

Frequently Asked Questions

SGP.32 – AirOn360® IoT for the Energy & Utilities Industry

Scalable Connectivity Management for Smart Metering and Grid Infrastructure

Connectivity for Critical Utility Infrastructure

The energy and utilities sector is undergoing large-scale digital transformation driven by smart metering rollouts, grid modernization, and decentralized energy systems. These developments require continuous, secure, and scalable connectivity across millions of distributed devices such as smart meters, grid sensors, and infrastructure monitoring units.

Unlike traditional IT environments, utility deployments are characterized by extremely long device lifecycles, strict regulatory requirements, and installation in physically constrained or remote environments. Devices must remain operational for 10–20 years, often without physical access after installation.

SGP.32 introduces a modern, IP-based standard for Remote SIM Provisioning (RSP) designed specifically for large-scale IoT environments. It enables secure, fully remote management of eSIM/iSIM profiles (G+D's Sm@rtSIM®) without user interaction and without reliance on legacy SMS-based mechanisms.

AirOn360® IoT implements SGP.32 as a managed service and extends it with additional capabilities that ensure reliable real-world operation in utility environments, including factory provisioning, global connectivity optimization, and temporary bootstrap connectivity.

Strategic Relevance of SGP.32 for Utilities

Q: Why is SGP.32 relevant for smart metering and utility infrastructure?

A: SGP.32 is highly relevant for utilities because it enables centralized, automated management of connectivity across very large and geographically distributed device fleets. Smart meters and grid devices are often deployed in environments where physical access is limited or costly, making remote lifecycle management essential.

With SGP.32, connectivity profiles can be managed, updated, and replaced remotely over the entire lifetime of a device. This allows utilities to adapt to regulatory changes, network evolutions, and operational requirements without replacing hardware in the field.

Q: How does SGP.32 improve on SGP.02 in utility environments?

A: SGP.02 has been widely used in early smart metering and M2M deployments, but it relies on OTA-HTTP or SMS-based mechanisms and introduces operational complexity in large-scale environments.

SGP.32 removes these dependencies and introduces a fully IP-based, cloud-native architecture. This significantly improves scalability, reduces operational overhead, and better aligns with modern utility IT and IoT platforms.

Architecture in Utility Deployments

Q: What does the SGP.32 architecture look like in smart metering and grid devices?

A: In utility environments, SGP.32 is embedded into devices such as smart meters, grid sensors, and infrastructure monitoring units.

Each device contains a secure element, the eUICC or iUICC (Sm@rtSIM®), which securely stores connectivity profiles. The IoT Profile Assistant (IPA) executes profile operations and can be implemented either in the device software (IPAd) or directly within the secure element (IPAe), depending on device constraints.

The backend is managed by the AirOn360® eIM (eSIM IoT Remote Manager), which orchestrates connectivity lifecycle operations across the entire utility fleet. It communicates with the SM-DP+, which securely prepares and delivers operator profiles according to GSMA standards.

Q: When is IPAd preferred in utility devices?

A: IPAd is typically used in smart metering and grid devices that already include a communication stack such as LTE-M, NB-IoT, or similar low-power technologies. It offers greater flexibility and can integrate more easily into existing IoT communication frameworks used in utility head-end or data collection systems.

IPAe is preferred in highly constrained devices where minimal software footprint and simplified integration are required.

Connectivity Lifecycle in Utility Operations

Q: How are smart meters and grid devices typically provisioned?

A: In utility deployments, connectivity provisioning often takes place during manufacturing using AirOn360® In-Factory eSIM for efficient In-Factory Profile Provisioning (IFPP). This ensures that devices are connectivity-ready when installed in the field, which is critical for large-scale rollouts where immediate operational readiness is required.

In other cases, devices use a bootstrap connectivity profile that enables initial communication until permanent SGP.32 profiles are activated remotely. Hybrid models are also common depending on rollout strategy and regional constraints.

Q: Why is IFPP particularly important in utilities?

A: IFPP is especially important because smart meters and grid devices are often installed in locations that are difficult or expensive to access after deployment. Ensuring that devices are already connected at the time of installation reduces commissioning complexity and eliminates the need for manual provisioning in the field.

This significantly improves rollout efficiency in national or regional smart metering programs.

