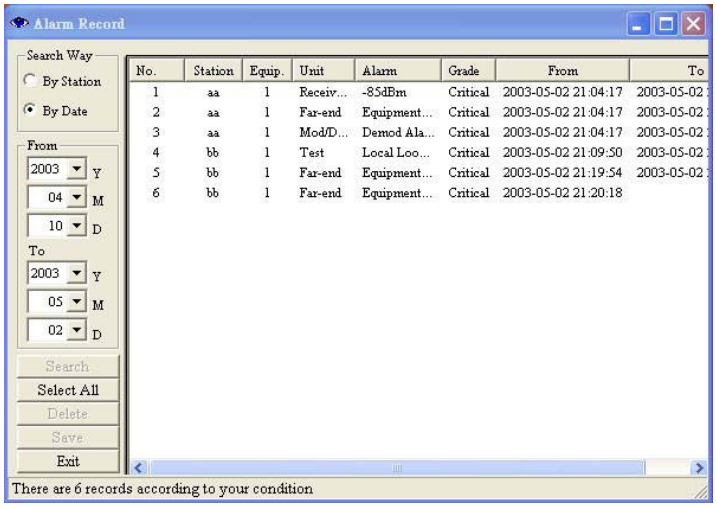

Figure 8-45: Sort by Date

Alarm record sorted by date: In **Search Way**, tick **By Date**, select **From** and **To**, press **Search**.

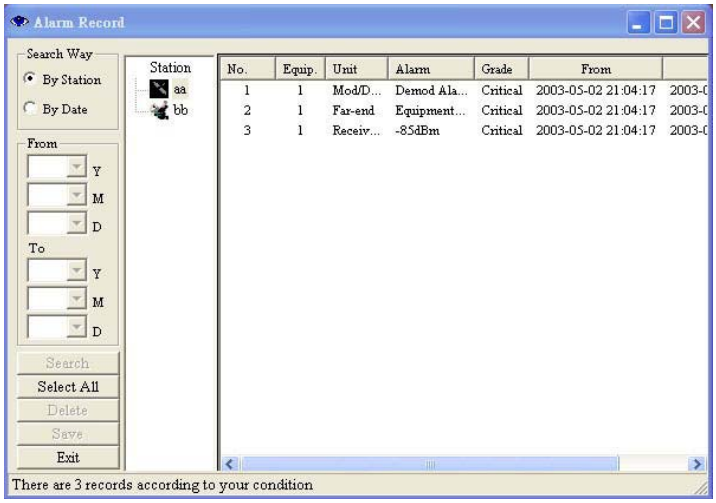

Figure 8-46: Sort by Station

Press **Select All** to select all the records. Press the **Save** to save the files. The following **Save As** window will appear. Select the desired folder and file name. Press **Save**.

The file will be saved as *.txt or *.xls. You may use any word processor or Microsoft Office Excel to open the file.

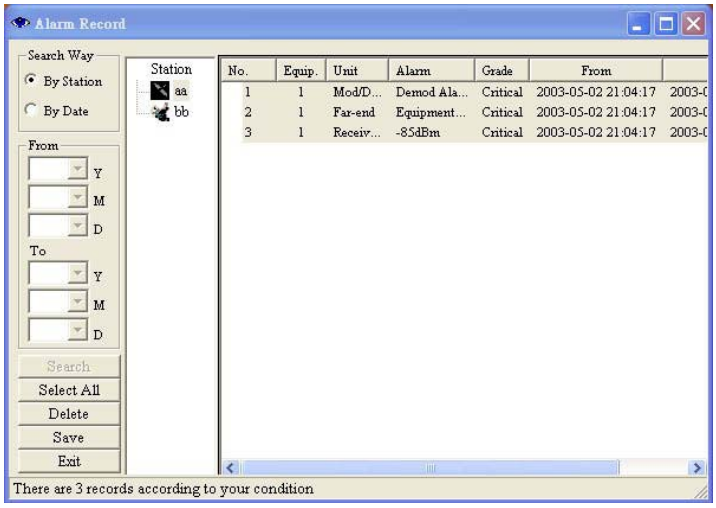

Figure 8-47: Select All Alarm Records

Single Deletion: Select the record you need to delete. Press **Delete**.

Overall Deletion: Press the **Select All** button and press **Delete**.

8.8.2 Event Record

In the **Main Window**, select **System Record** → **Event Record**. Another initialization window will appear. For system administrator's easy management, Event Record records all the setting changes that had taken place.

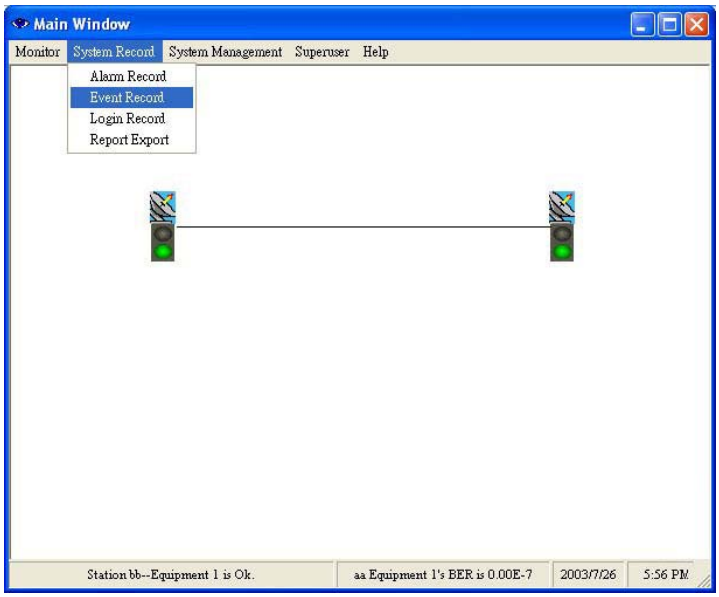

Figure 8-48 Event Record (1)

