

# Intelligent Edge in Smart Cities

A large part of recent activities in the area of the Internet of Things (IoT) have been focused on the smart city, where local governments have started to use hyper connectivity to monitor, track, or control city assets, with an overall goal of providing citizens with more efficient services. Smart parking, waste management, street lighting and public safety are but a few examples of the ways by which local authorities are attempting to harness new technologies to improve their citizens' lives.

In a typical IoT smart city project, thousands of different sensors and end point need to connect to a central Command & Control (C&C) room, where the collected data is presented in the form of actionable information on cloud-based dashboards. This requires at least four different functionalities at the point where the data from all these sensors is aggregated, i.e., the edge:

- Program logic controller (PLCs)
- Aggregation of remote sensors
- LTE or other wireless backhaul
- Protocol conversion (from legacy SCADA to MQTT) if devices from mixed generations are used

Until today, in many cases four separate boxes were needed in each remote location. When multiplied by the number of sites the result is a massive footprint that would prove to be very expensive to manage and maintain.



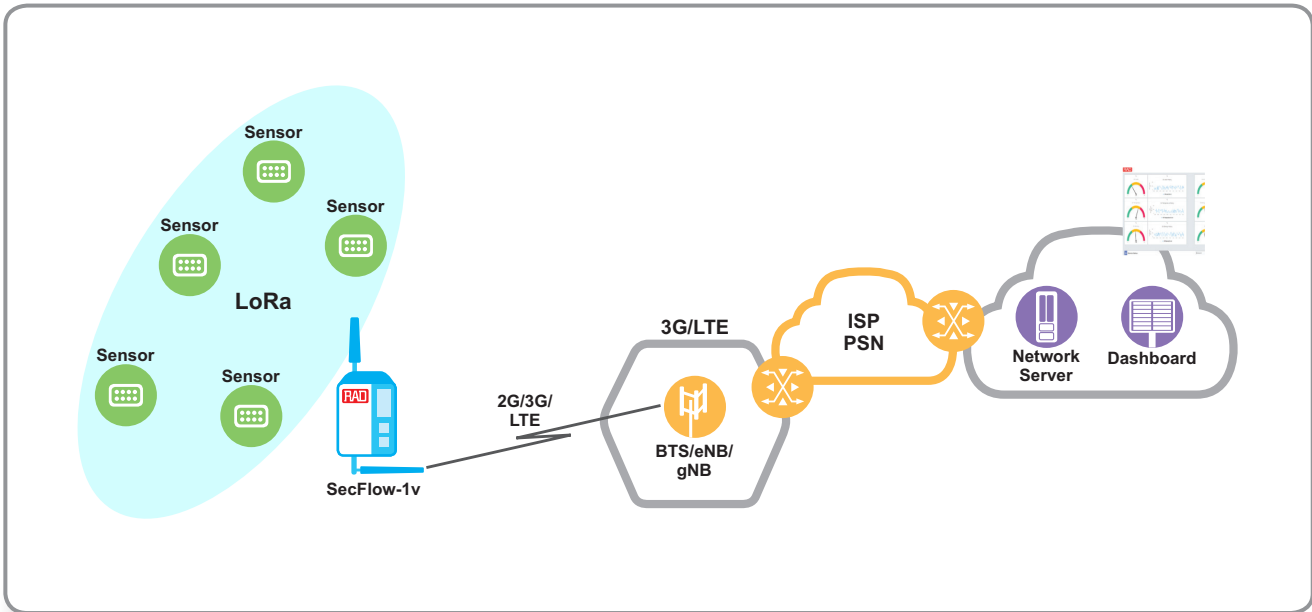
Your Network's Edge®

## Application Brief

### Intelligent Edge in Smart Cities

# RAD's Secure Industrial IoT Gateway Solution with Edge Computing Simplify Smart City Deployments

RAD offers ruggedized, multiservice and compact Industrial IoT (IIoT) gateways with Edge Computing, a VPN aggregator and advanced security information and event management (SIEM). RAD's IIoT solution hosts both networking and non-networking functions on the same hardware, to reduce the number of devices in the network and increase security and reliability.



