



# Transforming Fire Safety Solutions through Advanced IoT

## iBOSS on iSCADA Solution

End-to-end IoT solutions deliver responsive, cost-effective and scalable fire alarm monitoring system.

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### Executive summary

The Internet of Things (IoT) has transformed and reshaped the way we interact with our environment, particularly for the realm of fire and life safety. With increasing levels of fire safety awareness worldwide, conventional fire protection systems are transitioning to internet-based solutions in order to enhance the standard of fire safety maintenance.

Today, Intel has the technology and expertise to bring more secure and responsive IoT solutions to the industry. Solutions based on Intel® IoT Gateway technology provide leading performance and security for intelligence at the edge. It also enables real-time analysis and more efficient process controls, while reducing data transmission cost.

iBOSS and iSMART are examples of such technology. Cloud-based monitoring solutions that provide cost-effective and highly scalable fire alarm monitoring system, these new fire safety operational systems are also key focus areas for future development with its advantages for fire and rescue departments, contractors, facilities managers and property owners. Business benefits are more clearly defined, and maintenance is minimal without compromising on the effectiveness of fire alarm control and safety.

This paper brings a discussion on how a highly scalable internet and web-based fire alarm monitoring system will elevate the level of maintenance in the industry. These advanced embedded internet technologies address all future and emerging requirements, deliver quality maintenance services and upgradable external communication to accommodate rapidly evolving technologies and property management landscape.

### Moving fire safety solutions into the future

Today, facility asset management solutions have been hit by the “perfect storm” for IoT-driven acceleration and evolution, with many major corporations and government agencies outsourcing their facilities management functions.

Web-based and remote monitoring & control together with online data acquisition, coupled with the exploding growth of embedded Internet, represent a rapidly growing segment within this market. As a result, it drives an ever-increasing need for technology-driven fire safety solutions. Organizations are now looking at this solution to be more than just mere fire detection by providing a more intensive and holistic fire safety management systems. Some examples would include the iSCADA, iBOSS and iSMART.

There is a wide spectrum of challenges facing conventional fire alarm systems. To address these challenges the iSnet Bomba Operations Safety System (iBOSS) has been developed as a specific fire safety development that operate on the iSCADA platform. It improves fire safety through better maintenance and response via remote monitoring, and actively involves building owners in fire safety monitoring on their premises.

The Internet-based Supervisory Control and Data Acquisition (iSCADA) is a complete SaaS platform developed by Intel's partner (Devices World) and optimized for IoT, utilizing public internet infrastructure as the data communication medium while monitoring and controlling distributed systems from a central location.

## iBOSS – A trusted and reliable Web-based cloud platform for fire safety management

iBOSS is an integrated cloud computing platform incorporating the most recently deployed Internet-based technology. With a very modular architecture that engenders upgradability and operational flexibility, it incorporates all the features and functionalities found in the generic SCADA systems. The difference lies in that it is customized to provide highly resilient services as a national fire safety platform.

Bomba uses iBOSS to optimize the nationwide delivery of fire alarm signals. With a fourth generation solution recently developed and deployed to address the exact needs of Bomba, this unique platform helps to deliver operational relevance, enhance situational awareness, and eliminate false alarms.

A unique feature of iBOSS is its excellent user interface. Although designed to meet Bomba's unique existing requirements, an enhanced version of iBOSS, (iSMART) is capable of addressing future fire safety monitoring and firefighting operational requirements as they evolve. It also has the unique ability to control and monitor data across multiple locations, systems and users.

### Unique advantages of iBOSS

Seamless data integration, cost-effectiveness, high scalability and increased productivity are the four main advantages that iBOSS offer.

#### Seamless data integration

With iBOSS, it not only delivers highly reliable data in real time, but also historical trending data that effectively improves the manpower and time resources available at a fire rescue department through automated monitoring. Urgent data is also immediately transmitted to recipients in a more effective manner. As a result, building owners, maintenance contractors, facility managers and the fire and rescue department can be actively involved as part of the system process through data collection. This information can then be shared among building owners. In the event of a fire, building plans and other relevant data can also be incorporated into the information stream received from the fire and rescue department.

