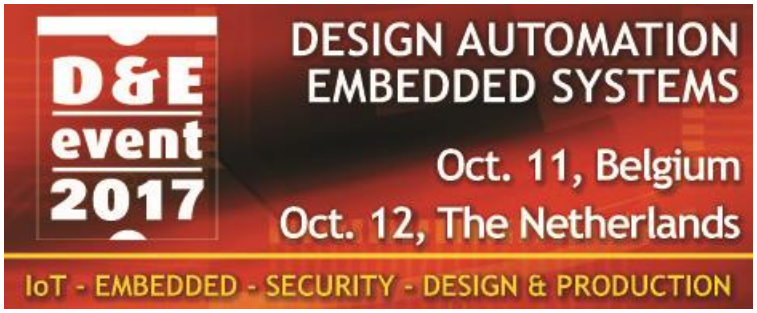
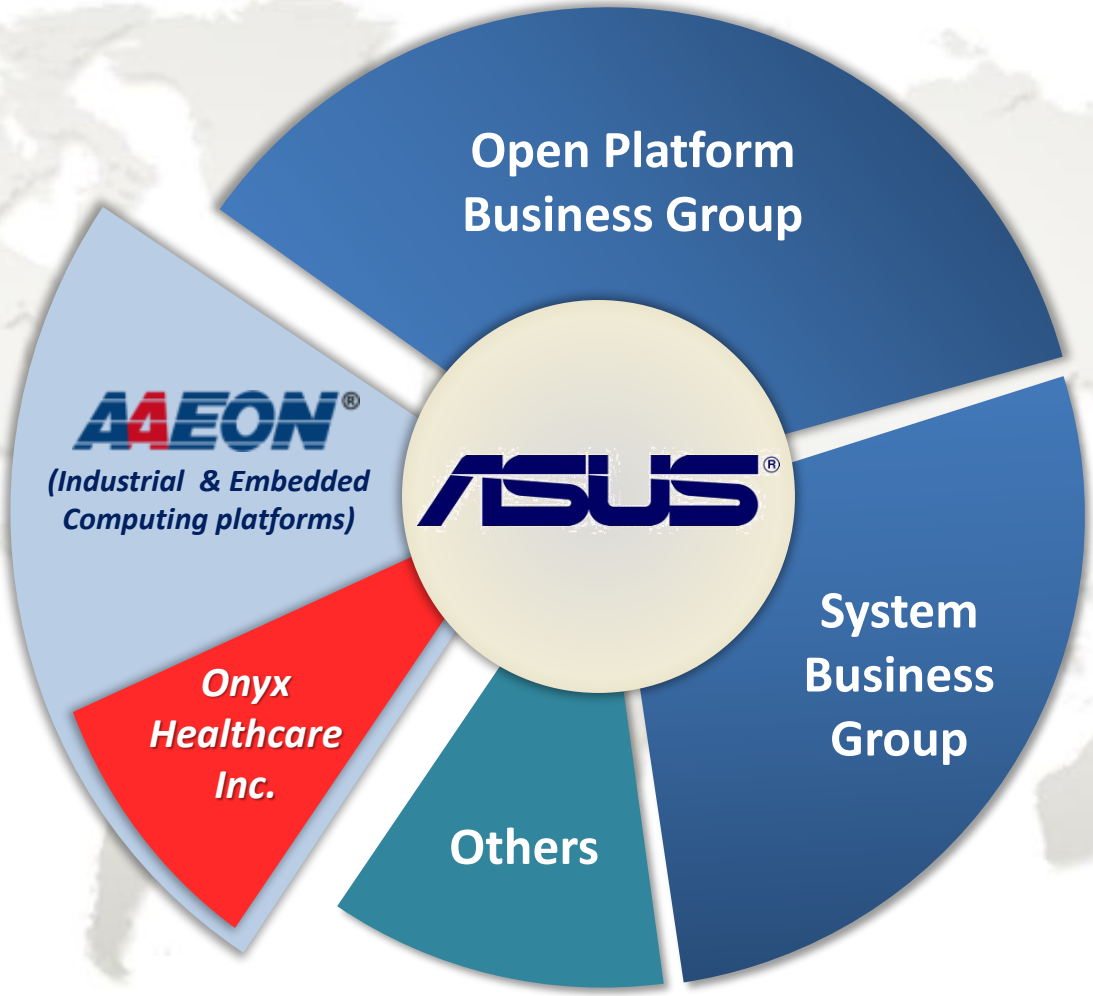
AAEON IIoT solutions

