Loop-IP6700
TDMoEthernet

Description

The Loop-IP6700 TDMoEthernet is an ideal solution for transporting varied TDM traffic over IP networks. As the core communications network migrates from Circuit Switched Network to Packet Switched Network, the Loop-IP6700 provides a flexible and cost-effective choice.

On the WAN side, the Ethernet interface can be 10/100 BaseT or 100 BaseFX. For the User Tributary interface, the TDM Tributary interface can be either multiple E1 or T1 or serial or E3/DS3. The Ethernet Tributary interface can be 2 10/100 BaseT ports. Loop-IP6700 converts the TDM data stream and timing information into packets and transmits to the connected Packet Switched Network. Another Pseudowire device converts the received packet stream back to original TDM data stream along with the original timing information.

The Loop-IP6700 has built-in AC or DC power. Management choices include DB-9 console port, Ethernet port, and SNMP port with default IP address in addition to Inband management for communication with remote management centers.

For transport of TDM signals, the Jitter and Wander adheres to G.823/G.824 Traffic Interface and G.823/G.824 Synchronous Interface when OCXO is selected in order to provide excellent clock traceability and stability.

The IP6700's Ethernet uplink can further be uploaded into other equipment such as microwave and wireless links for applications like emergency services and public transportation.

Features

Mechanics and Electrics

- ANSI shelf
- Power Module: Single AC or DC power

WAN Interface

- 1 Electric Ethernet (10/100 BaseT) port or 1 Optical Ethernet (100 BaseFX) port

User Tributary Interface

- TDM Tributary interface:
  - Up to 4 E1/T1
  - Up to 2 serial: V.35 or EIA530 or X.21 or V.36/RS449 or RS422 / V.11
  - 1 E3/DS3
- Ethernet tributary interface:
  - 1x 10/100 BaseT Ethernet port plus 1 user-selectable 10/100 BaseT Ethernet/SNMP port

L2 Switching Capability

- Jumbo frame size up to 1916 bytes
- IS-IS Packet transparency
- VLAN
  - Maximum 4K VLAN ID
  - Maximum 16 con-current VLAN Groups
  - Supports C-VLAN/S-VLAN tag adding and removing on Pseudowire
  - Supports 802.1q Port-Based VLAN on Ethernet/SNMP Port
- Supports 802.1d MAC Learning
- Supports 803.3x Flow control on input ports

QoS

- Ingress Rate Limiting per Ethernet port with 32Kbps granularity
- IP Network Level:
  - 6-bit DiffServ Code Point -DSCP field – ToS

Pseudowire Capability

- Supports TDMoIP-AAL1, SAToP, CESoPSN, and MEF-8
- Supports E1/T1 traffic emulation over UDP/IP and Ethernet network
- Supports Timeslot Grooming
- Maximum 64 pseudowires
- PDV Compensation Depth:
  - E1: up to 256ms
  - T1: up to 340ms
- Jitter Buffer size: 1 ms to 512 ms
- Minimum packetization latency < 1 ms
- Excel calculator is provided*

Pseudowire Diagnostics 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 and Wander

- PPM version: Conforms to G.823/G.824 Traffic Interface
- PPB version: Conforms to G.823/G.824 Synchronous Interface

Timing Reference

- Internal
- External: BNC connector
- Line (E1/T1)
- Adaptive Clock Recovery: All Pseudowires can apply ACR

OAM Capability

- Supports 2 SNTP Timing References
- Multi-color LED indicators
- Alarm relay
- ACO (Alarm Cutoff) button

Management Interface

- 1 user-selectable Ethernet/SNMP port
- SNMPv1/v3
- LCD and keypad
- DB-9 Console port with VT100 menu
- Telnet and SSHv1/SSHv2
- C-VLAN/S-VLAN tag on management traffic
- LoopView GUI
- Inband management: through one time slot (64Kbps)

