

Product Specification

Industrial 24-Port 10/100/1000Mbps with 4 Shared SFP Managed Gigabit Switch

IGSW-24040T

Version 1.1

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Change History:

Revision:	Date:	Author:	Change List
1.0	2011/5/16	Norman Tsai	Initial release
1.1	2012/7/11	Norman Tsai	Fix DI/DO specification

Author:	Norman Tsai	Editor:	Marc Liao
Reviewed By:	Kent Kang	Approved By:	Tom Shih

1. PRODUCT DESCRIPTION

Environmentally Hardened Design for Industrial Networks

The PLANET IGSW-24040T is an environmentally hardened Industrial Managed Ethernet Switch with high Port-density, Gigabit Fiber link capability and 19" rack-mountable design. It is specifically designed to operate stably in electrically harsh and the toughest environment with extended operating temperature range. The IGSW-24040T is equipped with advanced management functions and provides **24 10/100/1000Base-T** copper ports and **4 shared 1000Base-S/LX SFP** slots delivered in a rugged strong case. It is capable of providing non-blocking switch fabric and wire-speed throughput as high as 48 Gbps in the temperature range from **-40 to 75 Degree C** without any packet loss and CRC error, which greatly simplifies the tasks of upgrading the industrial and building automation LAN for catering to increasing bandwidth demands such as IP video surveillance. The IGSW-24040T is the most reliable choice for highly-managed and Fiber Ethernet application in Industrial network.

- ▶ **Extend Operating Temperature:** From **-40 to 75 Degree C**
- ▶ **Robust Industrial Protection:** **IP30** metal case and 19" rack-mountable design
- ▶ **Ethernet Protection:** 6KV DC ESD protection
- ▶ **Power Redundant:** 1+2 RPS design, supports one **100~240V AC** and dual **36~72V DC** power input
- ▶ **Redundant Ethernet Network:** STP, RSTP and MSTP to greatly improve redundant data backup for links and guarantee network resilience
- ▶ **Flexible Fiber uplink capability:** Compatible with **1000Base-SX/LX** and **100Base-FX** SFP transceiver

Layer 2 / Layer 4 Full-functioned Managed Switch for Building Automation Networking

The IGSW-24040T Industrial Managed Ethernet Switch is ideal for applications in the factory data centers and distributions. It provides advanced Layer 2 to Layer 4 data switching and redundancy, Quality of Service traffic control, network access control and authentication, and Secure Management features to protect customer's industrial network connectivity with reliable switching recovery capability that is suitable for implementing fault tolerant and mesh network architectures.

Cost-effective IPv6 Managed Gigabit Switch solution for industrial

The current IPv4 network infrastructure is not capable enough to provide IP Address to each single users/Clients. The situation forces the ISP to build up the IPv6 (Internet Protocol version 6) network infrastructure speedily. To fulfill the demand, PLANET releases the IPv6 management Gigabit Ethernet Switch. It supports both IPv4 and IPv6 management functions. It can work with original network structure (IPv4) and also support the new network structure (IPv6) in the future. With easy and friendly management interfaces and plenty of management functions included, the IGSW-24040T Managed Switch is the best choice for you to build the IPv6 FTTx edge service and for Industrial to connect with IPv6 network.

AC + DC Redundant Power to ensure continuous operation

PLANET IGSW-24040T is equipped with dual power systems which are one 100~240V AC power supply unit and one DC 36 ~ 72V power supply unit for redundant power supply installation. Dual power systems are also provided to enhance the reliability with either 100~240V AC power supply unit or DC 36 ~ 72V power supply unit. Furthermore, with the 36~ 72V DC power supply implemented, the IGSW-24040T can be applied as the telecom level device that could be located at the electronic room.

Powerful Security

The Managed Switch offers comprehensive Access Control List (ACL) for enforcing security to the edge. Its protection mechanisms also comprise of port-based 802.1x and MAC-based user and device authentication. The port-security is effective in limit the numbers of clients pass through, so that network administrators can now construct highly secured corporate networks with time and effort considerably less than before.

