IRF1401, IRF1421 - Industrial Router & Firewall

Extended Data Sheet

Variants	Ethernet	Wireless connectivity
IRF1401	4 x RJ45 100 Mbit/s	-
IRF1421	4 x RJ45 100 Mbit/s	2G/3G/4G LTE

General characteristics

1 x WAN	100 Mbit/s Ethernet interface
3 x LAN	Three 100 Mbit/s Ethernet interfaces running as switch.
1 x Digital In	Controls multiple options with Digital In • Enable/disable (W)WAN • Activate/deactivate VPN • Packet filter rules can be triggered by Digital In
Firewall operating modes	Routing mode with stateful filtering of IPv4 traffic
Packet filter	Enables the use of pre-defined rule sets for standard communication requirements and an easy-to-use wizard for new filter sets.
Configuration	Configuration via web interface (HTTP, HTTPS and API) Initial setup with easy-to-use configuration wizard
VPN	• OpenVPN: Layer 2 (Ethernet) and Layer 3 (IP) transport with SSL-based encryption. Support for tunneling via HTTP proxy and packet filtering. • Big-LinX: ADS-TEC smartcard-based OpenVPN with cloud services. Support for tunneling via HTTP proxy and packet filtering.
Industrial Internet of Things (IIoT)	Easy setup for datasets with support of multiple sources and targets • Modbus/TCP interface: Enables the status request and control of VPN channels. Enables ModbusTCP for data collection. • Modbus/RTU interface: Enables Modbus/RTU interface for data collection. • OPC/UA: Enables OPC UA for data collection. • Big-LinX data push: Enables data push with ADS-TEC WWH to Big-LinX. • MQTT: Enables the sending of data to a defined target by MQTT.
WWAN	Optional integrated LTE multi-band wireless module (4G/3G/2G) for high-speed wireless internet access.
SNMP	SNMP basic support enables the integration in existing network monitoring tools.
Memory card	Saves the complete configuration and enables easy replacement of the unit.
Big-LinX	ADS-TEC Big-LinX smartcard-based VPN system
API	Rich set of software APIs ranging from JSON RPC 2.0 to low level "adsdp", suitable even for microcontrollers.

Basic software specifications

IPv4	• Two IP addresses in IP router mode
	• NAT (masquerading), e.g., for outgoing WAN traffic
	• All interfaces can be configured as DHCP clients.
	• The default gateway can be configured manually.
	• Dynamic DNS
	• PPPoE support for all IP interfaces for use with DSL modems

IP routing	• Ten static net or host routes are configurable
	• Dynamic routing according to RIPv2 and OSPF (basic functions)
	RIPv2 parameters:
	− "simple password" authentication
	− interfaces can be switched as active or passive
	OSPF parameters:
	− "simple password" authentication
	− interfaces can be switched as active or passive
	• Log level can be configured additionally

IP forwarding & port forwarding	Port forwarding for TCP/UDP ports or complete IP addresses.
	Including the following features:
	• Optional source NAT for forwarding to hide the original source.
	• Conditional source matching to enable forwarding only for special addresses.
	• IP forwarding on VPN channels for running additional virtual IPs on the VPN which will be forwarded to the local network.

DHCP server	DHCP server on WAN and/or LAN interfaces; DNS and gateway are taken over dynamically if an interface is configured as DHCP client.

DHCP relay	Enables the transmission of all DHCP queries to an upstream DHCP server.

VPN parameters

OpenVPN	OpenVPN is an open source alternative to IPsec. The software is freely available for Linux, MacOS/X and Windows.
	• Alternatively configurable as TCP or UDP client or server
	• Authentication with X.509 certificates
	• HTTP proxy tunnel support in client mode, proxy authentication: Basic, NTLM
	• Maximum of ten different OpenVPN processes
	• ~100 VPN clients on a pure OpenVPN server setup (depending on system RAM usage)
	• Each single configuration has a separate interface which can be used for packet filter rulesets
	• Layer 2 Ethernet tunnels for bridging industrial Ethernet protocols over IP networks
	Further supported OpenVPN parameters:
	• IP address assignment and assignment of static routes to OpenVPN clients
	• IP address acquisition from OpenVPN servers in client mode
	• Radius server authentication for client authentication on server processes

X.509 certificate management	• Separate certificate management for verification of the validity of all existing certificates
	• Upload function for client, CA and CRL certificates
	• Preinstalled set of demo-certificates for quick function tests
	• SCEP for automated certificate enrollment

