Cellular Connectivity

Nodegrid Services Router and Nodegrid Serial Console appliances offer many cellular connectivity options, covering single- and dual-5G or 4G. These give customers resilient access to branch, edge, and IIoT locations and solutions, for business use cases ranging from retail to industrial manufacturing.

Customers can select from single- and dual-modem options for **5G, 4G, and 4G-FirstNet** deployments, providing up to 3.4Gbps (5G) download speed per active modem.

Nodegrid devices offer a dual-modem, quad-SIM option. This provides the ultimate in connectivity and resilience, enabling two concurrent Internet connections without any switch-over time between carriers. Both modems are always online to keep customers covered.

The wireless WAN Internet connection brings two main benefits:
1. It serves as a lifeline for management, with secure out-of-band access via Internet connection
2. It prevents downtime, providing IP passthrough to keep production networks online

This flexibility and data throughput enable many use cases, especially when paired with the open Nodegrid OS, tertiary failover options, and 3rd-party app hosting (SD-WAN, NGFW). Nodegrid devices serve as the resilience gateway for isolated out-of-band management, and branch and edge routing; create a Services Delivery Platform for agile and orchestrated deployments/ops at industrial, edge, and IoT sites; and provide a secure environment for Disaster Recovery and ransomware recovery.

Overview
Bringing locations online requires enterprise connectivity, which usually means waiting weeks or months for fixed lines to be installed. Slow deployments limit how quickly business can scale to meet demand. Cellular connectivity — especially 5G — solves this problem.

5G is becoming a hard requirement for many enterprise applications, but administrators still face challenges deploying cellular-based connectivity around the globe. These include changing ISPs, variations in vendor support, quality of connectivity per location, and a lack of flexibility to meet evolving needs.

ZPE Systems' Nodegrid SR appliances were built with these challenges in mind. Nodegrid's cellular connectivity is reliable and consistent across the globe. Combined with ZPE Systems' data plans and ZPE Cloud for global device management, customers can deploy units directly from the factory to their worldwide locations, without the need to pre-stage devices or place specialized staff on-site.

Three modem options meet any customer requirement:

● 5G modem, which provides global 5G, 4G, and 3G coverage in the sub-6 spectrum range
● Default 4G modem, which provides global 4G and 3G coverage with up to 600Mbps download
● FirstNet-Capable modem (USA Band 14), which provides global 4G and 3G coverage to first responders

Features

- Support for global 5G, LTE, and UMTS connectivity
- AT&T and Verizon certified
- FirstNet-ready (Band 14)
- Max Throughput (Down/Up):
  - 5G: 3.4 Gbps/460 Mbps
  - LTE: 1.6 Gbps/211 Mbps

- Dual-SIM support per modems
- Multi-Active modem support
- Multi-Failover support (3 levels)
- IP-Passthrough support
- SMS-based status
- Geo Location and Geo Whitelisting support via GNSS
- Antenna extension available

While 5G/4G are vital to connectivity, resilience also depends on the software running the connection. Nodegrid OS enhances site reliability, with features like:

- Regular cellular connectivity health check, which detects and corrects connectivity issues
- Cellular connectivity history, which gives a historical view of signal strength and data throughput
- Multi-level failover options enable failover and fallback between multiple modems and multiple ISPs
- IP-Passthrough: Customers can enable Nodegrid SR cellular connectivity to downstream routers
- SMS-based actions enable customers to control and retrieve information from the modem
- Geolocation and Geo-based Whitelisting: GPS-based location details can be used by administrators to control access to the appliance or to perform a secure wipe as needed

