

# IOT PLATFORM

Shaping the Smart Cities of Tomorrow





With the proliferation of IoT deployments and massive data collection to enhance the situation awareness of cities and drive use cases to benefit residents, having a unified IoT platform to connect, manage and transform these vast quantities of data from sensors to applications, is essential for successful IoT implementations and to accelerate smart city initiatives.

## Sense, Connect, Integrate and Manage

ST Engineering's AGIL™ IoT Platform is a scalable, multi-tenant, and unified platform that securely manages and connects all types of devices, networks, applications and systems. It leverages best of breed IoT technologies and communications solutions on a single platform to provide greater benefits and enhanced efficiency to municipals, city service providers and enterprises.

The IoT Platform focuses on achieving business and operational objectives without the difficulty of managing complex integrations, different protocols and incompatibility issues. It optimises connectivity and network operations while fostering agility and productivity for sustainable cities.

## Key Challenges

Challenges of IoT deployment:

- **Lack of a unified platform**
  - To manage and make sense of the collected data for fast IoT deployment
- **Diverse choice of devices and sensors from various vendors**
  - Every IoT solution uses different sensors and it is a challenge to scale to millions of devices
- **No one size fits all network technology**
  - Different connectivity solutions are needed to drive various IoT use cases and applications
- **Different IoT protocols and standards**
  - Costly to inter-operate applications
  - Difficult to process different data sets from various sources
- **End-to-end security**
  - Ensure reliable protection of data, networks and applications

