



**ANSI Unit Front View**



**ETSI Unit Front View**

## Description

As the core communications network migrates from TDM to IP, the Loop-IP6716 is a cost effective choice to transport E1/T1 TDM signals over the new IP network. The Loop-IP6716 TDMoEthernet provides flexible solutions with four hot-swappable slots supporting the 4E1/T1 plug-in cards.

Loop-IP6716 can transport 4, 8, 12, or 16 T1/E1 signals with timing and Ethernet traffic over IP network. Connection to the IP network is through dual WAN ports. The WAN consists of 2 combo Gigabit Ethernet (GbE) with 2 RJ45 and 2 SFP housing. On the user side, the TDM ports can be multiple E1 or T1, each with timing preserved. The Ethernet port is 10/100/1000 BaseT.

Extensive choice of power module includes AC/DC hybrid, single AC, and single DC. Management choices include console port, Ethernet port, and SNMP port for communication with remote management centers. For transport of TDM signals E1, T1, Jitter and Wander adheres to G.823 Traffic and G.823 Synchronous to provide excellent clock recovery.

## Feature

- 1U height, ETSI shelf (full front access) or ANSI shelf (front and back access)
- Point to point and point to multi-points applications
- Max. 256 pseudo-wires (PW), 64 per E1/T1 card
- Aggregate ports:
  - 2 combo Gigabit Ethernet (GbE) with 2 RJ45 and 2 SFP housing
  - Aggregate Line (1+1) protection
  - 2 WAN ports with link aggregation (port trunking)
- Tributary ports:
  - Four general purpose hot-swappable slots for:
    - Quad E1/T1 cards (software-selectable):
    - Up to 16 E1/T1 ports per system
  - LAN interface: one 10/100/1000 BaseT Ethernet plus one SNMP port/Ethernet port
- Power Modules
  - Fixed: AC & DC (coexistent), 100 to 240 Vac and -36 to -75 Vdc
  - Hot-swappable Power:
    - -48 Vdc plug-in modules (-36 to -75 Vdc), dual for redundancy
    - AC plug-in module (100 to 240 Vac), dual for redundancy (ANSI only)
- Bridging & Switching
  - Jumble frame up to 10k bytes
  - VLAN
    - Q-in-Q
  - Packet transparency
- QoS
  - User-configurable CoS
  - User-configurable ToS in outgoing IP frame
- Max. 340ms Packet Delay Variation
- Built-in BERT for E1/T1 to line or WAN direction
- Alarm propagation between E1/T1 line and WAN port
- Jitter & Wander
  - PPM: per G.823 Traffic
  - PPB: per G.823 Synchronous
- Jitter buffer size: Max. 512 kB
- Min. packetization (pseudowire) latency < 1.4 ms
- Multi-color LED indicators
- Alarm relay
- Management port and interface
  - LCD and keypad (optional for ANSI shelf only)
  - Console port with VT100 menu
  - SNMP port:
    - Embedded SNMP
    - Telnet
    - LoopView GUI
- Support SNTP
- IETF TDMoIP (RFC5087), SAToP (RFC4553), and CESoPSN (RFC5086) compliance
- RoHS compliance

## Ordering Information

To specify options, choose from the list below:

