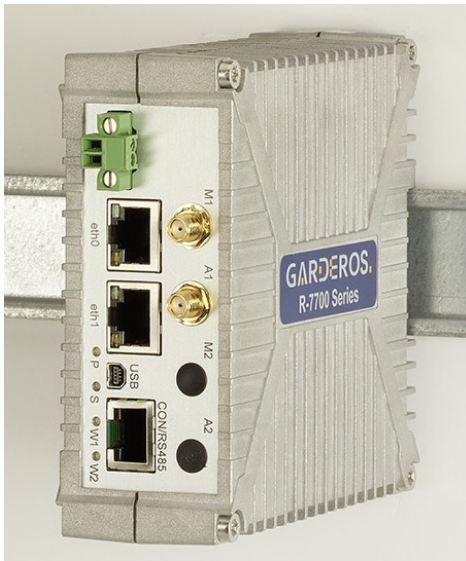


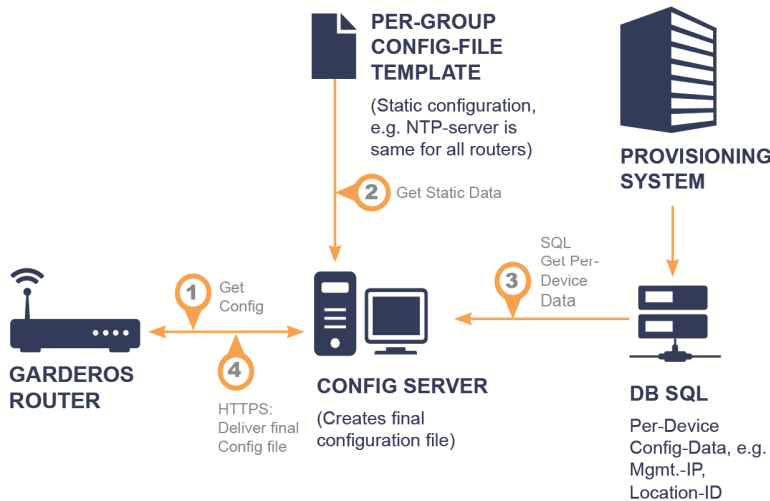


Application and project description

Secure and reliable connectivity for professional industrial applications in telecommunications, energy supply and traffic surveillance. The multi-functional Garderos R-7700 Series routers are specially manufactured for use in remote, difficult accessible locations with harsh environmental parameters, such as extreme temperatures.



Core functions



- Central administration
- Scalable to several thousand routers with one web server
- Routers periodically check for updates
- Hardware- and configurable software-watchdogs for highest availability
- Standard interfaces for easy integration into existing infrastructure
- "Cyber Security" by design, secure protocols and functions

HARDWARE FEATURES

Casing

Material	Diecast aluminium
Dimensions (WxHxD)	
without / with connectors	44.5x110x115mm / 44.5x110x121mm
without / with connectors (xDSL type)	80.5x112x115mm / 80.5x112x121mm
Weight without / with xDSL	~0.4kg / ~0.6kg
Ingress protection	IP40
IEC protection class	3
Mounting	DIN rail mountable (integrated DIN rail clip and mounting holes for external DIN rail clip) or use as desktop device

Temperature range

Operating temperature range depends on router model. Please see "ordering information".

Interfaces on casing

Power connector	Phoenix 2 pin
Serial connector	1x RJ-45 console/data + optional 1x D-Sub 9 (female) data
WWAN antenna connector	2-4x SMA (female)
Ethernet connector	2x RJ-45
WLAN antenna connector	2x RP-SMA (female)
SIM card slot	2x Mini-SIM (thermoresistant) or optional 1x Mini-SIM + 1x MFF-SIM chip
DSL connector	1x RJ-45
USB connector	1x USB 2.0 type Mini-B Host

Power supply

Input voltage	12-60 VDC
Power consumption	~4-8W

Serial interface

RS-232 (console)	RJ-45
optional RS-232 (data)	D-Sub 9
RS-485 half-duplex (data)	RJ-45

