

# NB1601-LWWtSc-G

## Industrial Router with LTE + WLAN + BT/BLE + 4x ETH + RS-232/485 + DIO + GNSS

Modular mobile router with 4-port Ethernet switch to connect remote locations.



### Keyfeatures

<b>Mobile / Cellular</b>	1x LTE, UMTS, GSM
<b>SIM</b>	2x Micro SIM
<b>WiFi / WLAN</b>	1x Dual-band IEEE 802.11 a/b/g/n (Wi-Fi 4), 1x Bluetooth Low Energy
<b>Ethernet</b>	4x Fast Ethernet
<b>IO</b>	4x Digital I/O
<b>Serial / Fieldbus</b>	1x RS-232/485, 1x RS-232 Console
<b>Positioning</b>	Multi-GNSS
<b>Operation Temperature</b>	-40 °C to +70 °C
<b>Software</b>	Routing, Network Services, VPN, Firewall, Link Management, Supervisor, SDK, free updates
<b>Compliance</b>	CE (RED)
<b>Modularity</b>	Extensions on request

### Product description

The NB1601 offers the key technologies for stationary applications that require reliable Internet access.

### Applications

- Condition Monitoring
- Industrial Security
- Factory Automation
- Remote Management
- Smart Buildings
- Mining
- Point of Sale
- Digital Signage

### Specifications

<b>Mobile / Cellular</b>	<b>Standard</b>	1x Multimode LTE, UMTS, GSM for EMEA <b>4G - LTE</b> B1 (2100), B3 (1800), B5 (850), B7 (2600), B8 (900), B20 (800) <b>3G - DC-HSPA+/UMTS</b> B1 (2100), B2 (1900), B5 (850), B8 (900) <b>2G - GSM/GPRS/EDGE</b> B2 (1900), B3 (1800), B5 (850), B8 (900) <b>Category</b> LTE Cat 4 <b>Antenna ports</b> 2x2 MIMO <b>Data rate down / up (max)</b> 150 Mbps / 50 Mbps <b>Voice</b> CSFB (with optional Software License) <b>FCC ID</b> XPYTOBYL210
	<b>Region</b>	Europe, Middle East and Africa (EMEA)
	<b>Connectors</b>	2x SMA female
	<b>SIM</b>	2x Micro SIM - 3FF
<b>WiFi / WLAN</b>	<b>Standard</b>	1x Dual-band WLAN 2.4/5 GHz a/b/g/n (Wi-Fi 4) + BT 4.2 combo <b>Wireless standard</b> IEEE 802.11a/b/g/n (Wi-Fi 4) Bluetooth 4.2, Bluetooth Low Energy <b>Frequency</b> 2.4/5 GHz <b>Antenna ports</b> 2x2 MIMO <b>Data rate (max)</b> 144 Mbps 2.4 GHz 2x2 MIMO, 150 Mbps 5 GHz SISO <b>Modes</b> Client or access point (up to 10 clients) <b>FCC ID</b> Z64-WL18DBMOD
	<b>Connector</b>	2x SMA female
<b>Ethernet</b>	<b>Standard</b>	4x Fast Ethernet <b>Ethernet standard</b> 100BASE-TX, Auto MDIX <b>Speed</b> 10/100 Mbps
	<b>Connector</b>	4x RJ45

<b>Positioning</b>	<b>Standard</b>	1x Multi-GNSS <b>Receiver</b> BeiDou, Galileo, GLONASS, GPS/QZSS 72-channel u-blox M8 engine 3 concurrent GNSS channels <b>Antennas</b> Active or passive <b>Accuracy</b> Up to 2.5 m CEP <b>Sensitivity</b> Up to -164 dBm <b>Services</b> Standalone, Assisted GPS Data server with JSON, NMEA data stream
	<b>Connector</b>	1x SMA female
<b>USB</b>	<b>Standard</b>	1x USB 2.0 Host
	<b>Connector</b>	1x Type A
<b>Serial, Fieldbus</b>	<b>Protocol</b>	1x RS-232 <b>Protocol</b> EIA-232 <b>Signals</b> TX, RX <b>Signal level</b> High > 5 VDC, low < -5 VDC <b>Bit rate</b> Up to 115 200 Bit/s 1x RS-232/485 combo (software switchable) <b>Protocol</b> EIA-232 <b>Signals</b> TX, RX <b>Signal level</b> High > 5 VDC, low < -5 VDC <b>Bit rate</b> Up to 115*200 Bit/s <b>Protocol</b> EIA-485 <b>Signals</b> A, B <b>Signal level</b> Differential output voltage, loaded 1.5 VDC - 3.6 VDC <b>Bit rate</b> Up to 115*200 Bit/s <b>Termination</b> 120 Ω for RS-485 configurable by software
	<b>Connector</b>	2x Terminal block header 3.5 mm (screw locking)
<b>IOs</b>	<b>Type</b>	2x Digital I/O <b>Signals</b> 1x DI, 1x DO <b>DI signals</b> +, - <b>DI level</b> Low: 0 - 3 VDC, high: 9 - 32 VDC <b>DO signals</b> Relay outputs with NO, NC, COM (normally open, normally closed) <b>DO level</b> 0 - 32 VDC/1A <b>Isolation</b> 1'500 VDC 2x Digital I/O <b>Signals</b> 1x DI, 1x DO <b>DI signals</b> +, - <b>DI level</b> Low: 0 - 3 VDC, high: 9 - 32 VDC <b>DO signals</b> Relay outputs with NO, NC, COM (normally open, normally closed) <b>DO level</b> 0 - 32 VDC/1A <b>Isolation</b> 1'500 VDC <b>Module</b> COM-I/O shield
	<b>Connector</b>	2x Terminal block header 3.5 mm (screw locking)
<b>System</b>	<b>Core</b>	600 MHz (HW Rev. A) or 1 GHz (HW Rev. B02) single core, 512 MB RAM, 4 GB flash
	<b>Module Slots</b>	1x miniPCIe / extension combo (USB), 1x Shield

