Amphenol
MILITARY HIGH SPEED

FAMILY OF 10G FIBER + COPPER RUGGED ETHERNET SWITCHES

10/100/1G/2.5G/5G/10G Base-T + 1G/10G/25G/40G/100G Compatibility

Miracle Switch

PRODUCT HIGHLIGHTS

- *Boot time is less than 10 seconds*
- *Power consumption is less than 50 watts*
- *Lightly managed switching functionality*
- *Source code available for 3rd party applications*
- *Secure and rugged for the harshest environments*

DESCRIPTION

Amphenol's multi-channel Rugged Ethernet Switchboxes is conduction cooled and configurable for system connectivity, various speeds, port types, as well as interoperation with several high-speed media converters and cable assemblies for system interfacing.

Many fiber optic and copper channels are available. In Amphenol's state of the art communications testing center, the switchbox is aggressively tested at line rates to RFC 2889 for switch and RFC 2544 for L2/L3 performance, latency, packet forwarding and other key items.

The switch is manufactured using derivates of Amphenol's MIL-DTL-38999 Series III connectors. These connectors contain standard AS39029 qualified Size 22D contacts and Octonet contacts. Amphenol's Octonet contacts are a proven design used in a variety of military programs. The Octonet is a Size 8 contact that houses four differential pairs, capable of a data rate of 4Gbps maximum and 100Ohm impedance. This contact system has been tested and passed all specification requirements of AS39029 qualification.

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FEATURES & BENEFITS

- Up to 28 ports are capable of 10/100/1G Base-T compatibility
- Up to 6 ports are capable of 10/100/1G/2.5G/5G/10G Base-T compatibility
- Up to 32 ports are capable of up to 10/40G fiber
- 28V MIL-STD-740A input module – see this specification for input power considerations.
- 50 watts or less typical power consumption
- Less than 10 second boot time from power on to traffic switching.
- Mil-spec power supply with hold-up capacitor and in-rush current limiting circuit
- Built in test functionality for power up, initiated, and continuous operation.
- MIL-DTL-38999 power, debug/maintenance, and data connectors
- Mil-spec black painted chassis with cold plate external conduction cooling
- Host management process with expanded Ethernet features including:
    - o CLI interface and web interface
    - o IPV4 / IPV6 routing
    - o Information on links and port counters
    - o Tagged and untagged vlan configurations
    - o Trunk link aggregation
    - o Port mirroring
    - o Port based QoS
    - o 802.1P QoS
    - o Rate limitations
    - o Loop detection
    - o Multicast IGMP snooping
    - o Reset functionality with authenticated Ethernet command
    - o CNSA 1.0 algorithms
    - o Secure Methods for logging into switch over management Ethernet
    - o Approved zeroization methods
    - o Denial of service protections
    - o Firewall functionality
    - o Secure booting
    - o Cable diagnostics
    - o Access control

ORDERING INFORMATION

Part Number	Dimensions (inches)	Capability
CF-02WA00-19X	8.5 x 5.7 x 2.1	28 ports @ 10/100/1GBase-T 6 ports @ 10/100/1G/2.5G/5G/10GBase-T
CF-02WA00-26X	6 x 5 x 13.2	6 ports @ 10/100/1GBase-T 32 ports @ up to 10GBase-SR (1GBase-SX supported; some 25G)
CF-02WA00-27X	3.5 x 2.4 x 5	6 ports @ 10/100/1GBase-T 6 ports @ up to 10GBase-SR (1GBase-SX supported; some 25G)

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DIMENSIONAL INFORMATION — CF-02WADO-19X