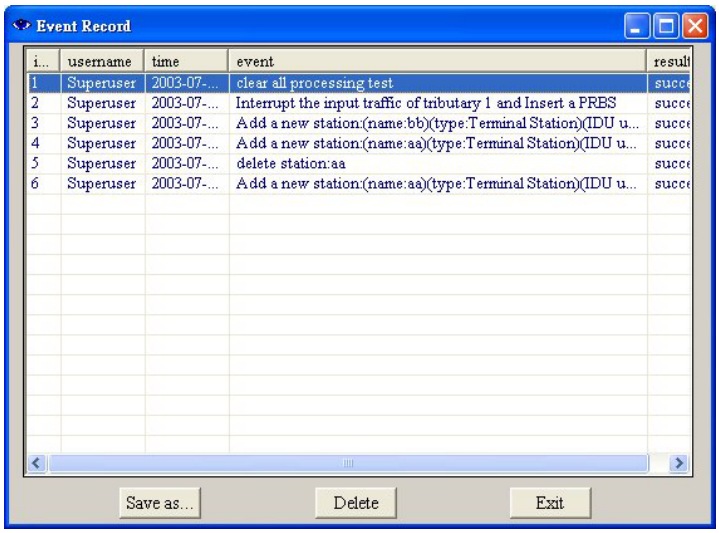

Figure 8-49 Event Record (2)

Save as…: buttons allows users to save single or all events as Excel files.

8.8.3 Login Record

In the **Main Window**, select **System Record** → **Login Record**. Another initialization window will appear.

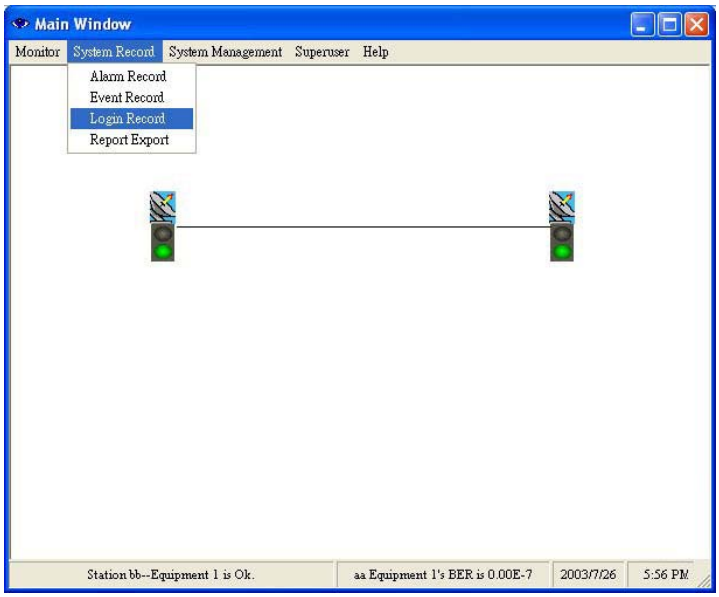

Figure 8-50: Login Record

Select the record you need to delete. Press **Delete**.

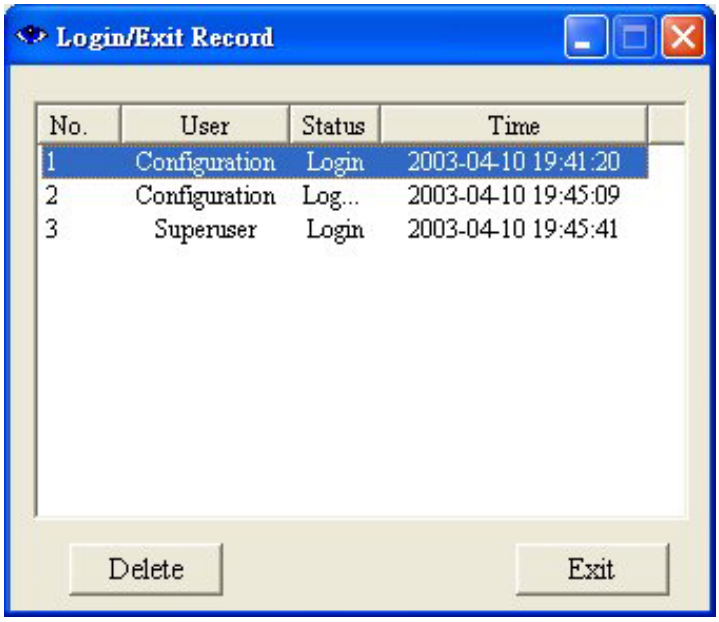

Figure 8-51: Deleting Login Record

8.8.4 Report Export

In the **Main Window**, select **System Record → Record Export**. Another initialization window will appear.