Technical Specifications

- 5G Modem:
  - Uses a Telit FN990A40/A28
  - Global support for 5G/4G (LTE) and 3G (UMTS)
  - Dual-SIM support
  - Max Throughput (down/up): 5G: 3.4 Gbps/550 Mbps, LTE: 1.6 Gbps/211 Mbps, UMTS: 42 Mbps/11 Mbps
  - GNSS support (GPS, GLONASS, BeiDou, Galileo,)
  - Regulatory Approval: GCF, RED, PTCRB, FCC, IC, NCC, JATE/TELEC, RCM, KC
  - Support for private 5G
- Default 4G/LTE Modem:
  - Uses a Sierra Wireless EM7565
  - AT&T and Verizon certified
  - Dual-SIM support
  - Default Bandwidth: 60Mhz
  - Max Throughput (down/up): LTE: 600 Mbps/150 Mbps, UMTS: 42 Mbps/5.76 Mbps
  - Global support for 4G (LTE) and 3G (UMTS)
  - GNSS support (GPS, GLONASS, BeiDou, Galileo, QZSS)
  - Regulatory Approval: GCF, RED, PTCRB, FCC, IC, NCC, JATE/TELEC
- FirstNet Capable Modem :
  - Uses a Quectel EM120R-GL
  - FirstNet Capable
  - AT&T and Verizon certified
  - Dual SIM support
  - Max Throughput (down/up): LTE: 600 Mbps/150 Mbps, UMTS: 42 Mbps/5.76 Mbps
  - Global support for 4G (LTE) and 3G (UMTS)
  - GNSS support (GPS, GLONASS, BeiDou, Galileo)
  - Regulatory Approval: GCF, CE, PTCRB, FCC, IC, Anatel, IFETEL, NCC, KC, JATE/TELEC, RCM, ICASA, SRRC/ NAL/ CCC
- Connectors: SMA connectors
- Supported Appliances: Nodegrid NSCP and all Nodegrid SR appliances

Ordering Information
Default 4G/LTE

Supported Models	Single 4G SKU	Dual 4G SKU
Nodegrid Net SR	NSR-M2-4G NSR-M2-4G-WiFi NSR-M2-4G-128GB NSR-M2-4G5G	Supported (inquire for SKU)
Nodegrid Gate SR	ZPE-GSR-48-4G ZPE-GSR-48-4G-W5 ZPE-GSR-48-4G-W5-D128G ZPE-GSR-816-4G ZPE-GSR-816-4G-W5 ZPE-GSR-816-4G-W5-D128G	Supported (inquire for SKU)
Nodegrid Hive SR	ZPE-HSR416-4G-GW ZPE-HSR416-4G-W5-GW ZPE-HSR416-4G-W5-D128G-GW	Supported (inquire for SKU)
Nodegrid Bold SR	ZPE-BSR-24-4G ZPE-BSR-24-4G-W5 ZPE-BSR-24-4G-W5-D128G ZPE-BSR-48-4G ZPE-BSR-48-4G-W5 ZPE-BSR-48-4G-W5-D128G	Supported (inquire for SKU)
Nodegrid Link SR	ZPE-LSR24-4G ZPE-LSR24-4G-W5 ZPE-LSR24-4G-W5-D128G ZPE-LSR48-4G ZPE-LSR48-4G-W5 ZPE-LSR48-4G-W5-D128G	Not Supported
Nodegrid Mini SR (Single SIM Only)	ZPE-MSR24-4G ZPE-MSR24-4G-W5 ZPE-MSR24-W5-EXT ZPE-MSR24-4G-EXT ZPE-MSR24-4G-W5-EXT	Not Supported
Nodegrid Serial Console Plus	ZPE-NSCP-TxxR-STND-SAC-4G ZPE-NSCP-TxxR-STND-DAC-4G ZPE-NSCP-TxxR-STND-DDC-4G ZPE-NSCP-TxxR-STND-SAC-W5-4G ZPE-NSCP-TxxR-STND-DAC-W5-4G ZPE-NSCP-TxxR-STND-DDC-W5-4G	Not Supported xx – Amount of ports. Options are 16, 32, 48, 96

FirstNet Capable (Band 14)

Supported Models	Single 4G SKU	Dual 4G SKU
Nodegrid Net SR	Supported (inquire for SKU)	Supported (inquire for SKU)
Nodegrid Gate SR	Supported (inquire for SKU)	Supported (inquire for SKU)
Nodegrid Hive SR	Supported (inquire for SKU)	Supported (inquire for SKU)
Nodegrid Bold SR	Supported (inquire for SKU)	Supported (inquire for SKU)
Nodegrid Link SR	Supported (inquire for SKU)	Not Supported
Nodegrid Mini SR	Supported (inquire for SKU)	Not Supported
Nodegrid Serial Console Plus	Supported (inquire for SKU)	Not Supported

