

Preliminary



## ICS-24S4XM

Industrial 24x100/1000Base-X SFP with 4x Combo, and 4x 10GbE SFP+ Core Switch

## ICS-24S2XM

Industrial 24x100/1000Base-X SFP with 4x Combo, and 2x 10GbE SFP+ Core Switch

ICS-24S4XM及ICS-24S2XM為配備24個千兆SFP端口及4個Combo端口，外加2個或4個10G SFP+端口的乙太網核心交換器。此系列機型皆為無風扇並配備備援隔離式電源供應器(2組交流電、2組隔離式直流電，或交流電 + 隔離式直流電)，可裝設於19吋的標準機架中。它們不僅能提供各種不同的第2層管理功能(IGMP、VLAN、QoS、安全性、IPv6、頻寬控制、端口鏡射、纜線診斷和節能乙太網)，也支援u-Ring 備援環網，u-Ring 最多可建立14個備援環網以供彈性應用，尤其適合應用在骨幹基礎架構中。此系列交換器也可使用CTC Union的SmartView™ Element Management System來進行集中式便利管理，並提供SmartConfig™輔助進行大量設備的方便及快速設定。

此系列產品位於堅固的裝設機箱內，並符合多項工業級標準，極為適合部署在嚴苛的環境中，以執行關鍵任務的網路服務，是適合核心層或骨幹應用的解決方案，同時具備可靠性及可擴充性。

### 功能特色

- 24 個 100/1000Base-X SFP 及 4 個 Combo (SFP+RJ-45) 和 4 個 10GBase-X SFP+ (ICS-24S4XM)
- 24 個 100/1000Base-X SFP 及 4 個 Combo (SFP+RJ-45) 和 2 個 10GBase-X SFP+ (ICS-24S2XM)
- 通過 UL60950-1、CE、FCC、鐵道交通 EN50121-4 認證
- 隔離式 DC 電壓 24/48VDC 冗餘備援，或 / 和 AC 電源輸入 (110/220 VAC)
- 通過工業級 EMS (抗電磁干擾)，EMI (電磁波干擾)，EN61000-6-2, EN61000-6-4 認證
- 支援網路線斷線診斷，可以診斷網路線故障點，定位線纜的故障點距離
- 支援 Green Ethernet IEEE802.3az (Energy Efficient Ethernet) Management，優化電源消耗
- STP、RSTP、MSTP、ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for redundant cabling
- 每台設備可支援 u-Ring，u-Chain 或 Sub-Ring 型態的環網 (圖 3)，一台設備最多可設 14 個環網 (圖 1)
- u-Ring 冗餘乙太網環網，在最多 250 個裝置時，恢復時間 <10ms
- DHCP client/Relay/Snooping/Snooping option 82/Relay option 82
- QoS、Traffic classification QoS、CoS、bandwidth control for Ingress and Egress、Storm Control、DiffServ
- IEEE802.1q VLAN、MAC based VLAN、IP subnet based VLAN、Protocol based VLAN、VLAN translation、GVRP、MVR
- Dynamic IEEE 802.3ad LACP Link Aggregation、Static Link Aggregation
- IGMP snooping V1/V2/V3、IGMP Filtering/ Throttling、IGMP query、IGMP proxy reporting、MLD snooping V1/V2
- 安全管制功能：Port based 和 MAC based IEEE802.1X、RADIUS、ACL、TACACS+、HTTP/HTTPS、SSL/SSH v2
- 支援透過 TFTP 和 HTTP 進行軟體升級，韌體冗餘備份防止升級失敗
- 支援 IEEE1588 PTP V2 精密時間同步
- 支援 RMON、MIB II、Private MIB、Port mirroring、Event syslog、DNS、NTP/SNTP、IEEE802.1ab LLDP
- 支援 IPv6 Telnet server/ICMP v6
- 支援 CLI, Web based management、SNMP v1/v2c/v3、Telnet server 管理方式
- 支援 SmartConfig™，提供快速且便利的設定工具，以方便於設定大量的設備
- 支援 SmartView™ 集中式的管理系統

