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PASOLINK NEO

6/7/8/10/11/13/15/18/23/26/28/32/38/52 GHz
5 x E1 ~ 48 x E1, 2 x 40/48 x E1, 1 ~ 2 x E3,
1 ~ 2 x STM-1, 2 ~ 4 x 10/100 BASE-T(X), GbE
DIGITAL RADIO SYSTEM
(1+0/1+1 system)



NEC Corporation

1. INTRODUCTION

To provide reliable digital access links and fully exploit the potential of end-to-end advanced networks, NEC has developed the PASOLINK NEO, a narrow band point-to-point digital microwave relay system operating at radio frequency (RF) bands of 6/7/8/10/11/13/15/18/23/26/28/32/38/52 GHz.

This system meets an increasing demand for digital transmission services, and will satisfy the needs for common carrier access links, private links, urban area networks, rural area networks, temporary networks or emergency links for data and transmissions.

The PASOLINK equipment offers very high performance with large system flexibility, which is easy to install and is a field proven to be very reliable.

The PASOLINK NEO system provides interface types of PDH, SDH and LAN. The transmission signals are 5 to 48 x E1, 2 x 40/48 x E1, and 1 to 2 x E3, 1 to 2 x STM-1, 2 to 4 x 10/100 Base-T(X) and GbE signals.

The systems consist of antennas, outdoor unit (ODU) and Indoor unit (IDU) same as PASOLINK series. They are connected through a coaxial cable for each radio channel. Available configurations are non-protected type (1+0) and protected type (1+1). The protected type is available for twin-path type and hot-standby type.



Figure 1 Antenna and ODU (direct mount 1+0) (6 - 52 GHz)

Capacity Menu

Capacity (E1/STM -1 (Mbps)	5E1	10E1	16E1 ^{*1} /20E1	32E1 ^{*2} /40E1	32E1 ^{*2} /48E1	STM -1
	10	20	40	80	100	155
Modulation Scheme	Channel Separation ^{*3} (MHz)					
QPSK	7	14 (13.75)	28 (27.5)			
16QAM	3,5	7	14 (13.75)	28 (27.5)		
32QAM					28 (27.5)	
128QAM						28 (27.5)

*1: In case of using 16E1 interface card

*2: In case of using 32E1 interface card

*3: 13.75 or 27.5 MHz is also applied for 18 GHz.

(a) 1+1 1U height with PDH+LAN interface



(b) 1+1 1U height with SDH interface

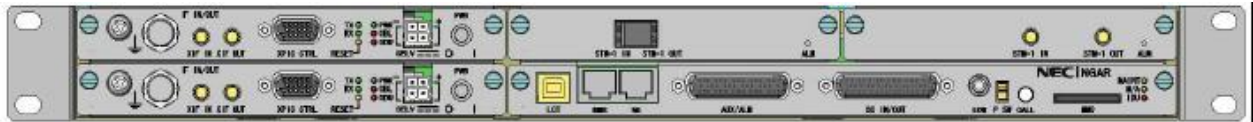


Figure 2 IDU

2. FEATURES

2.1 Advanced Technologies and Superb Performance

- High reliability and Quality
- Excellent field proven MTBF
- Low power consumption
- 10 Base-T/100 Base-TX, 1000 Base-SX/LX, 1000 Base-T (LAN interface)
- APS for STM-1 optical
- VLAN implementation
- E1 Line Digital Cross Connect (DXC)

2.2 High System Gain / High spectrum efficiency

- High System Gain achieved by each modulation with Forward Error Correction (FEC) Technology and distortion cancelling technique called linearizer.
- High spectrum efficiency achieved by QPSK to 128 QAM selectable technology.
- Allowing smaller antennas and reducing system cost.

2.3 Easy and Quick Installation

- Interconnection : Only one coaxial cable and automatic equalization
- Very Compact and Light
- Various mounting methods for IDU, ODU and Antenna
- Easy Antenna direction adjustment
- Graphical User Interface for installation and monitoring

2.4 Frequency Agility and Easy Tuning

- Field tunable local oscillator (Synthesizer)
- RF point frequency can be changed through Local Craft Terminal (LCT).
- Sub-band of type is changeable by replacing RF Filter.

2.5 System Flexibility

- Non-protected (1+0) or Protected (1+1)
- 1+1 Hot Standby / Space Diversity / Twin Path System with Hitless switch
- IDU is used commonly for 6 - 52 GHz
- Changeable data transmission rate (5 to 48x2 Mbps, 2x40/48x2 Mbps, 1 to 2x34 Mbps, 155 Mbps, 2x155 Mbps, 10/100 Base-T(X), 1000 Base-SX/LX, 1000 Base-T) at the same IDU
- Software settable Modulation (QPSK/16 QAM/32 QAM/128 QAM) of IDU
- Common ODU for PDH/SDH/LAN, also Co-Channel Dual Polarization system
- Wide Input Line Voltage range is -40.5 to -57 VDC

The Power supply interface $\pm(20$ to 60) VDC apply to additional unit.

