Loop-IP6702
TDMoEthernet

Description

The Loop-IP6702 device allows operators to transport Unframed 1 or 2 E1 (1 or 2 Unframed T1) data stream with timing information over PSN (Packet Switched Network) via Pseudowire Protocol - SAToP. Another IP6702 converts the received packet stream back to original E1 or T1 data stream with original timing information. This allows cost-effective migration from existing legacy TDM networks to Packet Switched Network.

On the Network side, the WAN interface can be either 10/100M BaseT Electric or 100 BaseFX Optical. On the TDM Service side, the TDM ports can be one or two Unframed E1 and one or two Unframed T1. Two Ethernet LAN ports are also available for Ethernet data traffic.

For transport of TDM E1/T1 signals the Jitter and Wander performance adheres to G.823 Traffic Interface (+/- 1ppm).

***** Future Option

Features

Mechanics and Electrics

- ANSI shelf
- Power:
  - Fixed AC
  - Fixed DC
  - Combined AC and DC (AoD)

WAN Interface

- On-board 10/100 BaseT Electrical Ethernet
- On-board 100 BaseFX Optical Ethernet

User Tributary Interface

- TDM Tributary interfaces: up to 2 E1 or 2 T1 Unframed mode
- Ethernet Tributary interfaces: 1 x 10/100 BaseT Ethernet port plus 1 user-selectable 10/100 BaseT Ethernet/SNMP port

L2 Switching

- Jumbo frame size up to 2048 bytes
- VLAN:
  - Maximum 4K VLAN ID
  - Maximum 16 con-current VLAN Groups
  - Support C-VLAN/S-VLAN tag adding and removing on Pseudowire
  - Support 802.1q Port-Based VLAN on Ethernet/SNMP Port
  - Support Q-in-Q
- Support Multiple Bridge Groups
- Support 802.1d MAC Learning
- Support 803.3x Flow control on input ports
- Packet Transparency

QoS

- IP Network Level:
  - 6-bit DiffServ Code Point -DSCP field – ToS

Pseudowire Capability

- Support SAToP
- Support E1/T1 traffic emulation over UDP/IP Network
- Maximum 2 Pseudowires
- PDV Compensation Depth: up to 512 ms
- Jitter Buffer Size: up to 1024 frames
- Excel calculator is provided

Pseudowire Diagnostic Function

- Built-in BERT for E1/T1 to Line or WAN direction
- ARP, Ping and Trace Route
- IP – MAC Table Display
- Pseudowire Information
  - Packet Creation Time (ms)
  - Jitter-Tolerance Delay (ms)
  - Single-Trip Delay (ms)
  - Total Frame Length (bytes)
  - Packet per second
  - Required Bandwidth (Mbps)
  - Header Overhead (%)

Jitter & Wander

- PPM version: conforms to G.823 Traffic Interface (+/- 1ppm)

Timing Reference

- Internal (20 ppm)
- Line (E1/T1)
- Adaptive Clock Recovery: All Pseudowires can apply ACR

OAM Capability

- Support 1 SNTP timing reference
- Alarm propagation between E1 or T1 to line and WAN port
- Multi-color LED indicators
- Alarm relay
- ACO (Alarm Cutoff) button

Management Interfaces

- 1 user-selectable Ethernet/SNMP port
- SNMP v1/v3* with 5 SNMP trap IP
- DB-9 Console port with VT-100 menu
- Telnet and SSHv1*/SSHv2*
- C-VLAN/S-VLAN tag on management traffic
- LoopView GUI

Standards Compliance

- SAToP

* Future Option

Ordering Information

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

Main Unit

Model	Description	Notes
Loop-IP6702-S-ETH-PPM-1aa-pp-**G**	IP6702 with G.823 traffic interface, 1 **electric Ethernet** WAN port, 1 LAN port, 1 SNMP port and **1x E1 or 1x T1** port.	• Where **aa** and **pp** are defined below. • For other special optical modules, please contact your nearest Loop sales representative. • Low Speed for E1/T1
Loop-IP6702-S-ETH-PPM-2aa-pp-**G**	IP6702 with G.823 traffic interface, 1 **electric Etherne**t WAN port, 1 LAN port, 1 SNMP port and **2x E1 or 2x T1** ports.	
Loop-IP6702-S-SFPH-PPM-1aa-pp-**G**	IP6702 with G.823 traffic interface, 1 **SFP (mini-GBIC) optical housing** for WAN port (SFP optical module not included), 1 LAN port, 1 SNMP port and **1x E1 or 1x T1** ports.	
Loop-IP6702-S-SFPH-PPM-2aa-pp-**G**	IP6702 with G.823 traffic interface, 1 **SFP (mini-GBIC) optical housing** for WAN port (SFP optical module not included), 1 LAN port, 1 SNMP port and **2x E1 or 2x T1** ports.	

