

## FOS-5152

48-port 100/1000Base-X SFP  
4-port 1/10GBase-R SFP  
Managed Fiber Access Switch

### Description

Connection Technology Systems (CTS) FOS-5152 is a high density Layer 2 access switch equipped with 48 x dual-speed SFP slots and 4 x 1/10Gbps SFP+ uplink ports. All SFP slots can accommodate a wide range of SFP transceivers including single-mode, WDM transceivers. FOS-5152 has sufficient functionalities for service providers and enterprises who plan to implement FTTX or Metro Ethernet networks, enable easy operation and deployment of service.

FOS-5152 delivers wire-speed throughput for data, voice and IPTV services, using non-blocking 176Gbps switching fabric. 1+1 power supply design can provide seamless power changeover to reach sustainability of power if one of the power supplies failed.

For inspirational design features, FOS-5152 comes with new features of Fast Ring v2, Smart fan & Intelligent transceiver diagnostic mechanism for better topology recovery, device monitoring & user trouble shooting.

Many services providers are extending their existing data service with triple-play service because it generates higher revenue return. Advanced triple-play features on FOS-5152 includes Multicast VLAN Registration, IGMP snooping, IGMP fast leave, IGMP filtering, various QoS classifications and rate limit control facilitate service providers to deploy manageable network environment and deliver a robust triple-play service.

In order to provide customers extra security and separation, FOS-5152 has come with Selective Q-in-Q & Q-in-Q feature, as they enables service providers to separate different customers & services at Layer 2 level.

CTS has never settled in improving users' management experience, as FOS-5152 can easily be operated with web interface, console, telnet CLI, SNMP and DHCP auto-provision.

## ■ High Density Interface

Enable to offer high density ports (176Gbps switching fabric with 4 x 10Gbps + 48 x 1Gbps port) in 19 inch/ 1 rack unit (1U), making it a cost-effective device for switch deployment.

## ■ Up to 10Gbps Uplink Speed

Equipped with four 10G ports to fulfill the demand of higher bandwidth for traditional internet services and over-the-top services.

## ■ Smart Fan with Auto-Speed Control

Besides high quality fan to enhance heat dissipation, Smart Fan can adjust fan speed according to temperature to have better control of device power consumption & noise

## ■ Intelligent Transceiver Diagnostic

Greatly helps network operators to monitor current status & whether SFP transceiver parameter (e.g. temperature) is beyond or under threshold or not.

## ■ Selective Q-in-Q

Enable operators to differentiate various types of users (home/ enterprise) & service level by encapsulating VLAN tags.

## ■ Multicast VLAN Registration

Reduces the bandwidth required to distribute IPTV multicast streams by eliminating duplication of multicast streams on different VLANs.

## ■ Power Supply Redundancy

By combining two power sources (2AC or 2DC or 1AC + 1DC), power redundancy can be well achieved.

## Target Applications

- **FTTX Metro Ethernet Implementations.**

## Interface

- SFP Slot:  
48 x 100/1000Base-X SFP
- SFP+ Slot:  
4 x 10GBase-SR/LR SFP+  
Compatible with 1000Base-X transceiver
- Console Port:  
1 x RS-232 to RJ-45 serial port
- Terminal Block  
1 x Digital Input (Dry contact)

## Standards

- IEEE 802.3u 100Base-FX
- IEEE 802.3z 1000Base-X
- IEEE 802.3ae 10Gb/s Ethernet
- IEEE 802.3ad Link Aggregation (LACP)
- IEEE 802.1ab LLDP
- IEEE 802.1p Priority IEEE 802.1q Tag VLAN
- IEEE 802.1d STP
- IEEE 802.1w RSTP
- IEEE 802.1x Port based Network Access Control

## H/W Specification

- MAC Address table: 32K
- Non-blocking Switching Fabric: 176Gbps
- Throughput @ 64Bytes: 103.9Mpps
- Packet Buffer: 16Mbit
- Jumbo Frame: 12K Bytes
- Store and Forward Switching Mechanism

## LED

- Power A & B, Status, COM, Speed/Link/Act

## Forward/Filter Rate

- 100M: 148,800/148,800pps
- 1000M: 1,488,000/1,488,000pps
- 10G: 14,880,000/14,880,000pps

## Layer 2 Switch Features

### VLAN

- IEEE 802.1q VLAN  
VLAN ID: 4094 IDs  
VLAN Concurrent Groups: 4K VLAN Groups
- Port Based VLAN
- VLAN Translation
- Q-in-Q Double tag with Configurable Ether Type
- Selective Q-in-Q