Standards Compliance

- TDMoIP, SAToP, CESoPSN, MEF-8

* 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	Note
Loop-IP6700-S-EH-PPM-pp-add-temp-**G**	IP6700 with G.823/G.824 **traffic** interface, 1 **electric Ethernet** WAN port, 1 LAN port, 1 SNMP port, and **1x E3/DS3 high speed interface**	• PPM = G.823/G.824 traffic interface • PPB = G.823/G.824 synchronous interface (G.823 for E1, G.824 for T1) • High Speed for E3/DS3 only (E3/DS3 software programmable) • Low Speed for E1, T1 and serial interface.
Loop-IP6700-S-EL-PPM-aa-bb-cc-dd-pp-add-temp-**G**	IP6700 with G.823/G.824 **traffic** interface, 1 **electric Ethernet** WAN port, 1 LAN port, 1 SNMP port, and **low speed interfaces described below**	
Loop-IP6700-S-OH-PPM-pp-add-temp-**G**	IP6700 with G.823/G.824 **traffic** interface, 1 **optical Ethernet** WAN port, 1 LAN port, 1 SNMP port, **1x E3/DS3 high speed interface**. SFP optical module is not included.	
Loop-IP6700-S-OL-PPM-aa-bb-cc-dd-pp-add-temp-**G**	IP6700 with G.823/G.824 **traffic** interface, 1 **optical Ethernet** WAN port, 1 LAN port, 1 SNMP port, **low speed interfaces described below**. SFP optical module is not included.	
Loop-IP6700-S-EH-PPB-pp-add-temp-**G**	IP6700 with G.823/G.824 **synchronous** interface, 1 **electric Ethernet** WAN port, 1 LAN port, 1 SNMP port, **1x E3/DS3 high speed interface**.	
Loop-IP6700-S-EL-PPB-aa-bb-cc-dd-pp-add-temp-**G**	IP6700 with G.823/G.824 **synchronous** interface, 1 **electric Ethernet** WAN port, 1 LAN port, 1 SNMP port, **low speed interfaces described below**.	
Loop-IP6700-S-OH-PPB-pp-add-temp-**G**	IP6700 with G.823/G.824 **synchronous** interface, 1 **optical Ethernet** WAN port, 1 LAN interface, 1 SNMP port, **1x E3/DS3 high speed interface**. SFP optical module is not included.	
Loop-IP6700-S-OL-PPB-aa-bb-cc-dd-pp-add-temp-**G**	IP6700 with G.823/G.824 **synchronous** interface, 1 **optical Ethernet** WAN port, 1 LAN port, 1 SNMP port, **low speed interfaces described below**. SFP optical module is not included.	

- Where **aa** and **bb** are used to select **connector**.
  If these modules are not required, leave this field blank.

aa, bb=	Description	Notes
E75	E1 75 ohm with BNC connector	• 75 ohm/120 ohm is software selectable.
E120	E1 120 ohm with RJ48C connector	
T1	T1 with RJ48C connector	

- Where **cc** and **dd** are used to select **connector**.
  If these modules are not required, leave this field blank.

cc, dd=	Description	Notes
E75	E1 75 ohm interface with BNC connector	• 75 ohm/120 ohm is software selectable.
E120	E1 120 ohm interface with RJ48C connector	
T1	T1 interface with RJ48C connector	
22	V.35 interface with DB25 female connector	
33	EIA530 interface with DB25 female connector	
44	X.21 interface via DB25P male to DB15S female (1-feet) conversion cable	
66	V.36 / RS449 interface via DB25P male to DB37S female (1-feet) conversion cable	
77	RS422 / V.11 interface with DB25 female connector	

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

pp=	Description	Notes
AC	Single AC power plug-in module (100 to 240 Vac)	• For AC, choose an appropriate power cord.
DC	Single -48Vdc power plug-in module (-36 to -72 Vdc)	

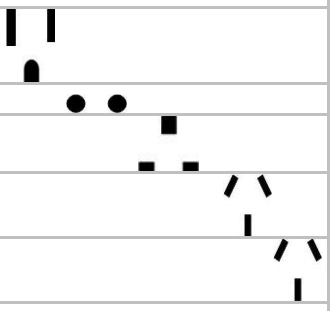
- Where **add** is used to select the **LCD and keypad**.
  If these modules are not required, leave this field blank.

add =	Description	Note
LCD	Front panel with LCD and keypad	• LCD is supported for ANSI shelf only. • LCD only supports the temperature range of 0-50°C.

