DATA SHEET

NEWBRIDGE R690-5G

Industrial 5G Router with Wi-Fi 6

5G NR | 4G LTE | WI-FI 6



A ruggedised 5G router for vehicles and industrial sites — 5G SA/NSA with 4G and 3G fallback, dual-band 2×2 Wi-Fi 6, five Gigabit Ethernet ports, serial and digital I/O, and a 10–55 V DC input with ignition sense, in a fanless aluminium enclosure rated −40 °C to 85 °C.

5G SA/NSA	5 × GbE	−40…85 °C
3GPP RELEASE 16	WAN / LAN PORTS	OPERATING RANGE

CELLULAR

- 5G NR Sub-6 GHz, SA and NSA
- Up to 3.5[1] Gbps downlink
- 4×4 downlink MIMO, 4 antennas
- Dual nano-SIM slots

WI-FI 6 & POSITIONING

- 802.11ax 5 GHz 2x2 – 1,201[2] Mbps
- 802.11ax 2.4 GHz 2x2 – 574[2] Mbps
- Access point and client modes
- Multi-constellation GNSS

WIRED & I/O

- 5 × Gigabit Ethernet, any as WAN
- Optional 802.3af/at PoE output
- 2 × RS-485 or CAN, 1 × RS-232
- 1 × digital in, 1 × relay out, USB 2.0

RUGGED DESIGN

- 10–55 V DC with ignition sense
- Reverse-polarity and surge protection
- Locking FAKRA antenna connectors
- Fanless aluminium enclosure, IP30

INTRODUCTION

The Newbridge R690-5G is an industrial 5G router built for the power, temperature and vibration conditions found in vehicles and unattended sites. It converts a 5G, 4G or 3G mobile connection into five Gigabit Ethernet ports and a dual-band Wi-Fi 6 network, giving buses, service fleets, engineering and mining vehicles, kiosks and remote cabinets a fast, managed link.

A Qualcomm 5G modem supports both standalone and non-standalone 5G networks, with 4×4 downlink MIMO across four antenna ports. Two nano-SIM slots let the router hold a second operator profile.

Every antenna port uses a colour-keyed FAKRA connector, the locking automotive standard, so cables stay seated under vibration and cannot be mated to the wrong port.

Power comes from a 10–55 V DC input that accepts 12 V, 24 V and 48 V vehicle and site supplies directly. A dedicated ignition (ACC) line starts the router with the vehicle, and the input is protected against reverse polarity and surges.

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On the wired side, any of the five Gigabit ports can be assigned as a WAN port, and the cellular link, a wired WAN and a Wi-Fi client link can back each other up. The four LAN ports can optionally supply 802.3af/at PoE to cameras, access points and IP phones on board.

Dual-band 2×2 Wi-Fi 6 serves passengers and on-board devices on 2.4 GHz and 5 GHz at the same time, or joins an existing Wi-Fi network as a client.

For telemetry and control, the router carries two RS-485 ports (or two CAN bus ports as an option), an RS-232 port, a digital input and a relay output. Satellite positioning is reported over the network in NMEA 0183 format.

The Linux-based system runs Docker containers, so custom applications can be hosted on the router itself. Remote management covers status and signal monitoring, reboot, firmware upgrade, TR-069 and SNMP.

[1] Cellular rates are theoretical peak rates of the 5G modem: up to 3.5 Gbps downlink / 555 Mbps uplink in 5G NSA, and up to 2.5 Gbps downlink / 900 Mbps uplink in 5G SA. Actual speed depends on the mobile network, signal conditions, spectrum and SIM plan. Wired ports are Gigabit Ethernet.

[2] Wi-Fi rates are theoretical PHY (link) rates — 2×2 with 80 MHz channels and 1024-QAM on 5 GHz, and 2×2 with 40 MHz channels and 1024-QAM on 2.4 GHz — not user-achievable throughput. The combined 1,775 Mbps figure is the sum of the two PHY rates. Actual wireless throughput and coverage vary with environment, antenna placement and client devices.

INTERFACES



Antenna and I/O panel — two Wi-Fi and one GNSS FAKRA connector, the RS-485/CAN and digital I/O terminal block, the RS-232 port, and four 5G FAKRA connectors.

