

6.4-7.1 GHz SDH Digital Radio



Super SkyLink Digital Microwave Radio

- IDU Interface
 - SDH STM-1/Optical or 63E1
- Software Defined IDU
 - Multi-function defined by software :
 - Frequency Range 、 Modulation
 - Capacity 、 Output Power

Features

- Modulized system which is easier for future upgrade and maintenance.
- Module support hot swap. Shutdown the system is not required when changing the modules.
- Built-in Bit Error Rate performance monitoring
- RSSI Indicator which makes antenna adjustment much easier.
- Long distance transmission.
- High performance on Anti-multipath

Correction

- Built-in advanced Adaptive Equalizer
- Powerful Trellis Coded Modulation concatenated with Reed-Solomon Error Correction
 - => Increasing the ability of Anti-multipath

Optical Specifications



Optical connector

- Ordering Information: Molex Part Number 86066-4000 or equivalent
- Cable: Single-mode fiber cable, maximum length 15 km
- SC Duplex Fiber 1310 nm Single Mode

Network Management

- Four user groups access level
(Monitor, Operator, Administrator, Integrator)
- User Interface
 1. WEB GUI (Normal / SSL)
 2. Command Line Interface
(Serial Console / Telnet / SSH)
 3. SNMP agent (SNMPv1, v2, v3)

SNMP (Optional)

- Remote Consoles and JAVA Web access.
- GUI client runs on PC/Windows 2000 or XP operating systems.
- Allows viewing and printing of all node statistics and alarm reports. Configurable report design that provides routine and on-demand reports.

A screenshot of a data table or report interface from a software application. The table has multiple columns, with the first column containing a list of identifiers or names. The subsequent columns contain numerical data, some of which are highlighted in green. The interface includes a header row and a footer row with navigation controls.