- Where **temp** is used to select the temperature range.
  This module **must be selected** one from the list below.

temp =	Description	Note
TP1	Temperature range from 0-50°C	
TP2	Temperature range from 0-60°C	

Accessories

Model	Description	Note
User's Manual		
Loop-IP6700-UM	User's Manual (optional paper hard copy). A CD version of the manual is included with every order.	
Firmware Upgrade		
Loop-IP67003-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		
Loop-ACC-PC-USA-**G**	AC power cord for Taiwan/America	
Loop-ACC-PC-EU-**G**	AC power cord for Europe	
Loop-ACC-PC-UK-**G**	AC power cord for UK	
Loop-ACC-PC-AUS-**G**	AC power cord for Australia	
Loop-ACC-PC-CH-**G**	AC power cord for China	
SFP Optical Modules		
Please place your order using the 5-digit alphanumeric codes listed in the separate SFP Optical Module Brochure.		

Ordering Examples

Examples 1:
Main unit: Loop-IP6700-S-EH-PPM-AC-LCD-TP1
➔ A high speed unit with G.823/G.824 traffic, 1 electric Ethernet WAN port, 1x E3/DS3, 100 to 240 Vac power, LCD, and temperature range from 0-50°C

Examples 2:
Main unit: Loop-IP6700-S-EL-PPM-E75-E75-22-22-AC-TP2
➔ A low speed unit with G.823 /G.824 traffic, 1 electric Ethernet WAN port, 2x E75 ports, two V.35 ports, 100 to 240 Vac power, and temperature range from 0-60°C

Examples 3:
Main unit: Loop-IP6700-S-OH-PPB-AC-TP1
➔ A high speed unit with G.823 synchronous, an optical Ethernet WAN port, one E3/DS3, 100 to 240 Vac power, temperature range from 0-50°C

Examples 4:
Main unit: Loop-IP6700-S-OL-PPB-E120-E120-22-22-AC-TP2
➔ A low speed unit with G.823 synchronous, an optical Ethernet WAN port, two E120 ports, two V.35 ports, 100 to 240 Vac power, and temperature range from 0-60°C

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:	1~4
Line Rate:	2.048Mbps ± 50 ppm
Line Code:	AMI/HDB3
Framing:	ITU G.704 (CRC: on/off, CAS: on/off, unframed)

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

NOTE: E1/T1 is jumper-selectable

T1 Tributary Interface

Number of ports:	1~4
Line Rate:	1.544M bps ± 32 ppm
Line Code:	AMI / B8ZS
Framing:	D4/ ESF/ ESF&T1.403/ NONE (clear channel)

Input Signal:	DS-1 from 0 dB to -26 dB w/ALBO
Output Signal:	DSX-1, DS-1
Pulse Template:	Per AT&T TR 62411
Impedance:	100 ohm twisted pair
Connector:	RJ48C

NOTE: E1/T1 is jumper-selectable

Serial Tributary Interface

Number of Ports:	1~2	
Type:	DCE	
Line Rate:	n x 56K bps (n= 1 to 31) or n x 64K bps (n= 1 to 32)	
Interface/ Connector:	**V.35**	DB25S
	EIA530	DB25S
	X.21	DB15S via DB25P to DB15S conversion cable
	V.36/RS449	DB37S via DB25P to DB37S conversion cable
	RS422/V.11	DB25S

