IFS-402GSM
4x 10/100Base-TX+ 2x 100/1000Base-X SFP

IFS-803GSM
8x 10/100Base-TX+ 3x 100/1000Base-X SFP

IFS-1604GSM
16x 10/100Base-TX+ 4x 100/1000Base-X SFP

此系列產品是工業級網管型百兆乙太網交換器，具有4~16個10/100Base-TX電口和2~4個SFP千兆/百兆光口，提供穩定可靠的乙太網路傳輸。此系列交換器也支援多種管理功能，其中包括STP/ RSTP / MSTP和ITU-T G.8032及Multiple u-Ring 冗餘環網、L2 Ethernet IGMP、VLAN、QoS、Security、IPv6、bandwidth control、Port mirroring、電纜診斷和綠色節能乙太網。內建雙電源的設計，讓此系列產品可為了始終保持連線的特殊應用提供冗餘備援電源機制。此系列產品同時也能達到標準工作溫度範圍（-10～60℃）及寬工作溫度範圍（-40～75℃）以滿足工業自動化特殊應用的需求。搭配堅固的Din Rail軌道式或壁掛安裝外殼。此產品專為惡劣環境、如工業網路、安全自動化應用、交通監控及智能交通系統（ITS），也適用於許多環境條件超出一般商規產品規格的軍事和公用事業的市場應用中。此外，此系列交換器也可搭配CTC管理平台SmartView™使用，以提供網管人員更加便利、即時且集中式的網路管理。

功能特色

- 提供 4 個 10/100Base-TX RJ-45 電 口 + 2 個 100/1000Base-X SFP 光口 (IFS-402GSM)
- 提供 8 個 10/100Base-TX RJ-45 電 口 + 3 個 100/1000Base-X SFP 光口 (IFS-803GSM)
- 提供 16 個 10/100Base-TX RJ-45 電 口 + 4 個 100/1000Base-X SFP 光口 (IFS-1604GSM)
- 雙電源輸入 12/24/48VDC (9.6~60VDC) 冗餘備援
- 通過 UL60950-1，CE, FCC，鐵道交通 EN50121-4 認證
- 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
- 支援綠色節能乙太網 IEEE802.3az EEE (Energy Efficient Ethernet) Management，優化電源消耗
- 支 援 STP，RSTP，MSTP，ITU-T G.8032 Ethernet Ring Protection Switch (ERPS)
- 每台設備可支援 u-Ring，u-Chain 或 Sub-Ring 型態的環網 (圖四)，最多可設 5 個環網 (圖二)
- u-Ring 冗餘乙太網環網，在最多 250 個裝置時，恢復時間 <10ms
- 支 援 DHCP client/Relay/Snooping/Snooping option 82/Relay option 82
- 支援 QoS，Traffic classification QoS，CoS，bandwidth control for Ingress and Egress，Storm Control，DiffServ
- 支援 IEEE802.1q VLAN, Mac based VLAN，IP subnet based VLAN，Protocol based VLAN，VLAN translation，GVRP，MVR
- 支援動態 IEEE 802.3ad LACP Link Aggregation，Static Link Aggregation
- 支援 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，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，以利於設定大量的設備
- 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 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic
	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): 4.8Gbps (IFS-402GSM) 7.6Gbps (IFS-803GSM) 11.2Gbps (IFS-1604GSM)	
Data Processing	Store and Forward	

Flow Control	IEEE 802.3x (全雙工), Back pressure (半雙工)
網路連接器	4x 10/100Base-TX RJ-45 and 2x 100/1000Base-X SFP Fiber connector (IFS-402GSM) 8x 10/100Base-TX RJ-45 and 3x 100/1000Base-X SFP Fiber connector (IFS-803GSM) 16x 10/100Base-TX RJ-45 and 4x 100/1000Base-X SFP Fiber connector (IFS-1604GSM) RJ-45 UTP端口支援Auto negotiation功能、自動MDI/MDI-X等功能，SFP端口使用DDMI支援雙速100/1000M
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
電源供應	雙電源輸入12/24/48VDC (9.6~60VDC) 冗餘備援 (可拔插式配接器)

