12-CHANNEL RUGGED ETHERNET SWITCH

1/10GBASE-T COPPER

DESCRIPTION

Amphenol's 12-channel Rugged Ethernet Switchbox 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.

Each copper port is capable of 10/100/1G/10GBASE-T Ethernet connectivity. 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.

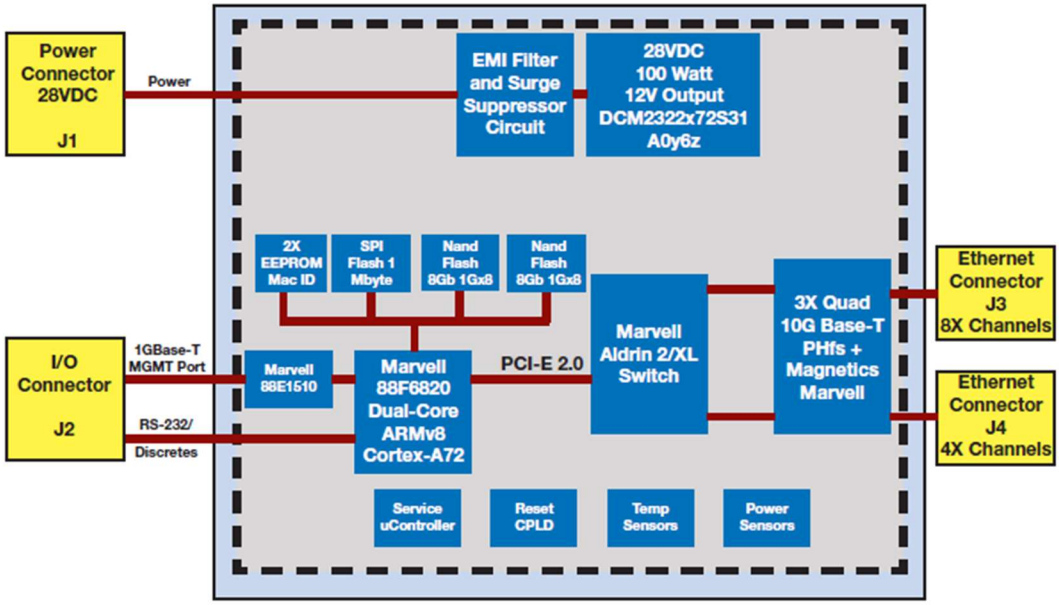
The switch is manufactured using derivates of Amphenol's MIL-DTL-38999 Series III connectors. These connectors contain standard AS39029 qualified Size 22D contacts and Octonet contacts. Amphenol's Octonet contacts are a proven design used in a variety of military programs. The Octonet is a Size 8 contact 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.

Jared Sibrava • +1 (607) 643 - 1845 • jsibrava@amphenol-aao.com
amphenol-aerospace.com

FEATURES AND BENEFITS

- 12-Channels of copper 1G/10GBASE-T
- 28V MIL-STD-740A input module
- 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:
    - Multicast
    - Link Aggregation Control Protocol (LACP)
    - Protocol-Independet Multicast (PIM)
    - Internet Group Management Protocol (IGMP)
    - Simple Network Management Protocol (SNMP)
    - Capable of supporting thousands of Virtual Local Area Networks (VLAN)
    - Each VLAN has its own Dynamic Host Configuration Protocol (DHCP) server for various devices
    - Configurable cross-VLAN multicast routing
    - Storm-prevention
    - IPV4 and IPV6 support
    - Spanning tree protocol
    - Temperature and current monitoring
    - Thermal shutdown in the event of thermal runaway
    - SSH, NTP, PTP, TFTP, secure FTP Support
    - Custom configuration files
    - Web server interaction
    - Link and port counter status
    - Configurable port speed/routing

