

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.

ETHERNET INTERFACE

Head-of-line blocking (HOL) protection

Back pressure

Auto MDI/MDIX

Jumbo frames

Flow control (IEEE 802.3X)

Port mirroring

Stacking

LAYER 2

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

MAC Table

Independent learning mode per VLAN

MAC Multicast Support

Configurable aging time of MAC addresses

Static MAC Entries

MAC Flapping logging

ROUTING

Static IP routes

Dynamic routing protocols RIPv2, OSPFv2, OSPFv3, BGP (requires license, see Ordering)

Address Resolution Protocol (ARP)

VRRP

PIM SM, PIM DM, IGMP Proxy

ECMP Load Balancing

IP Unnumbered

RESILIENCY

Link aggregation

Static LAG

Dynamic LAG (LACP)

LAG Balancing Algorithm

L2 Protection

STP (Spanning Tree Protocol, IEEE 802.1d)

RSTP (Rapid Spanning Tree protocol, IEEE 802.1w)

MSTP (Multiple Spanning Tree, IEEE802.1s)

STP Multiprocess

PVSTP+



ETS-1-10G

Ethernet Access Switches

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

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
 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 and client

DHCP

DHCP snooping
 DHCP clients filtering
 DHCP autoprovision
 DHCP relay (IPv4 support)
 DHCP Relay Option 82

IPv6

IPv6 Host
 Dual-stack

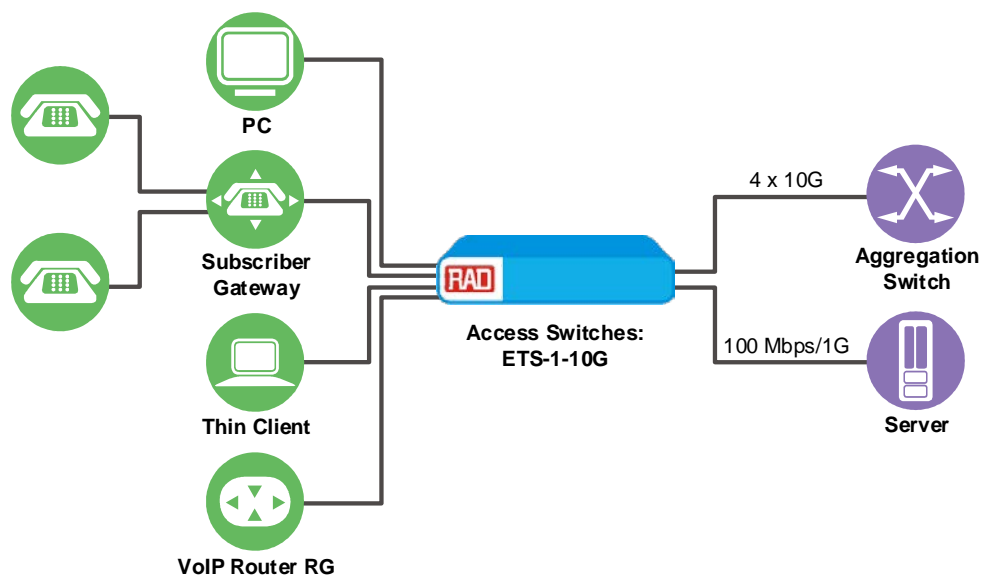


Figure 1. ETS-1-10G Ethernet Access Switches Use Case

SECURITY

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
BPDU 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

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)
ACL-based traffic classification
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

MONITORING AND DIAGNOSTICS

Statistics on interfaces
RMON/SMON
CPU utilization monitoring per task and per traffic type
Temperature monitoring
TCAM utilization monitoring
RAM utilization monitoring
Virtual Cable Testing (VCT)
Optical transceiver diagnostics
Green Ethernet

