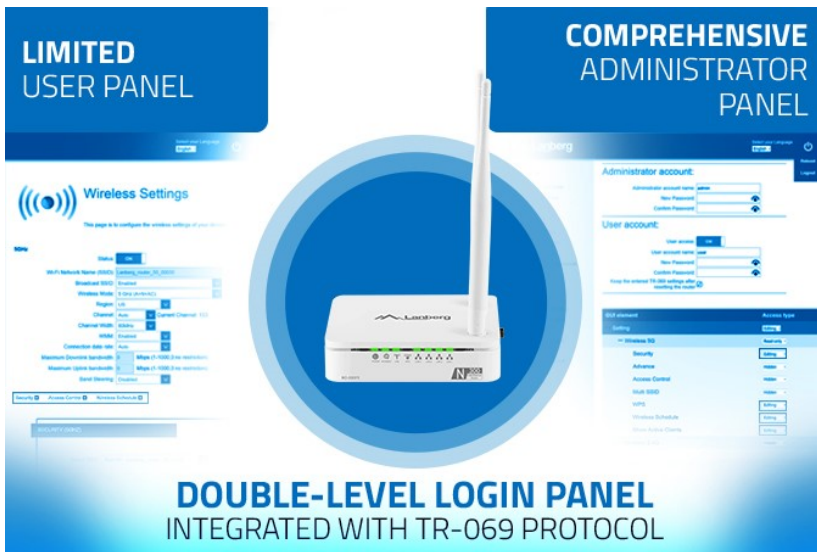




## ROUTER MENU WITH **DOUBLE-LEVEL ACCESS PANEL** DESIGNED FOR COMPREHENSIVE AND FLEXIBLE USER MANAGEMENT FOR ISP



Along with the 2nd firmware version, the routers have been fitted with a double access panel:

- 1) the administrator panel with all options available including the ISP-limited features,
- 2) the user panel with access only to certain features, approved by the administrator.

This software gives the administrator / ISP the right to decide which features the user should see and which not. By logging in to the router from the administrator panel, on a specially prepared intuitive website, it is easy to set which pages, subpages and modal windows are to be modified, and which to read or completely hidden from view.

Moreover, adequately configured **TR-069** with the 2nd version of the software allows ISPs to save the settings and automatically download them from the operator's server (ACS) in case the customer intentionally or accidentally restores the router to the factory settings. Due to the specially designed function, the reset button does not change the TR-069 settings introduced by the administrator. After the reset, the router reconnects to the ISP, based on previously entered data, and re-downloads all the initial settings (including the access restrictions). The class that allows you to manage double access in the TR-069 tree is called `InternetGatewayDevice.DeviceConfig`.

### DESIGNED FOR **RELIABLE OPERATION AND FULL CONTROL**

Modern, efficient and secure router Lanberg RO-030FE is a perfect solution for home users, as well as, for the purposes of SMB. Due to the device's functionality, capabilities of the software and the equipment itself, this particular networking product will find a great use for Internet service providers (ISPs).

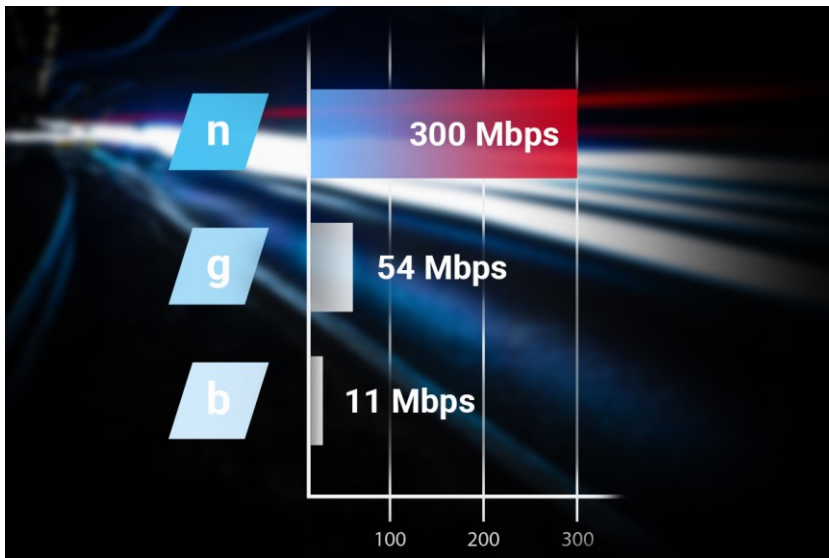
The possibility of 4 devices wired connections, operation in 5 different modes, Beamforming feature, stable, full of possibilities, flexible Wi-Fi, MIMO technology and Parental control are just some of the advantages of this device.