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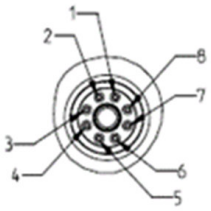
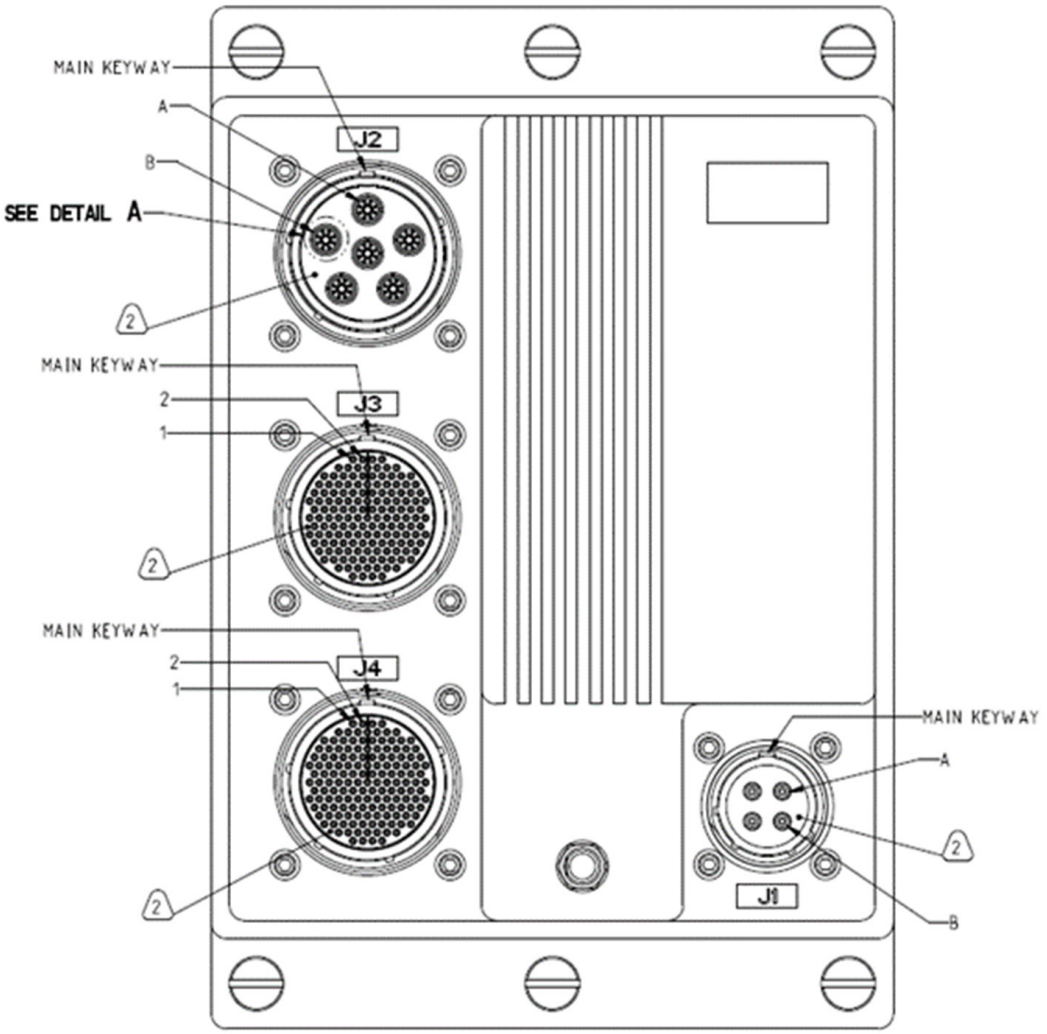
DIMENSIONAL INFORMATION — 19X



DETAIL A
OCTONET
SCALE 4.000
6 PLACES



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I/O CHART — 19X

I/O CHART

CONNECTOR	PIN ID	DATA DIRECTION	SIGNAL NAME
J1 POWER 15-4P	A	IN	28VDC_IN
	B	OUT	28VDC_RTN
	C	--	SAFETY GROUND CHASSIS
	D	--	NOT CONNECTED
	SHELL	--	CHASSIS

