AAEON IQRF Solution: From prototype to real world

AAEON @ IQRF 2017 Summit, Prague

Presenters: Fabrizio Del Maffeo, Managing Director AAEON Europe & UP Founder
Marco Barbato, Product & Technical Directo, AAEON Europe
The Industrial IoT company of ASUS

ASUS Group

Open Platform Business Group

System Business Group

Others

Onyx Healthcare Inc.

Industrial & Embedded Computing platforms

Focus • Agility • Competitiveness
Headquartered in Taipei, Taiwan, AAEON now has 12 locations worldwide to serve the needs of our global partners.
AAEON Product Divisions

ECD
- 3.5", 5", PC-104 SBCs
- COM Carrier ODM
- PICMG SBCs

ISD
- Firewall NVR

SPD
- Embedded Box PC
- HMI/Panel PC
- Industrial display
- Rack mount IPC

IPCBU
- Industrial Mother Board
  (ATX, Mini-ITX, etc.)

DMS
- Industrial PC Server
- Storage Server ODM

RMD
- Semi-rugged & Rugged Tablet PC
- Handheld PC
The Gap – IoT ProMakers Vs Industrial

**PROFESSIONAL MAKERS**
- Cost Effective Solutions
- No / Limited Customization
- Technology Maven
- Limited Performance
- Short Product Development Cycle
- Try, See & Think

**START UP**
- Community Support
- Limited Lifecycle
- Focus on Prototype

**INDUSTRY**
- Expensive Solutions
- Vendor Support
- Wide Range of Performances
- Customization
- 5-7 Yrs Lifecycle
- Long Product Development Cycle
- Technology Laggard
- Focus on Mass Production
- Think, Try & See

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www.aeon.com
The Idea

The Most Popular platform for prototyping

The Most Scalable Hardware with multi OS Support

Industrial Grade Electronic Manufacturing Process and Components
600+ backers (270 companies backed UP)
Join our UP Community!
Share your projects!
Ask questions, seek support!

>3000 members

**FORUM**
Leave your messages here.

**DOWNLOADS**
ubilinux™ and other software for UP Board.

**HACKATHON**
Join the competition!
<table>
<thead>
<tr>
<th>Type</th>
<th>Single board Computer</th>
<th>Single board Computer</th>
<th>Single board Computer + Computer-on-module</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dim.</td>
<td>86.5x56.5mm</td>
<td>86.5x90mm</td>
<td>56.5x66mm</td>
</tr>
<tr>
<td>CPU</td>
<td>x8-z8350 (4C) up to 1.92GHZ</td>
<td>N3350 (2C) up to 2.4GHz N4200 (4C) up to</td>
<td>x8-z8350 (4C) up to 1.92GHZ</td>
</tr>
<tr>
<td>RAM</td>
<td>up to 4GB RAM</td>
<td>up to 8GB RAM</td>
<td>up to 4GB RAM</td>
</tr>
<tr>
<td>On-board mem.</td>
<td>up to 64GB eMMC</td>
<td>up to 128GB eMMC</td>
<td>up to 64GB eMMC</td>
</tr>
<tr>
<td>USB 2.0</td>
<td>4 + 2 from EXHAT</td>
<td>2</td>
<td>2 (pin header)</td>
</tr>
<tr>
<td>USB 3.0</td>
<td>1 (OTG)</td>
<td>4 (incl. 1x OTG)</td>
<td>1</td>
</tr>
<tr>
<td>Expansion</td>
<td>40-pin GP-bus</td>
<td>40-pin GP-bus</td>
<td>100 pin GP-bus</td>
</tr>
<tr>
<td>SATA3</td>
<td>N/A</td>
<td>1</td>
<td>N/A</td>
</tr>
<tr>
<td>Video output</td>
<td>1x HDMI 1x MIPI-DSI</td>
<td>1x HDMI + 1x DP 1x eDP</td>
<td>1x HDMI</td>
</tr>
<tr>
<td>GbLAN</td>
<td>1</td>
<td>2</td>
<td>N/A</td>
</tr>
<tr>
<td>MIPI-CSI</td>
<td>1x 2 lane</td>
<td>1x 2 lane 1x 4 lane</td>
<td>1x 2 lane 1x 4 lane</td>
</tr>
<tr>
<td>Graphic</td>
<td>Intel Gen 8 HD 400</td>
<td>Intel Gen 9 HD 500/HD 505</td>
<td>Intel Gen 8 HD 400</td>
</tr>
<tr>
<td>OS Support</td>
<td>Windows 10 full, Yocto, Ubuntu, Ubilinux, Android 6.0</td>
<td>Windows 10 full, <strong>Windows IoT Core</strong>, Yocto, Ubuntu, Ubilinux, Android 6.0</td>
<td>Windows 10 full, Yocto, Ubuntu, Ubilinux, Android 6.0</td>
</tr>
<tr>
<td>Longevity</td>
<td>2020</td>
<td>2024</td>
<td>2020</td>
</tr>
</tbody>
</table>
IoT Starter KIT

- UP with IQRF adapter
- Microsoft Azure
- Ready extensions: github.com/iqrfsdk

Components:
- IQRF Router
- IQRF Nodes
- Sensor kit
- Relay kit

Extensions:
- Inteliments Cloud
- Ubiworx Framework
- Resin Deployment
- RehiveTech Management
- NodeRed Dashboard

- Co₂, T Sensors
- RH, VOC Sensors
- Wireless Relays
- Power Sockets

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Indoor Lighting

Building Automation

Street Lighting

Logistic

Automation

Intelligent Parking
AAEON IoT Gateways offering

UP-GWS01
Entry level IoT Gateway

UP-GWS02
IIoT LoRA Gateway & Network Server

Catalogue solutions

Solutions concepts (available by project)