The challenges of Designing a Gateway Platform for the Industrial Internet of Things



ASUS Group

The Industrial IIoT company of ASUS



AAEON Corporate

Company Name: AAEON Technology Inc.

Founded: 1992 (Acquired by ASUS in 2011)

Employees: 850+

Location: Taipei, Taiwan

Corporate Headquarters

AAEON Worldwide Offices

Headquartered in Taipei, Taiwan, AAEON now has 15 locations worldwide to serve the needs of our global partners

AAEON Product Divisions

ECD	NSD	SPD	IPCBU	DMS	RMD	IIoT
3.5”, 5”, PC-104 SBCs COM Carrier ODM PICMG SBCs	Firewall NVR	Embedded Box PC HMI/Panel PC Industrial display	Industrial Mother Board *(ATX, Mini-ITX, etc.)*	ODM solutions Board&System level Vertical applications	Semi-rugged & Rugged Tablet PC Handheld PC	IIoT Gateways, End Nodes, Devices

IOT

The connection of devices (the Things) through the internet so they can collect and share data without human assistance.

IoT devices range from smart thermostats to vehicle systems to biochip transponders on farm animals. Even people can be outfitted with sensors connected to the internet.

IoT “things” aren’t just dumb devices that can be turned on and off remotely, they:

- are “smart” devices with their own local logic and processing
- have protocols for exchanging information with each other
- send and receive information and commands over a network (including the internet)

IIOT

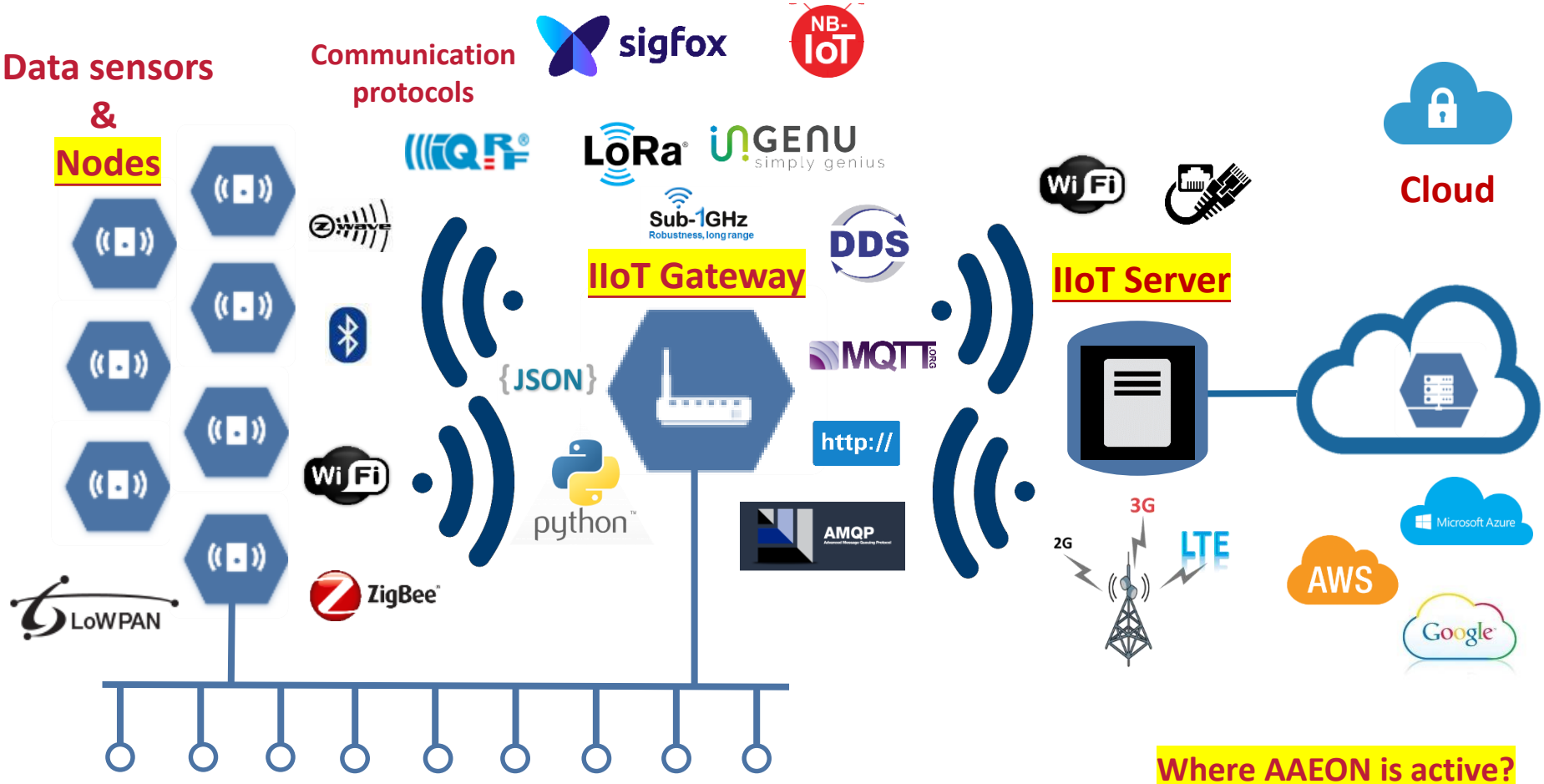
IIoT is the use of IoT technologies for industrial purposes – from gas pumps to HVAC systems to machinery on the factory floor.

