

## Viking Series

10/100/1000Base-T/BX, Auto MDI/  
MDIx, Autonegotiable D38999,  
BiDirectional Single Fiber Optical Link

### 5 Port (4+1), Jam Nut

#### FEATURES

- 4x10/100/1000Base-T nonblocking wire speed copper Ethernet ports per IEEE 802.3:2005
- 1x1000Base-BX-U/D single fiber Ethernet port per IEEE 802.3:2005
- Electrical cable links up to 100 Meters (EIA/TIA Cat-5E)
- Fiber optic link distances up to 80.0Km over 9/125 $\mu$  SMF single fiber optical cables per IEEE 802.3:2005
- Operating temperature range from -40°C to +85°C
- Single fiber \*ELIO® connector interface per EN4531 / 3645 / 4626 / ARINC 801
- Shock, vibration and immersion resistant per MIL-STD-810
- OD-CD, NI or ZN-NI plating options for excellent corrosion resistance
- Aluminum connector shells and housing are strong, durable and light weight

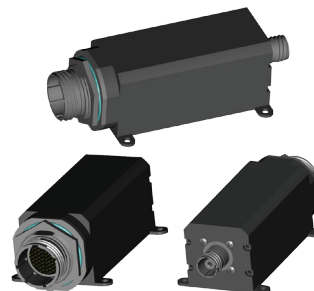
#### APPLICATIONS

Viking series 4+1 port BiDirectional Ethernet switches enable high speed network communications over long distances in harsh environments.

- Civil and military vehicle networking
- Aerospace and naval platform networks
- Unmanaged Ethernet switch applications
- Undersea to surface data transmission

The MIL-DTL-38999, Series III connectors provide a sealed interface that is water-tight to MIL-STD-810 when mated.

\*ELIO® is a registered trademark of Esterline Souriau



D38999In-Line4+1Port10/100/1000Base-T/BXEthernetSwitch

#### DESCRIPTION

Viking series 10/100/1000Base-T/BX Ethernet switches consist of 4x10/100/1000Base-T ports plus 1x1000Base-BX-U/D port in a wall or floor mounted inline MIL-DTL-38999 connector assembly.

The Viking series Ethernet switch offers two separate D38999 Ethernet connector interfaces. One interface is a D38999/19-35 with 4x10/100/1000Base-T Ethernet ports compliant with IEEE-802.3U:2005 plus the 28VDC interface. The other interface is a D38999/09-01 with 1x1000Base-BX-U/D Ethernet fiber optic port per IEEE-802.3U:2005.

The Viking 4+1 port Single Fiber Ethernet switch is a highly integrated and extremely rugged solution for harsh environment networking applications. Its small size, light weight and low power requirements make it an excellent fit for next generation networks.

Viking series 10/100/1000Base-T/BX Ethernet switches are vibration isolated, environmentally hardened units designed for use in harsh environment applications.

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

#### ORDERING INFORMATION

Application	Part Number
10/100/1000Base-T/BX-U upstream - 10Km	V41J-5UAB-FF-U
10/100/1000Base-T/BX-D downstream - 10Km	V41J-5UAB-FF-D
10/100/1000Base-T/BX-U upstream - 80Km	V41J-5UAB-FF-UZ
10/100/1000Base-T/BX-D downstream - 80Km	V41J-5UAB-FF-DZ

See Appendix A2 for more part number options

# Facilitating Secure Communications in Harsh Environments

## 4+1 Port Viking Series Ethernet Switch with BiDirectional Single Fiber Optical Link 4x10/100/1000Base-T / 1x1000Base-BX-U/D, 28VDC

### 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
Supply Voltage	$V_{CC}$	+18.0	28.0	+36.0	V
Power Supply Noise (p-p)	$N_p$			200	mV

### INTERFACE SPECIFICATIONS COMPLIANCE

Requirement	Feature	Condition	Notes
MIL-STD-883	ESD	Class II	2200V
MIL-STD-810	Vibration	3.8g <sup>2</sup> /Hz	43G rms
MIL-STD-810	Shock	40.0g	6-9mS
MIL-STD-810	Immersion	1.0 meter	2.0Hours
MIL-STD-1344	Flame Resistance	Method 1012	30 Seconds
MIL-STD-1344	Damp Heat	10 Cycles	24 Hours
FDA / CDRH / IEC-825-1	Eye Safety	Class 1	No Safety Interlocks Required

