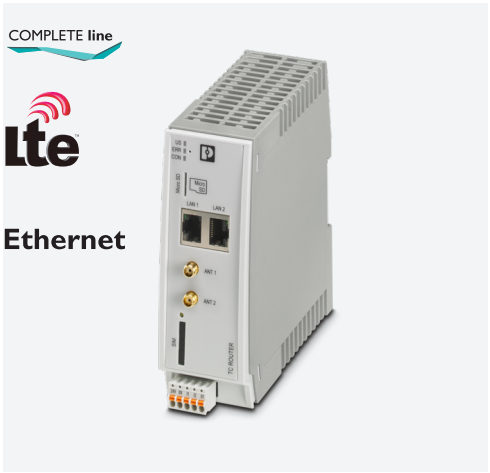
TC ROUTER 3002T-4G

Industrial cellular router



Data sheet
107023_en_06

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1 Description

The **TC ROUTER...** cellular routers enable high-performance high-speed data links via cellular networks. The integrated firewall and VPN (Virtual Private Network) protect your application against unauthorized access.

The TC ROUTER ...-4G is an industrial 4G cellular router (LTE) with fallback to 3G (UMTS/HSPA) and 2G (GPRS/EDGE).

The focus is on EMC, electrical isolation, and surge protection for reliable and secure communication. In addition, the data link and quality of the cellular network are monitored. If required, the device sends a message or re-establishes the cellular connection.

Features

- Virtual dedicated line to connect networks via cellular network
- Stateful inspection firewall for dynamic filtering
- IPsec and OpenVPN
- VPN remote start via SMS or call
- Two switching inputs and one switching output
- Alarm sent via SMS or e-mail directly via the integrated switching input
- Configuration via web-based management or microSD card
- Two local Ethernet connections
- Switchable energy-saving mode
- Integrated logbook
- Extended temperature range of -40 °C ...+70 °C

Observe these notes

The devices are intended for use in Europe.
If you are planning to use the device outside of Europe, refer to the “5 Use outside of Europe” section.

Make sure you always use the latest documentation.
It can be downloaded at: phoenixcontact.com/product/2702528
The additional information in the user manual must also be strictly observed.

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3 Ordering data

Description	Type	Item no.	Pcs./Pkt.
Industrial 4G LTE router, European version, fallback to 3G UMTS/HSPA+ and 2G GPRS/EDGE, 2 Ethernet interfaces, firewall, NAT, IPsec and OpenVPN support, 2x SMA-F antenna socket, SMS and e-mail transmission, 2 digital inputs, 1 digital output	TC ROUTER 3002T-4G	2702528	1

Accessories	Type	Item no.	Pcs./Pkt.
Primary-switched TRIO POWER power supply with push-in connection for DIN rail mounting, input: 1-phase, output: 24 V DC/3 A C2LPS	TRIO-PS-2G/1AC/24DC/3/C2LPS	2903147	1
PCB connector, nominal cross section: 1.5 mm², color: light gray, nominal current: 8 A, rated voltage (III/2): 160 V, contact surface: Sn, contact connection type: Socket, number of rows: 1, number of positions: 5, product range: FK-MCP 1,5/..-ST, pitch: 3.81 mm, connection method: Push-in spring connection, conductor/PCB connection direction: 0 °, plug-in system: COMBICON MC 1,5, locking: without, mounting method: without, type of packaging: packed in cardboard	FK-MCP 1,5/ 5-ST-3,81GY35BD-01	1105115	50
Multiband omnidirectional antenna for wall or mast mounting, 0.6 GHz ... 7.1 GHz, gain: 1 dBi ... 3 dBi, degree of protection: IP67, seawater-resistant, connection: N (female), incl. mounting bracket and mast clamps	ANT-OMNI-0671-01	1396316	1
Multiband omnidirectional antenna with protection against vandalism for control cabinet mounting, frequency band: 0.6 GHz ... 7.1 GHz, gain: 2 dBi ... 4 dBi, degree of protection: IP67, shockproof: IK10, seawater-resistant, connection: N (female)	ANT-OMNI-0671-02	1396318	1
Multiband omnidirectional antenna for installation in plastic control cabinets not visible from the outside, frequency band: 0.6 GHz ... 7.1 GHz, gain: 1 dBi .... 2 dBi, connection: SMA (male), antenna connector with 90° articulated joint	ANT-OMNI-0671-03	1565400	1
Coaxial cable, 50 Ω, length: 0.5 m, N(m) - SMA(m), external cable diameter: 2.8 mm, transmission frequency: ≤7.25 GHz, typical attenuation: 800 MHz 0.4 dB, 2.4 GHz 0.7 dB, 5.8 GHz 1.1 dB, 7.25 GHz 1.5 dB	NBC-COX-CNM/0.5-S/COX-CKM	1340139	1
Coaxial cable, 50 Ω, length: 1 m, N(m) - SMA(m), external cable diameter: 4.9 mm, transmission frequency: ≤7.25 GHz, typical attenuation: 800 MHz 0.5 dB, 2.4 GHz 0.8 dB, 5.8 GHz 1.2 dB, 7.25 GHz 1.4 dB	NBC-COX-CNM/1.0-M/COX-CKM	1340143	1
Coaxial cable, 50 Ω, length: 3 m, N(m) - SMA(m), external cable diameter: 4.9 mm, transmission frequency: ≤7.25 GHz, typical attenuation: 800 MHz 1.4 dB, 2.4 GHz 2.3 dB, 5.8 GHz 3.6 dB, 7.25 GHz 4.2 dB	NBC-COX-CNM/3.0-M/COX-CKM	1340144	1

