Bosch* Micro-Climate Monitoring System Q&A

Purpose

This document is a high-level reference guide that may be used to address customer questions regarding the Bosch* Micro-Climate Monitoring System.

For specific technical details, please reference the Bosch MCMS Partner Training.

Target Audience

Intel Ecosystem Partners – SI partners

Not approved for audiences beyond those listed above.

Partner Q&A: Bosch Micro-Climate Monitoring System

Key Messaging

Historically, air quality monitoring solutions have been bulky, expensive to buy, expensive to maintain, and impractical to adopt for widespread deployment. Additionally, current air quality management technology often cannot provide the critical analytical link between the cause and effect of pollution.

Major advances in sensor technologies, fueled by Intel® IoT-based solutions, have brought game-changing improvements to the pollution monitoring table:

- Reliable, real-time data accuracy
- Time- and location-based trend analysis
- Easy-to-use data gathering tools
- In-depth back-end analytics
- Low-cost implementation

The Bosch IoT-based MCMS is optimized for speedy deployment with minimal additional infrastructure investment at one-hundredth the size of traditional air quality monitoring stations. While many systems might cost anywhere from USD 150K to 250K, the end-to-end MCMS system—including software, sensors, and services—runs at a low cost. The sensor devices also are extremely light and easy to install and relocate to numerous locations within an urban area, making them suitable for high-impact air pollution mitigation studies.

Q1. What is the Bosch Micro-Climate Monitoring System?

- Intel and Bosch have partnered to provide a miniaturized, end-to-end, air quality management solution using pollution data analytics called the Bosch Micro-Climate-Monitoring System.

Q2. What is the value of the Bosch Micro-Climate Monitoring System?

- Bosch MCMS is an air quality (AQ) monitoring system that uses miniature electrochemical sensors. These sensors integrate into an end-to-end management solution through Intel® IoT Platform ingredients. The Bosch MCMS provides:
- **A Complete package** of Sensors, Software and Services offered to the customer
- A solution that provides **smart, contextually-relevant** information, not just data
- An **end-to-end win** that **brings together** information gathering, economic advantage, precision telemetry, and user/customer experiences

Q3. What are the solution's components?

- The Bosch MCMS components are as follows:
- Sensors: Bosch MCMS incorporates high accuracy gas sensors (CO, O3, NO2, SO2), PM, and environmental parameter sensors
- Air quality management (AQM) edge software
- Intel® cloud infrastructure (HDC 2.0) together with the Bosch cloud infrastructure (AQM APIs and AQM UI)

- 24-7 monitoring solutions covering 10-20x locations per zone than traditional monitors using the Intel® IoT Platform reference design[1]
- Intel® IoT Gateway Technology
  - Intel® Quark™ powered gateway and sensor interface
  - Intel Security Solutions
  - Wind River Helix Device Cloud

Q4. What are the ideal operating conditions for the Bosch MCMS?

- Bosch MCMS solutions are primarily intended to be deployed for outdoor applications. They are not rated for industrial grade environments, and hence are not typically for very harsh conditions (high heat, extremely reactive environments, etc.). The systems can also be deployed in indoor conditions. Please refer to our specifications sheet for more detailed ideal operating conditions.

Q5. What are some targeted use-cases for Bosch MCMS?

- The Bosch MCMS has 3 main customer segments in the following order of priority
- **Smart Cities—**Through dynamic alerts and notifications, Bosch MCMS can power environmental monitoring for the next-generation Smart City: From wide coverage, refined resolution of points of sources, and realistic, near-real time telemetry, Bosch MCMS enables scaling and strengthening of the AQ network.
- **Smart campus, communities—**From community management to residential homes, Bosch MCMS can scale to improve AQ visibility across the community. Existing residents can integrate Bosch MCMS monitoring into their smart homes to track conditions around ventilation, lighting, etc., driving fitness recommendations and providing near real-time warnings and alerts. At the management level, the Bosch MCMS platform can enable predictive abatement actions and improve vehicle and traffic control.
- **Industrial—** From one dashboard, Bosch MCMS can enable solutions from perimeter monitoring, real-time emissions tracking, smart threshold/alert levels and breach detection. Bosch MCMS can integrate with existing ERP systems to avoid CAPEX losses from having to rip and replace. Drive high pollution process identification, energy savings through dynamic abatement control, and meet pre-compliance requirements to avoid customer downtime and compliance costs. And with Bosch MCMS, customers can do more to keep surroundings clean through green imaging.