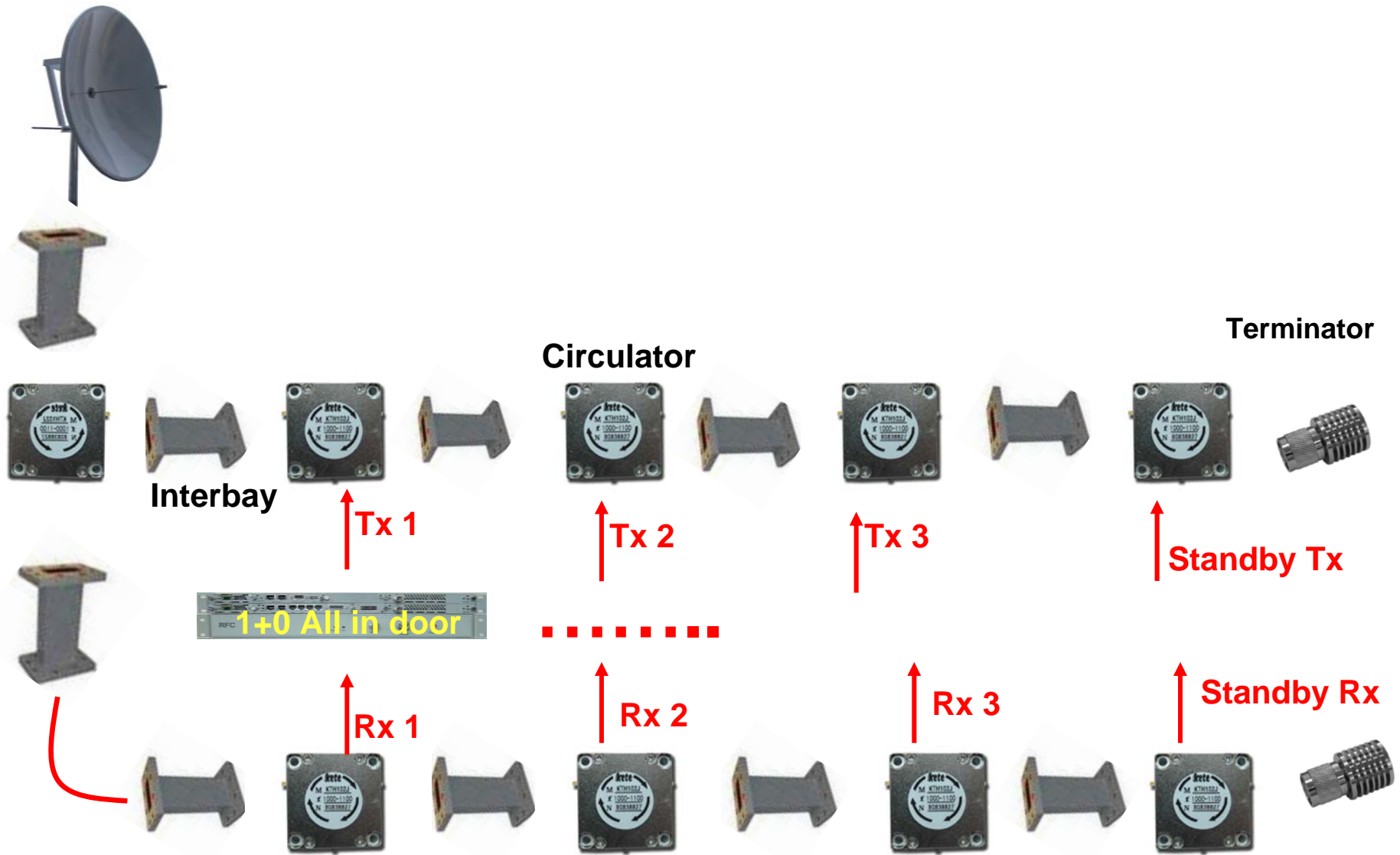
Other Features

- Software programmable channels
- Tx Power Control : ATPC & MTPC
- Built-in Alarm system (SNR , RSL , Error and log file)
- Capable of accessing from remote and programmable user profile which provides high security system.
- Environmental alarm I/O
- Built-in System Loop Test.
(Local LIU/ IF/RF , Remote LIU Loopback Test)

