

ETS-1-10G

Ethernet Access Switches



- L2+ switches
- Stacking support
- Multicast support (IGMP Snooping, MVR)
- Advanced security (with multi-layer ACL, IP Source Guard, and Dynamic ARP Inspection)

MARKET SEGMENTS AND APPLICATIONS

New generation access switches provide end users connectivity to large-scale corporate networks, small and medium business networks, and service provider networks, using 1G/10G interfaces.

The switches support physical stacking, VLANs, multicast groups, and advanced security.

INTERFACE

Head-of-line blocking (HOL) protection
 Back pressure
 Auto MDI/MDIX
 Jumbo frames
 Flow control (IEEE 802.3X)
 Port mirroring
 Stacking

MAC TABLE

Independent learning mode per VLAN
 MAC Multicast Support
 Configurable aging time of MAC addresses
 Static MAC Entries
 MAC Flapping logging

VLAN

Voice VLAN
 802.1Q
 Q-in-Q
 Selective Q-in-Q
 GVRP

L2 MULTICAST

Multicast profiles
 Static Multicast groups
 IGMP Snooping v1,2,3
 Port/host-based IGMP Snooping Fast Leave
 IGMP proxy-report (for PoE options)
 IGMP authorization via RADIUS
 MLD Snooping v1,2
 IGMP querier
 MVR

L2

STP (Spanning Tree Protocol, IEEE 802.1d)
 RSTP (Rapid Spanning Tree protocol, IEEE 802.1w)
 MSTP (Multiple Spanning Tree, IEEE802.1s)
 STP Multiprocess
 PVSTP+
 Spanning Tree Fast Link option
 STP Root Guard
 STP Loop Guard
 BPDU Filtering
 STP BPDU Guard
 VLAN-based Loopback Detection (LBD)
 ERPS (G.8032v2)
 Private VLAN
 Layer 2 Protocol Tunneling

L3

Static IP routes
 Dynamic routing protocols RIPv2, OSPFv2, OSPFv3, BGP (requires license, see Ordering)
 Address Resolution Protocol (ARP)

ETS-1-10G

Ethernet Access Switches

VRRP

PIM SM, PIM DM, IGMP Proxy

ECMP Load Balancing

IP Unnumbered

LINK AGGREGATION

Static LAG

Dynamic LAG (LACP)

LAG Balancing Algorithm

IPV6

IPv6 Host

Dual-stack

SERVICE

Virtual Cable Testing (VCT)

Optical transceiver diagnostics

Green Ethernet

SECURITY

DHCP Snooping

DHCP Option 82

IP Source Guard

Dynamic ARP Inspection

sFlow

MAC-based authentication, Port Security, Static MAC entries

Port-based authentication IEEE 802.1x

DoS attack prevention

Traffic segmentation

Protection against non-authorized DHCP servers

DHCP clients filtering

BPDUs attacks prevention

NetBIOS/NetBEUI filtering

PPPoE Intermediate Agent

ACL (ACCESS CONTROL LISTS)

L2-L3-L4 ACL

Time-Based ACL

IPv6 ACL

ACL based on:

- Physical port number
- IEEE 802.1p
- VLAN ID
- EtherType
- DSCP
- Protocol type
- TCP/UDP port number
- User Defined Bytes