End-to-End Connectivity Beyond SGP.32

Q: Does SGP.32 alone ensure connectivity in utility environments?

A: SGP.32 manages the lifecycle of SIM profiles but does not by itself guarantee continuous connectivity in all operational phases. Utility environments often require additional connectivity layers to ensure that devices remain reachable during installation, operation, and maintenance cycles.

AirOn360® IoT therefore extends SGP.32 with complementary connectivity services that ensure operational continuity across the entire device lifecycle.

Q: What is IoTgo® Intelligent Online used for in utilities?

A: IoTgo® Intelligent Online provides temporary and bootstrap connectivity for devices that are not yet fully provisioned or require fallback access. In utilities, this is particularly important during installation, commissioning, or maintenance phases where permanent connectivity profiles may not yet be active or temporarily unavailable.

It ensures that devices can always establish a minimal connection to backend systems when required.

Q: What is IoTgo® Connect and why is it relevant for utilities?

A: IoTgo® Connect provides a global and hybrid connectivity layer that ensures utility devices remain reachable across regions, network types, and coverage conditions. It enables intelligent selection of connectivity based on performance, coverage, cost, and regulatory requirements.

This is particularly relevant for utilities operating across multiple regions or relying on diverse network infrastructures, including cellular and satellite-supported connectivity in remote areas.

Q: What is IoTgo® Control?

A: IoTgo® Control is a centralized Connectivity Management Platform (CMP) that provides a unified interface for managing connectivity across SGP.02, SGP.22, and SGP.32 environments. It enables visibility, lifecycle control, and operational management of large-scale utility device fleets.

For utilities, it simplifies operations by consolidating connectivity management into a single platform integrated with existing IT and OT systems.

Integration into Utility IT Systems

Q: How does AirOn360® IoT integrate into utility platforms?

A: AirOn360® IoT is designed with an API-first architecture and integrates directly into utility systems such as Meter Data Management (MDM), Head-End Systems (HES), and IoT data platforms. This enables automation of connectivity operations including device onboarding, monitoring, and lifecycle management.

Security and Regulatory Compliance

Q: How is connectivity secured in utility deployments?

A: Security is ensured through hardware-based protection in the eUICC/iUICC and encrypted communication across all system components. All profile operations are protected using industry-standard cryptographic mechanisms, ensuring secure handling of connectivity credentials in critical infrastructure environments.

Q: How does the solution support regulatory compliance in utilities?

A: Utilities operate in highly regulated environments with strict requirements around data protection, sovereignty, and infrastructure security. AirOn360® IoT supports these requirements through regional deployment options, secure credential management, and flexible data residency configurations.

Scaling Utility Deployments

Q: How does AirOn360® IoT support large-scale smart meter rollouts?

A: The platform is designed to scale to millions of devices across national and regional utility networks. Its cloud-native architecture ensures consistent performance and centralized control even in very large and geographically distributed deployments.

Key Value for Energy & Utility Operators

Q: What are the main benefits of AirOn360® IoT for utilities?

A: The primary benefit is long-term, scalable connectivity management for critical infrastructure. Devices remain operational throughout their entire lifecycle, regardless of network evolution, regulatory changes, or environmental constraints.

This enables utilities to reduce operational complexity, improve deployment efficiency, and maintain reliable data flow from distributed infrastructure.

What should utilities consider next?

A: Utilities should evaluate connectivity as a long-term lifecycle capability rather than a one-time provisioning step. SGP.32 provides the foundation for this model, while AirOn360® IoT and IoTgo® services ensure operational continuity across installation, operation, and maintenance phases.

Early validation through pilot deployments is recommended to ensure integration with existing utility IT/OT systems and large-scale rollout strategies.



Secure connections.
Unlimited potential.

About Giesecke+Devrient

Giesecke+Devrient (G+D) is a global SecurityTech company headquartered in Munich, Germany. G+D makes the lives of billions of people more secure. The company shapes trust in the digital age, with built-in security technology in three segments: Digital Security, Financial Platforms and Currency Technology.

G+D was founded in 1852 and today has a workforce of 14,500 employees. In the fiscal year 2025, the company generated a turnover of 3.2 billion euros. G+D is represented by 118 subsidiaries and joint ventures in 41 countries.

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