Remote Secure Connectivity
Manage Devices And Security From Anywhere, Anytime

> Global Cellular Connectivity
> Secure Connectivity
> Data Management Portal
> Quad Core, A53 Processor
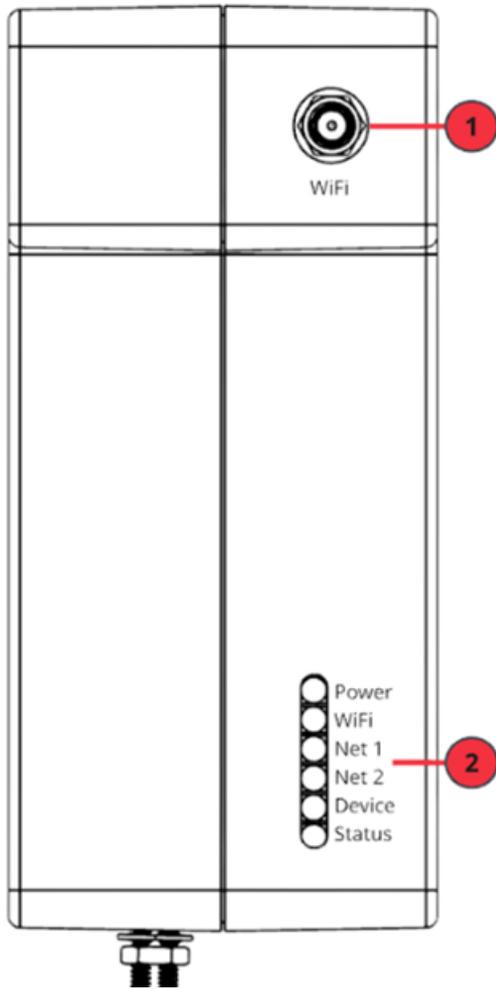> WAN Failover

ES1000

The FreeWave Elements™ ES1000 goes beyond traditional cellular gateways and standard network devices. Built on FreeWave's Zentry™ zero-trust security platform and managed through the Zentry console, the ES1000 enables virtually instant access and management your edge devices on an advanced security fabric.
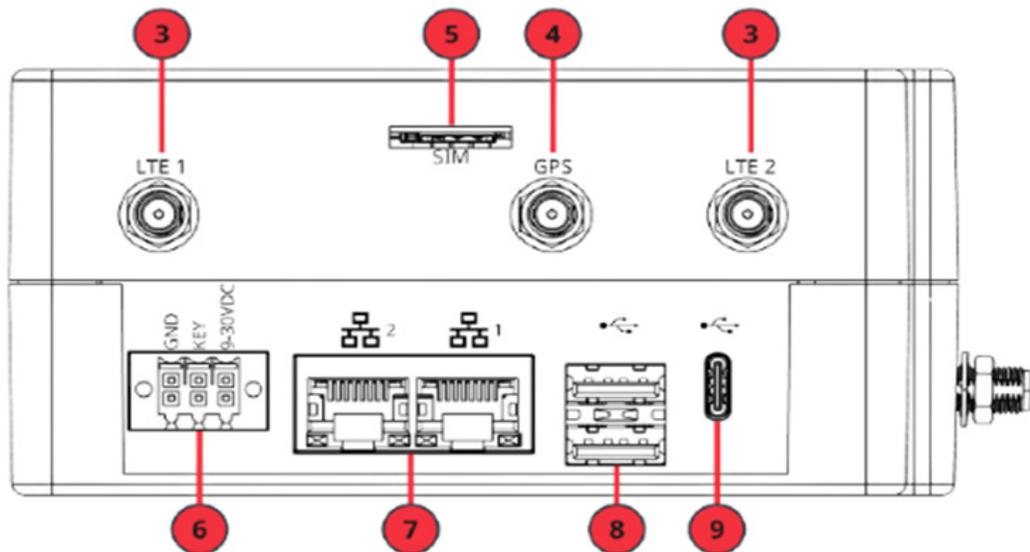
ES1000 WHAT'S IN THE BOX

Item	Part Number	Qty	Description
Gateway	ES1000	1	FreeWave Elements ES1000, highly configurable LTE IoT gateway designed to fit to any industrial IoT solution
Antennas	EAN0047LT	2	Cellular antenna Right Angle Straight male SMA
	EAN2455SR	1	WiFi Antenna
Cable	ASC0018AA	1	8-inch Black & Red cable with term blog plug 6Pos Str 3.5 mm
Power Options	EMD1280CO	1	Wall Adapter / Includes Terminal Block, Attached
SIM Card/Service	IOT.CELL.IND.1SIM-I	1	Velocity IoT Sim Card
	IOT.CELL.ONERATE+	1	Velocity IoT International Data Plan
Zentry	Zentry Services	1	Zero-Trust architecture solution for secured connectivity
Optional Accessories			
DIN Rail Mount	MBRK-DIN-ES1K	1	ES1000 DIN Rail Mounting Bracket