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

Model	Description	Note
<b>Main Unit</b>		
Loop-IP6716-S-CA-PPM-s1-s2-s3-s4-pp1-pp2-add1-add2- <b>G</b>	1U height ANSI chassis with G.823 traffic and 4 general purpose hot-swappable slots	<ul style="list-style-type: none"> <li>▪ Where <b>s1, s2, s3, s4, pp1, pp2, add1</b> and <b>add2</b> are defined in the tables below</li> <li>▪ For the allowed pp1, pp2 combinations, refer to <b>NOTE 1</b></li> <li>▪ 2 aggregate ports (GbE optical interface with SFP housing), please order separately for SFP optical modules listed in the table below</li> </ul>
Loop-IP6716-S-CA-PPM-s1-s2-s3-s4-AD-add1-add2- <b>G</b>	1U height ANSI chassis with G.823 traffic, 4 general purpose hot-swappable slots and fixed AC/DC coexist power	
Loop-IP6716-S-CE-PPM- s1-s2-s3-s4-pp1-pp2-add2- <b>G</b>	1U height ETSI chassis with G.823 traffic and 4 general purpose hot-swappable slots	
Loop-IP6716-S-CE-PPM-s1-s2-s3-s4-AD-add2- <b>G</b>	1U height ETSI chassis with G.823 traffic, 4 general purpose hot-swappable slots and fixed AC/DC coexist power	
Loop-IP6716-S-CA-PPB- s1-s2-s3-s4-pp1-pp2-add1-add2- <b>G</b>	1U height ANSI chassis with G.823 synchronous and 4 general purpose hot-swappable slots	
Loop-IP6716-S-CA-PPB-s1-s2-s3-s4-AD-add1-add2- <b>G</b>	1U height ANSI chassis with G.823 synchronous, 4 general purpose hot-swappable slots and fixed AC/DC coexist power	
Loop-IP6716-S-CE-PPB- s1-s2-s3-s4-pp1-pp2-add2- <b>G</b>	1U height ETSI chassis with G.823 synchronous and 4 general purpose hot-swappable slots	
Loop-IP6716-S-CE-PPB-s1-s2-s3-s4-AD-add1-add2- <b>G</b>	1U height ETSI chassis with G.823 synchronous, 4 general purpose hot-swappable slots and fixed AC/DC coexist power	
<b>Plug-in Modules</b>		
Loop-IP6716-S-4ETRJ- <b>G</b>	Four E1/T1 port with RJ48C connector (E1-120 ohms/E1-75 ohms /T1 software-selectable)	▪ Conversion adaptor is not included
<b>Accessories</b>		
<b>Plug-in Power Module</b>		
Loop-IP6716-S-SA- <b>G</b>	Single AC power plug-in module (100 to 240 Vac), dual power for ANSI chassis only	
Loop-IP6716-S-SD48- <b>G</b>	Single -48 Vdc power plug-in module (-36 to -75 Vdc)	
<b>User's Manual</b>		
Loop-IP6716-UM	User's Manual (paper hard copy-optional). A CD version of the manual is already included as standard equipment.	
<b>Ear Mounts</b>		
19"/23" ear mounts	A pair of 19"/23" ear mounts is supplied as part of standard package. <b>Note:</b> For other sizes, please contact your nearest Loop sales representative.	
<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>Blank Panel</b>		
30.001479.A00LF- <b>G</b>	Blank panel for Slot 1~4	
30.001455.A00LF- <b>G</b>	Blank panel for single DC power slot	
30.001454.A00LF- <b>G</b>	Blank panel for single AC power slot	

<b>SFP Optical Modules</b>	
Please place order using 5 letters in the SFP module tables below	

■ Where **s1, s2, s3, s4** are used to select plug-in modules for Slots 1- 4.

<b>s =</b>	<b>Description</b>	<b>Note</b>
<b>4ETRJ</b>	Four E1/T1 port with RJ connector (E1-120 ohms/E1-75 ohms /T1 software-selectable)	▪ For power redundancy, order a second power module

■ Where **pp1** is used to select the 1st power module.

<b>pp1 =</b>	<b>Description</b>	<b>Note</b>
<b>SA</b>	Single AC power plug-in module (100 to 240 Vac)	▪ All plug-in power modules are interchangeable.
<b>SD48</b>	Single -48 Vdc power plug-in module (-36 to -75 Vdc)	▪ For AC choose an appropriate power cord

■ Where **pp2** is used to select the 2nd power module. If pp2 is not required leave this field blank.

<b>pp2 =</b>	<b>Description</b>	<b>Note</b>
<b>SA</b>	Single AC power plug-in module (100 to 240 Vac) for ANSI only	▪ For redundancy purposes, ordering a second plug-in module will provide dual power.
<b>SD48</b>	Single -48 Vdc power plug-in module (-36 to -75 Vdc)	▪ You cannot order a second SA for ETSI unit. ▪ For AC choose an appropriate power cord ▪ <b>NOTE 1</b>

■ Where **add1** is used to select the LCD option.

<b>add1 =</b>	<b>Description</b>	<b>Note</b>
LCD	LCD front panel display	▪ LCD is supported for ANSI shelf only

■ Where **add2** is used to select an external clock. If an external clock is not required, leave this field blank.

