultra low power (SB 200 nA, 10mA RX), Star Network, Private Networks
- **Range:** up to 20km open air
- **Number of devices:** Up to several hundred per GW
- **Applications:** telemetry, industrial control and automation of buildings and cities (street lights, parking etc.).
- **Learn more:**
  - <https://www.lora-alliance.org/>
  - <http://www.semtech.com/wireless-rf/lora/LoRa-FAQs.pdf>



# SimpleLink™ Sub-1 GHz

- **What's is it:** SimpleLink™ Sub-1 GHz is a Low Power Wide Area Network (LPWAN) technology from Texas Instruments (TI)
- **Technology:** Radio 868MHz (916/433), license free ISM available worldwide
- **Features:** battery life oriented, <3mA RX current, Co-existence technology to avoid range reduction due to disturbances  
Scalable data rate, Up to 1000 kb/s (lowest range)
- **Range:** up to several kilometers
- **Number of devices:** Up to several tens per GW
- **Applications:** Metering, Alarm & Security, Automation
- **Learn more:**
  - <https://training.ti.com/ti-simplelink-sub-1-ghz-wireless-solutions-iot-technical-introduction>



# Roadmap

# IIoT Solution line - Automation



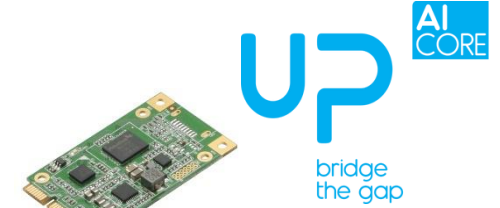
**4G Automation High-End  
Edge Gateway**



**4G Automation  
Low-end  
Edge Gateway**



**IP68 rugged Automation  
Edge Gateway**



**Integrable with  
UP AI Core**

**Industry 4.0 in a box  
solution kit**



# IIoT Solution line - LoRaWAN<sup>™</sup>



LoRa End Node  
platform



IIoT LoRa Edge  
Gateway &  
Network Server



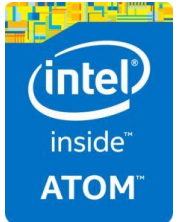
4G LoRa Edge  
Gateway & Network Server



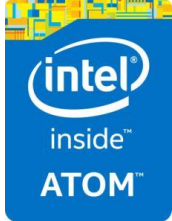
IP68 Outdoor 4G LoRa  
Edge Gateway & Network Server



LoRa Private Network  
Solution kit



# IIoT Solution line - IQRF



**IQRF Starter Kit**



**Indoor IQRF 4G  
Edge Gateway**



**Smart city IQRF  
Edge Gateway**



# Products overview

# 4G Automation IIoT entry level gateway

- **Product name:** TBD, variation of AIOT-IGWS01 including Quectel EC25-E 4G modem, WiFi and Bluetooth  
(AIOT-IGWS01.Z8350.w/2G memory.32G eMMC.3GHAT.2 x COM port.w/o VESA plate)
- **Status:**
  - Available for sampling, 3-days shipping from Europe / standard lead time 4-to-8 weeks
  - Mass Production by end June (awaiting RED certification)
- **Feedbacks from market:**
  - (+) Good ratio price/performances for entry level automation applications
  - (+) Easy to fit existing solutions (retrofit) with new devices integration
  - (+) all RF equipped will remove roadblock for implementation
- **Best fit for:**
  - Industrial Automation integrators and distributors
  - IoT system integrators





# 4G Automation IIoT high end gateway



- **Product name:** TBD (Intel ATOM N3350 CPU, 6-36V power input, Analog I/O, Relays, Serial ports, 4G, WiFi/BT, AI)
- **Status:**
  - Sample under testing and validation, MP estimated by September 2018
- **Feedbacks from market:**
  - (+) Good ratio price/performances for industrial automation
  - (+) Dual GbLAN, wide range input, powerful for edge computing
  - (+) ready for new generation solutions (OPC-UA, Industrial frameworks)
- **Best fit for:**
  - Industrial Automation integrators and distributors
  - KA of Industrial Automation
  - IoT system integrators



