AT-AR770S
Secure Gigabit VPN Router

**AT-AR770S**
- 2 x WAN combo ports (SFP or 10/100/1000TX)
- 4 x LAN 10/100/1000TX ports
- 2 x PIC slots
- 1 x Asynchronous console / modem port

**Flexible High Speed WAN Options**
The AT-AR770S is the first Allied Telesis router to offer gigabit connectivity for both the LAN switch and WAN Ethernet ports. Eth0 and Eth1 are combo ports. This means that they can make use of an SFP instead of the standard copper RJ-45 connection.

Both the SFP and RJ-45 physical ports are managed by the same interface IC, providing a single ‘port’ with two connectivity options. When using an SFP port on the AT-AR770S, the corresponding RJ-45 port is disabled. However, when the SFP transceiver is removed, the RJ-45 port becomes operational again.

**Secure Modular Routing Solution**
The AT-AR770S has been designed to meet the needs of small to medium enterprises/businesses or branch office businesses. The AT-AR770S offers significant advances in processing performance, Quality of Service (QoS), routing, remote connectivity and security.

**Extensive VPN Capability**
The AT-AR770S provides extensive IPSec-based VPN capability, allowing the interconnection of offices, remote tele-workers, and other users who require secure access to a corporate network. The integrated hardware acceleration, standard on the AT-AR770S, maximizes encryption throughput and removes the need to purchase a hardware upgrade package. The AT-AR770S is compatible with industry standard IPSec VPN clients.

**Performance**
The AT-AR770S provides superior performance over other secure VPN routers in this market space. While most secure routers have stateful firewalls with NAT, QoS, and IPSec VPN termination capability, very few can perform all three functions and still provide excellent performance with the mixed packed sizes seen in real networks. The AT-AR770S can support up to 1000 concurrent VPN tunnels or up to 500 Mbps AES or 3DES throughput.

This level of performance enables secure site-to-site VPNs over multiple WAN interfaces while still firewalling the local network across multiple LAN ports.

**Key Features**

**Hardware**
- 2 x SFP or 10/100/1000TX WAN interfaces
- 2 x Port Interface Card (PIC) slots
- 4 x 10/100/1000TX LAN ports
- 1 x Asynchronous console / modem port
- DMZ port: configurable on any of the WAN/LAN ports
- 128MB RAM
- 32MB Flash
- RoHS compliant

**Security**
- IP Filtering
  - Stateful Inspection Firewall
  - 802.1x
  - NAT-T
- Authentication: RADIUS, TACACS, MD5, PAP, CHAP

**VPN/Encryption**
- DES, AES\(^2\), 3DES\(^2\) encryption
- 5,000 configured IPSec VPN tunnels
- (1000 active tunnels)
- HW accelerated IPSec performance: Up to 500Mbps\(^1\)
- Supports industry standard VPN clients
- Manageability
- CLI management
- SNMPv3

**Manageability**
- CLI management
- SNMPv3

**Extensive routing support**
- WAN load balancer
- Software QoS
- RIPv1 and v2
- OSPFv1 and v2
- GRE
- IPX
- VRRP
- IPv6 – optional
- BGP-4 – optional
- RIPng – optional

**Multicast routing protocols**
- PIM-DM
- PIM-SM
- DVMRP
- IGMPv1
- IGMP Snooping
- IPv6 Multicast – optional
- PIMv6 – optional
- MLD – optional

**Support for traditional network protocols**
- X.25
- Frame Relay

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\(^1\) Performance figure estimates from pre-production units.
\(^2\) AES & 3DES disabled in AR770S-51
Security
In addition to hardware-based encryption, the AT-AR770S comes with other advanced security features such as traffic filtering with event logging. Traffic filtering uses the source and destination address, port, protocol and TCP packet type to provide control over traffic that passes through the AT-AR770S. A Stateful Inspection Firewall provides an increased level of security and complements the packet filtering function. HTTP and SMTP proxies on the AT-AR770S provide improved control over web and mail communications.

