

NB1601 Industrial Router

Ruggedized Router with LTE, WiFi, GNSS and 4x Ethernet



The NB1601 LTE & WLAN combines a cellular router and a WiFi in one device. Four Ethernet ports, digital I/O, a serial port, GNSS and an extension slot enable applications as condition monitoring or telemetry.

As the successor to the well-established NB1600, the new NB1601 industrial router offers the key technologies for stationary applications requiring reliable Internet access. The NB1601 enables wireless Internet access and ensures high availability using two SIM cards from different providers. As a special highlight, the NB1601 offers four Ethernet ports, which are highly configurable. Each port can be configured either as a LAN or as a WAN port. The also integrable WLAN IEEE 802.11abgn module opens up further possibilities for easy integration of devices into the network. The router also has GNSS with the satellite systems GPS, GLONASS, Galileo and BeiDou.

For the application as a device server, the router also has two isolated binary digital inputs and relay outputs for connecting sensors and actuators as well as a serial RS-232/485 combo-interface. The NB1601 comes with an USB port which allows fast configuration and firmware update via memory stick. In addition, with Extension EXT 2 there is a set of project-bound expansion interfaces such as RS-232, RS-485, CAN and IBIS or an additional modem available.

The durable metal housing suitable for DIN rail mounting in combination with the supported temperature range -40 °C to 70 °C stands for robustness and enable use in challenging conditions.

It's possible to run customer applications in a LXC Container. The SDK environment allows to implement all types of applications with simple scripts. Data preprocessing can be done directly on the router, thus saving an additional IPC.

The supplied router software is based on well proven components including an embedded Linux operating system and a wide range of communication and routing protocols as Mobile IP, OSPF, BGP and RSTP. With its powerful VPN protocol suite, remote devices can easily and securely be connected. Other features include a smart Link Manager for optimized cellular connections, Quality of Service (QoS) for an efficient data exchange, E-Mail and SMS for alarming and notifications, a web server and RADIUS authentication and hidden SSID's for WLAN.

Applications

- WiFi client
- Condition monitoring
- Remote management
- Telemetry
- CCTV server
- Device server
- Industrial firewall
- VPN Server

Key Features

- LTE/UMTS/GSM
- Dual SIM
- WiFi, Bluetooth
- GNSS
- Ethernet switch
- 2/2 Digital I/Os
- RS-232, RS-485
- Extension slot
- Feature-rich software
- SDK scripting
- DIN rail mounting

Performance

- 600MHz single core ARM CPU
- 100 Mbps routing performance

Specifications

Mobile / Cellular	1 Standard multimode LTE, UMTS and GSM module 4G - LTE: B1 (2100), B3 (1800), B5 (850), B7 (2600), B8 (900), B20 (800) 3G - DC-HSPA+/UMTS: B1 (2100), B2 (1900), B5 (850), B8 (900) 2G - GSM/GPRS/EDGE: B5(850), B8(900), B3(1800), B2(1900) Data rates: max. 150 Mbps downlink / 50 Mbps uplink (Bandwidth 20M CAT4) 2 SMA female antenna connectors supporting 2x2MIMO Modems for other regions on request.
SIM	2 Micro SIM (3FF) ETSI TS 102 221 V9.0.0
WLAN / WiFi	1 WiFi IEEE 802.11abgn up to 144 Mbps 2.4 GHz 2x2 MIMO, 150 Mbps 5 GHz SISO Access point / client mode; Max users in access point mode: 10 2 SMA female supporting MIMO or standard antennas
Bluetooth / BLE	1 Dual-Mode Bluetooth 4.2 and BLE. Up to 10 BLE connections. 1 SMA female, shared with WLAN by Bluetooth single antenna coexistence.
Ethernet Switch	4 Fast Ethernet ports, 10/100 Mbps, auto MDIX, RJ45 connectors
USB	USB 2.0 Host; USB A connector
Serial	1 Serial console, RS-232 (TxD, RxD, GND), up to 1Mbps; connector: 3 pins of 10-pin terminal block (w. screw), 3.5 mm pitch 1 Serial combo interface, RS-232 (TxD, RxD, GND) or RS-485 (D+, D-) modes configurable; connector: 3 pins of 8-pin EXT 1 terminal block (w. screw), 3.5 mm pitch
Digital I/O	2 DI: level 0 (0-3VDC), level 1 (9-32VDC), isolation 1.5kVp 2 DO: 0-32VDC/1A; isolation: 1.5kVp; Connectors: 1 DI + 1DO on 10-pin terminal block (w. screw), 3.5 mm pitch; 1 DI + 1DO on 8-pin EXT 1 terminal block (w. screw), 3.5 mm pitch
Storage	4GB internal eMMC flash (shared with host system)
Dimensions, weight	Width 45mm x height 124/134mm x depth 110/121mm, ca. 450g
Power	Nominal Input Voltages: 12VDC, 24VDC (+/-20%); Average power consumption: 7W Connector type: 2 pins of 10-pin terminal block (w. screw), 3.5 mm pitch
Environment	Temperature range: -40 °C to +70 °C; Ingress Protection Rating: IP40
MTBF	>300'000h
GNSS	1 GNSS data server supporting GPS, GLONASS, Galileo, BeiDou; tracking sensitivity up to -162 dBm; connector: SMA female, support for active and passive antennas
Extension EXT 2 (optional)	1 Additional modem (miniPCIe): LTE/UMTS/GSM, CDMA 450, LTE 450, LTE 750, GSM-R; -- or -- 1 Extension modules (planned); Isolated: CAN, DIO, RS-232, RS-485, IBIS; Others: FXS, 32/64GB eMMC, Audio or customer specific
Compliance	CE according to 2014/53/EU (RED), 2011/65/EU (RoHS), 2012/19/EU (WEEE), 1907/2006/EC (REACH), FCC according to 47 CFR, Part 15B
Standards	EN 62368-1, EN 62311, EN 55032, EN 55035, EN 61000-6-2, EN 61000-6-3, EN 301 489-1, EN 301 489-3, EN 301 489-7, EN 301 489-17, EN 301 489-24, EN 301 489-52, EN 300 328, EN 301 511, EN 301 893, EN 301 908-1, EN 301 908-2, EN 301 908-13
Order numbers: NB1601-LWWtSc-G Software Licences	(contact sales for more models, options or project specific adaptations) LTE +WLAN +BT/BLE +COM-I/O +GNSS -Vi: LXC Virtualization / -V: Voice (pending)

NetModule AG
Maulbeerstrasse 10
3011 Bern

T +41 31 985 25 10
F +41 31 985 25 11

Switzerland

NetModule GmbH
Frankfurter Strasse 92
65760 Eschborn

T +49 6196 77 99 79 0
F +49 6196 77 99 79 9

Germany