## Solution Highlights

- A comprehensive communications solution for CCTV cameras, WiFi access points, sensors, payment kiosks, etc.
- All-in-One Industrial IoT Gateways simplifies deployment and scale up to reduce CapEx and OpEx; ruggedized devices for outdoor installations
- Virtual environment for user-tailored applications allows customers to add new container-based functions on top of SecFlow devices
- Seamless communications over fiber optics, radio links, 2G/3G/LTE cellular links, and leased lines
- Integrated IPsec encryption, Stateful Firewall, X.509, VPN
- Zero-touch provisioning with enhanced cyber security (stateful firewall, SIEM)
- Integrated LoRaWAN gateway or PLC software
- Secure remote access for end-user device management
- Transparent delivery of legacy traffic from serial-based devices
- M2M protocol gateway
- Point-to-multipoint radio connectivity supports high capacity mission-critical traffic over licensed and unlicensed sub-6 GHz bands

## Edge Computing

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**Edge Computing** allows hosting of various software-based functionalities on an edge device, so that less devices are required there, introducing cost and space savings and flexibility to add future functions. As the data produced by sensor-rich assets to be processed closer to where it is created, rather than sending it all the way to a centralized control center. As a result, the following benefits can be achieved:

- **Ultra-low latency:** As the data doesn't need to be sent across long routes to data centers or cloud services, better deterministic response time due to low latency can be achieved.
- **Trigger local, real-time actions** when anomalies are detected.
- **Enable smart data collection** for advanced support programs or predictive maintenance.
- **Tighter cyber security** as less assets require protection.
- Flexibility in choosing **best-of-breed** tools.

With Edge Computing capabilities, RAD's SecFlow supports more than secure networking functionality, providing the option for onboard server functionality capable of hosting third-party software using containers to reduce the number of boxes required. In the context of large-scale smart city deployments, this integrated gateway approach simplifies operations that rely on thousands of connected assets, while strengthening security.

## Harnessing LPWAN Connectivity

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Low-power WAN (LPWAN) technologies including narrowband IoT (NB-IoT), LTE-M, and LoRaWAN to support large scale connectivity for collecting sensor data for such applications, which tend to require sporadic connectivity for low bandwidth data transfer. LoRaWAN in particular has increasingly been deployed in smart city applications due to its use of unlicensed spectrum, the availability of standardized, low-cost modules with long battery life. RAD's IIoT gateways use LoRaWAN to connect smart city devices to the cloud for data processing and management.

As a multifunctional solution, the SecFlow can be used for more than just standalone projects like parking or waste management. With a range of networked devices including street lights, utilities and parking meters, the enhanced insights gained help reduce the city's energy use, increase efficiency for waste management, and make construction zones safer, among other benefits – including monetizing new services.

