



Features:

- 6U height, full front access (ETSI) shelf
- Hot-swappable cross-connect modules, tributary modules and power modules
- Temperature controlled fan tray
- Cross-connect module
 - STM-1/4 (OC-3/12) software configurable aggregate lines
 - 1+1 protection
- Tributary modules
 - 8 tributary slots
 - Dual ports STM-1/4 (OC-3/12) module
 - Triple ports E3/T3 module with M13 option on T3 tributaries *
 - 16/32/63 ports E1/T1 tributary module
 - 1 GBE and 8 FE tributary module with L2 switch*
 - 1 GBE or 8 FE tributary module without L2 switch*
- Power Modules
 - DC module (-36 to -72 Vdc)
 - AC and DC (coexistent) module (90 to 240 Vac; -36 to -72 Vdc)
 - Dual power (1+ 1) protection
- Networking protection
 - Tributary protection
 - E1/T1: Card, Port, Line
 - E3/T3: Card, Port, Line
 - B155/622: MSP, SNCP
 - Cross-connect Unit (XCU) protection
 - MSP, SNCP
- TM, ADM, and cross-connect
- Full cross-connect at VC11/VC12/VC3/VC4 levels
- External/Internal/Line timing source with SSM
- Ethernet supports GFP, LAPS, VCAT and LCAS
- DTMF Engineering Order-Wire using VoIP phone
- Management
 - Console port, VT100 menu-driven
 - SNMP port
 - Telnet
 - Centralized management over DCC channel
 - SSH

Note: * Future Option

Description:

SM-4000-R STM-1/4 (OC-3/12) is an economical, STM-1/4 (OC-3/12) ADM Rack designed to have full add and drop capability up to:

- 1 STM-4 tributaries
- 8 STM-1 tributaries
- 18 E3/T3 tributaries *
- 378 E1/T1 tributaries
- 48 10/100M Ethernet EoS tributaries *
- 6 GBE EoS tributaries *

With up to 4 STM-1/4 (OC-3/12) interfaces on cross-connect modules and 6 STM1 (OC3) interfaces on tributaries, the SM-4000-R can offer the service provider a versatile protection scheme including SNCP, and MSP (1+1) protection for both ring and linear network topology.

All interfaces are fully compliant with the relevant ETSI standards and ITU recommendations. The SM-4000-R provides powerful Operation, Administration, Maintenance and Provisioning (OAM&P) functionality, including fault management, performance monitoring, configuration management, and network security management. Through console port, LAN port, In-band E1, and DCC channel, the OAM&P can be achieved both locally and remotely via SNMP or menu-driven interfaces.

RoHS Compliance Statement






This product complies with DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the restriction of the use of certain hazardous substances in electrical and electronic equipment, dated 27 January 2003, including ANNEX.

<p>CERTIFIED ISO-9001</p>

Ordering Information

To order specify:

Note: RoHS compliant units are identified by the letter **G** appearing immediately at the end of the ordering code.