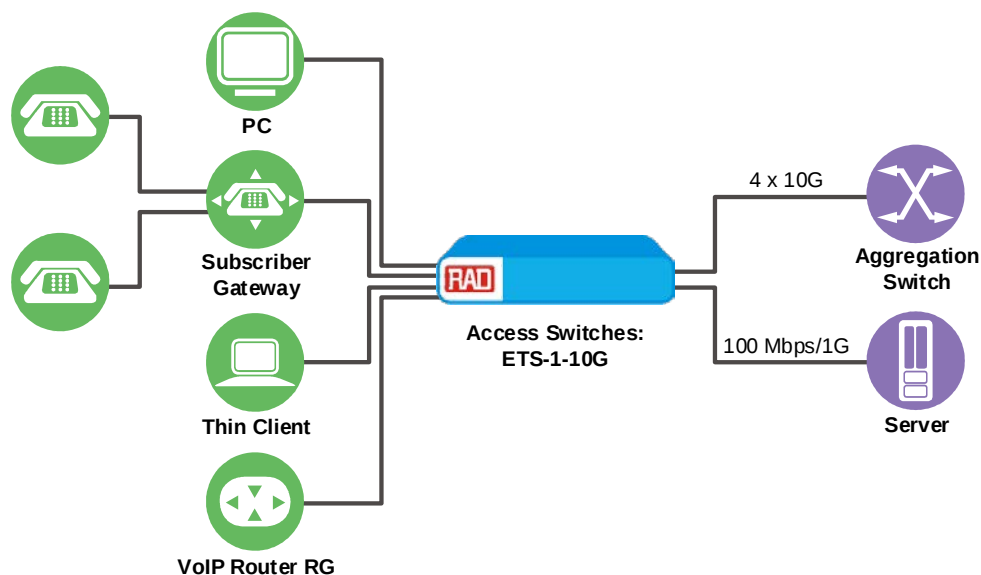


Figure 1. ETS-1-10G Ethernet Access Switches Use Case

ETS-1-10G

Ethernet Access Switches

QUALITY OF SERVICE (QOS) AND RATE LIMITING

QoS statistics
Shaping, policing
IEEE 802.1p Class of Service (CoS)
Storm Control
Bandwidth management
Scheduling algorithms: Strict Priority/Weighted Round Robin (WRR)
Three marking colors
ACL-based CoS/DSCP mark assignment
Setting the IEEE 802.1p priority for management VLAN
DSCP to CoS/CoS to DSCP remarking
ACL-based VLAN assignment
802.1p, DSCP mark assignment for IGMP

OAM/CFM

802.3ah Ethernet Link OAM
Dying Gasp
802.3ah Unidirectional Link Detection (UDLD)

MAIN MANAGEMENT

Download and upload of configuration file via TFTP/SCP
Redirecting output of CLI commands to an arbitrary file on ROM
SNMPv3
Command Line Interface (CLI)
Web interface
Syslog
SNTP (Simple Network Time Protocol)
Traceroute
LLDP (802.1ab) + LLDP MED
Access control – privilege levels
Management interface blocking
Local authentication

IP addresses filtering for SNMP
RADIUS, TACACS+ clients
SSH server
SSL
Macro commands
CLI commands logging
System log
DHCP autoprovision
DHCP Relay (IPv4 support)
DHCP Option 12
DHCP Relay Option 82
PPPoE Circuit-ID tag
Flash File System
Debugging commands
Rate limit of traffic to CPU
Password encryption
Password recovery
Ping (IPv4/IPv6 support)
DNS server
DNS client

MONITORING

Statistics on interfaces
RMON/SMON
CPU utilization monitoring per task and per traffic type
Temperature monitoring
TCAM utilization monitoring
RAM utilization monitoring