### MATERIALS

Item	Detail	Notes
Shell and housing	Aluminum Alloy	
Plating	OD-CD, NI or ZN-NI	
Insert	Thermoplastic	
Interfacial Seal	Elastomer	
Alignment Sleeves	Composite Polymer	

# Facilitating Secure Communications in Harsh Environments

4+1 Port Viking Series Ethernet Switch with BiDirectional Single Fiber Optical Link  
4x10/100/1000Base-T / 1x1000Base-BX-U/D, 28VDC

## OPTICAL TRANSMITTERS $T_A$ = Operating Temperature Range

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Output Power xxxx-xxxx-xx-x xxxx-xxxx-xx-xZ	$P_o$	-9.5 -1.0		-4.0 +5.0	dBm

## OPTICAL RECEIVERS $T_A$ = Operating Temperature Range

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Sensitivity xxxx-xxxx-xx-x xxxx-xxxx-xx-xZ	$P_i$	-20.0 -24.0		-2.0 +8.0	dBm

## POWER SUPPLY CURRENT $T_A$ = Operating Temperature Range

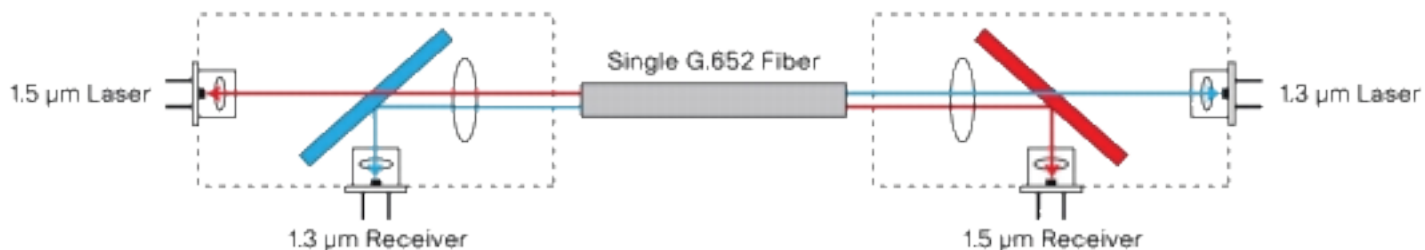
Parameter	Symbol	Minimum	Typical	Maximum	Unit
Supply Current per Port @ 28VDC	$I_{cct}$		250	350	mA

## OPTICAL LINK DISTANCES

Protocol	Cable Specification	Distance
Gigabit Ethernet - IEEE-802.3:2005 - 1000BASE-BX xxxx-xxxx-xx-x xxxx-xxxx-xx-xZ	9/125 $\mu$ SMF	10.0Km 80.0Km