Model	Description	Note
Main Unit		
SM-4000-R-CHA-G	6U height Rack chassis for O9400 without CPU and power modules	
CPU Modules and Supporting Plug-in Modules		
SM-4000-R-CC4-G	CPU module with cross-connect unit and two STM-1/4 (OC-3/12) interfaces without SFP (mini-GBIC) optical modules	One required for each chassis Order two for redundancy
SM-4000-R-CBA-G	Connector Board	One required for each chassis
SM-4000-R-FANA-G	Fan Tray with temperature controlled board	One required for each chassis
Tributary Plug-in Modules		
SM-4000-R-16TE-G	16 E1(120 ohm) or 16 T1 software programmable interface plug-in module	Order two with Y box for redundancy
SM-4000-R-32TE-G	32 E1(120 ohm) or 32 T1 software programmable interface plug-in module	Order two with Y box for redundancy
SM-4000-R-63TE-G	63 E1(120 ohm) or 63 T1 software programmable interface plug-in module	Order two with Y box for redundancy
SM-4000-R-16E75-G	16 E1(75 ohm) interface plug-in module	Order two with Y box for redundancy
SM-4000-R-32E75-G	32 E1(75 ohm) interface plug-in module	Order two with Y box for redundancy
SM-4000-R-63E75-G	63 E1(75 ohm) interface plug-in module	Order two with Y box for redundancy
SM-4000-R-B16-G	STM-1/4 (OC-3/12) software programmable interface plug-in module without SFP (mini-GBIC) optical modules	Order two for redundancy
SM-4000-R-9EoS4NSW-G	1 GBE or 8FE interface plug-in module without L2 switch	(Future Option)
SM-4000-R-9EoS4SW-G	1 GBE and 8FE interface plug-in module with L2 switch	(Future Option)
SM-4000-R-3TE3-G	3 T3 or 3 E3 software programmable interface plug-in modules	(Future Option)
Software		
SM-4000-R-3M13-G	A software key to activate the 3TE3 module to have M13 /Mx3 function for T3 interface only	(Future Option)
Accessories		
User's Manual		
SM-4000-R-UMA	Optional, paper copy of User Manual. A CD version of the manual is already included as standard equipment.	
Power Modules		
SM-4000-R-SD48-G	Single -48Vdc (-36 to -72Vdc) power module	For redundancy purposes, ordering a second plug-in module will provide dual power. For AC power module, choose an appropriate power cord.
SM-4000-R-SAD-G	Single AC and DC (coexistent) power module (90 to 240Vac, 50/60Hz and -36 to 72Vdc)	
Power Cord		
ACC-PC-USA	AC power cord for Taiwan/America	
ACC-PC-EU	AC power cord for Europe	
ACC-PC-UK	AC power cord for UK	
ACC-PC-AUS	AC power cord for Australia	
ACC-PC-CH	AC power cord for China	

Order Wire Phone		
SM-4000-R-OW-G	Order Wire (VoIP) Phone	
SIP Proxy Server		
SM-4000-R-SIP	SIP proxy server basic software	
Conversion Panels		
ACC-Y-2SCSI-16RJ-G	1u Y-box panel for two SCSI to 16 RJ connectors without cables	Used for: -16TE, -32TE, -63TE
ACC-Y-2SCSI – 16 WW-G	1u Y-box panel for two SCSI to 16 Wire Wrap without cables	Used for: -16TE, -32TE, -63TE
ACC- Y-2SCSI – 16BNC-G	1.5u Y-box panel for two SCSI to 16 BNC connectors without cables	Used for: -16E75, -32E75, -63E75
ACC-Y-4SCSI- 4T50P8-G	1u Y-box panel for four SCSI to four TELCO 50 connectors (8 ports per TELCO connector) straight without cables	
ACC-Y-4SCSI- 3T50P12-G	1u Y-box panel for four SCSI to three TELCO 50 connectors (12 ports to the first TELCO connector, 12 ports to the second TELCO connector and 8 ports to the third TELCO connector) straight without cables	
ACC-Y-4SCSI- 2T64P16-G	1u Y-box panel for four SCSI to two TELCO 64 connectors (16 ports per TELCO connector) straight without cables	
Cable		
ACC-CAB-SCSIM-2M-SCSIM-G	A 2m SCSI ,68 Pin, male to male cable	
Blank Panels		
30.001076.A00LF	Blank panel for power supply slots	
30.001077.A00LF	Blank panel for other slots	

SFP Optical/Electrical Module Plug-in Tables

155M bps	MHBTW	Multi mode (mini GBIC) SFP, 155M, 1310nm commercial (0 to +70°C), 2Km, LC optical connector	Use 2 fibers for all SFP optical modules
	PHB3W	Single mode (mini GBIC) SFP 155M, 1310nm commercial (0 to +70°C), 30Km, LC optical connector	
	PHB5W	Single mode (mini GBIC) SFP 155M, 1310nm commercial (0 to +70°C), 50Km, LC optical connector	
	PHCUW	Single mode (mini GBIC) SFP 155M, 1550nm commercial (0 to +70°C), 100Km, LC optical connector	
	PHCXW	Single mode (mini GBIC) SFP 155M, 1550nm commercial (0 to +70°C), 120Km, LC optical connector	
	PHB3D	Single mode (mini GBIC) SFP 155M, 1310nm commercial (0 to +70°C), 30Km, LC optical connector with digital diagnostic monitoring	
	PHB5D	Single mode (mini GBIC) SFP 155M, 1310nm commercial (0 to +70°C), 50Km, LC optical connector with digital diagnostic monitoring	
	PHCUD	Single mode (mini GBIC) SFP 155M, 1550nm commercial (0 to +70°C), 100Km, LC optical connector with digital diagnostic monitoring	
	PHCXD	Single mode (mini GBIC) SFP 155M, 1550nm commercial (0 to +70°C), 120Km, LC optical connector with digital diagnostic monitoring	
	EHNAC	Electrical transceiver module, SFP 155M, (-40 to ~+85°C), 100m, mini-BNC coaxial connector	