<b>add2 =</b>	<b>Description</b>	<b>Note</b>
EXT	External Clock	

**NOTE 1:** The combinations of pp1 and pp2 power modules:

For ANSI unit:

- **pp1=SA** (Single AC power plug-in in front or at rear)
- **pp1=SD48** (Single DC power plug-in at rear)
- **pp1=SD48, pp2=SD48** (Dual hot-swappable DC)
- **pp1=SA, pp2=SA** (Dual hot-swappable AC, one front and one rear plug-in)
- **pp1=SA, pp2=SD48** (Hot-swappable AC front and DC rear plug-in)

**Note:** For ANSI unit, DC power is available in rear panel only

For ETSI unit (all power modules in front):

- **pp1=SA** (Single AC power plug-in)
- **pp1=SD48** (Single DC power plug-in)
- **pp1=SD48, pp2=SD48** (Dual hot-swappable DC power plug-in)

**SFP Optical Module for Gigabit Ethernet (GbE) Interface**

<b>1.25G (mini GBIC) Dual Fiber Commercial (0 to 70°C)</b>	<b>MTAFW</b>	Multi-mode optical module with dual uni-directional fiber, 1.25G, 850nm, 550m, LC connector w/o DDM, 1000Base-SX	<ul style="list-style-type: none"> <li>▪ Use 2 fibers for all SFP optical modules</li> <li>▪ All 1.25G optical modules downgrading to 622M data rate will be workable</li> </ul>
	<b>MTAFD</b>	Single-mode optical module with dual uni-directional fiber, 1.25G, 850nm, 550m, LC connector with DDM, 1000Base-SX	
	<b>MTBTD</b>	Single-mode optical module with dual uni-directional fiber, 1.25G, 1310nm, 2Km, LC connector with DDM, 1000Base-SX+	
	<b>MTBTW</b>	Multi-mode optical module with dual uni-directional fiber, 1.25G, 1310nm, 2Km, LC connector w/o DDM, 1000Base-SX+	
	<b>PTB2W</b>	Single-mode optical module with dual uni-directional fiber, 1.25G, 1310nm, 20Km, LC connector w/o DDM, 1000Base-LX	
	<b>PTB4W</b>	Single-mode optical module with dual uni-directional fiber, 1.25G, 1310nm, 40Km, LC connector w/o DDM, 1000Base-LHX	
	<b>PTC5W</b>	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 50Km, LC connector w/o DDM, 1000Base-XD	
	<b>PTC6W</b>	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 60Km, LC connector w/o DDM, 1000Base-XD	
	<b>PTC8W</b>	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 80Km, LC connector w/o DDM, 1000Base-ZX	
	<b>PTC9W</b>	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 90Km, LC connector w/o DDM, 1000Base-ZY	
	<b>PTCVW</b>	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 110Km, LC connector w/o DDM, 1000Base-APD	
	<b>PTCXW</b>	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 120Km, LC connector w/o DDM, 1000Base-APD	
	<b>PTB1D</b>	Single-mode optical module with dual uni-directional fiber, 1.25G, 1310nm, 10Km, LC connector with DDM, 1000Base-LX	
	<b>PTB3D</b>	Single-mode optical module with dual uni-directional fiber, 1.25G, 1310nm, 30Km, LC connector with DDM, 1000Base-LHX	
	<b>PTB4D</b>	Single-mode optical module with dual uni-directional fiber, 1.25G, 1310nm, 40Km, LC connector with DDM, 1000Base-LHX	
	<b>PTC5D</b>	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 50Km, LC connector with DDM, 1000Base-XD	
	<b>PTC6D</b>	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 60Km, LC connector with DDM, 1000Base-XD	
	<b>PTC8D</b>	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 80Km, LC connector with DDM, 1000Base-ZX	
	<b>PTC9D</b>	Single-mode optical module, with dual uni-directional fiber, 1.25G, 1550nm, 90Km, LC connector with DDM	
	<b>PTCVD</b>	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 110Km, LC connector with DDM, 1000Base-APD	
<b>PTCXD</b>	Single-mode optical module with dual uni-directional fiber, 1.25G, 1550nm, 120Km, LC connector with DDM, DDM1000Base-APD		
<b>622M-1.25G (mini GBIC) Dual Fiber Commercial (0 to 70°C)</b>	<b>PKB1W</b>	Single-mode optical module with dual uni-directional fiber, 622Mbps~1.25G, 1310nm, 10Km, LC connector w/o DDM, 1000Base-LX	

<b>1.25G (mini GBIC) Bi-directional Single Fiber Commercial (0 to 70°C)</b>	<b>PTD1W</b>	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1310 nm / Rx 1550 nm, 10Km, LC connector w/o DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> <li>▪ 1310 nm from master to slave</li> <li>▪ Order <b>PTD1W</b> to use with <b>PTE1W</b></li> <li>▪ Use 1 fiber</li> </ul>
	<b>PTE1W</b>	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1550 nm / Rx 1310 nm, 10Km, LC connector w/o DDM, GbE/1X fiber channel	