2. PRODUCT FEATURES

➤ **Physical Port**

- **24-Port 10/100/1000Base-T** Gigabit RJ-45 copper
- **4 100/1000Base-X** mini-GBIC/SFP slots, shared with Port-21 to Port-24
- RS-232 DB9 console interface for Switch basic management and setup

➤ **Industrial Conformance**

- 36V to 72V DC, redundant power with polarity reverse protect function
- -40 to 75 Degree C operating temperature
- IP-30 metal case, 19-inch Rack-mountable
- Relay alarm for port breakdown, power failure
- Supports 6000 VDC Ethernet ESD protection
- Free fall, Shock and Vibration Stability

➤ **Layer 2 Features**

- Prevents packet loss with back pressure (Half-Duplex) and IEEE 802.3x PAUSE frame flow control (Full-Duplex)
- High performance of Store-and-Forward architecture and runt/CRC filtering eliminates erroneous packets to optimize the network bandwidth
- Storm Control support:
 - Broadcast / Multicast / Unknown-Unicast
- Supports **VLAN**
 - IEEE 802.1Q Tagged VLAN
 - Up to 256 VLANs groups, out of 4041 VLAN IDs
 - Provider Bridging (VLAN Q-in-Q) support (IEEE 802.1ad)
 - Private VLAN Edge (PVE)
- Supports **Spanning Tree Protocol**
 - STP, IEEE 802.1D Spanning Tree Protocol
 - RSTP, IEEE 802.1w Rapid Spanning Tree Protocol
 - MSTP, IEEE 802.1s Multiple Spanning Tree Protocol, spanning tree by VLAN
 - BPDU Guard
- Supports **Link Aggregation**
 - IEEE 802.3ad Link Aggregation Control Protocol (LACP)
 - Cisco ether-channel (Static Trunk)
 - Maximum 12 trunk groups, up to 16 ports per trunk group
 - Up to 32Gbps bandwidth (Duplex Mode)
- Provide Port Mirror (many-to-1)

- Port Mirroring to monitor the incoming or outgoing traffic on a particular port

➤ **Quality of Service**

- Ingress Shaper and Egress Rate Limit per port bandwidth control
- 4 priority queues on all switch ports
- Traffic classification:
 - IEEE 802.1p CoS
 - TOS / DSCP / IP Precedence of IPv4/IPv6 packets
 - IP TCP/UDP port number
 - Typical network application
- Strict priority and Weighted Round Robin (WRR) CoS policies
- Supports QoS and In/Out bandwidth control on each port
- Traffic-policing policies on the switch port
- QoS Control List Wizard makes QoS creation and configuration easier and more quickly
- DSCP remarking
- Voice VLAN

➤ **Multicast**

- Supports IGMP Snooping v1, v2 and v3
- Querier mode support
- IGMP Snooping port filtering and throttling
- Multicast VLAN Registration (MVR)

➤ **Security**

- IEEE 802.1x Port-Based / MAC-Based network access authentication
- Built-in RADIUS client to co-operate with the RADIUS servers
- TACACS+ login users access authentication
- RADIUS / TACACS+ users access authentication
- IP-Based Access Control List (ACL)
- MAC-Based Access Control List
- Source MAC / IP address binding
- **DHCP Snooping** to filter un-trusted DHCP messages
- **Dynamic ARP Inspection** discards ARP packets with invalid MAC address to IP address binding
- **IP Source Guard** prevents IP spoofing attacks
- Auto DoS rule to defend DoS attack
- IP address access management to prevent unauthorized intruder