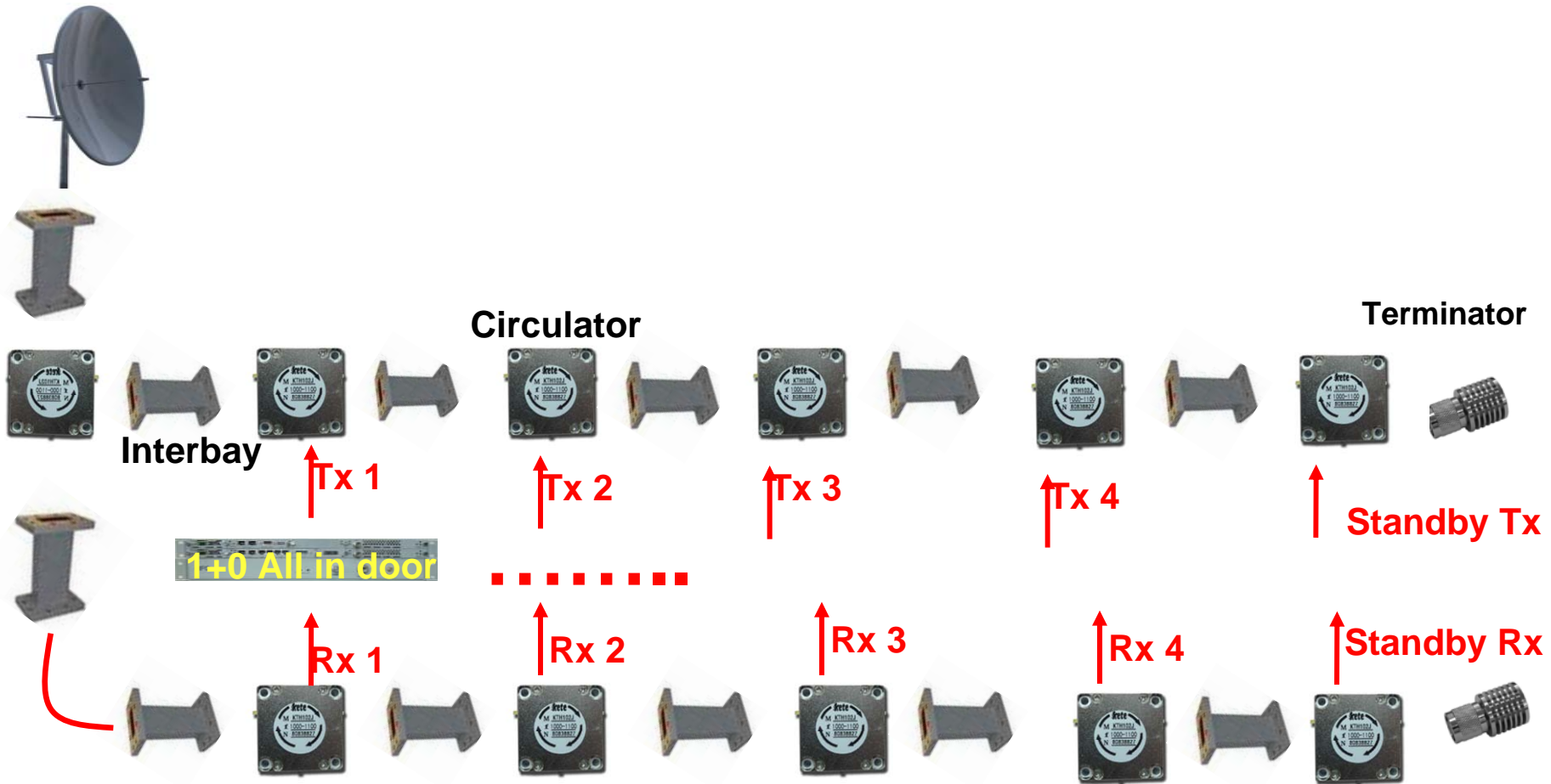
Mux 9400 Description

- SDH ADM / TM
- Full cross-connect at VC11/VC12/VC3/VC4
- With up to 4 STM-1/4 (OC-3/12) aggregate interfaces on cross-connect modules and 8 STM-1 (OC-3) interfaces on tributaries, the