Loop-IP6702 TDMoEthernet

Description:

Loop-IP-6702 device allows operator to transport 1 or 2 E1/T1* with timing and Ethernet traffic over IP network. This allows cost effective migration to IP network from existing voice and data network using existing TDM based equipment.

On the WAN side, the Ethernet interface can be 10/100M electric or 100FX optical Ethernet. On the tributary side, the TDM ports can be one or two E1 and T1*. Two Ethernet LAN ports are also include for lower priority user data traffic as well.

Loop-IP-6702 has built-in AC or DC power. Management choices include console port, SNMP port, and in-band management through the Ethernet WAN port.

For transport of TDM signals E1Jitter and Wander adheres to G.823 Traffic.

Features

- Dimensions: 210 x 41.5 x140 mm (W x H x D)
- WAN port
  - WAN1: 10/100 BaseT or optical Ethernet (100 Base-FX)
  - WAN2*: the optical SFP becomes WAN2 and can also be used as protection for WAN1
- Tributary ports
  - TDM interfaces, up to 2 E1 or T1* unframed mode
  - Two LAN interfaces: one 10/100 BT Ethernet plus one user select 10/100 BT Ethernet/SNMP
- Point to point and point to multi-points applications
- Max 2 pseudo-wires (PW), one PW per E1
- Each PW can be assign a separate VLAN ID (from 1 to 4049)
- Power options:
  - Fixed AC (100 to 240 VAC)
  - Fixed DC (-42 to -72 VDC)
  - Combine AC and DC (AoD): 100 to 240 VAC; -42 to -72 VDC
- Clock source: internal (20 ppm), E1 line or PW
- Bridging & Switching
  - Jumbo frame up to 2048 byte
  - VLAN (TDM part)
    - VLAN Q-in-Q (tagging and removal)
    - Packet transparency
  - VLAN (switch part)
    - 802.1q Port Base VLAN/Port Isolation (1~16 entries)
  - E1/Ethernet data and management can assign different VLAN

- Qos
  - User configurable ToS in outgoing IP frame
- Packet Delay Variation
  - E1: up to 256 ms
- Supports SNTP: update the system time from NTP timeserver. (This function needs NTP timeserver to sync time.)
- Built-in BERT for E1 or T1*
- Jitter & Wander: G.823 traffic
- Multi-color LED indicators
- Alarm relay
- Management port and interface
  - Console port with VT100 menu
  - SNMP port:
    - SNMP V1 with 5 SNMP trap capability
    - Telnet
    - LoopView GUI
- IETF SAToP (RFC4533) and MEF8* compliance
- Alarm propagation between E1 or T1* to line and WAN port

* Future Option

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 (RoHS compliant)		Description	Note
Loop-IP6702-S-ETH-PPM-1aa-pp-**G**		IP6702 with G.823 traffic, a SNMP port, an electric Ethernet WAN port, one E1/T1 port, and one LAN interface.	Where aa, pp, and SFP modules are defined below.
Loop-IP6702-S-ETH-PPM-2aa-pp-**G**		IP6702 with G.823 traffic, a SNMP port, an electric Ethernet WAN port, two E1/T1 ports, and one LAN interface.	
Loop-IP6702-S-SFPH-PPM-1aa-pp-**G**		IP6702 with G.823 traffic, a SNMP port, one E1/T1 port and one LAN interface, SFP (mini-GBIC) optical housing for WAN port (SFP optical module not included).	T1 is future option.
Loop-IP6702-S-SFPH-PPM-2aa-pp-**G**		IP6702 with G.823 traffic, a SNMP port, two E1/T1 ports and one LAN interface, SFP (mini-GBIC) optical housing for WAN port (SFP optical module not included).	Optical Ethernet is future option.
Accessories			
User's Manual			
Loop-IP6702-UM	Loop-IP6702-UM	User's Manual (paper hard copy-optional). A CD version of the manual is already included as standard equipment.	
SFP Optical Modules			
Please place your order by using 5 letters in the SFP optical module table below.			
Power Cord (All power cords are RoHS compliant)			
Loop-ACC-PC-USA	Loop-ACC-PC-USA	AC power cord for Taiwan/America	
Loop-ACC-PC-EU	Loop-ACC-PC-EU	AC power cord for Europe	
Loop-ACC-PC-UK	Loop-ACC-PC-UK	AC power cord for UK	
Loop-ACC-PC-AUS	Loop-ACC-PC-AUS	AC power cord for Australia	
Loop-ACC-PC-CH	Loop-ACC-PC-CH	AC power cord for China	
Conversion cable (All power cords are RoHS compliant)			
Loop-ACC-CAB-RJ48M-15-2BNC-G		RJ48C / Male to BNC / Female *2 Conversion cable, Length: 15 cm	