耗電量	輸入電壓	IFS-402GSM	IFS-803GSM	IFS-1604GSM
	12VDC	5.7W	6.5W	10.8W
	24VDC	5.8W	7W	10.6W
	48VDC	8.5W	8.6W	12.5W

LED指示燈	Power 1 (綠), Power 2 (綠), Fault (琥珀色) CPU Act(綠) Ring Master (黃) RJ-45 連接埠 :10/100 Link/Active(綠) SFP光端口 Link/Active(綠)

Jumbo Frame	9.6KB
MAC Address Table	8K
Memory Buffer	256K 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
可插拔式配接器	Provide 2 redundant power, alarm relay contact, 6 Pin
工作溫度	-10 ~ 60°C (IFS-402GSM, IFS-803GSM, IFS-1604GSM) -40 ~ 75°C (IFS-402GSM-E, IFS-803GSM-E, IFS-1604GSM-E)
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	106 x 62.5 x 135 mm (D x W x H) (IFS-402GSM) 106 x 72 x152 mm (D x W x H) (IFS-803GSM, IFS-1604GSM)
重量	0.715公斤(IFS-402GSM) 0.79公斤(IFS-803GSM) 0.82公斤 (IFS-1604GSM)
安裝方式	Din Rail 軌道式安裝或壁掛式
MTBF	321,556Hrs (IFS-402GSM) 409,312Hrs (IFS-803GSM) 145,967Hrs (IFS-1604GSM)

產品保固	5 年
認證	
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

軟體規格

拓撲

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 (Ethernt, 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	up to 5 instances that each supports u-Ring, u-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings. 恢復時間 <10ms 每個環最多可達250個設備
Loop Protection	提供
ITU-T G.8032 / Y.1344 ERPS (乙太網環保護)	恢復時間 <50ms Single Ring, Sub-Ring, Multiple ring topology network

QoS特色

Class of Service	IEEE802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE802.1p based CoS 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

IP Multicasting 特色

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

安全性

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 Password Authentication	Local Authentication Remote Authentication (透過 RADIUS / TACACS+)
Management Interface Access Filtering	Web, Telnet / SSH , CLI RS-232 console

Management特色

CLI	Cisco® like CLI
Web Based Management	
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)
Warning Message	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

IPv6特色

IPv6 Management	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

Specifications & design are subject to change without prior notice. Please visit CTC Union website for more details.

IFS-402GSM, IFS-803GSM, & IFS-1604GSM

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其他特色	
Green Ethernet	支援IEEE802.3az EEE (Energy Efficient Ethernet) 優化電源消耗
	依照網路線長短，自動調節功耗，以節省短線時的耗電

Green Ethernet	網路埠無連接時，自動降低輸出功耗
	LED 功率管理 :調節LED
Cable Diagnostic	偵測網路線的故障點距離

應用圖
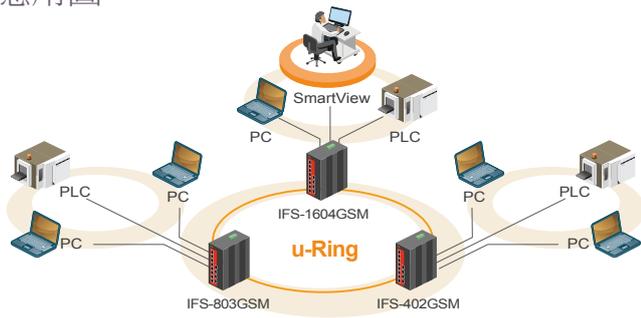
圖1：(應用案例)

圖2：Multiple Rings

- 最多可達5 個環
- 每個環最多可達250個設備

圖3：(方便又容易設定的 u-Ring 功能設定Web 畫面)

圖4：u-Ring Type

u-Ring Type

Determining the backup path (u-Chain type)