Mux can offer the service provider a versatile protection scheme including SNCP(UPSR), and MSP (1+1) protection for both ring and linear network topology.

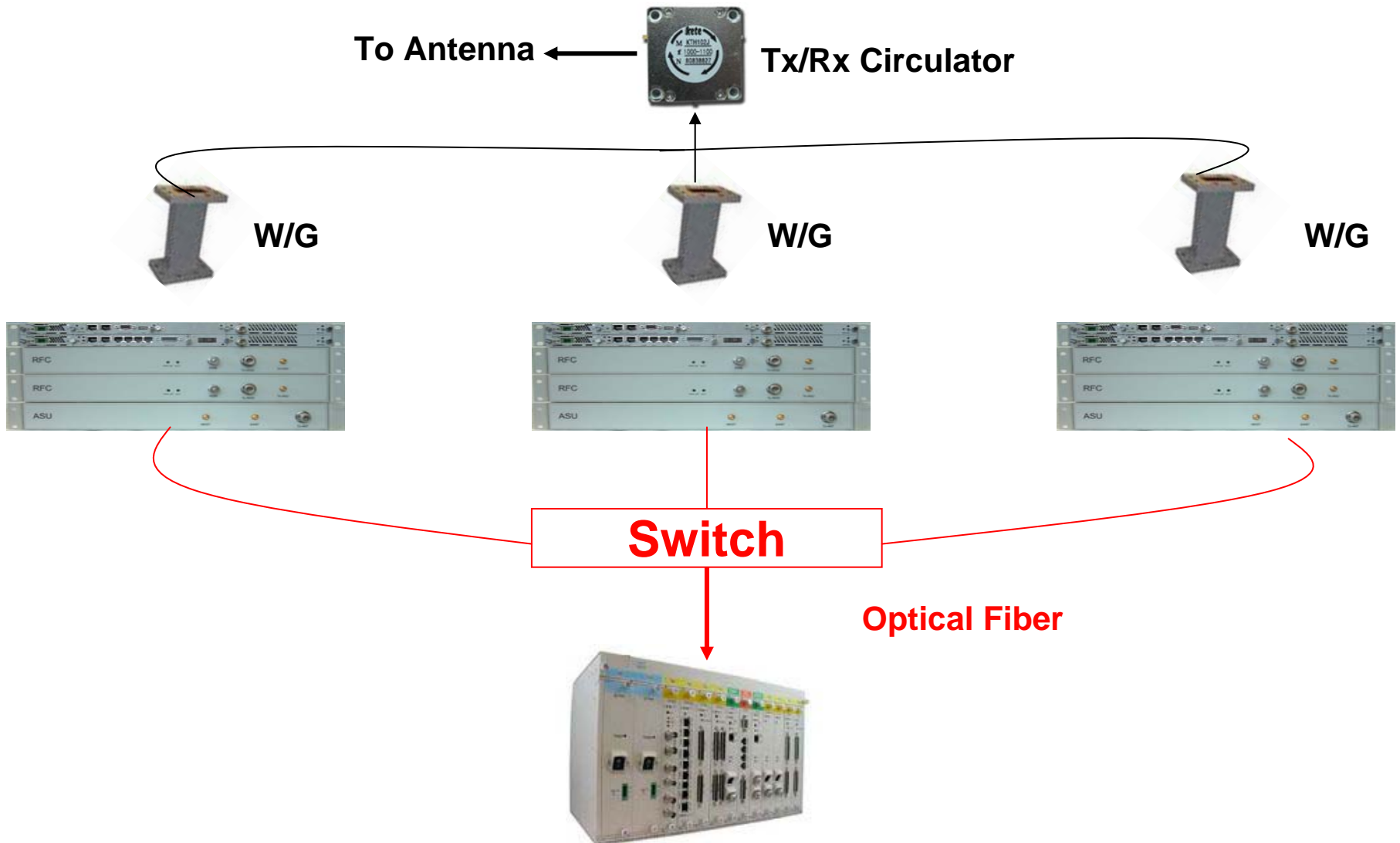
2 + 1 FD Configuration (All in door)