Industrial IT

Configuration and monitoring

Web interface	• Tooltips for all important options
	• German/English language support
	• Access via HTTP/HTTPS is freely configurable for any interface; access violations may be logged
	• Configurable HTTPS certificate
	• HTTP access can be deactivated
	• Free definition of unlimited user accounts with detailed access (write) control for any configuration option
Modbus/TCP	The native Modbus/TCP interface enables control of the device by, e.g., a PLC.
	The following functions are imaged in the registers:
	OpenVPN, separate status request and activation/deactivation of the ten possible OpenVPN connections
SNMP	Recent MIB information can be found at:
	https://www.ads-tec.de/support/download/industrial-it/software.html
Eventlog/syslog	Eventlog can be sent to syslog server
	Eventlog visible via web interface
Remote capture	Remote capture interface for use with Wireshark.
	With this feature, you can use every interface on the firewall as a remote capture interface on an additional diagnostics Windows PC.

Firewall filters

|	
General	• All filter rules are fast and easily configured with the web interface packet filter.
	• Layer 2 and Layer 3 filter rules are possible.
	• Ten sub-rules are possible per rule set.
	• The source and target interfaces must be defined firmly per rule set.
Network groups	Grouping of single IP addresses and network addresses to groups which can be used on Layer 2 or on Layer 3 filter rule sets.
Hardware groups	Grouping of MAC addresses into groups which can be used on Layer 2 filter rule sets.

Miscellaneous

Date & time NTP relay	• Three different remote NTP servers are configurable.
	• NTP server relay can be enabled to distribute the time in a local network.
Configuration backup	Setups can be stored in files and read back

Industrial IT

Mechanical

Schematic
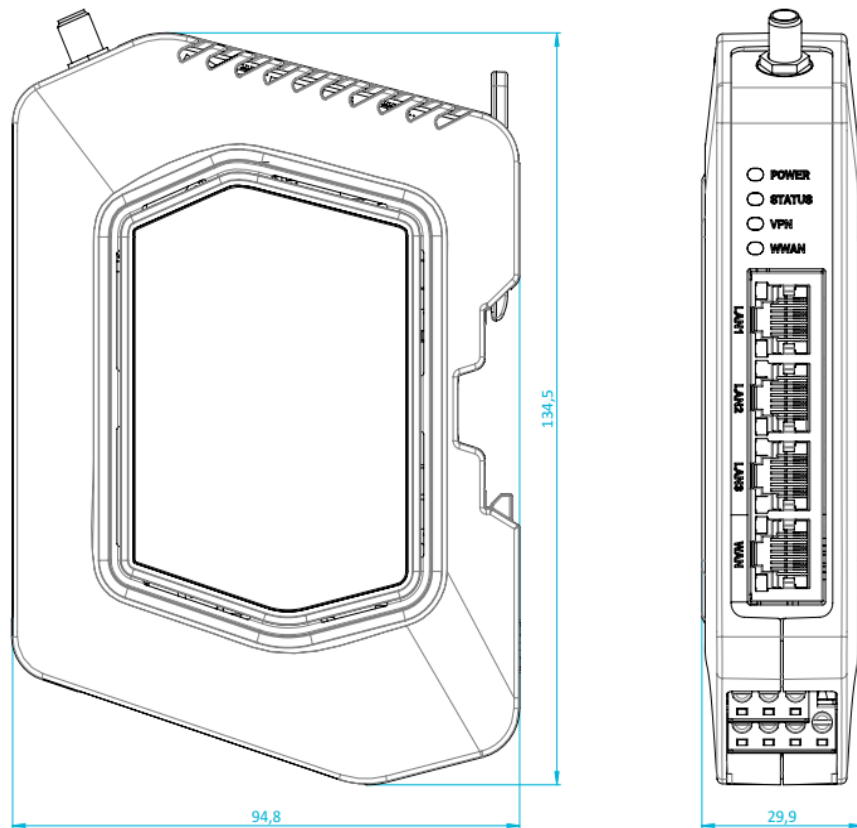
Dimensions   Height x width x depth (in mm): 134.5 x 29.9 x 94.8

ads·tec

Industrial IT

WWAN (optional)

