

# FTTX SOLUTIONS

COMPREHENSIVE SOLUTION FOR  
HIGH GRADE COMMUNICATION



- Access Switch
- Fiber CPE Switch
- Gateway
- Wi-Fi Mesh
- Industrial Switch

# CTS

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## About CTS

- CTS is a leading network solution provider headquartered in Taiwan. We are professional in design and manufacture products for the Last Mile Connectivity. With branch offices in Japan, Sweden, Austria, India, and the U.S., we aim to develop solutions to achieve sustainability, and grow together with partners worldwide.
- Founded in 1998, public since 2015
- 142 employees internationally, 20% belong to R&D
- 350+ Customers in over 40 countries
- 97.8% Customer Satisfaction

## Our Mission

Find the market gap from user scenario and application

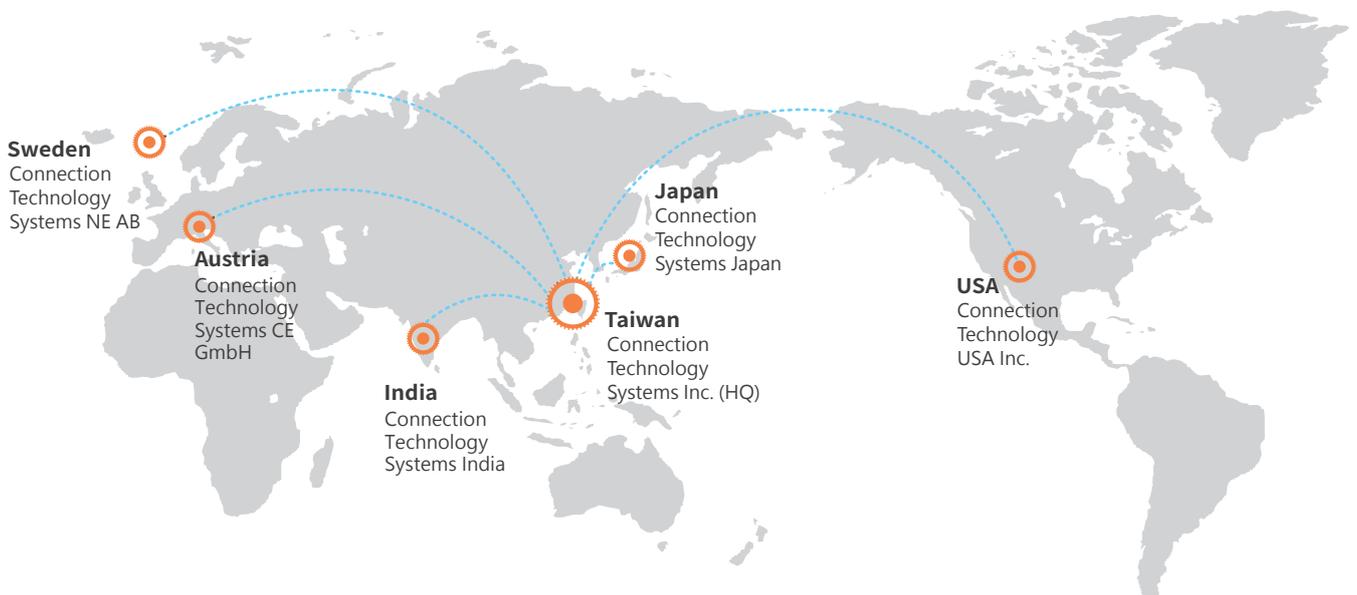
Design reliable products that connect people at the Last Mile

Fulfill customer demands with differentiated and sustainable solutions

## Sustainability

We provide reliable and sustainable solution for our customers so they can use for a long time, reducing the waste of our planet. We also adhere to the most stringent global compliance standards.

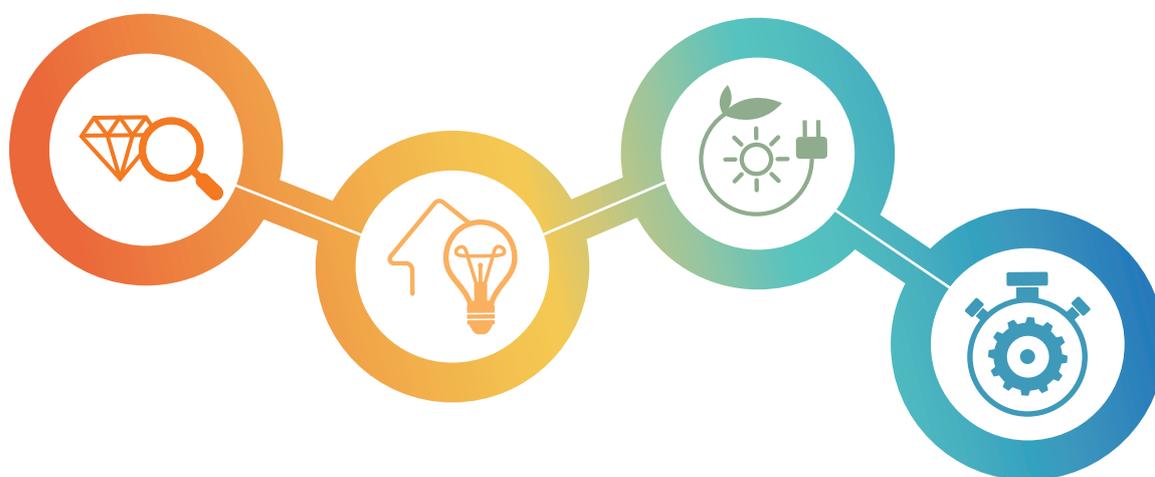
CTS acknowledges the importance of the UN Sustainable Development Goals (SDGs) and we've integrated into our business strategy. We've started to work with our suppliers and partners on the GHGs and PCF. We plan to release sustainability report to our stakeholders every year.



# Why CTS

## The Spirit of Pursuing Excellence

For CTS, our achievement is defined by each successful story our customers have experienced. Until this day, with 20 years experiences in the field, CTS' innovative spirit and passion still driving the company to pursue excellence. Through continuously interact with the clients and the markets, CTS has insisted on keeping "Differentiation and Glocalization" which has make us one of the leading solution providers for telecom companies, network operators, and broadband service providers all over the world.



## Quality Assurance

### Engineering Design

- SW/HW Collaboration
- Design Verification Test
- Design for Manufacturing
- Solution & Risk Analysis

### Own Production

- Made in Taiwan
- IQC/PQC/FQC/OQC
- First Pass Yield
- Dynamic Burn-in Test

### Reliability Test

- High Temperature Operating
- High Temperature Storage
- Damp Heat Cycling Test
- Accelerated Aging Test
- MTBF with MIL-HDBK-217F
- ISO 9001, 14001, CE, FCC

### Timely Services

- Engineering Services
- Local Branch Support
- RMA Center
- Root Cause Analysis

# Flexible FTTB Solution for Mid-size Apartment Buildings in Middle East

## Background

The client is the top Telecom in Middle East whose main service including telephony, Internet, and TV/IPTV services. This company started its Fiber to the Apartment Building deployment project in hope to reach out to its end customer to provide a reliable, secure, and fast network connectivity to home premises ...