The router is equipped with the Realtek RTL8196E chipset, providing hardware NAT support - available bandwidth allows for transfer of approximately 100 Mbps - not available directly with software solutions. In addition to providing Wi-Fi, the device has an RTL8192ER system responsible for maintaining an efficient, stable, fast wireless network using MIMO technology. The flash memory of the device is 8 MB SPI Flash-EPROM and 32 MB DDR2 - dedicated to operating memory.

Along with the time of this router's release on the market, the manufacturer provides support in the form of software updates, including the development and implementation of new features, functionality extensions and continuous progress on this device, providing the end-user and especially the Internet service providers (ISPs) with full control over the development of the router, as well as, with flexible configuration of the product itself.

## WI-FI TRANSMISSION TO 300 MBPS



Lanberg's base model router provides a strong and stable network and data transmission up to 300 Mbps compliant with the 802.11n standard, effectively offering up to 12 times faster data transmission than in what previous standards had in store.

On top of that, Lanberg's router is backward compatible with older generation devices, allowing support for the most wireless devices.

## 20/40 MHZ AUTO-BANDWIDTH SWITCHING

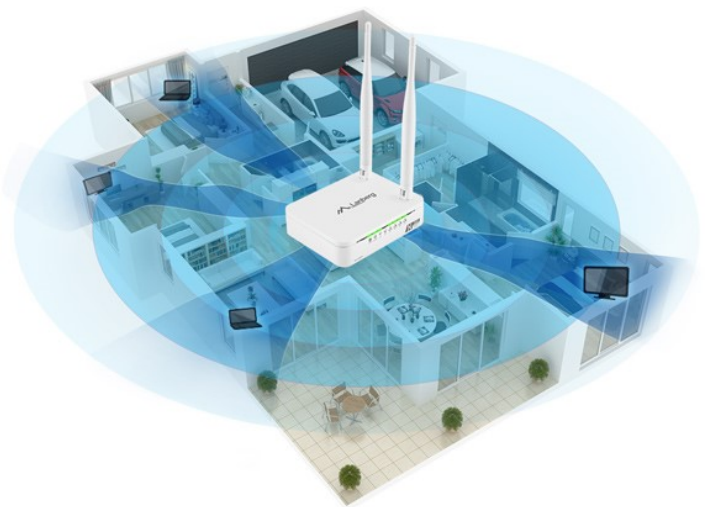
This function is an intelligent solution that increases the stability of Wi-Fi network for N mode. The operation of 2.4GHz wireless network with a channel width of 40 MHz allows you to increase the fixed transfer rate, at the expense of signal susceptibility to interference and reduction of "free" channels for other networks. When there are many other wireless networks nearby the router, they can interfere with each other, which can lead to more frequent packet loss and associated retransmissions, and most importantly - to the drops in performance and the transfers of Wi-Fi networks.

Lanberg's router scans the surroundings in terms of mutual and disruptive Wi-Fi networks and detects the situation itself, thus automatically changing the frequency from 40 to 20 MHz. The network remains stable and more resistant to possible interference.

## STABLE NETWORK WITH BEAMFORMING

Beamforming technology allows focused transmission of a wireless signal (Wi-Fi) that creates data beams focused strictly on the receiving devices. The router's antennas automatically detect the direction of the received signal and then form the wave beam in such a way that the transmission is directed as much as possible to the receiving device.

This technology allows you to increase the strength, infiltration and stability of the signal compared to current, ordinary transmissions, while maintaining the same environmental conditions as optical obstacles. In practice, the user gains much more stable, focused Wi-Fi connection with increased efficiency and usability.



