



VIKING SERIES

10X 10/100/1000BASE-T + 2X10GBASE-SR PORTS, MIL-DTL-38999,
L2 MANAGED ETHERNET SWITCH, 28VDC



Viking series 10 + 2 Ethernet switches consist of 10x 10/100/1000Base-T ports plus 2x10GBase-SR MMF ports integrated into a wall or floor mounted assembly.

The external copper cable interface of the Viking series 10/100/1000Base-T + 10GBase-SR Ethernet switch is a D38999/25-35 series III connector with 10x IEEE-802.3 compliant Gigabit Ethernet ports plus the power supply and ground connections. The external fiber optic cable interface of the Viking series 10+2 Ethernet switch is a D38999/13-04 series III connector with 2x 10GBase-SR multimode fiber optic ten Gigabit Ethernet ports.

Viking series Ethernet switches are vibration isolated, environmentally hardened components designed for use in harsh environment applications.

- Sealed against liquid and solid contaminants
- Shock and vibration resistant

10 + 2 PORT ETHERNET SWITCH, D38999, 28 VDC, 10X 10/100/1000BASE-T + 2X 10GBASE-SR PORTS, L2 + MANAGED ETHERNET SWITCH

L2 Managed D38999 10 Gigabit Ethernet Switch
10x 10/100/1000Base-T + 2x10GBase-SR Ports

FEATURES

- 10x triple-speed (10/100/1000 Mbps) copper Ethernet ports
- 2x 10GBase-SR Multimode fiber optic Ethernet ports
- Copper cable link distances up to 100 Meters (EIA/TIA Cat-5E)
- Optical fiber link distances up to 300 Meters (50/125µ2000MHz*Km MMF)
- Operating temperature range from -40°C to +85°C
- Full duplex flow control per IEEE Std 802.3X and half duplex back pressure, symmetric and asymmetric*
- Shock, vibration and immersion resistant per RTCA/DO-160G
- Olive drab cadmium plating meets stringent corrosion resistance specifications
- Aluminum connectors and housings are strong, durable and light weight
- Auto sensing of half or full duplex operation*
- 802.1Q VLAN switch with 32K MACs and 4K VLANs
- Push, pop, and translate ingress/egress
- Policing with storm control and MC/BC protection
- Hierarchical quality of service (QoS)

APPLICATIONS

Viking series 10/100/1000Base-T = 10GBase-ST Ethernet switches enable high speed network communications in harsh environments.

The MIL-DTL-38999, Series III shells provide sealed interfaces that are water-tight to MIL-STD-810 when mated.

The 10Gbps multimode optical fiber interface supports applications where copper cable link distance, bandwidth, weight or bulk make the use of twisted pair, twinax or quadrax copper conductors unacceptable.

**See pinout pages 8-10 for port specific specifications*

ORDERING INFORMATION

Application	Part Number
10x10/100/1000Base-T + 2x10GBase-SR	VM448-AiWN

See Appendix A2 for more part number options

10 + 2 PORT ETHERNET SWITCH, D38999, 28 VDC, 10X 10/100/1000BASE-T + 2X 10GBASE-SR PORTS, L2 + MANAGED ETHERNET SWITCH

ABSOLUTE MAXIMUM RATINGS

Absolute maximum limits mean that no catastrophic damage will occur if the product is subjected to these ratings for short periods, provided each limiting parameter is in isolation and all other parameters have values within the performance specification. It should not be assumed that limiting values of more than one parameter can be applied to the product at the same time.