E3 Tributary Interface

Number of ports:	1
Line Rate:	34.368M bps ± 4.6 ppm
Line Code:	HDB3
Framing:	Unframed
Input Signal:	ITU G.703

Output Signal:	ITU G.703
Output Mask:	ETS 300 689 Sec.4.2.1.2 ITU G.703
Jitter and Wander:	ITU G.824
Impedance:	75 ohm coax
Connector:	BNC connector

NOTE: E3/ DS3 is software-selectable

DS3 Tributary Interface

Number of ports:	1
Line Rate:	44.736M bps ± 4.6 ppm
Line Code:	B3ZS
Framing:	Unframed
Input Signal:	ITU G.703

Output Signa:l	ITU G.703
Output Mask :	Bellcore GR-499-core
Jitter and Wander:	ITU G.824
Impedance:	75 ohm coax
Connector:	BNC connector

NOTE: E3/ DS3 is software-selectable

Packet Delay Variation Compensation Depth

For E1:	Up to 256 ms
For Unframed T1:	Up to 340 ms
For Framed T1:	Up to 256 ms
For Framed T1 with CAS:	Up to 192 ms
For Unframed E3:	Up to 60 ms
For Unframed DS3:	Up to 45 ms

Timing Source

Primary /Secondary Clock: Internal, Line (A, B, C or D), Adaptive Clock Recovery, External (for low speed tributary port E1/T1/serial only, manufacture option)

External Timing

Input Signal	E1 (2.048M bps), 2M bps, 75 ohm
Connector	BNC

Alarm Relay

Alarm Relay	Fuse alarm, performance alarm
Connector	3 pin terminal block
Maximum Current	1A for 30 Vdc, 0.3A for 125 Vac

Network Management

Console Port

Electrical:	RS232 interface
Terminal:	Menu driven VT-100
Connector:	DB9, female, serial

SNMP Port

Protocol:	SNMP v1/v3
Connector:	RJ45 at front panel

Inband Management

Through any one time slot (64K bps) for low speed ports (E1/T1) with frame mode only
HDLC and PPP management protocol

Performance Monitors (E1/T1)

Performance Store:	The last 24-hour performance in 15-minute interval
Performance Reports:	Date &Time, Error Second (ES), Unavailable Second (UAS), Bursty Errored Second (BES), Severe Error Second (SES), Controlled Slip Second (CSS), and Loss of Frame Count (LOF)

Alarm Reports (E1/T1)

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

Currently-Active Alarm Summary (CAAS)

Diagnostics Test (E1/T1)

Loopback:	Line loopback, Payload loopback and Local loopback
Remote Loopback:	Payload loopback

Power

AC Module:	100 to 240 Vac, 50/60 Hz
DC Module:	-36 to -72 Vdc
Consumption	Maximum 10W

Physical and Environmental

Dimensions	212.6 x 44 mm x 197 mm (W x H x D)
Net Weight	1.8 kg
Temperature	0-50°C or 0-60°C
Humidity	0-95% RH (non-condensing)
Mounting	Desk-top stackable, 19" rack mountable

Standards Compliance

IEEE

802.1p	Priority Code Point
802.1q	VLAN Tagging
802.1ad	Q-in-Q

IETF

RFC3411	SNMPv1, v2c, v3
RFC4553	SAToP
RFC5086	CESoPSN
RFC5087	TDMoIP

MEF 8 CESoETH

ITU

G.703	E1/DS1
G.704	DS0
G.706	Frame Alignment and CRC
G.823/G.824	Traffic and Synchronous Interface
G.826	End to End Error Performance
PWE3	Pseudo Wire Emulation Edge-to-Edge
V.11	Balanced Interface with a Maximum Data Rate of 10Mbps

