



1U ETSI Front View  
1U ANSI Rear View



1U ANSI Front View

## Loop-O9100 ADM/TM



3U ANSI Front View



3U ETSI Front View  
3U ANSI Rear View

### Features

- 1U and 3U case option, ETSI shelf (full front access) or ANSI shelf (front and rear access)
- Rack mount, Wall mount, and Stand-Alone
- TM, ADM
- Multiple Tributary modules (option):
  - 4/12/20/28-channel E1/DS1 fixed on base unit
  - Hot-swappable Tributary module on 3U case only:
    - 28-channel E1/DS1 module
    - 1/3-channel E3/DS3 module
    - 4-port Ethernet module with or w/o switch
- Redundant hot-swappable AC/DC power card (1U ANSI and 3U shelf only)
- SNCP-I protection
- Optional MSP (1+1) protection
- Expandable No of STM-1 aggregate interface (ANSI shelf only)
- Centralized management with Loop's EMS/NMS over DCC channel
- External/Internal/Line timing
- Support VCAT, GFP, and LCAS
- Performance monitoring
- Alarm suppression, masking, and report
- Switched option for Ethernet card to support Ethernet lease line service and virtual LAN.
- Ethernet Order Wire (EOW) using VoIP technology
- RoHS compliant

### Description

Loop-O9100 ADM/TM is an economic compact STM1 ADM & TM Multiplexer designed to add & drop up to:

- For 1U shelf:
  - 56 x E1/T1 Tributaries
  - 3 x DS3/E3 Tributaries
  - 4 x 10/100M Ethernet Tributaries

- For 3U shelf:
  - 112 x E1/T1 Tributaries
  - 6 x DS3/E3 Tributaries
  - 12 x 10/100M Ethernet Tributaries

With up to 4 aggregate optical/electrical STM-1 interfaces, the Loop-ADM can offer the service provider a versatile protection scheme including SNCP-I 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 Loop-ADM 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, and DCC channel, the OAM&P can be achieved both locally and remotely via SNMP or menu-driven interfaces.

### Powerful SDH Loop's EMS/NMS

The Loop-ADM provides a complete set of operation interfaces that are consistent with the Telecommunication Management Network (TMN) concept (ITU Recommendation M.30, G.784) for SDH Network Element/ Operations System (NE/OS), NE/NE, and NE/Craft communications. User can easily operate Loop-ADM both locally or remotely for centralized management.

## Ordering Information

To specify options, choose from list below:

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

Model (non RoHS compliant)	Model (RoHS compliant)	Description	Note
<b>Main Unit</b>			
Loop-O9100-1UA-h-n-ver-Add	Loop-O9100-1UA-h-n-Ver-Add-G	1U height ANSI (rear & front access) shelf capable of supporting ①ADM with SNCP-I (Sub-Network Connection Protection) or ② TM with MSP (1+1) protection	<ul style="list-style-type: none"> <li>• For ANSI shelf without "A" option, customer shall separately order "Plug-in Trunk Module" below.</li> <li>• where <b>h, n, A, ver,</b> and <b>Add</b> are defined in below tables</li> <li>• The 1st <b>A</b> is for east-side trunk, the 2nd <b>A</b> is for west-side trunk</li> <li>• 0A for no trunk module, 1A for one trunk module, 2A for two trunk modules (1+1 protection).</li> </ul>
Loop-O9100-1UE-h-n-A-A-ver-Add	Loop-O9100-1UE-h-n-A-A-ver-Add-G	1U height ETSI (fully front access) shelf capable of supporting ①ADM with SNCP-I (Sub-Network Connection Protection) or ② TM with MSP (1+1) protection	
Loop-O9100-3UA-n-ver-Add	Loop-O9100-3UA-n-ver-Add-G	3U height ANSI (rear & front access) shelf capable of supporting ①ADM with SNCP-I (Sub-Network Connection Protection) or ② TM with MSP (1+1) protection or ③ Both simultaneously	
Loop-O9100-3UE-n-1A-1A-ver-Add	Loop-O9100-3UE-n-1A-1A-ver-Add-G	3U height ETSI (fully front access) shelf capable of supporting ADM with SNCP-I (Sub-Network Connection Protection)	
Loop-O9100-3UE-n-2A-0A-ver-Add	Loop-O9100-3UE-n-2A-0A-ver-Add-G	3U height ETSI (fully front access) shelf capable of supporting TM with MSP(1+1) protection	
Loop-O9100-3UE-n-2A-1A-ver-Add	Loop-O9100-3UE-n-2A-1A-ver-Add-G	3U height ETSI (fully front access) shelf Capable of supporting ①ADM with SNCP-I (Sub-Network Connection Protection) and ② TM with MSP (1+1) protection	
Loop-O9100-3UE-n-2A-2A-ver-Add	Loop-O9100-3UE-n-2A-2A-ver-Add-G	3U height ETSI (fully front access) shelf capable of supporting ①ADM with SNCP-I (Sub-Network Connection Protection) or ② TM with MSP (1+1) protection or ③ Both simultaneously	