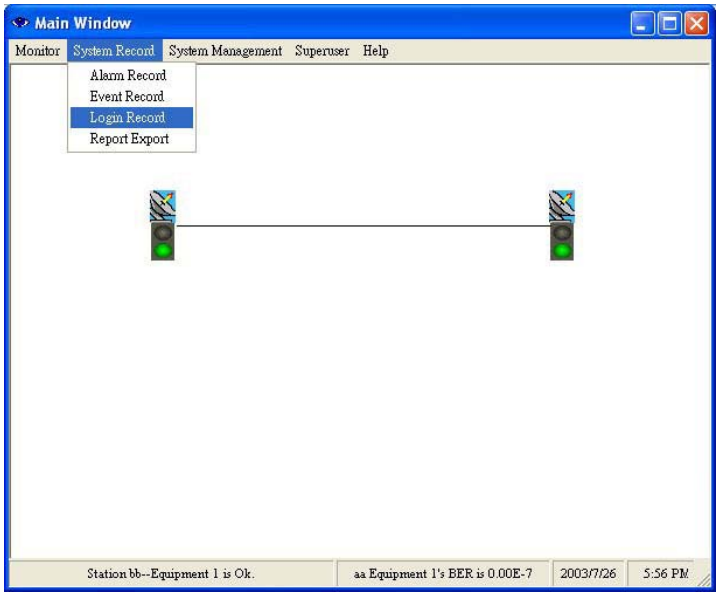

Figure 8-52: Report Export (1)

Report From/To: Enter the date for reports.

System Report: There are 5 kinds of reports - S**ystem Report**、**Alarm Report**、**IDU Report**、**ODU Report**、**Link**

Report.

System Report reports the system setting. **Alarm Report** reports all the alarms. **IDU Report** reports the IDU's setting and alarm. **ODU Report** reports the ODU's setting and alarm. **Link Report** reports all the links, the setting and alarm.

System Report and **Alarm Report**- can tick IDU、ODU、Link as the source.

IDU Report、**ODU Report** and **Link Report** – can tick System、Alarm as the source.

Show Report: The reports are shown in the desired format from the date selected. Light blue represents equipment's status, light green represents IDU's status, light yellow represents ODU's status and light orange represents the Link's status.

Export List: Export List is used along with **File Path** and **Save As…** to open in Microsoft Office Excel.

File Path: The path for saving the reports are **C:\Program Files\Arbeit**.

Save As…: The file can be saved as a different name in different location. Press **Save** to complete.

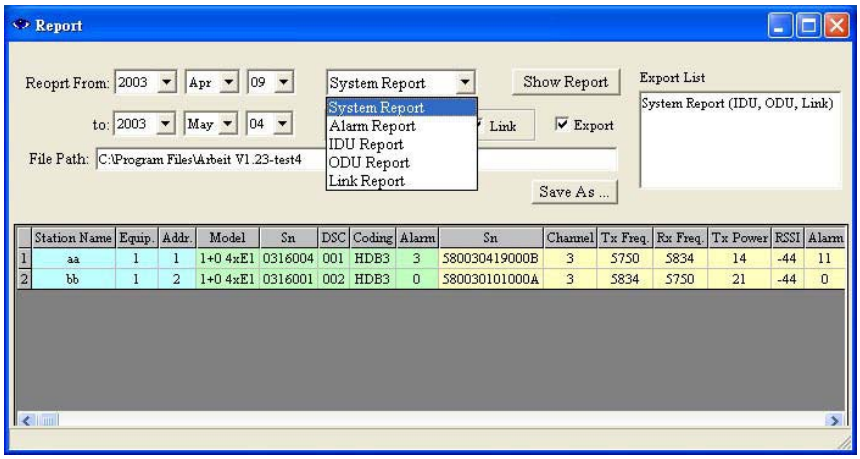

Figure 8-53: Report Export (2)

8.9 Help

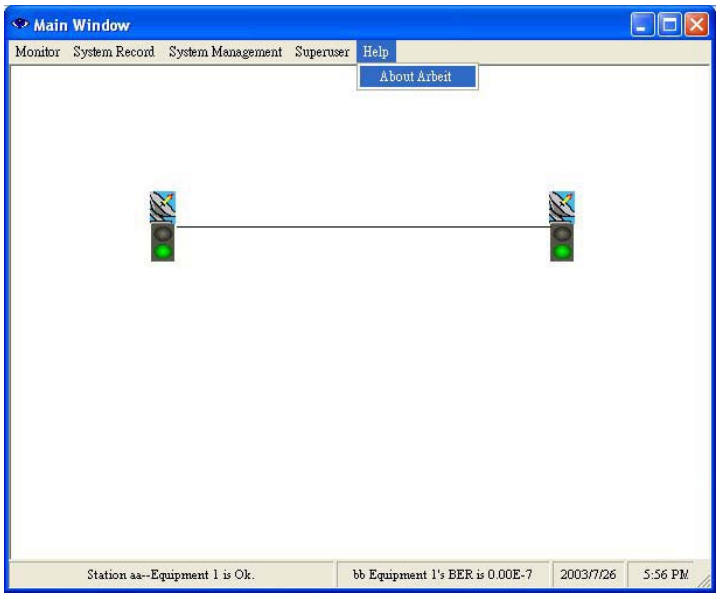

Figure 8-54: Help

8.9.1 Help

Check all functions and explanations.

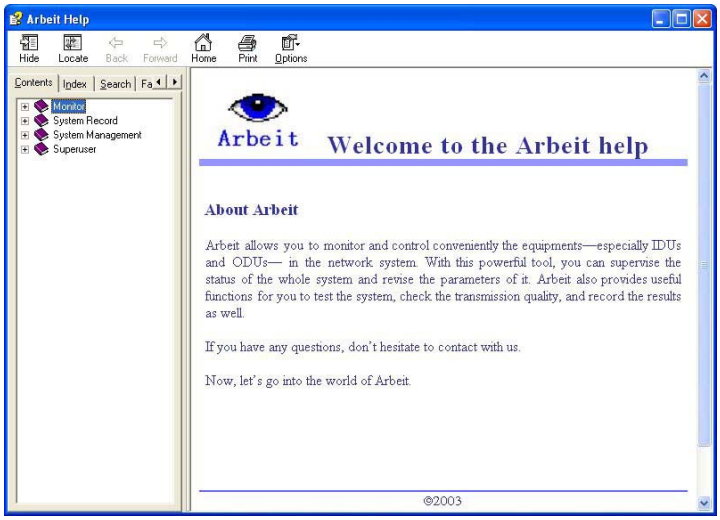

Figure 8-55: Function Explanations

8.9.2 About Arbeit

Check Arbeit version.

