TC MGUARD RS2000/4000 4G VPN

Industrial 4G cellular router (LTE) with integrated firewall and VPN



Data sheet
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1 Description

The **TC MGUARD ... 4G VPN** is an industrial 4G cellular router (LTE) with 3G and GPRS fallback, integrated firewall, VPN and alarm inputs and outputs.

The devices offer high-speed Internet access via 4G cellular network with fallback to 3G (UMTS/HSPA) and 2G (GPRS/EDGE). You can therefore benefit from the advantages of the Internet and communicate with your automation systems from any location over public cellular networks.

With the help of predefined configuration on SD cards, the devices can be easily and quickly started up or replaced. The devices support precise time synchronization and positioning, specifically for mobile applications, via GPS and GLONASS.

For secure key generation and management, the devices are equipped with a trusted platform module (TPM).

Features

- High-speed cellular interface with provider redundancy
- Integrated 4-port switch
- Maximum security with IPsec protocol on Layer 3
- Web-based management, SNMP
- Replaceable configuration memory
- RS-232 interface with COM server function for integrating serial devices
- Flexible routing
- Up to 10 parallel VPN tunnels (up to 250 possible with additional license as an option)
- Supports current certificates such as x509.v3
- Stateful inspection firewall for dynamic filtering
- Extended temperature rating
- Connection for VPN enable button and VPN status LED

Make sure you always use the latest documentation.
It can be downloaded at: phoenixcontact.net/product/2903586
This document is valid for the products listed in the “Ordering data”.

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3 Ordering data

Description	Type	Order No.	Pcs./Pkt.
Security appliance, WAN and 4G cellular interface, SD card slot, 10 VPN tunnels, intelligent firewall with full scope of functions, router with NAT/1:1 NAT, optional CIFS Integrity Monitoring, 4-port Managed Switch, 2 SIM card slots, GPS receiver	TC MGUARD RS4000 4G VPN	2903586	1
Security appliance with 4G cellular interface, SD card slot, 2 VPN tunnels, firewall for easy configuration, router with NAT/1:1 NAT, 4-port switch, 2 SIM card slots, GPS receiver	TC MGUARD RS2000 4G VPN	2903588	1

Accessories	Type	Order No.	Pcs./Pkt.
Patch cable, CAT5, assembled, 0.5 m	FL CAT5 PATCH 0,5	2832263	1
Patch cable, CAT5, assembled, 2 m	FL CAT5 PATCH 2,0	2832289	1
Patch cable, CAT5, assembled, 10 m	FL CAT5 PATCH 10,0	2832629	1
Dust protection caps for RJ45 socket	FL RJ45 PROTECT CAP	2832991	10
RJ45 connector, shielded, with bend protection sleeve, 2 pieces, gray for straight cables, for assembly on site. For connections that are not crossed, it is recommended that you use the connector set with gray bend protection sleeve.	FL PLUG RJ45 GR/2	2744856	1
RJ45 connector, shielded, with bend protection sleeve, 2 pieces, green for crossed cables, for assembly on site. For connections that are crossed, it is recommended that the connector set with green bend protection sleeves is used.	FL PLUG RJ45 GN/2	2744571	1
Crimping pliers, for assembling the RJ45 plugs FL PLUG RJ45..., for assembly on site	FL CRIMPTOOL	2744869	1
FO converter with SC duplex fiber optic connection (1300 nm), for converting 10/100Base-T(X) to multi-mode fiberglass (50/125 µm). Auto negotiation and auto MDI(X) function. Comprehensive link diagnostics. DIN-rail mountable, 18 ... 30 V DC supply.	FL MC EF 1300 MM SC	2902853	1
Program and configuration memory, plug-in, 512 Mbyte.	SD FLASH 512MB	2988146	1
License for up to 250 additional VPN online connections	FL MGUARD LIC VPN-250	2700193	1
License for up to 10 additional VPN online connections	FL MGUARD LIC VPN-10	2700194	1
GSM UMTS antenna, with omnidirectional characteristic, 2 m antenna cable with SMA round connector	PSI-GSM/UMTS-QB-ANT	2313371	1
Multiband cellular antenna with mounting bracket for outdoor installation, 5 m antenna cable with SMA circular connector, suitable for LTE/4G and 5G	TC ANT MOBILE WALL 5M	2702273	1
Cellular antenna cable, 5 m in length, SMA (male) -> SMA (female), 50 ohm impedance	PSI-CAB-GSM/UMTS- 5M	2900980	1
Cellular antenna cable, 10 m in length, SMA (male) -> SMA (female), 50 ohm impedance	PSI-CAB-GSM/UMTS-10M	2900981	1