## COPPER LINK DISTANCES

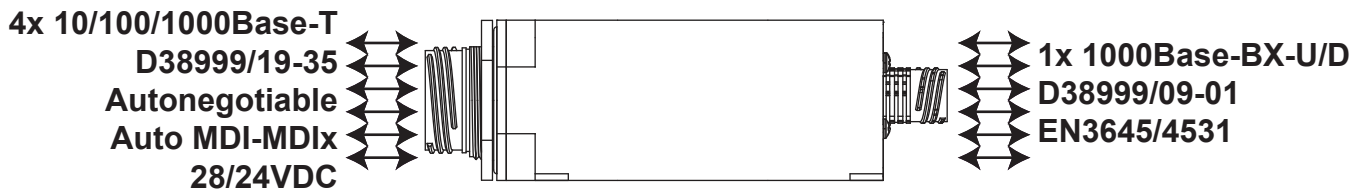
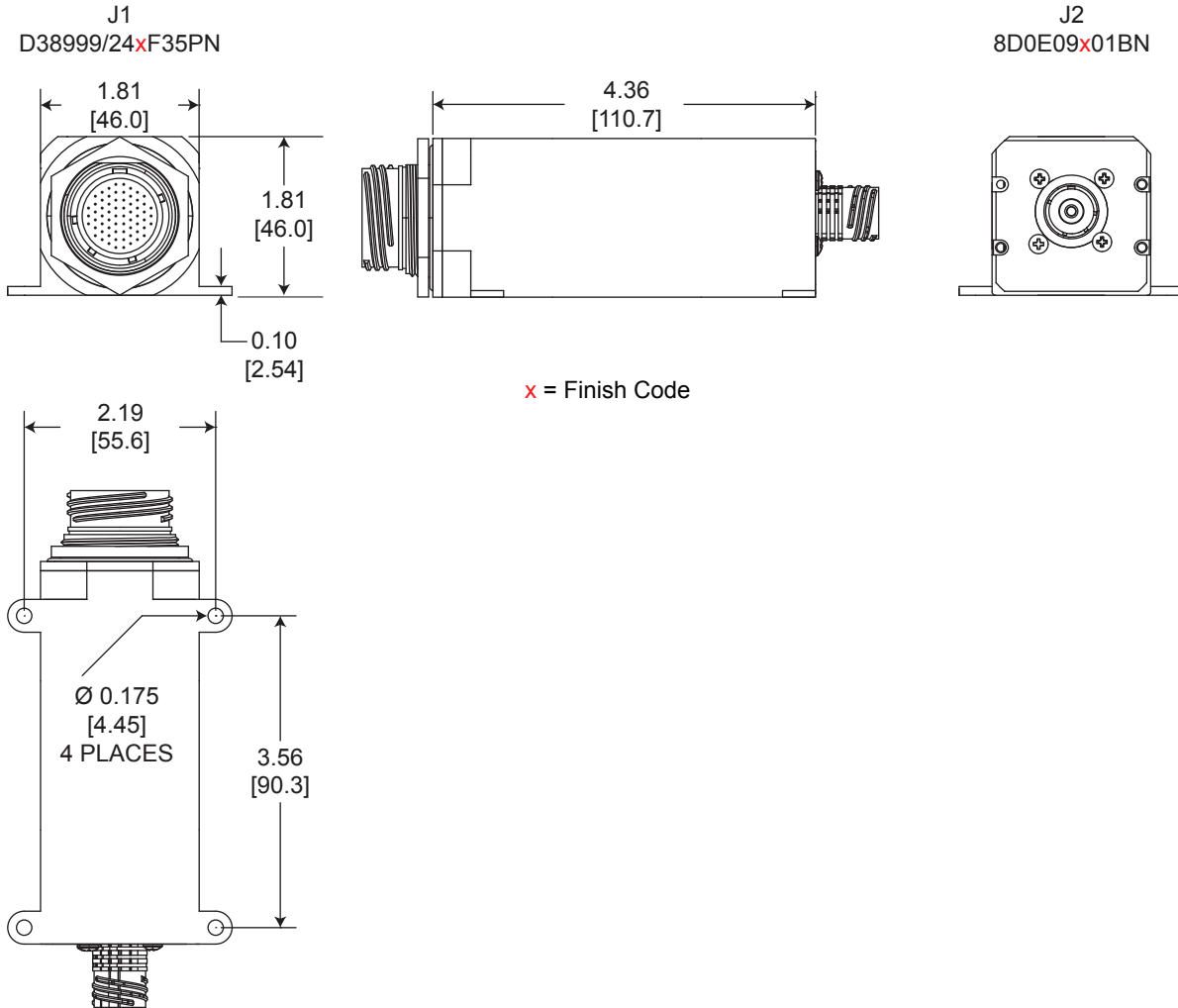
Protocol	Cable Specification	Distance
Gigabit Ethernet - IEEE-802.3:2005 - 10/100/1000BASE-T	TIA/EIA-568-B Cat 5E	100M



4+1 Port Viking Series Ethernet Switch with BiDirectional Single Fiber Optical Link  
 4x10/100/1000Base-T / 1x1000Base-BX-U/D, 28VDC

## OUTLINE DRAWING

Dimensions are shown as: inches (mm)



## PORT / FUNCTION ASSIGNMENTS

Port #	Function
J1	4x10/100/1000Base-T + 28VDC
J2	1x1000Base-BX-U/D

# Facilitating Secure Communications in Harsh Environments

4+1 Port Viking Series Ethernet Switch with BiDirectional Single Fiber Optical Link  
4x10/100/1000Base-T / 1x1000Base-BX-U/D, 28VDC