ANTENNA & I/O PANEL

5G antennas	‣ Black — Main (transmit / receive) ‣ White — Diversity (receive) ‣ Blue — MIMO 1 (receive) ‣ Magenta — MIMO 2 (transmit / receive)
Wi-Fi antennas	‣ Grey — Wi-Fi 1, dual-band 2.4 / 5 GHz ‣ Brown — Wi-Fi 2, dual-band 2.4 / 5 GHz
GNSS antenna	1 × FAKRA, for the optional dedicated GNSS receiver
Terminal block	A1, B1, A2, B2 (RS-485 or CAN), DI+, DI−, DO, COM
RS-232	1 × RJ45 (TXD, RXD, GND)

NETWORK & POWER PANEL

Ethernet	1 × WAN and 4 × LAN, 10/100/1000 Mbps RJ45 (default roles)
SIM	Dual nano-SIM tray (SIM 1 / SIM 2)
USB	1 × USB 2.0 Type-A
Power	GX12 3-pin locking connector: V+, V−, ACC
Indicators	PWR, SYS, SIM 1, SIM 2, and two cellular signal-strength bars
Reset	Recessed button; hold 6 seconds to restore factory defaults

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SYSTEM PLATFORM

Processor	Qualcomm quad-core, 1.8 GHz
Memory	1 GB DDR3 (8 Gbit)
Storage	4 GB eMMC
Operating System	Embedded Linux with Docker container support; secure boot

CELLULAR

5G Modem	Qualcomm Snapdragon X62, 3GPP Release 16
Network Modes	5G NR standalone (SA) and non-standalone (NSA); 4G LTE; 3G WCDMA
5G NR Sub-6 GHz	n1, n3, n5, n7, n8, n20, n28, n38, n40, n41, n75, n76, n77, n78
LTE-FDD	B1, B3, B5, B7, B8, B20, B28, B32
LTE-TDD	B38, B40, B41, B42, B43
WCDMA	B1, B5, B8
MIMO	‣ Downlink 4×4: n1, n3, n7, n38, n40, n41, n77, n78 ‣ Uplink 2×2: n38, n40, n41, n77, n78
Peak Rates (theoretical)	‣ 5G NSA: 3.5 Gbps down / 555 Mbps up ‣ 5G SA: 2.5 Gbps down / 900 Mbps up ‣ LTE: 1.6 Gbps down / 211 Mbps up ‣ WCDMA: 42 Mbps down / 5.76 Mbps up
Transmit Power	‣ Class 3, 23 dBm ±1.5 dB – LTE and 5G NR bands ‣ Class 3, 23.5 dBm ±1.5 dB – WCDMA bands ‣ Class 2, 26 dBm ±1.5 dB – B41, n41, n77, n78
SIM	2 × nano-SIM serving one 5G modem
Antenna Ports	4 × FAKRA

WI-FI

Wireless Standards	IEEE 802.11a/b/g/n/ac/ax (Wi-Fi 6), concurrent dual-band
Frequency Bands	2.412–2.472 GHz · 5.150–5.850 GHz
Spatial Streams	2×2 MU-MIMO per band
Channelization	2.4 GHz: 20, 40 MHz · 5 GHz: 20, 40, 80 MHz
Peak PHY Rate	2.4 GHz 574 Mbps · 5 GHz 1,201 Mbps · 1,775 Mbps combined
Modulation	Up to 1024-QAM
Transmit Power	Up to 27 dBm per chain, conducted; limited in firmware to the local regulatory maximum
Operating Modes	Access point; client (bridge)
Antenna Ports	2 × FAKRA, dual-band

POSITIONING (GNSS)

Standard	GNSS receiver integrated in the 5G modem, sharing the 5G antennas
Option	Dedicated GNSS receiver with built-in LNA, inertial navigation support and its own FAKRA antenna port
Constellations	GPS, GLONASS, BeiDou, Galileo, QZSS
Signals (dedicated)	GPS L1 C/A, Galileo E1, QZSS L1, GLONASS L1, BeiDou B1
Accuracy	Position < 1.5 m CEP; velocity < 0.1 m/s
Time to First Fix	Cold < 32 s, warm < 25 s, hot < 2 s
Sensitivity	Tracking −162 dBm, reacquisition −152 dBm, acquisition −145 dBm
Output	NMEA 0183 over TCP; 1 Hz default, up to 10 Hz