Where **aa**=

	Must select one from list below	Description	Note
E120	E1 120 ohm with RJ48C connector	(75 ohm/120 ohm is software selectable)	
E75	E1 75 ohm with RJ48C connector	(75 ohm/120 ohm is software selectable)	• Please order RJ48 to BNC conversion cable.
T1	T1 with RJ48C connector		• (future option)

Where **pp**=

	Description	Note
AoD	Powered by AC 100 to 240 VAC or DC -48VDC (-42 to -72 VDC), but not both simultaneously. Support sealing current looped.	• For AC, choose an appropriate power cord. • For DC, wire to included IEC socket. • No safety certification for DC portion.
AC	Powered by AC 100 to 240 VAC.	• Please choose an appropriate power cord.
DC	Powered by DC -48VDC (-42 to -72 VDC).	

SFP Optical Module (All SFP Optical Modules are RoHS compliant)

SFP 155 Mbps (mini GBIC) Dual Fiber Commercial (0 to 70°C)	MHATW	Multi mode optical module with dual uni-directional fiber, 155Mbps, 850nm, 2Km, LC connector w/o DDM, Fast Ethernet and compliant with ITU G.957	
	MHBTW	Multi mode optical module with dual uni-directional fiber, 155Mbps, 1310nm, 2Km, LC connector w/o DDM, Fast Ethernet and compliant with ITU G.957	
	PHB3W	Single mode optical module with dual uni-directional fiber, 155Mbps, 1310nm, 30Km, LC connector w/o DDM, S-1.1/IR1/Fast Ethernet	
	PHB5W	Single mode optical module with dual uni-directional fiber, 155Mbps, 1310nm, 50Km, LC connector w/o DDM, L-1.1/LR1/Fast Ethernet	
	PHCUW	Single mode optical module with dual uni-directional fiber, 155Mbps, 1550nm, 100Km, LC connector w/o DDM, L-1.2/LR2Fast Ethernet	
	PHCXW	Single mode optical module with dual uni-directional fiber, 155Mbps, 1550nm, 120Km, LC connector w/o DDM, L-1.2 extended distance	
	PHB3D	Single mode optical module with dual uni-directional fiber, 155Mbps, 1310nm, 30Km, LC connector with DDM, S-1.1/IR1/Fast Ethernet	• Use 2 fibers for all SFP optical modules
	PHB5D	Single mode optical module with dual uni-directional fiber, 155Mbps, 1310nm, 50Km, LC connector with DDM, L-1.1/LR1/Fast Ethernet	
	PHC8D	Single mode optical module with dual uni-directional fiber, 155Mbps, 1550nm, 80Km, LC connector with DDM, L-1.2/LR2	
	PHCUD	Single mode optical module with dual uni-directional fiber, 155Mbps, 1550nm, 100Km, LC connector with DDM, L-1.2/LR2/Fast Ethernet	
	PHCXD	Single mode optical module with dual uni-directional fiber, 155Mbps, 1550nm, 120Km, LC connector with DDM, L-1.2 extended distance	
	PHCRD	Single mode optical module with dual uni-directional fiber, 155Mbps, 1550nm, 160Km, LC connector with DDM, L-4.2 extended distance	
	PHCYD	Single mode optical module with dual uni-directional fiber, 155Mbps, 1550nm, 200Km, LC connector with DDM, L-4.2 extended distance	
	PHCZD	Single mode optical module with dual uni-directional fiber, 155Mbps, 1550nm, 240Km, LC connector with DDM, L-4.2 extended distance	
155 Mbps Bi-directional Single Fiber Commercial (0 to 70°C)	PHD2W	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1310 nm / Rx 1550 nm, 10~20Km, LC connector w/o DDM, Fast Ethernet and compliant with ITU G.957	1310 nm from master to slave Order PHD2W to use with PHE2W Use 1 fiber
	PHE2W	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1550 nm / Rx 1310 nm, 10~20Km, LC connector w/o DDM, Fast Ethernet and compliant with ITU G.957	1550 nm from slave to master Order PHE2W to use with PHD2W Use 1 fiber
	PHD4W	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1310 nm / Rx 1550 nm, 40Km, LC connector w/o DDM, Fast Ethernet and compliant with ITU G.957	1310 nm from master to slave Order PHD4W to use with PHE4W Use 1 fiber
	PHE4W	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1550 nm / Rx 1310 nm, 40Km, LC connector w/o DDM, Fast Ethernet and compliant with ITU G.957	1550 nm from slave to master Order PHE4W to use with PHD4W Use 1 fiber