## Smart City Deployment Example

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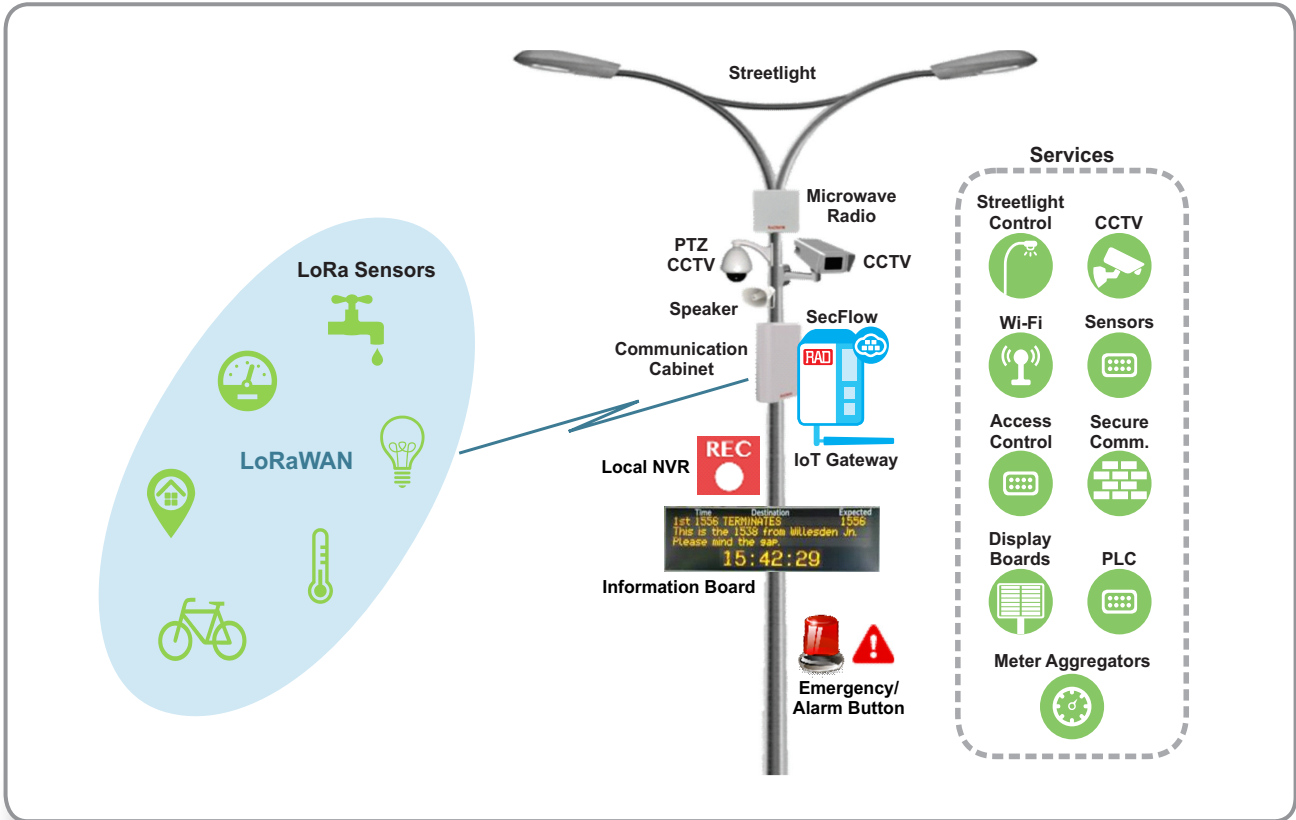
RAD's IIoT Gateway solution is being used as the focal point for delivering multiple secured connectivity services in a unique smart city project in South Africa. The project has since been replicated in other parts of the world.

The IIoT Gateways are installed on "smart poles" within private residential estates, residential and commercial complexes and gated communities managed by resident associations. They bring together connectivity and security solutions, including intercom and visitor management platforms, access control, CCTV and IoT devices, as well as license plate recognition systems and panic buttons, among others. RAD's devices securely carry the data from these devices to the control room, to allow real-time response, monitoring and analytics.

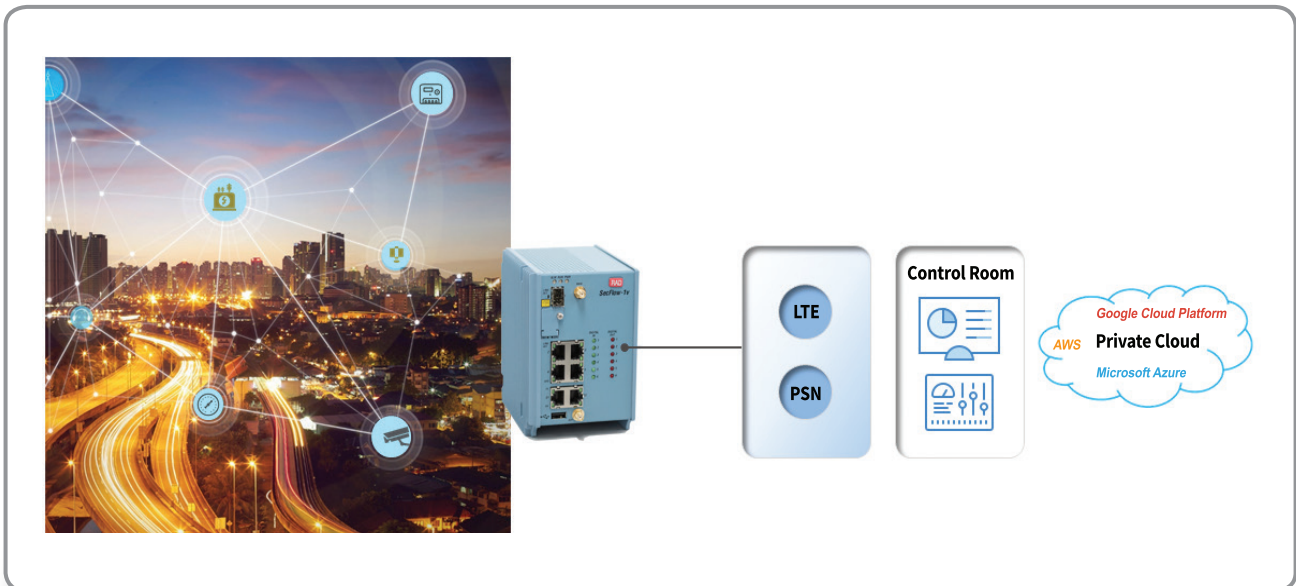
The SecFlow Gateways are installed inside an IP67 Smart Communication Junction Cabinet that is protecting the device and also housing a DC power supply, long life battery backup with UPS, lighting surge protectors, and a cabinet controller for remote monitoring of temperature, door open/close, battery and power status, as well as other indications if needed.