Accessories	Type	Order No.	Pcs./Pkt.
Attachment plug with Lambda/4 technology as surge protection for coaxial signal interfaces. Connection: Male/female SMA connectors.	CSMA-LAMBDA/4-2.0-BS-SET	2800491	1
License for mGuard Secure VPN Client v11.x	MGUARD SECURE VPN CLIENT LIC	2702579	1
GNSS receiver and NTP (Network Time Protocol) for Ethernet networks, receives time, date, and location via GPS, GLONASS, or Galileo, web-based management, supply via PoE (af) or 24 V DC, integrated antenna, IP68 housing	FL TIMESERVER NTP	1107132	1

Operation of the wireless system is only permitted when using accessories available from Phoenix Contact. The use of any other components can lead to the withdrawal of the operating license.

You can find the approved accessories for this wireless system listed with the item at phoenixcontact.net/product/2903586.

4 Technical data

Supply	
Supply voltage range	11 V DC ... 36 V DC (via pluggable COMBICON screw terminal block)
Typical current consumption	< 320 mA (24 V DC)
Max. current consumption	< 1.8 A (at 11 V DC (incl. 3 x 125 mA for the outputs))
Electrical isolation	VCC // PE
Test voltage data interface/power supply	1 kV (50 Hz, 1 min.)
Torque	0.56 Nm ... 0.79 Nm
Stripping length	7 mm
Conductor cross section	
flexible	0.20 mm^2 ... 2.50 mm^2
rigid	0.20 mm^2 ... 2.50 mm^2
AWG	24 AWG ... 14 AWG

Only use devices with limited output voltage ($U \leq 36$ V DC) and limited output current ($I \leq 2$ A) as the external voltage source.

Functions	TC MGUARD RS4000 4G VPN	TC MGUARD RS2000 4G VPN
Management	Web-based management, SNMP	Web-based management, SNMP
Firewall rules	Configurable stateful inspection firewall with full scope of functions	Simplified 2-click stateful inspection firewall
Filtering	MAC and IP addresses, ports, protocols	Incoming or outgoing traffic
Routing	Standard routing, NAT, 1:1-NAT, port forwarding	Standard routing, NAT, 1:1-NAT, port forwarding
Number of VPN tunnels	10 (up to 250 tunnels with additional license as an option)	2 (fixed, Ipsec (IETF standard))
1:1 Network Address Translation (NAT) in the VPN	Supported	Supported
Encryption methods	DES, 3DES, AES-128, -192, -256	DES, 3DES, AES-128, -192, -256
Internet Protocol Security (IPsec) mode	ESP tunnel / ESP transport	ESP tunnel / ESP transport
Authentication	X.509v3 certificates with RSA or PSK	X.509v3 certificates with RSA or PSK
Data integrity	MD5, SHA-1	MD5, SHA-1
Dead peer detection (DPD)	RFC 3706	RFC 3706

Ethernet interface, 10/100Base-T(X) in accordance with IEEE 802.3	TC MGUARD RS4000 4G VPN	TC MGUARD RS2000 4G VPN
Number of ports	6	4
Connection method	RJ45	RJ45
Transmission speed	10/100 Mbps (auto negotiation)	10/100 Mbps (auto negotiation)
Transmission length	100 m (shielded twisted pair)	100 m (shielded twisted pair)
Test voltage	1 kV (50 Hz, 1 min.)	1 kV (50 Hz, 1 min.)
Protocols supported	TCP/IP, UDP/IP, FTP, HTTP	TCP/IP, UDP/IP, FTP, HTTP
Auxiliary protocols	ARP, DHCP, PING (ICMP), SNMP V1, SMTP	ARP, DHCP, PING (ICMP), SNMP V1, SMTP