### Plug-in Tributary Module – for 3U shelf only:

Loop-O9100-28E75	Loop-O9100-28E75-G	28E1 plug-in module w/ 75 ohm	<ul style="list-style-type: none"> <li>• For <b>3U</b> shelf only</li> <li>• Select <b>1 to 3</b> cards from the list</li> </ul>
Loop-O9100-28E120	Loop-O9100-28E120-G	28E1 plug-in module w/ 120 ohm	
Loop-O9100-28T1	Loop-O9100-28T1-G	28T1 plug-in module	
Loop-O9100-1DS3	Loop-O9100-1DS3-G	1-port DS3 module	
Loop-O9100-3DS3	Loop-O9100-3DS3-G	3-port DS3 module	
Loop-O9100-1E3	Loop-O9100-1E3-G	1-port E3 module	
Loop-O9100-3E3	Loop-O9100-3E3-G	3-port E3 module	
Loop-O9100-4ETHSW	Loop-O9100-4ETHSW-G	4-port Ethernet with Switch module	
Loop-O9100-4ETHNS	Loop-O9100-4ETHNS-G	4-port Ethernet without Switch module	

**Plug-in Trunk Module – for ANSI (1U & 3U) shelf only:**

Loop-O9100-TK-A	Loop-O9100-TK-A-G	All types of trunk module	<ul style="list-style-type: none"> <li>• For ANSI shelf only</li> <li>• Where A is defined as below</li> </ul>
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**Plug-in Power Module – for 1U shelf:**

Loop-O9100-1U-SA	Loop-O9100-1U-SA-G	Single AC power supply (90 to 264 Vac)	<ul style="list-style-type: none"> <li>• For AC choose an appropriate power cord</li> </ul>
Loop-O9100-1U-SD24	Loop-O9100-1U-SD24-G	Single DC power supply (-24 Vdc: -18 to -36 Vdc)	
Loop-O9100-1U-SD48	Loop-O9100-1U-SD48-G	Single DC power supply (-48 Vdc: -36 to -75 Vdc)	

**Plug-in Power Module – for 3U shelf:**

Loop-O9100-3U-SA	Loop-O9100-3U-SA-G	Single AC power supply (90 to 264 Vac)	<ul style="list-style-type: none"> <li>• For AC choose an appropriate power cord</li> </ul>
Loop-O9100-3U-SD24	Loop-O9100-3U-SD24-G	Single DC power supply (-24 Vdc: -18 to -36 Vdc)	
Loop-O9100-3U-SD48	Loop-O9100-3U-SD48-G	Single DC power supply (-48 Vdc: -36 to -75 Vdc)	

**Accessories**

<b>User's Manual</b>			
Loop-O9100-UM	User's Manual (paper hard copy-optional). A CD version of the manual is already included as standard equipment.		

<b>Power Cord (All power cords are RoHS compliant)</b>			
Loop-ACC-PC-USA	AC power cord for Taiwan/America		
Loop-ACC-PC-EU	AC power cord for Europe		
Loop-ACC-PC-UK	AC power cord for UK		
Loop-ACC-PC-AUS	AC power cord for Australia		
Loop-ACC-PC-CH	AC power cord for China		

<b>Order Wire Phone</b>			
Loop-O9100-OW	Loop-O9100-OW-G	Ethernet Order Wire phone (using VoIP technology)	

<b>SIP Proxy Server</b>			
Loop-O9100-SIP	Loop-O9100-SIP-G	SIP Proxy Server Basic Software	Customer must provide a MAC address so that a license key can be generated to operate the software at that address.

<b>Connector Panel</b>			
Loop-O9100-RJ	Loop-O9100-RJ-G	28-port RJ48 connector panel (For 19" or 23" rack), 2U height	Connector panel includes two 100cm cables (SCSI 68 pin Male to SCSI 68 pin Male)
Loop-O9100-BNC	Loop-O9100-BNC-G	28-port BNC connector panel (For 19" or 23" rack), 2U height	
Loop-O9100-WW	Loop-O9100-WW-G	28-port Wire-Wrap pins connector panel (For 19" or 23" rack), 2U height	

■ where h is used to select chassis type for 1U shelf:

h =	Chassis height	On board		Additional fixed module									
		E1/ T1	28E1 (75 ohm)	28E1 (120 ohm)	28T1	1-port DS3	1-port E3	3-port DS3	3-port E3	4ETHSW	4ETHNS		
100	1U	✓		✓									
101													
102					✓								
103						✓							
104							✓						
105								✓					
106									✓				
107										✓			
108											✓		
109												✓	

■ where **n** is used to select on-board E1/ T1 type:

n =	Description	Note
<b>4E75</b>	4 E1 lines with 75 ohm	
<b>12E75</b>	12 E1 lines with 75 ohm	
<b>20E75</b>	20 E1 lines with 75 ohm	
<b>28E75</b>	28 E1 lines with 75 ohm	
<b>4E120</b>	4 E1 lines with 120 ohm	
<b>12E120</b>	12 E1 lines with 120 ohm	
<b>20E120</b>	20 E1 lines with 120 ohm	
<b>28E120</b>	28 E1 lines with 120 ohm	
<b>4T</b>	4 T1 lines	
<b>12T</b>	12 T1 lines	
<b>20T</b>	20 T1 lines	
<b>28T</b>	28 T1 lines	

■ where **A** is used to select trunk module type:

- NOTE:** 1. The 1st **A** is for east-side trunk, the 2nd **A** is for west-side trunk.  
2. All optical modules are RoHS compliant.

