Model Information

Main Features

- Industrial VPNRouter with Firewall, NAT & DNS
- Secure remote access with VPN tunnel
- VPN with SSL/TLS and AES-256
- Easy network setup using SimpleVPN
- Supports Ethernet, WLAN and 3G/4G
- Rich connectivity: LANs, COMs, USBs, DI/Os, CAN
- ESD surge protection
- Low Power, fanless, secure connectors
- Operating temperature range: -20°C - +65°C
- DIN RAIL /Wall mountable
- Robust metal case

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VPNRouter iR 5221

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Overview

The VPNRouter iR 5221 is an advanced industrial VPN router designed for security sensitive network applications. The product's main feature includes the easy setup of secure VPN connections (SSL/TLS and AES-256 based) to other remote VPNRouters. The VPNRouter can act as the central firewall/router to the Internet or as a VPN gateway within an existing local network. In both roles, the VPNRouter can be a server or a client for the VPN. With the VPNRouter, one can significantly reduce costs as remote management and monitoring of critical assets is made possible. Examples of such assets include power and water treatment stations, production lines, ATMs, CCTVs and many other M2M applications.

Basic Router Services

The VPNRouter software is based on OpenWrt, which complies with all industrial high security standards. Over the browser based web front-end, the user can easily configure all network services including DHCP, DNS, NTP, UPnP and Firewall. Furthermore, it has the following security features:

- openVPN provides secure communication tunnels, using encryption of all IP packets and sender authentication whenever users access a private network over the public Internet.

- The firewall controls traffic between various trust zones shielding the private network from unauthorized outside access such as NAT.

Rich connectivity

VPNRouters support broadband GSM/3G/4G as Internet access variants for installation on mobile vehicles. Wifi is available as a common option. Furthermore, three SMA-antenna sockets are

provided. All interfaces - namely the serial ports, Digital I/O and CAN-Bus (VPNRouter iR 5221 only) - are remotely accessible over the LAN ports and VPN supported by services such as RFC2217, Modbus/TCP and VSCAN API; this allows simple remote access to a variety of industrial machines. The USB port can be used for firmware updates or the transfer of VPN configuration files.

Easy VPN deployment with SimpleVPN

SimpleVPN software enables a simple and comfortable OpenVPN configuration of all VPNRouters, whether they are used as Servers or Clients. The VPN setup of the whole can be fully configured by a single VPNRouter: Once a configuration of a VPNRouter is done, it can then easily be exported to other VPNRouters within the network with the use of a either a USB-Stick, a configuration file or Ethernet cables. SimpleVPN supports common VPN standards such as OpenVPN. The level of simplicity that comes with the handling of necessary encryption keys and certificates, which can be created on the device itself, makes it easy and convenient for the user to establish a VPN tunnel network.

Rugged Hardware

The industrial VPNRouter series stands out due to their robust and compact design. VPNRouters are fanless, have small footprint and are DIN Rail mountable systems. They are fully ESD and surge protected, complying with IEC 61000-4-2 (8kV air and 4KV contact). Properties such as low power consumption (3W typical), an extended temperature range ($-20°C$ to $+65°C$) and a wide range power supply (12-50V DC) make them ideal for harsh industrial environments. The options of WLAN and GSM/3G/4G modems for installations on mobile platforms exist. The MTBF of 10.5 years at 45°C environments shows the high technological reliability of VPNRouter series.

