



Connectivity with Compatibility

Providing the best meter communication solutions





ZENNER USA

All that counts.

Providing the best meter communication solutions



AMI

Smart City Connectivity

Get Smart with the Latest in Meter Automation

ZENNER technologies can be used as stand-alone or combined into one connectivity solution:

LoRaWAN, Ground-Based Mesh, Cellular

Flowing into one customer-facing, single database for simpler management of utility information.



Cellular
Great as stand-alone or for just reading outlying meters

Ground-Based Mesh

Reliable, Proprietary, Fixed-Network AMI

Use Stand-alone or combine any of ZENNER's connectivity options

Connectivity

Walk/Drive by

For customers not ready to deploy a fixed network, ZENNER offers the ability to upgrade to a fixed network without changing hardware.

Advantages: does not require a fixed network or IoT to operate. Hardware is fixed network ready.

LoRaWAN (Fixed Network)

A low-cost hub & spoke solution for customers with flat terrain or who have/plan to deploy a municipal open-standard based wireless IoT infrastructure. (Also for use with a 3rd-party LoRaWAN IoT infrastructure.)

Advantages: increased sensitivity, resistant to signal interference, long distance reach over flat terrain

Ground Based Mesh (GFSK)

An advanced proprietary solution that can cover any topology, web around hills and buildings, across gaps, and provide coverage in ways star networks and LoRaWAN systems cannot.

Advantages: Large packet sizes (wireless over network updates), Better error correction, covers any topology

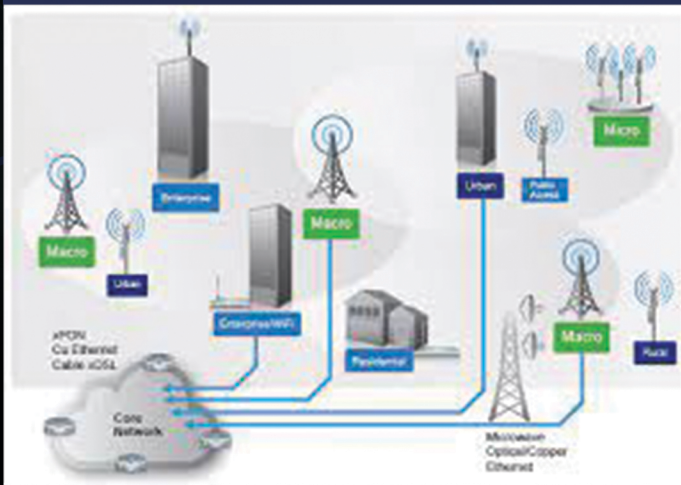
Cellular

Cellular - Uses the built telecommunication network from a service provider. Using the network requires minimal investment into connectivity infrastructure. LTE and 5G are the principal technologies.

Advantages: Use a prebuilt infrastructure, low-cost for outlying endpoints not within nearby proximities

Cellular

Great as a standalone system, or combine with LoRa or Mesh to reach outlying areas



Using the flexibility of cellular technology, utilities can cost-effectively and selectively use existing cellular infrastructure to provide all of their smart city networking needs.

LoRaWAN

Open protocol system that allows thousands of different devices the municipality or community can connect over one network

Monitor other utility assets such as pump stations and tanks








ZENNER is a global leader in the design, manufacturing, and deployment of LoRaWAN systems and devices.

LoRaWAN technology is long range, low power, reducing the maintenance and increasing the life of individual automated devices.

ZENNER is part of the LoRaWAN Alliance, expanding innovation and devices capable of achieving the goal of making our cities and communities smarter through connectivity.

LoRaWAN

Key characteristics of LoRaWAN devices

 Low cost Lower than mission critical technologies	 Long range From 2-15 miles	 Low consumption Longer battery life, better ROI	 Bidirectional Uplink and downlink	 Security High resistance to jammers	 Open standard At all levels of the ecosystem	 Flexibility Mobility & Lora P2P
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Long battery life (smaller data packages)

Wide area connectivity (due to modulation scheme)

Low cost chipsets and networks

Massive device volumes sending small data packets

Simple & quick deployment (due to association at the factory before shipping)

Designed to serve the IoT.