Think of sensors (pressure, temperature, vibration, flow, and many more), that are already collecting data, but now that data can be combined with data from other systems and collected, analyzed, and exchanged data in new ways.

- Operational efficiency, maintenance
- Safety -> Remove humans from many environments (reducing risks)
- Productivity
- Monitoring and control
- Reliability
- Performance diagnostics
- Allows machines to act autonomously

IIoT application pattern

Event detection/Actuation | Collection/Elaboration | Data analysis



Existing bus and devices - **RETROFIT**

Where AAEON is active?

Challenges IIoT

One of the biggest is figuring out how all the existing automated devices can be retrofitted and connected to use industrial IoT.

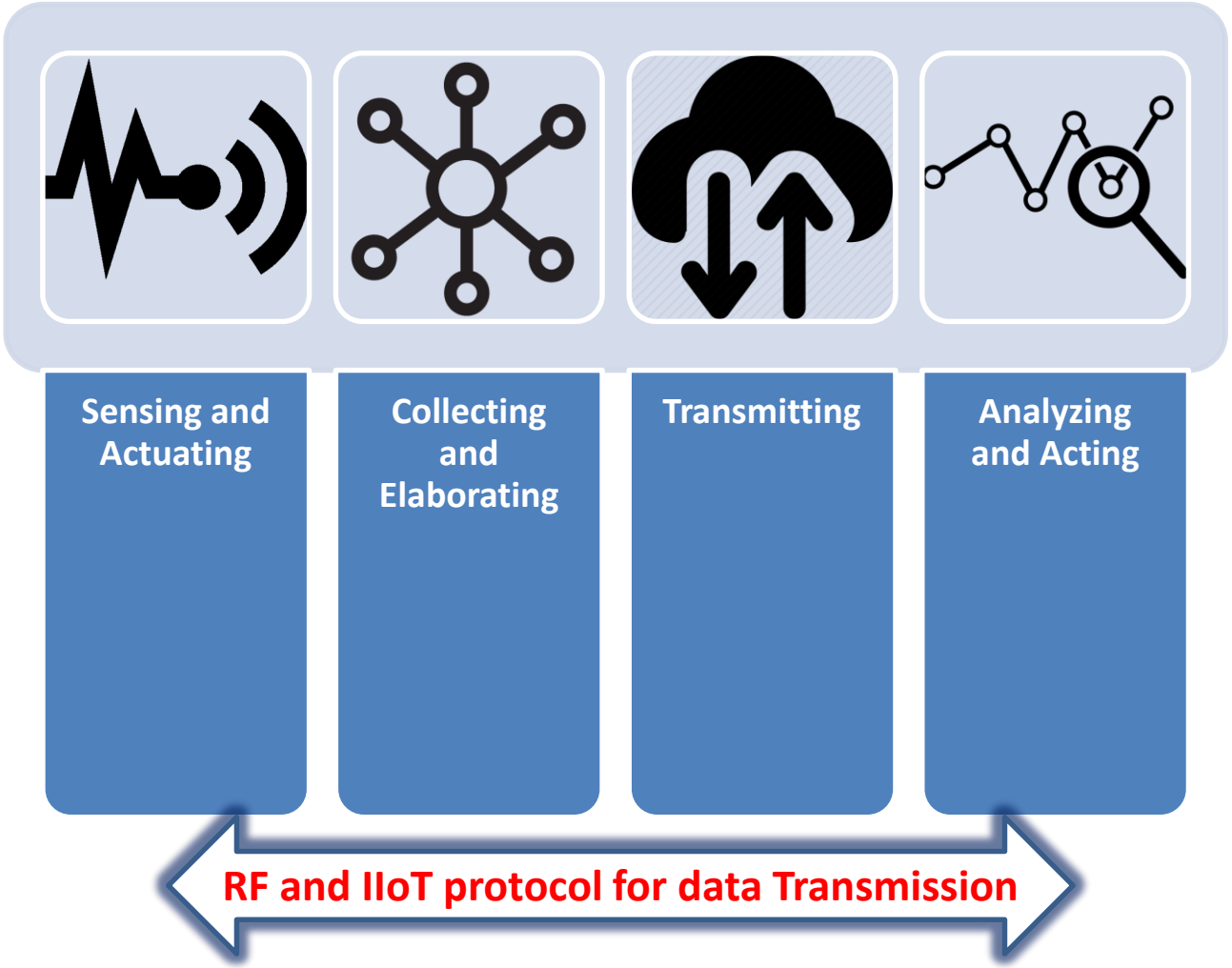
Existing automated processes use proprietary protocols, different architectures, and have limited networking ability.

They tend to be isolated islands of technology.

