gemalto
security to be free

Cinterion® SensorLogic

Application Enablement Platform

Application Enablement Cinterion® SensorLogic Platform

Technological advances are making it possible for organizations to do more by connecting to and communicating with the assets that matter most to them and their customers.

From sensors and batteries, to smart phones and other intelligent devices, to cellular networks and cloud computing, all these technologies are coming together to pave the way for innovative new services that were simply not possible just a few short years ago. The millions – and soon billions – of connected devices that are being deployed around the world underscore the opportunity that is building with this trend. Executives and team leaders are envisioning new, customer-facing services powered by real-time information from connected devices. They know that this intelligence can be used in their organizations for maximum business benefit, creating differentiation, competitive advantages and new revenue streams.

What is much less clear to many in this group is how best to move forward. With Machine-to-Machine (M2M), the foundation of Internet of Things (IoT) solutions, value chains are complex and time to market is long. Executives are searching for solutions to create and deploy high quality connected services quickly, cost-effectively and securely. That's why some of the world's largest companies are partnering with Gemalto to tap the power of the 'connected world'.

With Gemalto's broad portfolio of Cinterion M2M hardware, software and services, we are helping organizations build and launch game changing connected solutions. Specifically, they are using the SensorLogic Platform with its cloud-based infrastructure and 'platform-as-a-service' delivery model, to build innovative, flexible and scalable applications quickly, easily and at a fraction of the cost of other alternatives.

SensorLogic delivers:
> Innovative, connected applications and services that boost revenues
> Low development costs and minimal IT overhead
> Fast time-to-market and major competitive advantages

SensorLogic benefits:
> Improves time-to-market
> Reduces complexity
> Lowers cost of ownership
> Future-proofs technology investment
> Grows with your business

Platform Overview
The Platform is designed for anyone who wants to deliver new managed M2M services – network operators, equipment manufacturers, software vendors, system integrators and enterprise IT teams. By handling the complex underlying architecture required in virtually all enterprise-grade M2M applications, it allows development teams to move forward faster and more effectively with their connected device initiatives.

Intelligent, Reliable and Scalable Foundation for M2M Applications

The Platform utilizes a cloud-based architecture with benefits that include reliability, flexibility and cost savings. Whether hosted at our data centers or yours, the Platform enables:

> Connecting any type of device over SMS / IP connection
> Correlating real-time device data with information from enterprise and peer applications in the cloud
> Creating actionable business information and events
> Accelerating application development using pre-defined services

Whether supporting hundreds of customers, or hundreds of thousands of devices, the Platform and the applications that are built on it can scale to meet the needs of any business or organization.
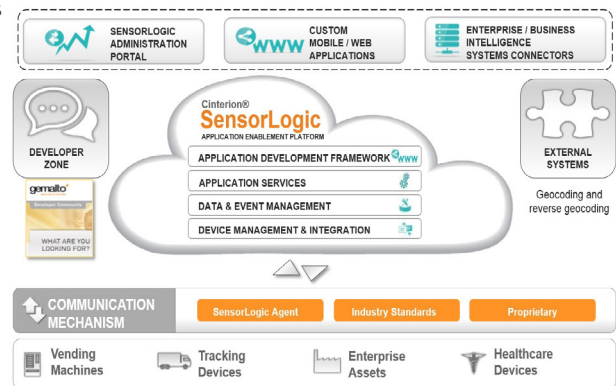
Key Platform Components

The Platform aims to move beyond simple device connectivity to produce actionable business information that is the key ingredient in new M2M-based smart businesses.

Network and Device Management
The Platform facilitates gathering and normalizing of data from any type of device or sensor. This normalization allows applications to apply common business processes on the incoming data regardless of source or format. It also enables data to move fluidly and cohesively from and across different kinds of networks.

Specific functions include:
> Open device communication
> Protocol translation
> Real-time data normalization and storage
> Device and network configuration and activation

This management layer also offers a homogenous view of M2M implementations and integrated administrative workflows across multiple devices, networks and provisioning systems. This enables simplified device management, provisioning and activation services. These capabilities work across any and all wireless network operator's environments and include:

> Add, manage, delete devices
> Set device network profiles
> Manage device reporting frequency and protocols

Complex Event Processing
As the 'brains' of the Platform, this layer is where collected data is augmented – with data from web applications or enterprise systems – and then processed and analyzed. Event processing, starting with simple rule-based processing, can identify when device data has surpassed a threshold or when a device has moved out of a specific geographic region. In turn, events can be mapped to specific actions and text notifications sent to users or systems.