<b>Software</b>	<b>Features</b>	<p>NetModule Router Software (supported features depending on product variant)</p> <p><b>Package</b> The standard software package includes an intuitive user interface, covering all modern routing protocols and enables efficient mass deployment.</p> <p><b>General</b> Fail-safe update (FOTA), upgrade via USB, HTTP(S), (S)FTP or TFTP, remote CLI &amp; WebGUI, RADIUS authentication, Simple Certificate Enrollment Protocol (SCEP), Hardware- und Software Watchdog</p> <p><b>Remote Management</b> Manage and monitor devices with SNMP V1/V2/V3, Netmodule vendor MIB, telnet, SSH, or HTTP/HTTPS</p> <p><b>Cellular Networking</b> Multi-SIM / eSIM support (optional license), multi-APN support, signal strength monitoring, dedicated bearers, CSFB/VoLTE calls (optional license)</p> <p><b>Wireless LAN</b> Access Point, Client Mode, Mesh Point or Dual Modes (Mesh Access Point / Access Point - Client), WLAN Pseudo-Bridge Client Mode: Multiple Client SSID Profile, Encryption: Open, WEP, WPA1/2/3-Personal, WPA1/2/3-Enterprise. Fast Roaming: Fast BSS Transition (802.11r), PreAuthentication, Protected Management Frames (802.11w) AP Mode: Multi-SSIDs (up to 8) Encryption: Open WPA1/2/3-Personal, WPA1/2/3-Enterprise Fast Roaming: Fast BSS Transition (802.11r), PreAuthentication, DFS support Protected Management Frames (802.11w) Client Tracking, Band Steering, Hide SSID broadcasting, Isolate Clients, Accounting, Short guard Intervall Mesh Mode (802.11s): Encryption: None, SAE. Gateway announcements</p> <p><b>Link Management</b> Link prioritization, link aggregation, load balancing, multipath-TCP, IP-passthrough, link supervision,</p> <p><b>Services</b> DHCP Client/Server, DNS Caching Server, Email, SMS Service, NTP Client/Server, SNMP Server, DynDNS, SSH Server, SNMP Agent, HTTP/HTTPS/FTP Server, IPv6 for WAN, 802.1x over Ethernet, MQTT Broker Voice Gateway (SIP, Call Routing, Audio with optional license) Coovachilli Hotspot</p> <p><b>Routing</b> Destination, policy, multipath, mobile-IP, OSPF, BGP, multicast, TCP-MSS clamping, bridging discovery protocols LLDP, CDP, SONMP, EDP, FDP, IRDP, VRRP, STP/RSTP, VRRP, VLAN, PPPoE, VXLAN</p> <p><b>VPN</b> OpenVPN, IPsec (IKEv1 and IKEv2), PPTP, GRE, L2TP, CSD dial-in, Certificate revocation service</p> <p><b>Firewall</b> Stateful firewall, connection tracking, NAT, NAPT, masquerading, bridge filtering, Adress translation (based on SRC and DST ports)</p> <p><b>Encryption</b> supporting password protected PKCS12 files, integrated random certificate key generator, "Let's encrypt" certificate, ECC (Certificates with Elliptic Cryptography)</p> <p><b>Quality of Service</b> Diffserv, SFQ, HTB, Priority-based Queuing, Netflow (Softflow)</p> <p><b>Programmability</b> SDK</p> <p><b>Troubleshooting</b> Logging, Ping, Traceroute, Tcpdump, Speed-test</p>
	<b>Licenses</b>	<p>GNSS</p> <p><b>Enabled service</b> GNSS location service</p> <p>Server with JSON-, NMEA stream</p>
<b>Power</b>	<b>Input Voltage</b>	<p>12, 24 VDC</p> <p><b>Nominal voltages</b> 12, 24 VDC</p> <p><b>Absolute voltages</b> 12 VDC to 24 VDC (-20 % / +20 %)</p>
	<b>Connector Consumption</b>	<p>1x Terminal block header 3.5 mm (screw locking)</p> <p>7 W (average), 10 W (max)</p>
<b>Mounting</b>		DIN-Rail
<b>Dimensions</b>	<b>W x H x D</b>	Width 45 mm x height 124/134 mm x depth 110/121 mm
<b>Weight</b>		450 g
<b>Environment</b>	<b>Operating Temperature</b>	-40°C to +70°C
	<b>Ingress Protection Level</b>	IP40
<b>MTBF</b>		300'000 h / 34.2 years, according SN29500 at environmental temperature 40 °C
<b>Certifications</b>	<b>Compliance Domain</b>	CE according to 2014/53/EU (RED), 2011/65/EU (RoHS) Industrial
<b>Order Code</b>		NB1601-LWWtSc-G