BLOCK DIAGRAM



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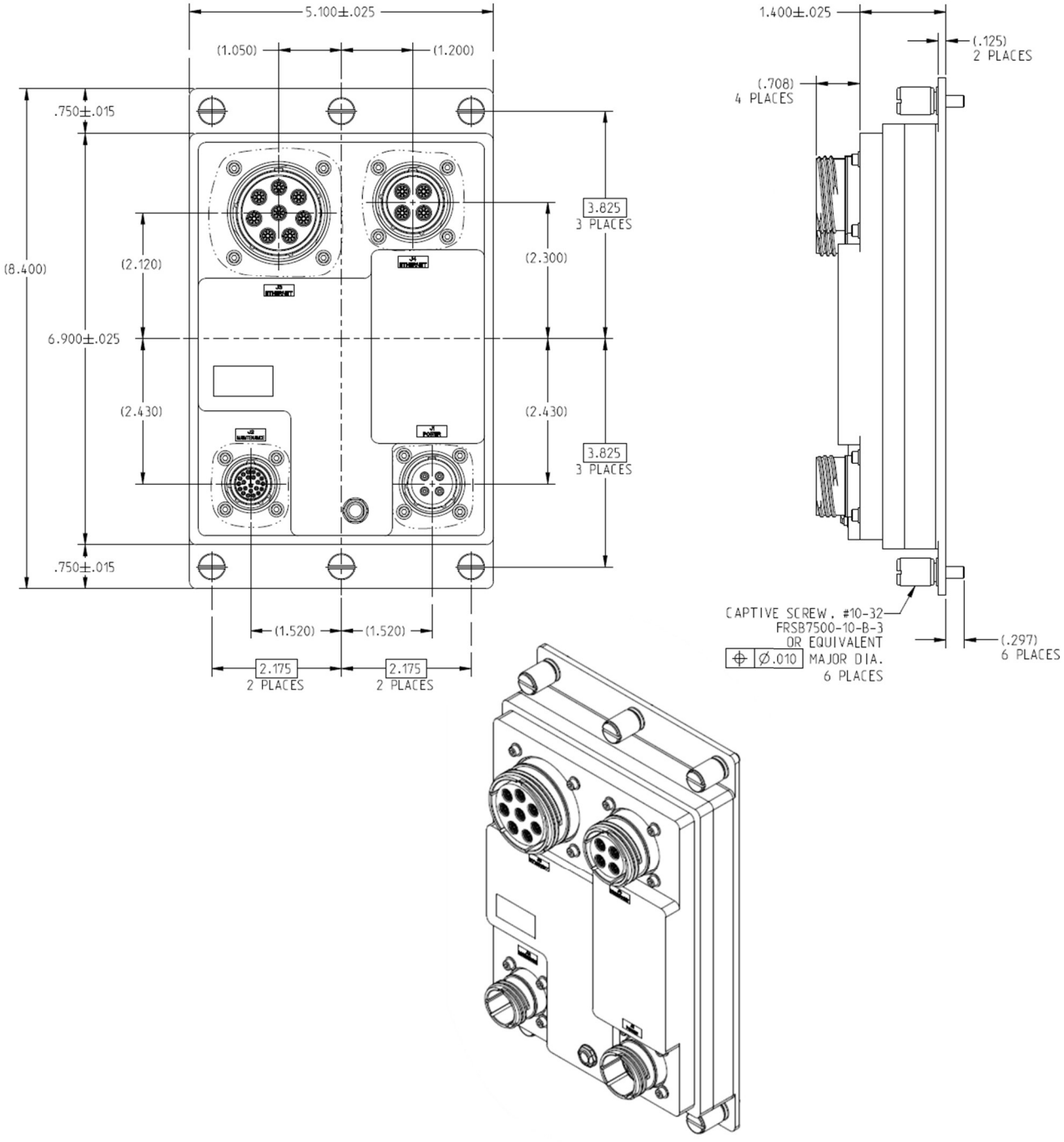
ORDERING INFORMATION

PART NUMBER	DESCRIPTION
CF-020400-076	12-channel rugged network switch, 10GBASE-T

MECHANICAL SPECIFICATIONS

CF-020400-076



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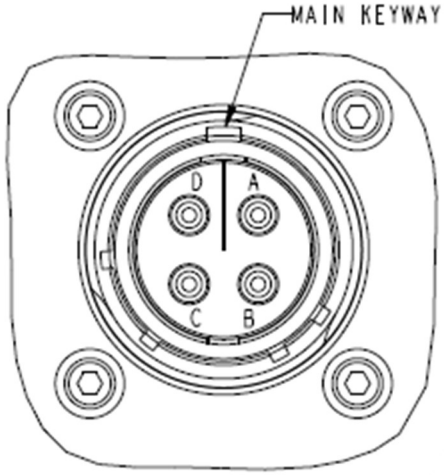
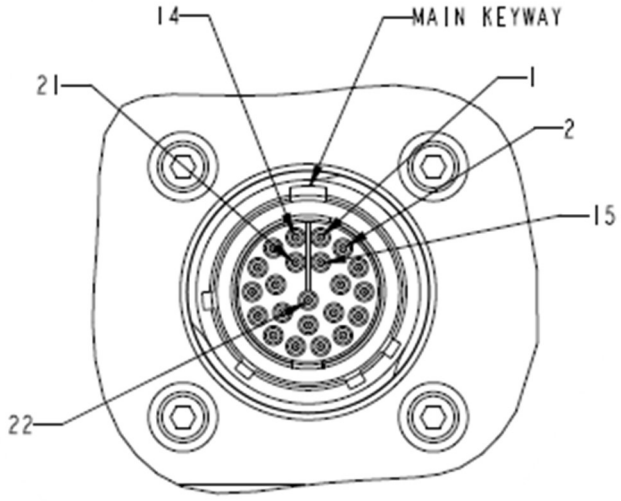
PINOUT