**CTS Products**



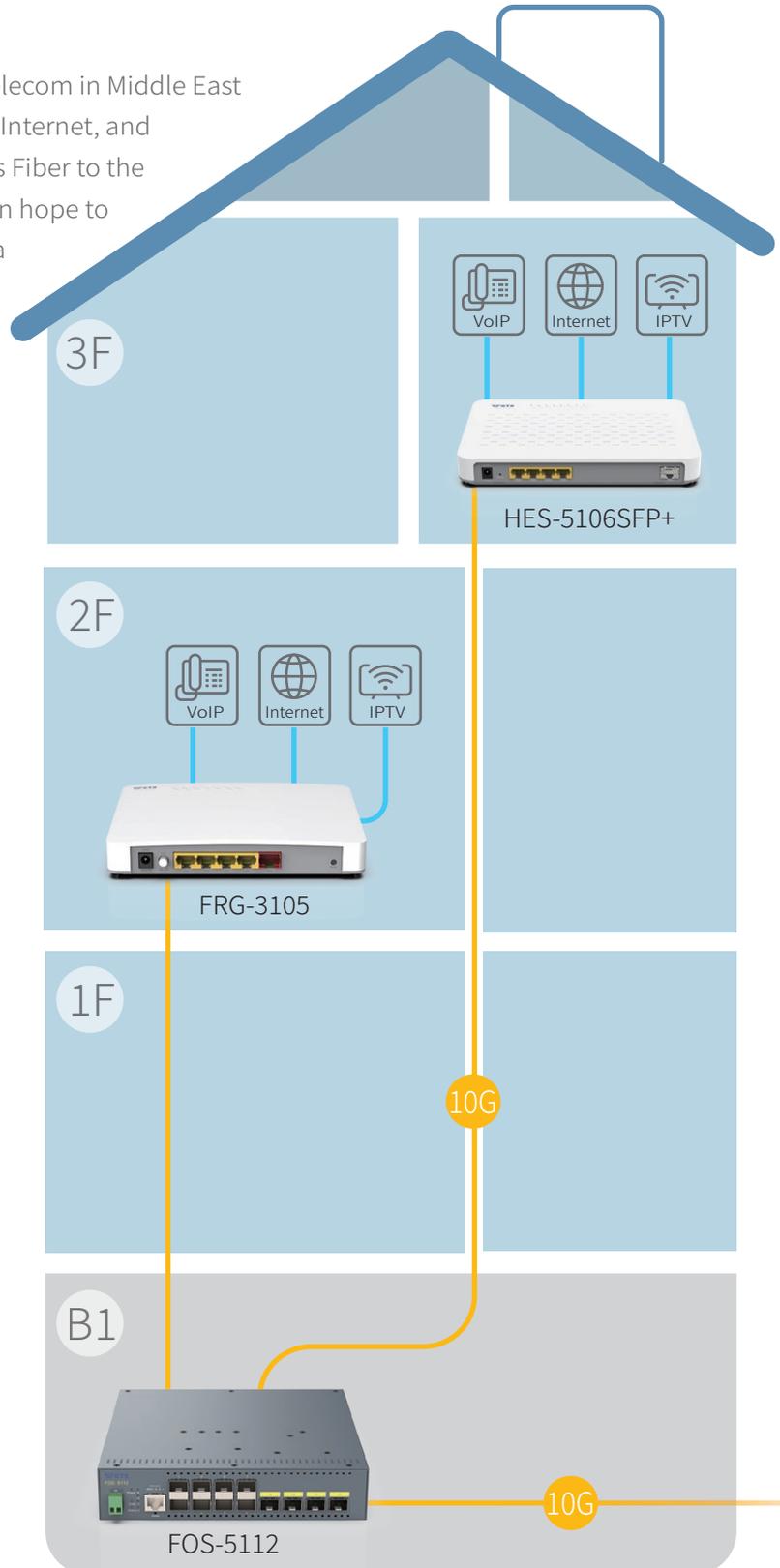
**FOS-5112**

8-Port 1G Fiber  
+ 4-Port 10G Fiber  
Managed Switch



**FOS-3110/ FOS-3114**

10/14-Port Gigabit  
Fiber Managed Switch





## Challenge

- ① Need high uplink bandwidth to Internet service provide.
- ② Average 8~10 units in the apartment building.
- ③ Confine installation space.
- ④ Limited DC power sources.
- ⑤ Low noise tolerance.
- ⑥ Need to manage large amount of devices.
- ⑦ Collect usage data in order to improve its service.



## Solution & Benefit

- ① Supports 4 1/10G fiber uplink SFP+ slots.
- ② 8/10/14 dual rate fiber LAN port support for up to 1 G speed.
- ③ Supports cabinet-mount or rack-mount of 9, 12 and standard 19-inch rack.
- ④ Built-in AC PSU require less hassles to find DC power source in residential environment.
- ⑤ Fanless design eliminates residents' complaint on noise, also ensures longer life span.
- ⑥ VLAN, QoS, DHCP and IGMP Snooping for service provision.
- ⑦ Remote management through IP Telnet, WEB, SNMP and SSH to reduce maintenance cost.



### Networking Consultant

Advise application layout and plan for two solutions within three months.



### Trustworthy Partner

Constant communication and field research aimed to pin point customer's problem.



### In-house Designer

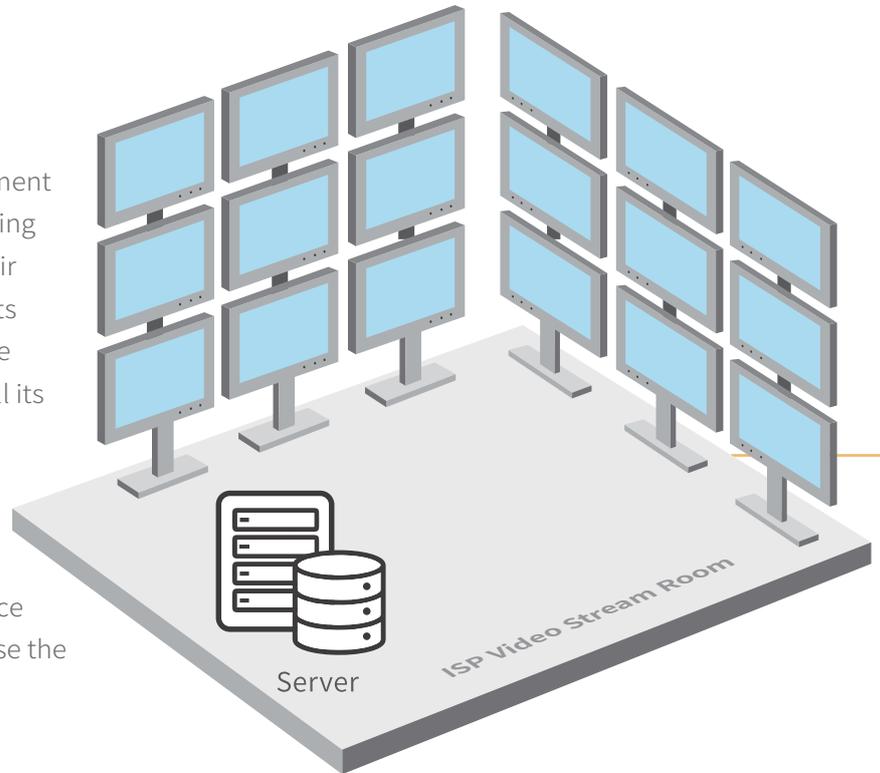
Collaborate with customers to create the most fitted solution to address the issue.

# PoE Solution for IPTV Service in Japanese Apartment Complex

## Background

One of the top apartment management company in Japan has been providing Satellite IPTV service in every of their apartment units since 2002. While its leasing business rapidly expand, the original solution can no longer fulfill its tenants' demand for better video streaming quality.

The apartment management company was looking for a new solution with best price-performance ratio from a vendor who can promise the best quality and sales services ...

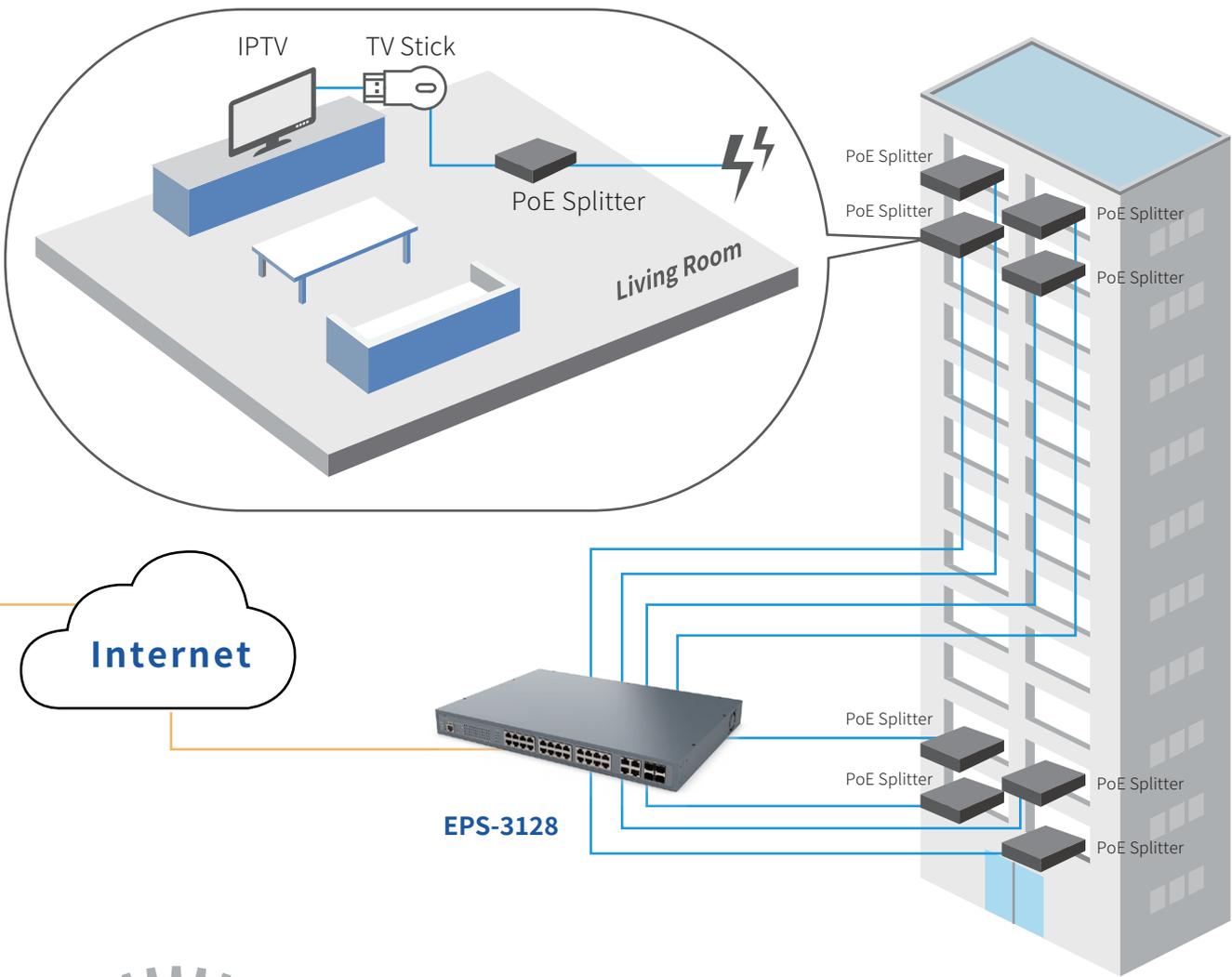


## Challenge

- ① Average 21~24 units in one building, each unit has a TV stick need to be connected.
- ② The client is keen to reduce wiring complexity by PoE solution.
- ③ Require features that can enable smooth IPTV streaming service.

