



## AT-AR440S

### Secure ADSL2+ Router

#### AT-AR440S

- 1 x ADSL2+ port
- 5 x 10/100BASE-T ports
- 1 x PIC
- 1 x Asynchronous port

#### ADSL Business Class Routing Solution

The AT-AR440S is a competitively priced, business-class, secure ADSL router. This desktop, broadband router allows businesses to take advantage of cost effective DSL connections without compromising on bandwidth, throughput, features, or security.

The AT-AR440S has been designed with the needs of the branch office or small to medium business in mind and comes with dying gasp and the WAN back-up features businesses expect.

The AT-AR440S comes with, or has as optional extras, all the software features necessary for a product of this type, such as:

- An extensive VPN capability
- Comprehensive ADSL support
- An extensive QoS suite
- Multiple routing protocols
- A comprehensive configuration and management suite

#### Extensive VPN Capability

The AT-AR440S provides extensive IPsec based VPN capability, allowing the inter-connection of branch offices, remote tele-workers, and other users who require secure access to a corporate network. This capability provides a cost effective alternative to long-distance dial-in, leased line or frame-relay connections. The AT-AR440S comes complete with integrated hardware acceleration to maximise encryption and throughput during secure communication. The product is compatible with industry standard IPsec VPN clients.

Two new GUI wizards for site-to-site and remote access VPNs (available in AlliedWare 2.9.1) make VPN configuration a snap.

#### Security

In addition to hardware-based encryption, the AT-AR440S comes with other security features, such as traffic filtering with event logging. Traffic filtering uses the source and destination addresses, port, protocol and TCP packet types to provide control over traffic that passes through the AT-AR440S. The AT-AR440S' Stateful Inspection firewall provides an increased level of security and HTTP and SMTP proxies provide improved control over web and mail communication.

#### Software Quality of Service

The AlliedWare™ operating system provides advanced Quality of Service (QoS) and traffic shaping features. There are five key QoS features available on the AT-AR440S:

- Bandwidth Metering
- RED Curves
- Mixed Scheduling
- Virtual Bandwidth
- Dynamic Application Recognition (DAR)

Software QoS also supports eight queues per interface. DAR is used to snoop for session setup exchanges and dynamically create classifiers that match the voice and video packets in the session. For more information, see the Allied Telesis Advanced QoS White Paper available on our website.

#### Flexibility of Modular Routing

A Port Interface Card (PIC) port on the AT-AR440S provides businesses with a high degree of flexibility, enabling them to future proof their investment, obtain additional functionality or make use of WAN back-up options. For example, a backup WAN card, such as an ISDN card, can be installed in the PIC port enabling businesses to protect themselves against ADSL downtime. The PIC options available also enable businesses to achieve a higher LAN density without purchasing an additional switch. The AT-AR440S PIC port is

#### Key Features

- 1 x Annex A ADSL2+ port
- Modular Router – 1 PIC that supports a range of WAN interfaces
- Integrated encryption engine supporting DES, 3DES and AES
- 5 x 10/100 Mbps Ethernet switched LAN ports, any port can also be reconfigured as a DMZ
- Secure VPN capability with IPsec
- Automatic WAN back-up
- Stateful inspection firewall
- QoS
- SNMP and CLI management
- Web GUI
- Dying gasp
- Optional features available such as:
  - IPv6
  - BGP-4
  - Server Load Balancing
- RoHS compliant

# AT-AR440S | Secure ADSL2+ Router

compatible with a range of PICs, including BRI/PRI ISDN, high speed E1/T1, Synchronous, and FXS VoIP.

## Performance

The AT-AR440S provides a significant improvement in the performance of Allied Telesis' modular router family. The 300MHz CPU within the AT-AR440S ensures that large packets are forwarded at wire-speed and that small packets are forwarded with minimal delay.

## Comprehensive Management and Configuration

The AT-AR440S 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), and a browser-based Graphical User Interface (GUI) is also provided to simplify configuration and management of the AT-AR440S. The GUI provides access to default set-ups in key management areas and provides access to regional settings. Allied Telesis' SNMP support extends to SNMPv3, which provides the option of secure management.