I/O CHART			
CONNECTOR DESCRIPTION	PIN NO.	DATA DIRECTION	SIGNAL NAME
J1 (POWER) 15-4P	A	IN	280VDC_IN
	B	OUT	28VDC_RTN
	C	--	SAFETY GROUND / CHASSIS
	D	--	NOT CONNECTED
	SHELL	--	CHASSIS
J2 (MAINTENANCE) 13-35P	1	OUT	RS232_CONSOLE_TX
	2	IN	RS232_CONSOLE_RX
	3	--	RS232_CONSOLE_GND
	4	OUT	POWER_SUPPLY_STATUS
	5	IN	RS232_PIC_RX
	6	OUT	RS232_PIC_TX
	7	OUT	CHASSIS_STATUS
	8	--	RS232_PIC_GND
	9	OUT	TEMP_WARNING_STATUS
	10	BI	DEBUG_I2C_SCL
	11	BI	DEBUG_I2C_SDA
	12	--	RESET
	13	--	RESET_RETURN
	14	BI	DEBUG_CPU_1GBASET_DA+
	15		DEBUG_CPU_1GBASET_DA-
	16		DEBUG_CPU_1GBASET_DB+
	17		DEBUG_CPU_1GBASET_DB-
	18		DEBUG_CPU_1GBASET_DC+
	19		DEBUG_CPU_1GBASET_DC-
	20		DEBUG_CPU_1GBASET_DD+
	21		DEBUG_CPU_1GBASET_DD-
	22	--	NOT CONNECTED
	SHELL	--	CHASSIS



J1



J2

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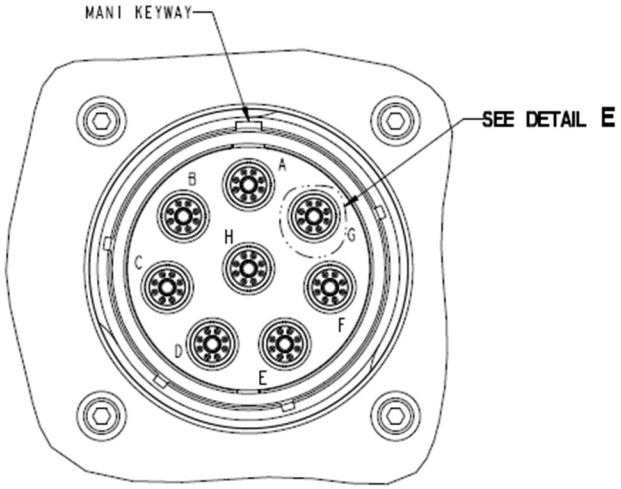
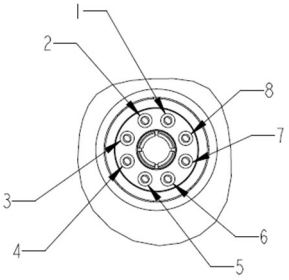
I/O CHART			
CONNECTOR DESCRIPTION	PIN NO.	DATA DIRECTION	SIGNAL NAME
J3 10GBASE-T 25-8S	A-1	BI	PORT1_10GBASE-T_DA+
	A-2		PORT1_10GBASE-T_DA-
	A-3		PORT1_10GBASE-T_DB+
	A-4		PORT1_10GBASE-T_DB-
	A-5		PORT1_10GBASE-T_DC+
	A-6		PORT1_10GBASE-T_DC-
	A-7		PORT1_10GBASE-T_DD+
	A-8		PORT1_10GBASE-T_DD-
	A-OUTER		CHASSIS
	B-1	BI	PORT2_10GBASE-T_DA+
	B-2		PORT2_10GBASE-T_DA-
	B-3		PORT2_10GBASE-T_DB+
	B-4		PORT2_10GBASE-T_DB-
	B-5		PORT2_10GBASE-T_DC+
	B-6		PORT2_10GBASE-T_DC-
	B-7		PORT2_10GBASE-T_DD+
	B-8		PORT2_10GBASE-T_DD-
	B-OUTER		CHASSIS
	C-1	BI	PORT3_10GBASE-T_DA+
	C-2		PORT3_10GBASE-T_DA-
	C-3		PORT3_10GBASE-T_DB+
	C-4		PORT3_10GBASE-T_DB-
	C-5		PORT3_10GBASE-T_DC+
	C-6		PORT3_10GBASE-T_DC-
	C-7		PORT3_10GBASE-T_DD+
	C-8		PORT3_10GBASE-T_DD-
	C-OUTER		CHASSIS
	D-1	BI	PORT4_10GBASE-T_DA+
	D-2		PORT4_10GBASE-T_DA-
	D-3		PORT4_10GBASE-T_DB+
	D-4		PORT4_10GBASE-T_DB-
	D-5		PORT4_10GBASE-T_DC+
	D-6		PORT4_10GBASE-T_DC-
	D-7		PORT4_10GBASE-T_DD+
	D-8		PORT4_10GBASE-T_DD-
	D-OUTER		CHASSIS
	E-1	BI	PORT5_10GBASE-T_DA+
	E-2		PORT5_10GBASE-T_DA-
	E-3		PORT5_10GBASE-T_DB+
	E-4		PORT5_10GBASE-T_DB-
	E-5		PORT5_10GBASE-T_DC+
	E-6		PORT5_10GBASE-T_DC-
	E-7		PORT5_10GBASE-T_DD+
	E-8		PORT5_10GBASE-T_DD-
	E-OUTER		CHASSIS
	F-1	BI	PORT6_10GBASE-T_DA+
	F-2		PORT6_10GBASE-T_DA-
	F-3		PORT6_10GBASE-T_DB+
	F-4		PORT6_10GBASE-T_DB-
	F-5		PORT6_10GBASE-T_DC+
	F-6		PORT6_10GBASE-T_DC-
	F-7		PORT6_10GBASE-T_DD+
	F-8		PORT6_10GBASE-T_DD-
	F-OUTER		CHASSIS