## Solution & Benefit

- ① 24 PoE ports provide up to 30W per port and maximum 100m transmission distance is perfect for powering TV sticks without extra wiring.
- ② IGMP Snooping, IGMP Fast Leave, IGMP Filtering, various QoS classifications and rate limit control to deliver smooth IPTV service.
- ③ Alarm threshold, port priority, quick control, and schedule-based provide efficient and effective management on PoE ports.



### EPS-3128

24-Port Gigabit **802.3at PoE** + 4-Port Gigabit Combo Managed Switch



#### Networking Consultant

Local team provides quick and on-time support.



#### Trustworthy Partner

Actively response to customer's technical issue.



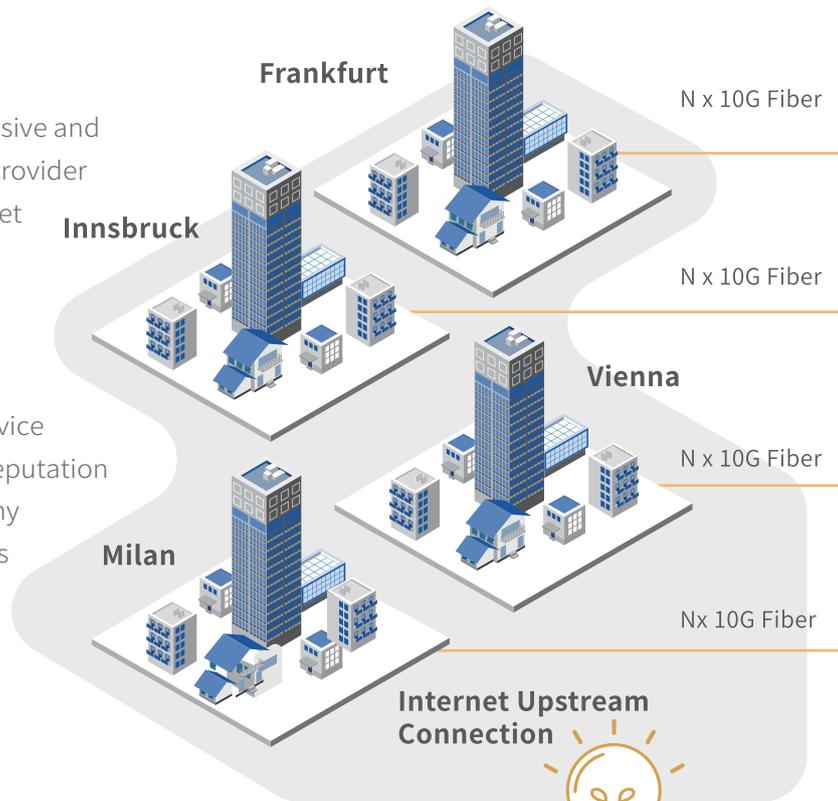
#### In-house Designer

Continuously improving through FW and HW update.

# Austria's Regional Service Provider Chose CTS Switches for Its Network Infrastructure

## Background

Established in 1999, Citynet is a progressive and modern Internet operator and service provider located in the City of Hall in Tyrol. Citynet offers Internet access, mobile Internet, VoIP and IPTV to private home users. It also offers web space, security products, cloud services and server housing for business customers. Its service structure has made itself an excellent reputation among the areas. However, the company must keep looking for the best solutions to keep up with its customers' ever-growing requests on service quality ...



## Challenge

- ① Being owned by the city's utility company raise the public expectation for outstanding service quality.
- ② Higher Internet speed is inevitable trend in near future.
- ③ Need a fine selection of access switch that suits the various applications.
- ④ Has to create differentiation in order to meet the competition from national or international operators.

## Solution & Benefit

- ① Stable and reliable network connection with very few defects.
- ② Collaborated to create 10 Gigabit network infrastructure in keeping with the vision for a future-proof network.
- ③ Offered scalable solutions for different deployment scenario and applications including managed 10G to 1G Layer 2 Ethernet Fiber and CPE switches.
- ④ Robust centralized network management, monitoring and provisioning can fulfill the commitment of reliable service.

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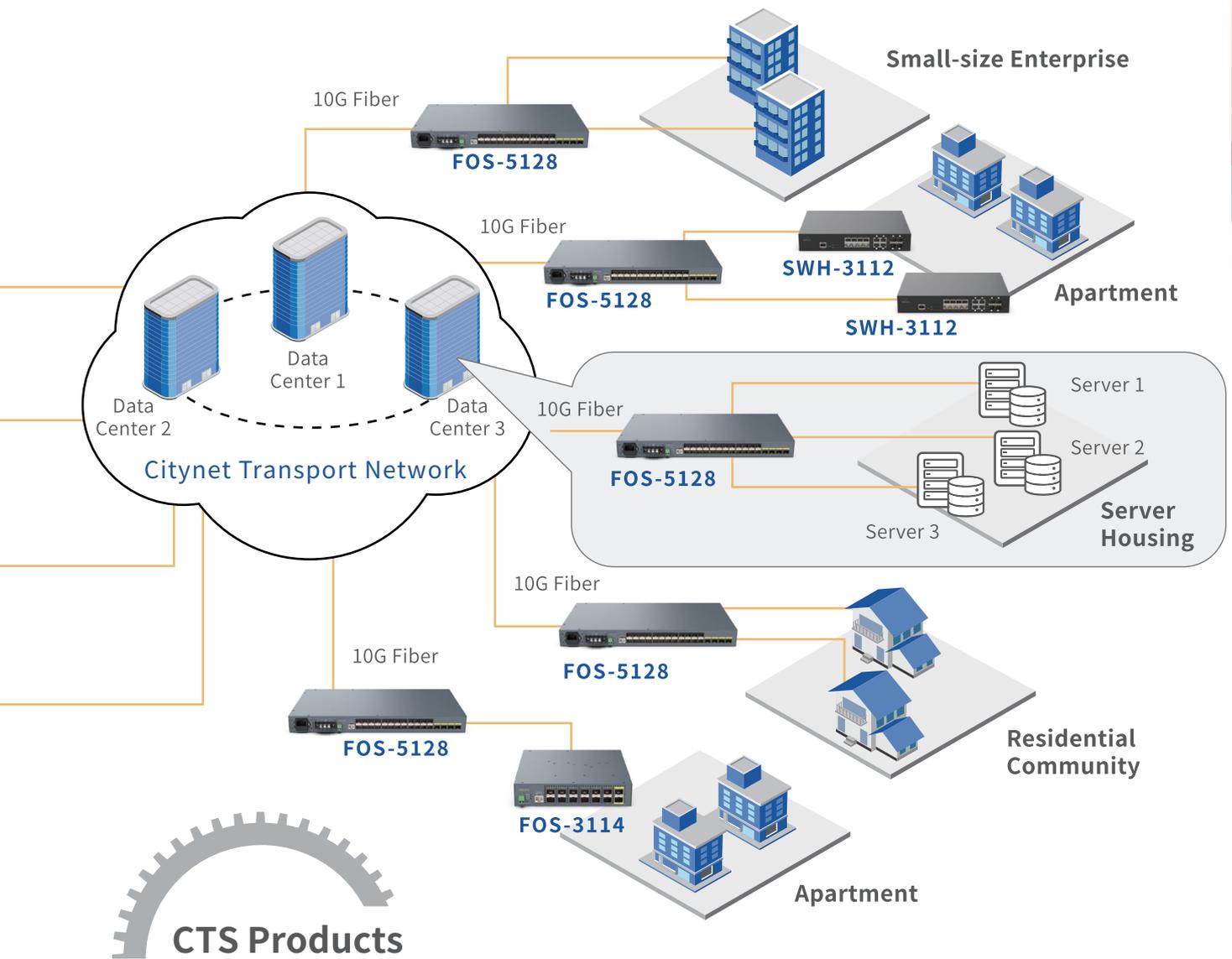
The important thing for technician was the usability. CTS products are easy to integrate and they are reliable and very stable.

”



Manuel Kofler, Head of IT,  
Stadtwerke Hall in Tirol GmbH





## CTS Products



### FOS-5128

24-Port 1G + 4-Port 10G Fiber Managed Switch



### FOS-3114

14-Port Gigabit Fiber Managed Switch



### SWH-3112

8-Port Gigabit Copper + 4-Port Gigabit Combo Managed Switch



#### Networking Consultant

Regional technical support quickly identified and resolved the issues during the deployment stage.



#### Trustworthy Partner

CTS works closely with the customer to provide the solution that help to achieve their vision.



#### In-house Designer

Robust management functions enable the operator to provide best service to the end customers.