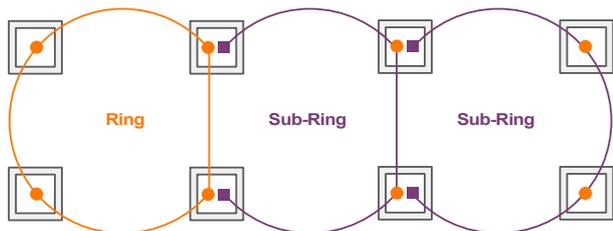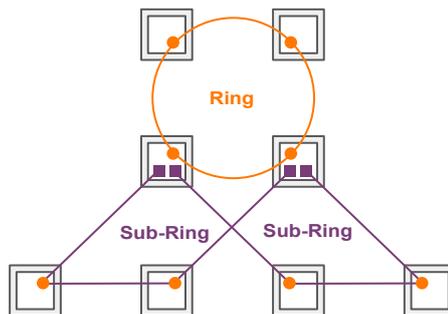A major ring and a Sub-Ring topology

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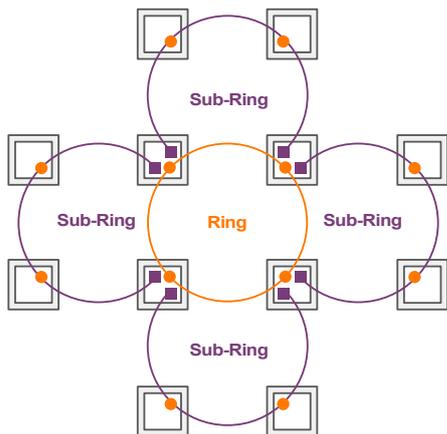sales@ctcu.com
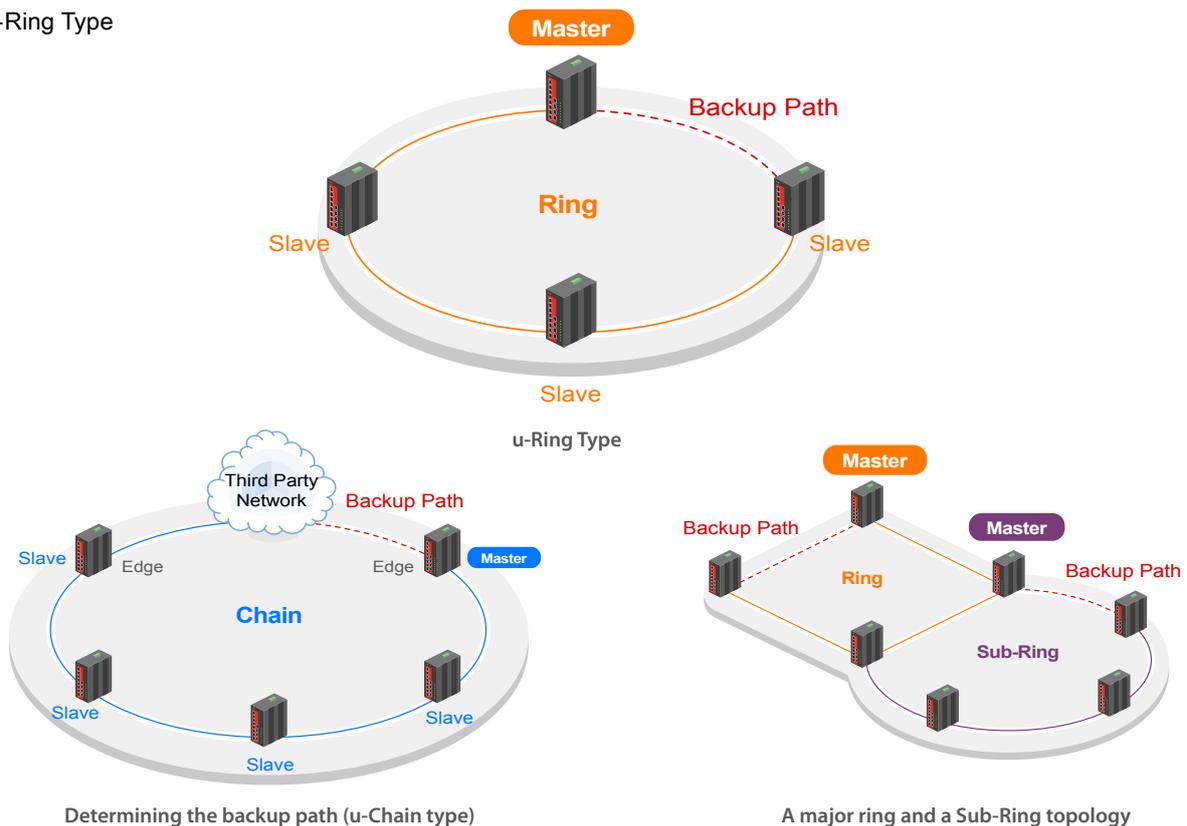
圖5：(Ring 配置範例)