	PHD6W	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1310 nm / Rx 1550 nm, 60Km, LC connector w/o DDM, Extend distance L4.2	1310 nm from master to slave Order PHD6W to use with PHE6W Use 1 fiber
	PHE6W	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1550 nm / Rx 1310 nm, 60Km, LC connector w/o DDM, Extend distance L4.2	1550 nm from slave to master Order PHE6W to use with PHD6W Use 1 fiber
	PHD8W	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1310 nm / Rx 1550 nm, 80Km, LC connector w/o DDM, Extend distance L4.2	1490 nm from master to slave Order PHD8W to use with PHE8W Use 1 fiber
	PHE8W	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1550 nm / Rx 1310 nm, 80Km, LC connector w/o DDM, Extend distance L4.2	1570 nm from slave to master Order PHE8W to use with PHD8W Use 1 fiber
	PHQ8W	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1490 nm / Rx 1570 nm, 80Km, LC connector w/o DDM, Fast Ethernet and compliant with ITU G.957	1490 nm from master to slave Order PHQ8W to use with PHR8W Use 1 fiber
	PHR8W	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1570 nm / Rx 1490 nm, 80Km, LC connector w/o DDM, Fast Ethernet and compliant with ITU G.957	1570 nm from slave to master Order PHR8W to use with PHQ8W Use 1 fiber
	PHQXW	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1510 nm / Rx 1590 nm, 120Km, LC connector w/o DDM, Extend distance L4.2	1490 nm from master to slave Order PHQXW to use with PHRXW Use 1 fiber
	PHRXW	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1590 nm / Rx 1510 nm, 120Km, LC connector w/o DDM, Extend distance L4.2	1570 nm from slave to master Order PHRXW to use with PHQXW Use 1 fiber
	PHQRW	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1510 nm / Rx 1590 nm, 160Km, LC connector w/o DDM, Extend distance L4.2	1490 nm from master to slave Order PHQRW to use with PHRRW Use 1 fiber
	PHRRW	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1590 nm / Rx 1510 nm, 160Km, LC connector w/o DDM, Extend distance L4.2	1570 nm from slave to master Order PHRRW to use with PHQRW Use 1 fiber
	PHQYW	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1510 nm / Rx 1590 nm, 200Km, LC connector w/o DDM, Extend distance L4.2	1490 nm from master to slave Order PHQYW to use with PHRYW Use 1 fiber
	PHRYW	Single mode optical module with single bi-directional fiber, 155Mbps, Tx 1590 nm / Rx 1510 nm, 200Km, LC connector w/o DDM, Extend distance L4.2	1570 nm from slave to master Order PHRYW to use with PHQYW Use 1 fiber

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

NOTE:
1.   For other special optical modules, please contact your nearest Loop sales representative.
     * Low Speed for T1, E1
2.   PPM = G.823 Traffic