### 產品規格

符合標準	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE802.3ae	10 Gbit/s Ethernet over fiber
	IEEE 802.1d	STP (Spanning Tree Protocol)
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol)
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)
	IEEE 802.1Q	Virtual LANs (VLAN)
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication
	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)
	IEEE 802.3x	Flow control for Full Duplex
	IEEE 802.1ad	Stacked VLANs, Q-in-Q
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)
	IEEE 802.3az	EEE (Energy Efficient Ethernet)
VLAN ID	4094	IEEE802.1Q VLAN VID

交換架構	Back-plane (Switching Fabric): 128Gbps (ICS-24S4XM) 88Gbps (ICS-24S2XM)
Data Processing	Store and Forward
Flow Control	IEEE 802.3x 全雙工模式 Back pressure for 半雙工模式
網路連接器	24個 100/1000Base-X SFP 和 4個 GbE Combo (UTP/SFP)+ 4個10GBase-X SFP+ (ICS-24S4XM) 24個100/1000Base-X SFP和4個GbE Combo (UTP/SFP)+ 2個10GBase-X SFP+ (ICS-24S2XM) RJ-45 UTP 端口，支援 10/100/1000Base-T(X)，Auto negotiation speed,自動MDI/MDI-X 功能 GbE port SFP 支援雙速度 (100M/1000M) with DDMI 10GbE port SFP+ 支援雙速度 (1000M/10G) with DDMI
Console	RS-232 (RJ-45)
網路線規格	UTP/STP above Cat. 5e cable EIA/TIA-568 100-ohm (100m)
通訊協議	CSMA/CD
電壓極性保護	提供
電流過載保護	提供
CPU Watch Dog	提供
電源輸入	配備2個隔離式DC輸入冗餘備援電源 (-LL model) 配備1個隔離式DC輸入及1個AC輸入 冗餘備援電源 (-HL model) 配備2個AC輸入冗餘備援電源(-HH model) 隔離式 DC 輸入: 隔離式24/48V (18~60VDC), 可拔插式配接器 AC 輸入: 110/240VAC (88VAC~264VAC)
耗電量	TBD

LED指示燈	Power 1 (綠), Power 2 (綠), Act /Fault (綠/紅), Ring Master (綠) 每RJ-45端口: 10/100 Link/Active(綠), 1000 Link/Active(黃) SFP (P1~P24) 每光纖端口: 100Base-X Link/Active (綠), 1000Base-X Link/Active (黃) SFP+ (P25~P28) 每光纖端口: 1000Base-X Link/Active (琥珀色), 10GBase-X Link/Active (藍)
Jumbo Frame	10K
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
告警訊息	System Syslog, SMTP/ e-mail event message, alarm relay
告警繼電器規格	Relay outputs with current carrying capacity of 1 A @24VDC, 2Pin 可插拔式配接器
工作溫度	-10 ~ 60°C
工作濕度	5% to 95% (無冷凝)
儲存溫度	-40 ~ 85°C
外殼	金屬外殼, IP30防護, 無風扇
尺寸	315 x 440 x 44 mm (D x W x H)
重量	TBD
安裝方式	19" rack mount
MTBF	TBD
產品保固	5年

## 軟體規格

<b>Topology</b>	
VLAN	IEEE 802.1q VLAN, up to 4094 802.1Q VLAN VID IEEE 802.1q VLAN, up to 4094 Groups IEEE 802.1ad Q-in-Q MAC-based VLAN, up to 256 entries IP Subnet-based VLAN, up to 128 entries Protocol-based VLAN(Ethernet, SNAP, LLC), up to 128 entries VLAN Translation, up to 256 entries GVRP (GARP VLAN Registration Protocol) MVR ( Multicast VLAN Registration)
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), up to 5 trunk group Dynamic (IEEE 802.3ad LACP), up to 5 trunk group
Spanning Tree	IEEE802.1d STP IEEE802.1w RSTP IEEE802.1s MSTP
Multiple u-Ring	每台設備可支援u-Ring, u-Chain 或Sub-Ring 型態的環網, 一台設備最多可設14 個環網 u-Ring 冗餘以太網環網, 在最多 250 個裝置時,恢復時間 <10ms
Loop Protection	提供
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	恢復時間<50ms Single Ring, Sub-Ring, Multiple ring topology network
<b>QoS特色</b>	
Class of Service	IEEE802.1p 8 active priorities queues for per port
Traffic Classification	IEEE802.1p based CoS
QoS	IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps 單位 : bit or frame
Bandwidth Control for Egress	Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps 單位 : bit Per queue / Per port shaper
DiffServ (RF 2474)	Remarking
Storm Control	for Unicast, Broadcast, Multicast
<b>IP多點特色</b>	
IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2 Port Filtering Profile Throttling, Fast Leave Maximum Multicast Group : up to 1022 entries Query / Static Router Port