WAN

WWAN interface

xDSL	ADSL2+ (Annex B/J), VDSL2 (Annex B), Vectoring
Technology/Bands	2G/3G ¹⁾ , 2G/3G/4G ²⁾ , CDMA ³⁾ , 4G ⁴⁾
CDMA EVDO, 1x	for CDMA ³⁾
CDMA RUIIM, non-RUIIM	for CDMA ³⁾
Dual WWAN	

LAN interface

Ethernet	2x 10/100/1000BT
Autosensing	
Auto-MDIX	

WLAN interface

Supported standards	1x 802.11n a/b/g
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Other features

Hardware watchdog	Monitors "heartbeats" from router OS. Restarts router in case of software problems.
Cryptographic hardware accelerator	md5, aes, des, 3des, sha1, sha512

Certifications

Criteria for EMI immunity and radiation	IEC 61850-3
Vibration resistant	EN 60068-2-6:2008
Shock resistant	EN 60068-2-27:2009

Regulations

RoHS, CE, FCC

¹⁾ 2G/3G Module

WCDMA
800/850/900/AWS1700/1900/2100MHz
EDGE/GPRS/GSM
850/900/1800/1900MHz
HSPA+ peak download speed: 21.1 Mbps
HSPA+ peak upload speed: 5.76 Mbps

²⁾ 2G/3G/4G Module (European variant*)

LTE 800/1800/2600 MHz
WCDMA 900/2100MHz
EDGE/GPRS/GSM 900/1800/1900MHz
HSPA+ peak download speed: 21.1 Mbps
HSPA+ peak upload speed: 5.76 Mbps
LTE peak download speed: 100 Mbps
LTE peak upload speed: 50 Mbps

*other variants available e.g. for NA

³⁾ CDMA 450MHz

EV-DO Rev. A, B
1xRTT
R-UIIM and non R-UIIM

⁴⁾ 4G Module

LTE 450/800/1800/2600
LTE peak download speed:
100 Mbps
LTE peak upload speed: 50 Mbps

ROUTING FEATURES

Operating system

- Garderos Router Software (GRS) Rel. 3.0

WWAN Features

- PPP over WWAN *
- Dual WAN (Cellular, Ethernet) *
- Dual WWAN (WWAN, WWAN) *
- CDMA RUIIM and non-RUIIM *
- CDMA ESN and MEID authentication *

Router Features

- IPv4
- IPv6
- IPv4, IPv6 dual stack
- Local loop interface
- Ethernet configurable link speed
- Ethernet IP assignment static IP, DHCP, PPPoE
- Ethernet bridging
- VLAN support (802.1q and priority tagging)
- Layer 2 bridge interface
- STP on bridge interface
- PPPoE client with PAP and CHAP
- PPPoE always on
- PPPoE session termination before provider reconnect
- PPPoE client static IP
- Static routes
- Dynamic routing protocols RIPv2, OSPFv2, BGPv4
- Filtering for dynamic routing protocols
- Firewall (IPv4, IPv6)
- Firewall (packet filter)
- Firewall (connection tracking)
- NAT (PAT and 1-to-1)
- Source-NAT (SNAT)
- Port forwarding
- Invalid-packet-filter
- DHCP server
- DHCP address pools per VLAN/interface
- DHCP secure ARP
- DHCP ARP ping before assigning lease
- DHCP accounting (RADIUS)
- Configurable MTU
- Path MTU discovery
- TCP MSS adjustment
- Diffserv (set DSCP bits based on IP-source/destination address and/or ports/protocols)
- QoS packet prioritization (bandwidth reservation based on IP-source/destination address and/or ports/protocols)
- Ethernet port security (block port after cable removal)
- Reverse path filter

VPN

- GRE
- IPsec with PSK and certificate authentication
- IPsec encryption algorithms AES, DES, 3DES, AES256
- IPsec phase 1 key length up to 8192 bit
- IPsec phase 2 key length up to 6144 bit
- IPsec throughput max. 119 Mb/s
- IPsec throughput (3des-sha1-modp1024) 105 Mb/s
- IPsec throughput (aes-sha256-modp4096) 119 Mb/s
- IPsec VPN gateway
- Min. number 5 IPsec tunnels
- NHRP dynamic tunnel management
- OpenVPN with PSK and certificate authentication