## Feature Summary

### ADSL

ANSI T1.413  
ITU G.992.1 Annex A  
ITU G.992.3 Annex A<sup>1</sup>  
ITU G.992.5 Annex A<sup>1</sup>  
Downstream data rate: Up to 24 Mbps<sup>2</sup>  
Upstream data rate: Up to 1 Mbps<sup>2</sup>  
Connector: RJ11  
30 PVCs  
Dying gasp  
RFC 2684 MPoA Encapsulation over ATM (IP, bridging & encapsulated routing)  
RFC 2364 PPPoA  
RFC 2516 PPPoE  
RFC 2225 IPoA Classical IP & ARP over ATM

### Routing

PPP and IP Routing  
RIP v1 & v2  
DHCP  
OSPF  
DVMRP (including draft\_ietf\_idmr\_dvmrp\_v3\_10)  
BGP-4<sup>3</sup>  
IPX  
NAT

### WAN Protocols

X.25  
Frame Relay

### VPN

L2TP  
NAT-T  
Windows® XP VPN client interoperability

## Security

Hardware acceleration  
IPSec  
IKE  
ISAKMP  
PKI  
SSH  
SSL  
SMTP & HTTP Proxy  
Authentication: RADIUS, TACACS, MD5, PAP, CHAP  
Encryption: DES, 3DES, AES  
IP Filtering  
Firewall: Stateful Inspection

## QoS

IP  
• RSVP  
• IP Packet Prioritisation  
• Prioritisation based on TOS & Diffserve  
• Low latency queuing (LLQ)  
• Weighted fair queuing  
ATM  
• Per VC queuing and traffic shaping  
• Unspecified bit rate (UBR)  
• Constant bit rate (CBR)  
• Nonreal-time variable bit rate (VBRnrt)

## Management

CLI  
Browser Based GUI  
SNMPv3  
**IPv6<sup>3</sup>**  
RIPng  
IPv6 RFC 2460  
Neighbour discovery RFC 2461  
Stateless address autoconfiguration RFC 2462  
ICMPv6 RFC 2463  
Transmission of IPv6 packets RFC 2464  
Connection of IPv6 domains via IPv4 clouds RFC 3056  
PIMv6

## Reliability

MTBF: 120 000 hrs

## Redundancy

External modem backup  
VRRP  
WAN load balancing<sup>4</sup>  
ISDN backup

<sup>1</sup> 2.9.1-11 or later required

<sup>2</sup> Maximum specified by ADSL chip-set vendor, achieved speeds are dependent on DSLAM and line characteristics, including length

<sup>3</sup> Software features requiring the purchase of a feature licence

<sup>4</sup> Available in AlliedWare release 2.9.1-08 or later, requires the purchase of a feature licence

<sup>5</sup> AR021S (V3) requires AlliedWare® Operating System version 2.9.1-13 or later

## Hardware Features

1 x ADSL2+ Port  
5 x 10/100 Mbps Switch  
1 x Async Console port  
1 x Port Interface Card (PIC)  
DMZ port: Obtained by configuring one of the switch ports

## Processor

300MHz  
Internal security encryption engine

## Memory

64MB Ram  
16MB Flash

## Power Characteristics

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

## Physical Dimensions

Dimensions: 335mm (W) x 44mm (H) x 180mm (D)  
Weight: 1.96kg

## Environmental

Operating Temp: 0°C to 50°C  
Storage Temp: -25°C to 70°C  
Operating relative humidity: 5 to 80% non-condensing  
Acoustic Level: ANSI S12.10 – Desktop 47 dBA

## Approvals & Certifications

UL  
TUV  
UL60950  
EN60950  
EN55022 class A  
EN55024  
FCC class A  
VCCI class A  
AS/NZS CISPR22 class A  
CE

## Optional Extras

AT-AR440S ships with both a rack mount kit and a wall mount kit.