V.24 (RS-232) interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1	
Connection method	D-SUB 9 plug
Data format/encoding	UART/NRZ: 8 Data, 1/2 Stop, None/Even/Odd Parity
Serial transmission speed	9.6; 19.2; 38.4; 57.6; 115.2 kbps
Transmission length	15 m
Data flow control/protocols	Software handshake, Xon/Xoff or hardware handshake RTS/CTS

Wireless interface		
Interface description		GSM / GPRS / EDGE / UMTS / HSPA / LTE (FDD)
Antenna connection method		SMA (female)
Frequency range		
	4G	800 MHz (LTE B20) 900 MHz (LTE B8) 1800 MHz (LTE B3) 2100 MHz (LTE B1) 2600 MHz (LTE B7)
	3G	900 MHz (UMTS/HSPA B8) 1800 MHz (UMTS/HSPA B3) 2100 MHz (UMTS/HSPA B1)
	2G	900 MHz (2 W (EGSM)) 1800 MHz (1 W (EGSM))
Data rate		≤ 100 Mbps (LTE (DL)) ≤ 50 Mbps (LTE (UL))
Antenna		50 Ω impedance SMA antenna socket
SIM Interface		1.8 volt, 3 volt
LTE		CAT3
Network check		LED bar graph to display receive quality
Protocols supported		GPS (Global Positioning System), GLONASS
Digital input		
Number of inputs		3
Input signal, Voltage		10 V DC ... 30 V DC
Input signal, Current		5 mA
Digital output		
Number of outputs		3
Output signal, Voltage		10 V DC ... 30 V DC (depending on the operating voltage)
Output signal, Current		≤ 125 mA (Short-circuit-proof)

General data	
Basic functions	Router with intelligent firewall and VPN for 10 tunnels (up to 250 supported with optional additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card
Degree of protection	IP20
Degree of pollution	2
Dimensions (W/H/D)	45 mm x 130 mm x 114 mm
Housing material	Metal silver
Free fall in acc. with IEC 60068-2-32	1 m
Vibration resistance in acc. with EN 60068-2-6/ IEC 60068-2-6	5g, 10...150 Hz, 2.5 h, in XYZ direction
Shock in acc. with EN 60068-2-27/IEC 60068-2-27	Operation: 15g, 11 ms period, half-sine shock pulse
Shock in acc. with EN 60068-2-27/IEC 60068-2-27	Storage: 30g, 11 ms period, half-sine shock pulse
Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU

MTTF (mean time to failure)	
SN 29500 standard, temperature 25°C, operating cycle 21%	532 Years
SN 29500 standard, temperature 40°C, operating cycle 34.25%	250 Years
SN 29500 standard, temperature 40°C, operating cycle 100%	104 Years

Ambient conditions	
Ambient temperature	
Operation	-40 °C ... 60 °C
Storage/transport	-40 °C ... 70 °C
Humidity	
Operation	5 % ... 95 % (non-condensing)
Altitude	≤ 5000 m (for restrictions, see the manufacturer's declaration for altitude operation)

Conformance/Approvals	
CE	CE-compliant
Corrosive gas test	ISA-S71.04-1985 G3 Harsh Group A
Free from substances that could impair the application of coating	according to P-VW 3.10.7 57 65 0 VW-AUDI-Seat central standard

Conformance with EMC Directive 2014/30/EU		
Noise immunity according to EN 61000-6-2		
Electrostatic discharge	EN 61000-4-2	
	Contact discharge	± 6 kV (Test Level 3)
	Discharge in air	± 8 kV (Test Level 3)
	Comments	Criterion B
Electromagnetic HF field	EN 61000-4-3	
	Frequency range	80 MHz ... 3 GHz (Test Level 3)
	Field intensity	10 V/m
	Comments	Criterion A
Fast transients (burst)	EN 61000-4-4	
	Input	± 2.2 kV (Test Level 3)
	Signal	± 2.2 kV (Test Level 3)
	Comments	Criterion B
Surge current loads (surge)	EN 61000-4-5	
	Input	± 0.5 kV (DC supply)
	Signal	± 1 kV (Data line, asymmetrical)
	Comments	Criterion B
Conducted interference	EN 61000-4-6	
	Frequency range	0.15 MHz ... 80 MHz
	Voltage	10 V
	Comments	Criterion A

Criterion A	Normal operating behavior within the specified limits.
Criterion B	Temporary impairment to operational behavior that is corrected by the device itself.