■ SimpleVPN

Functionality	SimpleVPN implemented in to VPN Routers can create a network of VPN tunnels. The network has star topology: all Client Routers (in Branches or Home Offices) connect to one central Server Router (in the Head Office). The Server acts as a central Hub/Switch for all data transfers: each PC in an office communicates with any other PC in other offices over the Server/Router. Changes in the configuration of Clients are easily done on the Server.
Security	Based on OpenVPN with SSL/TLS and AES-256
No. of VPN Tunnels	Depends on Internet connection Max. 5 Clients per Server in typical applications More Clients are possible with low data transfer demand
Management	The VPNRouter acting as Server allows the configuration of all Clients. Transfering the configuration to other clients can be done via • USB-Stick • File Upload / Download • Ethernet cable (before deploying the Client Routers)
Keys / Certificates	Generated locally on the VPNRouter, or upload them from another reliable source
Device Roles	Router Role: In this mode the VPN Router can be configured as Router providing access to the Internet via Ethernet, 3G/4G Modem or WLAN. Ethernet supports xDSL, TV-Cable or fiber. The VPN tunnels are supported on all types of media. Internet and VPN access is granted to the local LAN ports, behind the built-in Firewall. Gateway Role: A VPN Router is placed into an existing company's local network, creating a VPN Gateway for IP addresses connected by VPN tunnels. PCs and other Devices in the local network use this Router as a Route to access the other offices.
Remote Access / Remote Service	The integrated software services also allow secure VPN connections to machines and devices with serial ports, CAN Bus interfaces, facilitating smart remote control of these interfaces on the VPN Routers. Using VSCAN API for CAN-Bus, RFC 2217 for serial ports and Modbus/TCP for Digital I/O full remote access to the machines is enabled in a very convenient way. Machines and devices with LAN interfaces are remote connected via LAN ports of the VPN Router.

■ Software

Networking Services	Firewall with NAT, DHCP and DNS NTP, Dynamic DNS, UPnP
Interface Services	These interfaces allow remote access • GPIO via MODBUS/TCP • Serial Port RS232/RS422/RS485 via RFC 2217 and Telnet • CAN Bus via VSCAN API

■ System

Hardware	• ARM Cortex-A8 RISC CPU @ 600MHz • 256MB DDR3 • Real time clock with battery backup
Mass Storage	• 256MB NAND Flash memory • SD 2.0 / SDHC SD-card slot
Network	• 1x 1000/100/10 Mbps Gigabit Ethernet • 4x 100/10 Mbps on integrated Fast Ethernet Switch • WLAN 802.11b/g/n (optional) 3 x SMA antenna sockets available
Expansion Slots	• 1 x miniPCIe slot with USB 2.0 and 1 x SIM card slot • usage with GSM/3G/4G modems
Serial Peripherals	• 2x USB 2.0 as Host • 1x USB 2.0 OTG • 2x RS232/422/485 high speed • 1x Console Port RS232 • 1x I²C
CAN Bus	• 1x CAN High Speed, 20kbps up to 1Mbps • Signals: CAN_H, CAN_L, CAN_GND • SocketCAN, CANopen (CANFestival)
Digital Input/Output	• 4x TTL Output signals (64mA sink / 32mA source) • 4x TTL Input signals • Terminal block connector
LED	• 1x Power, 1x 3G, 1x WLAN, 1x Application • LAN: 5x Link and Speed

■ Serial Ports

Features	• 2x RS232/422/485 • Highspeed UART, 64 Byte FIFO (16C750) • RS232: up to 921.6/1000 kbps • RS422/485: up to 3.7 Mbps
Available Modes	Configured by DIP-Switch or Software • RS232 • RS422 full duplex • RS485 4-wire, full duplex • RS485 2-wire, half duplex, without echo
Signals	• RS232: TxD,RxD, RTS,CTS, DTR,DSR, DCD, RI, GND • RS422: Tx+/-, Rx+/-, GND • RS485 2−wire: Data+/-, GND • RS485 4−wire: Tx+/-, Rx+/-, GND
RS485 Data Direction Control	Driver Automatic via RTS

■ Wireless interface (option)

Standards	2.4GHz Radio, supports IEEE Std. 802.11b/g/n
WLAN Modes	Access Point (AP) or Client (Station)