ETS-1-10G

Ethernet Access Switches

Table 1. Technical Features – ETS-1-10G Product Family

Specification	ETS-1-10G/ 4SP/24U	ETS-1-10G/4SP/ 4CMB/20S/DC ETS-1-10G/4SP/ 4CMB/20S/DCR ETS-1-10G/4SP/ 4CMB/20S/12V/AC ETS-1-10G/4SP/ 4CMB/20S/ACR	ETS-1-10G/ 4SP/48S/AC	ETS-1-10G/ 4SP/24P	ETS-1-10G/ 4SP/48P/AC
Packet Processor	Marvell 98DX3236-A1 (AlleyCat3)		Marvell 2x98DX3236-A1 (AlleyCat3)	Marvell 98DX3236-A1 (AlleyCat3)	Marvell 2x98DX3236-A1 (AlleyCat3)
Interfaces					
10/100/1000BASE-T (RJ-45)	24	-	48	-	-
10/100/1000BASE-T (RJ-45) PoE/PoE+	-	-	-	24	48
1000BASE-X/100BASE-FX (SFP)	-	20	-	-	-
10/100/1000BASE- T/1000BASE- X/100BASE-FX Combo	-	4	-	-	-
10GBASE-R (SFP+)/1000BASE-X (SFP)	4	4	4	4	4
Console port	RS-232/RJ-45				
Performance					
Bandwidth	128 Gbps	128 Gbps	176 Gbps	128 Gbps	176 Gbps
Throughput for 64 bytes	92.1 MPPS	92.1 MPPS	130.9 MPPS	93.1 MPPS	130.9 MPPS
Buffer memory	12 Mbit	12 Mbit	24 Mbit	12 Mbit	24 Mbit
RAM (DDR3)	512 MB	512 MB	512 MB	512 MB	512 MB
ROM (RAW NAND)	512 MB	512 MB	512 MB	512 MB	512 MB
MAC table	16K	16K	16K	16K	16K
VLAN table	4K	4K	4K	4K	4K
L2 Multicast groups	2K	2K	2K	2K	2K
Quality of Service (QoS)	8 egress queues per port				
TCAM	For routing: 1024 x IPv4 For traffic processing: 1024 x 24B				
ARP table	1K	1K	1K	1K	1K
Link Aggregation Groups (LAG)	16, up to 8 ports per LAG				
Maximum size of ECMP groups	8	8	8	8	8
Jumbo frame size	10240 bytes				
Stacking	8 devices				

ETS-1-10G

Ethernet Access Switches

Table 2. Power, Physical, and Environmental Specifications – ETS-1-10G Product Family

Specification	ETS-1-10G/ 4SP/24U	ETS-1-10G/4SP/ 4CMB/20S/DC ETS-1-10G/4SP/ 4CMB/20S/DCR	ETS-1-10G/4SP/ 4CMB/20S/12V/AC ETS-1-10G/4SP/ 4CMB/20S/ACR	ETS-1-10G/ 4SP/48S/AC	ETS-1-10G/ 4SP/24P	ETS-1-10G/ 4SP/48P/AC
Maximum power consumption	25W	35W	45W	85W	410W	1600W
Power supply	110 VAC – 264 VAC, 50 Hz or 36 VDC – 72 VDC	36 VDC – 72 VDC	12V/AC: 176 VAC – 264 VAC, 50 Hz or 12 VDC ACR: 110 VAC – 264 VAC, 50 Hz	110 VAC – 264 VAC, 50 Hz	176 VAC – 264 VAC, 50 Hz or 36 VDC – 72 VDC	176 VAC – 264 VAC, 50 Hz (up to 2 hot-swappable power supplies)
PoE budget	-	-	-	-	380W	1450W
Operating temperature	-20 to 55°C (-4 to 122°F)					
Storage temperature	-40 to 70°C (-40 to 158°F)					
Operating humidity	Up to 95% non-condensing					
Cooling	Passive	4 fans	4 fans	4 fans	2 fans	4 fans
Form factor	19", 1U					
Dimensions W x D x H mm (in)	430 x 158 x 44 (17 x 6.2 x 1.7)	Single PS: 430 x 243 x 44 (17 x 9.6 x 1.7) Dual PS: 430 x 275 x 44 (17 x 10.8 x 1.7)	Single PS: 430 x 243 x 44 (17 x 9.6 x 1.7) Dual PS: 430 x 275 x 44 (17 x 10.8 x 1.7)	440 x 280 x 44 (17 x 11 x 1.7)	440 x 203 x 44 (17 x 7.9 x 1.7)	440 x 490 x 44 (17 x 19 x 1.7)
Weight (net, kg)	2.7	4.15	4.15	6.31	16.3	3.62
Weight (gross, kg)	2.8	4.3	4.3	6.6	16.4	3.8