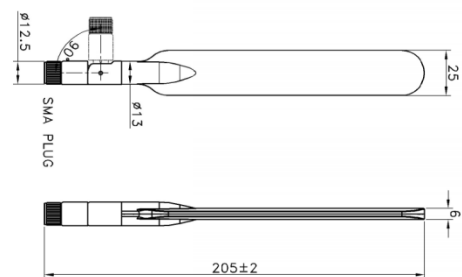|	
WWAN module	Two optional integrated multi-band wireless modules (LTE(4G)/UMTS(3G)/GPRS(2G)) for high-speed wireless internet access: • EMEA • EMEA + Americas

Data speed	• EMEA (CAT 4):
	  Peak download rate: 150 Mbit/s
	  Peak upload rate: 50 Mbit/s
	• EMEA + Americas (CAT 6):
	  Peak download rate: 300 Mbit/s
	  Peak upload rate: 50 Mbit/s

Frequency bands	EMEA • LTE: B1 (2100),B3 (1800), B7 (2600), B8 (900), B20 (800DD) • UMTS/WCDMA: B1 (2100), B8 (900) • GSM/GPRS/EDGE: B8 (900), B3 (1800) • Certification: CE, CE RED EMEA + Americas • LTE: B1 (2100), B2 (1900), B3 (1800), B4 (AWS), B7 (2600), B12 (700ac), B13 (700c), B20 (800DD), B5 (850), B25 (1900), B26 (US 850 Ext), B29 (US 700de Lower), B41 (TDD 2500), B30 (2300 WCS) • UMTS: B1 (2100), B2 (1900), B8 (900), B4 (AWS), B3 (1800), B5 (850) • Certification: FCC, CE, GCF, PTCRB, IC, CE RED
Transmit power	EMEA • LTE: +23 dBm +2.7/-2.7 dB (Power Class 3) • WCDMA : 24 +1/-3 dBm (Power Class 3) • GSM900: 33 ± 2 dBm (Power Class 4) • GSM1800: 30 ± 2 dBm (Power Class 1) EMEA + Americas • LTE Band 1,2,3,4,5,8,12,13,20,25,26: +23 dBm +/- 1 dB • LTE Band 7,30,41: +22 dBm +/- 1 dB • UMTS: +23 dBm +/- 1 dB
Antennas	An antenna is included in the scope of delivery. Antenna gain and frequencies: 1 dBi @ 698-960 MHz 2 dBi @ 1710-1990 MHz 2 dBi @ 2300-2400 MHz 2 dBi @ 2500-2700 MHz Polarisation: vertical
Operating modes	• Permanent connection • Manual connection control via API or SMS • Fallback connection with active ICMP monitoring of target IP via Ethernet
Requirements for separate external LTE antennas	• Antenna system: external multi-band 1x1 antenna system • 1 x SMA connectors, MAIN • Coaxial cable: nominal impedance of 50 ohms, e.g., RG174 • EMEA/ EMEA + Americas - operating bands - ant. 1: 698–960 MHz; 1710–1990 MHz; 2300–2400 MHz; 2500–2690 MHz • Radiation patterns of ant. 1: nominally omni-directional radiation pattern in azimuth plane

Industrial IT

Hardware specifications

Ethernet access	4 x RJ45 100BASE-TX
Power supply	24 V ⎓ +/- 20%
	Requirements for the power supply unit:
	• Class PS2 acc. to IEC 62368-1 – or – Limited Power Source (LPS) acc. to IEC 60950-1
	• Short circuit current: < 8 A
	• For devices with UL approval: NEC Class 2
Current consumption	IRF1401: max. 0.5 A (≙ 12 W @ 24 V)
	IRF1421: max. 0.8 A (≙ 19.2 W @ 24 V)
Over voltage category	I as per DIN EN 60664-1 (max. 1500 V)
Digital In	24 V ⎓ for, e.g., triggering VPN connections
SCM card slot	For ADS-TEC memory cards and smartcards
SIM card slot	For SIM cards for mobile broadband
Real time clock (RTC)	RTC integrated

General data

Weight	Approx. 200 g
Vibration	EN 60068-2-6
Shock	EN 60068-2-27
EMC	EN55032:2015, EN61000-6-2:2005, FCC SDoC
Operating temperature	-30…+70 °C, EN 60068-2-1, EN 60068-2-2, EN 60068-2-14
Storage temperature	-40…+85 °C, EN 60068-2-1, EN 60068-2-2, EN 60068-2-14
Pollution degree	2 as per IEC 61010-1
Altitude during operation	2000 m or less
Humidity	5...90%, no condensation, EN 60068-2-38, EN 60068-2-78
Protection class	IP30