OAM/CFM

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

Table 1. Technical Features – ETS-1-10G Devices with Internal Power Supply

Specification	ETS-1-10G/ 4SP/24U	ETS-1-10G/4SP/ 4CMB/20S/DC ETS-1-10G/4SP/ 4CMB/20S/12V/AC	ETS-1-10G/ 4SP/48S/AC	ETS-1-10G/ 4SP/24P	ETS-1-10G/ 4SP/48P	ETS-1-10G/4SP/ 48U/12V/AC
Packet Processor	Marvell 98DX3236-A1 (AlleyCat3)					
Interfaces						
10/100/1000BASE-T (RJ-45)	24	-	48	-	-	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	4
Console port	RS-232/RJ-45					
Performance						
Bandwidth	128 Gbps			176 Gbps		
Throughput for 64 bytes	92.1 MPPS	92.1 MPPS	130.9 MPPS	93.1 MPPS	130.9 MPPS	130.9 MPPS
Buffer memory	12 Mbit	12 Mbit	24 Mbit	12 Mbit	24 Mbit	24 Mbit
RAM (DDR3)	512 MB	512 MB	512 MB	512 MB	512 MB	512 MB
ROM (RAW NAND)	512 MB	512 MB	512 MB	512 MB	512 MB	512 MB
MAC table	16K	16K	16K	16K	16K	16K
VLAN table	4K	4K	4K	4K	4K	4K
L2 Multicast groups	2K	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					
Link Aggregation Groups (LAG)	16, up to 8 ports per LAG					
Maximum size of ECMP groups	8					
Jumbo frame size	10240 bytes					
Stacking	8 devices					

Table 2. Technical Features –ETS-1-10G with Dual Hot Swappable Power Supplies

Specification	ETS-1-10G/4SP/ 4CMB/20S	ETS-1-10G/4SP/ 4CMB/20U	ETS-1-10G/4SP/ 4CMB/4S	ETS-1-10G/4SP/ 48U	ETS-1-10G/4SP/ 48S
Packet Processor	Marvell 2x98DX3336-A1 (PonCat3)				
Interfaces					
10/100/1000BASE-T (RJ-45)	-	20		48	
10/100/1000BASE-T (RJ-45)	-				
PoE/PoE+					
1000BASE-X/100BASE-FX (SFP)	20		4		48
10/100/1000BASE-T/1000BASE-X/100BASE-FX Combo	4	4	4	-	-
10GBASE-R (SFP+)/1000BASE-X (SFP)	4	4	4	4	4
Console port	RS-232/RJ-45				
Performance					
Bandwidth	128 Gbps	128 Gbps	96 Gbps	176 Gbps	
Throughput for 64 bytes	95 MPPS	95 MPPS	71 MPPS	130.9 MPPS	
Buffer memory		12 Mbit		24 Mbit	
RAM (DDR3)		512 MB		512 MB	
ROM (RAW NAND)		512 MB		512 MB	
MAC table		16K		16K	
VLAN table			4K		
L2 Multicast groups			4K		
Quality of Service (QoS)	8 egress queues per port				
TCAM	For routing: 1024 x IPv4 For traffic processing: 1024 x 24B		For routing: 13K For traffic processing: 3Kx24B		
ARP table			4K		
Link Aggregation Groups (LAG)	16, up to 8 ports per LAG				
Maximum size of ECMP groups	8				
Jumbo frame size	10240 bytes				
Stacking	8 devices				

Table 3. Power, Physical, and Environmental Specifications – ETS-1-10G with Internal Power Supply

Specification	ETS-1-10G/ 4SP/24U	ETS-1-10G/4SP/ 4CMB/20S/DC	ETS-1-10G/4SP/ 4CMB/20S/12V/AC	ETS-1-10G/ 4SP/48S/AC	ETS-1-10G/ 4SP/24P	ETS-1-10G/ 4SP/48P	ETS-1-10G/ 4SP/48U/12V/AC
Maximum power consumption	25W	35W	45W	85W	410W	1600W	85W
Power supply	110 – 264 VAC, 50 Hz or 36 – 72 VDC	36 VDC – 72 VDC	176 – 264 VAC, 50 Hz or 12 VDC	110 – 264 VAC, 50 Hz	176 – 264 VAC, 50 Hz or 36 – 72 VDC	100 – 240 VAC, 50 Hz (up to 2 hot-swappable power supplies)	100 – 240 VAC, 50 Hz or 12 VDC
PoE budget	-	-	-	-	380W	1440W (dual PS) 720W (single PS)	
Operating temperature	-10 to 45°C (14 to 113°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	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)	430 x 243 x 44 (17 x 9.6 x 1.7)	430 x 243 x 44 (17 x 9.6 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)	440 x 280 x 44 (17 x 11 x 1.7)
Weight	2.7	4.15	4.15	6.31	16.3	3.62	3.85

Table 4. Power, Physical, and Environmental Specifications – ETS-1-10G with Dual Hot Swappable Power Supplies