- Min. number 5 OpenVPN tunnels
- OpenVPN Layer 2 and 3
- Bridging OpenVPN Layer 2 Tunnel

Router management

- RS-232 management console
- Reserved RS-232 communication port, fully connected
- SSH server
- Telnet server
- Administrator authentication by TACACS+, RADIUS, password file and public key authentication
- Administrator roles
- Limit number of administrators
- Command line interface (CLI)
- Remote configuration file download (HTTP/HTTPS)
- OCSP (configuration file download)
- HTTP basic authentication for config-file download
- Certificate authentication for configuration file download
- Remote software updates
- Router bulk management
- SNMPv2 and SNMPv3 monitoring
- SNMPv2 and SNMPv3 traps
- Hardware and software watchdogs
- Syslog

WLAN *

- 802.11n a/b/g
- Multiple SSID
- Hidden SSID
- Configurable channel
- Configurable transmit power
- Intra cell traffic blocking
- WEP (64 and 128 bit), WPA and WPA2
- 802.1x
- EAP (802.11i, RADIUS authentication, TLS,SIM)
- Access point and client mode

Other functions

- DNS server and proxy
- DynDNS client
- NTP client, server
- NTP with MD5 authentication
- LXC virtualization (project based)
- Link monitor (ping)
- Cron job
- Security hardening (switch off unsecure features)
- Serial-to-network proxy (ser2net)
- Serial modes: Console, Off and Script
- Scripting interface
- Open APIs for network integration

*) Prerequisite is a suitable interface. Please see also "ordering information".

ORDERING INFORMATION

Garderos model number:	Ethernet (10/100/1000 BT)	RS-232 (console)	WLAN (802.11n a/b/g)	xDSL	2G/3G Module ¹⁾	2G/3G/4G EU-Module ²⁾ or 4G Module ⁴⁾	CDMA 450MHz ³⁾	Operating temperature range
R-7701 (2x LAN/WLAN)	2	1	1					-40 °C to +75 °C
R-7707 (2x LAN)	2	1						-40 °C to +75 °C
R-7711 (2x LAN/xDSL/WLAN)	2	1	1	1				-35 °C to +70 °C
R-7717 (2x LAN/xDSL)	2	1		1				-35 °C to +70 °C
R-7721 (2x LAN/3G/WLAN)	2	1	1		1			-40 °C to +75 °C
R-7722 (2x LAN/4G/WLAN)	2	1	1			1		-40 °C to +75 °C
R-7727 (2x LAN/3G)	2	1			1			-40 °C to +75 °C
R-7728 (2x LAN/4G)	2	1				1		-40 °C to +75 °C
R-7731 (2x LAN/xDSL/CDMA/WLAN)	2	1	1	1			1	-35 °C to +70 °C
R-7737 (2x LAN/xDSL/CDMA)	2	1		1			1	-35 °C to +70 °C
R-7747 (2x LAN/3G/CDMA)	2	1			1		1	-40 °C to +75 °C
R-7748 (2x LAN/4G/CDMA)	2	1				1	1	-40 °C to +75 °C
R-7757 (2x LAN/3G/4G)	2	1			1	1		-40 °C to +75 °C
R-7758 (2x LAN/4G/4G)	2	1				2		-40 °C to +75 °C
R-7759 (2x LAN/3G/3G)	2	1			2			-40 °C to +75 °C
R-7761 (2x LAN/xDSL/3G/WLAN)	2	1	1	1	1			-35 °C to +70 °C
R-7762 (2x LAN/xDSL/4G/WLAN)	2	1	1	1		1		-35 °C to +70 °C
R-7767 (2x LAN/xDSL/3G)	2	1		1	1			-35 °C to +70 °C
R-7768 (2x LAN/xDSL/4G)	2	1		1		1		-35 °C to +70 °C
R-7771 (2x LAN/CDMA/WLAN)	2	1	1				1	-40 °C to +75 °C
R-7777 (2x LAN/CDMA)	2	1					1	-40 °C to +75 °C

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