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

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

Loop-IP6702 TDMoEthernet Product Specifications

SFP Optical Module Specification

SFP Optical Module	Direction	Data Rate	Wavelength(nm)	Connector	Distance
MHATW	Dual uni-directional fiber	155M	850nm	LC without DDM	2 Km
MHBTW	Dual uni-directional fiber	155M	1310nm	LC without DDM	2 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
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
PHCRD	Dual uni-directional fiber	155M	1550nm	LC with DDM	160 Km
PHCYD	Dual uni-directional fiber	155M	1550nm	LC with DDM	200 Km
PHCZD	Dual uni-directional fiber	155M	1550nm	LC with DDM	240 Km
PHD2W	Single bi-directional fiber	155M	Tx 1310 nm/Rx 1550 nm	LC without DDM	10~20 Km
PHE2W	Single bi-directional fiber	155M	Tx 1550 nm/Rx 1310nm	LC without DDM	10~20 Km
PHD4W	Single bi-directional fiber	155M	Tx 1310 nm/Rx 1550nm	LC without DDM	40 Km
PHE4W	Single bi-directional fiber	155M	Tx 1550 nm/Rx 1310 nm	LC without DDM	40 Km
PHD6W	Single bi-directional fiber	155M	Tx 1310 nm/Rx 1550nm	LC without DDM	60 Km
PHE6W	Single bi-directional fiber	155M	Tx 1550 nm/Rx 1310 nm	LC without DDM	60 Km
PHD8W	Single bi-directional fiber	155M	Tx 1310 nm/Rx 1550 nm	LC without DDM	80 Km
PHE8W	Single bi-directional fiber	155M	Tx 1550 nm/Rx 1310nm	LC without DDM	80 Km
PHQ8W	Single bi-directional fiber	155M	Tx 1490 nm/Rx 1570nm	LC without DDM	80 Km
PHR8W	Single bi-directional fiber	155M	Tx 1570 nm/Rx 1490 nm	LC without DDM	80 Km
PHQXW	Single bi-directional fiber	155M	Tx 1510 nm/Rx 1590nm	LC without DDM	120 Km
PHRXW	Single bi-directional fiber	155M	Tx 1590 nm/Rx 1510 nm	LC without DDM	120 Km
PHQRW	Single bi-directional fiber	155M	Tx 1510 nm/Rx 1590nm	LC without DDM	160 Km
PHRRW	Single bi-directional fiber	155M	Tx 1590 nm/Rx 1510 nm	LC without DDM	160 Km
PHQYW	Single bi-directional fiber	155M	Tx 1510 nm/Rx 1590nm	LC without DDM	200 Km
PHRYW	Single bi-directional fiber	155M	Tx 1590 nm/Rx 1510 nm	LC without DDM	200 Km

Electric Ethernet WAN Interface

Interface	10/100 BaseT
Connector	RJ45

Optical Ethernet WAN Interface *

Speed	100 Base-FX
Connector	SFP 3.3V

E1 Tributary Interface

Line Rate	2.048 Mbps $\pm$ 50 ppm	Input Signal	ITU G.703
Framing	CCITT G.704	Output Signal	ITU G.703
Line Code	AMI/HDB3	Jitter	CCITT G.823
Connector	BNC and RJ48C	Electrical	75 ohm coax/120 ohm twisted pair (programmable)

T1* Tributary Interface

Line Rate	1.544 Mpbs $\pm$ 32 ppm	Input Signal	DS-1 from 0dB to -26 dB w/ALBO
Framing	D4/ESF/ESF&T1.4.3/ None	Output Signal	DSX-1, DS-1
Line Code	AMI/B8ZS	Jitter	AT&T TR 62411
Connector	RJ48C	Electrical	RJ48C

LAN Tributary Interface

Number of Ports	2
Speed	10/100 BaseT
Connector	RJ45

Ethernet Switch
Jumbo frame up to 2048 bytes
User configurable ToS in outgoing IP frame
VLAN: Supports Q-in-Q
                Packet transparency

Packet Delay Variation
For E1:   Up to 256 ms

SNTP
SNTP client support
Sync with up to 2 time servers

Clock Source
Clock   Internal (20 ppm), E1 line , WAN port (PW)

Alarm Relay
Alarm Relay   Fuse alarm, performance alarm
Connector   3 pin terminal block