ZENNER USA can set up your network, or you can purchase and own your LoRaWAN network

The fastest, least expensive way to get data and make smarter decisions

Ground-Based Mesh

Stealth Reader[®]



Ground-Based Mesh is one of the most affordable, reliable, and easily expandable automation solutions available

Mesh works where other technologies fail in deploying AMI/IoT (Difficult terrains, dense obstacles).

ZENNER ground-based mesh is self-healing, meaning it can relay around signal obstacles, like trees, terrain, and new buildings.

Ground-Based Mesh

GFSK (Gaussian Frequency Shift Keying)

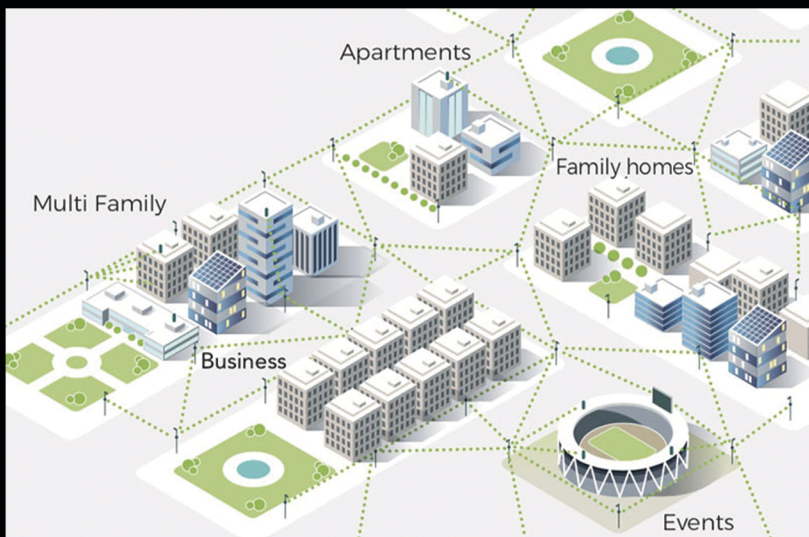
Key Unique Benefits:

Redundancy - data is not lost if an endpoint goes down

Send Larger Data Packets - software updates remotely

Proprietary Network - have control with a secure network

Mesh Adapts - mesh can web around topography changes



Mesh creates a web around obstructions.

Mesh is a self-healing network, able to adapt to ever-changing communities and environments.

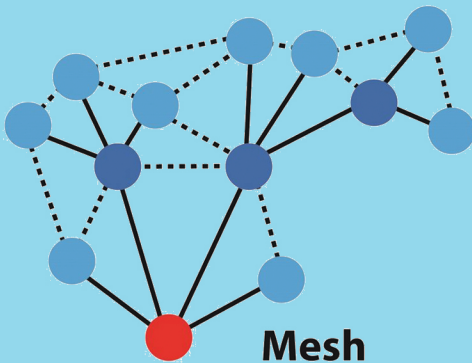
LoRaWAN vs GFSK



2-15 miles
Flat/Open Terrain

ZENNER LoRaWAN Hub & Spoke

Create redundancy with multiple collectors, while taking advantage of low power chirps. Chirps use short bursts of frequency that transmits small amounts of data increasing the range of LoRaWAN systems. Long range transmission allows for a more robust and cost effective solution compared to traditional line of sight systems, especially on flat terrain.