I/O CHART

CONNECTOR	PIN ID	DATA DIRECTION	PORT NO	SIGNAL NAME
J2 10GBASE-T 23-6S	A-1	BI	1	10GBase-T_DA+
	A-2			10GBase-T_DA-
	A-3			10GBase-T_DB+
	A-4			10GBase-T_DB-
	A-5			10GBase-T_DC+
	A-6			10GBase-T_DC-
	A-7			10GBase-T_DD+
	A-8			10GBase-T_DD-
	A-OUTER	--	--	CHASSIS
	A-CENTER	--	--	CHASSIS
	B-1	BI	2	10GBase-T_DA+
	B-2			10GBase-T_DA-
	B-3			10GBase-T_DB+
	B-4			10GBase-T_DB-
	B-5			10GBase-T_DC+
	B-6			10GBase-T_DC-
	B-7			10GBase-T_DD+
	B-8			10GBase-T_DD-
	B-OUTER	--	--	CHASSIS
	B-CENTER	--	--	CHASSIS
	C-1	BI	3	10GBase-T_DA+
	C-2			10GBase-T_DA-
	C-3			10GBase-T_DB+
	C-4			10GBase-T_DB-
	C-5			10GBase-T_DC+
	C-6			10GBase-T_DC-
	C-7			10GBase-T_DD+
	C-8			10GBase-T_DD-
	C-OUTER	--	--	CHASSIS
	C-CENTER	--	--	CHASSIS

I/O CHART

CONNECTOR	PIN ID	DATA DIRECTION	PORT NO	SIGNAL NAME
J2 10GBASE-T 23-6S	D-1	BI	4	10GBase-T_DA+
	D-2			10GBase-T_DA-
	D-3			10GBase-T_DB+
	D-4			10GBase-T_DB-
	D-5			10GBase-T_DC+
	D-6			10GBase-T_DC-
	D-7			10GBase-T_DD+
	D-8			10GBase-T_DD-
	D-OUTER	--	--	CHASSIS
	D-CENTER	--	--	CHASSIS
	E-1	BI	5	10GBase-T_DA+
	E-2			10GBase-T_DA-
	E-3			10GBase-T_DB+
	E-4			10GBase-T_DB-
	E-5			10GBase-T_DC+
	E-6			10GBase-T_DC-
	E-7			10GBase-T_DD+
	E-8			10GBase-T_DD-
	E-OUTER	--	--	CHASSIS
	E-CENTER	--	--	CHASSIS
	F-1	BI	6	10GBase-T_DA+
	F-2			10GBase-T_DA-
	F-3			10GBase-T_DB+
	F-4			10GBase-T_DB-
	F-5			10GBase-T_DC+
	F-6			10GBase-T_DC-
	F-7			10GBase-T_DD+
	F-8			10GBase-T_DD-
	F-OUTER	--	--	CHASSIS
	F-CENTER	--	--	CHASSIS

I/O CHART

CONNECTOR	PIN ID	DATA DIRECTION	PORT NO	SIGNAL NAME
J4 1GBase-T 23-15P	1	BI	21	1GBase-T_DA+
	2			1GBase-T_DA-
	6			1GBase-T_DB+
	7			1GBase-T_DB-
	13			1GBase-T_DC+
	14			1GBase-T_DC-
	15			1GBase-T_DD+
	16			1GBase-T_DD-
	3	BI	22	1GBase-T_DA+
	4			1GBase-T_DA-
	9			1GBase-T_DB+
	10			1GBase-T_DB-
	17			1GBase-T_DC+
	18			1GBase-T_DC-
	19			1GBase-T_DD+
	20			1GBase-T_DD-
	23	BI	23	1GBase-T_DA+
	24			1GBase-T_DA-
	25			1GBase-T_DB+
	26			1GBase-T_DB-
	34			1GBase-T_DC+
	35			1GBase-T_DC-
	36			1GBase-T_DD+
	37			1GBase-T_DD-
	28	BI	24	1GBase-T_DA+
	29			1GBase-T_DA-
	30			1GBase-T_DB+
	31			1GBase-T_DB-
	40			1GBase-T_DC+
	41			1GBase-T_DC-
	42			1GBase-T_DD+
	43			1GBase-T_DD-
	ALL OTHER PINS	--	--	NO CONNECT