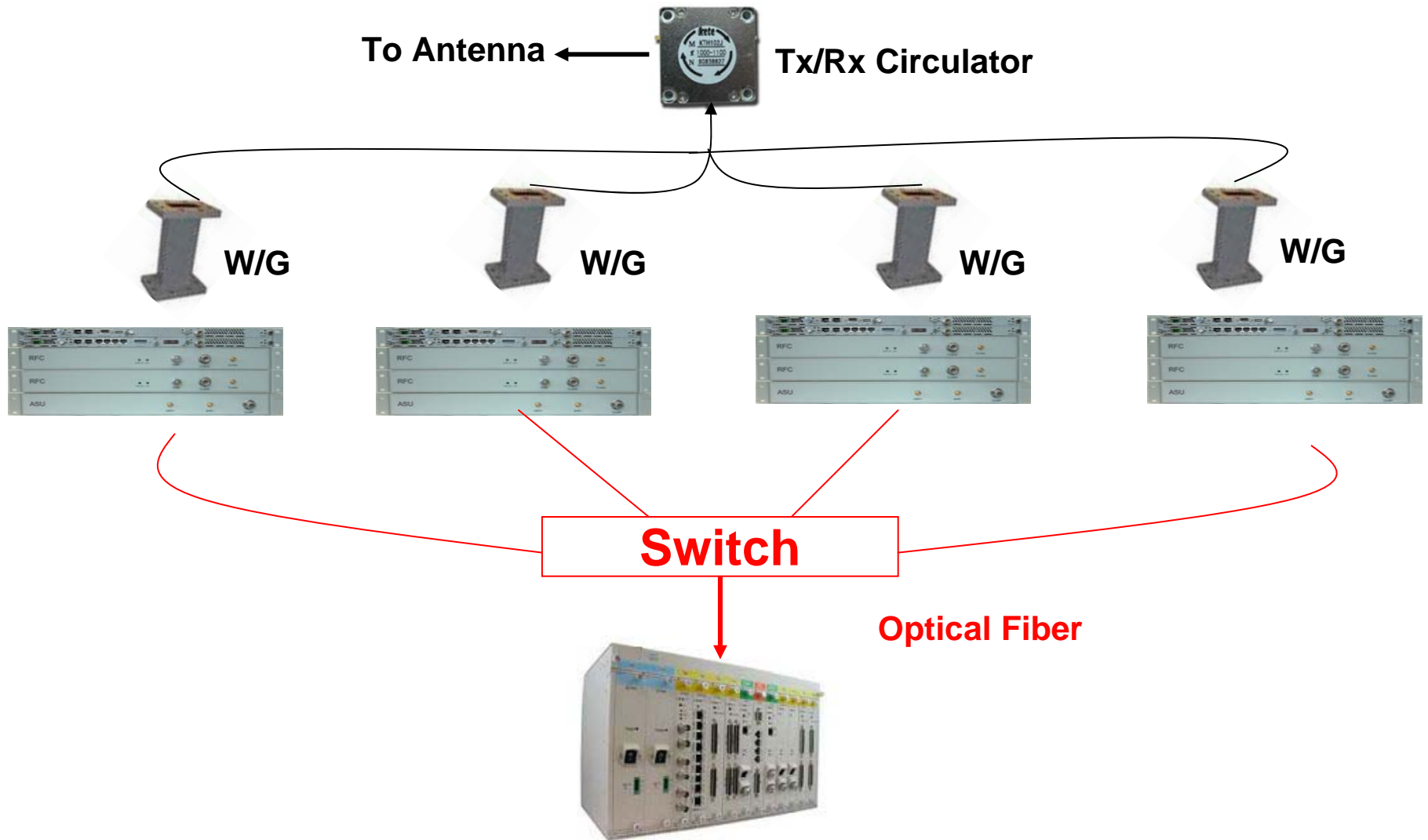
3 + 1 FD Configuration (All in door)



