TC MGUARD RS2000/4000 4G VPN

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

Data sheet
107583_en_02

1 Description

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

The devices offer high-speed Internet access via 4G mobile 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 mobile networks.

With the help of predefined configuration on SD cards, the devices can be easily and quickly started up or replaced.

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

Features

– High-speed mobile network interface with provider redundancy
– Integrated 4-port switch (managed for TC MGUARD RS4000 4G VPN)
– Maximum security with IPsec protocol on Layer 3
– Web-based management, SNMP
– Replaceable configuration memory
– Comprehensive connection options
– 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
– Connection for VPN enable button and VPN status LED
– Extended temperature range

[i] In light of the EoL (end-of-life) announcements regarding the mobile network chips used, the next device revision (hardware Version 02) will no longer offer a GPS interface. This means that these devices will no longer support time synchronization and positioning via GPS and GLONASS. The next device revision will be available in 2018.
Devices with hardware Version 01 will continue to support these functions, even beyond 2019.
If you require a GPS function in your application, please contact Phoenix Contact directly.

[i] 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 3 "Ordering data" .

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INSPIRING INNOVATIONS

2 Table of contents

3   Ordering data

Description	Type	Order No.	Pcs./Pkt.
Security appliance, WAN and 4G mobile network 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	TC MGUARD RS4000 4G VPN	2903586	1
Security appliance with 4G mobile network interface, SD card slot, 2 VPN tunnels, firewall for easy configuration, router with NAT/1:1 NAT, 4-port switch, 2 SIM card slots	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	10
Patch cable, CAT5, assembled, 2 m	FL CAT5 PATCH 2,0	2832289	10
Patch cable, CAT5, assembled, 10 m	FL CAT5 PATCH 10,0	2832629	10
Dust protection caps for RJ45 socket dust protection, color: black	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. RJ45 connector, material: polycarbonate, color: gray	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. RJ45 connector, material: polycarbonate, color: green	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 mobile communication antenna with mounting bracket for outdoor installation, 5 m antenna cable with SMA circular connector, suitable for LTE/4G	TC ANT MOBILE WALL 5M	2702273	1

Accessories	Type	Order No.	Pcs./Pkt.
Mobile network antenna cable, 5 m in length, SMA (male) -> SMA (female), 50 ohm impedance	PSI-CAB-GSM/UMTS- 5M	2900980	1
Mobile network antenna cable, 10 m in length, SMA (male) -> SMA (female), 50 ohm impedance	PSI-CAB-GSM/UMTS-10M	2900981	1
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

> **i** 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

> **i** Only use devices with limited output voltage (U ≤ 36 V DC) and limited output current (I ≤ 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 acc. with IEEE 802.3u	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	850 MHz (2 W (EGSM)) 900 MHz (2 W (EGSM)) 1800 MHz (1 W (EGSM)) 1900 MHz (1 W (EGSM)) 850 MHz (UMTS/HSPA B5) 900 MHz (UMTS/HSPA B8) 1900 MHz (UMTS/HSPA B2) 2100 MHz (UMTS/HSPA B1) 800 MHz (LTE B20) 850 MHz (LTE B5) 900 MHz (LTE B8) 1700 MHz (LTE B4) 1800 MHz (LTE B3) 1900 MHz (LTE B2) 2100 MHz (LTE B1) 2600 MHz (LTE B7)
Data rate	≤ 150 Mbps (LTE (DL)) ≤ 50 Mbps (LTE (UL))
Antenna	50 Ω impedance SMA antenna socket
SIM Interface	1.8 volt, 3 volt
GPRS	Class 12, Class B CS1 ... CS4
EDGE	Multislot Class 10
UMTS	HSPA 3GPP R9
LTE	CAT4
Network check	LED bar graph to display receive quality

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
MTTF (mean time to failure) SN 29500 standard, temperature 25 °C, operating cycle 21 % (5 days a week, 8 hours a day)	532 Years
MTTF (mean time to failure) SN 29500 standard, temperature 40 °C, operating cycle 34.25 % (5 days a week, 12 hours a day)	250 Years
MTTF (mean time to failure) SN 29500 standard, temperature 40 °C, operating cycle 100 % (7 days a week, 24 hours a day)	104 Years
Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU

Ambient conditions

Ambient temperature (operation)	-40 °C ... 60 °C
Ambient temperature (storage/transport)	-40 °C ... 70 °C
Permissible humidity (operation)	5 % ... 95 % (non-condensing)
Altitude	5000 m (for restrictions see manufacturer's declaration)

Approvals / Certificates

Conformance	CE-compliant
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
Noxious gas test	ISA-S71.04-1985 G3 Harsh Group A

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

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

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

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.