## All-inclusive Fiber Optic Switch Solutions

CTS FOS 51 Series can work as the fiber backbone switch with 8/24/48 100/1000Base-X dual-speed SFP slots and extra 4 1/10GBase-X dual-speed SFP+ slots, it offers great flexibility to work with different SFP/SFP+ transceivers. Through fiber optic cabling, FOS can connect to CTS CPE Fiber Switch by up to 120km. CTS Fiber Switch also supports powerful Layer 2 protocol function, robust security features and management interfaces.

- IEEE 802.1q Tagged VLAN, Q-in-Q, Port-based VLAN and VLAN Translation
- IGMP Snooping v1, v2 and v3; MLD Snooping v1 and v2
- Layer 2, 3 and 4 Access Control List
- IEEE 802.1p QoS, CoS and DSCP for 8 Priority Queues
- IEEE 802.3ad Link Aggregation and Static Trunk
- STP, RSTP and Loop Detection
- DHCP Snooping, DHCP Option 82 and DHCP Auto Provisioning
- WEB UI, CLI, Telnet, SSH and SNMP v1/v2c Management Interface



High Density



FOS-5152



Front Access Design



FOS-5128



8.5-inch Half Size



FOS-5112

## Small Size, Easy-deploy and Easy-expand Fiber Solutions



10G Solution



**HES-5106SFP+**



Fiber to the  
Home



**HES-3106**



Cable  
Management



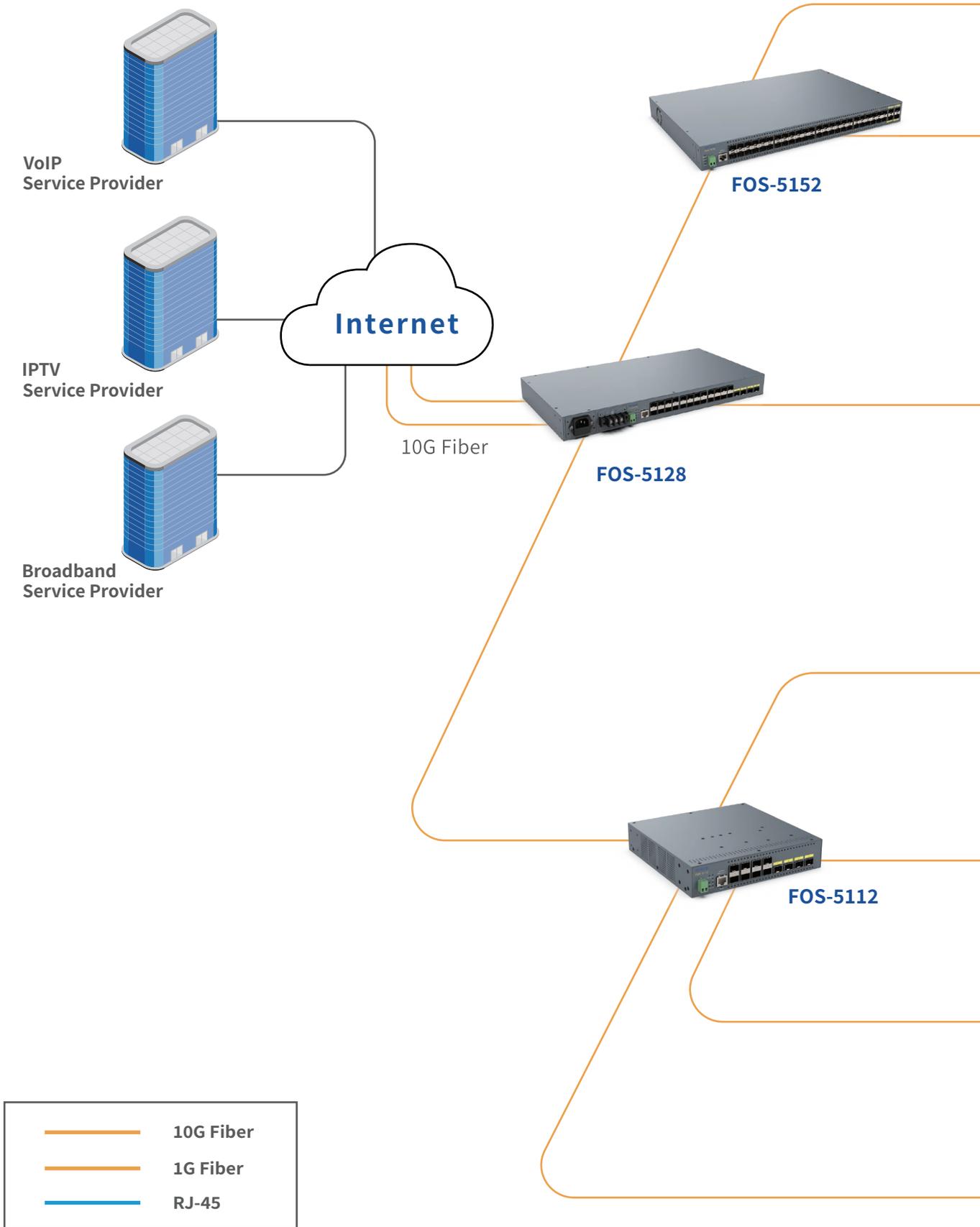
**HES-3106-SE**

As a leading provider of network equipment for FTTH, CTS CPE switch - HES series is designed to be installed in wall enclosures or on an individual wall-mount kit at any location. The add-on cable tray can organize excessive cable and provide extra protection to the delicate fiber. HES series equip with 4/5-port 10/100/1000Base-T copper and 1 extra 100/1000Base-X SFP or 1/10GBase-X SFP+ fiber interface that can flexibly work with suitable SFP transceivers to connect to backbone switch in up to 120km. HES series also supports powerful Layer 2 protocol functions, robust security features and management interfaces as follow.



- IEEE 802.1q Tagged VLAN, Q-in-Q and Port-based VLAN
- IGMP Snooping v1, v2 and v3
- IEEE 802.1p QoS, and ToS for 4 Priority Queues
- Loop Detection, Storm Control and Bandwidth Control
- DHCP Snooping, DHCP Client and DHCP Auto Provisioning
- WEB UI, CLI, Telnet, SSH and SNMP v1/v2c Management Interface

# Application of Fiber Switch Solutions





**Enterprise**

- IP Cam
- VoIP
- PC
- Wi-Fi AP
- Laptop



**Campus**

- IP Cam
- VoIP
- PC
- Wi-Fi AP
- Laptop



**Home**

- Internet
- VoIP
- IPTV



**Home**

- Internet
- VoIP
- IPTV

## 19/8.5-inch 10G Fiber Managed Access Switch

Model Name	FOS-5152	FOS-5128	FOS-5112
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Product Image



<b>Hardware</b>	10G SFP+	4 (1G Compatible)	4 (1G Compatible)	4 (1G Compatible)
	10/100/1000Base-T	-	-	-
	10/100Base-TX	-	-	-
	1000Base-X	48	24	8
	100Base-FX	Compatible	Compatible	Compatible
	RS-232 Console Port (RJ-45)	1	1	1
	Dimension W x D x H	440 x 290 x 44mm	440 x 205 x 44mm	210 x 235 x 44mm
	Operating Temperature (Humidity)	0~50°C (5~90%)		
	Power Source	100~240VAC/48VDC		
	Power Redundancy	●	●	-
	External Battery Type	-		
	PoE	-		
	MAC Address Table	32K	16K	16K
	Non-blocking Switching Fabric	176Gbps	128Gbps	96Gbps
	Memory Buffer	2048K Bytes	1536K Bytes	1536K Bytes
Jumbo Frame	12K Bytes			
<b>Traffic Management</b>	IPv6	IPv4/IPv6 Dual Stack		
	QoS	802.1p, ToS/DSCP		
	QoS Priority Queue	8		
	Bandwidth Control	●		
	Broadcast Storm Control	●		
	IPTV Multicast	IGMP Snooping v1/v2/v3, MLD Snooping v1/v2		
	Network Redundancy	CTS Fast Ring v2*, STP/RSTP		
	LACP	●		
	VLAN	802.1q, Q-in-Q, Port Based, VLAN-ID Based, Selective QinQ, VLAN Translation		
	VLAN ID	4094		
VLAN Group	4K			
<b>Security &amp; Authentication</b>	SSHv2	●		
	DHCP Option 82	●		
	Authentication	RADIUS, TACACS+, 802.1x MAB		
	ACL (Access Control List)	●		
<b>Network Management &amp; Maintenance</b>	Management	Telnet, SSHv2, HTTP, HTTPS, SNMP v1/v2c/v3		
	Port Mirroring	●		
	SNMP Power Down Trap	●		
	DHCP	Client, Auto Provisioning, Snooping		
	Time Synchronization	NTP/SNTP		
	Firmware/Configuration Upgrade	FTP/TFTP/HTTP		
<b>Certifications</b>	EMC/Safety	FCC Class A, CE		