Quality of Service (QoS)
The QoS implementation from Allied Telesis enables the AT-AR770S to dynamically identify high priority voice, video and application traffic, so that appropriate service levels can be maintained in congested networks. Advanced QoS allows voice, video, and data traffic to have QoS applied within individual IPSec tunnels, over GRE, as well as IPv6 to IPv4 tunnels.

Comprehensive Management and Configuration
The AT-AR770S comes with a comprehensive suite of management features and is also compatible with SNMP-based management packages. An extensive command set is available via the Command Line Interface (CLI). SNMP support from Allied Telesis extends to SNMPv3 to provide secure management.

WAN Load Balancer
The WAN Load Balancer on the AT-AR770S enables the router to combine bandwidth from multiple WAN connections for increased throughput, redundancy and reliable WAN connectivity. When a router simultaneously connects to multiple WAN networks, the WAN Load Balancer will distribute the traffic based on any one of a number of selectable balancing algorithms. A typical example would be a router that has two Internet connections each exchanging data to remote sites via different Internet providers. In this case an outage limited to one network will not result in a loss of connectivity to these sites.

Feature Summary

Hardware Features
2 x WAN combo ports (SFP or 10/100/1000TX)
4 x LAN 10/100/1000TX ports
2 x PIC
1 x Asynchronous console / Modem port
DMZ port: Obtained by configuring one of the WAN or LAN ports

Processor
833MHz
Internal security encryption engine

Memory
128MB Ram
32MB Flash

Power Characteristics
Input Voltage: 100-240 VAC, 50-60 Hz
Max Power Consumption: 40W
Internal Battery Backup (1 year)

Physical
Dimensions: 1RU rack mount
Depth 239mm, Width 440 mm
Height 44 mm
Weight: 2.95 kg

Environmental
Operating Temp: 0°C to 50°C
Storage Temp: -25°C to 70°C
Operating relative humidity: 5 to 80% non-condensing
Acoustic: General Office @ 40dB V. Measured in accordance with ANSI S12.10
Operating Altitude: Up to 10,000 feet

Approvals & Certifications
UL
TUV
UL60950-1
CEN/CSA-C22.2 No. 60950-1-03
EN60950-1
ASINZS 60950
EN60825-1
EN55022 class A
EN55024
FCC class A
VCCI class A
ASINZS C5912 class A
ACE

Optional Extras

Port Interface Cards:
AT-AR020 Single configurable E1/T1 interface that supports channelized/unchannelized Primary Rate ISDN/Frame Relay
AT-AR021S (V3) Single Basic Rate ISDN S/T interface
AT-AR023 Single Synchronous port up to 2Mbps to an external CSU/DSU (AT-V.35-DTE-00 or AT-X.21-DTE-00 cable required)
AT-AR024 Four Asynchronous RS-232 interfaces to 115Kbps

Software Features

Routing and Multicast
PPP and IP Routing
RIP v1 & v2
OSPF v1 & v2
BGP-4 (optional)
IPX
IGMPv2
PIM-SM / DM
DVMRP (including draft_ietf_idmr_dvmrp_v3_10)
DECNet

WAN Protocols
X.25
Frame Relay

Security
IP Filtering
Stateful Inspection Firewall
NAT-T
SMTP & HTTP Proxy
802.1x Authentication: RADIUS, TACACS, MD5, PAP, CHAP
SSH
SSLv1

VPN
L2TP
GRE
IPSec
IKE
ISAKMP
PKI
Encryption: DES, 3DES, AES
Microsoft Windows XP VPN client interoperability
Hardware acceleration

3 AT-AR021S (V3) requires AlliedWare Operating System version 2.9.1-13 or later
Quality of Service (QoS)
Extensive Traffic classifiers of L2 to L5 traffic to allow appropriate queuing of traffic
IP: IP source / destination address, TOS & DiffServ
Ethernet: MAC source / destination, 802.1q
TCP / UDP: Port numbers
VoIP: RTP source & destination
Queuing:
• Low latency queuing (LLQ)
• Class-based weighted fair queuing (CBWFQ)
• Deficit Round Robin (DRR)
Supported tunnel interfaces: PPP, L2TP, IPsec, GRE RSVP