<b>PTD2W</b>	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1310 nm / Rx 1550 nm, 20Km, LC connector w/o DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> <li>▪ 1310 nm from master to slave</li> <li>▪ Order <b>PTD2W</b> to use with <b>PTE2W</b></li> <li>▪ Use 1 fiber</li> </ul>
<b>PTE2W</b>	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1550 nm / Rx 1310 nm, 20Km, LC connector w/o DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> <li>▪ 1550 nm from slave to master</li> <li>▪ Order <b>PTE2W</b> to use with <b>PTD2W</b></li> <li>▪ Use 1 fiber</li> </ul>
<b>PTD4W</b>	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1310 nm / Rx 1550 nm, 40Km, LC connector w/o DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> <li>▪ 1310 nm from master to slave</li> <li>▪ Order <b>PTD4W</b> to use with <b>PTE4W</b></li> <li>▪ Use 1 fiber</li> </ul>
<b>PTE4W</b>	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1550 nm / Rx 1310 nm, 40Km, LC connector w/o DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> <li>▪ 1550 nm from slave to master</li> <li>▪ Order <b>PTE4W</b> to use with <b>PTD4W</b></li> <li>▪ Use 1 fiber</li> </ul>
<b>PTD6W</b>	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1310 nm / Rx 1550 nm, 60Km, LC connector w/o DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> <li>▪ 1310 nm from master to slave</li> <li>▪ Order <b>PTD6W</b> to use with <b>PTE6W</b></li> <li>▪ Use 1 fiber</li> </ul>
<b>PTE6W</b>	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1550 nm / Rx 1310 nm, 60Km, LC connector w/o DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> <li>▪ 1550 nm from slave to master</li> <li>▪ Order <b>PTE6W</b> to use with <b>PTD6W</b></li> <li>▪ Use 1 fiber</li> </ul>
<b>PTD1D</b>	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1310 nm / Rx 1550 nm, 10Km, LC connector with DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> <li>▪ 1310 nm from master to slave</li> <li>▪ Order <b>PTD1D</b> to use with <b>PTE1D</b></li> <li>▪ Use 1 fiber</li> </ul>
<b>PTE1D</b>	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1550 nm / Rx 1310 nm, 10Km, LC connector with DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> <li>▪ 1550 nm from slave to master</li> <li>▪ Order <b>PTE1D</b> to use with <b>PTD1D</b></li> <li>▪ Use 1 fiber</li> </ul>
<b>PTD2D</b>	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1310 nm / Rx 1550 nm, 20Km, LC connector with DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> <li>▪ 1310 nm from master to slave</li> <li>▪ Order <b>PTD2D</b> to use with <b>PTE2D</b></li> <li>▪ Use 1 fiber</li> </ul>
<b>PTE2D</b>	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1550 nm / Rx 1310 nm, 20Km, LC connector with DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> <li>▪ 1550 nm from slave to master</li> <li>▪ Order <b>PTE2D</b> to use with <b>PTD2D</b></li> <li>▪ Use 1 fiber</li> </ul>
<b>PTD4D</b>	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1310 nm / Rx 1550 nm, 40Km, LC connector with DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> <li>▪ 1310 nm from master to slave</li> <li>▪ Order <b>PTD4D</b> to use with <b>PTE4D</b></li> <li>▪ Use 1 fiber</li> </ul>
<b>PTE4D</b>	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1550 nm / Rx 1310 nm, 40Km, LC connector with DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> <li>▪ 1550 nm from slave to master</li> <li>▪ Order <b>PTE4D</b> to use with <b>PTD4D</b></li> <li>▪ Use 1 fiber</li> </ul>