\* CTS Fast Ring v2 includes Ring and Chain Protocol

### 19/8.5-inch 1G Fiber Managed Access Switch

Model Name	FOS-3128	FOS-3114	FOS-3110
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<b>Hardware</b>	10/100/1000Base-T	4 (COMBO)	-	2 (COMBO)
	10/100Base-TX	-	-	-
	1000Base-X	28	14	10
	100Base-FX	Compatible	Compatible	Compatible
	RS-232 Console Port (RJ-45)	1	1	1
	Dimension W x D x H	440 x 205 x 44mm	210 x 235 x 44mm	
	Operating Temperature (Humidity)	0~50°C (5~90%)		
	Power Source	100~240VAC/48VDC	100~240VAC	
	Power Redundancy	●	-	
	External Battery Type	-		
	PoE	-		
	MAC Address Table	16K	8K	
	Non-blocking Switching Fabric	56Gbps	28Gbps	20Gbps
	Memory Buffer	1536K Bytes	512K Bytes	
	Jumbo Frame	9K Bytes		
<b>Traffic Management</b>	IPv6	IPv4/IPv6 Dual Stack		
	QoS	802.1p, ToS/DSCP		
	QoS Priority Queue	8		
	Bandwidth Control	●		
	Broadcast Storm Control	●		
	IPTV Multicast	IGMP Snooping v1/v2/v3, MLD Snooping v1/v2		
	Network Redundancy	CTS Fast Ring v2*, STP/RSTP		
	LACP	●		
	VLAN	802.1q, Q-in-Q, Port Based		
	VLAN ID	4094		
	VLAN Group	2K		
<b>Security &amp; Authentication</b>	SSHv2	●		
	DHCP Option 82	●		
	Authentication	RADIUS, TACACS+	RADIUS, TACACS+, 802.1x MAB	
	ACL (Access Control List)	●		
<b>Network Management &amp; Maintenance</b>	Management	Telnet, SSHv2, HTTP, HTTPS, SNMP v1/v2c/v3		
	Port Mirroring	●		
	SNMP Power Down Trap	●		
	DHCP	Client, Auto Provisioning, Snooping		
	Time Synchronization	●		
	Firmware/Configuration Upgrade	FTP/TFTP/HTTP		
<b>Certifications</b>	EMC/Safety	FCC Class A, CE		

\* CTS Fast Ring v2 includes Ring and Chain Protocol

## 19/8.5-inch 10G Ethernet Managed Access Switch

Model Name	ESW-5128	ESW-5112-2MG
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Product Image



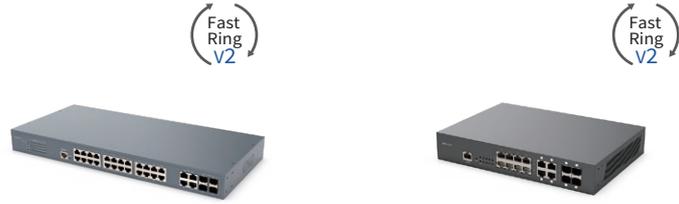
<b>Hardware</b>	10G SFP+	4 (1G Compatible)	2 (1G Compatible)
	1G/2.5G/5G/10GBase-T	-	2 (100M Compatible)
	10/100/1000Base-T	24	8
	10/100Base-TX	-	-
	1000Base-X	-	-
	100Base-FX	-	-
	RS-232 Console Port (RJ-45)	1	1
	Dimension W x D x H	440 x 205 x 44mm	210 x 235 x 44mm
	Operating Temperature (Humidity)	0~50°C (5~90%)	
	Power Source	100~240VAC/48VDC	100~240VAC/12VDC/48VDC
	Power Redundancy	●	
	External Battery Type	-	
	PoE	-	
	MAC Address Table	16K	
	Non-blocking Switching Fabric	128Gbps	96Gbps
	Memory Buffer	1536K Bytes	
Jumbo Frame	12K Bytes		
<b>Traffic Management</b>	IPv6	IPv4/IPv6 Dual Stack	
	QoS	802.1p, ToS/DSCP	
	QoS Priority Queue	8	
	Bandwidth Control	●	
	Broadcast Storm Control	●	
	IPTV Multicast	IGMP Snooping v1/v2/v3, MLD Snooping v1/v2	
	Network Redundancy	CTS Fast Ring v2*, STP/RSTP	
	LACP	●	
	VLAN	802.1q, Q-in-Q, Port Based, Selective QinQ, VLAN Translation	
	VLAN ID	4094	
	VLAN Group	4K	
<b>Security &amp; Authentication</b>	SSHv2	●	
	DHCP Option 82	●	
	Authentication	RADIUS, TACACS+, 802.1x MAB	
	ACL (Access Control List)	●	
<b>Network Management &amp; Maintenance</b>	Management	Telnet, SSHv2, HTTP, HTTPS, SNMP v1/v2c/v3	
	Port Mirroring	●	
	SNMP Power Down Trap	●	
	DHCP	Client, Auto Provisioning, Snooping	
	Time Synchronization	NTP/SNTP	
	Firmware/Configuration Upgrade	FTP/TFTP/HTTP	
<b>Certifications</b>	EMC/Safety	FCC Class A, CE	

\* CTS Fast Ring v2 includes Ring and Chain Protocol

## 19/10-inch 1G Ethernet Managed Access Switch

Model Name	ESW-3128	SWH-3112
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Product Image



<b>Hardware</b>	10G SFP+	-	-
	1G/2.5G/5G/10GBase-T	-	-
	10/100/1000Base-T	28	12
	10/100Base-TX	-	-
	1000Base-X	4 (COMBO)	4 (COMBO)
	100Base-FX	Compatible	Compatible
	RS-232 Console Port (RJ-45)	1	1
	Dimension W x D x H	440 x 205 x 44mm	265 x 183 x 44mm
	Operating Temperature (Humidity)	0~50°C (5~90%)	
	Power Source	100~240VAC/48VDC	100~240VAC
	Power Redundancy	●	-
	External Battery Type	-	
	PoE	-	
	MAC Address Table	16K	8K
	Non-blocking Switching Fabric	56Gbps	24Gbps
	Memory Buffer	1536K Bytes	512K Bytes
	Jumbo Frame	9K Bytes	
	<b>Traffic Management</b>	IPv6	IPv4/IPv6 Dual Stack
QoS		802.1p, ToS/DSCP	
QoS Priority Queue		8	
Bandwidth Control		●	
Broadcast Storm Control		●	
IPTV Multicast		IGMP Snooping v1/v2/v3, MLD Snooping v1/v2	
Network Redundancy		CTS Fast Ring v2**, STP/RSTP	
LACP		●	
VLAN		802.1q, Q-in-Q, Port Based	
VLAN ID		4094	
VLAN Group	2K		
<b>Security &amp; Authentication</b>	SSHv2	●	
	DHCP Option 82	●	
	Authentication	RADIUS, TACACS+, 802.1x MAB*	
	ACL (Access Control List)	●	
<b>Network Management &amp; Maintenance</b>	Management	Telnet, SSHv2, WEB, SNMP v1/v2c/v3	
	Port Mirroring	●	
	SNMP Power Down Trap	●	-
	DHCP	Client, Auto Provisioning, Snooping	
	Time Synchronization	SNTP	
	Firmware/Configuration Upgrade	FTP/TFTP/HTTP	
<b>Certifications</b>	EMC/Safety		FCC Class A, CE

\* Coming soon

\*\* CTS Fast Ring v2 includes Ring and Chain Protocol

## 19/8.5-inch PoE Managed Switch

	EPS-5112-8BT	EPS-3128-240W/480W
Model Name		EPS-3128-240W/480W-LP



Product Image



<b>Hardware</b>	10G SFP+	2 (1G Compatible)	-
	1G/2.5G/5G/10GBase-T	2 (100M Compatible)	-
	10/100/1000Base-T	8	28
	10/100Base-TX	-	-
	1000Base-X	-	4 (COMBO)
	100Base-FX	-	Compatible
	DI (Digital Input)	1	-
	RS-232 Console Port (RJ-45)	1	1
	Dimension W x D x H	210 x 290 x 44mm	440 x 330 x 44mm
	Operating Temperature (Humidity)	0~50°C (5~90%)	
	Power Source	100~240VAC	
	Power Redundancy	-	Internal Redundancy**
	External Battery Type	-	
	PoE	8 Port af/at/bt	24 Port af/at
	PoE Budget (Max.)	200W	240W/480W
	MAC Address Table	16K	
Non-blocking Switching Fabric	96Gbps	56Gbps	
Memory Buffer	1536K Bytes		
Jumbo Frame	12K Bytes	9K Bytes	
<b>Traffic Management</b>	IPv6	IPv4/IPv6 Dual Stack	
	QoS	802.1p, ToS/DSCP	
	QoS Priority Queue	8	
	Bandwidth Control	●	
	Broadcast Storm Control	●	
	IPTV Multicast	IGMP Snooping v1/v2/v3, MLD Snooping v1/v2	
	Network Redundancy	CTS Fast Ring v2***, STP/RSTP	
	LACP	●	
	VLAN	802.1q, Q-in-Q, Port Based, Selective QinQ, VLAN Translation	802.1q, Q-in-Q, Port Based
	VLAN ID	4094	
VLAN Group	4K	2K	
<b>Security &amp; Authentication</b>	SSHv2	●	
	DHCP Option 82	●	
	Authentication	RADIUS, TACACS+, 802.1x MAB	RADIUS, TACACS+, 802.1x MAB*
	ACL (Access Control List)	●	
<b>Network Management &amp; Maintenance</b>	Management	Telnet, SSHv2, HTTP, HTTPS, SNMP v1/v2c/v3	
	Port Mirroring	●	
	SNMP Power Down Trap	-	
	DHCP	Client, Auto Provisioning, Snooping	
	Sntp	●	
Firmware/Configuration Upgrade	FTP/TFTP/HTTP		
<b>Certifications</b>	EMC/Safety	FCC Class A, CE	