Management
CLI
SNMPv3

IPv6
RIPvng
IPv6 RFC 2460
Neighbour discovery RFC 2461
Stateless address auto configuration RFC 2462
ICMPv6 RFC 2463
Transmission of IPv6 packets RFC 2464
Connection of IPv6 domains via IPv4 clouds RFC 3056
DHCPv6

Country of Origin
China

Standards and Protocols
AlliedWare Software Release 2.9.2

BGP-4
RFC 1771 Border Gateway Protocol 4
RFC 1966 BGP Route Reflection
RFC 1997 BGP Communities Attribute
RFC 1998 Multi-home Routing
RFC 2385 Protection of BGP Sessions via the TCP MD5 Signature Option
RFC 2439 BGP Route Flap Damping
RFC 2858 Multiprotocol Extensions for BGP-4
RFC 2918 Route Refresh Capability for BGP-4
RFC 3065 Autonomous System Confederations for BGP
RFC 3392 Capabilities Advertisement with BGP-4

Encryption
RFC 1321 MD5
RFC 2104 HMAC

IPv4 RFC 2451 The ESP CBC-Mode Cipher Algorithms
IPSec 180 SHH-1
IPSec 186 RSA
IPSec 197 AES1
IPSec 46-3 DES
IPSec 46-3 3DES1
IPSec 140-2 Compliant

Ethernet
RFC 894 Ethernet II Encapsulation
IEEE 802.1D MAC Bridges
IEEE 802.1Q Remote MAC Bridging
IEEE 802.1Q Virtual LANs
IEEE 802.2 Logical Link Control
IEEE 802.3ac VLAN TAG
IEEE 802.3u 100BASE-T and 802.3u 1000 Base-T
IEEE 802.3x Full Duplex Operation

General Routing
RFC 768 UDP
RFC 791 IP
RFC 792 ICMP
RFC 793 TCP
RFC 826 ARP
RFC 903 Reverse ARP
RFC 925 Multi-LAN ARP
RFC 950 Subnetting, ICMP
RFC 1027 Proxy ARP
RFC 1035 DNS
RFC 1055 SLIP
RFC 1122 Internet Host Requirements
RFC 1142 OSI IS-IS Intra-domain Routing Protocol
RFC 1144 Van Jacobson’s Compression
RFC 1256 ICMP Router Discovery Messages
RFC 1288 Finger
RFC 1332 The PPP Internet Protocol Control Protocol (IPCP)
RFC 1334 PPP Authentication Protocols
RFC 1377 The PPP OSI Network Layer Control Protocol (OSNCP)
RFC 1378 The PPP AppleTalk Control Protocol (ATCP)
RFC 1510 CIDR
RFC 1519 CIDR
RFC 1542 BootP

RFC 1552 The PPP Internetworking Packet Exchange Control Protocol (IPXCP)
RFC 1570 PPP LCP Extensions
RFC 1582 RIP on Demand Circuits
RFC 1598 PPP in X.25
RFC 1618 PPP over ISDN
RFC 1661 The Point-to-Point Protocol (PPP)
RFC 1662 PPP in HDSL-like Framing
RFC 1701 GRE
RFC 1702 GRE over IPv4
RFC 1762 The PPP DE/Net Phase IO Control Protocol (DNCP)
RFC 1812 Router Requirements
RFC 1877 PPP Internet Protocol Control Protocol Extensions for Name Server Addresses
RFC 1918 IP Addressing
RFC 1962 The PPP Compression Control Protocol (CCP)
RFC 1968 The PPP Encryption Control Protocol (CEP)
RFC 1974 PPP Stac LLS Compression Protocol
RFC 1978 PPP Predictor Compression Protocol
RFC 1989 PPP Link Quality Monitoring
RFC 1990 The PPP Multilink Protocol (MP)
RFC 1994 PPP Challenge Handshake Authentication Protocol (CHAP)
RFC 2125 The PPP Bandwidth Allocation Protocol (BAP) / The PPP Bandwidth Allocation Control Protocol (BACP)
RFC 2131 DHCP
RFC 2390 Inverse Address Resolution Protocol
RFC 2516 A Method for Transmitting PPP Over Ethernet (PPPoE)
RFC 2822 Internet Message Format
RFC 2878 PPP Bridging Control Protocol (BCP)
RFC 2861 L2TP
RFC 3046 DHCP Relay Agent Information Option
RFC 3322 Assigned Numbers
RFC 3993 Subscriber-ID Sub-option for DHCP Relay Agent Option
ISO 10589, ISO 10589 Technical Corrigendums 1, 2, 3, ISO Intermediate System-to-Intermediate System
"ISO 8473, relevant parts of ISO 8348(X.213), ISO 8343/Adj2, ISO 8648, ISO 8648, ISO TR 9577 Open System Interconnection" 
ISO 9542 End System to Intermediate System Protocol Encapsulation of IPv6 Packets
http://www.iana.org/assignments/bootp-dhcp-parameters BootP and DHCP parameters