## POWERFUL 2T2R - MIMO ANTENNAS



With the use of MIMO technology, the user gains only benefits, due to the increased bandwidth of a wireless network based on multi-antenna transmission, both on the transmitting side and on the receiving side:

- Increased signal reliability due to increased resistance to fading,
- Increased signal-to-noise ratio (SNR) resulting from a collective reception - a radio signal is received by all receiving antennas,
- Increased bandwidth of radio connection as a result of data streams being divided into sub-streams, which in turn leads to a multiplexing gain.

## FLEXIBILITY AND VERSATILITY IN 1 = 5 DIFFERENT OPERATING MODES



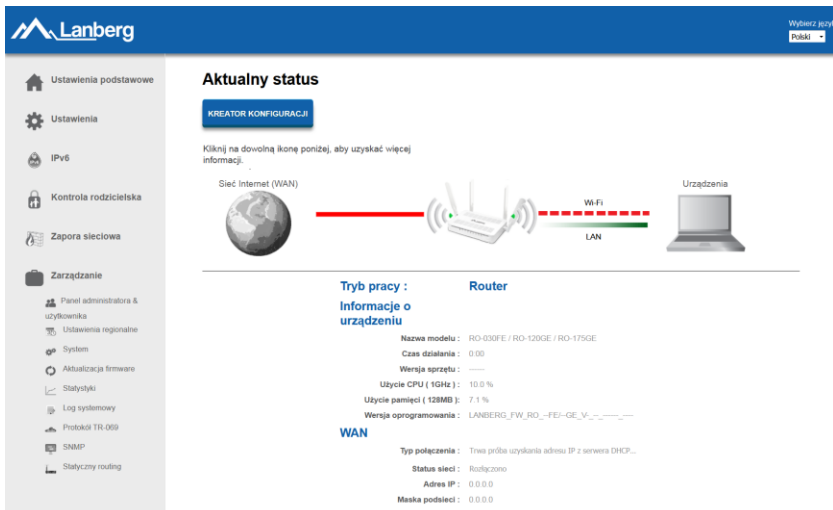
From the very beginning, Lanberg's router has the ability to operate in as many as 5 commonly used modes.

Depending on the demand, it can adopt the classical mode of **Router** or **Access Point (AP)**, and can also act as **WISP**, **Repeater** and **Client** by receiving the source (Internet) signal via radio transmission instead of the classic Ethernet interface.

## EASIER AND SAFER DEVICE(S)

### CONFIGURATION WITH WPS 2.0

With the WPS button, the user gains the ability to easily and quickly connect any devices to the router using WPS and 8-digit PIN. The implemented version of WPS 2.0 provides an increased level of security, thereby significantly reducing the chances of success of the "brute-force" attack.



## INTUITIVE MENU AND PARENTAL CONTROL

In order to meet the expectations of end users, the manufacturer took into account the most important features that should stand out during the design of the router's menu: simplicity, flexibility, intuitiveness, easy to use, friendly WWW interface.

Router RO-030FE has a simple to use, intuitive and transparent menu in Polish. All settings are properly and intuitively classified, which in practice also allows less advanced users to

configure the device for their own needs.

Additionally, Lanberg's router is equipped with **Parental control**, which enables detailed management of the user's access time the Internet, which is very useful when taking parents with children into consideration. By using this feature, device administrators, including parents, no longer have to worry about enforcing rules regarding the time frame of wireless network. From now on, the whole process is focused only on creating the right entry, and the rest will be done by the router. Your personal intervention in limiting Internet access will no longer be necessary - router will do it for you.

## MULTIPLE WIRELESS + GUEST NETWORKS

The user is given the opportunity to create up to four different, additional and independent wireless networks for 2.4 GHz band. Each of them can have its own encryption mode with a separate password and name - all options are exactly the same as for configuring the main wireless network.

Producent wychodząc naprzeciw oczekiwaniom użytkowników zapewnił możliwość utworzenia dla każdej z 4 dodatkowych sieci Wi-Fi powiązań dotyczących odrębnych, logicznie odseparowanych, wirtualnych sieci - VLAN.



Ponadto funkcja izolacji klientów sieci Wi-Fi pozwala na wygodne oddzielenie urządzeń podłączonych bezprzewodowo, zapewniając dodatkowy poziom ochrony i zmniejszenie ryzyka ataku na inne komputery podłączone do tego samego Wi-Fi.