## Port Interface Cards:

- AT-AR020 Single configurable E1/T1 interface that supports channelized/ unchannelized Primary Rate ISDN/ Frame Relay
- AT-AR021S<sup>5</sup> Single Basic Rate ISDN (S/T) interface (V3)
- AT-AR023 Single Synchronous port up to 2Mbps to an external CSU/DSU (AT-V35-DTE-00 or AT-X21-DTE-00 cable required)
- AT-AR024 Four Asynchronous RS232 interfaces to 115Kbps
- AT-AR027 Two VoIP FXS ports

## Country of Origin

China

## Standards and Protocols

Software Release 2.9.1

### 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  
RFC 2451 The ESP CBC-Mode Cipher Algorithms  
FIPS 180 SHA-1  
FIPS 186 RSA  
FIPS 197 AES  
FIPS 46-3 DES  
FIPS 46-3 3DES

### Ethernet

RFC 894 Ethernet II Encapsulation  
IEEE 802.1D MAC Bridges  
IEEE 802.1G Remote MAC Bridging  
IEEE 802.1Q Virtual LANs  
IEEE 802.2 Logical Link Control  
IEEE 802.3ac VLAN TAG  
IEEE 802.3u 100BASE-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 1812 Router Requirements  
RFC 1027 Proxy ARP  
RFC 1035 DNS  
RFC 1055 SLIP  
RFC 1122 Internet Host Requirements  
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 (OSINLCP)  
RFC 1378 The PPP AppleTalk Control Protocol (ATCP)  
RFC 1518 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 1701 GRE  
RFC 1702 GRE over IPv4  
RFC 1762 The PPP DECnet Phase IV Control Protocol (DNCP)  
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 (ECP)  
RFC 1974 PPP Stac LZS 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  
RFC 2390 Inverse Address Resolution Protocol  
RFC 2131 DHCP  
RFC 2125 The PPP Bandwidth Allocation Protocol (BAP) / The PPP Bandwidth Allocation Control Protocol (BACP)  
RFC 2516 A Method for Transmitting PPP Over Ethernet (PPPoE)  
RFC 2661 L2TP  
RFC 2822 Internet Message Format  
RFC 2878 PPP Bridging Control Protocol (BCP)  
RFC 3046 DHCP Relay Agent Information Option  
RFC 3232 Assigned Numbers Authentication Protocol (CHAP)  
RFC 3993 Subscriber-ID Sub-option for DHCP Relay Agent Option  
"IPX Router Specification", v1.2, Novell, Inc., Part Number 107-000029-001  
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/Add2, ISO 8648, ISO 8648, ISO TR 9577 Open System Interconnection"  
ISO 9542 End System to Intermediate System Protocol Encapsulation of IPsec Packets  
<http://www.iana.org/assignments/bootp-dhcp-parameters>  
BootP and DHCP parameters

### General Routing and Firewall

RFC 3022 Traditional NAT  
draft-ietf-ipsec-nat-t-ike-08.txt Negotiation of NAT-Traversal in the IKE  
draft-ietf-ipsec-udp-encaps-08.txt UDP Encapsulation of IPsec Packets

### IP Multicasting

RFC 1075 DVMRP  
RFC 1112 Host Extensions  
RFC 2236 IGMPv2  
RFC 2362 PIM-SM  
RFC 2715 Interoperability Rules for Multicast Routing Protocols  
RFC 3973 PIM-DM  
draft-ietf-idmr-dvmrp-v3-9 DVMRP

### IPsec

RFC 1828 IP Authentication using Keyed MD5  
RFC 1829 Ipsec algorithm  
RFC 2395 Ipsec Compression - LZS  
RFC 2401 Security Architecture for IP  
RFC 2402 AH - IP Authentication Header

RFC 2403 IPsec Authentication - MD5  
RFC 2404 IPsec Authentication - SHA-1  
RFC 2405 IPsec Encryption - DES  
RFC 2406 ESP - IPsec encryption  
RFC 2407 IPsec DOI  
RFC 2408 ISAKMP  
RFC 2409 IKE  
RFC 2410 IPsec encryption - NULL  
RFC 2411 IP Security Document Roadmap  
RFC 2412 OAKLEY  
RFC 3173 IPCOMP - IPsec compression