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Storage Temperature	T_s	-55		+100	°C

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Operating Temperature	T_A	-40		+85	°C
Power Supply Voltage	V_{CC}	+12.0	28.0	+36.0	V
Power Supply Noise (p-p)	N_p			200	mV

MATERIALS

Item	Detail	Notes
Shell and housing	T-6061 Aluminum Alloy	
Shell Plating	OD-CD, NI or ZN-NI	
Insert	Thermoplastic	
Interfacial Seal	Elastomer	
Weight	33.2 oz/940 g	

ELECTRICAL PERFORMANCE SPECIFICATIONS T_A = OPERATING TEMPERATURE RANGE

Parameter	Symbol	Typical	Maximum	Unit
Power Supply Current @ 28VDC	P_i	340	600	mA
Power	P	9.5	12	W

10 + 2 PORT ETHERNET SWITCH, D38999, 28 VDC, 10X 10/100/1000BASE-T + 2X 10GBASE-SR PORTS, L2 + MANAGED ETHERNET SWITCH

DESIGNED TO SPECIFICATIONS

Requirement	Description	Section
MIL-STD-461	Conducted Emissions	CE102
MIL-STD-461	Conducted Susceptibility	CS101, CS114-116
MIL-STD-461	Radiated Emissions	RE102
MIL-STD-461	Radiated Susceptibility	RS103
MIL-STD-810	High/Low Temp Opp	M 501.6 / 502.6 P II
MIL-STD-810	High/Low Temp Storage	M 502.6 / 502.6 P I
MIL-STD-810	Altitude Opp / Non-Opp	M 500 P I, 15k feet
MIL-STD-810	Humidity	M 507, P II
MIL-STD-810	Acoustic Noise	M 515.7 P I
MIL-STD-810	Shock	> 100G
MIL-STD-810	Vibration	M 514
MIL-STD-810	Sea Salt Atmosphere	M 509
MIL-STD-810	Fungus	M 508.6
ANSI/ESD S20.20	ESD	Class 1
MIL-STD-704	Steady State Limits for Voltage	LDC102
MIL-STD-704	Voltage Distortion Spectrum	LDC103
MIL-STD-704	Total Ripple	LDC104
MIL-STD-704	Normal Voltage Transients	LDC105
MIL-STD-704	Steady State Limits	LDC301
MIL-STD-704	Abnormal Voltage Transients	LDC302
MIL-STD-704	Steady State Limits for Voltage	LDC401
MIL-STD-704	Starting Voltage Transients	LDC501

10 + 2 PORT ETHERNET SWITCH, D38999, 28 VDC, 10X 10/100/1000BASE-T + 2X 10GBASE-SR PORTS, L2 + MANAGED ETHERNET SWITCH

ETHERNET SWITCH MANAGEMENT FEATURES WEB-BASED GUI FOR CONFIGURATION	
Performance	Parameter
1	Cable Diagnostic
	Cascading
	EEE Power Saving (IEEE 802.3az)
	AVS
	Link Aggregation
2	Jumbo Frame Support
	Switching/MAC Learning
	Broadcast Storm Control
	VLAN Support (Multiple Bridging Domains)
	Isolation Group (Tree)
	AutoVoIP
2 QoS	AutoDOS
	8 Queues Per Port
	IEEE 802.1p Priority Mapping
	DSCP Priority Mapping
	Scheduling Configurable SP
	Scheduling Configurable WRR
	Metering Rate Limiting
	Shaping Queue/Port
	Flow Control - PAUSE IEEE 802.3x
Management	Flow Contol - PFC IEEE 802.
	Debug CLI
	RESTful API
Multicast	Rx and Tx Counters
	IGMP Snooping
Protocols and Advanced	LLDP
	Rapid Spanning Tree

10 + 2 PORT ETHERNET SWITCH, D38999, 28 VDC, 10X 10/100/1000BASE-T + 2X 10GBASE-SR PORTS, L2 + MANAGED ETHERNET SWITCH

OPTICAL TRANSMITTERS T_A = OPERATING TEMPERATURE RANGE

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Output Power (BER<10 ⁻¹²)	P_o	-5.0		-1.0	dBm
Optical Output Wavelength	λ_{OUT}	840	850	860	nM
Spectral Width	$\Delta\lambda_{RMS}$			0.45	nM
Extinction Ratio	ER	3.0	5.5		dB

OPTICAL RECEIVERS T_A = OPERATING TEMPERATURE RANGE

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Sensitivity (BER<10 ⁻¹²)	P_i	-11.1		0.0	dBm
Optical Output Wavelength	λ_{IN}	840	850	860	nM