■ Where **aa** is used to select **connector**.
This module **must be selected** one from the list below.

aa=	Description	Notes
E75	E1 75 ohm with RJ48C connector	• 75 ohm/120 ohm is software selectable. • Please order RJ48 to BNC conversion cable.
E120	E1 120 ohm with RJ48C connector	
T1	T1 with RJ48C connector	

■ Where **pp** is used to select **power module**.
This module **must be selected** one from the list below.

pp=	Description	Notes
AoD	AC: 100 to 240 Vac -48Vdc DC: -42 to -72 Vdc (Both are not powered simultaneously. Support sealing current looped.)	• For DC, wire to included IEC socket.  • No safety certification for DC. • For AC, choose an appropriate power cord.
AC	100 to 240 Vac	
DC	-48Vdc (-42 to -72 Vdc)	

Accessories

User's Manual	
Loop-IP6702-UM	User's Manual (paper hard copy-optional). A CD version of the manual is already included as standard equipment.
Firmware Upgrade	
Loop-IP6702-FWUPGR	Firmware Upgrade. Customers who desire to have a firmware upgrade after their warranty has expired can purchase this option. This will upgrade the firmware to the most current version and provide an additional 12 months of software repair and patches on existing functionality as necessary.

Power Cord (All power cords are RoHS compliant)		
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	
Conversion cable		
Loop-ACC-CAB-RJ48M-28-2BNCF-**G**	RJ48C/ Male to BNC / Female, 2 Conversion cable; Length: 28 cm	
Tray		
81.TRAY19.1000-**G**	19" Tray for rack mount (One tray for two base units)	
SFP Optical Modules		
Please place your order using the 5-digit alphanumeric codes listed in the separate SFP Optical Module Brochure.		

Examples 1:
Main unit: Loop-IP6702-S-ETH-PPM-1E75-AC-G
Accessory: Loop-ACC-CAB-RJ48M-15-2BNCF-G
Description: IP6702 stand-alone unit with G.823 traffic interface, 1 electric Ethernet WAN port, 1x E1 75ohm interface port, 100 to 240 Vac power.

Examples 2:
Main unit: Loop-IP6702-S-SFPH-PPM-2E120-DC-G
Description: IP6702 stand-alone unit with G.823 traffic interface, 1 SFP optical housing for WAN port, 2x E1 120ohm interface ports, -42 to -72 Vdc power.

Specifications

SFP Optical Module
Please refer to SFP optical module brochure for detail.

WAN Interface
Number of Ports: 1 Electrical port or 1 Optical port

Electrical Port

Speed :	10/100 BaseT (802.3i, 802.3u) Auto-negotiation (10/100) Auto MDI/MDIX Full/Half Duplex
Connector:	RJ45

Optical Port

Speed :	100 BaseFX (802.3u)
Connector:	SFP

Ethernet Tributary Interface

Number of Ports:	2
Speed:	10/100 BaseT (802.3i, 802.3u) Auto-negotiation (10/100) Auto MDI/MDIX Full/Half Duplex
Connector:	RJ45

E1 Tributary Interface

Number of Ports:	2
Line Rate:	2.048 Mbps ± 50 ppm
Line Code:	AMI/HDB3
Framing:	CCITT G.704

Input Signal:	ITU G.703
Output Signal:	ITU G.703
Jitter and Wander:	ITU G.823 traffic mode
Impedance:	75 ohm coax/120 ohm twisted pair (programmable)
Connector:	BNC and RJ48C

T1 Tributary Interface

Number of ports:	2	Input Signal:	DS-1 from 0dB to -26 dB w/ALBO
Line Rate:	1.544 Mpbs ± 32 ppm	Output Signal:	DSX-1, DS-1
Line Code:	AMI/B8ZS	Jitter and Wander:	AT&T TR 62411
Framing:	None	Connector:	RJ48C

Timing Source

Primary/Secondary Clock: Internal (20 ppm), E1/T1 line , Adaptive Clock Recovery

Alarm Relay

Alarm Relay:	Fuse alarm, performance alarm
Connector:	3 pin terminal block
Maximum Current:	1A for 30 Vdc

Network Management

Console Port		**SNMP Port**	
Electrical:	RS232 interface	Protocol:	SNMP v1
Terminal:	Menu driven VT-100	Connector:	RJ45 at front panel
Connector:	DB9, female and DCE		

Performance Monitors (E1/T1)

Performance Store:	The last 24 hours performance in 15-minute intervals
Performance Reports:	Date &Time, Error Second (ES), Unavailable Second (UAS), Bursty Errored Second (BES), and Severe Error Second (SES)

Alarm Reports (E1/T1)

Alarm History:	Date & time, alarm type(i.e. clock loss, LOS, BPV, ES)
Alarm Queue:	Contains up to 160 alarm records of latest alarm types, alarm severity, date and time.