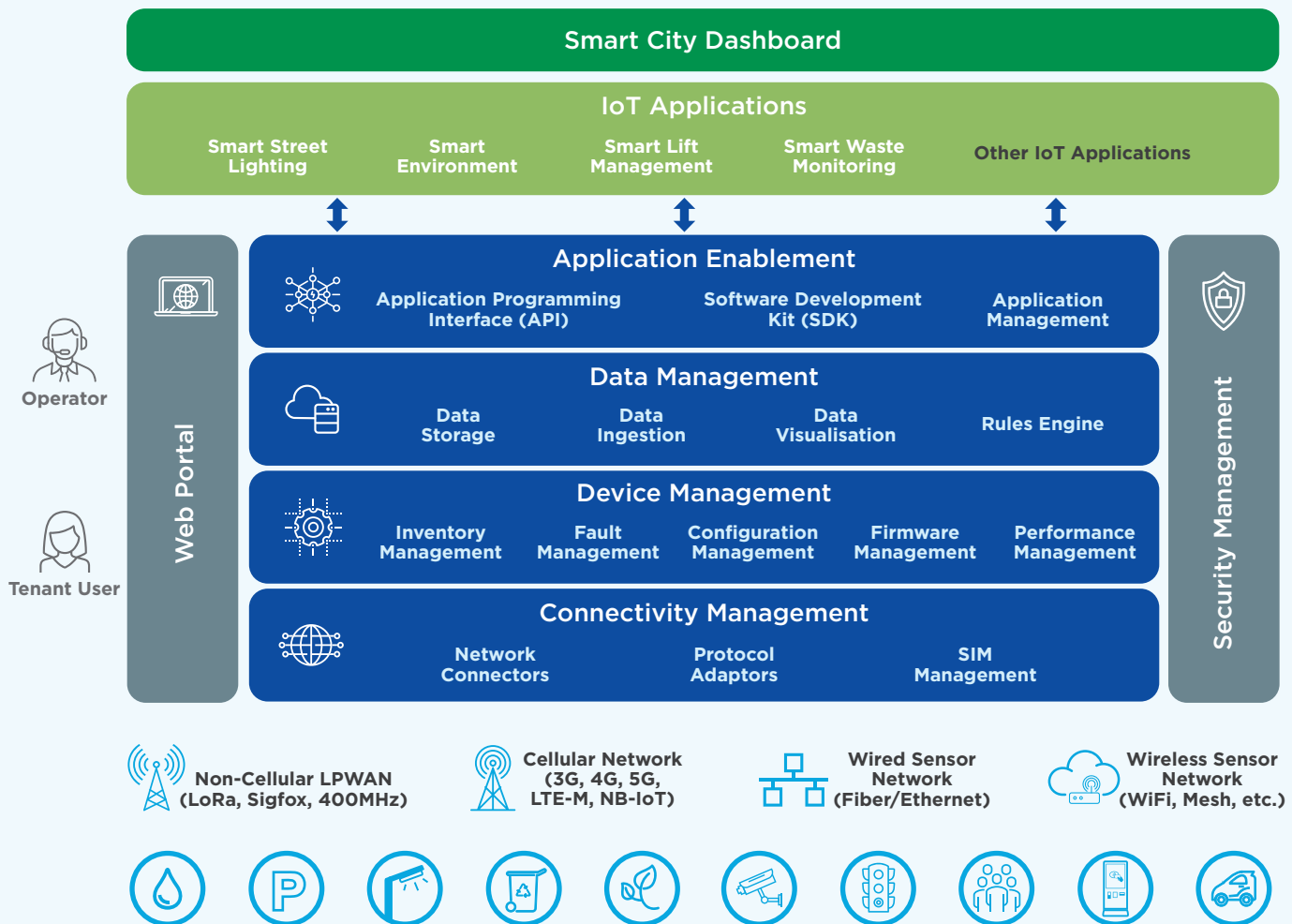
## Key IoT Applications

The IoT Platform is a key enabler of smart city applications to drive a sustainable and connected ecosystem. It is pre-integrated with various IoT solutions such as

- Smart Street Lighting
- Smart Waste Management
- Smart Lift Monitoring

The IoT Platform enables rapid development of IoT applications and integration with open Application Programming Interfaces (APIs).





## Key Benefits

- Seamless operation and reduce cost of ownership**
  - Unified and centralised IoT management platform
  - Open architecture to integrate with different networks and IoT technologies
  - Reduce complex management of different devices, sensors and networks
- Support different communications networks**
  - Network agnostic (support various sensor networks such as cellular/non-cellular, IP/non-IP, LPWAN and WiFi/Ethernet)
  - Out-of-the-box support for many standard IoT protocols
- Support different devices**
  - Device agnostic (support various sensors, gateways and field infrastructure equipment)
  - No need to lock in to specific devices
- Multi-tenancy**
  - Independent operations and control with data isolation and protection to enable
  - Each tenant to register for multiple applications
  - Each application to subscribe to different data
- Highly scalable**
  - Multi-tiered microservice architecture
  - Enable users to manage deployment of any size and scale based on their growth needs
- End-to-end secure platform**
  - Protect critical business information
- Interoperability**
  - Support multiple wired/wireless sensor network industrial standards and technologies
  - Support open communications protocols to easily integrate with wired/wireless sensors and equipment
  - Provide open APIs (MQTT, REST and Kafka) and JSON format for easy integration and data exchange with IoT applications and external systems
- Customisation**
  - Open and extensible platform to adapt to changing business needs
  - Provide extensions to partners to build additional plugins for the platform
- Flexible deployment model**
  - Can be deployed on premise or cloud. Independent of specific cloud hosting technology
  - Full management of cloud service hosted on different cloud environments (such as Amazon Web Services (AWS) and Microsoft Azure) without heavy investment on the infrastructure

## Key Platform Features



### Connectivity Management

Secure connection of devices across heterogeneous sensor networks. It easily extends to other IoT technologies. Features include

- Built-in LoRaWAN network server
- Standard IoT protocol support (such as TCP/UDP, SSH, SFTP, SNMP, REST, DLMS/COSEM, DDS, CoAP, MQTT, AMQP)
- Seamless service activation and usage monitoring of SIM-based M2M devices



### Device Management

Provide rich device lifecycle management and remote maintenance of IoT devices such as

- device onboarding and provisioning
- asset management
- configuration, control, management and maintenance
- fault management
- monitoring and diagnostics
- software and firmware updates
- device certification management



### Data Management

Collect, normalise and store diverse data from multiple IoT devices to support further processing, visualisation and analytics



### Application Enablement

Provide open APIs/SDKs to integrate sensors and data to IoT applications regardless of the IoT network and protocols that are used by the devices

## IoT Suite of Solutions

ST Engineering's suite of IoT solutions help smart cities to manage multiple smart city applications on a common platform. Its open architecture design leverages best of breed technologies and standards to facilitate data exchange and analytics, while generating valuable insights to improve quality of city services and enhance operational efficiency. Our solutions include

- AGIL IoT Platform
- AGIL Lighting Solution
- AGIL Street Lighting Solution
- AGIL Smart Lamp Post
- AGIL E-WATS Emergency Wireless Automatic Test System
- AGIL Lift Monitoring Solution
- AGIL Waste Monitoring Solution
- AGIL Water Advanced Metering Infrastructure (AMI)
- AGIL Smart Sensors

## Global Deployment

We have a proven track record in deploying more than 15 million wireless sensors and smart solutions that transform cities worldwide. Our global footprint covers various countries such as the UK, the US, Canada, France, New Zealand, Brazil and India.

Our solutions enhance city planning, improve service delivery, optimise efficiency and reduce operating costs essential for driving sustainable and liveable smart cities.

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