622M bps	PJB2W	Single mode (mini GBIC) SFP, 622M, 1310nm commercial (0 to +70°C), 15~ 20Km, LC optical connector	Use 2 fibers for all SFP optical modules
	PJB4W	Single mode (mini GBIC) SFP, 622M, 1310nm commercial (0 to +70°C), 40Km, LC optical connector	
	PJB5W	Single mode (mini GBIC) SFP, 622M, 1310nm commercial (0 to +70°C), 50Km, LC optical connector	
	PJC8W	Single mode (mini GBIC) SFP, 622M, 1550nm commercial (0 to +70°C), 80Km, LC optical connector	
	PIB1D	Single mode (mini GBIC) SFP, 155-622M, 1310nm commercial (0 to +70°C), 15Km, LC optical connector with digital diagnostic monitoring	
	PJB2D	Single mode (mini GBIC) SFP, 622M, 1310nm commercial (0 to +70°C), 15~20Km, LC optical connector with digital diagnostic monitoring	
	PJB4D	Single mode (mini GBIC) SFP, 622M, 1310nm commercial (0 to +70°C), 40Km, LC optical connector with digital diagnostic monitoring	
	PJB5D	Single mode (mini GBIC) SFP, 622M, 1310nm commercial (0 to +70°C), 50Km, LC with digital diagnostic monitoring	
	PJC8D	Single mode (mini GBIC) SFP, 622M, 1550nm commercial (0 to +70°C), 80Km, LC optical connector with digital diagnostic monitoring	

NOTE: For other special optical modules, please contact your nearest Olencom sales representative.

SM-4000-R SDH/SONET ADM PRODUCT SPECIFICATIONS

Max. Number of Cross-connect Modules

4 STM-1/4 (OC-3/12) aggregate lines

Max. Number of Tributary Modules

1 STM-4 (OC-12) tributaries
 8 STM-1 (OC3) tributaries
 18 E3/T3 tributaries
 378 E1/T1 tributaries
 6 GBE EoS tributaries
 48 10/100M Ethernet EoS tributaries

SFP Module Characteristics

SFP Optical Module (155 M bps)	Direction	Wavelength (nm)	Connector	Distance
MHBTW	Dual uni-directional fiber	1310nm	LC	2 Km
PHB3W	Dual uni-directional fiber	1310nm	LC	30 Km
PHB5W	Dual uni-directional fiber	1310nm	LC	50 Km
PHCUW	Dual uni-directional fiber	1550nm	LC	100 Km
PHCXW	Dual uni-directional fiber	1550nm	LC	120 Km
PHB3D	Dual uni-directional fiber	1310nm	LC (with DDM)	30 Km
PHB5D	Dual uni-directional fiber	1310nm	LC (with DDM)	50 Km
PHCUD	Dual uni-directional fiber	1550nm	LC (with DDM)	100 Km
PHCXD	Dual uni-directional fiber	1550nm	LC (with DDM)	120 Km
SFP Electrical Module (155 M bps)	Direction	Wavelength (nm)	Connector	Distance
EHNAC	Dual uni-directional	n.a.	Mini-BNC	100 m
SFP Optical Module (622 M bps)	Direction	Wavelength (nm)	Connector	Distance
PJB2W	Dual uni-directional fiber	1310nm	LC	15-20 Km
PJB4W	Dual uni-directional fiber	1310nm	LC	40 Km
PJB5W	Dual uni-directional fiber	1310nm	LC	50 Km
PJC8W	Dual uni-directional fiber	1550nm	LC	80 Km
PIB1D	Dual uni-directional fiber	1310nm	LC (with DDM)	15 Km
PJB2D	Dual uni-directional fiber	1310nm	LC (with DDM)	15-20 Km
PJB4D	Dual uni-directional fiber	1310nm	LC (with DDM)	40 Km
PJB5D	Dual uni-directional fiber	1310nm	LC (with DDM)	50 Km
PJC8D	Dual uni-directional fiber	1310nm	LC (with DDM)	80 Km