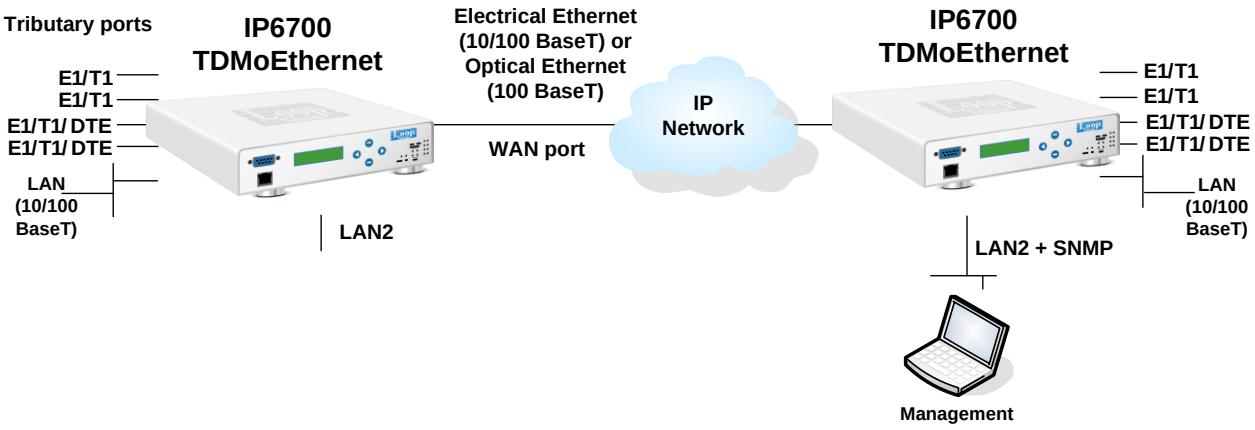
RoHS Restriction of Hazardous Substances Directive

Certifications

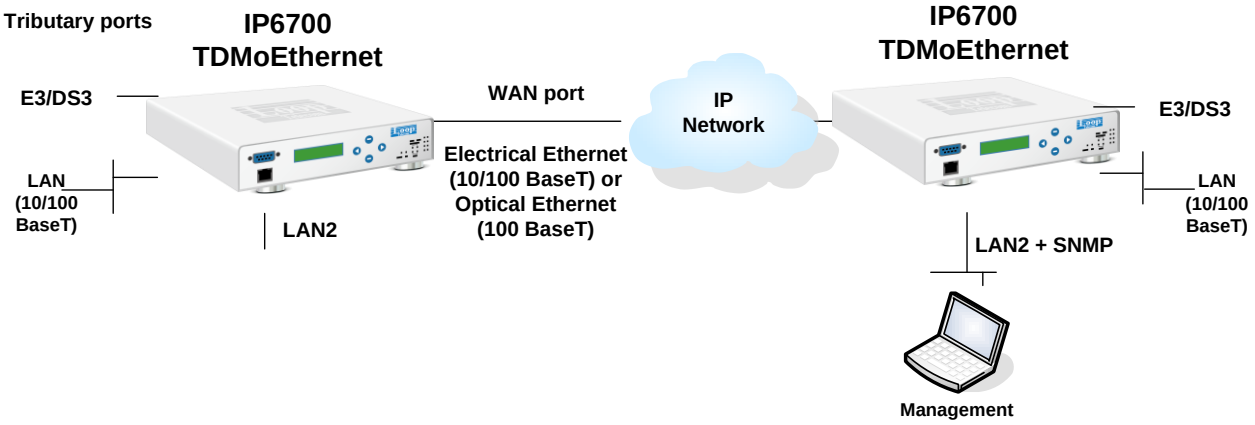
EMC	EN55022 Class A, EN50024, EN300 386, FCC Part 15 Subpart B Class A
Safety	IEC60950-1(CB), EN60950-1(CE)