ETS-1-10G

Ethernet Access Switches

Ordering

ETS-1-10G/4SP/24U/AC

Ethernet switch L2+, 24 ports of 10/100/1000BASE-T, 4 ports of 10GBASE-X (SFP+)/1000BASE-X (SFP), 220V AC

ETS-1-10G/4SP/24U/DC

Ethernet switch L2+, 24 ports of 10/100/1000BASE-T, 4 ports of 10GBASE-X (SFP+)/1000BASE-X (SFP), 48V DC

ETS-1-10G/4SP/4CMB/20S/DC

Ethernet switch L2+, 20 ports of 1000BASE-X/1000BASE-FX (SFP), 4 ports of 10/100/1000BASE-T/1000BASE-X/100BASE-FX Combo, 4 ports of 10GBASE-X (SFP+)/1000BASE-X (SFP), 48V DC

ETS-1-10G/4SP/4CMB/20S/DCR

Ethernet switch L2+, 20 ports of 1000BASE-X/1000BASE-FX (SFP), 4 ports of 10/100/1000BASE-T/1000BASE-X/100BASE-FX Combo, 4 ports of 10GBASE-R/1000BASE-X (SFP+/SFP), dual 48V DC

ETS-1-10G/4SP/4CMB/20S/12V/AC

Ethernet switch L2+, 20 ports of 1000BASE-X/100BASE-FX (SFP), 4 ports of 10/100/1000BASE-T/1000BASE-X/100BASE-FX Combo, 4 ports of 10GBASE-R (SFP+)/1000BASE-X (SFP), 220V AC, 12V DC

ETS-1-10G/4SP/4CMB/20S/ACR

Ethernet switch L2+, 20 ports of 1000BASE-X/1000BASE-FX (SFP), 4 ports of 10/100/1000BASE-T/1000BASE-X/100BASE-FX Combo, 4 ports of 10GBASE-R/1000BASE-X (SFP+/SFP), dual 220V AC

ETS-1-10G/4SP/48S/AC

Ethernet switch L2+, 48 ports of 10/100/ 1000BASE-T, 4 ports of 10GBASE-X (SFP+)/1000BASE-X (SFP), 220V AC

ETS-1-10G/4SP/24P/AC

Ethernet switch L2+, 24 ports of 10/100/1000BASE-T with PoE/PoE+, 4 ports of 10GBASE-X (SFP+)/1000BASE-X (SFP), 220V AC

ETS-1-10G/4SP/24P/DC

Ethernet switch L2+, 24 ports of 10/100/1000BASE-T with PoE/PoE+, 4 ports of 10GBASE-X (SFP+)/1000BASE-X (SFP), 48V DC

ETS-1-10G/4SP/48P/AC

Ethernet switch L2+, 48 ports of 10/100/1000BASE-T with PoE/PoE+, 4 ports of 10GBASE-X (SFP+)/1000BASE-X (SFP), 220V AC

ETS-1-BGP-LIC

License for using BGP protocol

International Headquarters

24 Raoul Wallenberg St., Tel Aviv 6971923, Israel
Tel 972-3-6458181 | Fax 972-3-7604732
Email market@rad.com

North American Headquarters

900 Corporate Drive, Mahwah, NJ 07430, USA
Tel 201-529-1100 | Toll Free: 800-444-7234 | Fax: 201-529-5777
Email market@radusa.com



Your Network's Edge®

www.rad.com

751-101-11/19 (4.0) Specifications are subject to change without prior notice. © RAD Data Communications Ltd. RAD products/technologies are protected by registered patents. To review specifically which product is covered by which patent, please see ipr.rad.com. The RAD name, logo, logotype, and the product names MiNID, Optimux, Airmux, IPmux, and MICK are registered trademarks of RAD Data Communications Ltd. All other trademarks are the property of their respective holders.