SEE SHEET 2

I/O CHART

CONNECTOR	PIN ID	DATA DIRECTION	PORT NO	SIGNAL NAME
J4 1GBase-T 23-15P	45	BI	25	1GBase-T_DA+
	46			1GBase-T_DA-
	47			1GBase-T_DB+
	48			1GBase-T_DB-
	58			1GBase-T_DC+
	59			1GBase-T_DC-
	60			1GBase-T_DD+
	61			1GBase-T_DD-
	49	BI	26	1GBase-T_DA+
	50			1GBase-T_DA-
	52			1GBase-T_DB+
	53			1GBase-T_DB-
	62			1GBase-T_DC+
	63			1GBase-T_DC-
	64			1GBase-T_DD+
	65			1GBase-T_DD-
	54	BI	27	1GBase-T_DA+
	55			1GBase-T_DA-
	56			1GBase-T_DB+
	57			1GBase-T_DB-
	66			1GBase-T_DC+
	67			1GBase-T_DC-
	68			1GBase-T_DD+
	69			1GBase-T_DD-
	83	BI	28	1GBase-T_DA+
	84			1GBase-T_DA-
	85			1GBase-T_DB+
	86			1GBase-T_DB-
	95			1GBase-T_DC+
	96			1GBase-T_DC-
	97			1GBase-T_DD+
	98			1GBase-T_DD-
	87	BI	29	1GBase-T_DA+
	88			1GBase-T_DA-
	89			1GBase-T_DB+
	90			1GBase-T_DB-
	99			1GBase-T_DC+
	100			1GBase-T_DC-
	102			1GBase-T_DD+
	103			1GBase-T_DD-

I/O CHART

CONNECTOR	PIN ID	DATA DIRECTION	PORT NO	SIGNAL NAME
J4 1GBase-T 23-15P	91	BI	30	1GBase-T_DA+
	92			1GBase-T_DA-
	93			1GBase-T_DB+
	94			1GBase-T_DB-
	104			1GBase-T_DC+
	105			1GBase-T_DC-
	106			1GBase-T_DD+
	107			1GBase-T_DD-
	109	BI	31	1GBase-T_DA+
	110			1GBase-T_DA-
	111			1GBase-T_DB+
	112			1GBase-T_DB-
	121			1GBase-T_DC+
	122			1GBase-T_DC-
	123			1GBase-T_DD+
	124			1GBase-T_DD-
	115	BI	32	1GBase-T_DA+
	116			1GBase-T_DA-
	117			1GBase-T_DB+
	118			1GBase-T_DB-
	126			1GBase-T_DC+
	127			1GBase-T_DC-
	128			1GBase-T_DD+
	129			1GBase-T_DD-
	132	BI	33	1GBase-T_DA+
	133			1GBase-T_DA-
	134			1GBase-T_DB+
	135			1GBase-T_DB-
	142			1GBase-T_DC+
	143			1GBase-T_DC-
	148			1GBase-T_DD+
	149			1GBase-T_DD-
	136	BI	34	1GBase-T_DA+
	137			1GBase-T_DA-
	138			1GBase-T_DB+
	139			1GBase-T_DB-
	145			1GBase-T_DC+
	146			1GBase-T_DC-
	150			1GBase-T_DD+
	151			1GBase-T_DD-