Emitted interference in acc. with EN 61000-6-4	
Radio interference voltage in acc. with EN 55011	EN 55011 class A industrial area of application
Emitted radio interference in acc. with EN 55011	EN 55011 class A industrial area of application
Interference emission	EN 61000-6-4

5 Use outside of Europe

The devices are intended for use in Europe.

If the required general conditions are met, use outside of Europe is possible.

For an initial idea of which frequency bands are available in your country of use, visit www.frequencycheck.com.

- Verify with your provider whether one of the following frequency bands is available:
  - LTE, CAT3, B1
  - LTE, CAT3, B3
  - LTE, CAT3, B7
  - LTE, CAT3, B8
  - LTE, CAT3, B20
- Verify with your provider whether there is network coverage at the installation location.
- Verify with your provider whether the device is approved for operation at the installation location.

6 Function

The **TC MGUARD RS4000 4G VPN** supports high-availability high-end security. It creates a remote maintenance infrastructure for the secure connection of machines and systems. For maximum availability, an additional external network is supported redundantly alongside the internal network (LAN) and the external network (WAN) in the form of the cellular interface. The integrated 4-port switch offers management functions and supports EtherNet/IP™.

- Firmware with extended scope of functions
- Meets the security requirements for remote access applications with parallel integration of machines and systems into higher-level networks
- Managed 4-port switch
- Two parallel interfaces for external networks: cellular communication and Ethernet (WAN)
- DMZ port
- Up to 10 parallel VPN tunnels (up to 250 possible with additional license as an option)
- CIFS Integrity Monitoring (optional)

The **TC MGUARD RS2000 4G VPN** is designed for applications with fewer complex requirements. The device acts as an industrial remote service router with a simplified configuration. The integrated 4-port switch saves space on the DIN rail.

- Basic security router with reduced complexity
- 4-port switch
- RS-232 interface with COM server function for integrating serial devices
- Simplified 2-click stateful inspection firewall
- Two VPN connections (cannot be extended)

Both versions have all the necessary standard functions for operating a flexible and robust Ethernet network.

Serial device server

The integrated COM server function is used to integrate RS-232 interfaces into Ethernet networks. This provides an easy way of implementing functions such as cable replacement or network integration.

- Cable replacement: two devices in combination tunnel serial connections via Ethernet.
- Network integration: you can integrate automation devices such as controllers or frequency inverters into a network using corresponding programming and diagnostics software.

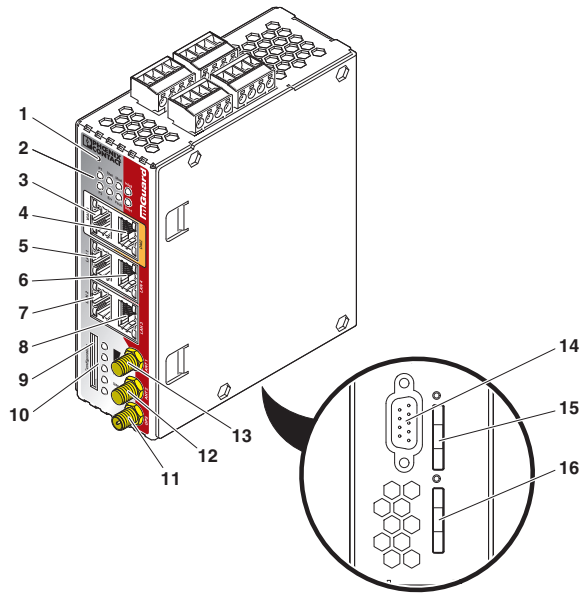
Device Manager

The Device Manager simplifies the management of mGuard security appliances. The tool features a template mechanism that enables the user to configure and manage all mGuard devices centrally - from a few hundred devices to several thousand.