\* Coming soon

\*\* Function available only when the total power consumption is under 240W for EPS-3128-480W(-LP) model

\*\*\* CTS Fast Ring v2 includes Ring and Chain Protocol

### Fiber Managed CPE Switch

Model Name	HES-5106SFP+	HES-3106-SE	HES-3106(B)
			HES-3106-DR
			HES-3106-PLUS(-DR)

Product Image



<b>Hardware</b>	10G SFP+	1	-	-
	1G/2.5G/5G/10GBase-T	1	-	-
	10/100/1000Base-T	4	5	5
	1000Base-X	Compatible	1 (W2A/SFP)	1 (FX/W2X/SFP)
	100Base-FX	-	Compatible	
	Dimension W x D x H	230 x 149 x 31.1mm	180 x 130 x 30mm	
	Operating Temperature (Humidity)	0~40°C (5~90%)	0~50°C (5~90%)	
	Cable Tray	Option (HES-FCT/HES-FCT-S)	Option (HES-FCT-S)	
	Power Source	100V~240VAC to 12 VDC Power Adaptor		
	Optional CATV RF Receiver	-	● (RF model only)	
	External Battery Type, Capacity	-		
	MAC Address Table	16K	4K	2K
	Non-blocking Switching Fabric	48Gbps	12Gbps	
	Memory Buffer	1536K Bytes	192K Bytes	128K Bytes
	Jumbo Frame	9K Bytes		
<b>Traffic Management</b>	IPv6	IPv4/IPv6 Dual Stack		
	QoS	802.1p, ToS/DSCP		
	QoS Priority Queue	8	4	
	Bandwidth Control	●		
	Broadcast Storm Control	●		
	IPTV Multicast	IGMP Snooping v1/v2/v3, MLD Snooping v1/v2		IGMP Snooping v1/v2
	Network Redundancy	-		
	LACP	-		
	VLAN	802.1q, Q-in-Q, Port Based	802.1q, Port Based	802.1q, Q-in-Q, Port Based
	VLAN ID	4094		
VLAN Group	4K	128		
<b>Security &amp; Authentication</b>	SSHv2	●		
	Loop Detection	●		
	Authentication	RADIUS		
	ACL (Access Control List)	●	-	
<b>Network Management &amp; Maintenance</b>	Management	Telnet, SSHv2, WEB, SNMP v1/v2c/v3		
	Port Mirroring	●		
	SNMP Power Down Trap	●		
	DHCP	Client, Auto Provisioning, Snooping	Client, Auto Provisioning	
	SNTP	●		
	Firmware/Configuration Upgrade	FTP/TFTP/HTTP	FTP/TFTP	
<b>Certifications</b>	EMC/Safety	FCC Class B, CE		

### Managed Gateway

Model Name	MRG-3106	FRG-3105SFP-CW-DR
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Product Image



<b>Hardware</b>	WAN Port	1 x 100M/1G/2.5GBase-T	1 x 100/1000Base-X SFP slot (1 x 10/100/1000Base-T combo port)
	LAN Port	1 x 100M/1G/2.5GBase-T 4 x 10/100/1000Base-T	4 x 10/100/1000Base-T
	Dimension W x D x H	180 x 130 x 30mm	180 x 130 x 28.5mm
	Operating Temperature (Humidity)	0~50°C (5~90%)	0~50°C (5~90%)
	Cable Tray	Option (HES-FCT-S)	Option (HES-FCT-S)
	Power Source	100V~240VAC to 12VDC Power Adaptor	
	MAC Address Table	4K	1K
	Jumbo Frame	12K Bytes	9K Bytes
<b>Traffic Management</b>	IPv4 Internet Connection Type	DHCP Client, Static IP, PPPoE, L2TP, PPTP IPv4 over IPv6 with v6Plus (MAP-E) or DS-Lite	DHCP Client, Static IP, PPPoE
	IPv6 Internet Connection Type	Link Local only, Auto Configuration, Static IP, PPPoE	Link Local only, Static IP, DHCP Client, PPPoE, 6in4/6to4/6rd Tunnel
	IPv6	IPv4/IPv6 Dual Stack	IPv4/IPv6 Dual Stack
	NAT/Bridge Hybrid Mode	NAT only	●
	DMZ Host	●	●
	QoS	-	Port Based, 802.1p, ToS/DSCP
	QoS Priority Queue	-	4
	Bandwidth Control	-	●
	IPTV Multicast	IGMP/MLD Snooping, Proxy	IGMP Snooping v1/v2, Proxy, Fast Leave
	VLAN	802.1q	802.1q
	VLAN Group	8	64
<b>Network Management &amp; Maintenance</b>	Management	HTTP, HTTPs	CLI, SSHv2, HTTP, HTTPs, SNMPv1/v2c
	RADIUS	-	●
	Packet & URL Filtering	●	●
	SNMP Power Down Trap	●	●
	DHCP	Server, Client	Server, Client, Auto Provisioning
	SNTP	●	●
	UPnP & DDNS	●	●
	CWMP	-	TR-069*
Firmware/Configuration Upgrade	FTP/TFTP/HTTP	FTP/TFTP/HTTP	
<b>Certifications</b>	EMC/Safety	FCC Class B, CE	FCC Class B, CE

\* Customizations may be required for the interoperability between the ACS server and the device

# MWR-3102-AX54

## Dual-Band Wi-Fi 6 Mesh System



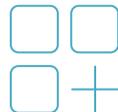
Dual Band



2.5G Ethernet



CWMP



App Support



Mesh System



WPA3



802.11ax

## Product Spec



### Main Chipset

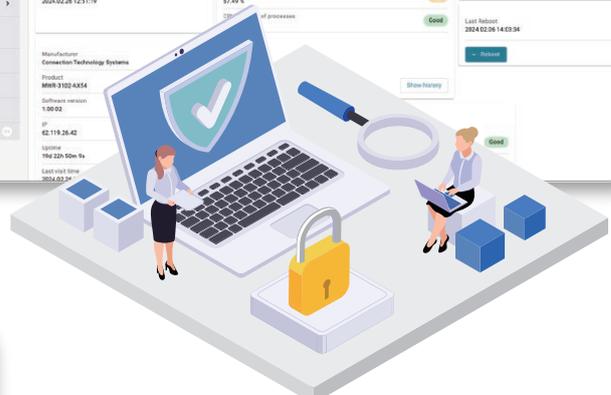
- Brand: Qualcomm
- CPU: Dual Core 1.0Ghz
- Flash: eMMC 4GB
- RAM: 512MB

### Wi-Fi Spec

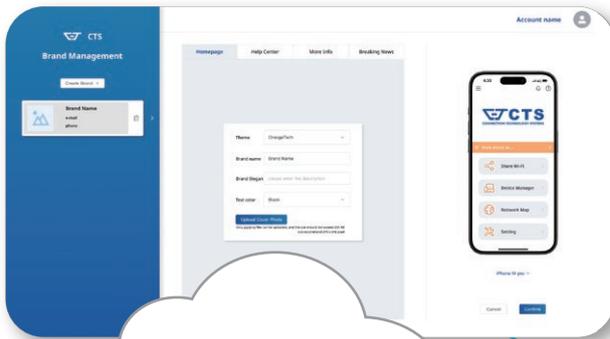
- 5G: Wi-Fi 6 AX4800
  - Antenna: 4 x 4 (DL/UL MU-MIMO) 20/40/80/160Mhz
  - Channel: For EU and UK 5150~5350Mhz for CH 36-64 5470~5725Mhz for CH 100-140
- 2.4G: Wi-Fi 6 AX600
  - Antenna: 2 x 2 (UL MU-MIMO) 20/40Mhz

# System structure

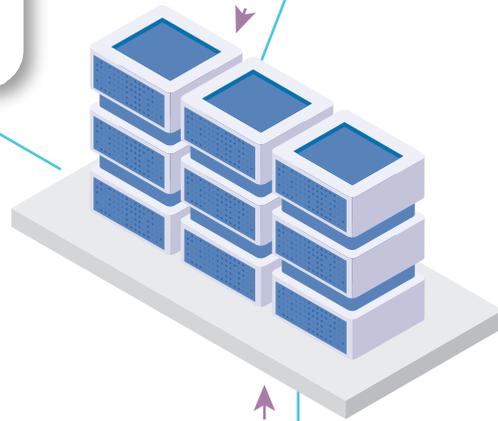
CTS CMS Platform  
Interactive with front-end users APP



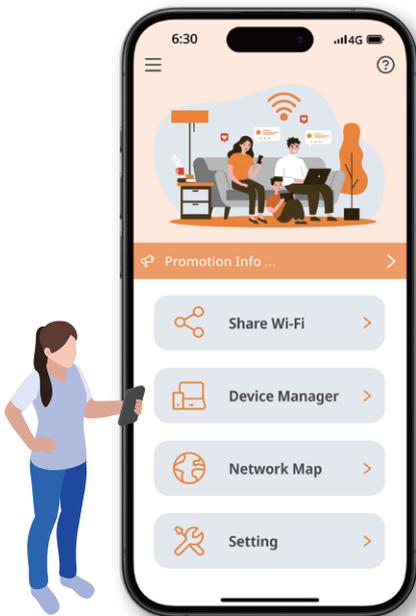
CWMP TR-069/181 ACS Server  
Device Operation Management