**Integrable with  
UP AI Core**

# IP68 rugged Automation Edge Gateway

- **Product name:** TBD (Intel Apollo Lake E3900, -20/70°C, PoE option available + 4G + multiple RF solutions like LoRaWAN<sup>™</sup>, IQRF and others)
- **Status:**
  - Final Validation, SGS IP68 passed
  - Mass production by end of July
- **Feedbacks from market:**
  - (+) extremely price competitive solution
  - (+) easy to fit existing applications (SW support)
  - (+) multi-purpose solution, easy expandable
- **Best fit for:**
  - Outdoor solutions
  - Industrial Automation integrators and distributors
  - KA of Automation
  - IoT system integrators





# Industry 4.0 Edge gateway with ESF

- **Product name:** TBD, variation of AIOT-IGWS01 including Quectel EC25-E 4G modem, WiFi and Bluetooth + pre-loaded Yocto OS with Eurotech ESF + ARKESSA pre-paid SIM card
- **Status:**
  - MP by July, 3-days shipping from Europe / standard lead time 4-to-8 weeks
- **Feedbacks from market:**
  - (+) Easy retrofit for Smart Industrial Automation
  - (+) complete A-to-Z solution, «Market Ready Solution»
- **Best fit for:**
  - Industrial Automation integrators and distributors
  - IoT system integrators



Δ R K E S S A Δ



# IQRF solutions

# IQRF Starter kit

- **Product name:** UP-IQRF IoT Starter Kit
- **Status:** MP, lead time ref UP-SHOP
- **Pricing:** ITP USD 379 Street price
- **Feedbacks from market:**
  - (+) Easy startup with IQRF technology
  - (+) complete solution HW + SW
  - (-) IQRF not well known outside east Europe
- **Best fit for:**
  - IQRF Alliance partners and customers



# 4G IQRF Automation Gateway

- **Product name:** AIOT-IGWS01-A20-N001  
(AIOT-IGWS01-A20-CA40232 + Quectel.EC25-E + IQRF + antenna)
- **Status:** M/P by Septmber, lead time 4 to 8 weeks
- **Feedbacks from market:**
  - (+) Market ready solution
  - (-) Very good ratio performances/price
- **Best fit for:**
  - Building and Industry monitoring
  - IQRF Alliance partners and customers
  - IoT System integrators

Coming Soon

4G LTE



# LoRaWAN<sup>™</sup> solutions

# Entry level Indoor LoRa Edge Gateway & Network Server



- **Product name:** AIOT-ILRA01  
(available with 2GB RAM + 32GB eMMC or 4GB RAM + 64GB eMMC, equipped with 8-channel radio)
- **Status:** Availble (MP), 3-days shipping from Europe / standard lead time 4 to 8 weeks
- **Feedbacks from market:**
  - (+) Powerful, good for edge computing, better than any other solution in the market
  - (+) Price is aligned to main competitors (Multitech Conduit, ARM based) with much higher HW spec
  - (+) Realiable and industrial
  - (+) qualified with LoRaWAN™ platforms (ResIoT, Actility\*, TTN, Talkpol, Stream)
  - (-) Missing native LoRa SW solution
  - (-) Lack of cellular backhaul connectivity
- **Best fit for:**
  - LoRaWAN™ network operators
  - IoT/LPWAN integrators
  - LoRaWAN™ Software platforms integrators



# Entry level Indoor LoRa Edge Gateway & Network Server

- X86 CPU Platform, Intel ATOM Quad Core 1,92GHz
- Industrial 8-channels LoRa Radio by IMST
- GbLAN wired communication + WiFi option
- USBs and HDMI output for easy installation and debug
- Extensive software support under Linux
- CE-RED/FCC certified
- 0-50°C
- Easy configuration platform, no constraints from hardware
- Compatible with ost common IoT framework, programming language and communication solutions
- LoRaWAN<sup>™</sup> ready Sw solutions
  - Semtech HAL github packet forwarder
  - ResIoT gateway and network server solution
  - The Thngs network
  - Actility (validation ongoing)