Accessories	Type	Item no.	Pcs./Pkt.
Coaxial cable, 50 Ω, length: 5 m, N(m) - SMA(m), external cable diameter: 4.9 mm, transmission frequency: ≤7.25 GHz, typical attenuation: 800 MHz 2.3 dB, 2.4 GHz 3.8 dB, 5.8 GHz 6 dB, 7.25 GHz 7.3 dB	NBC-COX-CNM/5.0-M/COX-CKM	1340147	1
Coaxial cable, 50 Ω, length: 3 m, N(m) - N(m), external cable diameter: 10.3 mm, transmission frequency: ≤7.25 GHz, typical attenuation: 800 MHz 0.5 dB, 2.4 GHz 0.8 dB, 5.8 GHz 1.3 dB, 7.25 GHz 1.5 dB	NBC-COX-CNM/3.0-L/COX-CNM	1340123	1
Coaxial cable, 50 Ω, length: 5 m, N(m) - N(m), external cable diameter: 10.3 mm, transmission frequency: ≤7.25 GHz, typical attenuation: 800 MHz 0.8 dB, 2.4 GHz 1.4 dB, 5.8 GHz 2.2 dB, 7.25 GHz 2.5 dB	NBC-COX-CNM/5.0-L/COX-CNM	1340124	1
Coaxial cable, 50 Ω, length: 10 m, N(m) - N(m), external cable diameter: 10.3 mm, transmission frequency: ≤7.25 GHz, typical attenuation: 800 MHz 1.6 dB, 2.4 GHz 2.7 dB, 5.8 GHz 4.3 dB, 7.25 GHz 5 dB	NBC-COX-CNM/10.0-L/COX-CNM	1340125	1
Coaxial cable, 50 Ω, length: 15 m, N(m) - N(m), external cable diameter: 10.3 mm, transmission frequency: ≤7.25 GHz, typical attenuation: 800 MHz 2.4 dB, 2.4 GHz 4.1 dB, 5.8 GHz 6.5 dB, 7.25 GHz 7.5 dB	NBC-COX-CNM/15.0-L/COX-CNM	1340126	1
Coaxial cable, 50 Ω, length: 30 m, N(m) - N(m), external cable diameter: 10.3 mm, transmission frequency: ≤7.25 GHz, typical attenuation: 800 MHz 4.8 dB, 2.4 GHz 8.1 dB, 5.8 GHz 12.9 dB, 7.25 GHz 15 dB	NBC-COX-CNM/30.0-L/COX-CNM	1340127	1
Attachment plug with surge protection for coaxial signal interfaces. Connection: N connector, female/female	CN-UB-70DC-6-BB	2803166	1
Antenna adapter for control cabinet feed-through, frequency range: 0.3 GHz ... 6 GHz, degree of protection: IP65, connection: 2 x N (female)	RAD-ADP-N/F-N/F	2867843	1
Vulcanizing sealing tape for external protection of adapters, cable connections, etc. against the effects of weather, roll length: 3 m	RAD-TAPE-SV-19-3	2903182	1
The FL DIN-RAIL ADAPTER 45 is designed to allow products 45 mm wide to be mounted flush to a standard 35 mm DIN rail, in any orientation.	FL DIN-RAIL ADAPTER 45	1456045	1
The FL PANEL ADAPTER 45 is designed to allow products 45 mm wide to be mounted flush to a panel, in any orientation.	FL PANEL ADAPTER 45	1456055	1
The FL DIN-RAIL ADAPTER 45 is designed to allow products 45 mm wide to be mounted flush to a standard 35 mm DIN rail, in any orientation.	FL DIN-RAIL ADAPTER 45	1456045	1