<b>PTD6D</b>	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1310 nm / Rx 1550 nm, 60Km, LC connector with DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> <li>▪ 1310 nm from master to slave</li> <li>▪ Order <b>PTD6D</b> to use with <b>PTE6D</b></li> <li>▪ Use 1 fiber</li> </ul>
<b>PTE6D</b>	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1550 nm / Rx 1310 nm, 60Km, LC connector with DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> <li>▪ 1550 nm from slave to master</li> <li>▪ Order <b>PTE6D</b> to use with <b>PTD6D</b></li> <li>▪ Use 1 fiber</li> </ul>
<b>PTD8D</b>	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1310 nm / Rx 1550 nm, 80Km, LC connector with DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> <li>▪ 1310 nm from master to slave</li> <li>▪ Order <b>PTD8D</b> to use with <b>PTE8D</b></li> <li>▪ Use 1 fiber</li> </ul>
<b>PTE8D</b>	Single mode optical module with single bi-directional fiber, 1.25G, Tx 1550 nm / Rx 1310 nm, 80Km, LC connector with DDM, GbE/1X fiber channel	<ul style="list-style-type: none"> <li>▪ 1550 nm from slave to master</li> <li>▪ Order <b>PTE8D</b> to use with <b>PTD8D</b></li> <li>▪ Use 1 fiber</li> </ul>

**NOTE:** For other special optical modules, please check SFP Optical Module brochure or contact your nearest Loop sales representative.

### Examples:

Loop-IP6716-S-CA-PPM-4ETRJ-4ETRJ-SA

A 1U ANSI chassis with G.823 traffic, two 4-port E1/T1 cards with RJ connectors, and 100 to 240 Vac power.

Loop-IP6716-S-CE-PPM-4ETDB25-4ETDB25-4ETDB25-4ETDB25-SD48-SD48-LCD

A 1U ETSI chassis with G.823 traffic, four 4-port E1/T1 with DB25 connectors, two 48Vdc power, and LCD

Loop-IP6716-S-CA-PPB-4ETRJ-AC

A 1U ANSI chassis with G.823 traffic, one 4-port E1/T1 cards with RJ connectors, and 100 to 240 Vac power.

## **Loop-IP6716S Product Specifications**

### Optical SFP Module Characteristic for GbE Ethernet(GbE) Interface

SFP Optical Module	Direction	Data Rate	Wavelength(nm)	Connector	Distance
MTAFW	dual uni-directional fiber	1.25G	850	LC without DDM	550 m
MTBTW	dual uni-directional fiber	1.25G	1310	LC without DDM	2 km
MTAFD	dual uni-directional fiber	1.25G	850	LC with DDM	550 M
MTBTD	dual uni-directional fiber	1.25G	1310	LC with DDM	2 km
PTB2W	dual uni-directional fiber	1.25G	1310	LC without DDM	20 km
PTB4W	dual uni-directional fiber	1.25G	1310	LC without DDM	40 km
PTC5W	dual uni-directional fiber	1.25G	1550	LC without DDM	50 km
PTC6W	dual uni-directional fiber	1.25G	1550	LC without DDM	60 km
PTC8W	dual uni-directional fiber	1.25G	1550	LC without DDM	80 km
PTC9W	dual uni-directional fiber	1.25G	1550	LC without DDM	90 km
PTCVW	dual uni-directional fiber	1.25G	1550	LC without DDM	110 km
PTCXW	dual uni-directional fiber	1.25G	1550	LC without DDM	120 km
PTB1D	dual uni-directional fiber	1.25G	1310	LC with DDM	10 km
PTB3D	dual uni-directional fiber	1.25G	1310	LC with DDM	30 km
PTB4D	dual uni-directional fiber	1.25G	1310	LC with DDM	40 km
PTC5D	dual uni-directional fiber	1.25G	1550	LC with DDM	50 km
PTC6D	dual uni-directional fiber	1.25G	1550	LC with DDM	60 km
PTC8D	dual uni-directional fiber	1.25G	1550	LC with DDM	80 km
PTC9D	dual uni-directional fiber	1.25G	1550	LC with DDM	90 km
PTCVD	dual uni-directional fiber	1.25G	1550	LC with DDM	110 km
PTCXD	dual uni-directional fiber	1.25G	1550	LC with DDM	120 km
PKB1W	dual uni-directional fiber	622M~1.25G	1310	LC without DDM	10 km