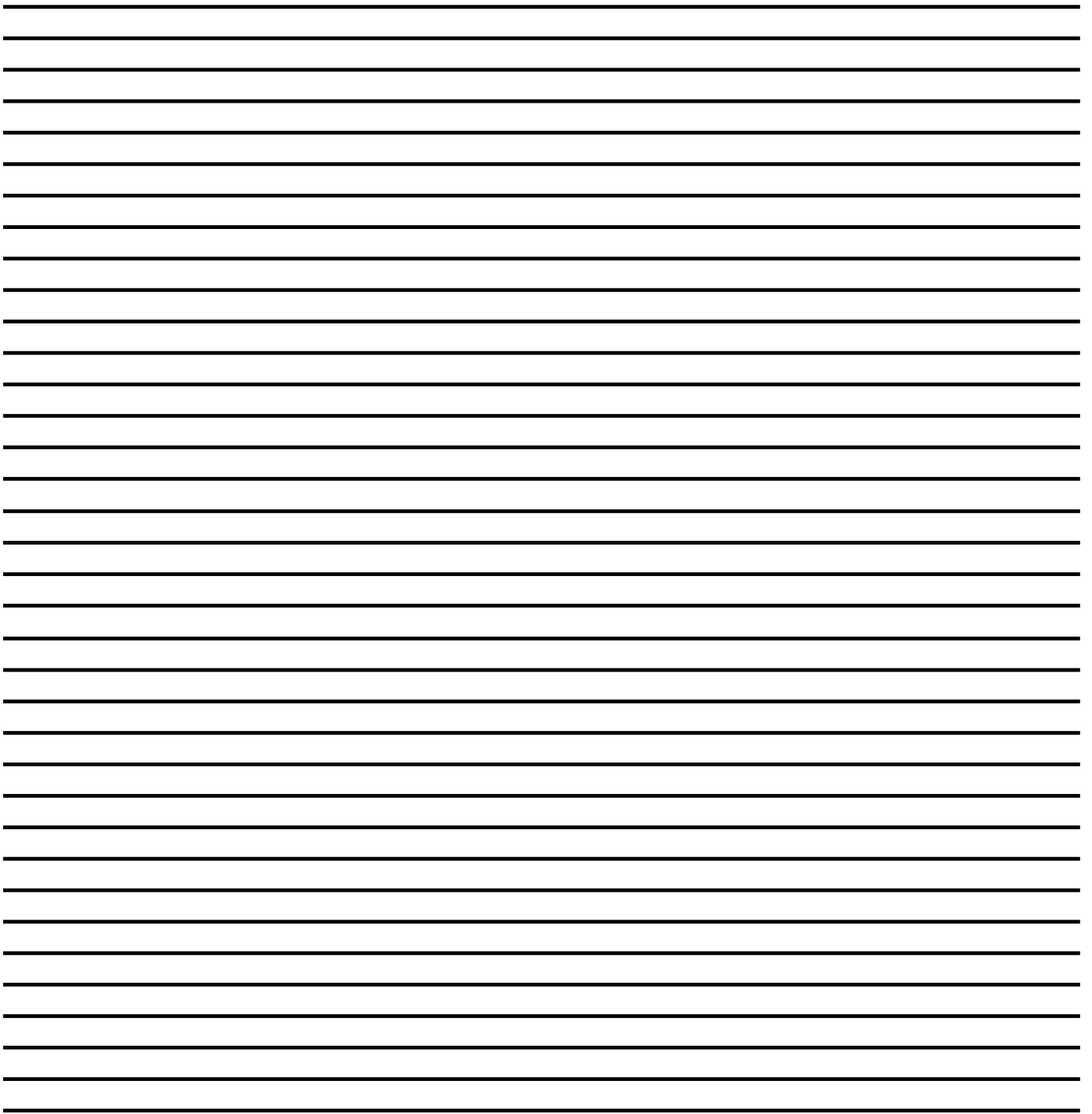


1-3 miles
All Terrain

ZENNER Mesh (GFSK)

GFSK transfers larger data packets which allows for increased redundancy (internal web) and remote updates. Mesh is the champion for challenging terrain and areas with difficult line of sight obstructions. GFSK modulation implemented by ZENNER vastly improves the reliability and distance the ground-based systems can achieve.







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