Network Management

Console Port		**SNMP Port**	
Electrical	RS232 interface	Protocol	V1
Protocol	Menu driven VT-100 terminal	Connector	RJ45 at front panel
Connector	DB9, female, DCE		
Baud rate	2400, 4800, 9600, 19200, 38400		

Performance monitors (E1/T1)*
Performance Store   The last 24 hours performance in 15-minute intervals
Monitor Registers   Line, user and remote site
Performance Reports Date &Time, Error second, Unavailable second, Bursty error second, and severe error second
Alarm History   Date & time, alarm type(i.e. clock loss, LOS, BPV, ES)
Alarm Severity   Critical, Major, Minor, Disable
Alarm Threshold   BPV (1×10^{-5} to 1×10^{-9}), ES (1 to 900 sec.), UAS (1 to 900 sec.)

Diagnostics test (E1/T1)*
Loopback   Line loopback and local loopback

Front Panel
LEDs   Power, ALARM
                          E1: ACT, TEST, LOS, BPV
                          Ethernet LAN: LINK/ACT, 10/100
                          Ethernet WAN: LINK/ACT, 10/100
                          PW (bundle): LOPI

Power
Fixed AC (100 to 240 VAC)
Fixed DC (-42 to -72 VDC)
Combine AC and DC (AoD): 100 to 240 VAC, -42 to -72 VDC
Power Consumption: <5.0W

Physical and Environmental
Dimensions   210 x 41.5 x 140 mm. (W x H x D)
Temperature   0 -50°C
Humidity   0-95% RH (NON-CONDENSING)
Mounting   Desk-top stackable, wall mount

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

Standard Compliance
ITU   G.703, G.704, G.706, G.823, G.824, G.826, PWE3
IETF   SAToP, 802.1p/Q
MEF   MEF8*
*Future Option

Loop-IP6702 Panel

Front Panel

Rear Panel
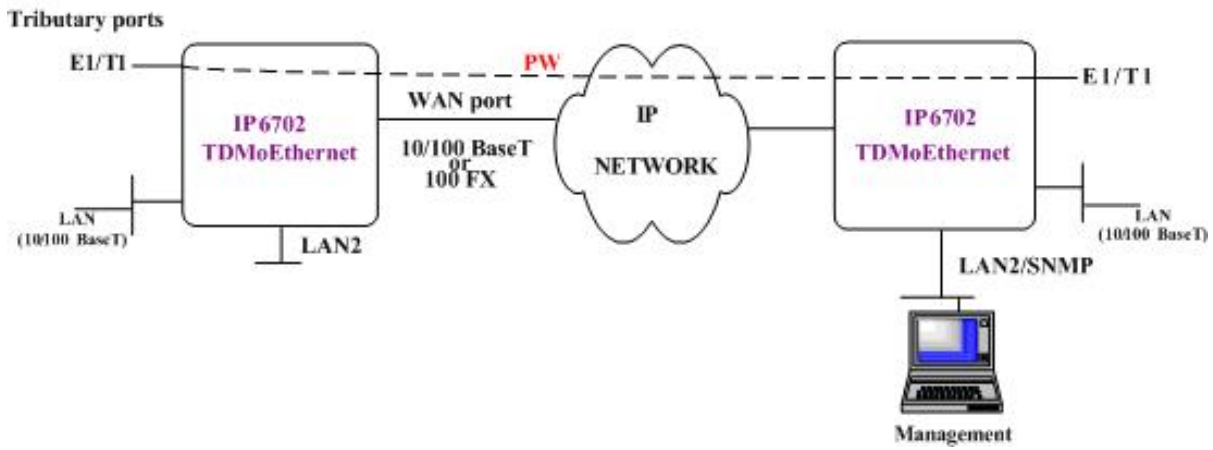### Optical Ethernet* (photo with 1 E1/T1 port IP6702)