### IPv6

RFC 1981 Path MTU Discovery for IPv6  
RFC 2080 RIPng for IPv6  
RFC 2365 Administratively Scoped IP Multicast  
RFC 2375 IPv6 Multicast Address Assignments  
RFC 2460 IPv6  
RFC 2461 Neighbour Discovery for IPv6  
RFC 2462 IPv6 Stateless Address Autoconfiguration  
RFC 2463 ICMPv6  
RFC 2464 Transmission of IPv6 Packets over Ethernet Networks  
RFC 2465 Allocation Guidelines for IPv6 Multicast Addresses Management Information Base for IP Version 6: Textual Conventions and General Group  
RFC 2466 Management Information Base for IP Version 6: ICMPv6 Group  
RFC 2472 IPv6 over PPP  
RFC 2526 Reserved IPv6 Subnet Anycast Addresses  
RFC 2529 Transmission of IPv6 over IPv4 Domains without Explicit Tunnels  
RFC 2710 Multicast Listener Discovery (MLD) for IPv6  
RFC 2711 IPv6 Router Alert Option  
RFC 2851 Textual Conventions for Internet Network Addresses  
RFC 2893 Transition Mechanisms for IPv6 Hosts and Routers  
RFC 3056 Connection of IPv6 Domains via IPv4 Clouds  
RFC 3307 Allocation Guidelines for IPv6 Multicast Addresses  
RFC 3315 DHCPv6  
RFC 3484 Default Address Selection for IPv6  
RFC 3513 IPv6 Addressing Architecture  
RFC 3587 IPv6 Global Unicast Address Format  
RFC 3596 DNS Extensions to support IPv6  
RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6

### Management

RFC 1155 MIB  
RFC 1157 SNMP  
RFC 1212 Concise MIB definitions  
RFC 1213 MIB-II  
RFC 1493 Bridge MIB  
RFC 1643 Ethernet MIB  
RFC 1657 Definitions of Managed Objects for BGP-4 using SMIv2  
RFC 2011 SNMPv2 MIB for IP using SMIv2  
RFC 2012 SNMPv2 MIB for TCP using SMIv2  
RFC 2096 IP Forwarding Table MIB  
RFC 2576 Coexistence between V1, V2, and V3 of the Internet-standard Network Management Framework  
RFC 2578 Structure of Management Information Version 2 (SMIv2)  
RFC 2579 Textual Conventions for SMIv2  
RFC 2580 Conformance Statements for SMIv2  
RFC 2665 Definitions of Managed Objects for the

## Ethernet-like Interface Types

RFC 2674 Definitions of Managed Objects for Bridges with Traffic Classes, Multicast Filtering and Virtual LAN Extensions (VLAN)  
RFC 2790 Host MIB  
RFC 2819 RMON (groups 1,2,3 and 9)  
RFC 2856 Textual Conventions for Additional High Capacity Data Types  
RFC 2863 The Interfaces Group MIB  
RFC 3164 Syslog Protocol  
RFC 3289 Management Information Base for the Differentiated Services Architecture  
CDP  
RFC 3410 Introduction and Applicability Statements for Internet-Standard Management Framework  
RFC 3411 An Architecture for Describing SNMP Management Frameworks  
RFC 3412 Message Processing and Dispatching for the SNMP  
RFC 3413 SNMP Applications  
RFC 3414 User-based Security Model (USM) for SNMPv3  
RFC 3415 View-based Access Control Model (VACM) for the SNMP  
RFC 3416 Version 2 of the Protocol Operations for SNMP  
RFC 3417 Transport Mappings for the SNMP  
RFC 3418 MIB for SNMP  
RFC 3636 Definitions of Managed Objects for IEEE 802.3 MAUs  
RFC 3768 VRRP  
draft-ietf-bridge-8021x-00.txt Port Access Control MIB  
IEEE 802.1AB LLDP