2.6 Maintenance Facilities

- Local and remote supervision function on IDU through LCT or PNMTj
- Remote monitoring of ODU operating condition on IDU through PNMTj
- Full front access at IDU for all cabling and user interface
- Loop back facility

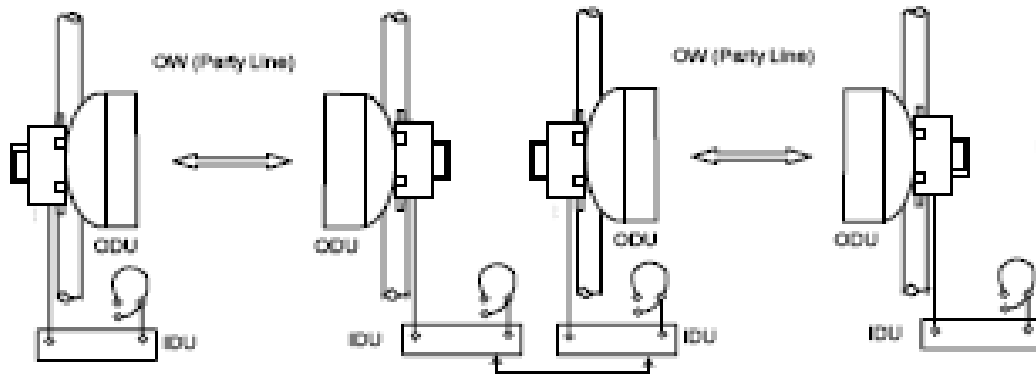
Near end baseband, Far end baseband

IF loop back

- Pre-settable BER alarm point: 10^{-3} , 10^{-4} or 10^{-5} (ext. alarm/AIS injection point)

2.7 Service Channels (Refer to Table 1)

- Engineering Order Wire (EOW):
(Refer to Fig.3) IDU- IDU and Party line
- Digital Port: RS-232 9.6 kbps ASYNC 2ch
V.11, 64 kbps SYNC 2ch (Contra/Co-directional selectable)
- SV Line commonality: (Refer to Fig. 4)



**Figure 3 Engineering Order Wire Connection
(EOW can be used under several tandem hops)**

Table 1

SC1 and SC2	V.11, kbps SYNC (Contra/Co-directional: Selectable)
SC3 and SC4	RS-232C, 9.6 kbps ASYNC
SC5	Engineering Order wire 1 ch
Connector	High Density D-sub 44 pins
LAN Interface	SC LAN Interface (Throughput: 64/128/256 kbps) (in case of using 16E1/32E1/1E3 or WS-SC-LAN INTFC)

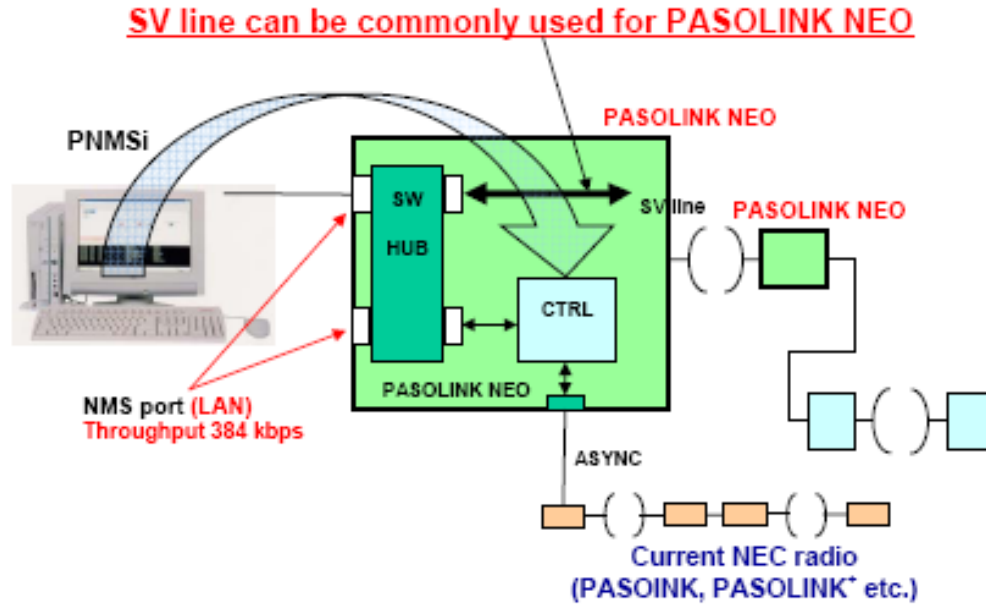


Figure 4 SV Line Commonality (SV LAN Interface)

2.8 APS (Automatic Protection Switch) function (Option)

APS realizes optical line protection for STM-1. This is simplified from conventional MSP (Multiplex Section Protection) function in order to fit RST mode equipment (ITU-T G.841, Non-revertive Mode).