QUALIFICATION STANDARDS

Parameter	Detail	Requirement	Test Method
Low Pressure (Altitude)	Storage	Sea level to 50,000 ft @ -57°C	MIL-STD-810G Method 500.5 Procedure I
	Operational	Sea level to 40,000 ft @ -54°C	MIL-STD-810G Method 500.5 Procedure II
	Explosive Decompression	8,000 ft to 23,100 feet in 8ms	MIL-STD-810G Method 500.5 Procedure IV
High Temperature extremes	Storage, cyclic	+95°C	MIL-STD-810G Method 501.5 Procedure I
	Operational, cyclic	+55°C	MIL-STD-810G Method 501.5 Procedure II
	Operational, constant	+71°C for 30 Minutes	MIL-STD-810G Method 501.5 Procedure II
Low Temperature extremes	Storage, cyclic	-57°C	MIL-STD-810G Method 502.5 Procedure I
	Operational, cyclic	-40°C	MIL-STD-810G Method 502.5 Procedure II
	Operational, sea level, constant	-65°C for 120 Minutes	MIL-STD-810G Method 502.5 Procedure II, as per F-16
Temperature	Shock, from constant	-54°C to +71°C at 125°C/Minute	MIL-STD-810G Method 503.5 Procedure I-B
Combined temperature-altitude-humidity	Operational, 10 cycles	-40°C to +71°C, Sea level to 60,000 ft	MIL-STD-810G Method 520.3 Procedure III
Humidity	Operational and Non-Operational, aggravated cycle	95% ± 4% Humidity, +30°C to +60°C, 10 cycles	MIL-STD-810F Method 507.5 Procedure II
Sand and Dust	Operational and Non-Operational, blowing	< 150um dust, 150um to 850um sand	MIL-STD-810G Method 510.5 Procedure I (Dust) Procedure II (Sand)
Rain	Operational, Dripping	7 gal/ft2/hr, 40 mph for 30 minutes	MIL-STD-810G Method 506.5 Procedure III
Fungus	Non-Operational	7-day growth	MIL-STD-810G Method 508.6
Salt Fog	Operational and Non-Operational, exposure	Four 24-hour wet/dry cycles	MIL-STD-810G Method 509.5
Explosive Atmosphere	Operational	At site and 40,000 ft altitudes	MIL-STD-810G Method 511.5 Procedure I
Acceleration, structural	Limit Loads	Performance at ±10.0g applied individually along all 3 axes	MIL-STD-810G Method 513.6 Procedure I

QUALIFICATION STANDARDS CONT.

	Ultimate Loads	Withstand without structural failure ±15.0g applied individually along all 3 axes	MIL-STD-810F Method 513.6 Procedure II
	Crash Landing	Remain captive, 40g fore, 20g aft and down, 10g up, 18g left and right	MIL-STD-810F Method 513.6 Procedure III
Shock – Functional	Operational	20g, 11ms nominal, 3 blows each direction, each axis (18 total), terminal peak sawtooth	MIL-STD-810G Method 516.6 Procedure I
Shock – Crash Hazard	Non-Operational	40g, 11ms nominal, 2 blows each direction, each axis (12 total)	MIL-STD-810G Method 516.6, Procedure V
Shock – Bench Handling	Non-Operational	4" drop, 1 drop per edge per face (24 total)	MIL-STD-810G Method 516.6, Procedure VI
Vibration	Operational, Performance, Jet aircraft	30 mins, 0.02 g2/Hz to 0.04 g2/Hz, 15 - 2000 Hz, Overall 4.46rms	MIL-STD-810G Method 514.6, Procedure I, Category 12, Annex D, Fig 514.6D-I
	Non-Operational, Endurance, Jet aircraft	60 mins, 0.04 g2/Hz to 0.06 g2/Hz, 15 - 2000 Hz, Overall 9.26rms	MIL-STD-810G Method 514.6, Procedure I, Category 12, Annex D, Fig 514.6D-I
	Operational, Gunfire Shock	7.5 min sweeps, 5 to 15 g, 66 to 856 Hz	MIL-STD-810G Method 519.6, Procedure III
	Operational, UH-60 Main Rotor speeds and blade numbers	4 hours, 0.001g2/Hz to 0.01g2/Hz, 3 to 500 Hz	MIL-STD-810G Method 514.6, Procedure I, Category 14, Annex A & Annex D, Table 514.6D-III
Acoustic Noise	Operational	30 mins, 140 dB overall, 50 to 10000 Hz	MIL-STD-810G Method 515.6 Procedure I
Conducted Emissions	Operational	Power Leads, 30 Hz to 10 kHz	MIL-STD-461G CE101 Par 5.4, CE101-4 Curve #2
	Operational	Power Leads, 10 kHz to 10MHz	MIL-STD-461G CE102 Par 5.5, Fig CE102-1 Basic Curve
Conducted Susceptibility	Operational	Power leads, 30Hz to 150 kHz	MIL-STD-461G CS101 Par 5.7, Fig CS101-1 Curve #2
	Operational	Bulk cable injection, 10 kHz to 200MHz	MIL-STD-461G CS114 Par 5.12, Fig CS114-1 Curve #5
	Operational	Bulk cable injection, impulse excitation, 30Hz for one minute	MIL-STD-461G CS115 Par 5.13, Fig CS115-1

QUALIFICATION STANDARDS CONT.