Diagnostics Test (E1/T1)

Loopback:	Line loopback and Local loopback

Power

AC (fixed module):	100 to 240 Vac
DC (fixed module):	-42 to -72 Vdc
AC & DC:	100 to 240 Vac and -42 to -72 Vdc
Consumption:	Maximum 5.0 W

Physical and Environmental

Dimensions:	210 x 41.5 x 140 mm (W x H x D)
Net Weight:	1.0 Kg
Temperature:	0 -50°C
Humidity:	0-95% RH (non-condensing)
Mounting:	Desk-top stackable, wall mountable, rack mount with 19” tray available

Standards Compliance

IEEE

802.1p	Priority Code Point
802.1q	VLAN Tagging
802.1ad	Q-in-Q
802.3i	10BaseT
802.3u	100BaseT, 100 BaseFX

IETF

RFC 3411	SNMPv1, v2c, v3
RFC4553	SAToP

ITU

G.703	E1/DS1
G.706	Frame Alignment and CRC
G.823/ G.824*	Traffic and Synchronous Interface (Traffic only)
G.826	End to End Error Performance
PWE3	Pseudo Wire Emulation Edge-to-Edge

MEF

8*	CESoETH

RoHS Restriction of Hazardous Substances Directive

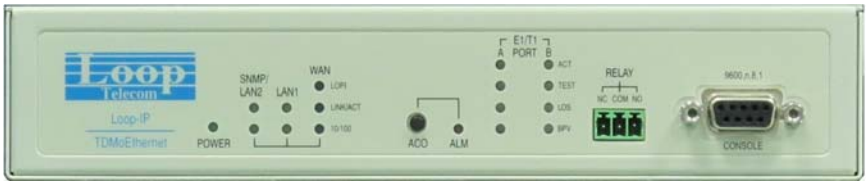
Certifications

EMC:	EN55022 Class A, EN50024, EN300 386, FCC Part 15 Subpart B Class A
Safety:	IEC60950-1(CB), EN60950-1(CE)

*Future option

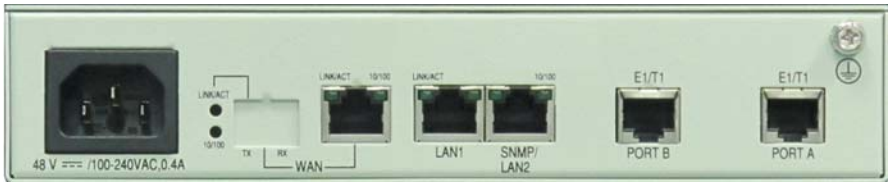
Panel Views

Front Panel View



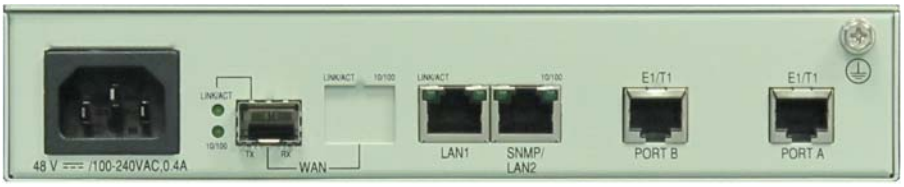
Rear Panel View: Electrical Ethernet with 1 x E1/T1 port

Rear Panel View: Electrical Ethernet with 2 x E1/T1 por



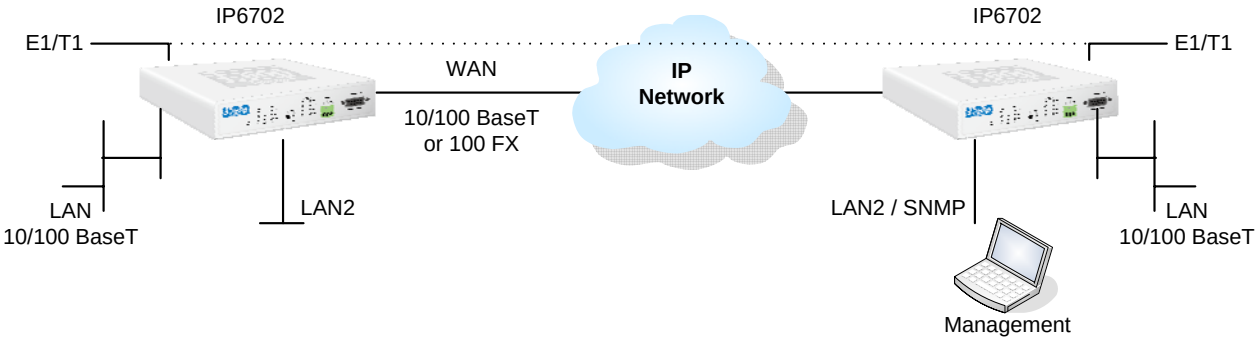
Rear Panel View: Optical Ethernet with 1 x E1/T1 port