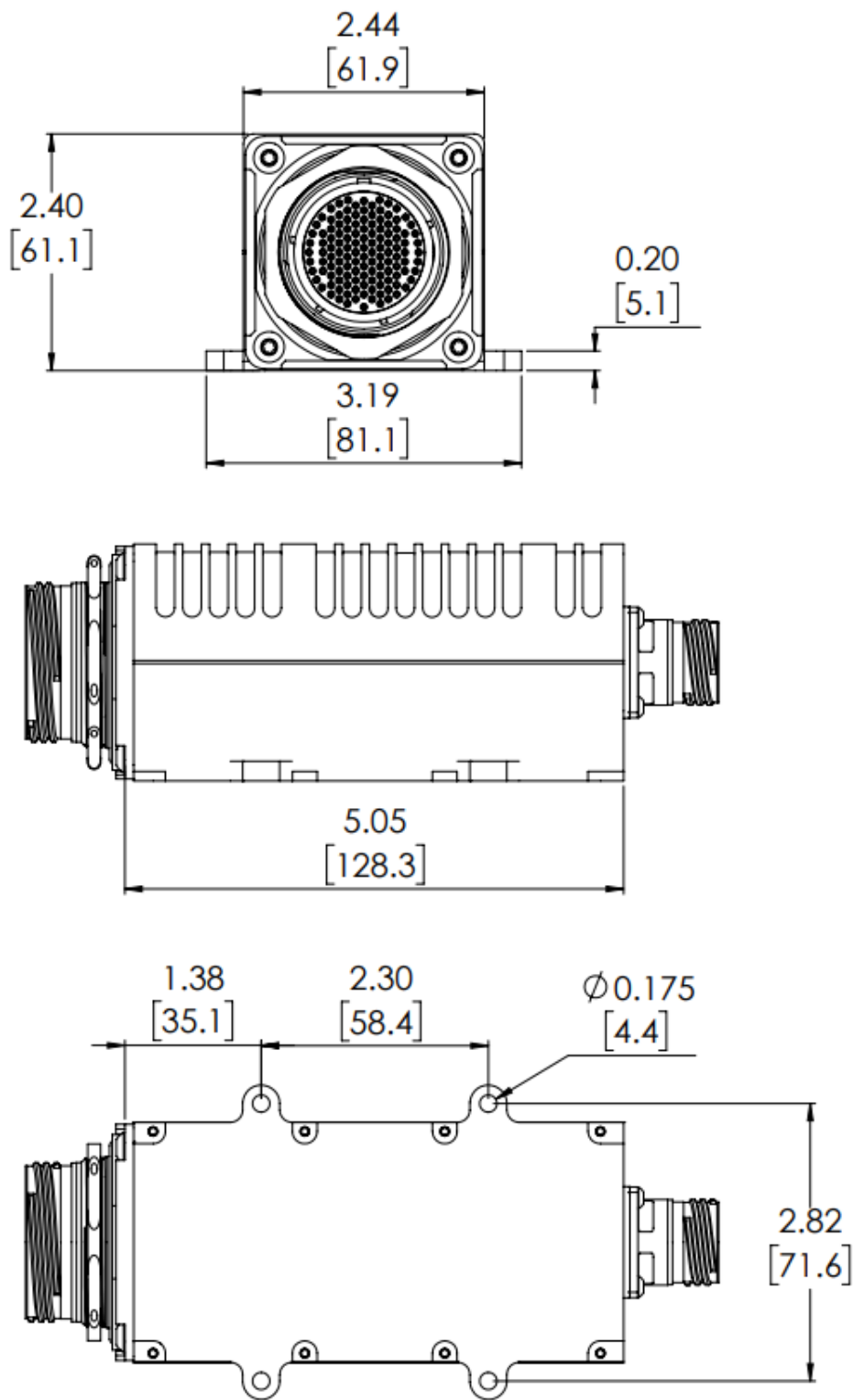
OPTICAL LINK DISTANCES

Cable Type	62.5/125 160MHz*Km	62.5/125 200MHz*Km	50/125 400MHz*Km	50/125 500MHz*Km	50/125 2000MHz*Km
Maximum Supported Link Distance - Meters	26	33	66	82	300