WIRED INTERFACES

Ethernet	5 × 10/100/1000 Mbps RJ45; any port assignable as WAN
PoE Output (option)	4 LAN ports, IEEE 802.3af/at, up to 30 W per port
Ethernet Protection	Surge 2 kV differential, 4 kV common mode; ESD ±4 kV contact, ±8 kV air
RS-485 / CAN	2 × RS-485 (standard) or 2 × CAN bus (option), terminal block, up to 115,200 bps
RS-232	1 × RJ45, up to 921,600 bps
Digital I/O	1 × digital input (dry contact); 1 × relay output
USB	1 × USB 2.0

POWER

Input	10–55 V DC, GX12 3-pin (V+, V−, ACC ignition sense)
Protection	Reverse polarity; surge 4 kV common mode
Power Consumption	< 24 W max (router, without PoE output)
With PoE Output	48 V / 3 A (144 W) supply required to power all four PoE ports

PHYSICAL & ENVIRONMENTAL

Enclosure	Fanless aluminium, IP30
Dimensions	180 × 116 × 44 mm (excluding mounting brackets)
Weight	830 g
Mounting	Integrated side brackets, M4 screws
Operating Temperature	−40 °C to 85 °C
Storage Temperature	−40 °C to 95 °C
Humidity	Up to 95%, non-condensing

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SOFTWARE SPECIFICATION

Routing & WAN

- 5G, 4G and 3G cellular WAN with dual-SIM support
- Wired WAN on any Ethernet port
- Wi-Fi client (bridge) uplink
- Link backup between cellular, wired WAN and Wi-Fi
- Dynamic DNS client

Security & VPN

- Firewall, with enable and disable control
- Port forwarding and DMZ host
- Blacklist and whitelist access control
- VPN clients: IPsec, OpenVPN, L2TP, WireGuard

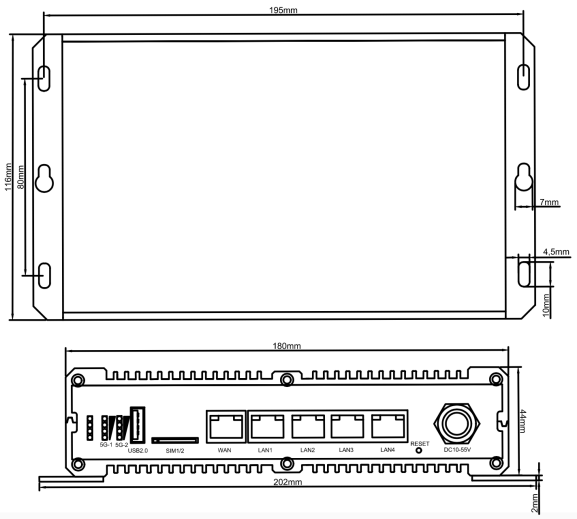
Wi-Fi

- Access point mode on 2.4 GHz and 5 GHz
- Client mode, bridging to an existing Wi-Fi network
- SSID and channel configuration

Management

- Remote status and signal monitoring
- Remote reboot, firmware upgrade and flight mode
- TR-069 client
- SNMP v1, v2c and v3
- Docker containers for customer applications
- GNSS position reporting, NMEA 0183 over TCP

DIMENSIONS (unit: mm)



180 × 116 × 44 mm, excluding mounting brackets

ORDER INFORMATION

ORDER NO.	DESCRIPTION
NB-R690-5G	Newbridge R690-5G Industrial 5G Router, 5G SA/NSA, dual-band Wi-Fi 6, 5 × Gigabit Ethernet, 2 × RS-485, RS-232, DI/DO, 10–55 V DC

FACTORY OPTIONS

PoE output	802.3af/at on the four LAN ports, with 48 V / 3 A supply
CAN bus	2 × CAN in place of 2 × RS-485
Dedicated GNSS	Standalone receiver with its own antenna port

Factory options are fitted at manufacture. State the options required when ordering.

IN THE BOX

- R690-5G router
- 4 × 5G antennas and 2 × Wi-Fi antennas, FAKRA
- 12 V / 2 A power adapter
- 1.5 m Ethernet cable

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Contact us at https://www.newbridge-tech.com/

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