SFP Optical Module	Direction	Data Rate	Wavelength(nm)	Connector	Distance
PTD1W	bi-directional fiber	1.25G	Tx1310/Rx1550 nm	LC without DDM	10 km
PTE1W	bi-directional fiber	1.25G	Tx1550/Rx1310 nm	LC without DDM	10 km
PTD2W	bi-directional fiber	1.25G	Tx1310/Rx1550 nm	LC without DDM	20 km
PTE2W	bi-directional fiber	1.25G	Tx1550/Rx1310 nm	LC without DDM	20 km
PTD4W	bi-directional fiber	1.25G	Tx1310/Rx1550 nm	LC without DDM	40 km
PTE4W	bi-directional fiber	1.25G	Tx1550/Rx1310 nm	LC without DDM	40 km
PTD6W	bi-directional fiber	1.25G	Tx1310/Rx1550 nm	LC without DDM	60 km
PTE6W	bi-directional fiber	1.25G	Tx1550/Rx1310 nm	LC without DDM	60 km
PTD1D	bi-directional fiber	1.25G	Tx1310/Rx1550 nm	LC with DDM	10 km
PTE1D	bi-directional fiber	1.25G	Tx1550/Rx1310 nm	LC with DDM	10 km
PTD2D	bi-directional fiber	1.25G	Tx1310/Rx1550 nm	LC with DDM	20 km
PTE2D	bi-directional fiber	1.25G	Tx1550/Rx1310 nm	LC with DDM	20 km
PTD4D	bi-directional fiber	1.25G	Tx1310/Rx1550 nm	LC with DDM	40 km
PTE4D	bi-directional fiber	1.25G	Tx1550/Rx1310 nm	LC with DDM	40 km
PTD6D	bi-directional fiber	1.25G	Tx1310/Rx1550 nm	LC with DDM	60 km
PTE6D	bi-directional fiber	1.25G	Tx1550/Rx1310 nm	LC with DDM	60 km
PTD8D	bi-directional fiber	1.25G	Tx1310/Rx1550 nm	LC with DDM	80 km
PTE8D	bi-directional fiber	1.25G	Tx1550/Rx1310 nm	LC with DDM	80 km

### Aggregate –Combo Gigabit Ethernet(GbE) Interface

Number of Ports	2
Speed	RJ45: 10/100/1000M bps SFP: 100/1000M bps
Surge Protection	IEC 61000-4-5 class 3
Connector	RJ45 for twisted pair GbE, LC for optical GbE, auto detection

### E1 Tributary Interface (E1/T1 software-selectable)

Line Rate	2.048M bps ± 50 ppm
Line Code	AMI/ HDB3
Framing	ITU G.704 (CRC: on/off, CAS: on/off, unframed)
Output Signal	ITU G.703
Input Signal	ITU G.703
Jitter	ITU G.823
Electrical	75 ohm coax/120 ohm twisted pair
Connector	RJ48C

### T1 Tributary Interface (E1/T1 software-selectable)

Line Rate	1.544M bps ± 32 ppm
Line Code	AMI / B8ZS (selectable)
Framing	D4 / ESF/ ESF&T1.403/ OFF (clear channel)
Output Signal	DSX-1, DS-1
Input Signal	DS1 with 0 dB to -26 dB ALBO
Surge Protection	FCC Part 68 SubPart D
Pulse Template	Per AT&T TR 62411
Connector	RJ48C

### LAN Ethernet Interface

Number of Port	1
Ethernet Functions	10/100/1000 BaseT, IEEE802.3 Auto-negotiation (10/100/1000M) Auto MDI/MDIX Full or half duplex
Connector	RJ45

### SNMP Ethernet

Number of Port	1
Ethernet Functions	10/100/1000 BaseT, IEEE802.3 Auto-negotiation (10/100/1000M) Auto MDI/MDIX Full or half duplex
Connector	RJ45

### Clock Source(for System and Port )

Primary/Secondary Clock	Internal, tributary port (S1P1 – S4P4), WAN port, external (for tributary port E1/T1 only, manufacture option)
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### External Clock

Input Signal 2.048 MHz, 2.048 Mbps, 1.544 Mbps (user selectable)  
Connector BNC

### Alarm Relay

Alarm Relay performance alarm  
Connector 3 pin terminal block  
Max. Current 1A for 30 VDC, 0.3A for 125 VAC

### Network Management

#### **Console Port**

Electrical RS232 interface  
Protocol Menu driven VT-100 terminal  
Connector DB9, female, DCE

#### **SNMP Port**

Protocol Telnet (VT100) and Embedded SNMP  
Connector RJ45 at rear panel

### Performance monitors (T1, E1)

Performance Store The last 24 hours performance in 15-minute intervals  
Monitor Registers user  
Performance Reports Date & Time, Error Second (ES), Unavailable Second (UAS), Bursty Errored Second (BES), Severe Error Second (SES), Controlled Slip Second (CSS), Available Second (AS), Loss of Frame Count (LOF), Degraded Minutes (DM), Error Free Seconds (EFS), and Bipolar Violation (BPV)  
Alarm History Date & time, alarm type (i.e. RAI/YEL, AIS, LOS, LOF, BPV, ES, UAS, CSS)  
Threshold ES/UAS/CSS: 1~900 (sec.)  
BPV: 10E-5~10E-9