5G

Supported Models	Single 5G SKU	Dual 5G SKU
Nodegrid Net SR	NSR-M2-5G NSR-M2-5G-WiFi NSR-M2-4G5G	Supported (inquire for SKU)
Nodegrid Gate SR	ZPE-GSR-816-5G **All ZPE-GSR-4x-xxxx models are not supported	*Call for SKU **All ZPE-GSR-4x-xxxx models are not supported
Nodegrid Hive SR	ZPE-HSR416-5G-GW	Supported (inquire for SKU)
Nodegrid Bold SR	Supported (inquire for SKU)	Supported (inquire for SKU)
Nodegrid Link SR	Not Supported	Not Supported
Nodegrid Mini SR	Not Supported	Not Supported
Nodegrid Serial Console Plus	Supported (inquire for SKU)	Not Supported

Accessories

Cellular Antenna Extender:

- Two Integrated cables, 3m (10 feet) or up to 8m (26 feet) with extension cable (CAB.S05M)
- Two SMA connectors
- Wall mount and magnetic mount option
- Indoor Use

SKU	Description
TG.08.0113B	Cellular/GPS/GLONASS/ BEiDOU1561-1575-1602 MHz antenna Hinged SMA Male - All Black, for LSR, BSR, GSR, NSR
MB.250.B	Magneto LTE/Cellular MIMO Magnet Mount Antenna Base w/ 2x SMA(F)RA -LTE Cell 1+2:3M CFD200 SMA(M)ST
CAB.S05M	CCD39720C011D005000 SMA Straight Jack (Female Socket) 5000mm, CFD-200, SMA Straight Plug (Male Pin)

Max Amount of Supported Cellular Modems by Model

Model	SKU	5G	4G	FirstNet	Wi-Fi
Nodegrid Net SR	ZPE-NSR-8x-xxx	5	10	10	10*
	ZPE-NSR-4x-xxx	5	10	10	10*
	ZPE-NSR-48L-DAC	5	10	10	10*
Nodegrid Gate SR	ZPE-GSR-4x-xxx	0	2	2	1
	ZPE-GSR-8x-xxx	2	2	2	1
Nodegrid Hive SR	ZPE-HSR4x-xxx	1	2	2	1*
	ZPE-HSR8x-xxx	1	2	2	1*
Nodegrid Bold SR	ZPE-BSR-2x-xxx	2	2	2	1
	ZPE-BSR-4x-xxx	2	2	2	1
Nodegrid Link SR	ZPE-LSR2x-xxx	0	1	1	1
	ZPE-LSR4x-xxx	0	1	1	1
Nodegrid Mini SR	ZPE-MSR2x-xxx	0	1	1	1**
Nodegrid Serial Console Plus	NSCP-TxxR-STND-xxx	1	1	1	1

Supported RF Bands

Bands	5G			4G		Firstnet Capable	
	5G	4G	3G	4G	3G	4G	3G
1	YES	YES	YES	YES	YES	YES	YES
2	YES	YES	YES	YES	YES	YES	YES
3	YES	YES		YES		YES	YES
4		YES	YES	YES	YES	YES	YES
5	YES	YES	YES	YES	YES	YES	YES
6			YES		YES		YES
7		YES		YES		YES	
8	YES	YES	YES	YES	YES	YES	YES
9				YES	YES		
12		YES		YES		YES	
13		YES		YES		YES	
14		YES				YES	
17		YES				YES	
18		YES		YES		YES	
19		YES	YES	YES	YES	YES	YES
20	YES	YES		YES		YES	
25						YES	
26		YES		YES		YES	
28		YES		YES		YES	
29		YES		YES		YES	
30	YES	YES		YES		YES	
32		YES		YES		YES	
34		YES					
38	YES	YES				YES	
39		YES				YES	
40	YES	YES				YES	
41	YES	YES		YES		YES	
42		YES		YES		YES	
43		YES		YES		YES	
46		YES		YES		YES	
48	YES	YES		YES		YES	
66	YES	YES		YES		YES	
71	YES	YES					
75	YES						
77	YES						
78	YES						
79	YES						

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