- 🟠 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

機構尺寸

IFS-402GSM
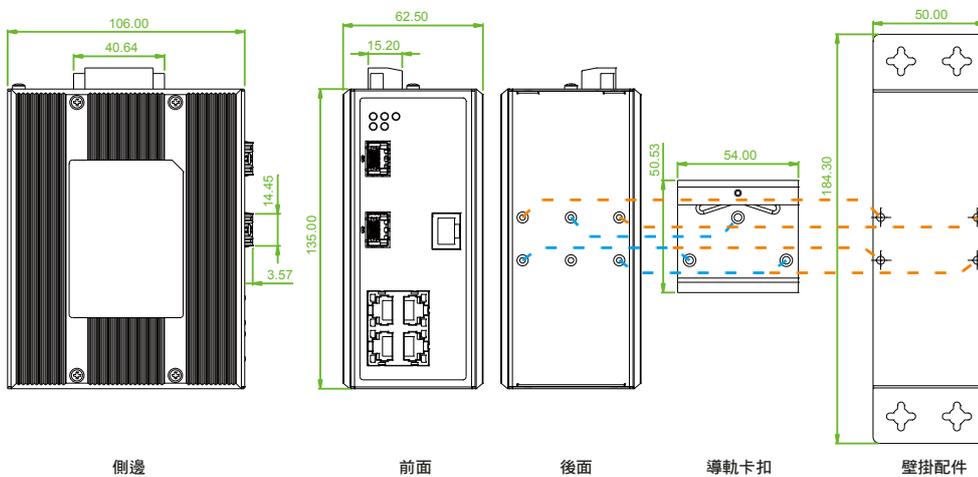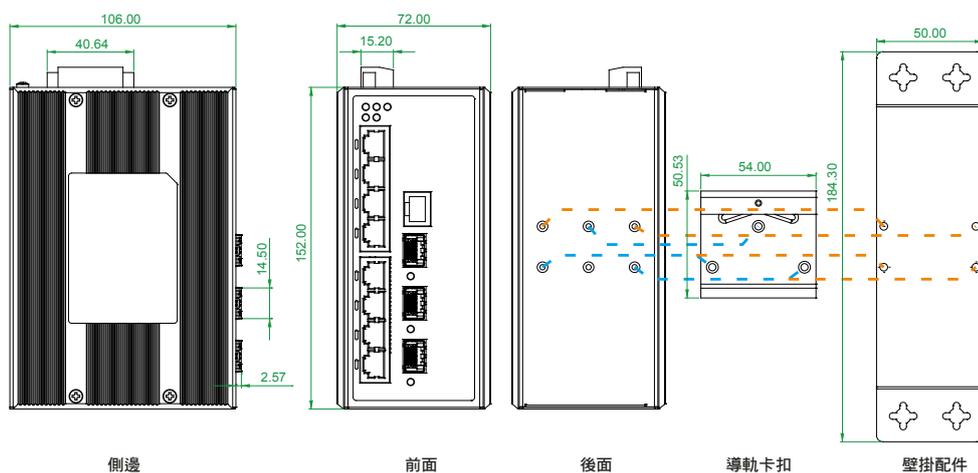
側邊　　　　　　　前面　　　後面　　　導軌卡扣　　　壁掛配件