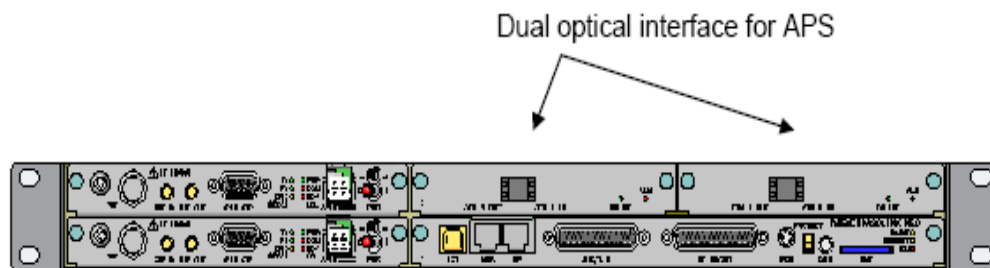


Figure 5 APS System

2.9 XPIC (Cross Polarization Interference Canceller)

PASOLINK NEO can improve its transmission capacity up to dual STM-1 in 28 MHz (27.5 MHz for 18 GHz band) bandwidth by using XPIC technology. In case of this capacity upgrading from one STM-1 system, the additional parts are dual polarized antenna, one more ODU/ IDU set, some XPIC cable kit and additional firmware. The upgrading can be realized with existing STM-1 equipment.

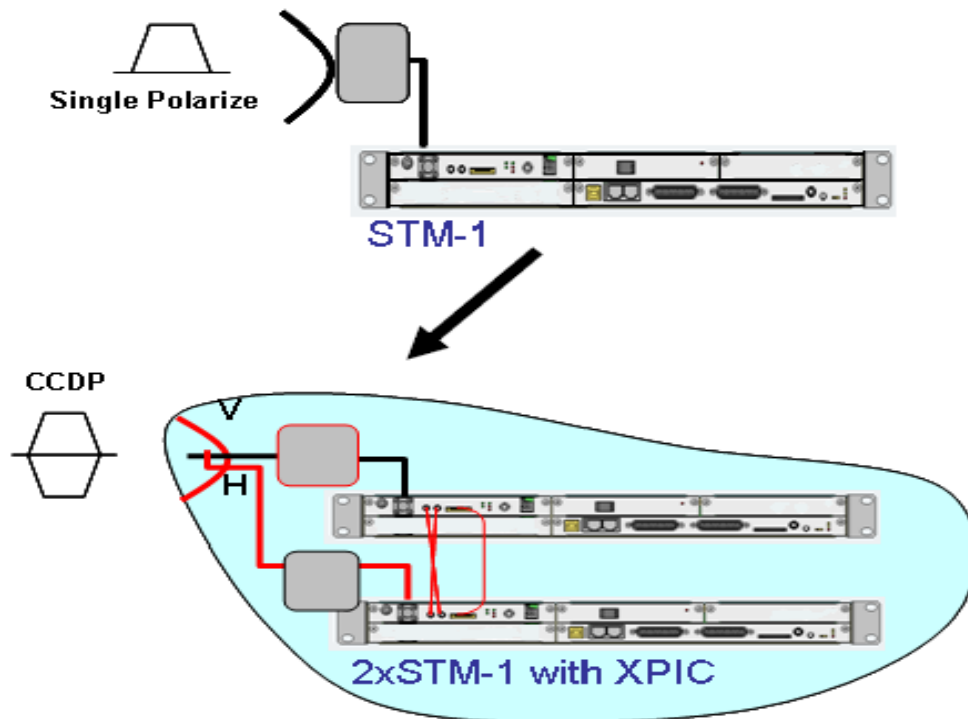


Figure 6(a) XPIC System

XPIC Function Menu

Capacity		Modulation Scheme/Cs*	Frequency Band (GHz)	
			6-38	52
PDH	2x40 mbps	16 QAM/14 (13.75) MHz	V	-
	2x80 Mbps	16 QAM/28 (27.5) MHz	V	-
	2x100 Mbps	32 QAM/28 (27.5) MHz	V	-
SDH	2x155 Mbps	128 QAM/28 (27.5) MHz	V	-

*: Channel Separation (13.75 or 27.5 MHz is also applied for 18 GHz.)

V: Available, -: Not available