7 Product description

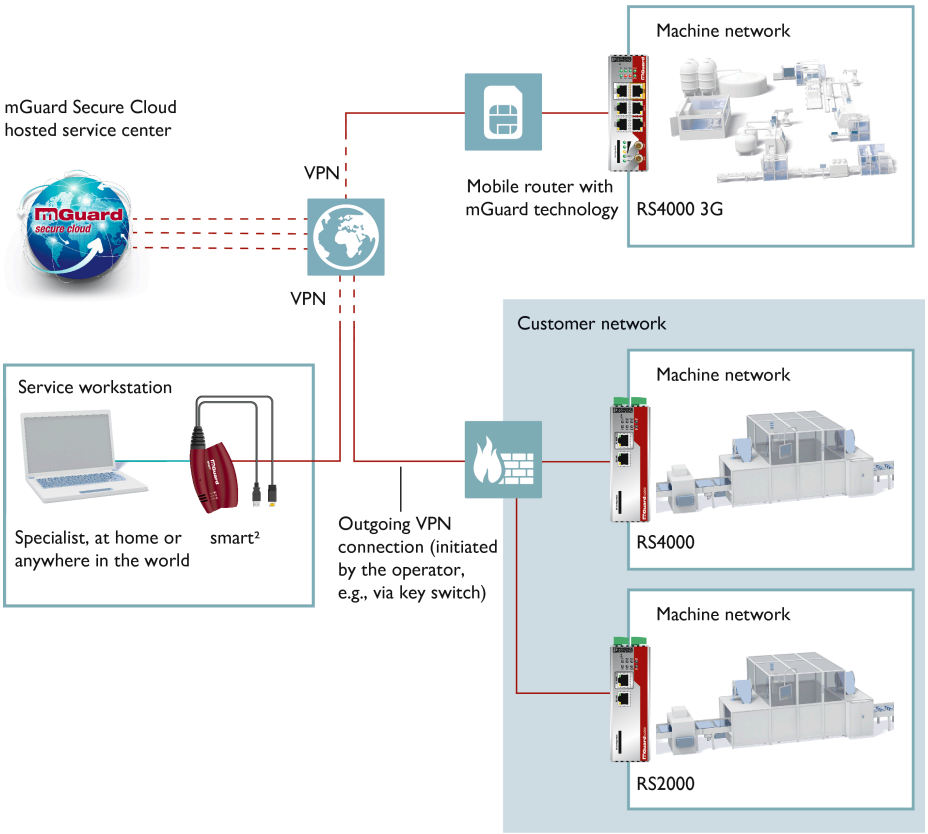
The 4G devices have two antenna connections. To achieve optimum LTE reception, always connect two antennas for 4G devices.

Figure 1 Operating elements



1	Reset button			
2	**Diagnostics and status indicators**			
	P1, P2	Green	On	Supply voltage present
	STAT	Green	Flashing	Heartbeat - the device is correctly connected and operating.
	ERR	Red	Flashing	Software system error - please restart.
	MOD	Green	On	Package data connection is established via cellular network.
	FAULT	Red	On	Fault: Signal output 01 open
	INFO1/2	Green	On	The configured VPN connection has been established.
3	WAN port (only MGUARD RS 4000)			
4	DMZ port (only MGUARD RS 4000)			
5 - 8	LAN ports (protected)			
9	Slot for optional memory card			
10	**Status LEDs**			
	Display of reception quality as bar graph			
		Yellow/ green/ green	On	Very good network reception
		Yellow/ green	On	Good network reception
		Yellow	On	Adequate network reception
			Off	Extremely poor or no network reception
	SIM 1	Green	On	SIM card 1 active
			Flashing	No PIN entered
	SIM 2	Green	On	SIM card 2 active
			Flashing	No PIN entered
11	RSMA antenna socket (GPS)			
12	SMA antenna connector 1, primary antenna (cellular network)			
13	SMA antenna connector 2, secondary antenna (cellular network)			
14	RS-232 interface			
15	Slot for SIM card 1			
16	Slot for SIM card 2			

8 Application example



Secure remote maintenance concepts from Phoenix Contact offer the following advantages:

- Availability regardless of location
- Reduced travel costs and downtimes
- Greater customer loyalty, thanks to a high level of service quality
- Less expense linked to warranties
- Fewer devices, as remote maintenance, routing, and firewall are combined in a single device
- Operator network protected against unauthorized access
- No security problems associated with the theft of equipment
- Same level of administration required, even if the number of machines increases
- The user alone enables remote maintenance
- Easy machine integration in customer networks
- Fast resolution of IP address conflicts
- Machines are protected from the operator network and vice versa
- No adaptation of machines and systems, no software required