A =	Description	Note
<b>0</b>	None	Valid for 2nd <b>A</b> only
<b>SAA</b>	single optical module with dual uni-directional fiber, 1310 nm, SC optical connector, 30 km reach (19dB) - <b>S1.1 physical layer*</b>	<ul style="list-style-type: none"> <li>• Use 2 fibers</li> <li>• * ITU-T Rec G.957 application code</li> </ul>
<b>SBB</b>	single optical module with dual uni-directional fiber, 1310 nm, SC optical connector, 50 km reach (30dB) - <b>L1.1 physical layer*</b>	
<b>SCC</b>	single optical module with dual uni-directional fiber, 1310 nm, FC optical connector, 30 km reach (20dB) - <b>S1.1 physical layer*</b>	
<b>SDD</b>	single optical module with dual uni-directional fiber, 1550 nm, SC optical connector, 20 km reach (12dB) - <b>S1.2 physical layer*</b>	
<b>SEE</b>	single optical module with dual uni-directional fiber, 1550 nm, SC optical connector, 100 km reach (30dB) - <b>L1.2 physical layer*</b>	
<b>SSM</b>	single optical module with single bi-directional fiber (master), 1310 nm transmit and 1550 receive, SC optical connector, 30 km reach (20dB) - <b>S1.1/ S1.2 physical layer*</b>	<ul style="list-style-type: none"> <li>• 1310 nm from master to slave</li> <li>• Order <b>SSM</b> to use with <b>SSS</b></li> <li>• Use 1 fiber</li> <li>• * ITU-T Rec G.957 application code</li> </ul>
<b>SSS</b>	single optical module with single bi-directional fiber (slave), 1310 nm receive and 1550 transmit, SC optical connector, 30 km reach (20dB) - <b>S1.1/ S1.2 physical layer*</b>	<ul style="list-style-type: none"> <li>• 1550 nm from slave to master</li> <li>• Order <b>SSS</b> to use with <b>SSM</b></li> <li>• Use 1 fiber</li> <li>• * ITU-T Rec G.957 application code</li> </ul>
<b>EEE</b>	Electrical STM1 module	
<b>SFPC</b>	SFP (mini-GBIC) optical housing plug-in card without SFP optical module	<ul style="list-style-type: none"> <li>• For ANSI models only</li> <li>• Order SFP 155 Mbps modules below</li> </ul>

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

#### SFP Optical Modules

<b>SFP 155 Mbps (mini GBIC) Dual Fiber</b>	<b>MHBTW</b>	Multi mode optical module with dual uni-directional fiber, 155M, 1310nm, 2Km, LC connector w/o DDM, Fast Ethernet and compliant with ITU G.957	<ul style="list-style-type: none"> <li>• Use 2 fibers for all SFP optical modules</li> </ul>
	<b>PHB2W</b>	Single mode optical module with dual uni-directional fiber, 155M, 1310nm, 15~20Km, LC connector w/o DDM, S-1.1/IR1	
	<b>PHB3W</b>	Single mode optical module with dual uni-directional fiber, 155M, 1310nm, 30Km, LC connector w/o DDM, S-1.1/IR1/Fast Ethernet	
	<b>PHB5W</b>	Single mode optical module with dual uni-directional fiber, 155M, 1310nm, 50Km, LC connector w/o DDM, L-1.1/LR1/Fast Ethernet	
	<b>PHC8W</b>	Single mode optical module with dual uni-directional fiber, 155M, 1550nm, 80Km, LC connector w/o DDM, L-1.2/LR2	

<b>PHCUW</b>	Single mode optical module with dual uni-directional fiber, 155M, 1550nm, 100Km, LC connector w/o DDM, L-1.2/LR2Fast Ethernet
<b>PHCXW</b>	Single mode optical module with dual uni-directional fiber, 155M, 1550nm, 120Km, LC connector w/o DDM, L-1.2 extended distance
<b>PHB3D</b>	Single mode optical module with dual uni-directional fiber, 155M, 1310nm, 30Km, LC connector with DDM, S-1.1/IR1/Fast Ethernet
<b>PHB5D</b>	Single mode optical module with dual uni-directional fiber, 155M, 1310nm, 50Km, LC connector with DDM, L-1.1/LR1/Fast Ethernet
<b>PHC8D</b>	Single mode optical module with dual uni-directional fiber, 155M, 1550nm, 80Km, LC connector with DDM, L-1.2/LR2
<b>PHCUD</b>	Single mode optical module with dual uni-directional fiber, 155M, 1550nm, 100Km, LC connector with DDM, L-1.2/LR2/Fast Ethernet
<b>PHCXD</b>	Single mode optical module with dual uni-directional fiber, 155M, 1550nm, 120Km, LC connector with DDM, L-1.2 extended distance

■ where **ver** is used to select shelf trunk multiplexing:

<b>ver =</b>	<b>Description</b>	<b>Note</b>
<b>STM</b>	ITU STM1 as the trunk multiplexing	