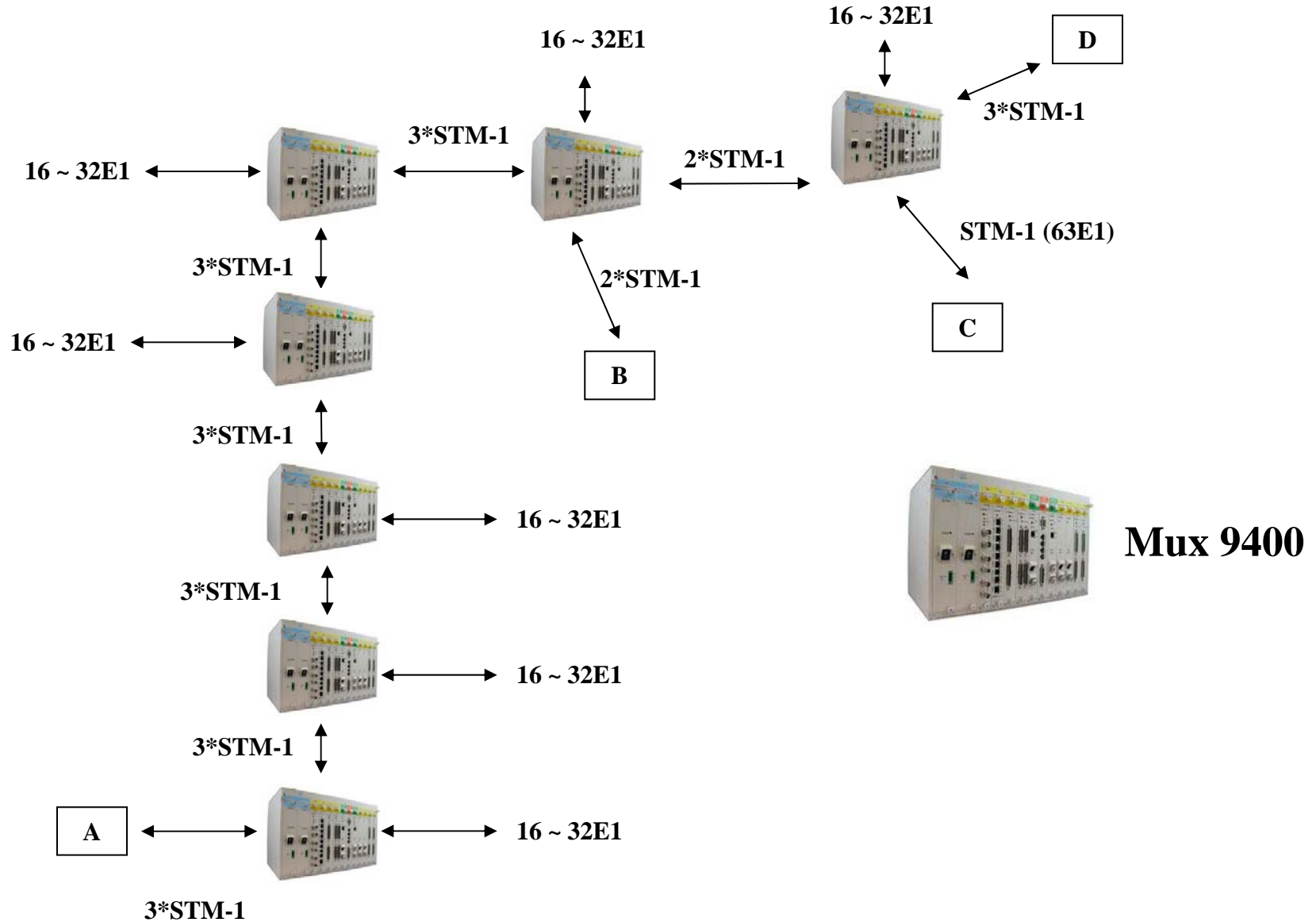
2+1 One Side L.O.M



3+1 One Side L.O.M



ADM Configuration



Link Budget

Path Name	Distance (Km)	Antenna Diameter (m)	Antenna Gain (dBi)	Tx Power (dBm)	Availability	RSSI (dBm)
MUKALA to MUKALA Mou.	1	1.8	39	10	100%	-35
MUKALA Mou. to AL RAIDAH	28.4	1.8	39	27	99.97%	-37
AL RAIDAH to HASYON	37.7	2.4	41	27	99.96%	-35
HASYON to RAS HOWAIRH	25.1	1.8	39	27	99.98%	-36
RAS HOWAIRH to JOL AL QA'A	79.1	3	43	27	99.94%	-38
JOL AL QA'A to AL QATN	25.4	1.8	39	27	99.98%	-36
AL QATN to SAYUON Mou.	38	2.4	41	27	99.95%	-35
SAYUON Mou. to SAYUON	0.94	1.8	39	10	100%	-35
KHARIR to SAYUON Mou.	25	1.8	39	27	99.98%	-36
AL-KHASHA'A to AL QATN	33.8	2.4	41	27	99.97%	-35

System Spec.

Transmitter& Receiver

Operating Frequency	6425 ~ 7100MHz
T/R Spacing	340MHz
TX Output Power	27dBm
RX Dynamic Range	-70dBm ~ -25dBm
Sensitivity	-68dBm (10 ⁻⁶ BER) -70dBm (10 ⁻³ BER)
Data Rate	155Mbps (63E1)
Modulation	128QAM
Channel BW(Capacity)	28 MHz(STM-1)
Receiver Max Input	-15dBm
Frequency stability	±2ppm
Co-Channel Interference	STM-1 : 26dB C/I @ BER:10 ⁻⁶
Ad-Channel Interference	STM-1 : -11dB C/I @ BER:10 ⁻⁶
IF Frequency	Tx: 350MHz , Rx: 140MHz

System Spec. (cont.)

System Features

Service Channel

VOW

2 x NMS (10/100 Base Tx)

Auxiliary DOW 64 kbps RS-422(is equivalent to ITU-T V.11)
or 19.2 kbps RS-232(is equivalent to ITU-T V.28)

Alarm/Serial Port Connector (HD-DSUB15 Male)

Panel Connections

Power supply x 2 IF/Telemetry x 2

Management System

Operating Method

Web Browser HyperTerminal

Telnet/SSH client SNMP

Proprietary GUI

Connectors

Optical

SC-Duplex Male

E1

RJ-48 G.703 (120 ohms balanced)

Ethernet

RJ-45 (10/100 Base-Tx)

IF connector

N-type Female

NMS

RJ-45 (10/100 Base-Tx)

System Spec. (cont.)

Power

DC Voltage	-48VDC (±10%)
AC Voltage	100 ~ 240VA

Environmental

Temperature(operation)	+5 °C to + 55 °C
Relative Humidity	10%~95% Non-condensing

Mechanical

Dimensions	IDU : 445(w)X238(d)X180(h)mm Mux : 433(w)x223.5(d)x 264(h)mm
Weight	15kg

Antenna Spec.

Antenna Spec



Freq. Range-MHz	6425 ~ 7100		
Polarization	V/H Dual		
Antenna Size-M	1.8	2.4	3
VSWR	≤ 15		
Gain-dBi	39	41	43
3dB BW (deg)	1.6	1.3	1.0
F/B Ratio – dB	51	53	55