<b>認證</b>	
EMC	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE EN55022 Class A
軌道交通	EN50121-4
重工業環境 抗電磁干擾	EN61000-6-2
重工業環境 電磁輻射干擾	EN61000-6-4
EMS (Electromagnetic Susceptibility) 抗電磁干擾等級	EN61000-4-2 (ESD) Level 3, Criteria B EN61000-4-3 (RS) Level 3, Criteria A EN61000-4-4 (Burst) Level 3, Criteria A EN61000-4-5 (Surge) Level 3, Criteria B EN61000-4-6 (CS) Level 3, Criteria A EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	UL60950-1
防撞擊	IEC 60068-2-27
防摔	IEC 60068-2-32
防震	IEC 60068-2-6

<b>安全性</b>	
IEEE 802.1X	Port-Based MAC-Based
ACL	Number of rules : up to 256 entries for L2 / L3 / L4
RADIUS authentication & accounting TACACS+ authentication & accounting, TACACS+ 3.0 HTTPS, HTTP SSL / SSH v2	
User Name	Local Authentication
Password	Remote Authentication(透過 RADIUS / TACACS+)
Authentication	Management
Interface Access	Web, Telnet / SSH , CLI RS-232 console
Filtering	
<b>網管特色</b>	
CLI	Cisco® like CLI
<b>Web Based Management</b>	
Telnet	Server
SNMP	V1, V2c, V3
SW & Configuration Upgrade	TFTP, HTTP 有備援韌體以防程式升級失敗
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
DHCP	Client, Relay, Snooping Snooping option 82 Relay option 82
IP Source Guard	
Port Mirroring	
Event Syslog	Syslog server (RFC3164) (Support 1 server )
告警訊息	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Master, Boundary, Slave Operating mode Operating in each port of these switch
NTP / SNTP	
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol LLDP-MED
<b>IPv6特色</b>	
IPv6 管理	Telnet Server/ICMP v6
SNMP over IPv6	
HTTP over IPv6	
SSH over IPv6	
IPv6 Telnet Support	
IPv6 NTP / SNTP Support	
IPv6 TFTP Support	
IPv6 QoS	
IPv6 ACL	Number of rules: up to 256 entries L2 / L3 / L4