➤ **Management**

- Switch Management Interfaces
 - Console / Telnet Command Line Interface
 - Web switch management
 - SNMP v1, v2c, and v3 switch management
 - SSH / SSL secure access
- Four RMON groups (history, statistics, alarms, and events)
- **IPv6** IP Address / NTP / DNS management
- Built-in Trivial File Transfer Protocol (TFTP) client
- BOOTP and DHCP for IP address assignment
- Firmware upload/download via HTTP / TFTP
- DHCP Relay and Option 82

- User Privilege levels control
- NTP (Network Time Protocol)
- Link Layer Discovery Protocol (LLDP) Protocol
- Cable Diagnostic technology provides the mechanism to detect and report potential cabling issues
- Reset button for system reboot or reset to factory default
- PLANET Smart Discovery Utility for deploy management
- ICMPv6
- Multi-level user account and password
- Digital Input / Digital Output
- Fault Alarm

3. PRODUCT SPECIFICATION

3.1 MAIN COMPONENT

Switch ASIC:	VITESSE VSC7407XHO-03	X 1
Giga Combo PHY:	VITESSE VSC8664-03	X 6
CPU:	ARM926EJ (integrated with VSC7407XHO-03)	X 1
Flash:	Extended temperature support available	X 1
DDR RAM:	Extended temperature support available	X 1
SRAM	Extended temperature support available	X 1
Open frame power supply	Mean Well PS-35-12 36Watts Power Supply	X 1

3.2 FUNCTION SPECIFICATION

Product	IGSW-24040T
Hardware Specification	
Copper Ports	24 10/ 100/1000Base-T RJ-45 Auto-MDI/MDI-X ports
SFP/mini-GBIC Slots	4 1000Base-SX/LX/BX SFP interfaces, shared with Port 21 to Port 24 Compatible with 100Base-FX SFP
Console	1 x RS-232 DB9 serial port (115200, 8, N, 1)
Switch Processing Scheme	Store-and-Forward
Switch Fabric	48Gbps / non-blocking
Address Table	8K entries
Share data Buffer	1392 kilobytes
Flow Control	IEEE 802.3x Pause Frame for Full-Duplex Back pressure for Half-Duplex
Jumbo Frame	10Kbytes

LED	Power, 1000 Link/Act, 100 Link/Act, SFP Link
Reset Button	< 5 sec: System reboot > 5 sec: Factory Default
Dimension (W x D x H)	440 x 200 x 44.5 mm, 1U height
Power Consumption	< Max. 30 Watts / 102 BTU (AC)
ESD Protection	6KV DC
Power Requirement – AC	AC 100~240V, 50/60Hz 0.75A
Power Requirement – DC	36V DC @ 0.75A, Range: 36V ~ 72V DC
DI/DO	2 Digital Input (DI): Level 0: -24~-2.1V (\pm 0.1V) Level 1: 2.1~24V (\pm 0.1V) Input Load Current: 10mA max. 2 Digital Output (DO): Open collector to 24VDC, 100mA max. load
Layer 2 function	
Basic Management Interfaces	Console, Telnet, Web Browser, SNMPv1, v2c
Secure Management Interfaces	SSH, SSL, SNMP v3
Port configuration	Port disable / enable Auto-Negotiation 10/100/1000Mbps full and half duplex mode selection Flow Control disable / enable Bandwidth control on each port Power saving mode control
Port Status	Display each port's speed duplex mode, link status, Flow control status Auto negotiation status, trunk status
VLAN	802.1Q Tagged Based VLAN Port-Based VLAN Q-in-Q Private VLAN Edge (PVE) Up to 256 VLAN groups, out of 4094 VLAN IDs
Port Trunking	IEEE 802.3ad LACP / Static Trunk Support 12 groups of 16-Port trunk support
QoS	Traffic classification based, Strict priority and WRR 4-level priority for switching - Port Number - 802.1p priority - 802.1Q VLAN tag DSCP/TOS field in IP Packet Policy-Based QoS
IGMP Snooping	IGMP (v1/v2) Snooping, up to 255 multicast Groups IGMP Querier mode support
Access Control List	IP-Based ACL / MAC-Based ACL Up to 256 entries
Alarm	Provides one relay output for port breakdown, power fail and link down port. Alarm Relay current carry ability: 1A @ DC 24V