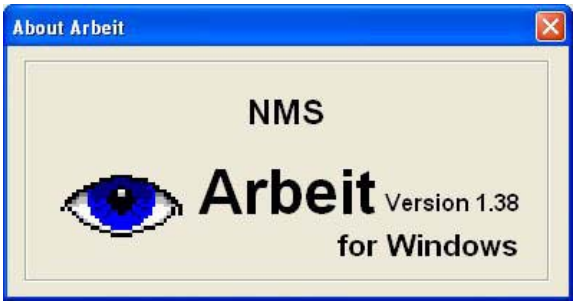

Figure 8-56 About Arbeit

8.10 Monitor

8.10.1 Network Monitor

In the **Main Window**, select **Monitor** → **Network Monitor**.

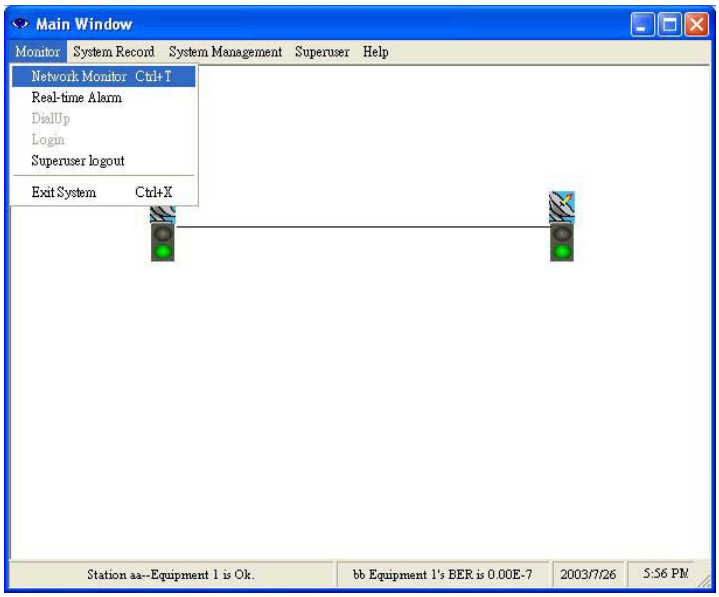

Figure 8-57: Network Monitor (1)

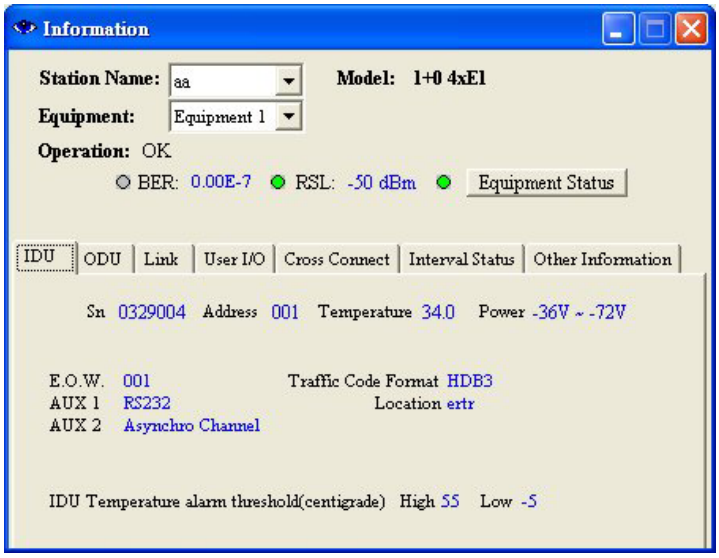

Figure 8-58: Network Monitor (2)

Network Monitor monitors all the station's information in the same link e.g. Station Name、Equipment No.、Model、Far End Equipment etc. The following diagram shows the network links framework. It will display all information of equipments in the same link.

SN: IDU's serial number.

Address: Link ID address.

Temperature: IDU's temperature.

Power: IDU's receiving power.

E.O.W: service telephone number.

AUX1: AUX1 protocol.

AUX2: AUX2 mythology.

Traffic Code Format: communication mode.

Location: Location details.

IDU Temperature alarm threshold(centigrade)