E1 Interface

Line Rate	2.048 Mbps \pm 50 ppm	Jitter	ITU G.823
Line Code	AMI/HDB3	Framing	Unframed with a framing monitor on receiving side
Input Signal	ITU G.703	Impedance	75 ohm coax/120 Ω twisted pair
Output Signal	ITU G.703	Connector	SCSI-II 68-pin One connector for 16 ports Two connectors for 32 ports Four connectors for 63 ports
Output Mask	ETS 300 689 Sec.4.2.1.2 ITU G.703		

T1 Interface

Line Rate	1.544 Mbps \pm 32 ppm	Jitter	ITU G.824
Line Code	AMI/B8ZS	Framing	Unframed with a framing monitor on receiving side
Input Signal	ITU G.703 DSX-1 0dB to -6dB	Impedance	100 ohm twisted pair
Output Signal	ITU G.703 DSX-1 w/short (0-110, 110-220, 220-330, 330-440, 440-550 feet)	Connector	SCSI-II 68-pin One connector for 16 ports Two connectors for 32 ports Four connectors for 63 ports
Output Mask	Bellcore GR-499-core		

E3 Interface

Line Rate	34.368 Mbps ± 20ppm	Jitter	ITU G.823
Line Code	HDB3	Framing	Unframed, G.751
Input Signal	ITU G.703	Impedance	75 ohm coax
Output Signal	ITU G.703	Connector	BNC connector
Output Mask	ETS 300 689 Sec.4.2.1.2 ITU G.703		

T3 interface

Line Rate	44.736 Mbps ± 20ppm	Jitter	ITU G.824
Line Code	B3ZS	Framing	Unframed, M13/Mx3, G.747
Input Signal	ITU G.703	Impedance	75Ω coax
Output Signal	ITU G.703	Connector	BNC connector
Output Mask	Bellcore GR-499-core		

Fast Ethernet interface

Line Rate	10/100M bps	Mapping	n x VC12, n x VC11, n x VC3 or n x VC4
Layer2 Protocol	RSTP, VLAN MSTP (future option) IGMP (future option) QoS (future option)	Connector	RJ45
Process Protocol	VCAT, GFP, LAPS, and LCAS		

Gigabit Ethernet interface

Line Rate	10/100/1000Mbps	Mapping	n x VC12, n x VC11, n x VC3 or n x VC4
Layer2 Protocol	RSTP, VLAN MSTP (future option) IGMP (future option) QoS (future option)	Connector	RJ45
Process Protocol	VCAT, GFP, LAPS, and LCAS		

System Clock

Clock Source	Internal clock 4 aggregate lines clocks (STM-1/4 (OC-3/12)) 6 tributary clocks 2 external clocks (2.048Hz or 2.048M bps for STM-1/4, 1.544M bps for OC-3/12)
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Management Interface

LED	Multi colors
Console	Electrical: RS232, DCE Connector: DB9, female User interface: Menu driven VT-100
Telnet	
SNMP	SNMPv1, RFC1213
OSS interface	10/100BaseT FE (IEEE 802.3u)
NE/NE interface	DCC/HDLC/PPP/Ethernet type II, In-band E1

Alarm Input/Output

Inputs			
Ports	4	Activation current	3 mA
Internal resistance	1K	Deactivation current	1.5 mA
Connectors	RJ45		
Outputs			
Ports	4	Max. rating of relay	3Vdc/1A; 125Vac/0.5A
Initial insul. resist.	Min. 100M ohm (at 500Vdc)		
Connectors	RJ45		