# Application Brief

## Intelligent Edge in Smart Cities



Industrial IoT Gateway with Edge Computing for Smart Poles



Industrial IoT Gateway Connectivity Architecture in Smart Cities

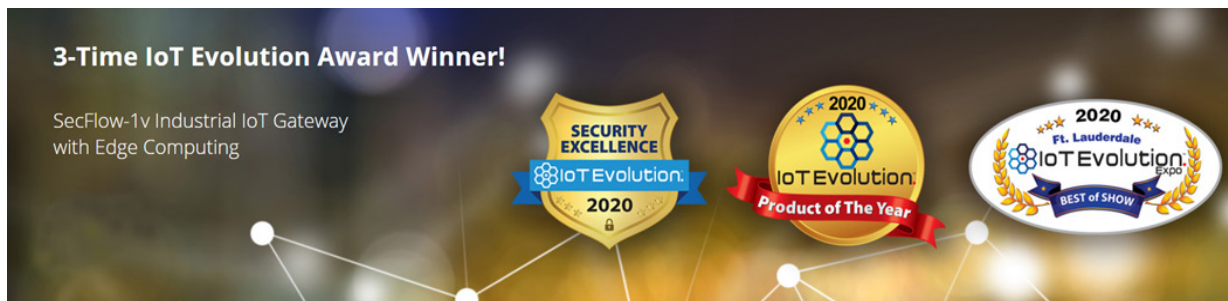
### Secflow Product Family Features

| SecFlow-1v  | SecFlow-1v-PLC  | SecFlow-1v-LoRa   |
|---|---|---|
| H: 157.2 mm (6.19 in) W: 82.8 mm (3.25 in) D:150 mm (5.9 in)          | H: 146 mm (5.74 in) W: 91.2 mm (3.59 in) D:132.6 mm (5.22 in)         | H: 157.2 mm (6.19 in) W: 82.8 mm (3.25 in) D:150 mm (5.9 in)          |
| Edge Computing  | Edge Computing with PLC software                                      | Edge Computing with LoRaWAN server                                    |
| Copper/SFP Ethernet ports   | Copper/SFP Ethernet ports   | Copper/SFP Ethernet ports   |
| POE   | POE   | POE   |
| Serial RS232/RS485  | Serial RS232/RS485  | Serial RS232/RS485  |
| Protocol Gateway – DNP3 and T101-104, MB-RTU/MB-TCP                   | Protocol Gateway – DNP3 and T101-104, MB-RTU/MB-TCP                   | Protocol Gateway – DNP3 and T101-104, MB-RTU/MB-TCP                   |
| Celluar Connectivity: Dual modem, dual SIM, LTE                       | Celluar Connectivity: Dual modem, dual SIM, LTE                       | Celluar Connectivity: Dual SIM, LTE                                   |
| Static Routing, OSPF, BGP   | Static Routing, OSPF, BGP   | Static Routing, OSPF, BGP   |
| Security & VPN: IPsec, AES-128, AES-256, PKI X509 SCEP server support | Security & VPN: IPsec, AES-128, AES-256, PKI X509 SCEP server support | Security & VPN: IPsec, AES-128, AES-256, PKI X509 SCEP server support |
| Management: Syslog, SNMPv3 Traps, HTTPS                               | Management: Syslog, SNMPv3 Traps, HTTPS                               | Management: Syslog, SNMPv3 Traps, HTTPS                               |

To learn more about RAD’s solutions for smart cities, contact us at [market@rad.com](mailto:market@rad.com)

#### 3-Time IoT Evolution Award Winner!

SecFlow-1v Industrial IoT Gateway with Edge Computing



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