應用圖

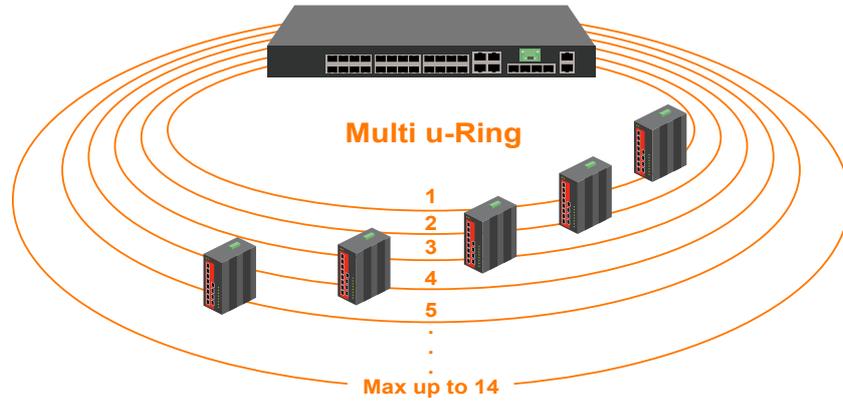


圖1：Multiple u-Ring

u-Ring Configuration Auto-refresh  Refresh

Delete	Instance	Type	Master	East		West	
				Port	Edge	Port	Edge
Delete	1	u-Ring	<input type="checkbox"/>	1		2	
Delete	2	u-Ring	<input type="checkbox"/>	4		3	
Delete	3	u-Ring	<input type="checkbox"/>	10		11	
⋮							
Delete	12	u-Chain	<input type="checkbox"/>	16	<input type="checkbox"/>	9	<input type="checkbox"/>
Delete	13	Sub-Ring	<input type="checkbox"/>	21			
Delete	14	u-Ring	<input type="checkbox"/>	28		8	

圖2：方便又容易設定的 u-Ring 功能設定Web 畫面

圖3：u-Ring類型

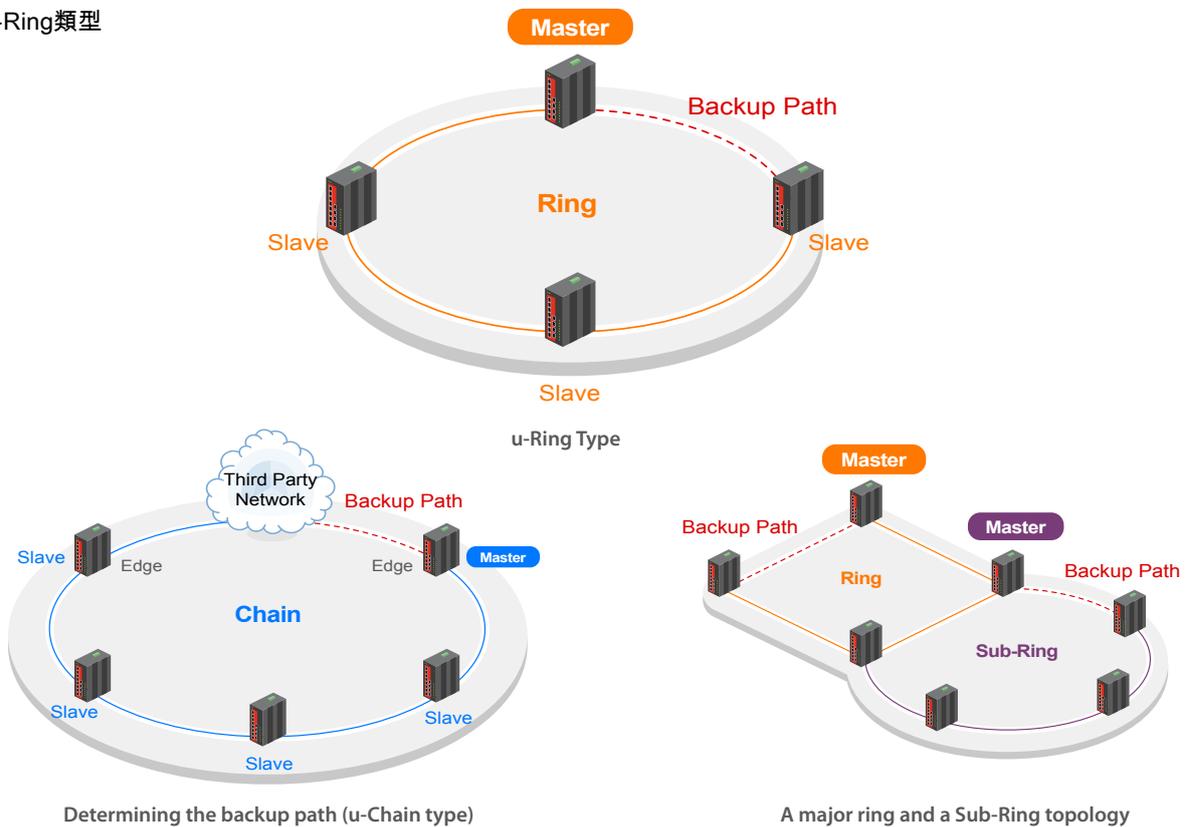
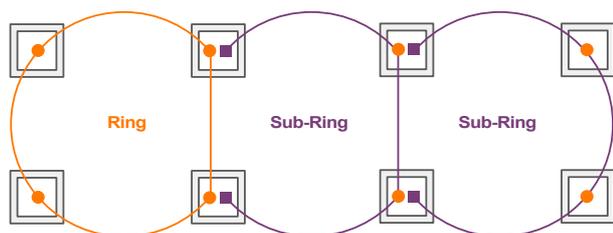
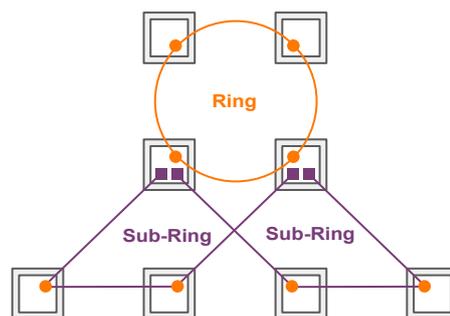