Diagnostics

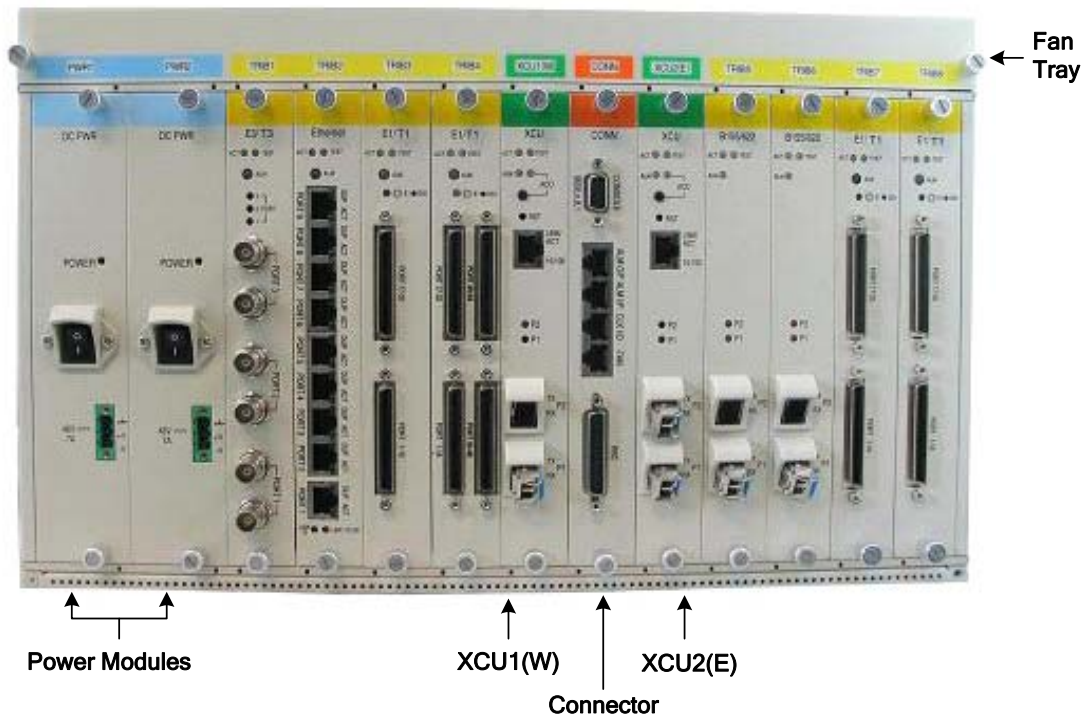
XCU card

Loopback Test	Local loopback, payload loopback, line loopback:
BERT Test	Optical interface Direction: to optical lines

B155/622 card

Loopback Test	Local loopback, payload loopback, line loopback:
BERT Test	Optical interface Direction: to optical lines