## CONTENTS OF THE PACKAGE

- Broadband wireless router: RO-030FE,
- Quick guide,
- 1.5 m RJ-45 4-wire patch cord,
- Power supply: AC 100 ~ 240 V, 50 / 60 Hz, 0.2 A, DC 12 V, 0.5 A.

## SPECIFICATION

Chipset		Realtek: RTL8196E, RTL8192ER	
CPU model		Realtek 52481	
Operating system; SDK		Linux 3.10.90; Realtek SDK 4.6.4 2080 build	
The amount and type of device memory		8 MB SPI FLASH - EPROM	
The amount and type of operating memory		32 MB DDR2	
Ethernet interface	Quantity; speed; WAN port type	1 x RJ-45 port; 100 Mb/s; auto: MDI-MDIX + negotiation	
	Quantity; speed; type of LAN ports	4 x RJ-45 port; 100 Mb/s; auto: MDI-MDIX + negotiation	
	Data transfer rate	10BASE-T (Ethernet): 10 Mb/s (half-duplex); 20 Mb/s (full duplex); 100BASE-TX (Fast Ethernet): 100 Mb/s (half-duplex); 200 Mb/s (full duplex);	
	Total switching bandwidth	1.0 Gb/s (0.8 LAN, 0.2 WAN)	
	Compatible network cables	TIA/EIA-568-A or TIA/EIA-568-B: 10BASE-T (Ethernet): 100 Ω UTP / 150 Ω STP; category 3 or higher; ≤ 100 m; 100BASE-T4 / 100BASE-TX (Fast Ethernet): 100 Ω UTP / 150 Ω STP; category 5e or higher; ≤ 100 m;	
	Standards	IEEE 802.1d: STP; IEEE 802.1p; IEEE 802.1q: VLAN; IEEE 802.3i: 10BASE-T; IEEE 802.3x: Flow control; IEEE 802.3u: 100BASE-T4 / 100BASE-TX; IEEE 802.3az: Green Ethernet;	
Wi-Fi interface	Type, speed; modulation – 2.4 GHz	IEEE 802.11b: up to 11 Mb/s; DSSS (CCK [DBPSK + DQPSK]); IEEE 802.11g: up to 54 Mb/s; DSSS (CCK [DBPSK + DQPSK]) + OFDM (BPSK + QPSK + QAM-16 + QAM-64); IEEE 802.11n: up to 300 Mb/s; OFDM (BPSK + QPSK + QAM-16 + QAM-64);	
	Radio power (E.I.R.P.) – 2.4 GHz	IEEE 802.11b: 19.98 dBm IEEE 802.11g: 19.92 dBm IEEE 802.11n 20 MHz: 19.94 dBm IEEE 802.11n 40 MHz: 19.54 dBm	
	Antennas – 2.4 GHz	Quantity, type, type, streams	2 x antenna; external, fixed, dipole; MIMO; 2T2R;
		Return loss	< -10 dB
		VSWR	< 2.0
		Energy gain	5 ± 1 dBi
		Impedance	50 Ω
		Connector type; cable diameter	I-PEX; 1.13 mm
		Efficiency	> 70 %
	Operating channels	USA (FCC): 11 channels: 2.412 GHz ~ 2.462 GHz; Europe (ETSI): 13 channels: 2.412 GHz ~ 2.472 GHz;	
	Security	WPS 2.0; WPS-PBC; WPS-PIN; 64/128-bit WEP; WPA/WPA2; WPA2 PSK (TKIP & AES); MAC address filtering; Broadcasting the wireless network name (SSID); RADIUS client; Isolation of connected clients in the Wi-Fi network;	
Functionalities	Frame aggregation (A-MPDU [BA] + A-MSDU); Asynchronous energy saving method (U-APSD); Beamforming; 2x2 MIMO; IAPP; Short Guard Interval [400ns]; LDPC; STBC; Low latency immediate High-Throughput Block Acknowledgement (HT-BA);		
Standards	IEEE 802.1x; IEEE 802.11b; IEEE 802.11e; IEEE 802.11g; IEEE 802.11i; IEEE 802.11k; IEEE 802.11n; IEEE 802.11w (Management frame protection);		
Router modes		Router; Access Point (AP); Client; Bridge; Repeater; WISP;	
Internet interface (WAN) modes		DHCP; Static IP address; PPPoE; PPTP; L2TP;	
Management		Web page: locally, remotely; CWMP (TR-069); SNMP v1/v2/v2c; Telnet*;	

