Intelligent Protection Switches

IPS-16 and IPS-32

Environment
Networks requiring
high reliability and resiliency

Applications
SCADA Backup
Ethernet Switch/Hub Redundancy
Fallback Switching
FEP/Router Sparing
Anti-Hacking Switch

Highlights

- ♦ Rear mounting of up to 16 interface cards
  - Multiple interface cards available
  - Datacom, telecom, optical fiber, LAN
- ♦ Signal Types
  - RS.232/V.24
  - EIA-530
  - V.35
  - RS-449
  - X.21
  - DS1/E1 PRI or BRI
  - 10/100BaseT Ethernet
  - 2-, 4-, 6-wire analog
  - OC1, 3, 12, 48; STM-1, 4, 16
  - Gigabit Ethernet (electrical or optical)
  - Fiber Channel 1.25 and 2.5 Gbps
  - Analog Video (RGB, Composite)
- ♦ Multiple Control Mechanisms
  - VT-100 terminal
  - CorScan control
  - TCP/IP Ethernet
  - Telnet
  - Front panel toggle switch
- ♦ Switching via magnetic latching relays
- ♦ MTBF greater than 10 million switching actions
- ♦ 7” high (4 RU) 19” rackmount chassis
- ♦ Dual AC power supply

Intelligent Protection Switches

The Cornet Technology Intelligent Protection Switches (IPS) are high bit-rate, high-bandwidth, electromechanical, 16 or 32 channel digital, analog and optical fiber A/B and A/B/C switches. These versatile switches are designed to manually or automatically switch an extensive range of electrical and optical interfaces for datacom, telecom, and LAN topologies. Applications for the IPS switches include: Out-of-Service Testing and Monitoring, SCADA Backup, Ethernet Switch/Hub Redundancy, Fallback Switching, FEP/Router Sparing and Anti-Hacking Switching.

Design Overview

The IPS Switch’s rear-mount design is ideal for multi-interface environments. Multiple interface cards are offered (three datacom, T1/E1, Analog/VF, balanced electrical, coaxial electrical, and optical cards). Two-channel interface cards are also available. Each interface card is designed with interface appropriate connectors enabling multiple interface cards to reside in a single chassis. In the IPS, LEDs located on the front panel correspond to each interface card for key datacom interface Leads. These LEDs indicate: A-position, B-position, Bus in Use, Transmit Data (TD), Receive Data (RD), and Status. A C-position LED is also offered in A/B/C IPS configurations. A passive monitor is available for a majority of the interface types offered.

The chassis for the IPS switch measures 7” high (4 RU) and 8” deep. It fits into a standard 19” cabinet. Spring-loaded toggle switches to control the “Master A/B” switch function as well as individual card A/B switching are located on the front panel. Each chassis handles 16 cards. Cards are available in single switch and two switch per card versions. Both the one switch card and two switch card can be mixed in the IPS-32 chassis version.

Control

Both manual and automatic control of the IPS switch are available. To automate switching, the IPS can be programmed to switch when predefined conditions are met.

Communication to the switch is through TCP/IP or SNMP (via a private MIB). This MIB allows users to develop customized software for integration into their network management system. A TCP/IP server and an SNMP agent are built into the controller card allowing control from either source. This design allows all switch functions to be controlled remotely.

Control of the IPS switches is also provided through Cornet Technology’s CorScan® control software. Functions offered with CorScan include: setting trap conditions, switching, status polling, and LED monitoring. CorScan automatically records switching and alarm events. The software also allows both group and scripted switching. For security, CorScan allows port control to be assigned to specific operators while others can control the entire system. For more details refer to the CorScan data sheet.

In addition to automated remote control, both the IPS-16 and IPS-32 can be controlled via a serial RS-232 interface from a local VT-100 terminal and via Telnet. A Control Interface Protocol is available. This protocol allows users to write their own system control and management software for incorporation into their Network Management Systems.

IPS controller cards support a user-defined IP address, that enables multiple IPS chassis to be chained together. In this configuration one IPS switch acts as a primary with an IP address while the other collocated chassis are access and controlled via an async RS-422 chain-in link. Up to 99 IPS chassis can be managed in this manner.