# 4G Indoor LoRa Edge Gateway & Network Server



- **Product name:** TBD  
(Intel ATOM Apollo Lake N3350+ IMST LoRaWAN™ Radio + M.2 WiFi ac/BT and 4G SIMCOM 7600E-H with antennas)
- **Status:** validation stage, MP expected by end of July
- **Feedbacks from market:**
  - (+) Powerful, good for edge computing, better than any other solution in the market
  - (+) Price will be better than any other competitor considering the features
  - (+) Reliable and industrial, fitting Industrial Automation (dual GbLAN)
  - (+) qualified with LoRaWAN™ platforms (ResIoT, Actility\*, TTN, Talkpol, Stream)
  - (-) Missing native LoRa SW solution
- **Best fit for:**
  - LoRaWAN™ network operators
  - IoT/LPWAN integrators
  - LoRaWAN™ Software platforms integrators





# 4G Indoor LoRa Edge Gateway & Network Server

- X86 CPU Platform, Intel ATOM Quad Core 2,40GHz
- Industrial 8-channels LoRa Radio by IMST
- Dual GbLAN wired communication
- Cellular 4G connectivity + ac WiFi/Bluetooth
- USBs and dual video output for easy installation and debug
- Extensive software support under Linux
- CE-RED/FCC certified
- 0-50°C
- Easy configuration platform, no constraints from hardware
- Compatible with ost common IoT framework, programming language and communication solutions
- LoRaWAN™ ready Sw solutions
  - Semtech HAL github packet forwarder
  - ResIOT gateway and network server solution
  - The Thngs network
  - Actility



# LoRaWAN™ industrial End Node platform

- **Product name:** TBD (based on Murata ABZ LoRaWAN™ IC, equipped with 2 Serial ports, I2C, onboard humidity, temperature and accelerometer sensors)
- **Status:**
  - HW design finalized, QA testing approaching
  - MP by end of July
- **Feedbacks from market:**
  - (+) flexible and scalable platform for end device manufacturer
  - (+) Industrial Low cost solution
- **Best fit for:**
  - LoRaWAN™ End device manufacturer
  - LoRaWAN™ IoT Integrators

**DRAFT**



# LoRaWAN™ Private Network on-premises

- Based on LoRaWAN™ Low Power Wide Area Network protocol license-free 868MHz (EU)
- Full controllable private network on-premises, all-in-a-box edge solution
- Same hardware for Gateway, Application Server and Network server
- Solid and complete software platform able to manage things, collect and elaborate data, represent in a dashboard the results
- Quick and easy start-up with ResIoT freemium solution



Enables smart metering, smart parking, industry 4.0, intelligent building, air monitoring and many other applications fitting LPWAN where closed environment is needed

**Ready now**

# LoRaWAN™ Private Network on-premises

- Starter kit for free evaluation up to 1 Gateway/Network Server and 5 nodes
- Pre-installed OS image for quick and easy start-up
- Online documentation  
[http://docs.resiot.io/Gateway\\_Aaeon\\_ILRA01/](http://docs.resiot.io/Gateway_Aaeon_ILRA01/)
- Multiple type of gateway
- All LoRaWAN™ certified
- Easily scalable
- Available now
- 3-days shipping

[www.resiot.io](http://www.resiot.io)



# LoRaWAN™ Quick Start kit (TTN)

Ready now

- Based on LoRaWAN™™ Low Power Wide Area Network protocol license-free 868MHz (EU)
- Powered by The Things Network solutions
- Pre-builds OS image, 1 step configuration (online docs)
- Free access to TTN Network server
- Will be updated to TTN Network stack V3 after summer 2018

<https://youtu.be/dvYREtWc1IA>



Enables the fastest start-up with LoRaWAN™™ technology

Immediate access to wide coverage network

Benefit of community and ecosystem

Easy switch to Industrial solutions (TTI) and on-premises private networks



# New solutions preview



# ULP Nodes and Gateways

- Entry level generation of IIoT solution
- Low end Industrial gateways and nodes, mainly ARM based
- New RF technologies (TI Sub-1GHz and NB-IoT)
- Tailored to fit vertical applications
- Status: available for projects and sampling, Under validation for MP
- Software solution under verifications
- Preparing samples
- Preparing starter kits (Intelligent Lighting)