## J1 / D38999/24xF35PA ELECTRICAL PIN FUNCTIONS - Continued on next page

Pin #	Port #	Function	RJ-45 Eq. Pin #	Logic Family
1	ALL	GND	N/A	Isolated from Case GND
2	ALL	GND	N/A	Isolated from Case GND
3	ALL	GND	N/A	Isolated from Case GND
4	N/A	N/C	N/A	Do Not Connect - Factory Use Only
5	0	MDD-	8	IEEE-802.3.2005 10/100/1000Base-T
6	0	MDD+	7	IEEE-802.3.2005 10/100/1000Base-T
7	1	MDD-	8	IEEE-802.3.2005 10/100/1000Base-T
8	1	MDD+	7	IEEE-802.3.2005 10/100/1000Base-T
9	N/A	N/C	N/A	Do Not Connect - Factory Use Only
10	N/A	N/C	N/A	Do Not Connect - Factory Use Only
11	0	MDC-	5	IEEE-802.3.2005 10/100/1000Base-T
12	0	MDC+	4	IEEE-802.3.2005 10/100/1000Base-T
13	N/A	N/C	N/A	Do Not Connect - Factory Use Only
14	1	MDC-	5	IEEE-802.3.2005 10/100/1000Base-T
15	1	MDC+	4	IEEE-802.3.2005 10/100/1000Base-T
16	N/A	N/C	N/A	Do Not Connect - Factory Use Only
17	N/A	N/C	N/A	Do Not Connect - Factory Use Only
18	0	MDB-	6	IEEE-802.3.2005 10/100/1000Base-T
19	0	MDB+	3	IEEE-802.3.2005 10/100/1000Base-T
20	N/A	N/C	N/A	Do Not Connect - Factory Use Only
21	N/A	N/C	N/A	Do Not Connect - Factory Use Only
22	1	MDB-	6	IEEE-802.3.2005 10/100/1000Base-T
23	1	MDB+	3	IEEE-802.3.2005 10/100/1000Base-T
24	N/A	N/C	N/A	Do Not Connect - Factory Use Only
25	N/A	N/C	N/A	Do Not Connect - Factory Use Only
26	0	MDA-	2	IEEE-802.3.2005 10/100/1000Base-T
27	0	MDA+	1	IEEE-802.3.2005 10/100/1000Base-T
28	N/A	N/C	N/A	Do Not Connect - Factory Use Only
29	N/A	N/C	N/A	Do Not Connect - Factory Use Only
30	N/A	N/C	N/A	Do Not Connect - Factory Use Only
31	1	MDA-	2	IEEE-802.3.2005 10/100/1000Base-T
32	1	MDA+	1	IEEE-802.3.2005 10/100/1000Base-T
33	N/A	N/C	N/A	Do Not Connect - Factory Use Only
34	N/A	N/C	N/A	Do Not Connect - Factory Use Only

# Facilitating Secure Communications in Harsh Environments

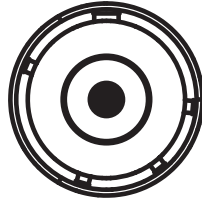
4+1 Port Viking Series Ethernet Switch with BiDirectional Single Fiber Optical Link  
4x10/100/1000Base-T / 1x1000Base-BX-U/D, 28VDC