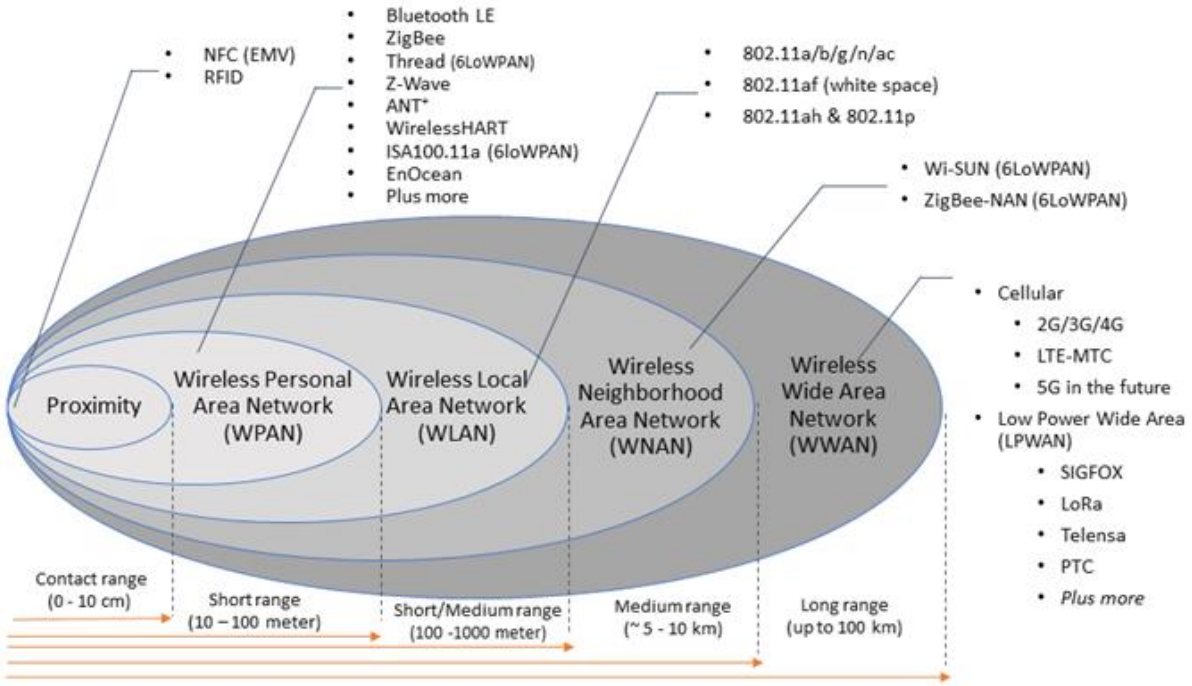
Main challenges for a standard IIoT GW

- to easy retrofit existing equipment's
- to be enough flexible to offer different wireless interfaces required by several applications
- To fit with different IIoT SW platforms