TX Power	802.11b:
	    Typ. 15.5dBm ±1.5 dBm @ 1Mbps (DSSS)
	    Typ. 15.5dBm ±1.5 dBm @ 11Mbps (OFDM)
	802.11g:
	    Typ. 15.6dBm ±1.5 dBm @ 6Mbps (CCK)
	    Typ. 13.5dBm ±1.5 dBm @ 54Mbps (OFDM)
	802.11n:
	    Typ. 13.4dBm ±1.5 dBm @ 6.5Mbps (OFDM)
	    Typ. 13.3dBm ±1.5 dBm @ 150 Mbps(OFDM)

RX Sensitivity	802.11b:
	    -95.6dBm @ 1Mbps, -88dBm @ 11Mbps
	802.11g:
	    -91.3dBm @ 6Mbps, -74.2dBm @ 54 Mbps
	802.11n:
	    -88.8dBm @ 6.5Mbps (20 MHz), -72dBm @
	    72.2Mbps (20 MHz)

Transmission Rate	802.11b: 11Mbps 802.11g: 6 to 54Mbps 802.11n: 6.5 to 150Mbps
Transmission Distance	Up to 100m in open areas
Wireless security	• WEP • WPA • WPA2 • WPA2-Enterprise (IEEE 802.1X/RADIUS)
Antenna Connector	RP (Reverse-Polarity) SMA

■ Power Requirements

Input Voltage	12 — 50V DC
Power Consumption	• 0.2A @ 12V minimal • 0.4A @ 12V typical, plus devices on USB and Aux. Power
Connector	3-pin Terminal Block
Aux.Power Output	on Digital I/O connector: 0.5A @ 5V max.

■ Housing and Mounting

Case	0.8mm sheet metal
Weight	w/o box 0.55kg; w/h box 0.9kg
Dimensions	154×104×50 mm³ (W×L×H)
Packaged	185×152×60 mm³
Mounting	• DIN Rail • Wall mount

■ Environmental Data

Operating Temp	−20°C — 65°C
Storage Temp	−30°C - 85°C
Ambient Humidity	10-85% non-condensing

■ Standards

Declarations	CE, FCC

EMI	• EN 55022 Class B • EN 61000-3-2: Limits of harmonic current emissions • EN 61000-3-3: Limitation of voltage changes • 47 CFR FCC Part 15 Subpart B
EMS (EN 55024)	• EN 61000-4-3: Radiated RFI • EN 61000-4-4: Electrical Fast Transient • EN 61000-4-5: Surge • EN 61000-4-6: Induced RFI • EN 61000-4-8: Power Frequency Magnetic Field • EN 61000-4-11: Power supply dips
ESD	EN 61000-4-2 4kV contact 8kV air for • Serial Ports • CAN Bus • USB • Ethernet • DC Power connector • Digital-I/O

■ MTBF (Mean Time Between Failures)

MTBF	26.5 Years @ 25°C 10.4 Years @ 45°C
Standard	Telcordia (Bellcore) Standard; RelCalc. 5.0 BELL-7

■ Warranty

Warranty Period	2 years

■ Ordering Information

6860	VPNRouter iR 5221

■ Options

6031	Power adapter 110-230V AC to 12V @1A, DC, EU plug
6034	Power adapter 110-230V AC to 12V @1A, DC, US plug
6689	WLAN Kit internal internal module 802.11b/g/n, pigtail and antenna Purchase time option, not for later retrofitting
3314	GSM/UMTS mPCIe card for 3G modem
3316	GSM/UMTS/LTE mPCIe card for 3G/4G modem
6829	DIO Extender Addon board to use Industrial Voltages 0 – 30V for Digital-I/O

■ Packaging

Packing list	• VPNRouter system iR 5221 • Printed Quick Installation Guide • Terminal blocks for Power Supply, Digital-I/O, CAN Bus • DIN Rail Adapter 24mm • Wall mounting plates

* Specifications are subject to change without notice.
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VPNRouter iR 5221

External WLAN (demonstrated on Baltos iR 2110)

(2019 Jan 02)