Accessories	Type	Item no.	Pcs./Pkt.
The FL DIN RA is installed in a standard, 19-inch rack (EIA-310-D, IEC 60297-3-100) to allow DIN rail mounted equipment to be rack mounted.	FL DIN RA	2891053	1
Configuration memory in micro SD format	FL MICRO SD FLASH	1129482	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 product at phoenixcontact.com/product/2702528.

4 Technical data

Supply	
Supply voltage range	10 V DC ... 30 V DC (via pluggable Push-in terminal block)
Typical current consumption	< 200 mA (24 V DC) 65 mA (with activated energy-saving mode)
Max. current consumption	1.7 A
Electrical isolation	VCC // LTE // Ethernet // PE
Connection method	**Push-in spring connection**
Stripping length	9.00 mm
Conductor cross-section	
flexible	0.14 mm² ... 1.5 mm²
AWG flexible	26 ... 16
rigid	0.14 mm² ... 1.5 mm²
AWG rigid	26 ... 16
Flexible with ferrules without plastic sleeve	0.25 mm² ... 1.5 mm²
Flexible with ferrules with plastic sleeve	0.25 mm² ... 0.75 mm²

Functions	
Management	Web-based management, SNMP
Firewall rules	Stateful inspection firewall
Filtering	IP addresses Ports Protocols
Number of VPN tunnels	≤ 10 (IPsec or OpenVPN)
1:1 Network Address Translation (NAT) in the VPN	supported
Encryption methods	3DES, AES-128, -192, -256
Internet Protocol Security (IPsec) mode	ESP tunnel
Authentication	X.509v3, PSK
Data integrity	MD5 SHA-1
Dead peer detection (DPD)	RFC 3706

Ethernet interface, 10/100Base-T(X) in accordance with IEEE 802.3	
Number of ports	2
Connection method	RJ45 jack, shielded
Serial transmission speed	10/100 Mbps, auto negotiation
Transmission length	100 m (shielded twisted pair)
Protocols supported	TCP/IP, UDP/IP, FTP, HTTP(S)
Auxiliary protocols	ARP, DHCP, PING (ICMP), SNMP V1/V2, SMTP(S), NTP, SSL/TLS, STARTTLS

Wireless interface	
Interface description	GSM / GPRS / EDGE / UMTS / HSPA+ / LTE
Frequency range	
4G	2600 MHz (LTE B38) 2500 MHz (LTE B41) 2300 MHz (LTE B40) 2100 MHz (LTE B1) 1800 MHz (LTE B3) 2600 MHz (LTE B7) 900 MHz (LTE B8) 800 MHz (LTE B20) 700 MHz (LTE B28A)
3G	2100 MHz (UMTS/HSPA B1) 900 MHz (UMTS/HSPA B8)
2G	900 MHz (2 W (EGSM)) 1800 MHz (1 W (EGSM))
Data rate	≤ 150 Mbps (LTE, DL) ≤ 50 Mbps (LTE, UL)
Antenna	50 Ω impedance SMA antenna socket
SIM Interface	1.8 volt, 3 volt
LTE	CAT4

Digital input	
Number of inputs	2
Input signal, Voltage	10 V DC … 30 V DC
Switching level "1" signal	10 V DC … 30 V DC