Specification	ETS-1-10G/4SP/4CMB/4S	ETS-1-10G/4SP/4CMB/20U	ETS-1-10G/4SP/4CMB/20S	ETS-1-10G/4SP/48U	ETS-1-10G/4SP/48S
Maximum power consumption	25W	35W	45W	45W	55W
Power supply	Hot Swappable Power Supplies, see Optional Accessories (ordered separately)				
PoE budget	-	-	-	-	-
Operating temperature	-10 to 45°C (14 to 113°F)				
Storage temperature	-40 to 70°C (-40 to 158°F)				
Operating humidity	Up to 95% non-condensing				
Cooling	2 fans	4 fans	4 fans	2 fans	4 fans
Form factor	19", 1U				
Dimensions W x D x H mm (in)	430 x 275 x 44 (17 x 10.8 x 1.7)			440x316x44 (17 x 12.4 x 1.4)	
Weight (kg)	3.15	3.25	3.50	3.95	4.0

Ordering

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

L2+ Ethernet switch, 24 ports of 10/100/1000BASE-T, 4 ports of 10GBASE-X (SFP+)/1000BASE-X (SFP), 110 – 264 VAC

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

L2+ Ethernet switch, 24 ports of 10/100/1000BASE-T, 4 ports of 10GBASE-X (SFP+)/1000BASE-X (SFP), 36– 72 VDC

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

L2+ Ethernet switch, 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), 36– 72 VDC

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

L2+ Ethernet switch, 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), 176 – 264 VAC or 12 VDC

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

L2+ Ethernet switch, 24 ports of 10/100/1000BASE-T with PoE/PoE+, 4 ports of 10GBASE-X (SFP+)/1000BASE-X (SFP), 176 – 264 VAC

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

L2+ Ethernet switch, 24 ports of 10/100/1000BASE-T with PoE/PoE+, 4 ports of 10GBASE-X (SFP+)/1000BASE-X (SFP), 110 – 240 VAC

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

L2+ Ethernet switch, 24 ports of 10/100/1000BASE-T with PoE/PoE+, 4 ports of 10GBASE-X (SFP+)/1000BASE-X (SFP), 36 – 72 VDC

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

L2+ Ethernet switch, 48 ports of 10/100/1000BASE-T with PoE/PoE+, 4 ports of 10GBASE-X (SFP+)/1000BASE-X (SFP), single 100 – 240 VAC

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

L2+ Ethernet switch, 48 ports of 10/100/1000BASE-T with PoE/PoE+, 4 ports of 10GBASE-X (SFP+)/1000BASE-X (SFP), dual 100 – 240 VAC

ETS-1-10G/4SP/48U/12V/AC

L2+ Ethernet switch, 48 ports of 10/100/1000BASE-T (RJ-45), 4 ports of 10GBASE-R (SFP+)/1000BASE-X (SFP), single 100 – 240 VAC or 12 VDC

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Switches with Dual Power Supply Slots

(Power Supplies are ordered separately)

ETS-1-10G/4SP/48U

L2+ Ethernet switch, 48 x 10/100/1000Base-T ports, 4 x 10GBase-R (SFP+)/1000Base-X (SFP) ports,, dual PS slots (PSs not included)

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

L2+ Ethernet switch, 48 x 1000BASE-X/100BASE-FX (SFP) 4 x 10GBASE-R/1000BASE-X (SFP+/SFP), , dual PS slots (PSs not included)

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

L2+ Ethernet switch, 4 ports of 1000BASE-X/100BASE-FX (SFP), 4 Combo ports of 10/100/1000BASE-T/1000BASEX/100BASE-FX, 4 ports of 10GBASE-R (SFP+)/1000BASE-X (SFP), , dual PS slots (PSs not included)

ETS-1-10G/4SP/4CMB/20U

L2+ Ethernet switch, 1 port of 10/100/1000BASE-T (OOB), 20 ports of 10/100/1000BASE-T, 4 Combo ports of 10/100/1000BASE-T/1000BASEX/100BASE-FX, 4 ports of 10GBASE-R (SFP+)/1000BASE-X (SFP), L2+, dual PS slots (PSs not included)

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

L2+ Ethernet switch, 1 port of 10/100/1000BASE-T (OOB), 20 ports of 1000BASE-X/100BASE-FX (SFP), 4 Combo ports of 10/100/1000BASE-T/1000BASEX/100BASE-FX, 4 ports of 10GBASE-R (SFP+)/1000BASE-X (SFP), L2+, dual PS slots (PSs not included)

Hot Swappable Power Supplies

Separately ordered per needed quantity (1 or 2) and type (DC or AC) for the devices with dual slots for removable power supplies

ETS-1-10G-PS/AC220/160W

AC Power Supply Module for ETS-1-10G, 100-264 VAC, 50-60 Hz, 160W

ETS-1-10G-PS/DC48/100W

DC Power Supply Module for ETS-1-10G, 36-76 VDC, 100W

OPTIONAL ACCESSORIES

ETS-1-BGP-LIC

License for using BGP protocol

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