10 + 2 PORT ETHERNET SWITCH, D38999, 28 VDC, 10X 10/100/1000BASE-T + 2X 10GBASE-SR PORTS, L2 + MANAGED ETHERNET SWITCH

OUTLINE DRAWING

Dimensions are shown as: inches [mm]



10 + 2 PORT ETHERNET SWITCH, D38999, 28 VDC, 10X 10/100/1000BASE-T + 2X 10GBASE-SR PORTS, L2 + MANAGED ETHERNET SWITCH

J1 / D38999/24XJ35PN ELECTRICAL PIN FUNCTIONS - CONTINUED ON NEXT PAGE

Port #	Pin #	Function	RJ-45 Eq. Pin#	Logic Family
1	9	MDA+	1	IEEE-802.3 - 10/100/1000Base-T
	17	MDA-	2	
	10	MDB+	3	
	18	MDB-	6	
	11	MDC+	4	
	19	MDC-	5	
	12	MDD+	7	
	20	MDD-	8	
2	25	MDA-	2	
	36	MDA+	1	
	26	MDB-	6	
	37	MDB+	3	
	27	MDC-	5	
	38	MDC+	4	
	28	MDD-	8	
	39	MDD+	7	
3	48	MDA+	1	
	59	MDA-	2	
	49	MDB+	3	
	60	MDB-	6	
	50	MDC+	4	
	61	MDC-	5	
	51	MDD+	7	
	62	MDD-	8	
4	71	MDA+	1	
	82	MDA-	2	
	72	MDB+	3	
	83	MDB-	6	
	73	MDC+	4	
	84	MDC-	5	
	74	MDD+	7	
	85	MDD-	8	

10 + 2 PORT ETHERNET SWITCH, D38999, 28 VDC, 10X 10/100/1000BASE-T + 2X 10GBASE-SR PORTS, L2 + MANAGED ETHERNET SWITCH

J1 / D38999/24XJ35PN ELECTRICAL PIN FUNCTIONS - CONTINUED ON NEXT PAGE

Port #	Pin #	Function	RJ-45 Eq. Pin#	Logic Family
5	94	MDA+	1	IEEE-802.3 - 10/100/1000Base-T
	105	MDA-	2	
	95	MDB+	3	
	106	MDB-	6	
	96	MDC+	4	
	107	MDC-	5	
	97	MDD+	7	
	108	MDD-	8	
6	109	MDA-	1	
	117	MDA+	2	
	110	MDB-	3	
	118	MDB+	6	
	111	MDC-	4	
	119	MDC+	5	
	112	MDD-	7	
	120	MDD+	8	
7	90	MDA+	1	
	101	MDA-	2	
	91	MDB+	3	
	102	MDB-	6	
	92	MDC+	4	
	103	MDC-	5	
	93	MDD+	7	
	104	MDD-	8	
8	66	MDA+	1	
	78	MDA-	2	
	67	MDB+	3	
	79	MDB-	6	
	68	MDC+	4	
	80	MDC-	5	
	69	MDD+	7	
	81	MDD-	8	

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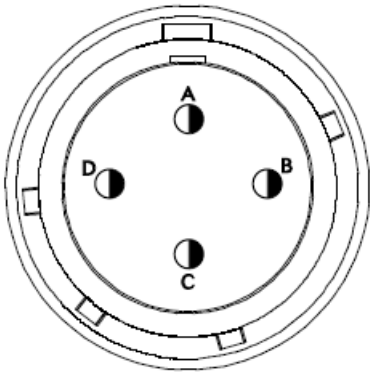
J1 / D38999/24XJ35PN ELECTRICAL PIN FUNCTIONS - CONTINUED FROM PREVIOUS PAGE