Rear Panel View: Optical Ethernet with 2 x E1/T1 port

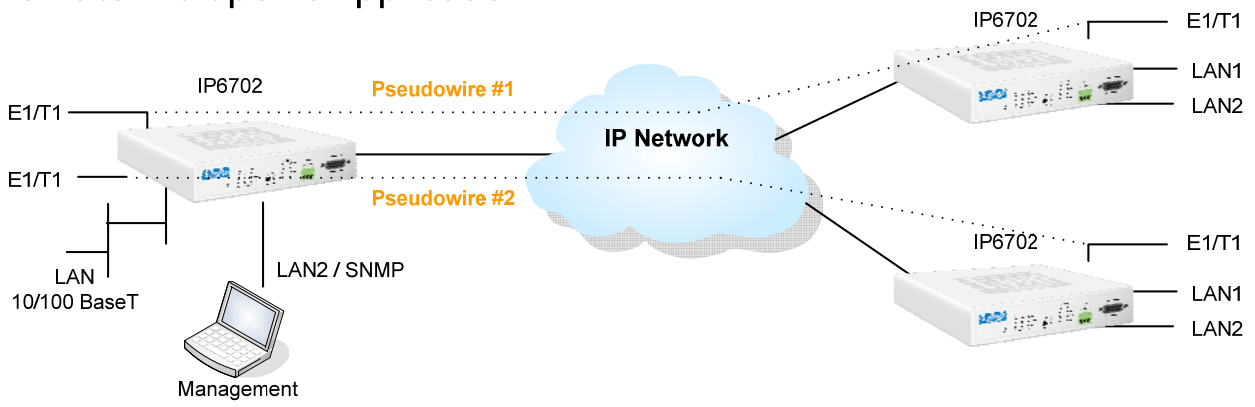


Application Illustrations

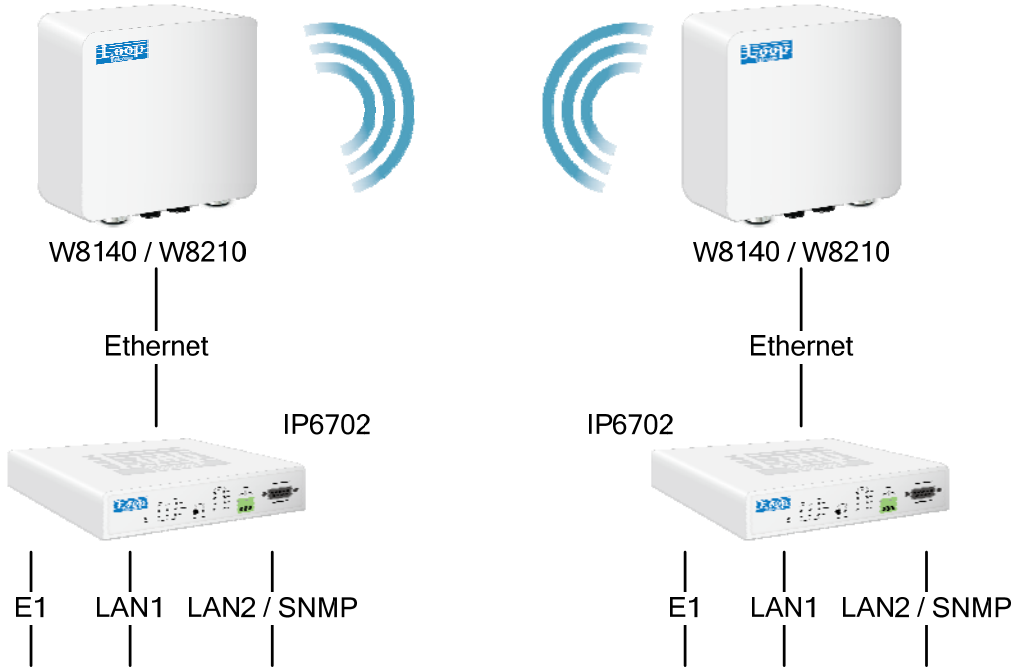
Point to Point Application



Point to Multipoint Application



E1/LAN Ethernet Radio Application



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