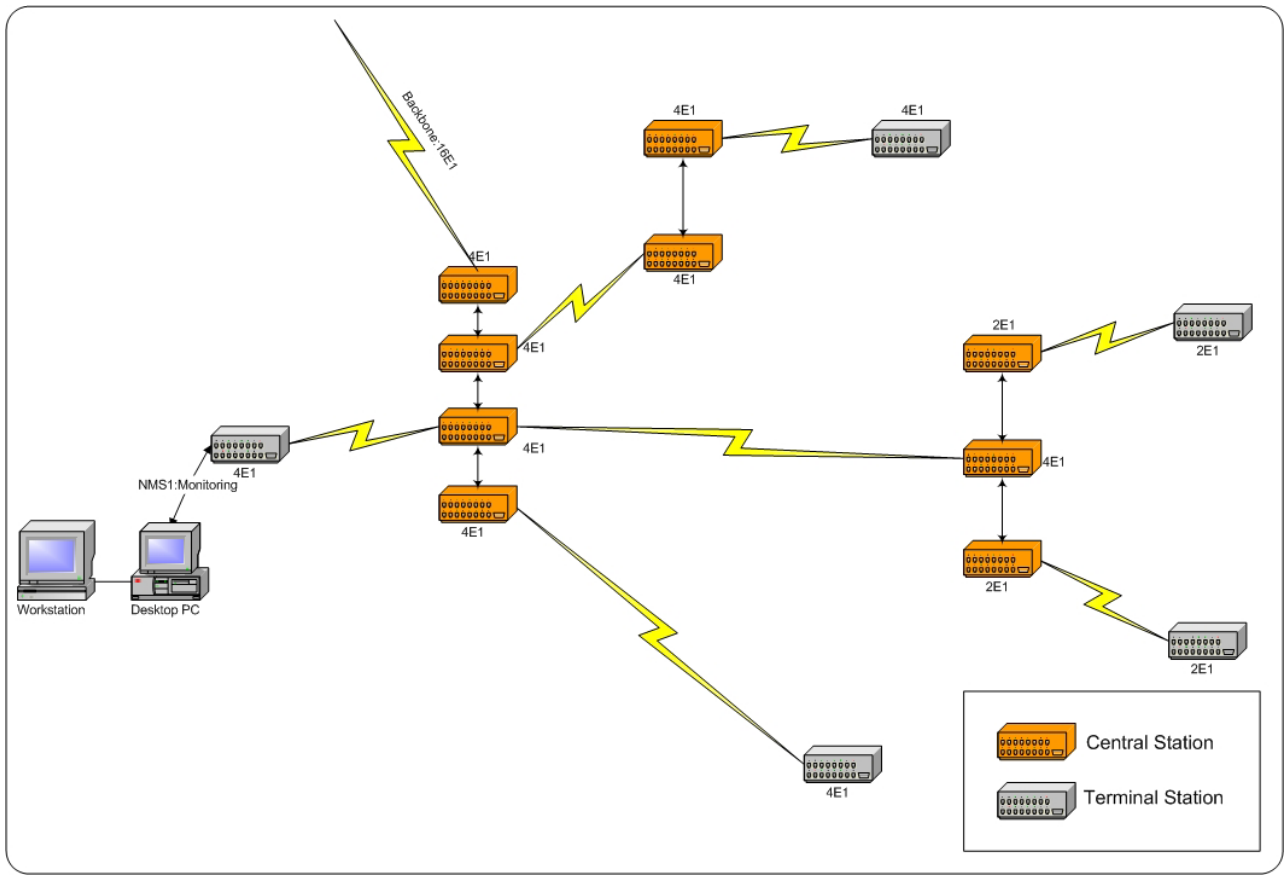

Figure 8-59: Network Monitor Links

In the above **Network Monitor** window, click on **Equipment Status**. The following dialog box appears:

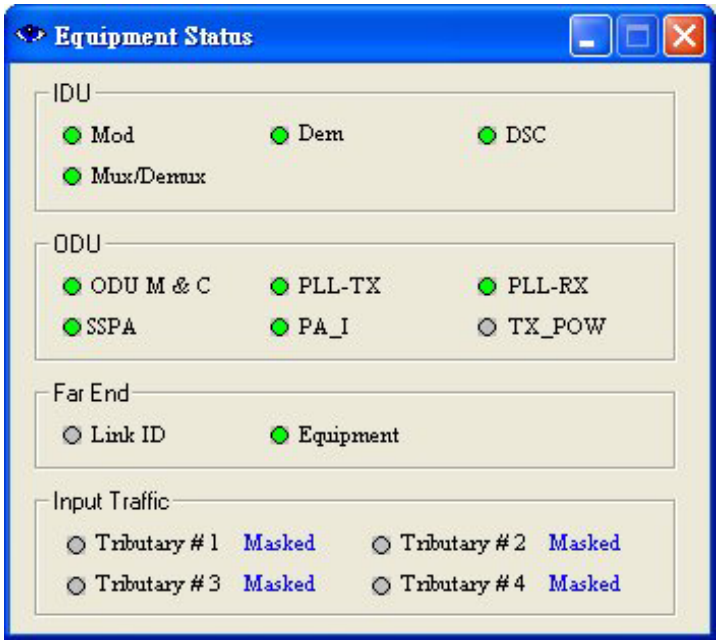

Figure 8-60: Equipment Status

Green = normal; Red = alarm; Grey = lost; Orange = test

Table 8-3: Equipment Status

Unit	Status	Description
IDU	AMP_M	Amplitude Modulation alarm
	Dem	De/modulation cannot detect the pulse
	EOW	Abnormal service signal
	Mux / Demux	De/modulation alarm
	PLL_MOD	PLL lock failure
ODU	ODU M & C	ODU control panel signal loss
	ODU Power	
	PLL-TX	RF TX local oscillator lock malfunction
	PLL-RX	RF RX local oscillator lock malfunction
	SSPA	Transmitting power alarm
	PA_I	PA alarm
	TX_POW	Transmitting power alarm and relay alarms if above ±2dB
Far End	Link ID	Link ID error
	Equipment	Remote equipment alarms
Input Traffic	Tributary #n AIS	IDU detect tributary n with all signal as 1
	Tributary #n LOS	IDU detected tributary n with no signal input
	Tributary #n no response	IDU cannot detect any tributary status

Under **Information windows → ODU** tab:

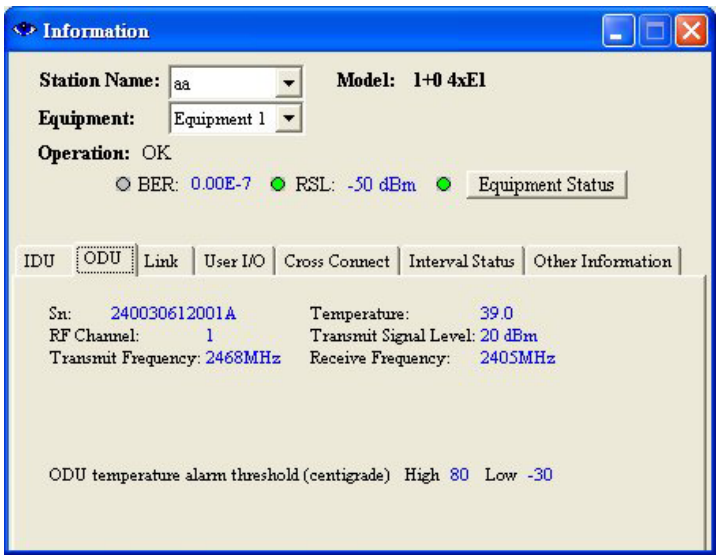

Figure 8-61: ODU Status

Sn: ODU's serial number.

RF Channel: working frequency channel.

Transmit Frequency: transmitting frequency channel.

Temperature: ODU's temperature.

Transmit Signal Level: transmitting signal power level.

Receive Frequency: receiving frequency channel.

ODU temperature alarm threshold(centigrade)

Under **Information windows → Link** tab:

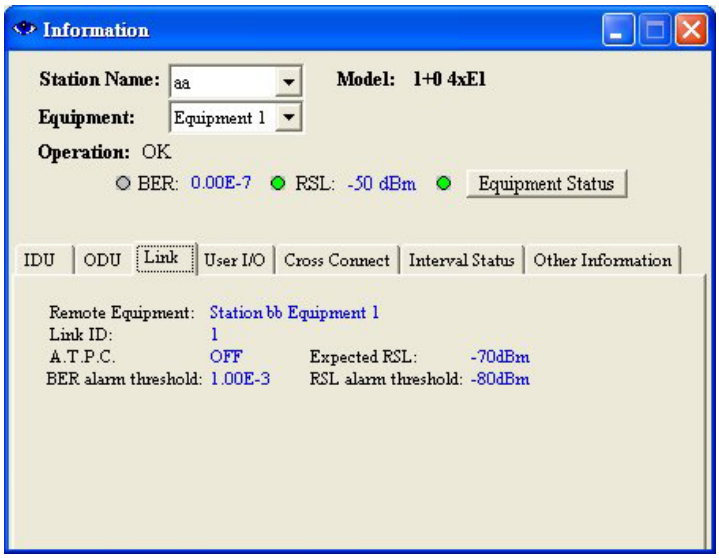

Figure 8-62: Link Status

Remote Equipment: remote station name.

Link ID: link identification.

ATPC: automatic transmission power control.

BER alarm threshold: BER alarm setting.

Expected RSL: receive signal level.

RSL alarm threshold: RSL alarm setting.

Under **Information windows → User I/O** tab:

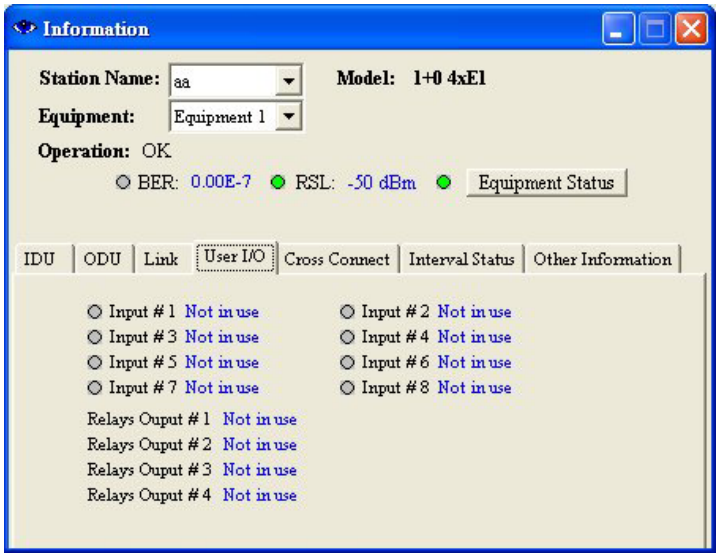

Figure 8-63 User I/O Status

Input #n: input port status.

Relays Output #n: output port status.

Under **Information windows → Cross Connect** tab:

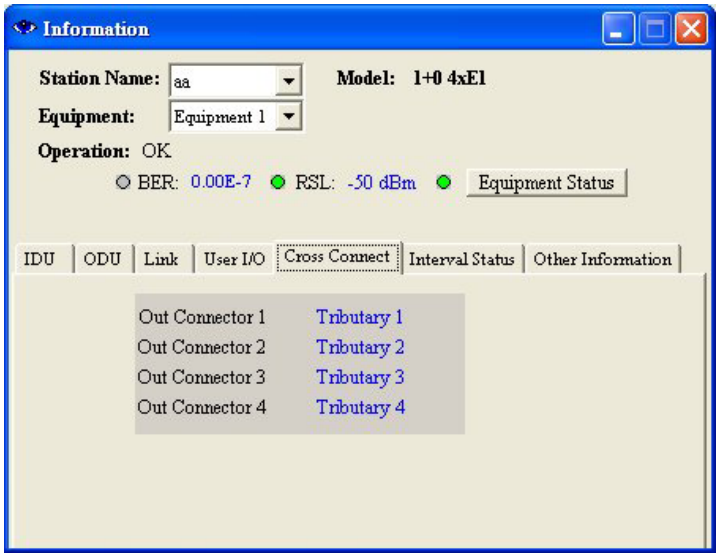

Figure 8-64 Cross Connect Status

Out Connector n – Tributary n: cross connection status.