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ES1000 PRODUCT DIAGRAM

1. Wi-Fi Antenna Connector (Female SMA)
2. LED Panel
3. LTE Antenna Connectors (Female SMA)
   LTE 1: Main Antenna
   LTE 2: Diversity Antenna
4. GPS Antenna Connector (Female SMA) – Available in the Future
5. SIM Card (Pre-Installed and Pre-Activated)
6. Power Port (Vehicle Key On/Off Available in the Future)
7. Ethernet Ports
8. USB-A Ports (USB 2.0)
9. USB-C Service Port (Cable Not Included)

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ES1000 TECHNICAL SPECIFICATIONS

Category	Specification
Processor	NXP i.MX 8M Plus, Quad-Core A53, NPU (2.3 TOPS)
Memory – RAM	4GB LPDDR4
Memory – ROM	32GB eMMC Flash
Memory	256GB User Storage Space
Wi-Fi	2.4GHz, 802.11a/b/g/n/ac
Ethernet	2× Gigabit (1 Gbps, Bridged)
Ethernet 1 Link Modes	10Base-T Half / Full; 100Base-T Half / Full; 1000Base-T Full
Ethernet 2 Link Modes	10Base-T Full; 100Base-T Full; 1000Base-T Full
USB	2× USB-A, 1× USB-C (USB 2.0 480Mbps)
Cellular – LTE	Bands: B1, B2, B3, B4, B5, B7, B8, B12, B13, B14, B18, B19, B20, B25, B26, B28, B29, B32, B38, B39, B40, B41, B42, B43, B48, B66, B71, B106
Cellular – HSPA+	Bands: B1, B2, B4, B5, B6, B8, B9, B19
Peak Data Rate	LTE: 600 Mbps DL / 150 Mbps UL
GNSS	GPS, Galileo, (ext. antenna required, not included)
Antenna	SMA (Main, Aux/GNSS, GNSS)
Failover	Configurable nested WAN failover between Ethernet, WiFi, and Cellular connections
Operating System	Linux with Docker support
Security	Secure Boot, Encrypted FS, Signed Apps, Zero Trust Agent (pre-installed)
Power Input	9–30 VDC
Power Consumption	Avg: 9 W (0.75 A @12 VDC); Peak: 17 W (1.4 A @12 VDC)
Dimensions	5.9 × 12.6 × 12.1 cm (2.323 × 4.949 × 4.764 in)
Weight	743 g (1.64 lbs)
Operating Temp	−20° to +70°C (−4° to +158°F)
Compliance	FCC Part 15.109
Model Number	ES1000

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ES1000 EAN2455SR ADJUSTABLE ANTENNA

Parameter	Specification
Frequency Range	2.4–2.5 GHz & 5.0–6.0 GHz
Gain	2.3 dBi max
VSWR	2:1 over band
Impedance	50 Ω nominal
Maximum Power	10 Watts
Connector	SMA Male
Length (Straight)	3 7/8 in (99 mm)
Length (90° Angle)	3 1/8 in (79 mm)
Inside Clearance (90°)	13/16 in (21 mm)
Case Material	Polyurethane
Operating Temp.	–40°F to +185°F (–40°C to +85°C)
Shock & Vibration	EN 61373, IEEE 1478, MIL-810G, TIA-329.2-C
Water Ingress	IPx5

ES1000 N0047LT LTE ANTENNA

Parameter	Specification
	LTE Bands (2G/3G/4G, CDMA, DCS, PCS, GSM, Whip Straight Angle)
Frequency Range	703–960 MHz (0.703–0.960 GHz) 1710–2170 MHz (1.71–2.17 GHz) 2300–2400 MHz (2.3–2.4 GHz) 2500–2690 MHz (2.5–2.69 GHz)
Peak Gain	–0.2 dBi @ 700 MHz 1.9 dBi @ 850 MHz 3.5 dBi @ 960 MHz 3.7 dBi @ 1710 MHz 1.5 dBi @ 1990 MHz 2.4 dBi @ 2170 MHz 2.6 dBi @ 2400 MHz 4.7 dBi @ 2550 MHz 5.6 dBi @ 2700 MHz
Feed Impedance	50 Ω
Power Handling	30 dBm
Interface	SMA Male (SMA-M)
Dimensions	205.9 × 35 × 7.7 mm (8.1 × 1.38 × 0.3 in)
Weight	40 g (1.4 oz)
Operating Temp.	–40°C to +85°C (–40°F to +185°F)
Humidity Range	5% – 95%
Cover Material	Plastic (Black)