SCA-RE Series



SRT Series



Lighting Gateway

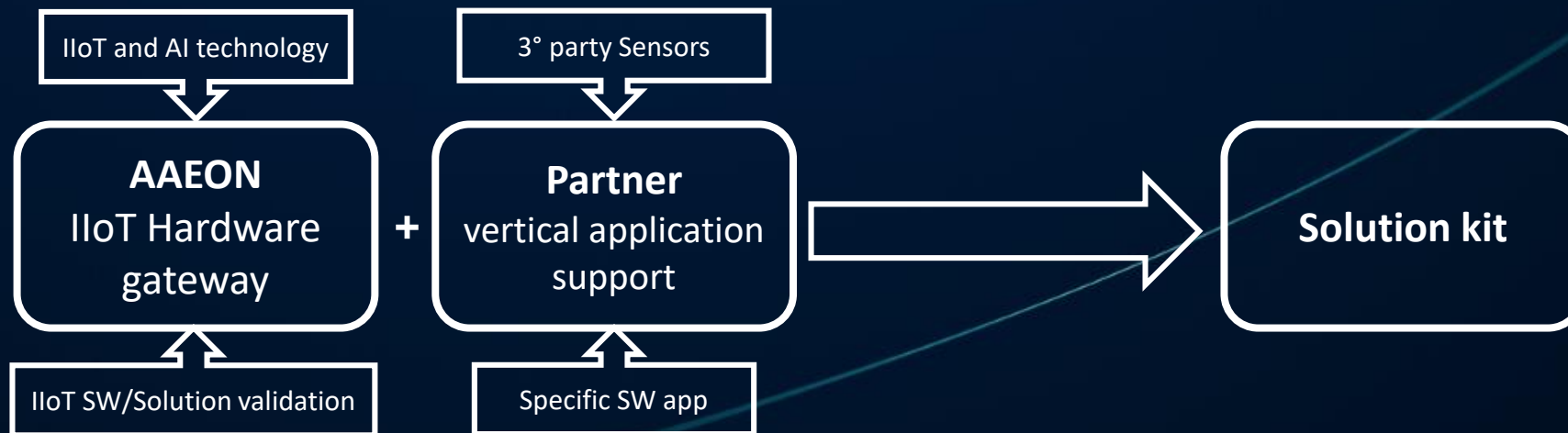


# Resources



# Creating value together

- Move away from simple box moving, heading value added solution
- **AAEON to create hardware and to integrate it with 3<sup>rd</sup> party IIoT SW and HW technologies**
- **Partners and Integrators to create and support vertical solutions**
- **Support to creation and promotion of initiatives about starter kit and solution kit**
- **Some example: Street lighting, smart parking, Intelligent building automation, Smart Industrial automation**




## AAEON support

- **Marketing Support** (promotion, tradeshow, events, publications)
- **Sales support** (exposure on AAEON worldwide sales network)
- **IIoT Partners program** (TBA)

# Newsletter

- Started in June
- Quarterly-based
- Providing info about products, technology and applications stories



**AAEON**<sup>®</sup>  
an ASUS assoc. co.

**Industrial IoT Updates  
News Over The Ether**

### Playing the first IIoT note with you

Today, AAEON Europe proudly presents the first newsletter dedicated to our Industrial IoT solutions.


The newsletter will be released on a quarterly base to inform you about product updates and share first hand information about the technologies we are using and the real applications we meet.

Beside the newsletter, please be invited to refer to our dedicated [IIoT website](#), which gives an overview of our current solutions, while offering articles, news and the very new DOCS section, where you can get started with our products.






We are open to your suggestions and feedback, so please contact us at the dedicated mailbox [here](mailto:iot@aaeon.eu)

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#### Solutions Portfolio



#### Highlights



**Check if you received it, otherwise we can subscribe you  
(Send a mail to [iot@aaeon.eu](mailto:iot@aaeon.eu))**

- Website is the main deck where to find updated info about IIoT products, solutions and applications.
- New Docs section where to find configuration guides and pre-built OS images
- New application story section



**See you on [Industrialgateways.eu](http://Industrialgateways.eu)**