



The RuggedRouter® RX1000 is an industrially hardened cyber security appliance with integrated router, firewall, and VPN functionality. The RX1000 can be used to establish an electronic security perimeter around critical cyber assets found in control and automation systems, in order to prevent the disruption of operations by accidental or malicious acts. It is ideally suited for electric power utilities, the industrial plant floor, and traffic control systems.

The cellular modem option for the RuggedRouter®, enables RuggedCell™ users to extend network boundaries, reaching remote sites with broadband throughputs and built in quality of service. The router is equipped with a cellular modem, allowing users to operate on a number of approved cellular networks. The cellular modem allows connections to be made over cellular radio data link using the Point-to-Point Protocol (PPP).

The RX1000 is hardened to the RuggedRated™ specification which provides a high level of immunity to electromagnetic interference (EMI) and heavy electrical surges typical of the harsh environments found in many industrial applications.

Key Features and Benefits

Overall Features

- Optional card for RuggedRouter RX 1x00 Series
- HSPA, HSDPA, UMTS, EDGE, GPRS, GSM
- RuggedRated™ reliability and protection

Performance

- Data Speed²: up to 7.2 mb/s downstream, 2 mb/s upstream
- Frequency Bands:
 - GSM/GPRS: 850/900/1800/1900 MHz
 - WCDMA/HSDPA/HSUPA: 800/850/1900/2100 MHz
- Receive Diversity Support

Radio parameters

- Output power: Up to 32 dBm
- Rx Sensitivity: < -106 dBm

Antenna Parameters

- Max Antenna Gain: 5 dBi (Cellular band), 4 dBi (PCS band)
- Antenna Connectors: (2x) 50 ohm SMA female

Security Appliance Functions

- Integrated Router/Firewall/VPN
- Stateful Firewall with NAT
- Full IPSec Virtual Private Networking
- VPN with 3DES, AES128, AES256 support
- RADIUS centralized password management

Environmental Specifications

- Immunity to EMI and high voltage electrical transients
 - Meets IEEE 1613 (electric utility substations)
 - Exceeds IEC 61850-3 (electric utility substations)

- Exceeds IEC 61800-3 (variable speed drive systems)
- Exceeds IEC 61000-6-2 (generic industrial environment)
- Operating Temperature: -40 to +85°C¹
- 18 AWG galvanized steel enclosure and 19" rack-mount adapter

Physical Ports

- Ethernet Options (up to 4 ports):
 - 10/100BaseTX, 100BaseFX
- WAN Port Options (up to 4 ports):
 - T1/E1 (channelized/unchannelized)
 - supports 2Mbps G.703 with 120 ohm balanced connections
 - PPPoE/Bridged Ethernet via ADSL
 - T3 DS3
 - 56 Kbps DDS
- Serial Ports (up to 4 ports):
 - Fully compliant EIA/TIA RS485, RS422, RS232 serial ports (software selectable) – RJ45 connectors
 - Raw socket mode support allows conversion of any serial protocol
 - Embedded Modem Port
 - Precision Time Protocol (PTP card: Accurate time synchronization using NTP, IRIG-B, and/or IEEE1588)

Protocols

- WAN
 - Frame Relay RFC 1490 or RFC 1294
 - PPP RFC 1661, 1332, 1321, 1334, PAP, CHAP Authentication
 - PPPoE over DSL
 - GOOSE messaging support
- IP
 - Routing
 - VRRP, OSPF, RIP, DHCP Agent (Option 82 Capable)
 - Traffic prioritization, NTP Server, IP Multicast Routing

Frame Relay Support

- ISO and ITU compliant, network certified.
- ANSI T1.617 Annex D, Q.933 or LMI Local Signaling

Ordering

- Order as part of the RuggedRouter® RX1000/RX1100 order code

Universal Power Supply Options

- Fully integrated power supplies (no external adaptors)
- Input voltage range of 9-59VDC, 88-300VDC, and 85-264VAC for worldwide operability
- Optional dual redundant, parallel load-sharing power supplies for increased network availability
- Can be powered from different sources for ultimate redundancy

Multiple Ethernet Ports:

- ▶ Up to 4 100 Mbps ports
- ▶ Fiber or Copper
- ▶ LC, ST, MTRJ, SC

Multiple WAN Ports:

- ▶ Up to 8 T1/E1
- ▶ Dual DSL
- ▶ Dual DDS 56kbps
- ▶ T3 DS3
- ▶ Cellular Modem - HSPA/EVDO rev. A

RuggedCell™

Modular HMI

- ▶ Front or Rear Mount



Precision Time Protocol (Optional):

- ▶ Built-in GPS, Antenna Input
- ▶ NTP Server and Client
- ▶ IRIG-B (user selectable)
- ▶ IEEE1588 master or slave port
- ▶ see separate PTP card datasheet

V.90 Modem (Optional);

- ▶ 56kbps
- or

RS232 External Modem Interface (Optional)

Serial Ports

- ▶ 4 or 8 ports
- ▶ Software Selectable RS232/RS422/RS485
- ▶ RJ45 connector

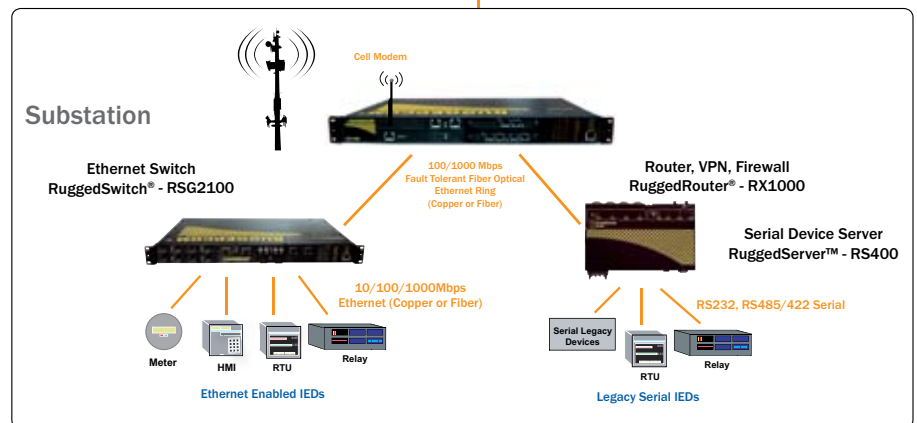
Mounting Options

- ▶ Panel/Din rail
- ▶ 19" Rack Mount

Sample Network Architecture



- ▶ For use as a primary or backup link
- ▶ Provide network connectivity for remote substations
- ▶ Provide backup to leased line facilities or private radio connections
- ▶ Eliminate costly upfront isolation charges



Notes: 1. Temperature range excluding carrier provided SIM
2. Theoretical peak physical throughput based on network services available

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Patent Pending
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