AIOT-CHT01
High performance Industrial Gateway

AIOT-BT01
Home thin client

AIOT-DRM
Building automation gateway

xxxxxx
Industrial Automation 3G Gateway

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City: Prague
Month: January
Average Low Temp: -5.3 Degrees
Average Snow Days: 12
City: Prague
Month: June
Average Max Temp: 21.4 Degrees
Average Rainy Days: 10
AAEON IP68 IQRF-ready IIoT Gateway
# IP Grade definition

<table>
<thead>
<tr>
<th>First Digit</th>
<th>Protection against Solid Foreign Objects and Access to Hazardous Parts</th>
<th>Second Digit</th>
<th>Protection against Liquids</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-</td>
<td>-</td>
<td>Non-protected</td>
</tr>
<tr>
<td>1</td>
<td><img src="image1.png" alt="Illustration" /> Protected against solid foreign objects of 50mm diameter and greater</td>
<td>1</td>
<td><img src="image2.png" alt="Illustration" /> Protected against drops of water falling vertically</td>
</tr>
<tr>
<td>2</td>
<td><img src="image3.png" alt="Illustration" /> Protected against solid foreign objects of 12.5mm diameter and greater</td>
<td>2</td>
<td><img src="image4.png" alt="Illustration" /> Protected against drops of water falling at up to 15° from the vertical</td>
</tr>
<tr>
<td>3</td>
<td><img src="image5.png" alt="Illustration" /> Protected against solid foreign objects of 2.5mm diameter and greater</td>
<td>3</td>
<td><img src="image6.png" alt="Illustration" /> Protected against spraying water at up to 60° from the vertical</td>
</tr>
<tr>
<td>4</td>
<td><img src="image7.png" alt="Illustration" /> Protected against solid foreign objects of 1.0mm diameter and greater</td>
<td>4</td>
<td><img src="image8.png" alt="Illustration" /> Protected against splashing water from all directions</td>
</tr>
<tr>
<td>5</td>
<td>Dust-protected</td>
<td>5</td>
<td><img src="image9.png" alt="Illustration" /> Protected against jet of water from all directions</td>
</tr>
<tr>
<td>6</td>
<td>Dust-tight</td>
<td>6</td>
<td><img src="image10.png" alt="Illustration" /> Protected against jet of water of similar force to heavy seas</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>7</td>
<td><img src="image11.png" alt="Illustration" /> Protected against the effects of immersion</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>8</td>
<td><img src="image12.png" alt="Illustration" /> Protected against prolonged effects of immersion under pressure to a specified depth</td>
</tr>
</tbody>
</table>

**IP68**

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UP-GWS03
IQRF Outdoor IP68 Gateway

IQRF Industrial IoT Gateway for harsh environment powered by Intel Apollo Lake ATOM x5 / x7, a powerful x86 Quad Core capable of high performances edge computing.

It can easily fit outdoor extreme conditions thanks to extended temperature, water and dust proof features.

A broad range of complementary connectivity options is available beside the IQRF Gateway function.
### Detailed specifications

<table>
<thead>
<tr>
<th>CPU</th>
<th>Intel® N3350/N4200 SoC or E3940/E3950</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory</td>
<td>Onboard 2GB / 4GB / 8 GB LPDDR4 memory</td>
</tr>
<tr>
<td>Graphics</td>
<td>Intel® Gen 9 HD, supporting 4K Codec Decode and Encode for HEVC4, H.264, VP8</td>
</tr>
<tr>
<td>Storage</td>
<td>Onboard 32 GB / 64 GB / 128 GB eMMC</td>
</tr>
<tr>
<td>Ethernet</td>
<td>1 x Realtek RTL8111G Gigabit Ethernet, RJ-45</td>
</tr>
<tr>
<td>Audio</td>
<td>1 x HDMI Audio on M12</td>
</tr>
<tr>
<td>External I/O Connector</td>
<td>1x RJ45 Connector on M12</td>
</tr>
<tr>
<td></td>
<td>1 x HDMI Connector on M12</td>
</tr>
<tr>
<td></td>
<td>1 x USB 3.0 Connector on M12 (IQRF transceiver antenna solution)</td>
</tr>
<tr>
<td></td>
<td>1X M12 Connector(8PIN RS232)</td>
</tr>
<tr>
<td></td>
<td>1x M12 Connector(3PIN DCIN)</td>
</tr>
<tr>
<td></td>
<td>4x Antenna</td>
</tr>
<tr>
<td></td>
<td>1x GND Screw</td>
</tr>
<tr>
<td>3G/mSATA</td>
<td>1 x Mini Card slot (full size) for 3G /mSATA</td>
</tr>
<tr>
<td>WIFI/BT</td>
<td>1 x M.2 slot for WIFI/BT module</td>
</tr>
<tr>
<td>LORA function</td>
<td>Frequency band 868MHz</td>
</tr>
<tr>
<td>Power</td>
<td>5V DC Only</td>
</tr>
<tr>
<td>Form Factor</td>
<td>220 mm x 140 mm x 165 mm</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>0-60°C / -20~+70</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>0% ~ 90% relative humidity, non-condensing</td>
</tr>
<tr>
<td>Certification</td>
<td>CE Class A, FCC</td>
</tr>
<tr>
<td>OS Support</td>
<td>Microsoft Windows 10 (full), Windows IOT Core, Linux (ubilinux, Ubuntu, Yocto)</td>
</tr>
<tr>
<td>IP</td>
<td>IP68</td>
</tr>
</tbody>
</table>
• Outdoor Gateway kit for Production
  – Elements: AIOT-GWS03 + IQRF transceiver Antenna–Integrated solution
  – Release: sample available in July, MP by End of September
  – Where to buy: AAEON & IQRF
Thanks