### Diagnostics test (T1, E1)

Loopback Line loopback, payload loopback and local loopback  
Remote Loopback Payload loopback  
E1: payload loopback and line loopback  
T1: In-band, AT&T-P, ANSI-P, and ANSI-L loopback

### Front Panel

LCD and Keypad For ANSI shelf only (2-line by 16 character)  
LEDs

### Power

AC Module 100 to 240 Vac  
-48 Vdc Module -36 to -75 Vdc  
AC/DC coexist (fixed module) (100 to 240 Vac and -36 to -75 Vdc)  
Power Consumption DC: Max. 17.5 W  
AC: Max. 18 W  
DC & AC: Max. 18.6 W

### Physical and /Environmental

Dimensions 438 mm x 44 mm x 226 mm (WxHxD)  
Temperature 0 to -50°C (operation)  
Humidity 0-95% RH (non-condensing)  
Mounting Desk-top stackable, wall mount, rack mount

### Certification

EMC EN55022 Class A, EN55024, FCC Part 15 Class A  
Safety EN60950-1, IEC60950-1

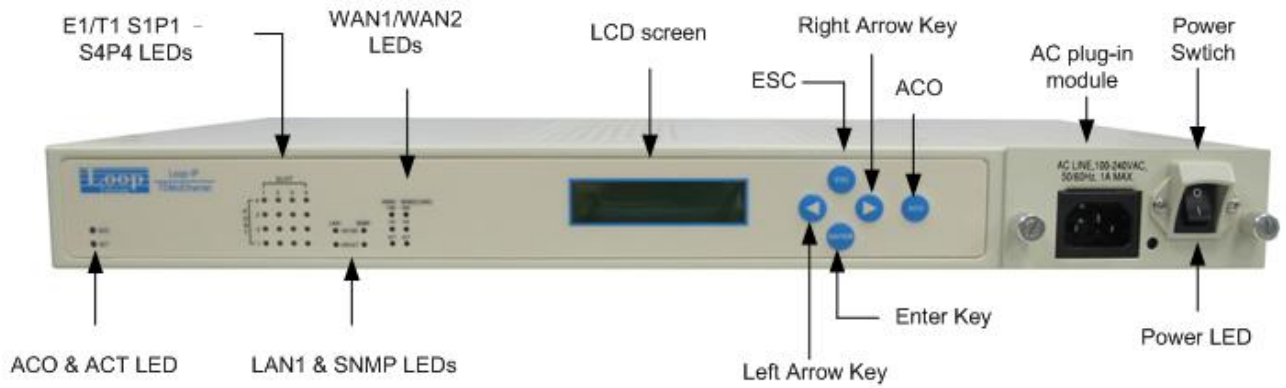
### Standards and Compliance

ITU-T G.703, G.704, G.823  
IEC 61000-4-5 class 3  
IEEE 802.3, 802.3u, 802.3z, 802.3X, 802.1q, 802.1ad  
IETF RFC5087 (TDMoIP), RFC4553 (SAToP), RFC5086 (CESoPSN), RFC1213 (SNMPv1), RFC4805 (E1)