Port #	Pin #	Function	RJ-45 Eq. Pin#	Logic Family
9	43	MDA+	1	Ports 9-10 Do Not Support Half-Duplex Operation
	55	MDA-	2	
	44	MDB+	3	
	56	MDB-	6	
	45	MDC+	4	
	57	MDC-	5	
	46	MDD+	7	
	58	MDD-	8	
10	21	MDA-	1	
	32	MDA+	2	
	22	MDB-	3	
	33	MDB+	6	
	23	MDC-	4	
	34	MDC+	5	
	24	MDD-	7	
	35	MDD+	8	
All	1	N/C	N/A	N/A
	2	N/C		
	3	CASE GND		
	4	+28V		
	5	28V RTN		
	6	N/C		
	7	N/C		
	14	N/C		
	100	Reset		Active Low LvTTL
	121	CLI		RS232_IN*
	128	CLI		RS232_OUT*
	47	Ground		RS 232_GND*

*RS-232 port is wired in a straight-through configuration

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J2 PIN FUNCTIONS ETHERNET PORT AND PIN ASSIGNMENTS TOP



Front view of the D38999 optical insert shown, fiber optic cable plug opposite - see Appendix A1 for details

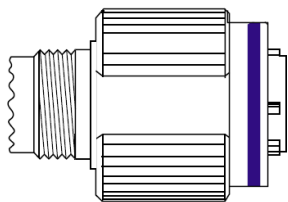
MIL-DTL-38999/20XC4PN OPTICAL INTERFACE		
Port Number	TX	RX
1	A	B
2	C	D

10 + 2 PORT ETHERNET SWITCH, D38999, 28 VDC, 10X 10/100/1000BASE-T + 2X 10GBASE-SR PORTS, L2 + MANAGED ETHERNET SWITCH

***D38999 PLUG - RECEPTACLE INSERT**

MIL-DTL-38999 Cable Plug

MS PLUG P/N	*J1: D38999/26xJ35Sy *J2: D38999/26xC4Sy
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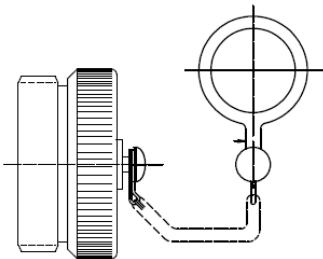


x = Finish, y = Polarization Option

***CABLE PROTECTION CAP**

D38999/32 Plug Protection Cap

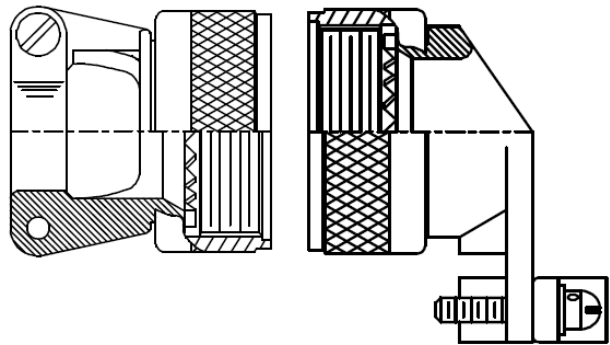
MS PLUG CAP P/N	*J1: D38999/32x25N *J2: D38999/32x13N
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***CABLE BACKSHELL**

MIL-C-85049 Cable Backshell

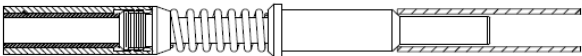
MS BACKSHELL P/N	*MS85049/xxxxxx**
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***FIBER OPTIC TERMINUS**

M29504 Receptacle Terminus

RECEPTACLE	*M29504/05-xxxx**
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**defined by fiber optic cable configuration

J2 D38999 PLUG PORT FUNCTIONS

Port Number	TX	RX
1	A	B
2	C	D

10 + 2 PORT ETHERNET SWITCH, D38999, 28 VDC, 10X 10/100/1000BASE-T + 2X 10GBASE-SR PORTS, L2 + MANAGED ETHERNET SWITCH

APPENDIX A2 PART NUMBER OPTIONS

VM448 - Ai W N

BASE PART NUMBER
VM448 = Viking Managed Ethernet Switch

CONFIGURATION
Ai = L2 Managed 10 + 2 Port Ethernet Switch

SHELL FINISH
F = NI
W = OD CD / NI
Z = ZN / NI
SHELL POLARIZATION
N = N
A = A
B = B
C = C
D = D



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