Under **Information windows → Interval Status** tab:

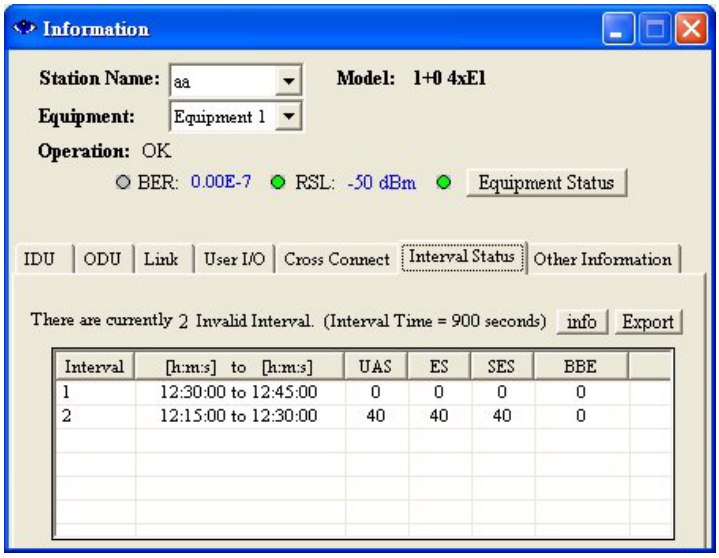

Figure 8-65 Interval Status

Press the **Info** tab under **Interval Status**. The following window appears:

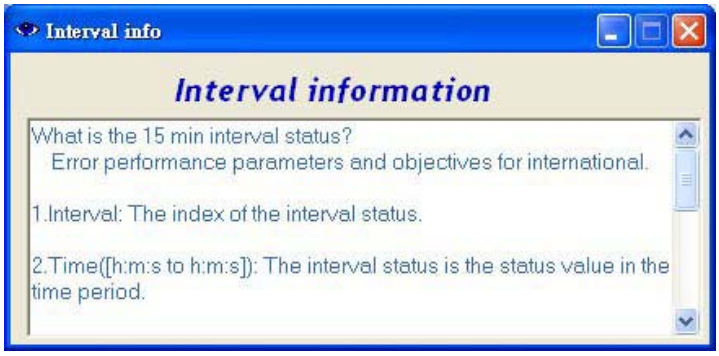

Figure 8-66 Interval Info

Under **Information windows → Other Information** tab:

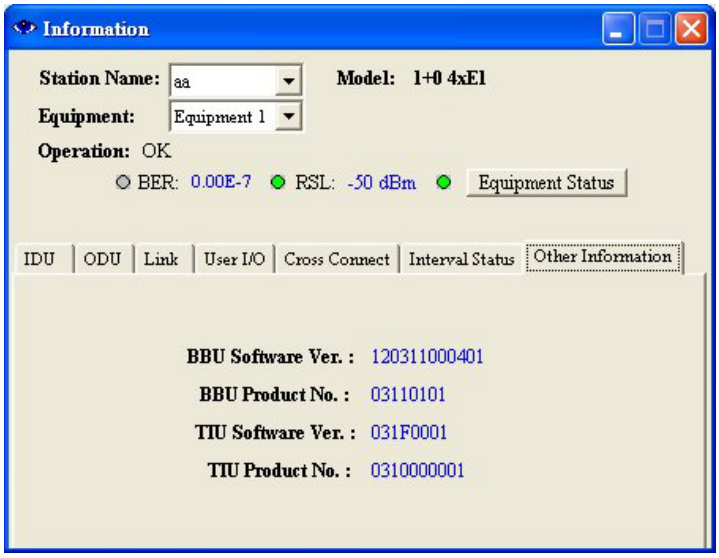

Figure 8-67 Other Information

BBU Software Ver.: Base Band Unit software version.

BBU Product No.: Base Band Unit product number.

TIU Software Ver.: Traffic Interface Unit software version.

TIU Product No.: Traffic Interface Unit product number.

8.10.2 Real-time Alarm

In the **Main Window**, select **Monitor** → **Real-time Alarm**.

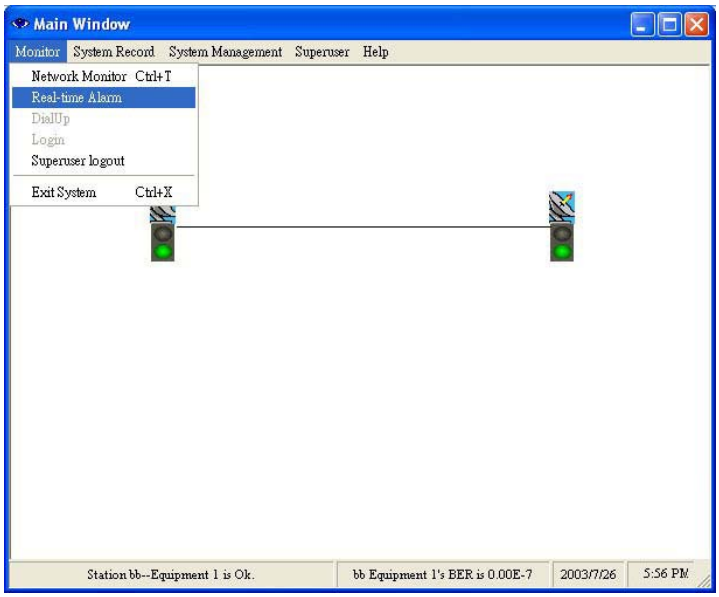

Figure 8-68: Real-time Alarm (1)

Until and unless the problem is removed or if the whole system is switched off, the real-time alarm will still be displayed on the window.