SNMP MIBs	RFC-1213 MIB-II IF-MIB RFC-1493 Bridge MIB RFC-1643 Ethernet MIB RFC-2863 Interface MIB RFC-2665 Ether-Like MIB RFC-2819 RMON MIB (Group 1) RFC-2737 Entity MIB RFC-2618 RADIUS Client MIB RFC-2933 IGMP-STD-MIB () RFC3411 SNMP-Frameworks-MIB IEEE802.1X PAE LLDP MAU-MIB
Standards Conformance	
Regulation Compliance	FCC Part 15 Class A, CE
Standards Compliance	IEEE 802.3 10Base-T IEEE 802.3u 100Base-TX/100Base-FX IEEE 802.3z Gigabit SX/LX IEEE 802.3ab Gigabit 1000T IEEE 802.3x Flow Control and Back pressure IEEE 802.3ad Port trunk with LACP IEEE 802.1D Spanning tree protocol IEEE 802.1w Rapid spanning tree protocol IEEE 802.1s Multiple spanning tree protocol IEEE 802.1p Class of service IEEE 802.1Q VLAN Tagging IEEE 802.1x Port Authentication Network Control IEEE 802.1ab LLDP RFC 768 UDP RFC 793 TFTP RFC 791 IP RFC 792 ICMP RFC 2068 HTTP RFC 1112 IGMP version 1 RFC 2236 IGMP version 2
Stability	IEC60068-2-32 (Free fall) IEC60068-2-27 (Shock) IEC60068-2-6 (Vibration)

3.3 PHYSICAL SPECIFICATIONS:

Dimensions:

440 x 200 x 44.5mm (W x D x H), 1U height

Weight:

2.96kg

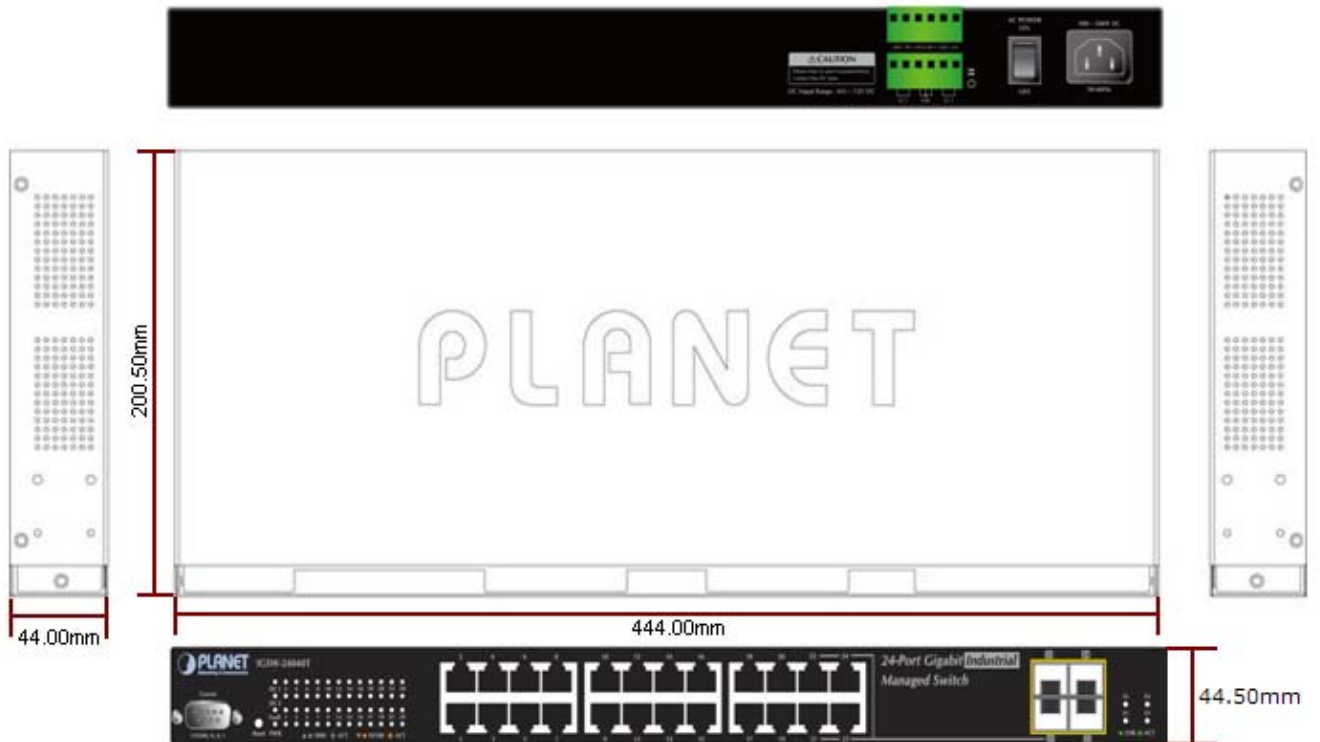
■ Front Panel:



■ Rear Panel:



■ Diagram:



■ LED definition

System

LED	Color	Function
PWR	Green	Lights to indicate that the Switch has power.
DC 1	Green	To indicate the DC1 has power.
DC 2	Green	To indicate the DC2 has power.
FAULT	Green	To indicate the DC1, DC2 or both have no power.

Per 10/100/1000Mbps port

LED	Color	Function
1000 LNK/ACT	Green	Lights to indicate the port is running in 1000Mbps speed and successfully established. Blink: indicate that the switch is actively sending or receiving data over that port.
10/100 LNK/ACT	Orange	Lights to indicate the port is running in 100Mbps or 10Mbps speed. Blink: indicate that the switch is actively sending or receiving data over that port.

Per 1000Base-SX/LX SFP interfaces

LED	Color	Function
LNK/ACT	Green	Lights to indicate the link through that port is successfully established.

3.4 ENVIRONMENTAL SPECIFICATION

Operating:

Temperature: -40°C ~ 75 Degree C (For DC Power Input)
-20°C ~ 60 Degree C (For AC Power Input)

Relative Humidity: 5% ~ 95% (non-condensing)

Storage:

Temperature: -40°C ~ 85 Degree C

Relative Humidity: 5% ~ 95% (non-condensing)

3.5 ELECTRICAL SPECIFICATION

Power Consumption:

INPUT \ Model	Input Voltage	IGSW-24040T
System on	36V DC	20.52 Watts / 70.4 BTU
	48V DC	22.08 Watts / 75.75 BTU
	60V DC	24.6 Watts / 84.4 BTU
	72V DC	26.64 Watts / 91.4 BTU
	110V AC	21.70 Watts / 74.45 BTU
	220V AC	21.8 Watts / 74.8 BTU
Ethernet Full Load	36V	31.5 Watts / 108.07 BTU
	48V	32.28 Watts / 110.75 BTU
	60V	36.60 Watts / 125.57 BTU
	72V	39.87 Watts / 136.79 BTU
	110V AC	34.5 Watts / 118.37 BTU
	220V AC	34.2 Watts / 117.34 BTU

3.6 REGULATORY COMPLIANCE

EMI:

- EN 55022 CLASS A:2006
- EN61000-3-2:2006
- EN61000-3-3: 1995+1A:2001+A2:2005

EMS:

- EN 55024:1998+A1:2001+A2:2003
- IEC 61000-4-2:2001
- IEC 61000-4-3:2008
- IEC 61000-4-4:2004
- IEC 61000-4-5:2005
- IEC 61000-4-6:2008
- IEC 61000-4-8:2001