Cloud



Broadband  
Operator  
Service Network



Subscriber with CTS APP  
For In-home Wi-Fi Network

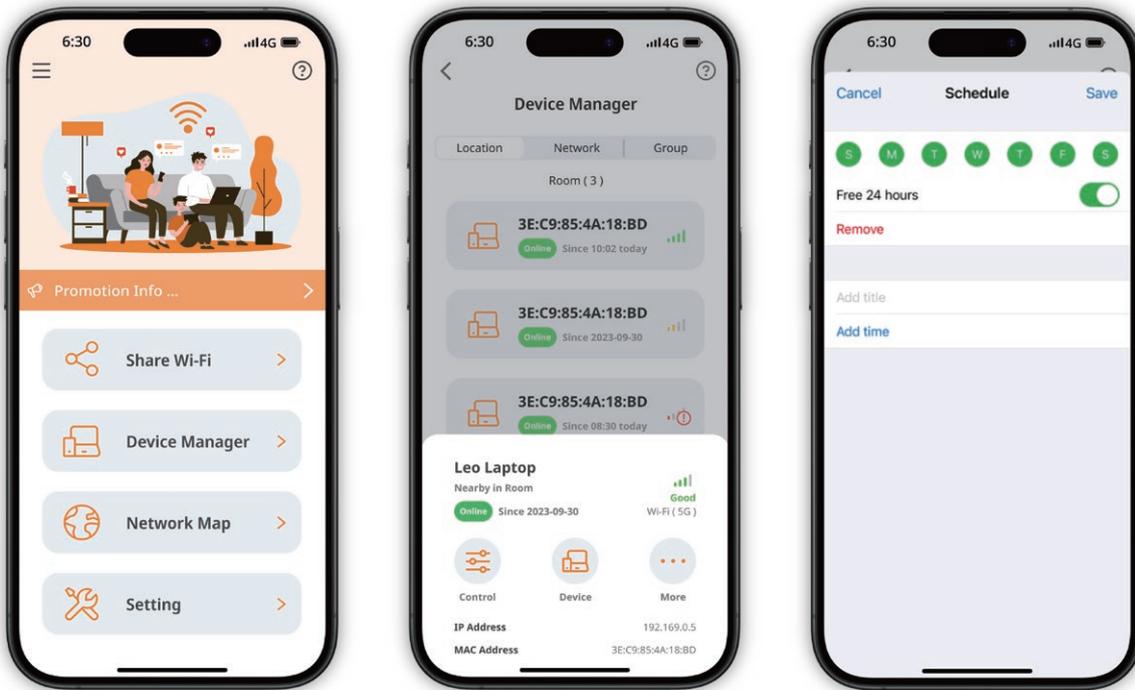


# APP iConNet



iConNet empowers users to effortlessly manage and monitor their Wi-Fi environment with enhanced intuitiveness. The application provides a quick, clean, and intuitive interface for accessing and controlling the MWR-3102 Wi-Fi router, contributing to an enhanced and ultimate user experience.

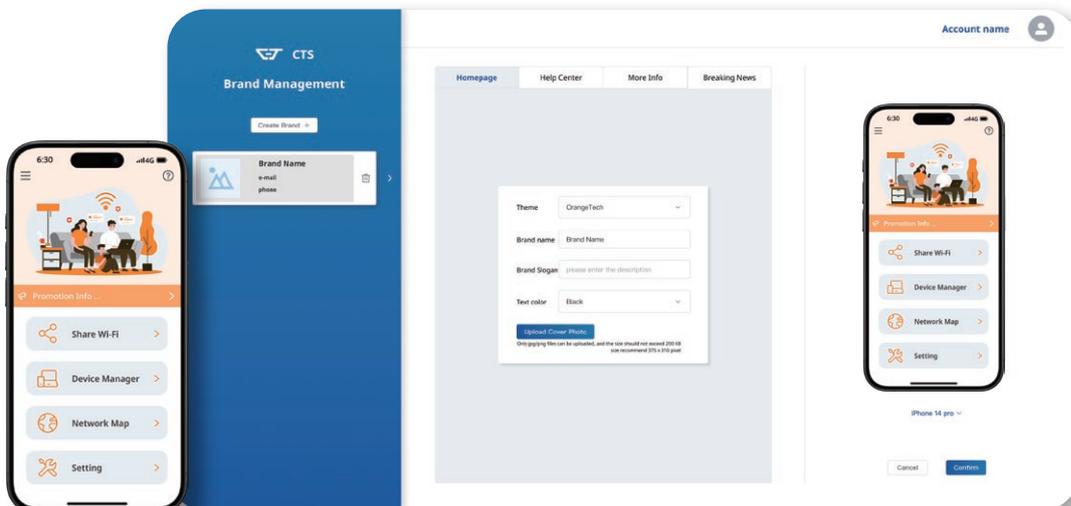
- Easily Onboarding
- Network Management
- Security - Parental control
- TroubleShooting



# CMS platform

A Content Management System (CMS) is a versatile platform equipped with a myriad of features that enable service providers to establish their brand, deliver instant messages, create customized FAQs, provide customer support, and disseminate digital marketing messages, among other functionalities.

- Branding for customize APP
- Dynamic synchronize configuration and status
- Push information or notification to end user



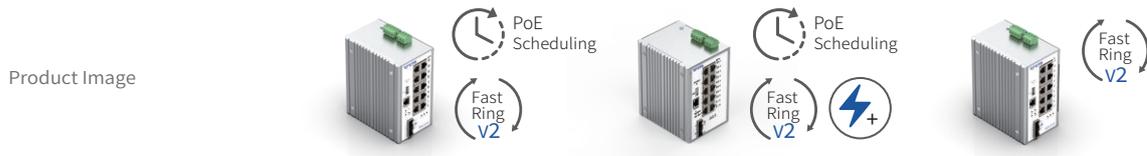
## Industrial Force 60W PoE Managed Switch

Model Name	IPS-3120-PoE++	IPS-3112-PoE++	
Product Image			
Hardware	10/100/1000Base-T	16	8
	10/100Base-TX	-	-
	1000Base-X	4	4
	100Base-FX	Compatible	Compatible
	RS-232 Console Port (RJ-45)	1	1
	Digital Input/Output	1 x DI + 1 x DO	
	PoE	8 x up to Force 60W PoE + 8 x 802.3af/at PoE+	8 x up to Force 60W PoE
	PoE Budget (Max.)	720W	480W
	Power Connector	Terminal Block	
	Power Source	48~54VDC Dual Input	
	Power Consumption	740W	495W
	Dimension W x D x H	115 x 135 x 200mm	80 x 135 x 200mm
	Operating Temperature (Humidity)	-40~75°C (5~90%)	
	MAC Address Table	8K	
	Non-blocking Switching Fabric	40Gbps	24Gbps
	Memory Buffer	4.1M Bytes	
Jumbo Frame	9K Bytes		
Traffic Management	IPv6	-	
	QoS	802.1p, ToS/DSCP	
	QoS Priority Queue	8	
	Bandwidth Control	-	
	Broadcast Storm Control	-	
	IPTV Multicast	IGMP Snooping v1/v2/v3	
	Network Redundancy	CTS Fast Ring v2*, STP/RSTP	
	LACP	●	
	VLAN	802.1q, Q-in-Q, Port Based	
	VLAN ID	4094	
VLAN Group	2K		
Security & Authentication	SSHv2	●	
	DHCP Option 82	-	
	Authentication	RADIUS, 802.1x MAB	
	ACL (Access Control List)	●	
Network Management & Maintenance	Management	Telnet, CLI, WEB, SNMP v1/v2c/v3	
	Port Mirroring	-	
	SNMP Power Down Trap	-	
	DHCP	Client, Auto Provisioning	
	SNTP	●	
	Firmware/Configuration Upgrade	FTP/TFTP/HTTP	
Certifications	EMC/Safety	FCC Class A, CE	
	Stability	IEC 60068-2-27 (Shock), IEC 60068-2-32 (Freefall), IEC 60068-2-6 (Vibration)	
	Surge	ITU-T K.21 Enhanced Level 6KV	