General Routing and Firewall
RFC 3022 Traditional NAT
draft-ietf-ipv6-nat-ike-08.txt Negotiation of NAT-Traversal in the IKE
draft-ietf-ipv6-udp-encaps-08.txt UDP Encapsulation of IPv6 Packets
IP Multicasting
RFC 1075 DVMRP
RFC 1112 Host Extensions
RFC 1012 Router Requirements
RFC 2236 OSPFv2
RFC 2362 PMIPv4
RFC 2715 Interoperability Rules for Multicast Routing Protocols
ISDN
ANSI T1.231-1997 Digital Hierarchy - Layer 1 In-Service Digital Transmission Performance Monitoring Standardization
ANSI T1.403-1995 Telecommunications - Network-to-Customer Installation - DS1 Metallic Interface
ANSI T1.408-1990 ISDN Primary Rate - Customer Installation Metallic Interfaces, Layer 1 Specification
AT&T TR 54016-1989 Requirements for Interfacing Digital Terminal Equipment to Services Employing the Extended Superframe Format
Austel TS 013.1:1990 General Requirements for Customer Equipment Connected to ISDN Basic Rate Access - Vol 1: Customer Equipment Access Interface Specifications
Bellcore SR-3887 1997 National ISDN Primary Rate Interface Guidelines
ETS 300 012:1992 Integrated Services Digital Network (ISDN);
Basic user-network interface; Layer 1 specification and test principles
ETS 300 102-1:1990 Integrated Services Digital Network (ISDN);
User-network interface layer 3; Specifications for basic call control
ETS 300 102-2:1990 Integrated Services Digital Network (ISDN);
User-network interface layer 3; Specifications for basic call control; Specification Description Language (SDL) diagrams
ETS 300 125:1991 Integrated Services Digital Network (ISDN);
User-network interface data link layer specification; Application of CCITT Recommendations Q.920/1.440 and Q.921/1.441
ETS 300 153:1992 Integrated Services Digital Network (ISDN);
Attachment requirements for terminal equipment to connect to an ISDN using ISDN basic access (Candidate NET 3 Part 1)
ETS 300 156:1992 Integrated Services Digital Network (ISDN);
Attachment requirements for terminal equipment to connect to an ISDN using ISDN primary rate access (Candidate NET 3 Part 1)
ETS 300 011:1992 Integrated Services Digital Network (ISDN);
Primary rate user-network interface; Layer 1 specification and test principles
G.794 (1988) Characteristics of 24-channel transmultiplexing equipments
German Monopol (BAPT 221) Type Approval Specification for Radio Equipment for Tagging and Identification
I.120 (1988) Integrated services digital networks (ISDNs)
I.121 (1988) Broadband aspects of ISDN
I.441 (1988) ISDN user-network interface reference configurations
I.430 (1988) Basic user-network interface - Layer 1 specification
I.431 (1988) Primary rate user-network interface - Physical layer specification
ITU-T G.703 Physical/electrical characteristics of hierarchial digital interfaces
ITU-T G.704 Synchronous frame structures used at 1544, 6312, 2048, 8488 and 44736 kbit/s hierarchical levels
ITU-T G.706 Frame Alignment and CRC Procedures Relating to Basic Frame Structures Defined in G.704
ITU-T Q.922 ISDN data link layer specification for frame mode bearer services
ITU-T G.703 (1972) Physical/electrical characteristics of hierarchial digital interfaces
Japan NTT I.430-a Leased Line Basic Rate User-Network Interface Layer 1-Specification
Q.921 (1988) ISDN user-network interface - Data link layer specification
Q.930 (1988) Digital subscriber Signalling System No. 1 (DSS 1) - ISDN user-network interface layer 3 - General aspects
Q.931 (1988) Digital subscriber Signalling System No. 1 (DSS 1) - ISDN user-network interface layer 3 specification for basic call control
Rockwell BtB370 Fully Integrated T1/E1 Framers and Line Interface data sheet
ACA TS 014:1:1990 General Requirements for Customer Equipment Connected to ISDN Primary Rate Access, Vol 1: Customer Access Interface Specifications
ACA TS 014:2:1990 General Requirements for Customer Equipment Connected to ISDN Primary Rate Access, Vol 2: Conformance Testing Specifications
Frame Relay
ANSI T151 Frame relay
RFC 1490, 2427 Multiprotocol Interconnect over Frame Relay