Breakdown by main elements

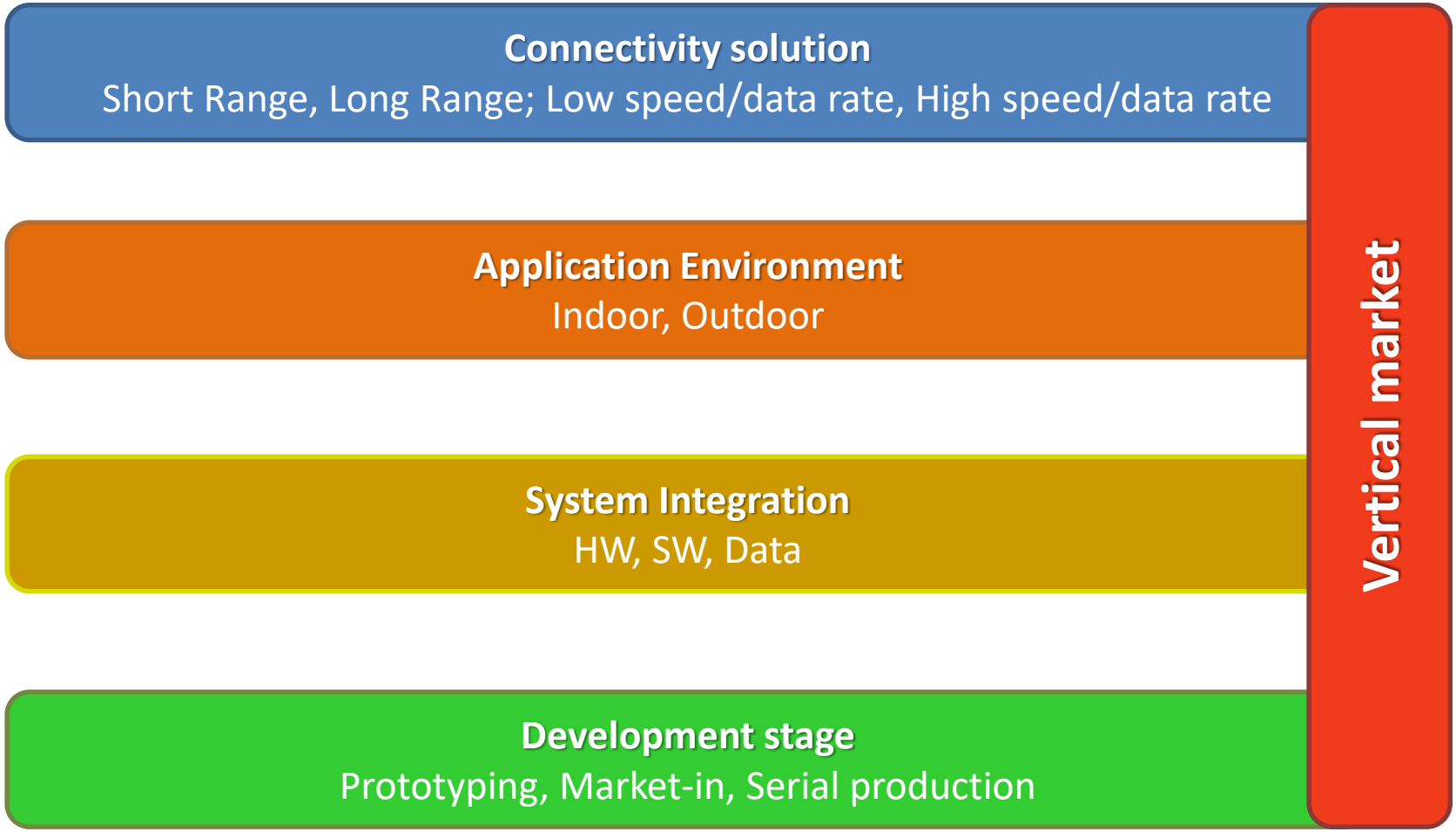


IIoT communication networks variety



Choice Influenced by distance, environment, application, cost

Strategy's elements



AAEON IIoT solution offering

IP68 Outdoor IIoT Gateway

Indoor IIoT Gateway

Automation Low-end Gateway

Automation High-End Gateway

IIoT LoRA Gateway & Network Server

LoRa End Point Low End

Smart Sensing Node

Ready MP

Developing

Application story

AAEON IIoT solutions

InVMA case history

Application

- Market: smart energy
- Application: retrofit of energy generator fueled by vegetable oil
- Targets: provide remote control and predictive maintenance
- Location: UK privately managed schools

HW Solution applied

- IIoT Gateway able to:
  - dialog with the Energy Generator's PLC via Modbus (added converter RS-485 to Modbus)
  - send up to the cloud via 3G relevant informations (machine status, alarms, etc…)
  - Execute actuations

- Installation environment: industrial electrical cabinet

SW Solution applied

Info to come from InVMA

- Onsite Controllable fuel level, Oil pressure and Coolant Temperature