The Platform includes geographic data analysis required to gather device location information from onboard GPS. Alternatively, it can also look up location using network-based location technologies or the platform's built in Cell-ID database. The Platform uniquely builds on this capability by adding complex event processing (CEP) services. CEP technology, widely used in the financial services industry, allows for high speed processing of M2M data feeds with complex queries that can span across data, devices, external sources and time to add context and identify trends and conditions. Together, these features allow the Platform to take data collected from assets monitored in the physical world, combine it with contextual data from other sources, and transform it into actionable intelligence that can be used to drive better business outcomes.

Specific capabilities include:
> Configurable business rules
> Data and event correlation
> Alerts and notifications
> GPS and Cell-ID location
> Geocoding and geofence services

Application Services

The Platform's Application Services enable the Web Services interfaces that developers use to access and operate the Platform. All features in the Platform are composed of Web Services and each of these is defined by a comprehensive set of application programming interfaces (APIs). This includes authentication services, device groups, user roles, and all the APIs used to configure the system, manage devices, set up rules and notifications, and read/write data to remote devices. In addition, the Platform offers an administrative portal which provides an easy to use graphical interface for basic operations.

Specific elements in this layer include:
> Open, standard application support
> Web Services APIs
> Users, roles and device group management
> Secure service authentication
> Data warehouse and reports
> Integration with enterprise systems

Cloud-Based System Administration

The Platform is designed so that it can be offered as a hosted service in the cloud. It supports a multi-tenant architecture allowing secure, simultaneous hosting of multiple applications and customer areas. It includes the key features and tools required to deploy, manage and administer the platform ensuring maximum uptime and optimal performance, without burdening customers' IT staff.

Specific functionality in this layer includes:
> Optional public or private hosting
> Services monitoring and diagnostics
> Multi-tenant administration and security
> Live maintenance and updates
> Backup, restore, and other data management functions

Rapid Application Development Framework

The Rapid Application development platform is comprised of two main bricks:
> The Development Studio with SensorLogic widgets and SensorLogic proxy
> The Server that runs vertical applications coming from the proxy and SensorLogic push manager

The full SensorLogic Web API is accessible through this environment conveniently packaged in a set of SensorLogic Widgets allowing to build customized dashboards in a snap, and directly linked to the device fleet. This is possible due to a vast library of SensorLogic widgets that can be graphically customized and linked to devices across any implementation.
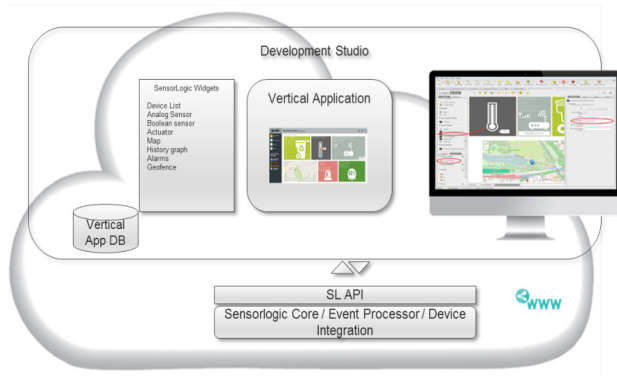
Rapid Application Development Studio

The Rapid Application development platform along with hosted vertical applications built on top of the framework, enables an innovative development studio that dramatically speeds up vertical operational dashboard creation. Simply start from the provided templates, organizing the devices and sensors the way your use case requires.