Digital output	
Number of outputs	1
Output signal, Voltage	10 V DC … 30 V DC (depending on the operating voltage)
Output signal, Current	≤ 50 mA (not short-circuit proof)

General data	
Function	Cellular router VPN gateway to the mGuard Secure Cloud
Degree of protection	IP20
Mounting type	DIN rail mounting
Dimensions (W/H/D)	45 mm x 130 mm x 127 mm
Material	
Housing	Plastic
Color	
Upper housing part	light grey (7035)
Vibration resistance in accordance with EN 60068-2-6/ IEC 60068-2-6	5g, 10...150 Hz, 2.5 h, in XYZ direction
Shock in accordance with EN 60068-2-27/IEC 60068-2-27	15g
Electromagnetic compatibility	Conformance with RED Directive 2014/53/EU
MTTF (mean time to failure)	
SN 29500 standard, temperature 25°C, operating cycle 21%	383 Years
SN 29500 standard, temperature 40°C, operating cycle 34.25%	184 Years
SN 29500 standard, temperature 40°C, operating cycle 100%	78 Years
Ambient conditions	
Ambient temperature	
Operation	-40 °C ... 70 °C (Maximum transmission power 5 dBm)
	-40 °C ... 60 °C (Maximum transmission power 23 dBm)
Storage/transport	-40 °C ... 85 °C
Humidity	
Operation	10 % ... 95 % (non-condensing)
Storage/transport	10 % ... 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
Wireless approval Brazil, ANATEL	09685-24-06497

Conformance with RED Directive 2014/53/EU		
Immunity in accordance with 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 kV (Test Level 3)
	Signal	± 2 kV (Ethernet)
	Comments	Criterion B
Surge current loads (surge)	EN 61000-4-5	
	Input	± 0.5 kV (symmetrical) ± 1 kV (asymmetrical)
	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.

Noise emission	
Emitted radio interference in acc. with EN 55011	Class B, area of application: Industry and residential
Radio interference voltage in acc. with EN 55011	Class B, area of application: Industry and residential

Conformance with RED Directive 2014/53/EU	
EMC - immunity to interference (electromagnetic compatibility of wireless systems)	EN 61000-6-2 Generic standard for the industrial sector
Safety - protection of personnel with regard to electrical safety	EN 62368
Health - limitation of exposure of the population to electromagnetic fields	EC Gazette 1999/519/EC EC Council recommendation of July 12, 1999
Radio - effective use of the frequency spectrum and prevention of radio interference	DIN EN 301511

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.

Check the following with your provider:

- Are any of these frequency bands available?
  - LTE, CAT4, B1
  - LTE, CAT4, B3
  - LTE, CAT4, B7
  - LTE, CAT4, B8
  - LTE, CAT4, B20
  - LTE, CAT4, B28A
  - LTE, CAT4, B38
  - LTE, CAT4, B40
  - LTE, CAT4, B41
- Is there network coverage at the installation location?
- Is the device approved for operation at the installation location?