- Remote management and actuations for the Energy Generator
- Predictive Maintenance

External look and feel

Internal view

Internal view

External view - details

Front Panel LCD
+
Control buttons

Energy Generator commands (Potentiometers)

Emergency button

Internal view - details

AAEON IIoT
Automation Gateway
UP-GWS02G

RS-485 to Modbus

DIN Rail PSU
24VDC to power USB LCD

Front Panel LCD (SUB)

DIN Rail PSU
220VAC to 5VDC

UP-GWS02G
Industrial Automation LE Gateway

CPU	**Intel® Atom™ x5-Z8350 Quad Core Processor**
System Memory	DDR3L, Memory Down, Non-ECC, 2GB, 1600Mhz
Storage	1 x eMMC 32GB Onboard
Multimedia IO	1 x HDMI
USB Ports	1 x USB 3.0 OTG 4x USB 2.0
Network Interface	1 x 1GbE LAN
Expansions	WiFi IEEE 802.11 a/b/g/n or b/g/n (optional) Bluetooth 4.0 (optional) 3G modem (optional)
Temperature range	0-50˚C
IOs	1x Serial port RS-232/485 configurable by jumper 1x Analog input 3x Digital I/O
Power input	5VDC
OS Support	Windows 10, Ubilinux / Ubuntu Linux / Yocto Linux Android 6.
Certifications	CE/FCC Class A
Mounting	Desktop mount VESA mount DIN Rail