3.7 REALIABILITY

MTBF > 100,000Hrs

3.8 BASIC PACKAGING

- IGSW-24040T X1
- User's Manual X1
- Quick Installation Guide X1
- Power Cord X1
- RS232 Cable X1
- Rubber Feet X4
- Two rack-mounting brackets with attachment screws X2

3.9 PACKING DIMENSION

Dimension: 520mm (W) x 450mm (D) x 90mm (H)

Weight: 19.9kg (Gross Weight)

5 pcs in one carton

APPENDIX 1: Chipset Datasheet

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24 x 1-Gigabit and 4 x 2.5 Gbps Layer-2 Ethernet Switch with Low-Cost Stacking/V-StaX™ and V-Core II™ CPU

The E-StaX-34™ is a 28-port Switch-on-a-Chip (SoC) device with an integrated high performance V-Core™ II processor and a V-CAP content-aware processor. E-StaX-34 is the first member of the SparX™ family that supports the V-StaX™ scalable switch interconnection architecture. E-StaX-34 is targeted at cost-effective Web-managed or managed standalone switches and stackable switch systems. The QoS and security offering makes E-StaX-34 ideal for VoIP and WLAN enabled switches. Excellent SerDes and nonblocking switching performance also makes E-StaX-34 perfect for use in embedded switch backplane applications, such as modular computer servers and DSLAMs. It also has two embedded Vitesse EcoEthernet, energy-efficient features that deliver green savings equivalent to over 400mW per port. The first, ActiPHY™, enables an automatic power savings mode that can detect unused Ethernet ports on network devices and power them down or place them in stand-by mode. The second, PerfectReach™, an intelligent algorithm, actively adjusts the power level needed based on cable length, saves energy for links shorter than the full 100 meters of cable length specified by IEEE standards.

Product Variants	Description
VSC7407XHO	596-pin, 35 mm x 35 mm BGA, 0 °C to 100 °C, lead-free second-level interconnect
VSC7407XHO-03	596-pin, 35 mm x 35 mm BGA, -40 °C to 100 °C, lead-free second-level interconnect

Key Features

- 24 10/100/1000 Mbps SGMII/SerDes Ethernet interfaces
- 4 10/100/1000/2500 Mbps V-StaX™ enabled SGMII/SerDes Ethernet interfaces
- Nonblocking wire-speed switching performance for all packet sizes
- 1376 kilobytes on-chip frame buffer
- V-StaX™ scalable switch interconnection architecture

Applications

- SerDes-Based Backplane Applications
- 28-Port Managed Gigabit Ethernet SMB/SME Switch
- 24-Port Stackable Gigabit Ethernet SMB/SME Switch

Related Products

- Ethernet MACs
- 1GE PHYs

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VSC8664 Datasheet Electrical Specifications

5.4 Operating Conditions

The following table shows the recommended operating conditions for the VSC8664 device.

Table 91. Recommended Operating Conditions

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Power supply voltage for V _{DDIO} at 1.8 V	V _{DDIO}	1.70	1.80	1.90	V
Power supply voltage for V _{DDIO} at 2.5 V	V _{DDIO}	2.37	2.50	2.63	V
Power supply voltage for V _{DDIO} at 3.3 V	V _{DDIO}	3.13	3.30	3.47	V
Power supply voltage for V _{DD33}	V _{DD33}	3.13	3.30	3.47	V
Power supply voltage for V _{DD12}	V _{DD12}	1.14	1.20	1.26	V
Power supply voltage for V _{DD12A}	V _{DD12A}	1.14	1.20	1.26	V
VSC8664 operating temperature ⁽¹⁾	T	0		90	°C
VSC8664-03 operating temperature ⁽¹⁾	T	-40		100	°C

1. Lower limit of specification is ambient temperature, and upper limit is case temperature.