Application Illustrations

Low Speed TDM Application



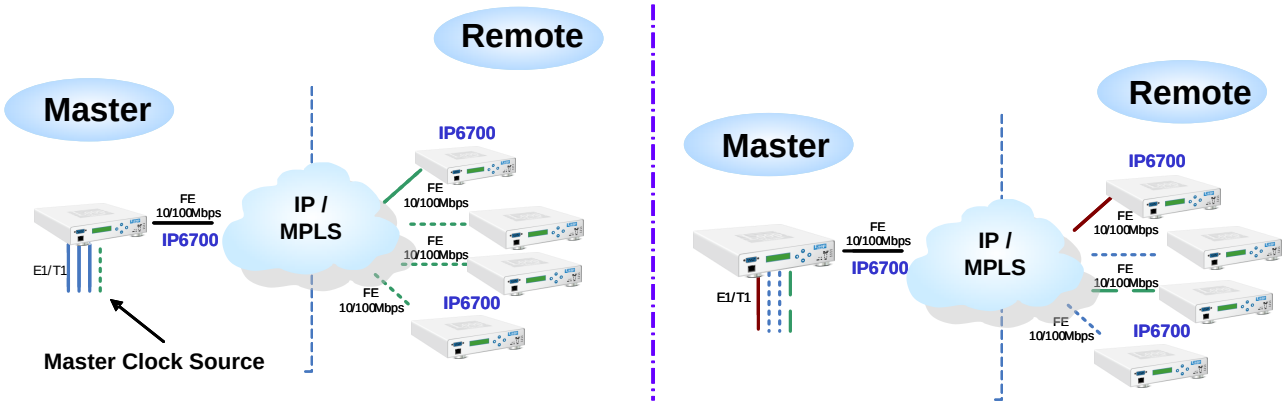
High Speed TDM Application



IP6700 Clock Option

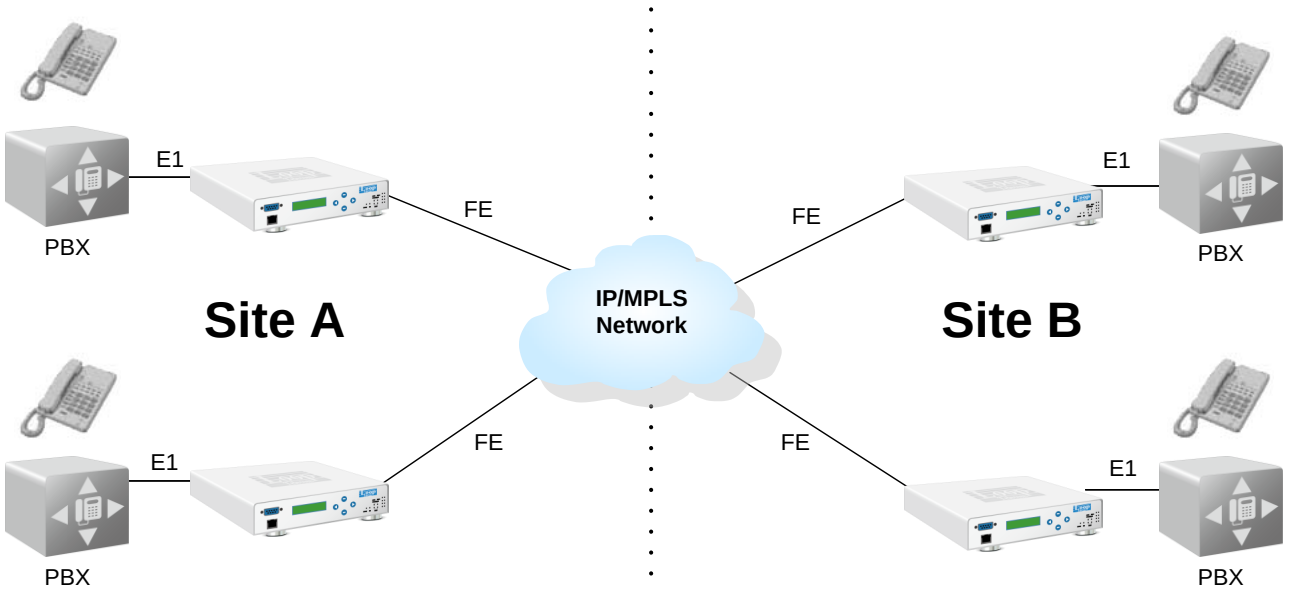
To set same clock source to all remote units