\* CTS Fast Ring v2 includes Ring and Chain Protocol

### Industrial 10-port Managed Switch

Model Name	IPS-3110	IPS-3110-PB	IES-3110
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<b>Hardware</b>	10/100/1000Base-T	10	10	10
	10/100Base-TX	-	-	-
	1000Base-X	2 (COMBO)	2 (COMBO)	2 (COMBO)
	100Base-FX	Compatible	Compatible	Compatible
	RS-232 Console Port (RJ-45)	1	1	1
	Digital Input/Output	1 x DO		
	PoE	8 x 802.3af/at PoE+		-
	PoE Budget (Max.)	240W		-
	Power Connector	Terminal Block		
	Power Source	48-54VDC Dual Input	24-54VDC Dual Input	12-54VDC Dual Input
	Power Consumption	255W		15W
	Dimension W x D x H	73 x 110 x 135mm	88 x 110 x 135mm	73 x 110 x 135mm
	Operating Temperature (Humidity)	-40~75°C (5~90%)		
	MAC Address Table	16K		
	Non-blocking Switching Fabric	20Gbps		
	Memory Buffer	256K Bytes		
	Jumbo Frame	9K Bytes		
<b>Traffic Management</b>	IPv6	-		
	QoS	802.1p, ToS/DSCP		
	QoS Priority Queue	8		
	Bandwidth Control	●		
	Broadcast Storm Control	●		
	IPTV Multicast	IGMP Snooping v1/v2		
	Network Redundancy	CTS Fast Ring v2*, STP/RSTP		
	LACP	●		
	VLAN	802.1q, Q-in-Q, Port Based		
	VLAN ID	4094		
VLAN Group	128			
<b>Security &amp; Authentication</b>	SSHv2	●		
	DHCP Option 82	-		
	Authentication	RADIUS, 802.1x		
	ACL (Access Control List)	●		
<b>Network Management &amp; Maintenance</b>	Management	Telnet, CLI, WEB, SNMP v1/v2c/v3		
	Port Mirroring	●		
	SNMP Power Down Trap	-	●	
	DHCP	Client, Auto Provisioning, Snooping		
	SNTP	●		
	Firmware/Configuration Upgrade	FTP/TFTP/HTTP/USB 2.0 Type A		
<b>Certifications</b>	EMC/Safety	FCC Class A, CE		
	Stability	IEC 60068-2-27 (Shock), IEC 60068-2-32 (Freefall), IEC 60068-2-6 (Vibration)		
	Surge	ITU-T K.21 Enhanced Level 6KV		

\* CTS Fast Ring v2 includes Ring and Chain Protocol

## Industrial 6-port Managed Switch

Model Name		IPS-3106-SE-PB	IPS-3106-SE
Product Image		  PoE Scheduling  Fast Ring v2 	  PoE Scheduling  Fast Ring v2
Hardware	10/100/1000Base-T	4	4
	10/100Base-TX	-	-
	1000Base-X	2	2
	100Base-FX	Compatible	Compatible
	RS-232 Console Port (RJ-45)	1	1
	Digital Input/Output	1 x DI + 1 x DO	
	PoE	4 x 802.3af/at PoE+	
	PoE Budget (Max.)	120W	
	Power Connector	Terminal Block	
	Power Source	24~54VDC Dual Input	48~54VDC Dual Input
	Power Consumption	135W	
	Dimension W x D x H	63 x 110 x 135mm	57 x 110 x 135mm
	Operating Temperature (Humidity)	-40~75°C (5~90%)	
	MAC Address Table	8K	
	Non-blocking Switching Fabric	12Gbps	
Memory Buffer	4.1M Bytes		
Jumbo Frame	9K Bytes		
Traffic Management	IPv6	●	
	QoS	802.1p, ToS/DSCP	
	QoS Priority Queue	8	
	Bandwidth Control	●	
	Broadcast Storm Control	●	
	IPTV Multicast	IGMP Snooping v1/v2/v3 MLD Snooping v1/v2	
	Network Redundancy	CTS Fast Ring v2*, STP/RSTP	
	LACP	●	
	VLAN	802.1q, Q-in-Q, Port Based	
	VLAN ID	4094	
VLAN Group	2K		
Security & Authentication	SSHv2	●	
	DHCP Option 82	●	
	Authentication	RADIUS, TACACS+, 802.1x MAB	
	ACL (Access Control List)	●	
Network Management & Maintenance	Management	Telnet, CLI, WEB, SNMP v1/v2c/v3	
	Port Mirroring	●	
	SNMP Power Down Trap	-	
	DHCP	Client, Auto Provisioning, Snooping	
	SNTP	●	
	Firmware/Configuration Upgrade	FTP/TFTP/HTTP	
Certifications	EMC/Safety	FCC Class A, CE	
	Stability	IEC 60068-2-27 (Shock), IEC 60068-2-32 (Freefall), IEC 60068-2-6 (Vibration)	
	Surge	ITU-T K.21 Enhanced Level 6KV	

\* CTS Fast Ring v2 includes Ring and Chain Protocol

### 10G Ethernet SFP+ Transceiver

Product Image



MODEL	SFP-51					
	Speed (Gbps)	Type	Connector	Distance	Wavelength (nm)	Temperature
SFP-51FC	10	MM	LC	300M	850	0~70°C
SFP-51FC(SM-02/10/20/40)	10	SM	LC	2/10/20/40KM	1310/1310/1310/1550	0~70°C
SFP-51W2A(SM-10/20/40)	10	WDM	LC	10/20/40KM	TX:1270/1270/1270 RX:1330/1330/1330	0~70°C
SFP-51W2B(SM-10/20/40)	10	WDM	LC	10/20/40KM	TX:1330/1330/1330 RX:1270/1270/1270	0~70°C

### Gigabit Ethernet SFP Transceiver

Product Image



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

Product Image



MODEL	SFP-31					
	Speed (Mbps)	Type	Connector	Distance	Wavelength (nm)	Temperature
SFP-31FC	1000	MM	LC	550M	850	0~70°C
SFP-31FC(SM-10/20/40)	1000	SM	LC	10/20/40KM	1310/1310/1310	0~70°C
SFP-31W2A(SM-10/20/40)	1000	WDM	LC	10/20/40KM	TX:1310/1310/1310 RX:1550/1550/1550	0~70°C
SFP-31W2B(SM-10/20/40)	1000	WDM	LC	10/20/40KM	TX:1550/1550/1550 RX:1310/1310/1310	0~70°C

### Copper Ethernet SFP Transceiver

Product Image



MODEL	SFP-50/30TP					
	Speed (Gbps)	Type	Connector	Distance	Wavelength (nm)	Temperature
SFP-50TP-MG(30M)	1/2.5/5/10	-	RJ-45	30M	-	0~65°C
SFP-30TP	1	-	RJ-45	100M	-	0~70°C

### Industrial 10G Ethernet SFP+ Transceiver

Product Image



MODEL	SFP-51-D					
	Speed (Gbps)	Type	Connector	Distance	Wavelength (nm)	Temperature
SFP-51FC(SM-02)-D	10	SM	LC	2KM	1310	-40~85°C

### Industrial Gigabit Ethernet SFP Transceiver

Product Image



MODEL	SFP-31-D					
	Speed (Mbps)	Type	Connector	Distance	Wavelength (nm)	Temperature
SFP-31FC-D	1000	MM	LC	550M	850	-40~85°C
SFP-31FC(MM-02)-D	1000	MM	LC	2KM	1310	-40~85°C
SFP-31FC(SM-10/20)-D	1000	SM	LC	10/20KM	1310/1310	-40~85°C
SFP-31W2A(SM-10/20)-D	1000	WDM	LC	10/20KM	TX:1310/1310 RX:1550/1550	-40~85°C
SFP-31W2B(SM-10/20)-D	1000	WDM	LC	10/20KM	TX:1550/1550 RX:1310/1310	-40~85°C

### Lightning Protector

Product Image



MODEL	LPB-101						
	Copper Port				Temperature	Dimension W x D x H	Note
	Speed (Mbps)	Type	Input Port	Output Port			
LPB-101G-P	10/100/1000	RJ-45 w/ PoE	1	1	0~50°C	70 x 25 x 25mm	It is necessary to be grounding properly when implementing.
LPB-101G	10/100/1000	RJ-45	1	1	0~50°C	70 x 25 x 25mm	

### External Battery Unit

Product Image



MODEL	EBU-120						
	DC Input	External Battery (Recommended Spec.)		Charging/Backup (for reference)		Temperature	Dimension W x D x H
	Voltage	Type	Capacity	Charging Time	Backup Time		
EBU-120	12V	VRLA	12V/2.3Ah	7hrs	2.2hrs (for HES-3109SSFP)	0~50°C	124 x 70 x 30mm

### Power Supply

Product Image



MODEL	Output			Input	Protection	Temperature	Dimension W x D x H
	Rated Power	Voltage Adj. Range*	Current Range	Voltage Range			
SDR-480-48	480W	48~55V	0~10A	90~264VAC 127~370VDC	Overload, Over Voltage, Over Temperature	-25~70°C	85.5 x 128.5 x 125.2mm
SDR-240-48	240W		0~5A	88~264VAC 124~370VDC			63 x 113.5 x 125.2mm
SDR-120-48	120W		0~2.5A			-30~70°C	40 x 113.5 x 125.2mm
SDR-75-48	76.8W		0~1.6A			32 x 102 x 125.2mm	
NDR-480-48	480W	48~55V	0~10A	90~264VAC 127~370VDC	Overload, Over Voltage, Over Temperature	-20~70°C	85.5 x 128.5 x 125.2mm
NDR-240-48	240W		0~5A				63 x 113.5 x 125.2mm
NDR-120-48	120W		0~2.5A			40 x 113.5 x 125.2mm	
NDR-75-48	76.8W		0~1.6A			32 x 102 x 125.2mm	
MDR-60-48	60W	48~56V	0~1.25A	85~264VAC 120~370VDC	Overload, Over Voltage	-20~70°C	40 x 100 x 90mm
MDR-20-12	20W	10.8~13.2V	0~1.67A			-20~70°C	22.5 x 100 x 90mm

\* Output Voltage Tolerance: ± 1.0%

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