## J1 D38999/24WF35PN ELECTRICAL PIN FUNCTIONS - Continued from the previous page

Pin #	Port #	Function	RJ-45 Pin #	Logic Family
35	2	MDA-	2	IEEE-802.3:2005 10/100/1000Base-T
36	2	MDA+	1	IEEE-802.3:2005 10/100/1000Base-T
37	N/A	N/C	N/A	Do Not Connect
38	N/A	N/C	N/A	Do Not Connect
39	N/A	N/C	N/A	Do Not Connect
40	3	MDA+	1	IEEE-802.3:2005 10/100/1000Base-T
41	3	MDA-	2	IEEE-802.3:2005 10/100/1000Base-T
42	N/A	N/C	N/A	Do Not Connect
43	N/A	N/C	N/A	Do Not Connect
44	2	MDB-	6	IEEE-802.3:2005 10/100/1000Base-T
45	2	MDB+	3	IEEE-802.3:2005 10/100/1000Base-T
46	N/A	N/C	N/A	Do Not Connect
47	N/A	N/C	N/A	Do Not Connect
48	3	MDB+	3	IEEE-802.3:2005 10/100/1000Base-T
49	3	MDB-	6	IEEE-802.3:2005 10/100/1000Base-T
50	N/A	N/C	N/A	Do Not Connect
51	N/A	N/C	N/A	Do Not Connect
52	2	MDC-	5	IEEE-802.3:2005 10/100/1000Base-T
53	2	MDC+	4	IEEE-802.3:2005 10/100/1000Base-T
54	N/A	N/C	N/A	Do Not Connect
55	3	MDC+	4	IEEE-802.3:2005 10/100/1000Base-T
56	3	MDC-	5	IEEE-802.3:2005 10/100/1000Base-T
57	N/A	N/C	N/A	Do Not Connect
58	N/A	N/C	N/A	Do Not Connect
59	2	MDD-	8	IEEE-802.3:2005 10/100/1000Base-T
60	2	MDD+	7	IEEE-802.3:2005 10/100/1000Base-T
61	3	MDD+	7	IEEE-802.3:2005 10/100/1000Base-T
62	3	MDD-	8	IEEE-802.3:2005 10/100/1000Base-T
63	N/A	N/C	N/A	Do Not Connect
64	ALL	VCC	N/A	18-36VDC
65	ALL	VCC	N/A	18-36VDC
66	N/A	N/C	N/A	Do Not Connect

4+1 Port Viking Series Ethernet Switch with BiDirectional Single Fiber Optical Link  
4x10/100/1000Base-T / 1x1000Base-BX-U/D, 28VDC

## J2 PIN FUNCTIONS ETHERNET PORT AND PIN ASSIGNMENTS TOP



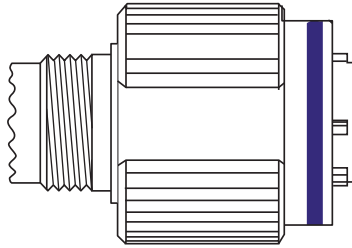
Front view of the D38999 optical  
insert shown, fiber optic cable plug  
opposite - see Appendix A1 for details

4+1 Port Viking Series Ethernet Switch with BiDirectional Single Fiber Optical Link  
4x10/100/1000Base-T / 1x1000Base-BX-U/D, 28VDC

## APPENDIX A1 Mating Fiber Optic Cable - Plug Configuration

### FIBER OPTIC CABLE PLUG - SOCKET INSERT

ESTERLINE SOURIAU PART NUMBER = 8D5E09x01AN    x = Finish Code



### ESTERLINE SOURIAU ELIO TERMINI PART NUMBER

ELIO® singlemode contact  
Ordering information

ELIO	09N	E	L	A
Cable external diameter & Contact sealing:				
09N: 0.9 <sup>±0.1</sup> mm. Non waterproof				
18N: from 1.5mm to 1.9mm. Non waterproof				
18W: 1.8 <sup>±0.1</sup> mm. Waterproof				
20N: from 1.7mm to 2.1mm. Non waterproof				
20W: 2.0 <sup>±0.1</sup> mm. Waterproof				
Fibre type:				
E: ELIO® Singlemode				
Boot type:				
L: Long boot				
S: Short boot				
N: No boot (non waterproof version only)				
Contact version index				





# Facilitating Secure Communications in Harsh Environments

4+1 Port Viking Series Ethernet Switch with BiDirectional Single Fiber Optical Link  
4x10/100/1000Base-T / 1x1000Base-BX-U/D, 28VDC

## APPENDIX A2 PART NUMBER OPTIONS

In-Line, 5x (4+1) Port, 10/100/1000Base-T / BX, Unmanaged Ethernet Switch

**V41 J - 5 U A B - F X - X**

Product Function  
V41= Inline Ethernet Switch

Shell Configuration  
J = Jam Nut

# of Ports  
5 = 4+1

Electrical Interface  
U= 1000Base-T

Power Supply Voltage  
A = 28.0VDC

Optical Interface  
B = 1000Base-BX

D38999 Shell Size  
F = 19-35

Enclosure Finish  
F = NI  
W = OD CD / NI  
Z = ZN / NI

Upstream / Downstream  
U = Upstream  
D = Downstream

Other mounting and interface options are available.  
Please consult the Protokraft website for alternate configurations.