IFS-803GSM

側邊　　　　　　　前面　　　後面　　　導軌卡扣　　　壁掛配件

2

Industrial Managed
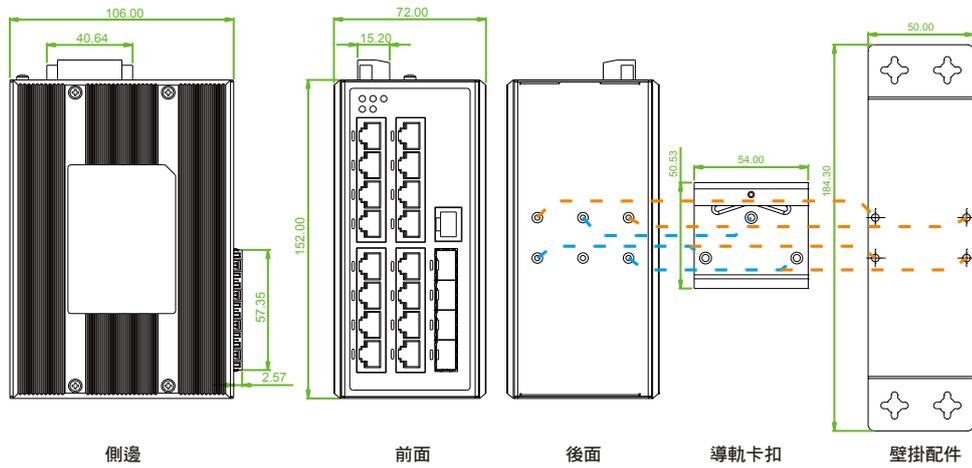FE Switch

Specifications & design are subject to change without prior notice. Please visit CTC Union website for more details.

IFS-402GSM, IFS-803GSM, & IFS-1604GSM
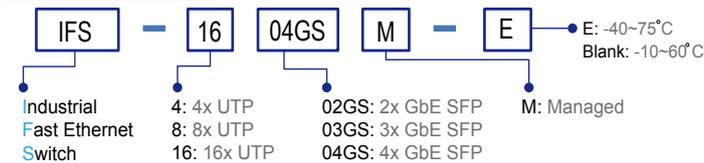
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IFS-1604GSM

106.00	72.00		50.00

侧邊　　　　　　　前面　　　　後面　　　導軌卡扣　　　壁掛配件

機構尺寸

型號	管理	總埠數	UTP 10/100 Base-TX	光纖 100/1000 Base-X	認證 鐵道交通 EN50121-4	安全 UL60950-1	EN61000-6-2 EN61000-6-4	CE FCC	操作溫度
IFS-402GSM	V	6	4	2 SFP	V	V	V	V	-10~60℃
IFS-402GSM-E	V	6	4	2 SFP	V	V	V	V	-40~75℃
IFS-803GSM	V	11	8	3 SFP	V	V	V	V	-10~60℃
IFS-803GSM-E	V	11	8	3 SFP	V	V	V	V	-40~75℃
IFS-1604GSM	V	20	16	4 SFP	V	V	V	V	-10~60℃
IFS-1604GSM-E	V	20	16	4 SFP	V	V	V	V	-40~75℃

型號命名規則

| IFS | — | 16 | 04GS | M | — | E |

E: -40~75℃
Blank: -10~60℃

Industrial
Fast Ethernet
Switch

4: 4x UTP
8: 8x UTP
16: 16x UTP

02GS: 2x GbE SFP
03GS: 3x GbE SFP
04GS: 4x GbE SFP

M: Managed

選購配件

DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50℃
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70℃
SFP 收發器	Compatible, Reliable, 5-year Warranty

SFP命名規則

| ISFP | — | M | 7 | 040 | — | 31 | — | E |

E:-40~85℃
空白:0~70 C

波長

工業級SFP
收發器

M: Multi Mode
S: Single Mode
T: Copper

7: GbE
5: FE

距離
002(2km)
020(20km),040(40km)