	Operational	Damped sinusoidal transients, cables and power leads, 10kHz to 100MHz, 5 minutes	MIL-STD-461G CS116 Par 5.14, Fig CS116-1 and CS116-2
Radiated Emissions	Operational	Magnetic field, 30Hz to 100kHz	MIL-STD-461G RE101 Par 5.17, Fig RE101-1 and Fig RE101-2
	Operational	Electric field, 10kHz to 18GHz	MIL-STD-461G RE102 Par 5.18, Fig RE102-3 Fixed wing external and Fixed wing internal < 25m
Radiated Susceptibility	Operational	Magnetic field, 30 Hz to 100 kHz	MIL-STD-461G RS101 Par 5.20 Fig RS101-2 Army
	Operational	Electric field, 2 MHz to 18 GHz	MIL-STD-461G RS103 Par 5.21, Table XI, Aircraft Internal Army
Power Supply	Operational, normal condition	Load measurements, ask for info	MIL-STD-704F Chg1 MIL-HDBK-704-8 LDC-101
	Operational, normal condition	Steady state limits, 22 Vdc to 29 Vdc	MIL-STD-704F Chg1 MIL-HDBK-704-8 LDC-102 Tests A, B, C
	Operational, normal condition	Voltage distortion spectrum	MIL-STD-704F Chg1 Fig 15 MIL-HDBK-704-8 LDC-103 Tests A thru K
	Operational, normal condition	Total ripple	MIL-STD-704F Chg1 Fig 15 MIL-HDBK-704-8 LDC-104, Table LDC104-II
	Operational, normal condition	Normal voltage transients, 18Vdc to 29Vdc	MIL-STD-704F Chg1 Fig 13 MIL-HDBK-704-8 LDC-105 Tests AA thru RR
	Operational, transfer interrupt	Power interrupt, 50ms, 22Vdc to 29Vdc	MIL-STD-704F Chg1 MIL-HDBK-704-8 LDC-201
	Operational, abnormal condition	Steady state limits, 20.0 Vdc and 31.5Vdc, 30 minutes	MIL-STD-704F Chg1 MIL-HDBK-704-8 LDC-301 Tests A and B
	Operational, abnormal condition	Abnormal voltage transients, abnormal condition	MIL-STD-704F Chg1 Fig 14 MIL-HDBK-704-8 LDC-302, Tests AAA thru NNN, 7 to 50V
	Operational, emergency condition	Steady state limits, 18 Vdc to 29 Vdc	MIL-STD-704F Chg1 MIL-HDBK-704-8 LDC-401

QUALIFICATION STANDARDS CONT.

Power Supply (cont.)	Operational, starting	Starting voltage transients, 12 Vdc to 29 Vdc	MIL-STD-704F Chg1 MIL-HDBK-704-8 LDC-501, Table LDC501-IV
	Operational, power failure and automatic recovery	Power failure, from 100ms to 7 seconds	MIL-STD-704F Chg1 MIL-HDBK-704-8 LDC-601 Tests A thru D
	Operational, power failure	Phase reversal protection/ prevention	MIL-STD-704F Chg1 MIL-HDBK-704-8 LDC-602
Chassis Grounding	Operating	Allow for proper electrical bonding through designated external stub and dedicated pins on connectors	SAE-AS-50881H
Electrical Bonding	Operating	Primary Chassis ground connection for electrical bonding provided by designated external stub	MIL-STD-464C, Paragraph 5.11.3
Mounting	For vibration tolerance	4x 10-32 captive screws	