DETAIL E

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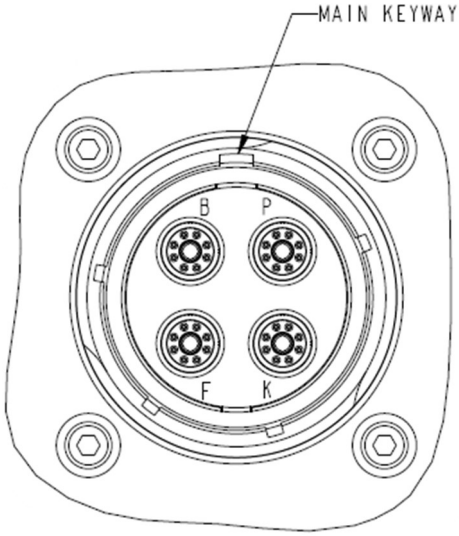
I/O CHART			
CONNECTOR DESCRIPTION	PIN NO.	DATA DIRECTION	SIGNAL NAME
J3 10GBASE-T 25-8S	G-1	BI	PORT7_10GBASE-T_DA+
	G-2		PORT7_10GBASE-T_DA-
	G-3		PORT7_10GBASE-T_DB+
	G-4		PORT7_10GBASE-T_DB-
	G-5		PORT7_10GBASE-T_DC+
	G-6		PORT7_10GBASE-T_DC-
	G-7		PORT7_10GBASE-T_DD+
	G-8		PORT7_10GBASE-T_DD-
	G-OUTER		CHASSIS
	H-1	BI	PORT8_10GBASE-T_DA+
	H-2		PORT8_10GBASE-T_DA-
	H-3		PORT8_10GBASE-T_DB+
	H-4		PORT8_10GBASE-T_DB-
	H-5		PORT8_10GBASE-T_DC+
	H-6		PORT8_10GBASE-T_DC-
	H-7		PORT8_10GBASE-T_DD+
	H-8		PORT8_10GBASE-T_DD-
	H-OUTER		CHASSIS
	SHELL	--	CHASSIS
J4 10GBASE-T 19-ABS	B-1	BI	PORT9_10GBASE-T_DA+
	B-2		PORT9_10GBASE-T_DA-
	B-3		PORT9_10GBASE-T_DB+
	B-4		PORT9_10GBASE-T_DB-
	B-5		PORT9_10GBASE-T_DC+
	B-6		PORT9_10GBASE-T_DC-
	B-7		PORT9_10GBASE-T_DD+
	B-8		PORT9_10GBASE-T_DD-
	B-OUTER		CHASSIS
	F-1	BI	PORT10_10GBASE-T_DA+
	F-2		PORT10_10GBASE-T_DA-
	F-3		PORT10_10GBASE-T_DB+
	F-4		PORT10_10GBASE-T_DB-
	F-5		PORT10_10GBASE-T_DC+
	F-6		PORT10_10GBASE-T_DC-
	F-7		PORT10_10GBASE-T_DD+
	F-8		PORT10_10GBASE-T_DD-
	F-OUTER		CHASSIS
	K-1	BI	PORT11_10GBASE-T_DA+
	K-2		PORT11_10GBASE-T_DA-
	K-3		PORT11_10GBASE-T_DB+
	K-4		PORT11_10GBASE-T_DB-
	K-5		PORT11_10GBASE-T_DC+
	K-6		PORT11_10GBASE-T_DC-
	K-7		PORT11_10GBASE-T_DD+
	K-8		PORT11_10GBASE-T_DD-
	K-OUTER		CHASSIS
	P-1	BI	PORT12_10GBASE-T_DA+
	P-2		PORT12_10GBASE-T_DA-
	P-3		PORT12_10GBASE-T_DB+
	P-4		PORT12_10GBASE-T_DB-
	P-5		PORT12_10GBASE-T_DC+
	P-6		PORT12_10GBASE-T_DC-
	P-7		PORT12_10GBASE-T_DD+
	P-8		PORT12_10GBASE-T_DD-
	P-OUTER		CHASSIS
	SHELL	--	CHASSIS