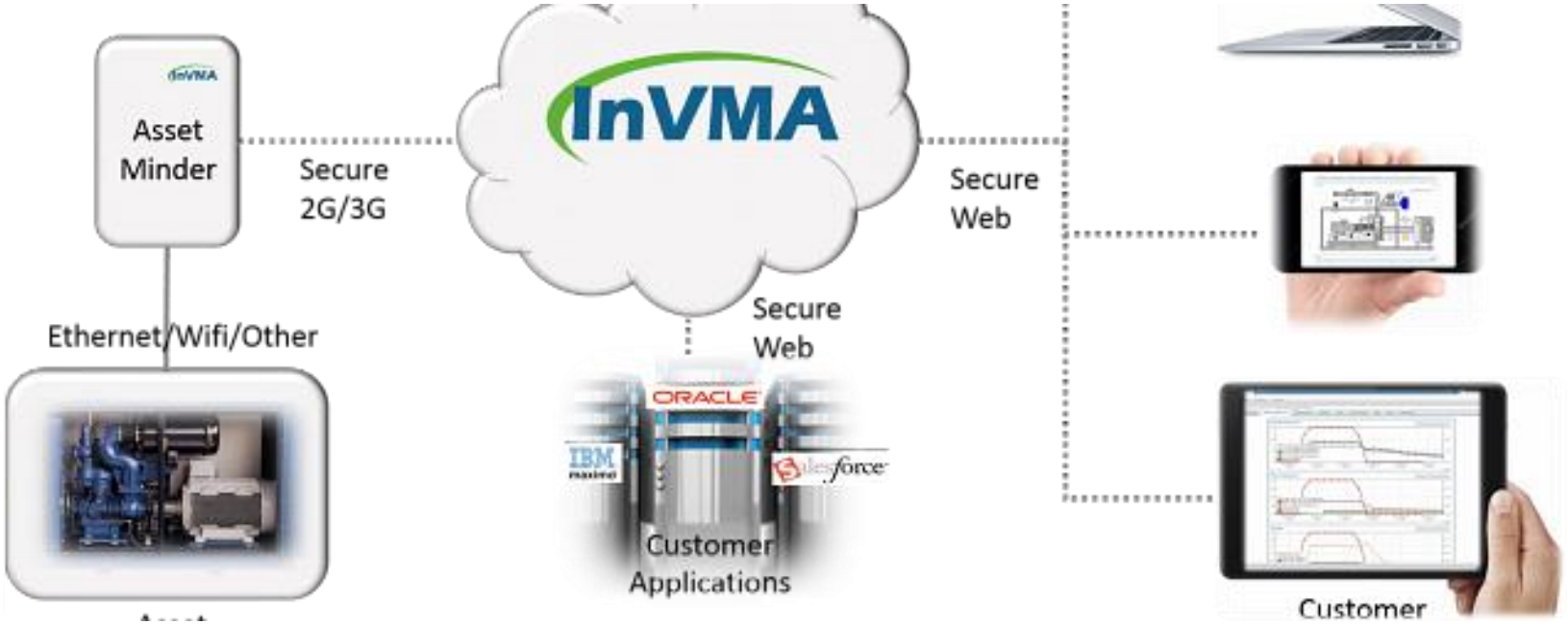
Availability: end of October

Analog input

RS-232/485

Focus • Agility • Competitiveness

InVMA solution: Assett Minder



http://assetminder.invma.co.uk/technology

IoT Gateways.eu by AAEON an ASUS assoc. co.

IIoT Gateways | IoT Starter kits | RF Technologies | Applications Stories | Ecosystem Partners | contact request | Webshop

Indoor Ethernet Gateway

Basic entry level solution
with powerful Quad Core Intel ATOM

The AAEON Ethernet Gateway is a basic edge computing solution powered by an Intel Quad Core ATOM processor.
It offers Gigabit Ethernet connectivity and USB ports for data collecting

LoRa Gateway & Network Server

Indoor Industrial LoRa Certified Gateway and Network Server

Outdoor Industrial Gateway

IP68 Rugged Industrial Gateway
for outdoor applications

Automation 3G Gateway

Industrial automation IoT Gateway
with 3G, Serial Port and Analog I/O

See you at www.industrialgateways.eu

Thanks

Thanks

D&E
event
2017
DESIGN AUTOMATION
EMBEDDED SYSTEMS
Oct. 11, Belgium
Oct. 12, The Netherlands
IoT - EMBEDDED - SECURITY - DESIGN & PRODUCTION