### QoS

- QoS 802.1p CoS / DSCP
- Scheduling Algorithm  
Weighted Round Robin (WRR)  
Strict Priority Queuing (SPQ)
- QoS Priority Queues: 8 Queues
- 802.1p P-bit & DSCP Remarking
- Port based rate limit (ingress/egress)

### Network Redundancy

- IEEE 802.1d Spanning Tree Protocol (STP)
- IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
- IEEE 802.3ad Link Aggregation (LACP)
- Static Port Trunking
- Up to 26 Aggregation Groups, 8 Ports per Group

### Multicast

- IGMP Snooping v1/v2/v3
- IGMP Fast Leave and Querier
- MLD v1/v2 Snooping
- MLD Querier
- IGMP/MLD Snooping Group: 768/256 Groups
- IP Multicast Filter with Segment and Profile
- Static Multicast Group
- Multicast VLAN Replication (MVR)

### IPv6 Feature

- IPv6 over Ethernet (RFC 2464)
- IPv6 Addressing Architecture (RFC 4291)
- IPv6 Dual Stack (RFC4213)
- ICMPv6 (RFC4884)
- Path MTU Discovery for IPv6 (RFC 1981)
- Neighbor Discovery (RFC4861)
- DHCPv6 Client

### Layer 2 Protocol Tunneling

- CDP, LLDP, STP, VTP, LACP, PAgP & UDLD

### Access Control List

- Physical port, Ether Type, MAC address, VID, ToS/DSCP, Protocol Type, L4 Port and IP address
- ACL entries (IPv4: 256 entries; IPv6: 128 entries)

## Security

- 802.1x Port Base Access Control
- 802.1x RADIUS Authentication
- 802.1x MAC Authentication Bypass
- RADIUS Based VLAN Assignment
- DHCP Option 82 Relay Agent
- DHCP Option 82 with configurable circuit and Remote ID
- DHCP Snooping and DHCP server trust port
- IP Source Guard
- Port Isolation
- Storm Control  
Unknown Unicast/Unknown Multicast/Broadcast
- MAC Limiter
- Loop Detection

## Management

- SNMP v1,v2c & v3/Web/Telnet/HTTPS/SSHv2/CLI
- Text Base CLI Configure file
- Port Configuration  
Speed/Duplex/Flow Control/Description
- NTP with Daylight Saving Time
- Layer 2 Control Protocol filter
- Static MAC address Table
- LLDP

## Maintenance

### Diagnostic

- Port Mirror
- ICMP Ping
- Event log
- Syslog
- SFP SFF-8472 DDMI & threshold monitor  
Temp/Volt/TX bias/TX power/RX power
- CPU  
Temperature / Utilization
- Memory Statistics
- FAN Speed
- System Voltage

### Upgrade/Restore

- Firmware Upgrade/Downgrade  
HTTP/HTTPS/FTP/TFTP
- DHCP Auto-provision via DHCP option 60/43
- Configuration Upload/Backup  
HTTP/HTTPS/FTP/TFTP
- DHCP Auto-provision via DHCP option 60/43

## Power Requirement

- Input AC: 100V ~ 240V 50/60Hz
- Input DC: 48V (Range: 44~52V)
- Power Consumption (Max.): 85W

## Environmental Condition

- Operation: 0°C ~ 50°C
- Storage: -20°C ~ 60°C
- Humidity: 5% ~ 90%, Non-condensing

## Dimension & Weight

- Size: 440 x 290 x 44 mm (W x D x H)
- Weight: 4.31 kg (2AC power version with Rack ear)