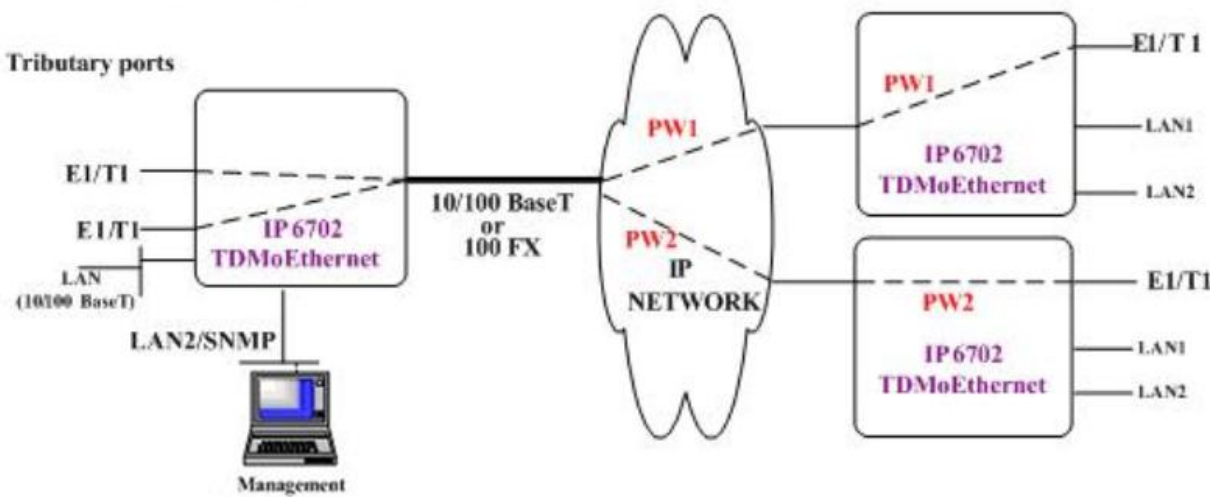
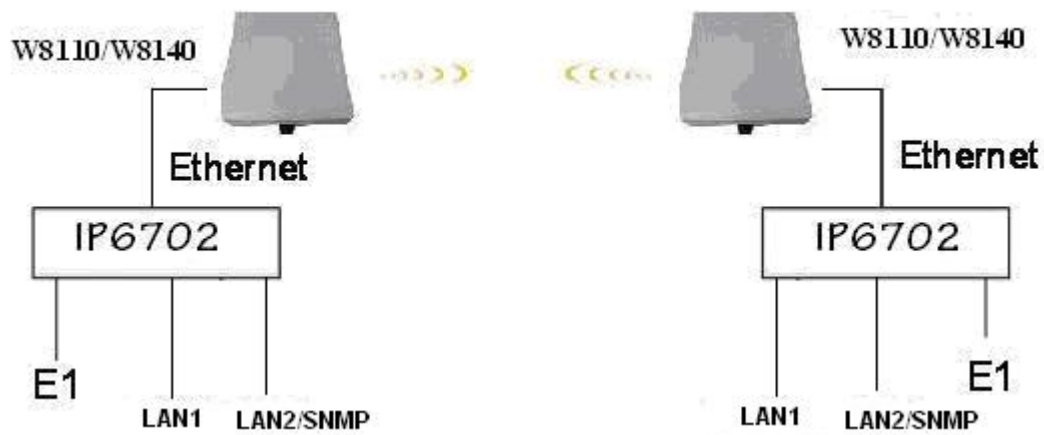### Electrical Ethernet (photo with 1 E1/T1 port IP6702)

Application Illustration

Point-to-point Application

Tributary ports

E1/T1

IP 6702
TDMoEthernet

PW

WAN port

10/100 BaseT
or
100 FX

IP
NETWORK

IP 6702
TDMoEthernet

E1/T1

LAN
(10/100 BaseT)

LAN2

LAN
(10/100 BaseT)

LAN2/SNMP

Management

Point-to-multi-point Application

Tributary ports

E1/T1

E1/T1

IP 6702
TDMoEthernet

LAN
(10/100 BaseT)

LAN2/SNMP

Management

10/100 BaseT
or
100 FX

PW1

PW2

IP
NETWORK

PW1

IP 6702
TDMoEthernet

E1/T1

LAN1

LAN2

PW2

IP 6702
TDMoEthernet

E1/T1

LAN1

LAN2

9

The application of Loop IP6702 is shown in the following figure.