■ where **Add** is used to select other additional options:

<b>Add =</b>	<b>Description</b>	<b>Note</b>
<b>CO</b>	Ring closure	<ul style="list-style-type: none"> <li>• Must be selected if used in ADM Ring or Linear applications</li> <li>• This option is not required for TM mode</li> <li>• Multiple option choices can be selected.</li> <li>• For dual homing application (See also Application Illustrations)</li> </ul>

## **Loop-O9100 STM1 ADM/TM PRODUCT SPECIFICATIONS**

### **SFP Module Characteristics**

<b>SFP Optical Module</b>	<b>Direction</b>	<b>Data Rate</b>	<b>Wavelength(nm)</b>	<b>Connector</b>	<b>Distance</b>
MHBTW	Dual uni-directional fiber	155M	1310nm	LC without DDM	2 Km
PHB2W	Dual uni-directional fiber	155M	1310nm	LC without DDM	15~20 Km
PHB3W	Dual uni-directional fiber	155M	1310nm	LC without DDM	30 Km
PHB5W	Dual uni-directional fiber	155M	1310nm	LC without DDM	50 Km
PHC8W	Dual uni-directional fiber	155M	1550nm	LC without DDM	80 Km
PHCUW	Dual uni-directional fiber	155M	1550nm	LC without DDM	100 Km
PHCXW	Dual uni-directional fiber	155M	1550nm	LC without DDM	120 Km
PHB3D	Dual uni-directional fiber	155M	1310nm	LC with DDM	30 Km
PHB5D	Dual uni-directional fiber	155M	1310nm	LC with DDM	50 Km
PHC8D	Dual uni-directional fiber	155M	1550nm	LC with DDM	80 Km
PHCUD	Dual uni-directional fiber	155M	1550nm	LC with DDM	100 Km
PHCXD	Dual uni-directional fiber	155M	1550nm	LC with DDM	120 Km

### **Physical/Electrical**

Dimensions for 3U	432 x 132 x 275 mm. (WxHxD)
Dimensions for 1U	432 x 44 x 275 mm. (WxHxD)
Power (AC)	90 to 240 VAC, 50/60Hz
Power (DC)	-24 Vdc (-18 to -36 Vdc) -48 Vdc (-36 to -75 c)
Temperature	0 to 50°C
Humidity	0-95%RH (non-condensing)
Mounting	Desk-top stackable, 19/23 inch rack mountable, and wall mountable
EOW	RJ-11
LAN port	RJ-45
Console port	DB-9
E1/T1 interface connector	SCSI-II 68 pins
Optical Interface connector	FC or SC
Number of Optical STM1	2 or 4 (only available on the 3U model)
Number of E1/T1 channels	4/ 12/ 20/ 28 (on base unit)

### **Clock Source**

Internal, STM1-Line, External

### **Management Interface**

Standard	SNMP V1 (RFC1213, RFC2863, RFC1493)
OSS interface	10/100BaseT FE (IEEE 802.3u )
NE/NE interface	DCC/HDLC/Ethernet type II

### **Max. Number of Tributary Modules**

#### **■ For 1U shelf:**

- 56 x E1/T1 Tributaries
- 3 x DS3/E3 Tributaries
- 4 x 10/100M Ethernet Tributaries

#### **■ For 3U shelf:**

- 112 x E1/T1 Tributaries
- 6 x DS3/E3 Tributaries
- 12 x 10/100M Ethernet Tributaries

### **Optical STM1 aggregate line**

#### **STM1 Optical Transmitter**

RMS	Max. 6 nm
Wavelength $\lambda$ 1	Max. 1350 nm, Min. 1280 nm
Wavelength $\lambda$ 2	Max. 1590, Min. 1520 nm
Output Power	Min. -12 dBm
Extinction Ratio	Min. 10 dB
Connector	SC or FC

### STM1 Optical Receiver

Sensitivity	Max. input power 0 dBm, Min. input power -34 dBm
Connector	SC or FC

### Tributary Modules

#### E1 module

Line Rate	2.048 Mbps $\pm$ 50 ppm	Framing	Unframed
Line Code	AMI/HDB3	Connector	Two SCSI-II 68-pin connectors
Input Signal	ITU G.703	Total Channels	28
Jitter	ITU G.823	Electrical	75 $\Omega$ coax/120 $\Omega$ twisted pair
Output Signal	ITU G.703		

#### T1 module

Line Rate	1.544 Mbps $\pm$ 32 ppm	Framing	Unframed
Line Code	AMI/B8ZS	Connector	Two SCSI-II 68-pin connectors
Input Signal	DSX-1 0dB to -30dB w/ALBO	Total Channels	28
Jitter	ITU G.824	Output Signal	DSX-1 w/short haul (0-133, 133-266, 266-399, 399-533, 533-655 feet)

#### DS3 module

Data Rate	44.736 Mbps $\pm$ 20ppm	Framing	Unframed
Line Code	B3ZS	Output Mask	Bellcore GR-499-core
Connector	BNC connector	Total Ports	1 or 3
Impedance	75 Ohm Coax	Jitter	ITU G.824