#### High scalability

Programming wise, iBOSS updates are automatically delivered to the cloud ensuring that all connected devices are up-to-date on enhancements. It has a universally accepted user interface that can be deployed in a cost-optimized manner without reducing effectiveness and efficiency for the user. This unique platform also allows for flexibility to integrate with communication channels via LAN, WAN, DSL, 3G, fibre optics network, and the interface works with Web browsers that include smart phones and tablets.

Most importantly, iBOSS allows users to interact and communicate with any other advanced emergency system or communication mode in a seamless manner. Building owners, fire and rescue personnel can access data using the web browser without requiring any technical or specialist knowledge. Annual maintenance will only involve software updates and upgrades; system back-up and other administrative tasks are handled at the server level from the solution provider.

#### Cost-effectiveness

Through effective management and control of false alarms, iBOSS offers cost-effectiveness to users. In addition, it requires minimal system and hardware maintenance while providing seamless communication between devices, servers and users which eventually also aid in lowering cost.

#### Increased productivity

The iBOSS not only delivers fire alarm alerts, but also provides intensive monitoring of firefighting and safety installations, enhancing fire safety monitoring and firefighting operations. Additionally, it also eliminates false alarms, while its self-check feature ensures faults are automatically reported in a process known as eMaintenance.

### Challenges of the conventional fire alarm system

Conventional fire alarm systems face a series of challenges, with the most significant factors being higher maintenance cost, poor maintenance service and capabilities from appointed contractors, complex implementation, alignment with emerging technologies and domain expansion capabilities. Existing fire certification procedures demand extensive manpower and time resources in ensuring that the fire detection and fire-fighting systems deployed in buildings or other facilities conform with these regulations. To ensure conformity with new regulations, this may also require upgrades of the fire fighting and fire detections systems to meet industry standard interface and upgradable external communication functionalities. Therefore, Legacy fire alarm systems need to be replaced to allow ease of integration and regulatory compliance.

Bomba, building and property owners need a sustainable and integrated system to effectively manage, monitor and control fire alarms with minimal cost and maintenance.

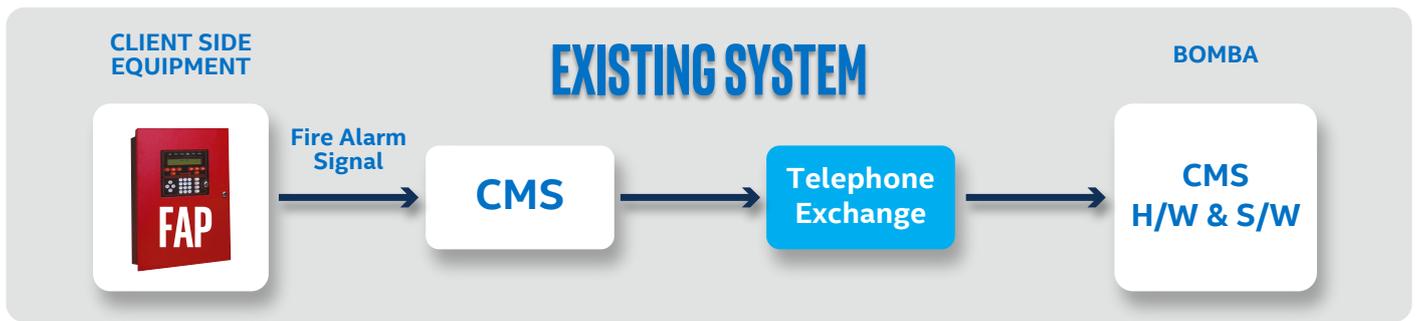


Figure 1. Addressing the conventional fire system setup.

## Cost-effective implementation of advanced fire safety monitoring system (iBOSS)

iBOSS delivers maximum uptime functionality and fire alarm signals on a nationwide basis by eliminating false alarms.