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Amphenol Ruggedization Design

OVERVIEW:

Amphenol integrated electronic products are designed and manufactured to our Ruggedization guidelines listed below. These guidelines ensure years of reliable operation in harsh environment applications where extreme operating temperatures, shock, vibration, and corrosive atmospheres are regularly experienced. Unless otherwise noted, the parts conform to the below specifications

TEMPERATURE:

- Operating Temperature
  - Thermal Cycles between -40°C and 85°C while device is operating
- Temperature is measured at chassis housing or card edge
  - Storage Temperature- Thermal Cycles between -55 °C and 125°C

HUMIDITY:

- Operating Humidity
  - Humidity cycle between 0-100% non-condensing humidity while device operating
- Storage Humidity
  - Humidity cycle between 0-100% condensing humidity

SEALING:

- Sealing can be optionally provided at the MIL-DTL-38999 interface with up to 10^{-5} cc/sec performance

SHOCK AND VIBRATION:

- Sine Vibration
  - PORT1_10G Peak, 5-2,000Hz
  - Based on a sine sweep duration of 10 minutes per axis in each of three mutually perpendicular axes. May be displacement limited from 5 to 44 Hz, depending on specific test.
- Random Vibration
  - 0.0005 @ 5Hz, 0.1 @ 15 Hz, 0.1 @ 2,000 Hz
  - 60 minutes per axis, in each of three mutually perpendicular axes.
- 40 G Peak Shock Cycle
  - Three hits in each axis, both directions, ½ sine and terminal-peak saw tooth, Total 36 hits.

FLUIDS SUSEPTABILITY:

- MIL-DTL-38999 receptacle interface per EIA-364-10E

ALTITUDE:

- -1,500 to 60,000 ft Altitude Testing w/ Rapid Depressurization

ELECTRONMAGNETIC COMPATIBILITY:

- Designed to comply with MIL-STD-461E

PRINTED CIRCUIT BOARD ASSEMBLIES:

- Conformal Coat
  - Amphenol performs Conformal Coating to both sides of printed circuit board assemblies using HUSMISEAL IB31 in accordance with IPC-610, Class 3.
- Printed Circuit Board Rigidity
  - Amphenol printed circuit boards are fabricated in accordance with IPC-6012, Class 3.
- Printed Circuit Board Fabrication
  - Amphenol printed circuit boards acceptance criteria is in accordance with IPC-610, Class 3.

OTHER:

- Designed for MIL-STD-704F Power
- Salt/Fog/Dust
- Fluids and Rain
- Explosive atmosphere

RELIABILITY PREDICTIONS (MTBF):

Amphenol can perform Mean Time Between Failure (MTBF) reliability analysis in full compliance with MIL-HDBK-217F-1 Parts Count Prediction and MIL- HDBK-217F-1 Parts Stress Analysis Prediction. We can also perform reliability analyses in full compliance of ANSI/VITA 51.1 if it is required or preferred over the later method.

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Amphenol
MILITARY HIGH SPEED

40-60 Delaware Avenue
Sidney, NY 13838
amphenol-aerospace.com | amphenolmao.com