Some available widgets
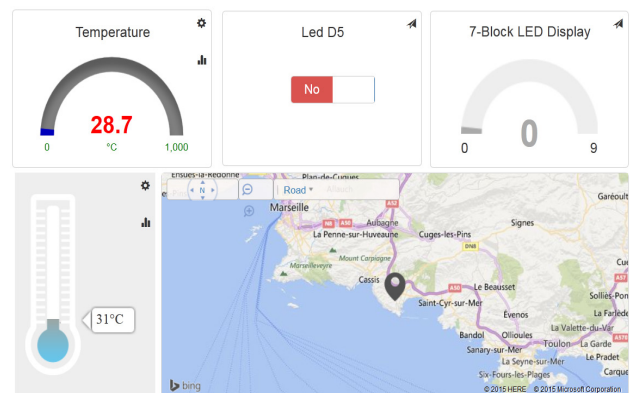
Device Management and M2M Connectivity Monitoring

When deploying M2M cellular devices, actively monitoring the network connectivity is key to ensuring service availability. The SensorLogic Agent, embedded either in a Cinterion Module or in your application processor, helps retrieve network related indicators and statistics to quickly react in case of issue and avoid costly in-field repairs whenever possible. Preventive maintenance is key in reducing the global cost of support for the M2M device lifecycle. As such, the Gemalto Cinterion portfolio of services provides end-to-end solution support leveraging the SensorLogic Application Enablement Platform and the SensorLogic Agent to provide valuable network related information about each device. The latest Java enabled modules, such as the EHS5/6 and BGS5 as well as the EHS6-T terminal, work seamlessly with the SensorLogic Platform and module monitoring services.

M2M Connectivity Monitoring
The SensorLogic Agent, released as a Java Midlet and embedded in the M2M module, retrieves network related data. Such information allows close monitoring of the status of device communication.

For instance, based on this information, it is possible to generate an alarm when the signal strength goes below a pre-defined level. This alerts service providers that preventative action is required to avoid service interruption. Similary, the built-in overvoltage alarms can help prevent module damage.
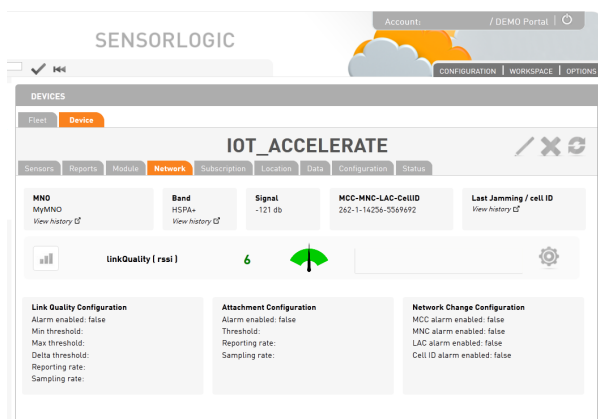

In addition, monitoring a change in the Cell-ID location is useful for devices that are not intended to be mobile after installation (e.g. vending machine, pumps, etc.). Knowing the exact location of devices and which MNO network is providing is crucial to controlling MNO roaming expenses as well as safeguarding against theft or vandalism

Module Services
At the heart of communication, the M2M module itself must be monitored to check its working condition and the status of applications running inside. For instance, abnormal use of memory, especially memory leaks, is often a sign of faulty implementation of embedded applications.

The supply voltage provides valuable information about power supply stability between the device and the module. Abnormal variance and unsuited values can deteriorate

the module and jeopardize its operation. For example, an alarm can be set when voltage is too high or low to prevent service failure. In the same manner, temperature monitoring can allow proactive action to improve quality of service.
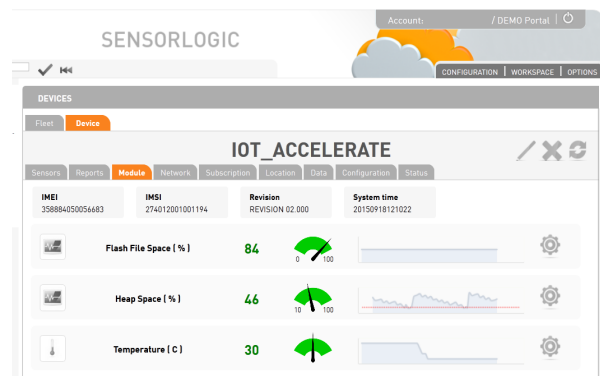
Close monitoring and control of such information is important throughout the whole lifecycle of the M2M module and the device