#### E3 module

Data Rate	34.368 Mbps $\pm$ 20ppm	Impedance	75 Ohm Coax
Line Code	HDB3	Framing	Unframed
Connector	BNC connector	Output Mask	ETS 300 689 Sec.4.2.1.2 ITU G.703
Total Ports	1 or 3	Jitter	TU G.824

#### Ethernet module

Data Rate	10/100Mbps	Connector	RJ-45 connector
Layer2 Protocol	Ethernet	Mapping	n x VC12, n x VC11, or n x VC3
Process Protocol	VCAT, GFP, LAPS, and LCAS	Total Ports	4

### Standards Compliance

ITU	G.664, G.707, G.7041, G.7042, G.775, G.783, G.806, G.823, G.747, X.86
ANSI	T1.105, T1.107
IEEE	802.1q (VLAN), 802.1w (RSTP), 802.1ad (stack VLAN), 802.3x (flow control), 802.1p (QoS)

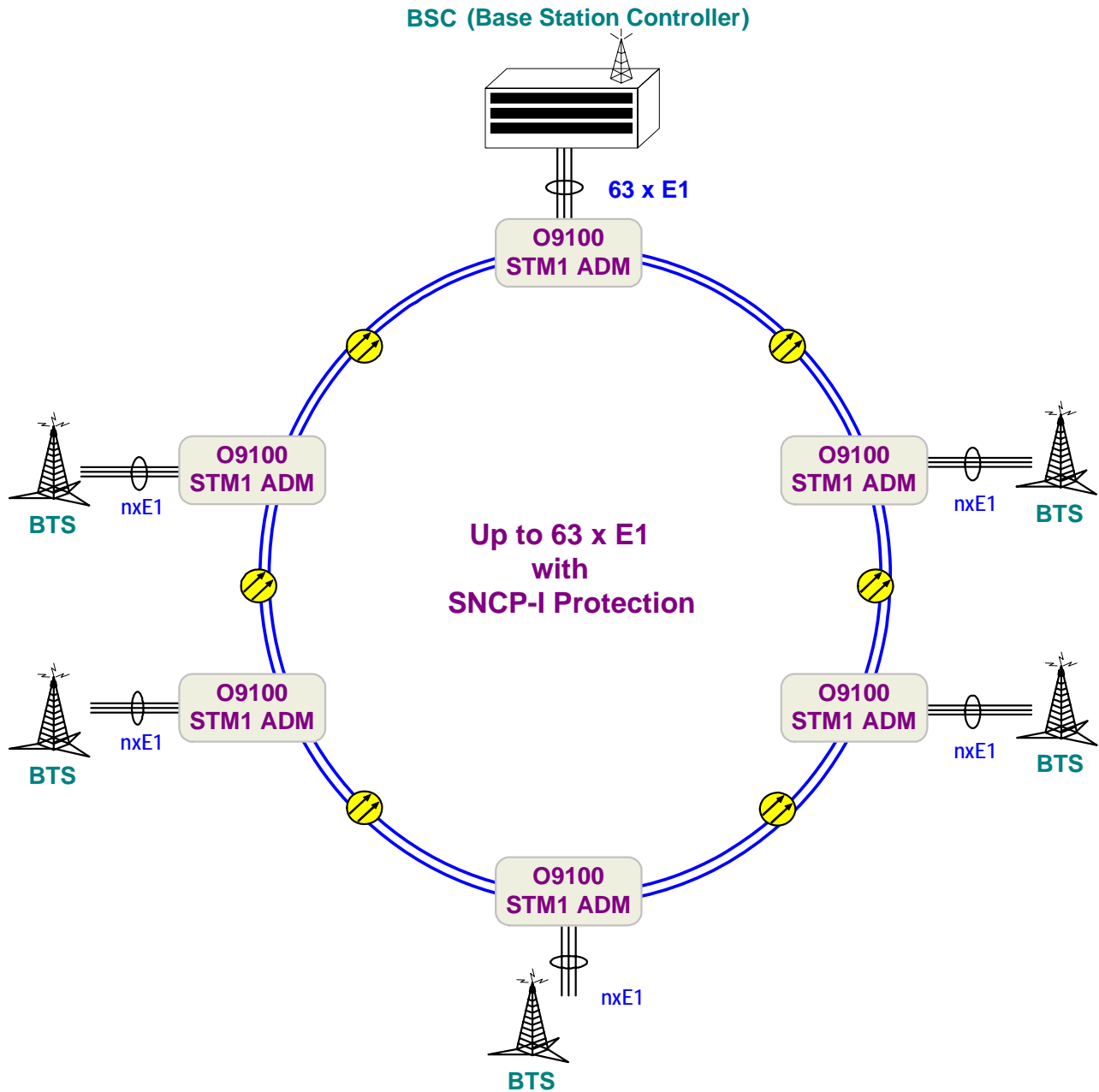
### Certification

EMC	EN55024
EMI	EN55022 Class A, 47 CFR Part 15 Subpart B Class A
Safety	UL60950 CSA60950 IEC60950
Environment	EN300 019-2-1 T1.3 EN300 019-2-2 T2.3 EN300 019-2-3 T3.2