To set different clock source to different remote units

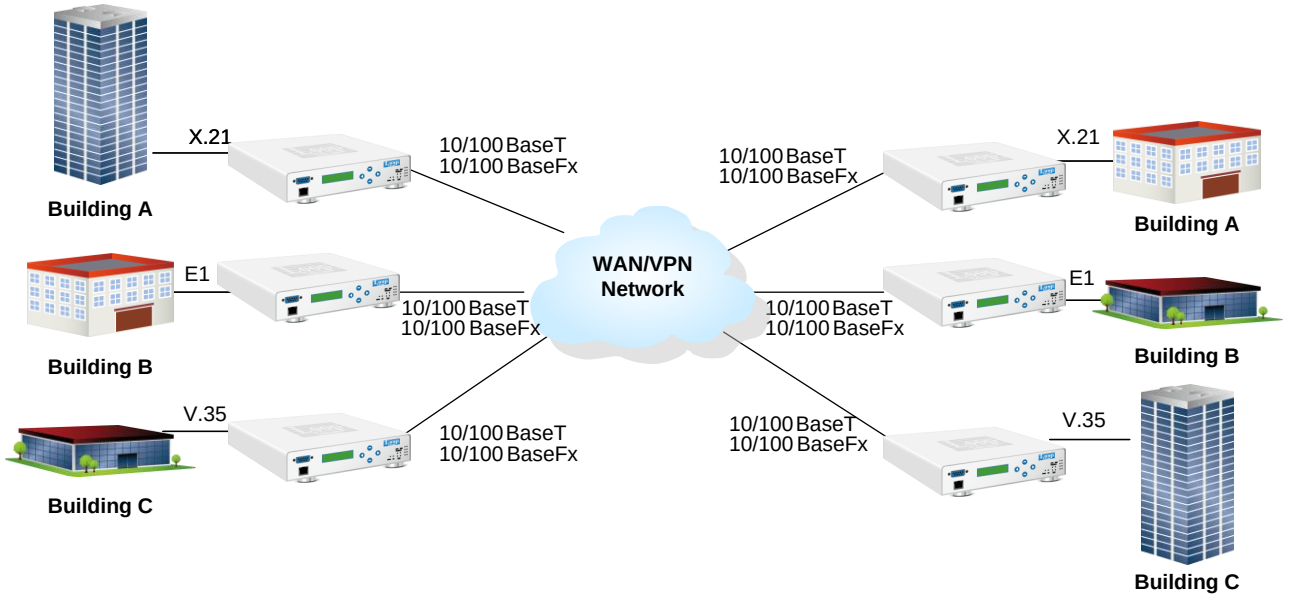


NOTE: If independent clocks are used with T1 signals and the WAN port is transported over a wireless network, then a possibility of an occasional 1 second pattern loss exists

IP6700 Extension Phone System



IP6700 on VPN Network



LoopTelecom.com

LOOP TELECOMMUNICATION INTERNATIONAL, INC.
ISO 9001 / ISO 14001

Worldwide
8F, No. 8, Hsin Ann Road
Hsinchu Science Park
Hsinchu, Taiwan 30078
+886-3-578-7696
www.looptelecom.com
sales@loop.com.tw

Taipei, Taiwan
6F, No. 36, Alley 38, Lane 358
Rueiguang Road
Neihu, Taiwan 11492
+886-2-2659-0399
michael_tzeng@loop.com.tw

North America
8 Carrick Road
Palm Beach Gardens
Florida 33418, U.S.A.
+1-561-627-7947
jimber561@aol.com

Tianjin, China
No. 240 Baidi Road
Nankai District
Tianjin 300192 China
+86-22-8789-4027
wym@loop-tj.com