Localization (optional feature)
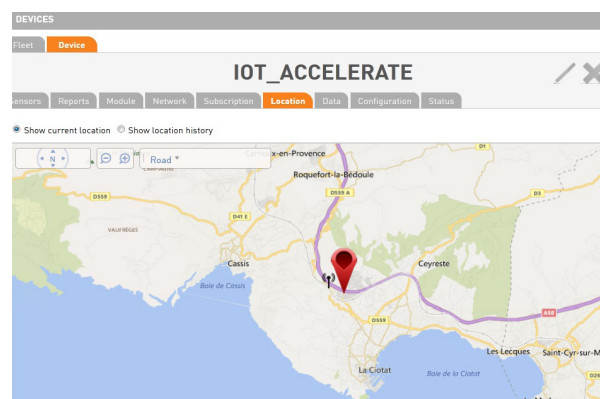
A Cell-ID geo-location service is proposed in order to locate or track a cellular-based device whenever the GNSS / GPS receiver signal is too weak or simply no receiver is available. Location history, geocoding and geofence services are then enabled.
These methods ensure reliability even in difficult conditions where GPS coverage is weak or unavailable.

Protocols and Standards

The SensorLogic Platform is agnostic to underlying physical protocols and it can support both wired or wireless communications including: GSM, UMTS, CDMA, or the 4G technologies. The Platform can communicate with M2M devices via SMS, UDP or TCP.

Devices also vary in communication capabilities across SMS, TCP, UDP and other formats.

The SensorLogic Platform keeps track of these capabilities in its Device Management layer and adapts to the type of communication available. The Platform also can use different transport protocols (e.g. SMS vs. TCP).
SMS mode is generally used for outbound commands from the Platform to the device or to wake up the device.

Gemalto is continuously adding new devices to the Platform. Contact your sales representative to get the latest SensorLogic Device Catalog. The SensorLogic Application Enablement Platform supports:
> Proprietary device protocols from the device manufacturers
> Industry standard device protocols (MQTT, Continua, DEX, LWM2M and more)
> Embedded software agents like the SensorLogic Agent (for M2M Java modules, Java 2 Standard Edition Platform or C implementation for Linux OS running on Intel and ARM processors)

A Scalable Platform

The Platform is designed to accommodate the incremental nature of M2M business growth. Organizations can start small and expand at their own pace without having to worry about outgrowing the system or hitting capacity ceilings. Additional services can be built in or integrated with the Platform to deliver innovative mash up features.

Specific scalability features of the platform include:
> Modular, services-oriented design
> Parallel, asynchronous processing
> No single point of failure
> Load-balanced
> High availability

Gemalto M2M Support includes:
> Personal design consulting for applications
> Extensive certification and conformance testing capabilities
> Global support
> Regular training workshops

Local engineers, a competent helpdesk, a dedicated team of R&D specialists and an advanced development center are the hallmarks of our leading support offer.

M2M Application Enablement Use Cases

Perishable Package Tracking

> Challenge

- Ensure quality of valuable, perishable cargo
- More predictability, less spoilage and theft
- Enable proactive intervention
- Audit trails for authorities and insurance

> Solution

- GSM wireless-enabled tracking with off-the-shelf devices
- Custom proactive application that tracks temperature, light, humidity, shock
- Unified platform for multiple service offer-rings
- Integrates with corporate tracking systems

> Benefits

- Improved customer confidence in critical deliveries
- High-value service: new revenues and competitive advantage
- Improved predictability, lower liabilities
- Rapid time-to-market with minimal internal resources
- Open, flexible platform scales with program, enables future offers

Smart Recycling Container

> Challenge

- Empty the container only when a certain capacity level is reached
- Avoid overloaded containers to improve the image of the city and to reduce hazardous situations and environmental impact
- Reduce vandalism

> Solution

- Ruggedized GSM wireless-enabled device installed into the recycling containers
- Multiple sensors (filling level, shock, flame, temperature, geolocation)
- Unified platform for multiple service offerings
- Integrates with corporate tracking systems

> Benefits

- Improved use of resources
- Reduce cost of operation
- Better quality of service
- Positive environmental impact

For more information, please visit:
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