## Application Illustrations

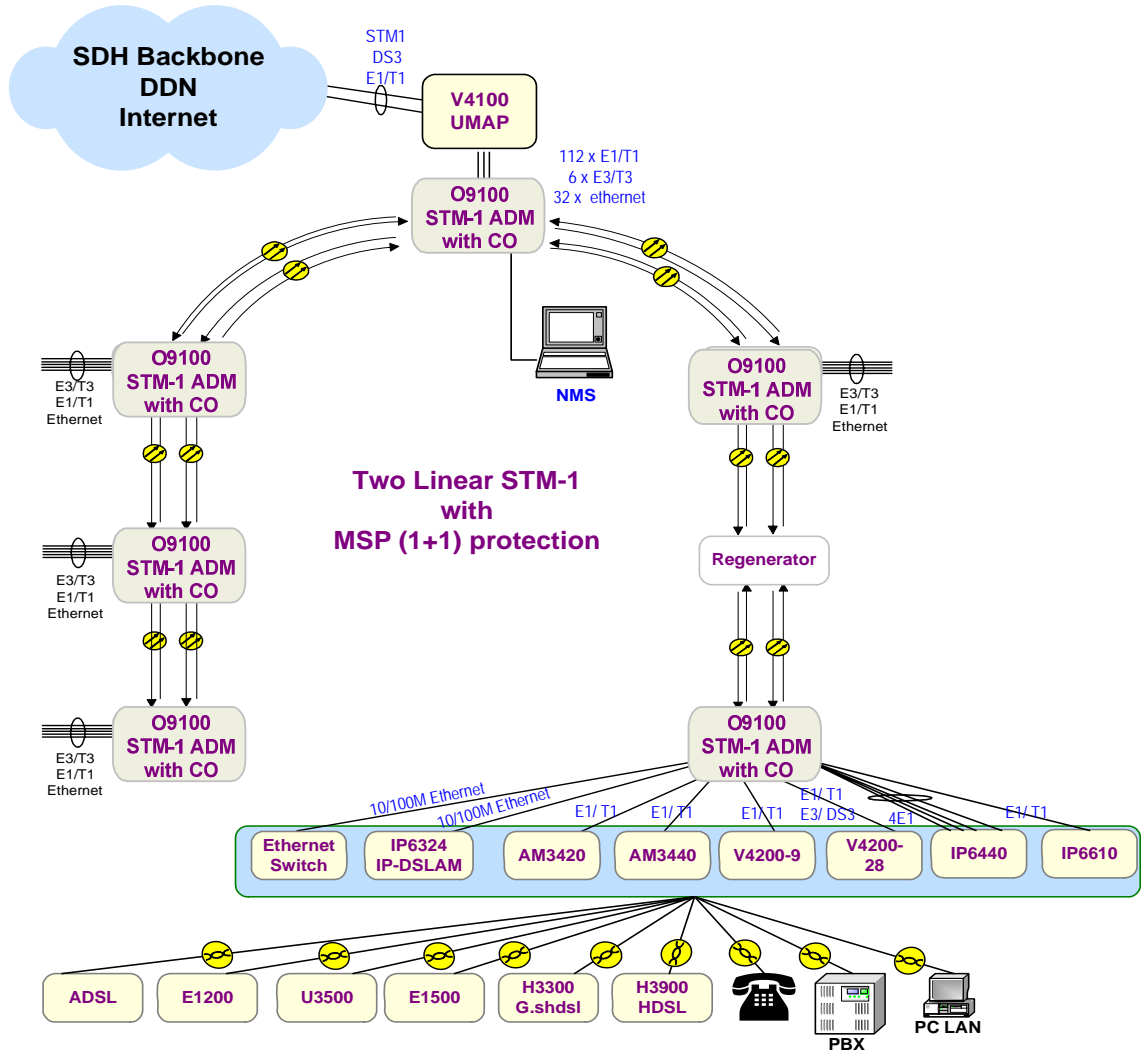
The Loop-ADM can be configured as either a Terminal Multiplexer (TM), or Add/Drop Multiplexer (ADM) with the same enclosure. With SNCP-I and MSP(1+1) protection, the Loop-ADM can easily provide a well-protected transmission path in various applications shown as follows:

### GSM Application

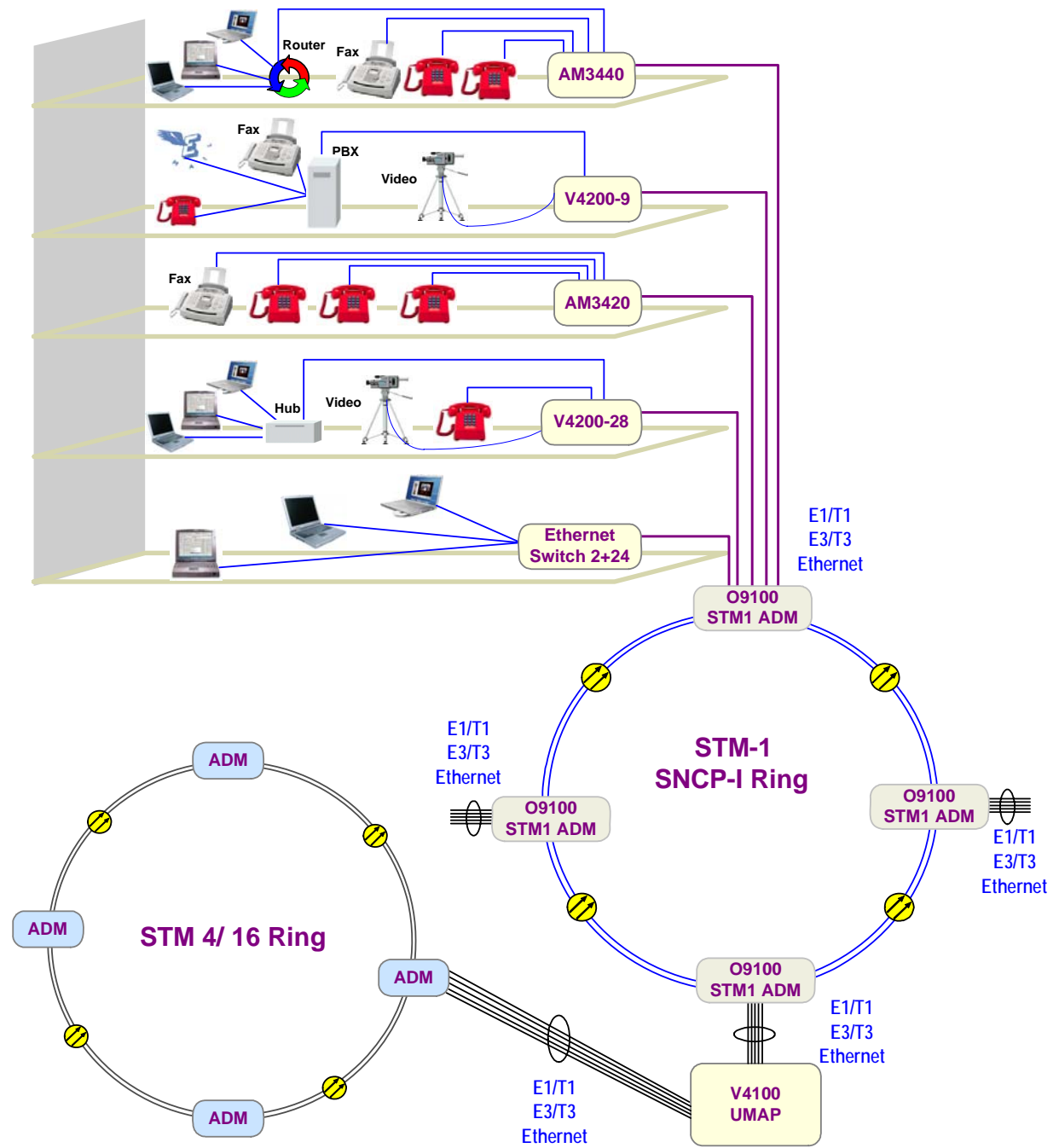




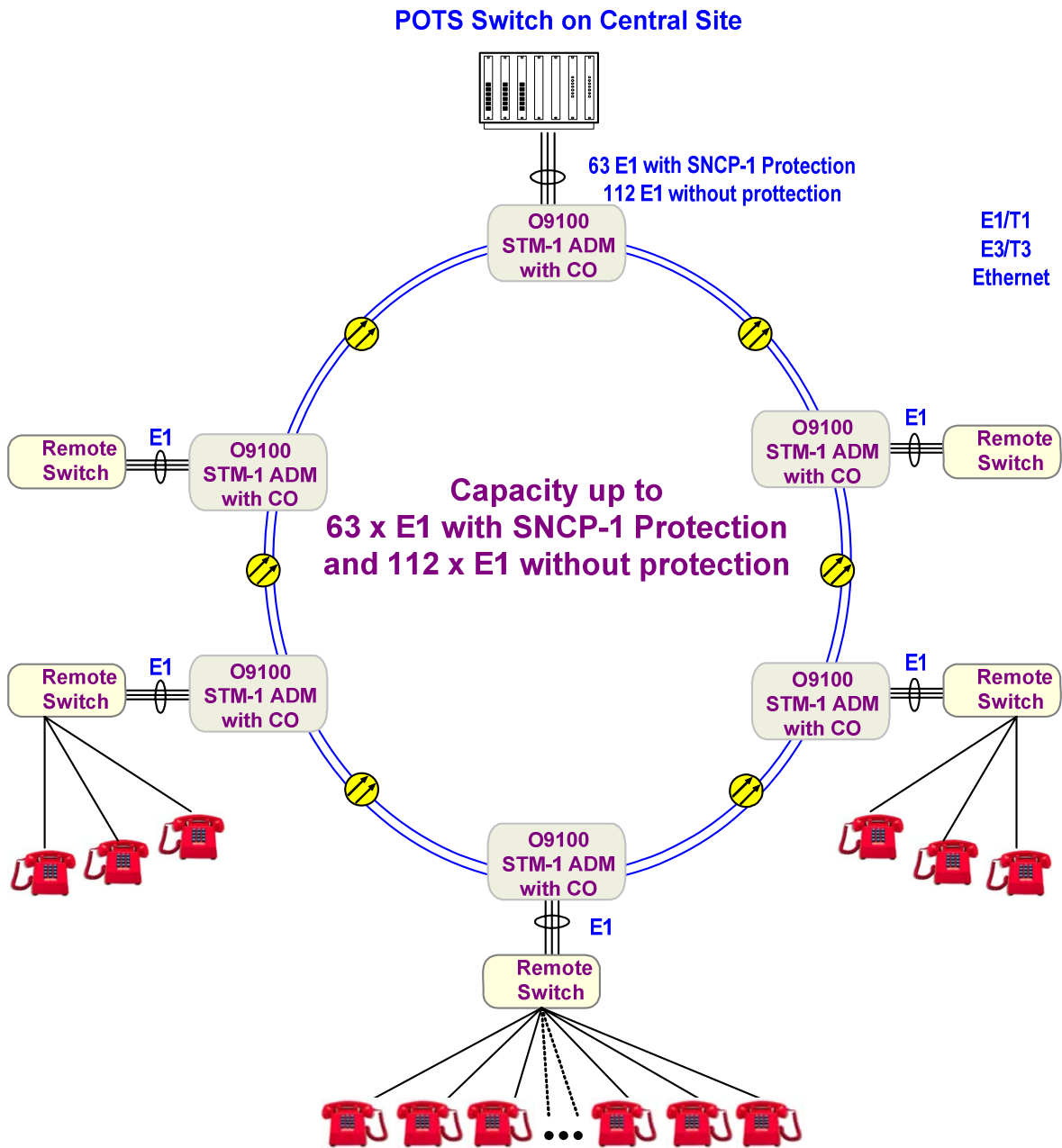
## Access Total Solution



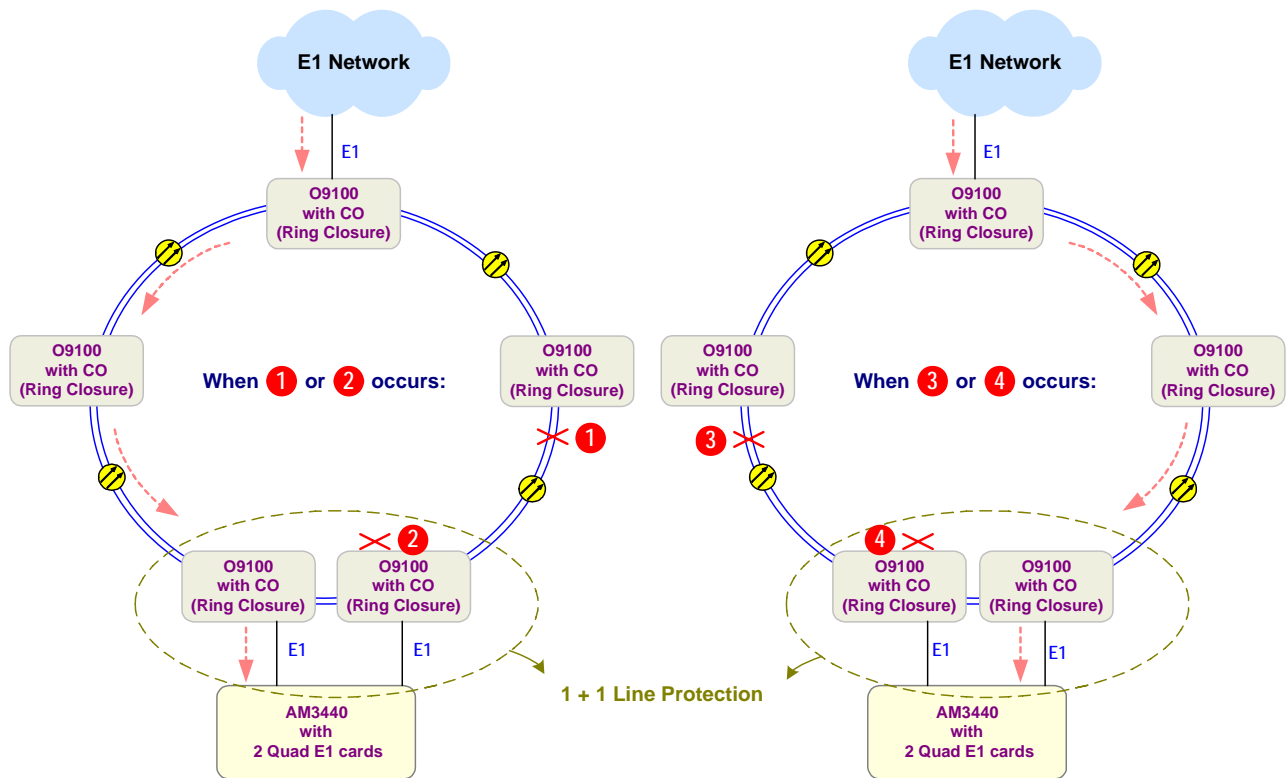
# Smart Building Application



# POTS Switch Application



## Dual Homing Application



**Note:** ① and ③ are fiber broken  
 ② and ④ are equipment broken



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