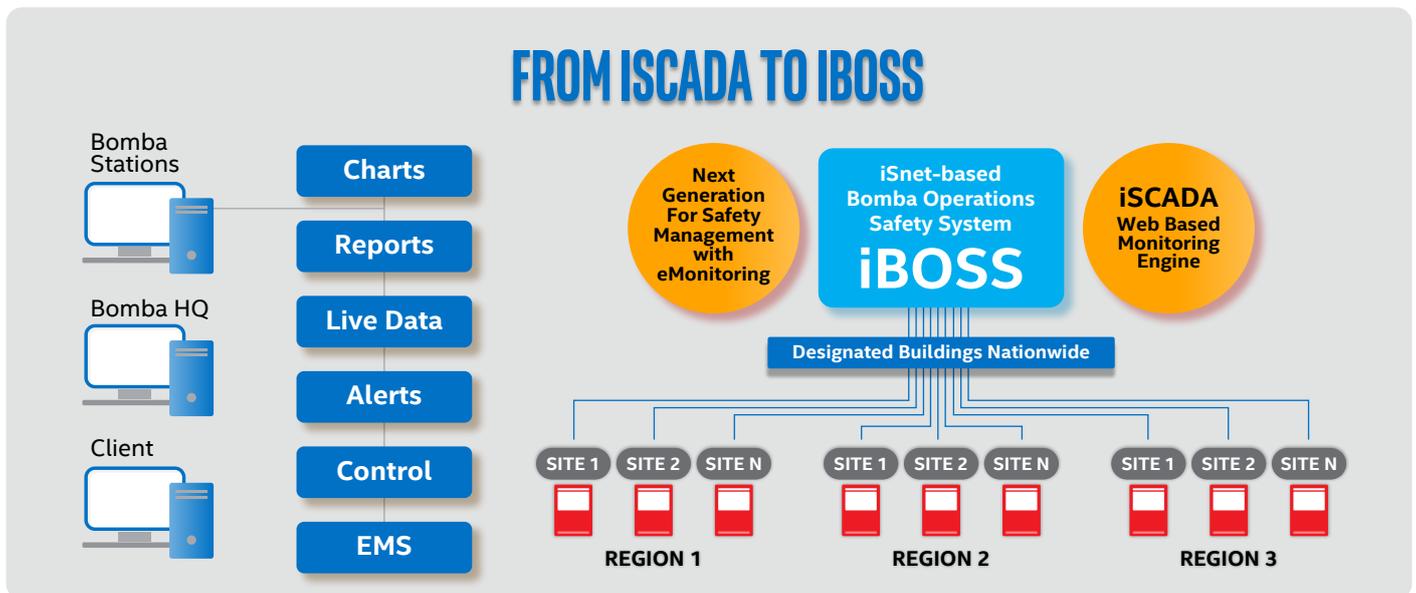


Figure 2. iBOSS – National fire safety and alarm monitoring solution.

A high level architectural view of iBOSS solution is shown in figure 2. The embedded Internet gateway with Intel® Quark™ SoC X1021 collects and transmits data over the internet, enable remote-device and application management without the need of complex engineering system:

1. Control panels will detect equipment and system faults within the building.
2. Failure data will then be picked up by Data Loggers and Embedded Internet Gateways retrofitted to the control panels.
3. The failure data will be automatically transmitted to an internet server without human intervention. The data will be processed by specialized software and users will be alerted of failures through mobile devices.
4. Processed data, inclusive of benchmarking indices will be presented to users on any PC with an internet connection and browser.
5. All users will have universal access to the same data in real time. Users here would include Bomba, contractors, facility managers and property owners.

## Proven and scalable integrated solution – iBOSS to iSMART

An important consideration of any advanced technology platform is the assurance that the platform will be able to serve well into the future with planned upgrades. The following two key components of the iBOSS platform are designed to accommodate technologies that will become available in the future.

The iBOSS enterprise cloud computing technology platform is developed based on the proven iSCADA cloud (Internet) computing platform. It is essentially an enterprise level SCADA platform which has been optimized to meet the unique requirements of the Fire Safety and Rescue Department in Malaysia as their future national fire alarm monitoring solution. The Intel Quark SoC-based gateway solution ensures the data generated transits securely and safely from sensors and devices to the cloud over wireless or local network. In short, it provides a high integrity platform to facilitate data flow securely between edge devices and cloud.