> **i** 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, CAT4, B1
  - LTE, CAT4, B2
  - LTE, CAT4, B3
  - LTE, CAT4, B4
  - LTE, CAT4, B5
  - LTE, CAT4, B7
  - LTE, CAT4, B8
  - LTE, CAT4, 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 mobile phone 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: mobile phone 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

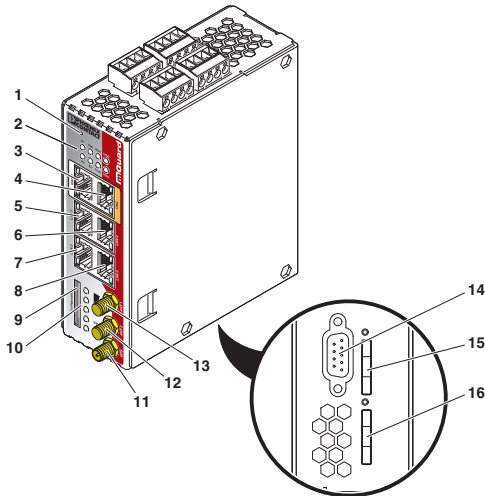| i	The 4G devices have two antenna connections. To achieve optimum LTE reception, always connect two antennas for 4G devices.

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 mobile phone.
FAULT	Red	On	Fault: Signal output 01 open
INFO 1, INFO 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 (mobile network)

13   SMA antenna connector 2, secondary antenna (mobile network)

14   RS-232 interface

15   Slot for SIM card 1

16   Slot for SIM card 2

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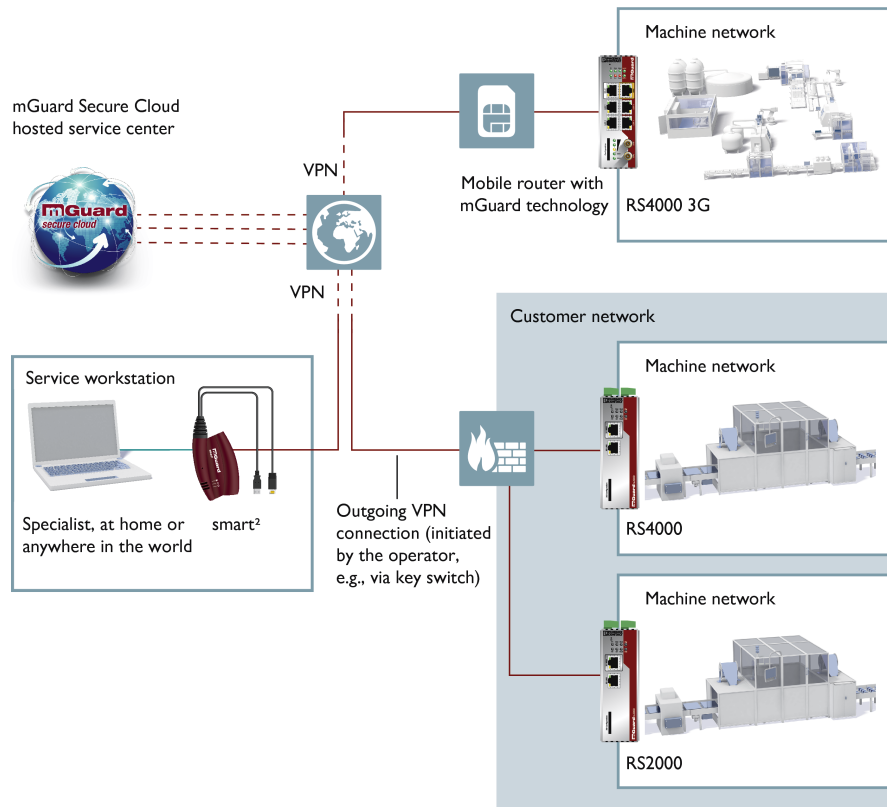
Secure remote maintenance concepts from
Phoenix Contact offer the following advantages:

– 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

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