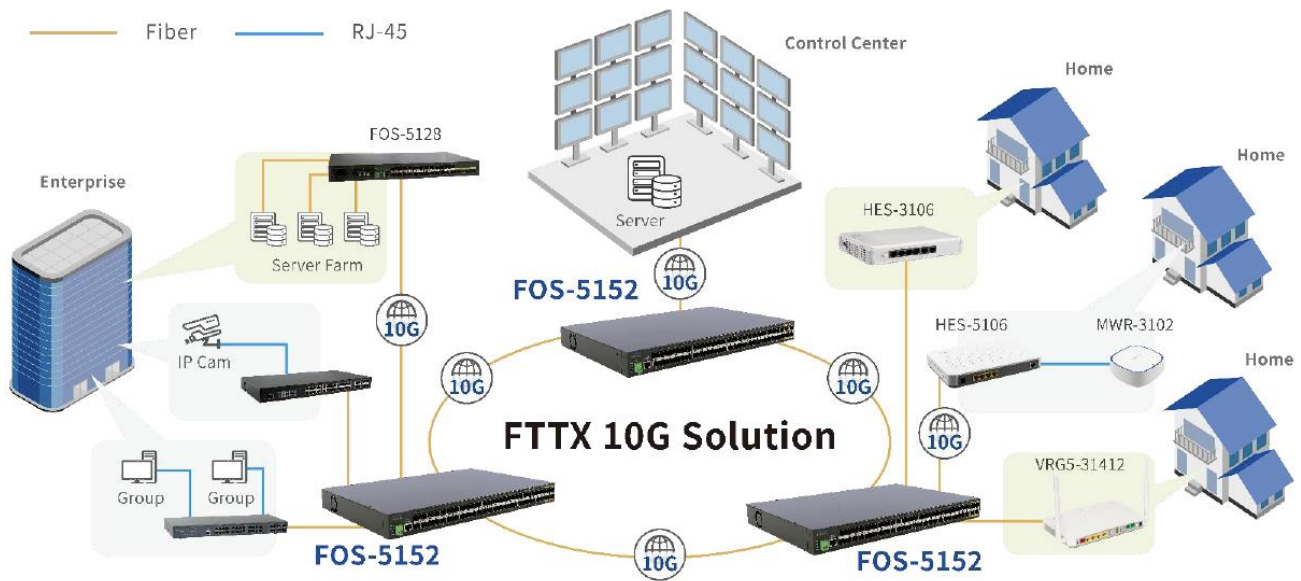
## EMC/Safety

- FCC Class A, CE

\* Under development function

\*\*Future feature

# Application Diagram



## Order Information

### FOS-5152

Model	1G Fiber Ports			10G Fiber Ports			Support Power Source
	Speed	Type	Ports	Speed	Type	Ports	
FOS-5152-1A	100/1000Mbps	SFP	48	1/10Gbps	SFP+	4	Fixed 1 Internal AC
FOS-5152-2A	100/1000Mbps	SFP	48	1/10Gbps	SFP+	4	Fixed 2 Internal AC
FOS-5152-1D	100/1000Mbps	SFP	48	1/10Gbps	SFP+	4	Fixed 1 Internal DC
FOS-5152-2D	100/1000Mbps	SFP	48	1/10Gbps	SFP+	4	Fixed 2 Internal DC
FOS-5152-1AD	100/1000Mbps	SFP	48	1/10Gbps	SFP+	4	Fixed 1 Internal AC and 1 Internal DC

Connection Technology Systems (CTS) reserves the right to change specification without prior notice.

# Accessory

## SFP-51

Model	Fiber Port					
	Speed	Type	Connector	Distance	Wavelength	Temperature
SFP-51FC	10Gbps	MM	LC	300M	850nm	0°C~70°C
SFP-51FC(SM-10/20)	10Gbps	SM	LC	10/20KM	1310/1310nm	0°C~70°C
SFP-51W2A(SM-10/20)	10Gbps	WDM	LC	10/20KM	TX: 1270/1270nm	0°C~70°C
					RX: 1330/1330nm	
SFP-51W2B(SM-10/20)	10Gbps	WDM	LC	10/20KM	TX: 1330/1330nm	0°C~70°C
					RX: 1270/1270nm	

## SFP-31-DR

Model	Fiber Port					
	Speed	Type	Connector	Distance	Wavelength	Temperature
SFP-31FC-DR	100/1000Mbps	MM	LC	2KM/550M	1310nm	0°C~70°C
SFP-31FC(SM-10)-DR	100/1000Mbps	SM	LC	10KM	1310nm	0°C~70°C
SFP-31W2A(SM-10/20)-DR	100/1000Mbps	WDM	LC	10/20KM	TX: 1310/1310nm	0°C~70°C
					RX: 1550/1550nm	
SFP-31W2B(SM-10/20)-DR	100/1000Mbps	WDM	LC	10/20KM	TX: 1550/1550nm	0°C~70°C
					RX: 1310/1310nm	

## SFP-31

Model	Fiber Port					
	Speed	Type	Connector	Distance	Wavelength	Temperature
SFP-31FC	1000Mbps	MM	LC	550M	850nm	0°C~70°C
SFP-31FC(SM-10/20)	1000Mbps	SM	LC	10/20KM	1310/1310nm	0°C~70°C
SFP-31W2A(SM-10/20)	1000Mbps	WDM	LC	10/20KM	TX: 1310/1310nm	0°C~70°C
					RX: 1550/1550nm	
SFP-31W2B(SM-10/20)	1000Mbps	WDM	LC	10/20KM	TX: 1550/1550nm	0°C~70°C
					RX: 1310/1310nm	

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