## OSPF

RFC 1245 OSPF protocol analysis  
RFC 1246 Experience with the OSPF protocol  
RFC 1586 OSPF over Frame Relay  
RFC 1793 Extending OSPF to Support Demand Circuits  
RFC 2328 OSPFv2  
RFC 3101 The OSPF Not-So-Stubby Area (NSSA) Option

## QoS

RFC 2205 Reservation Protocol  
RFC 2211 Controlled-Load  
RFC 2474 DSCP in the IPv4 and IPv6 Headers  
RFC 2475 An Architecture for Differentiated Services  
RFC 2697 A Single Rate Three Color Marker  
RFC 2698 A Two Rate Three Color Marker  
RFC 2597 Assured Forwarding PHB Group  
RFC 3246 An Expedited Forwarding PHB (Per-Hop Behavior)  
IEEE 802.1p Priority Tagging

## RIP

RFC 1058 RIPv1  
RFC 2082 RIP-2 MD5 Authentication  
RFC 2453 RIPv2

## Security

RFC 959 FTP  
RFC 1413 IDP  
RFC 1492 TACACS  
RFC 1779 X.500 String Representation of Distinguished Names.  
RFC 1858 Fragmentation  
RFC 2284 EAP  
RFC 2510 PKI X.509 Certificate Management Protocols  
RFC 2511 X.509 Certificate Request Message Format  
RFC 2559 PKI X.509 LDAPv2  
RFC 2585 PKI X.509 Operational Protocols  
RFC 2587 PKI X.509 LDAPv2 Schema  
RFC 2865 RADIUS

RFC 2866 RADIUS Accounting  
RFC 3280 X.509 Certificate and CRL profile  
draft-grant-tacacs-02.txt TACACS+  
Draft-IETF-PKIX-CMP-Transport-Protocols-01 Transport Protocols for CMP  
draft-ylonen-ssh-protocol-00.txt SSH Remote Login Protocol  
IEEE 802.1x Port Based Network Access Control  
PKCS #10 Certificate Request Syntax Standard  
Diffie-Hellman

## Services

RFC 854 Telnet Protocol Specification  
RFC 855 Telnet Option Specifications  
RFC 856 Telnet Binary Transmission  
RFC 857 Telnet Echo Option  
RFC 858 Telnet Suppress Go Ahead Option  
RFC 932 Subnetwork addressing scheme  
RFC 951 BootP  
RFC 1091 Telnet terminal-type option  
RFC 1305 NTPv3  
RFC 1350 TFTP  
RFC 1510 Network Authentication  
RFC 1542 Clarifications and Extensions for the Bootstrap Protocol  
RFC 1945 HTTP/1.0  
RFC 1985 SMTP Service Extension  
RFC 2049 MIME  
RFC 2068 HTTP/1.1  
RFC 2156 MIXER  
RFC 2217 Telnet Com Port Control Option  
RFC 2821 SMTP

## SSL

RFC 2246 The TLS Protocol Version 1.0  
draft-freier-ssl-version3-02.txt SSLv3

## X.25

RFC 1356 Multiprotocol Interconnect on X.25 and ISDN in the Packet Mode  
ITU-T Recommendations X.25 (1988), X.121 (1988), X.25

## xDSL

RFC 2225 IPoA Classical IP & ARP over ATM  
RFC 2364 PPP Over AAL5  
RFC 2684 IPoE Multiprotocol encapsulation over ATM  
ANSI T1.413 ADSL Metallic Interface  
ITU-T G.992.1 (G.DMT) ADSL Transceivers  
ITU-T G.992.1 (G.DMT) Annex A ADSL Transceivers  
ITU-T G.992.3 (G.DMT.bis) Annex A ADSL Transceivers  
ITU-T G.992.5 (G.DMT) Annex A ADSL Transceivers