圖4：Ring 配置範例

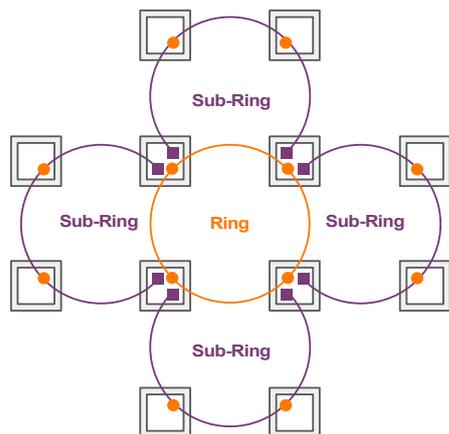
● u-Ring  
■ Sub-Ring



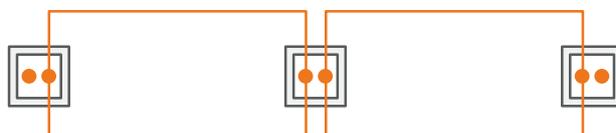
Ring Configuration Type



Combination of a ring and two Sub-Ring



Combination of a ring and four Sub-Ring

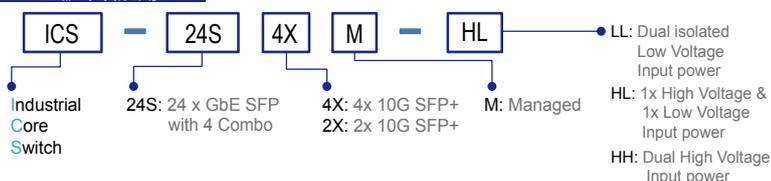


Cable Redundancy

## 訂購資訊

型號	管理	總埠數	GbE Port		10GbE	輸入電壓		認證			
			100/1000 Base-X SFP	10/100/1000 Base-T UTP or 100/1000Base-X SFP		IEEE 802.3ae SFP+	DC (Low Volt) isolated 24/48VDC	AC (High Volt) 110/240V AC	安全 UL60950-1	鐵道交通 EN50121-4	EN61000-6-2 EN61000-6-4
ICS-24S4XM-HH	V	28	20	4 Combo	4		2	V	V	V	V
ICS-24S4XM-HL	V	28	20	4 Combo	4	1	1	V	V	V	V
ICS-24S4XM-LL	V	28	20	4 Combo	4	2		V	V	V	V
ICS-24S2XM-HH	V	26	20	4 Combo	2		2	V	V	V	V
ICS-24S2XM-HL	V	26	20	4 Combo	2	1	1	V	V	V	V
ICS-24S2XM-LL	V	26	20	4 Combo	2	2		V	V	V	V

### 型號命名規則



### 選購配件

DR-120-24	Industrial Power, Input 88 ~ 132VAC / 176 ~ 264VAC, Output 24VDC, 120W, -10 ~ +60°C
DRP-240-48	Industrial Power, Input 85 ~ 264VAC, Output 48VDC, 240W, -10 ~ +70°C