SM-4000-R Front Panel

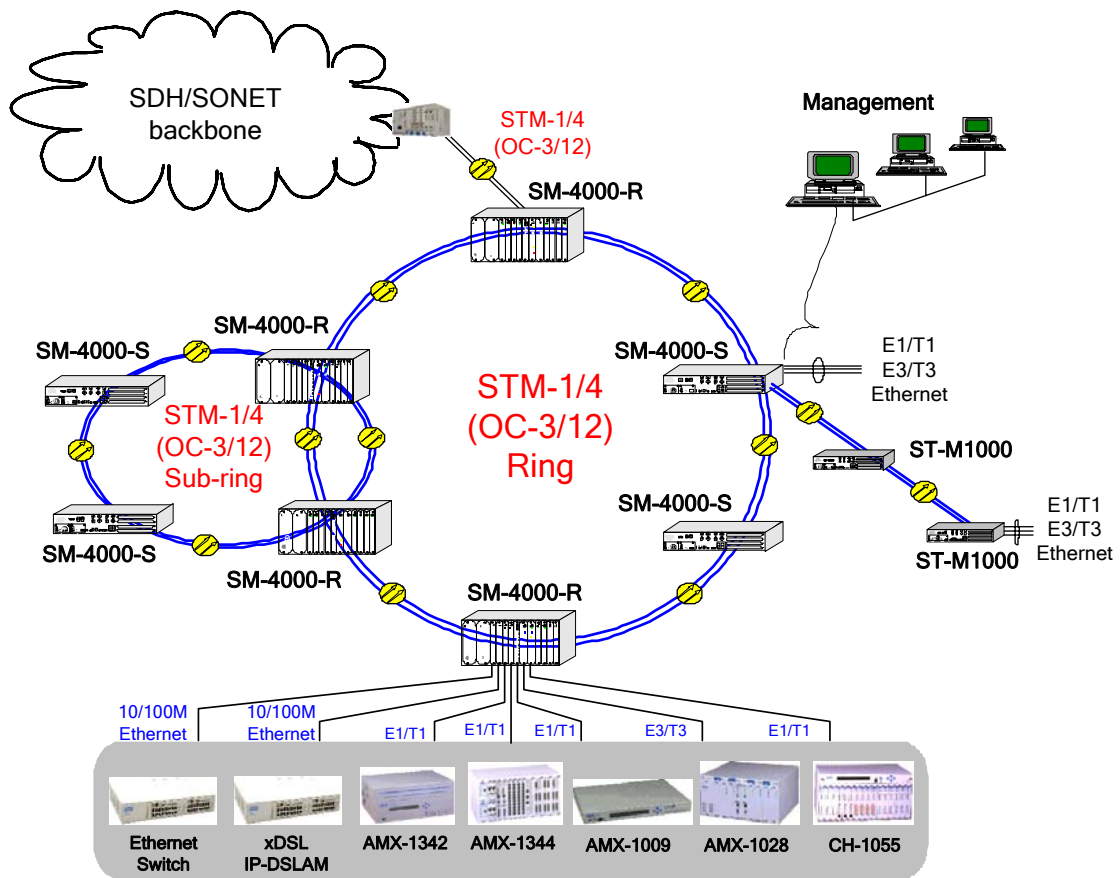


SM-4000-R Card Type and Capacity Reference Table

SLOTS	TRIB 1	TRIB 2	TRIB 3	TRIB 4	XCU1(W)	XCU2(E)	TRIB 5	TRIB 6	TRIB 7	TRIB 8	
GLOBAL PAYLOAD SDH	155M		155M		8 x 155M	8 x 155M	2 x 155M	N/A	4 X 155M	N/A	
Tributary (Plug-in Modules)							1 x 155M	1 x 155M	2 x 155M	2 x 155M	
Link without MSP	STM-1	N/A	STM-1	N/A	STM-1/4	CONNECTOR	STM-1/4	STM-1	STM-1	STM-1 (2 ports)	STM-1 (2 ports)
	STM-1	N/A	STM-1	N/A	STM-1/4		STM-1/4	STM-1	STM-1	STM-4	N/A
	STM-1	N/A	STM-1	N/A	STM-1/4		STM-1/4	STM-1 (2 ports)	N/A	STM-1 (2 ports)	STM-1 (2 ports)
Link with MSP (1+1)	STM-1	STM-1	STM-1	STM-1	STM-1/4		STM-1/4	STM-1 (2 ports)	STM-1 (2 ports)	STM-1 (2 ports)	STM-1 (2 ports)
	STM-1	STM-1	STM-1	STM-1	STM-1/4		STM-1/4	STM1-1 (2 ports)	STM-1 (2 ports)	STM-4	STM-4
Max 378 E1 (Single)	63 E1	N/A	63 E1	N/A				63 E1	63 E1	63 E1	63 E1
Max 252 E1 (Protection)	63 E1	63 E1	63E1	63 E1				63 E1	63 E1	63 E1	63 E1
Max. 18 E3 (Single)	3 E3	N/A	3 E3	N/A				3 E3	3 E3	3 E3	3 E3
Max 12 E3 (Protection)	3 E3	3 E3	3 E3	3 E3				3 E3	3 E3	3 E3	3 E3
Max 48 10/100 BT 6x 1000BT (Single)	8x10/100 BT 1 x 1000BT	N/A	8x10/100 BT 1 x 1000BT	N/A				8x10/100 BT 1 x 1000BT	8x10/100 BT 1 x 1000BT	8x10/100 BT 1 x 1000BT	8x10/100 BT 1 x 1000BT
Max 32 10/100 BT 4 x 1000 BT (Protection)	8x10/100 BT 1 x 1000BT	8x10/100 BT 1 x 1000BT	8x10/100 BT 1 x 1000BT	8x10/100BT T 1 x 1000BT			8x10/100 BT 1 x 1000BT	8x10/100 BT 1 x 1000BT	8x10/100 BT 1 x 1000BT	8x10/100 BT 1 x 1000BT	

Note : STM-4 could also be OC-12. STM-1 could also be OC-3. E1 could also be T1. E3 could also be

Application Illustration 1: Single Ring Protection



Application Illustration 2: Two Ring Protection