There are two additional use cases to highlight for the Bosch MCMS:

- **Construction Compliance—**By pairing Bosch MCMS with a network of IoT sensors across key construction blocks, customers can remotely automate compliance efforts. Sensor reports from engine emissions can be viewed on one pane of glass with the Bosch dashboard, along with automated early warning systems. Customers can also drive predictive maintenance by mapping "'worst and best" performing construction sites on the dashboard. All this can result in easier compliance tracking, better quality of working conditions, and demonstrable evidence of compliance.

[1] Intel, Intel IoT Technology Air Quality Monitoring, 2017

- **Traffic Authority—**Bosch MCMS can inform traffic routing and de-congestion, and enable near real-time warnings and recommendations for motorists and traffic authorities.

Q6. What is driving the need for this new solution?

- Several factors and trends are driving the need for the Bosch MCMS, such as:
- EPA standards (USA)
- Existing pollution issues (APAC)
- Rising global pollution levels
- Business regulations
- Health concerns

Q7. How is the Bosch solution different from others in the market?

- The Bosch MCMS is unique, offering high accuracy, at a fraction of the form factor of traditional environmental monitoring stations, at a drastically lower price point than traditional environmental monitoring stations, with many more IOT features and with an easier path to deployment.

Customer differentiators include:

- High accuracy gas measurement systems in PPB levels, that conform to global (WHO, CPCB, EPA) AQI measurement guidelines
- Intelligent Edge management, which allows Over-the-air (OTA) capabilities reducing physical interventions for items like upgrades, patches, configuring units, etc.
- Easy integration with APIs including AQI as per local body guidelines
- EMI/EMC compliant and safety tested as per CE and FCC regulations
- Deep engineering and R&D to create analytics and algorithms to derive valuable AQ telemetric data
- Credible partners (Intel) involved in product development bring cutting edge technology and market leading concepts
- Passed through stringent Bosch quality guidelines and tests to ensure highest quality and peace of mind
- End-to-end system security with encrypted binary code, data communication protocols, software and cloud storage and with API management (Intel Security Solutions, Bosch IoT Suite, etc.)

Q8. Can I integrate Bosch MCMS into an enterprise system such as SAP HANA or GE Predix?

- Yes, the system can be integrated in enterprise or smart city digital platforms.

Q9. Can customers use an on-premises (private/hybrid) cloud? 3rd party cloud?

- Yes, via Helix Device Cloud's flexible deployment functionality. To learn more about Helix Device Cloud visit their website here.

Q10. Is this solution certified by EPA?

- The Bosch MCMS solution is extremely new and is being introduced to the EPA now. All stakeholders are aware of the benefits of this technology and are using it to create new environmental monitoring standards. New technology adoption is usually validated by the market and regulatory standards follow.

Q11. Beyond the sale, what are the high value services channel partners can offer?

- As part of a solution being provided to the customer, Bosch sees a high value from channel partner contribution in installation, commissioning and service and maintenance of the systems.

Q12. How can I order/obtain this solution for one of my customers?

- Work directly with Bosch to order the solution for your customer:
  - **Aditya Adavi**, Segment Owner and Bosch* MCMS PLM - aditya.adavi@Bosch.com
  - **Mahesh Chikodi**, Bosch* Sales - mahesh.chikodi2@uk.Bosch.com

Q13. What is the price of the unit?

- Pricing is determined on a project to project basis. Prior to engaging with a customer in a pricing conversation, work with Bosch support to establish pricing for a given deal. For general pricing guidance, Bosch MCMS unit may be offered at less than $15k compared to an air quality monitoring station that can cost around $150K+[2].

Q14. What are deployment requirements?

- The system deployment process is designed to be as easy as possible consisting of 2 main deployment activities – Viz physical (electricity, connectivity, etc.) and Virtual (commissioning, user registration, etc.)
- Physical: partners will be trained on requirements at the time of deployment like power, infrastructure, network connectivity
- Virtual: Systems ultimately are information providers, and hence will need some IT commissioning and registration.

Q15. Who decides the commercials?

- There are multiple methods in how we jointly interact with the customer. Depending on the business model and arrangement between the partners and us, we can accordingly plan who the responsible entity is to discuss commercial quotes with the customer.

Q16. Who can I reach out to for support on any additional customer questions or clarifications?

- Both Bosch and Intel have responsibilities and people assigned to support our partners. Feel free to reach out to Bosch or your Intel representative and initiate communication directly to ensure no customer question is left un-answered.

[2] Intel, Better Air Quality Monitoring Leads to Healthier Lives, 2017

*Other names and brands may be claimed as the property of others

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