## 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 - DSI 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. I: Customer Equipment Access Interface Specifications  
Bellcore SR-3887 1997 National ISDN Primary Rate Interface  
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 5)  
ETS 300 011:1992 Integrated Services Digital Network (ISDN); Primary rate user-network interface; Layer 1 specification and test principles  
G.706 (1988) Frame Alignment and CRC Procedures Relating to Basic Frame Structures Defined in G.704  
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.411 (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 hierarchical 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 hierarchical digital interfaces  
Japan NTT I.430-a Leased Line Basic Rate User-Network Interface Layer 1-Specification  
New Zealand Telecom TNA 134 Telecom ISDN User-Network Interface: Layer 3: PART B Basic Call Control Procedures  
Q.920 (1988) Digital subscriber Signalling System No.1 (DSS1) - ISDN user-network interface data link layer - General aspects  
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 Bt8370 Fully Integrated T1/E1 Framer and Line Interface data sheet  
Technical Reference of Frame Relay Interface, Ver. 1,

# AT-AR440S | Secure ADSL2+ Router

November 1993, Nippon Telegraph and Telephone Corporation. Ver. 1, November 1993, Nippon Telegraph and Telephone Corporation  
ACA TS 013.2:1990 General Requirements for Customer Equipment Connected to ISDN Basic Rate Access, Vol 2: Conformance Testing Specifications  
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

RFC 1490, 2427 Multiprotocol Interconnect over Frame Relay  
ANSI T1S1 Frame Relay

## VoIP

RFC 2543 SIP  
G.711 A/μ law Pulse code modulation (PCM) of voice frequencies  
G.723.1 Dual rate speech coder for multimedia communications transmitting at 5.3 and 6.3 kbit/s  
G.729 A/B (Optional) Coding of speech at 8 kbit/s using conjugate-structure algebraic-code-excited linear-prediction (CS-ACELP)  
H.323 v2 Packet-based multimedia communications systems

## Ordering Information

AT-AR440S Secure ADSL2+ Router

Order number: 990-002348-xx

Where xx =     10 for U.S. power cord  
                  20 for no power cord  
                  30 for U.K. power cord  
                  40 for Australian power cord  
                  50 for European power cord

AT-AR440S ships with both a rack mount kit and a wall mount kit.

Order number: for an additional rack mount kit:  
990-000024-00

Order number: for an additional wall mount kit:  
990-000025-00

## Port Interface Card Options

### AT-AR020

Single configurable E1/T1 interface that supports channelized/unchannelized Primary Rate ISDN/Frame Relay  
Order Number: 990-001304-00

### AT-AR021S (V3)<sup>5</sup>

Single Basic Rate ISDN (S/T) interface  
Order Number: 990-002153-00

### 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)  
Order number: 990-001104-00

### AT-AR024

Four Asynchronous RS232 interfaces to 115Kbps  
Order number: 990-001105-00

### AT-AR027

Two VoIP FXS ports  
Order number: 990-001356-00

## Software upgrade options

### AT-AR400 – ADVL3UPGRD

AR400 series advanced layer 3 upgrade

- IPv6
- BGP4
- Server Load Balancing

Order number: 980-10021-00

### AT-FL-15

WAN Load Balancing  
Order number: 980-000038

<sup>5</sup> AR021S (V3) requires AlliedWare® Operating System version 2.9.1-13 or later

## 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.

Visit us online at [www.alliedtelesis.com](http://www.alliedtelesis.com)

## 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.

USA Headquarters | 19800 North Creek Parkway | Suite 100 | Bothell | WA 98011 | USA | T: +1 800 424 4284 | F: +1 425 481 3895

European Headquarters | Via Motta 24 | 6830 Chiasso | Switzerland | T: +41 91 69769.00 | F: +41 91 69769.11

Asia-Pacific Headquarters | 11 Tai Seng Link | Singapore | 534182 | T: +65 6383 3832 | F: +65 6383 3830

[www.alliedtelesis.com](http://www.alliedtelesis.com)

© 2008 Allied Telesis Inc. All rights reserved. Information in this document is subject to change without notice. All company names, logos, and product designs that are trademarks or registered trademarks are the property of their respective owners. 617-00580-05 Rev.K