The iBOSS architecture is also modular and incorporates all the features and functionalities found in the generic SCADA systems. In addition, it can be customized to provide high resilience service as a national fire safety platform. Its Web-centric design allows for easy integration into the latest Web-based technologies, especially for public user interfaces. A noteworthy feature of iBOSS is the flexibility of the platform, scalability and its upgradability.

An upgraded iBOSS compatible solution has been developed and exhaustively tested. This is iSMART, the future of iBOSS which is fully compatible with its parent program. iSMART will bring scalability and sustainability as key advantages to address all future requirements in fire safety monitoring, and automated facility management solutions. For customers, this is absolutely a great long-term investment to implement in their future roadmaps given its flexibility.

## The future of fire safety in smart buildings

A smart city integrates multiple information and communication technology (ICT) and IoT solutions in a secure fashion to manage a city's assets. Through the use of sensors integrated with real-time monitoring systems, data is collected from buildings and devices, and subsequently processed and analyzed. Comprehensive and accurate information is gathered and delivered to get actionable intelligence, which helps to reduce the risk of fire incidents and property damage.

The greater level of fire safety awareness and new statutory requirements has resulted in the demand of corresponding progress in eMaintenance and advanced technologies are required to keep up with the trend. As we progressively move into future, smart technology needs to be integrated as part of the city planning for further improvement of fire safety in the interest of public safety and protection of property. A reliable and highly scalable Internet-based fire safety solution is intended to meet the demands for a connected, efficient and sustainable environment.

## Conclusion

As we live in a generation where connected devices and cloud-based IoT solutions are present, it is important to be reminded that the fire safety industry has played a significant role in this evolution by transforming and impacting the way we live and react to our environment – in particular, fire protection and life safety.

Connecting fire alarm panels, devices and remote users are enhancing fire safety within buildings, while streamlined operations provide excellent user interfaces in a more cost-effective and scalable manner. iBOSS represent a breakthrough in fire safety technology and is fully developed, deployed and tested in its operating environment successfully.

iBOSS solutions (and the future iSMART) powered by Intel® IoT Gateway Technology will help to optimize fire safety protection in buildings, implement edge analytics that create value, and lead to long-term real cost savings without having to invest in or maintain expensive infrastructure. It also allows the flexibility to scale up to thousands incrementally. In time, this would serve as an important asset of the future smart city.

### DEVICES WORLD



Devices World Sdn. Bhd. ("Devices World") is a solution integrator in this IoT solution, with the goal to research, develop and market state-of-the-art enterprise solutions in the areas of Web-based data acquisition and electronic maintenance (eMaintenance).

The core technology of Devices World's iSCADA is protected by a US patent No: 6,965,935 awarded, and entitled "Network Architecture for Internet Appliances". Devices World 's technology has also been selected for the next-generation National Fire Alarm Monitoring System in Malaysia (iBOSS).

## Further reading

For more information about iBOSS solution, visit [iBOSS - Moving Bomba into the Future](#)

To learn more about Intel IoT Gateway, visit [intel.com/iotgateways](http://intel.com/iotgateways)

To learn more about ECS Intelligent Gateway GWS-QX2, visit <http://www.ecs.com.tw>

## GWS-QX2\* INTELLIGENT GATEWAY

GWS-QX2, an intelligent gateway from Elitegroup Computer System (ECS), can provide a smart connection between safety monitoring system with Bomba operations safety system to have always connected, accessible with more intelligence in safety monitoring.

GWS-QX2 gateways for Smart building applications are powered by Intel Quark Soc X1021, which supports an extreme temperature (up to 70°C) and secure boot. Some of its other benefits include:

- Embedded processors designed from the ground up for thermally constrained, fanless, and headless designs, which simplifies integration into smart homes.
- Rich I/O capabilities and an array of connectivity options for both wired and wireless protocols.
- Seamlessly interfaces with sensors and various memory options through several expansion ports.