6 Product description

Figure 1 Dimensions

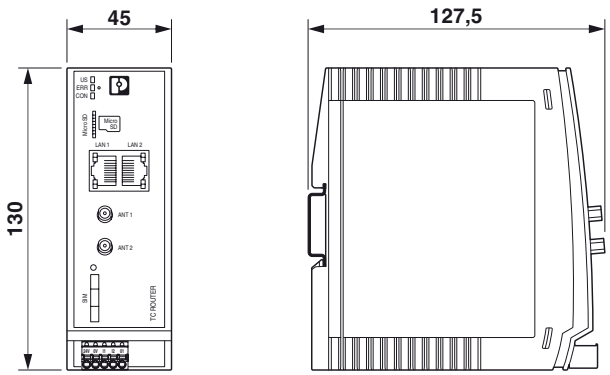
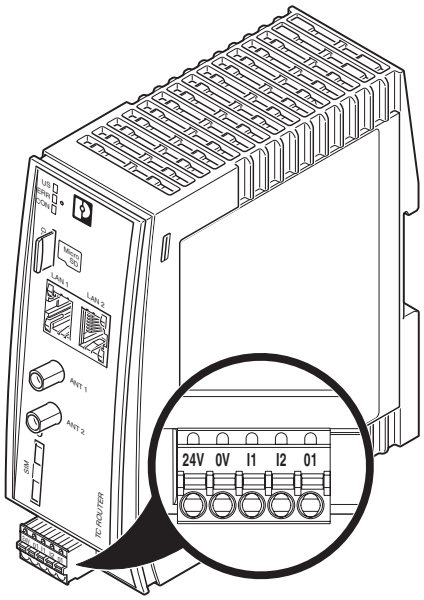
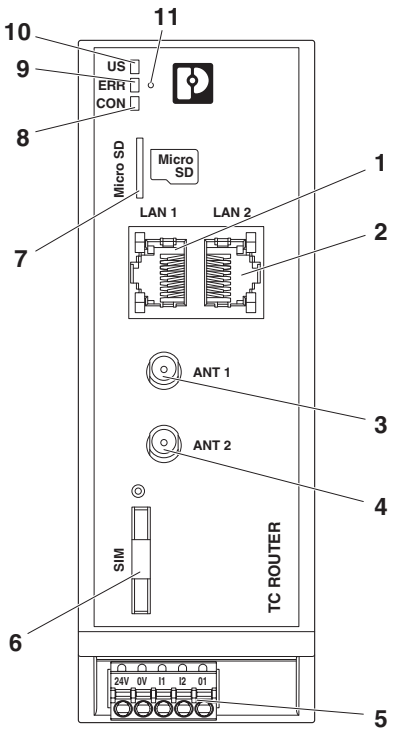


Figure 2 Device connections



6.1 Function elements



1 LAN interface 1
2 LAN interface 2
3 SMA antenna connection 1, primary antenna
4 SMA antenna connection 2, secondary antenna
5 Pluggable Push-in terminal block
6 SIM interface
7 Slot for micro SD card
8 CON-LED
9 ERR-LED
10 US-LED
11 Reset button

- To achieve optimal LTE reception, connect two suitable antennas to the antenna connections.

6.2 Status and diagnostics indicators

U_S	Power	Green
	On	Supply voltage present
ERR	Error	Red
	Off	Registered on the network
	Flashing	SIM card not inserted, SIM error (e.g. PIN or PUK locked)
	On	Searching for cellular network
CON	Connect	Yellow
	On	Connection established

The CON LED can be configured via web-based management. You can therefore monitor the cellular IP connection or the VPN tunnel.

6.3 Default settings

IP address	https://192.168.0.1
TLS	1.2 or 1.3
User name	admin
Password	admin
DHCP server	Disabled

Assign your own, secure admin password during initial startup.

6.4 Reset functions

You can reset the device via the web-based management or via the reset button.

In the delivery state, the device is completely reset to the default settings.

You can select the function of the reset button in web-based management. It is possible to reset only the password and the LAN IP address.

Web-based Management (WBM)

- In the web-based management, click on:
  – System, Configuration up-/download, Reset to factory defaults

Reset button

- Press and hold down the reset button for at least five seconds.

6.5 Inputs and outputs

Two configurable switching inputs for the following functions:

– SMS can be sent, even to multiple recipients
– E-mail can be sent, even to multiple recipients
– Output at a remote station can be controlled via SMS
– Restart router
– Start or stop mobile data link
– Switch IPsec or OpenVPN connection
– Automatically load configuration from a microSD card
– Activate energy-saving mode

One configurable switching output, activated by:

– Activation by the input at a remote station
– SMS
– Web-based management
– Incoming call
– Connection abort
– Status of the cellular network connection
– Status of the mobile data link
– Status of a VPN connection

6.6 Additional functions

Slot for microSD card

You can use a microSD card to load the configuration in the device or permanently store log files.

Energy-saving mode

In energy-saving mode, the power consumption of the cellular router is reduced for battery-powered applications. You can configure the mode via the web interface and activate it via a switching input. When energy-saving mode is activated, the communication interfaces switch to standby mode. Data transmission is limited.

XML interface

The XML interface enables operation and diagnostics of devices from the local LAN. You can therefore query the status of the cellular network connection via Ethernet, for example, or send SMS messages and e-mails.