Functions	LANBERG_FW_RO_030FE_V8_01R_180625_1400	Aggregation of Wi-Fi frames; Automatic bandwidth switching (20/40 MHz); Automatic channel selection + Bluetooth coexistence support; Auto-restart; Bandwidth control; Beacon interval; Beamforming; Broadcast storm control; Control of additional sideband channel; CSMA/CA-ACK; DDNS; DHCP server; DHCPv6; DMZ; Domain / URL filtering; EAP-MD5; EAP-PEAP; EAP-TLS; EAP-TTLS; Fragmentation threshold; Guest network; Hardware NAT; IAPP; ICMP Broadcast protection; ICMP Redirect protection; IEEE 802.1q: VLAN – Ethernet + Wi-Fi (WAN-LAN only); IEEE 802.1x EAP (Extensible Authentication Protocol) (only Wi-Fi); IGMP proxy v1/v2/v3 (+ on the physical interface); IGMP v1/v2 + MLD v1/v2 snooping; IP filtering; IPTV; IPv6 Neighbor Discovery; IPv6 tunnel through IPv4 (6in4); Isolation of connected clients in the Wi-Fi network; LAN & Wi-Fi client list; LAN IPv6; LDPC; Limitation of Wi-Fi output power; Limiting the bandwidth of downloading/uploading; MAC address cloning (WAN Ethernet); Management frame protection (MFP); MIB II; Multiple wireless networks (Multi SSID); NDP (Neighbor Discovery Protocol); NTP client; Parental control; PBC function; Port filtering; Port forwarding; Preamble length control; Preventing DoS attacks (ICMP Smurf, IP Land, IP Spoof, IP Teardrop, Per-Source IP Flood: FIN + ICMP + SYN + UDP, PingOfDeath, Port scanning TCP/UDP, TCP scanning, TCP SynWithData, UDP Bomb, UDP EchChargen, Whole System Flood: FIN + ICMP + SYN + UDP); Protection of B/G mode of the wireless network; QoS; RADIUS per (physical/virtual) Wi-Fi network; RADVD; Remote syslog; RIP (Routing Information Protocol) v1/v2; Router's own domain name; RTS threshold; Schedule for network access; Short Guard Interval; SNMP trap; SPI (Stateful Packet Inspection); Static DHCP leases; Static routing; STBC; STP; Support of IPSec, PPTP, L2PT packets (VPN Pass-through); Syslog; TFTP (Trivial File Transfer Protocol); UPnP; Virtual networks (VAP) – 4; Wi-Fi Multimedia (WMM, WMM-SA client mode, WMM-APSD); Wi-Fi time schedule; WPS 2.0; WPS-PBC; WPS-PIN
	LANBERG_FW_RO_030FE_V8_01R_190131_1800	Double-login panel (administrator & user); Information about signal strength and uptime of Wi-Fi clients; Mini-schedule of router reset (daily, weekly); Modification of existing VLAN entries; Port forwarding in ranges; Manual modification of the MCS index; Table of active connections per port (MAC and speed); Maintenance the entered TR-069 data after resetting the router to the factory settings; Managing a two-level panel through TR-069 (including changing administrator and user credentials); Change of activation of the reset button after a specified time (6s, 15s, 30s)
Power supply type		External adapter
Power - AC	Voltage	100 ~ 240 V
	Frequency	50 / 60 Hz
	Current	0.2 A
	Power consumption	5.3 W
Power - DC	Voltage	12 V
	Frequency	50 / 60 Hz
	Current	0.5 A
Cooling		Pasywne
LED indicators		Power; Internet; Wi-Fi (2.4 GHz); WPS; LAN (1-4);
Buttons		Power; Reset (on the bottom of the device); WPS;
Storage temperature		-5 ~ 70 °C
Storage humidity		10% ~ 90% non-condensing
Operating temperature		0 ~ 40 °C
Operating humidity		10% ~ 90% non-condensing
Dimensions (Length x Width x Height)		116 x 90 x 36 mm

\* By default, no changes are applied, that restrict access to this type of services. There may be a situation in which the appropriate requirement of the distributor for a given country may be implemented appropriate security or a dedicated password. In order to get access, please contact the Lanberg distributor in your country.