Ordering Information

**AT-AR770S**
Includes power cords for US, UK, Australia & Europe.

**AT-AR770S-51**
No AES & 3DES encryption enabled

Port Interface Card (PIC) Options

**AT-AR020**
Single software configurable E1/T1 interface that supports channelized/unchannelized Primary Rate ISDN/Frame Relay

**AT-AR021S (V3)**
(AT-AR021S V1 card is not supported on the AT-AR770S)
Single basic rate ISDN S/T interface

**AT-AR023**
Single synchronous port up to 2Mbps to an external CSU/DSU (AT-V.35-DTE-00 or AT-X.21-DTE-00 cable required)

**AT-AR024**
Four Asynchronous RS-232 interfaces to 115Kbps

**SFP Options**

**AT-SPFX/2**
100BASE-FX 1310 nm fiber up to 2 km

**AT-SPFX/15**
100BASE-FX 1310 nm fiber up to 15 km

**AT-SPFX/40**
100BASE-FX 1310 nm fiber up to 40 km

**AT-SPTX**
1000 BASE-T 100 m Copper

**AT-SPSX**
1000BASE-SX
GbE multi-mode 850 nm fiber

**AT-SPLX10**
1000BASE-LX
GbE single-mode 1310 nm fiber up to 10 km

**AT-SPLX40**
1000BASE-LX
GbE single-mode 1310 nm fiber up to 40 km

**AT-SPZX80**
1000BASE-ZX
GbE single-mode 1550 nm fiber up to 80 km

**Feature License**

**AT-AR700 – ADVL3UPGRD**
AR700 series advanced Layer 3 upgrade – includes:
• IPv6
• BGP-4
• Server Load Balancing

**AT-AES/3DES-00**
AES/3DES encryption activation key

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3 **AR021S (V3)** requires AlliedWare Operating System version 2.9.1-13 or later

4 Please check with your sales representative for ROHS compliance on SFP modules.
About Allied Telesis
Allied Telesis is part of the Allied Telesis Group. Founded in 1987, the company is a global provider of secure Ethernet/IP access solutions and an industry leader in the deployment of IP Triple Play networks over copper and fiber access infrastructure. Our POTS-to-10G iMAP integrated Multiservice Access Platform and iMG intelligent Multiservice Gateways, in conjunction with advanced switching, routing and WDM-based transport solutions, enable public and private network operators and service providers of all sizes to deploy scalable, carrier-grade networks for the cost-effective delivery of packet-based voice, video and data services.

Service and Support
Allied Telesis provides value-added support services for its customers under its Net.Cover programs. For more information on Net.Cover support programs available in your area, contact your Allied Telesis sales representative or visit our website: www.alliedtelesis.com.

RoHS
Allied Telesis RoHS-compliant product conforms to the European Union Restriction of the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic equipment. Allied Telesis ensures RoHS conformance by requiring supplier Declarations of Conformity, monitoring incoming materials, and maintaining manufacturing process controls.