SPECIFICATIONS

Chassis:	16 card slots per chassis Two switches per card for IPS 32 One switch per card for IPS 16
Interfaces/Port	
DB25 Connector Versions	
Quad Card:	EIA-232, EIA-530, EIA-449, V.35, X.21
Connectors:	DB-25(f) (A, B, Common)
Pins Switched:	2-25; pin 1 hard-wired (referenced to DB-25F connectors)
Bus:	Full (break DTE, break DCE, and monitor), or no bus
Lead Alarming:	RTS, CTS, DSR, DTR, no data, no clock (appropriate to specific interface, consult factory for details)
Lead Monitoring:	Snapshot of lead states available from craft port and displayed on CorScan 400/500
Switching Time:	< 10 msec.
Copper Path Card:	
Connector:	DB-25F
Leads Switched:	Pins 2 through 25; pin 1 hard-wired (referenced to DB-25F connector)
Bus:	none
Lead Alarming:	none
Lead Monitoring:	none
Switching Time:	< 10 msec.
Adaptors:	V.35(f), X.21 (f), DB-15 (f)
Optical Fiber:	Fiber Channel, OC-3/12/48
Fiber Type:	Single-mode (SM) 9/125 Multimode (MM) 62.5/125 or 50/125
Wave Length:	SM 1290/1610 nm; MM 750/1450 nm
Switching:	A/B, A/B/C
Signal Flow:	Bidirectional
Insertion Loss:	SM: 1.0 dB per switching element MM: 1.3 dB per switching element
Switching Time:	< 10 msec.
Connector:	SC, FC, ST
Signal Type:	OC1, 3, 12, 48; STM-1, 4, 16 Gigabit Ethernet Fiber Channel 1.25 and 2.5 Gbps
Coaxial Electrical:	RGB, Composite Video, E1 unbalanced, DS3/E3
Interface:	BNC (f), 75 Ω, unbalanced
Frequency Range:	120 MHz (-3 dB)
Switching:	A/B
Signal Flow:	Bidirectional
Insertion Loss:	< 0.5 dB
Signal Type:	Analog, Video (RGB, Composite) DS3 @ 45 Mbps; E3 @ 34 Mbps
Switching Time:	< 10 msec.
RJ-45 Connector Versions	T1/E1, VF, 10/100BaseT Ethernet, Gigabit Ethernet
Connectors:	RJ-45 socket (A, B, and Common), two per card
Pins Switched:	All eight
Bus:	Two full (break both ways and monitor), or no bus
Alarms:	None
Alarm Monitoring:	None
CorScan:	400/500
Switching Time:	< 10 msec.

Contact the factory to inquire about modules with higher bit rate, higher frequency switching capabilities, or alternate connectors.

Switching Methods	
Relay	Master A/B under control of external relay closure
Manual	Single channel switch (1 channel at a time) Master channel switch (all channels simultaneously in one chassis)
CorScan	Single Channel or TCP/IP Master Channel
SNMP	Group Switch (defines a group of individual channels) Scripted Switching

Automatic	
Interface Type	Switching Conditions
Datacom Interface	Monitors change of status of RTS, CTS, DSR, CD and DTR (RS.232, V.35), loss of Rx Data and/or Rx Clock (RS-530; RS-449) X.21 C&I Lead Status Change; Loss of T, R. and ST
Control	
Flash EPROM	On Controller Card:
CorScan:	CTI control software interfaces with controlled devices viaTCP/IP server and SNMP agent on each controller card through a private MIB Allows for sharing a single IP address across multiple chassis
LED's	Heartbeat; TD; RD; Bus in use
RS-232	Local CorScan terminal or from front-mounted A/B switch
Power Requirements	
Power Supply:	90/230 ± 10% VAC, 47/63 Hz
Current:	1 A
Power:	50 VA
DC Power:	-48 volts
Environmental	
Operating	0° to 50°C (32° to 122°F); 10 - 80% Relative Humidity (RH) non-condensing
Non-Operating	-20° to 70° C (-5°to 160°F); 98% RH @ 65° C (150° F)
Mechanical	
Dimensions:	7" H x 19" W x 8" D (17.7 cm H x 48.2 cm W x 20.3 cm H)
Weight:	Approx. 20 lbs (9Kg)

Note: All interface plug-in cards offered individually. Any one-channel card can reside in the same chassis

Ordering Information

IPS-16 Chassis with redundant power supplies	CCHA41214-1
IPS-32 Chassis	CCH41212-1
IPS A/B Controller Card IP, SNMP &Serial	C01351-1
IPS A/B Quad Card - DB25	C01352-2 no bus
IPS A/B Quad Card - DB25	C01352-1 one bus
Copper Path	C01352-4 no bus
IPS A/B Dual RJ-45 Card	C01353-1 with bus
	C01353-2 no bus
Coaxial	C05118-2 no bus
Fiber	C01357-1 A/B duplex sm, SC connectors
	C01357-2 A/B/C duplex sm, SC connectors
	C01357-3 A/B duplex mm, SC connectors
	C01357-4 A/B/C duplex mm, SC connectors
	C01357-7 A/B duplex sm, LC connectors
	C01357-8 A/B/C duplex sm LC connectors
	C01357-9 A/B duplex mm LC connectors
	C0157-10 A/B/C duplex mm LC connectors
Dual Redundant Power supply card	CCHA41165-1
-48 V DC Power Supply for IPS 16	CCHA41214-4
-48V DC Power Supply for IPS 32	CCHA41212-4
V.35F Adaptor	
X.21 (f) Adaptor	ADPA25M15F
HD-15 (f) Adaptor	ADPA25MH15F

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