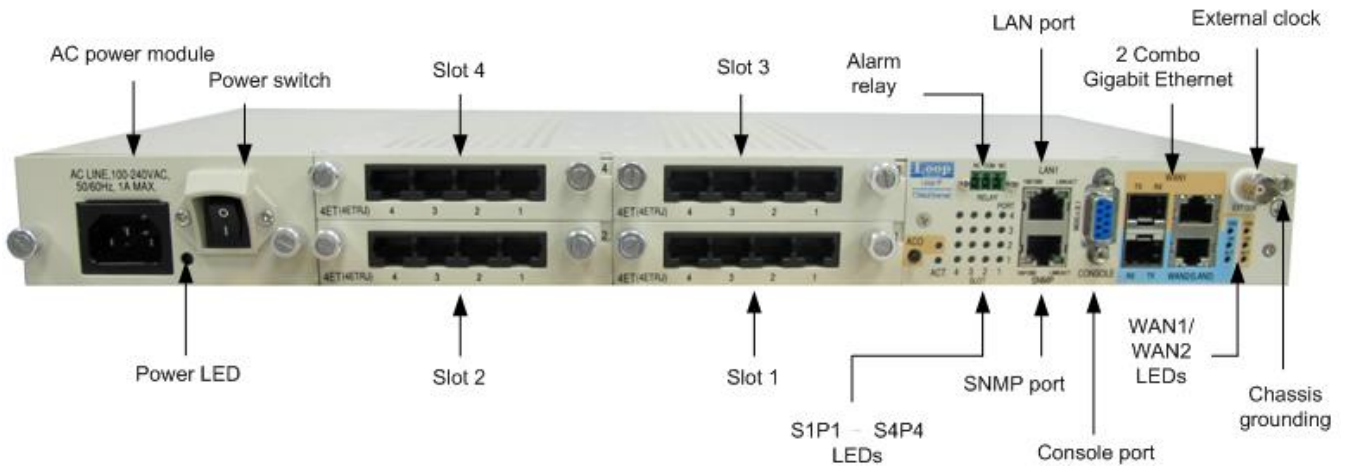


# Loop-IP6716 Panel

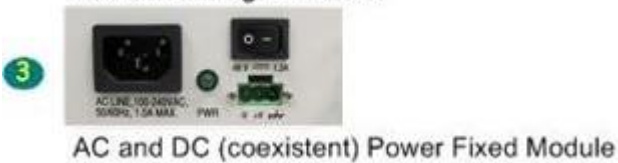
## LCD Front Panel



## Rear Panel

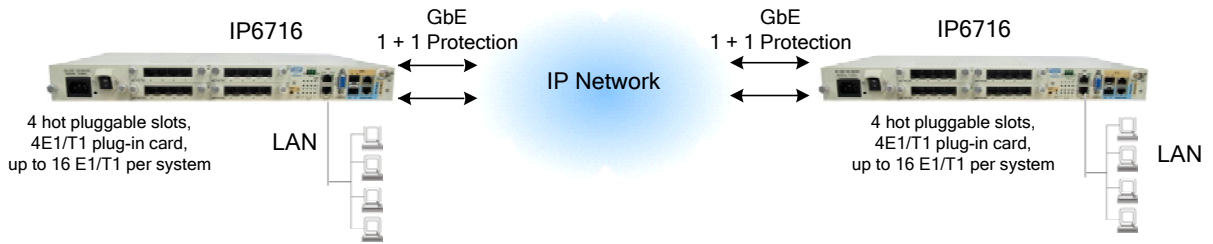


## Power Modules

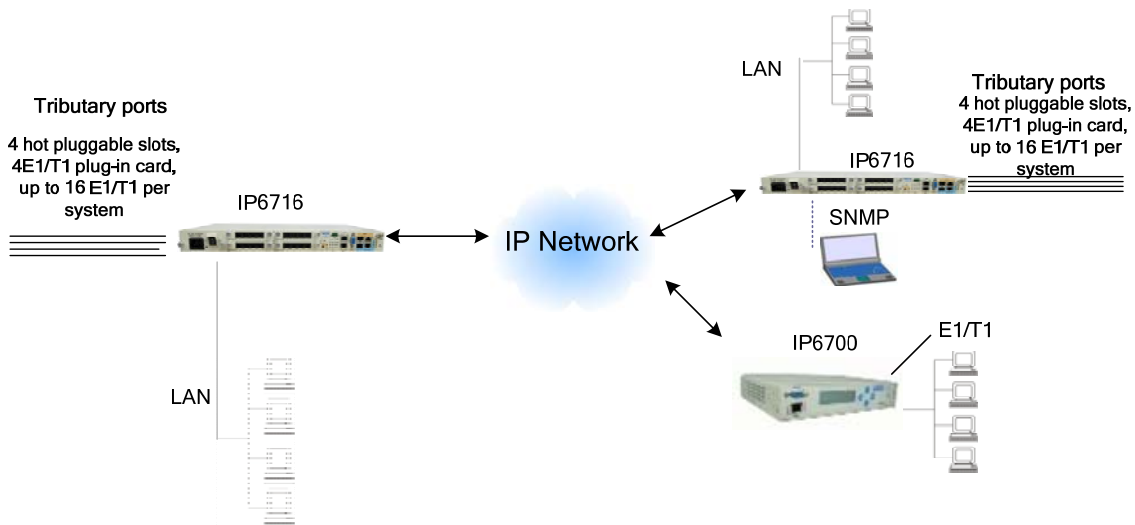


## Application Illustrations

### Point to Point



### Point to Multi-Point



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