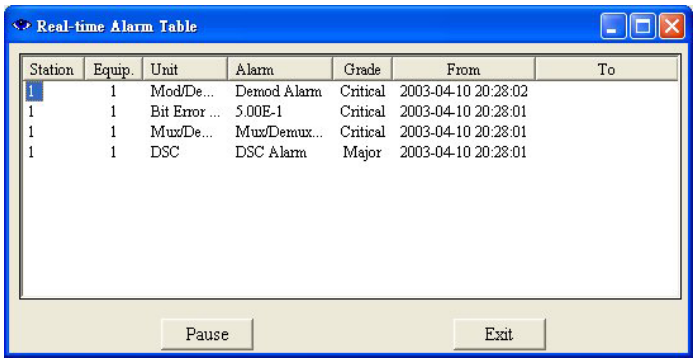

Figure 8-69: Real-time Alarm (2)

Pause: To put a pause to all the alarm status without changing, press **Pause**.

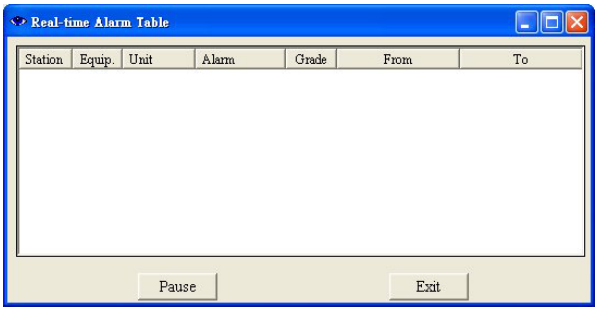

Figure 8-70: No Real-time Alarm

8.10.3 Dial-up

In the remote station, connect the modem to the phone PSTN line. The modem must be also connected to IDU's NMS2.

In the local station, login **Arbeit**. In the **Main Window**, select **Monitor → DialUp**.

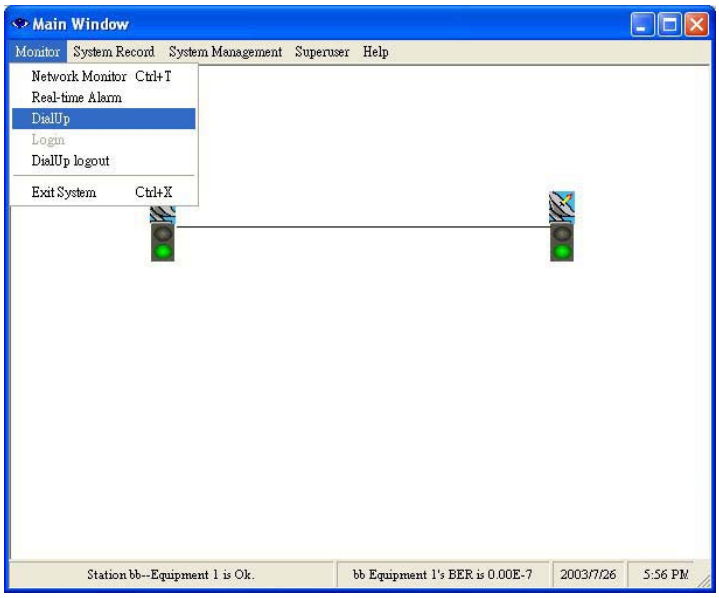

Figure 8-71 DialUp (1)

Login **DialUp** with present account "**dialup**" and password "**dialup**". The following Dial-up windows will appear. Enter phone number of remote phone. Press **Connect**. The status appears as shown "**CONNECT 24000/V44**". This means successful connection. Now you may monitor the remote equipment's status.

※***Note:*** This function allows monitoring the status. It does not allow any edit/modify changes.

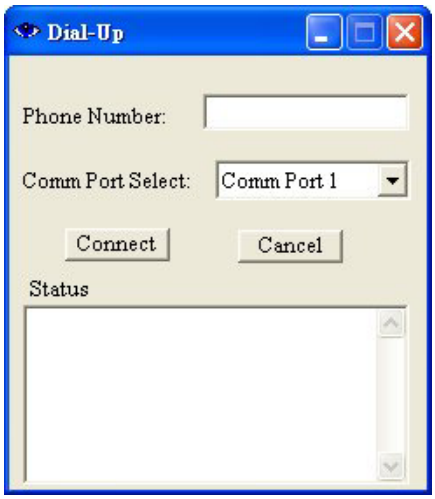

Figure 8-72 DialUp (2)

Figure 8-73 DialUp (3)

9 Appendices

9.1 Specifications

Table 9-1 Transmitter& Receiver

Operation Frequency		2400~2483.5/5725~5850MHz	
Communication Mode		Frequency Division Duplex, FDD	
Modulation		QPSK	
TX Output Power		≤ 22dBm	
RX Dynamic Range		-84dBm ~ -15dBm	
		2.4GHz	5.8GHz
Sensitivity (10^{-3} BER)	2E1	≤ -89dBm	≤ -89dBm
	4E1	≤ -86dBm	≤ -86dBm
	8E1	≤ -83dBm	≤ -83dBm
	16E1	≤ -80dBm	≤ -80dBm
Sensitivity (10^{-6} BER)	2E1	≤ -87dBm	≤ -87dBm
	4E1	≤ -84dBm	≤ -84dBm
	8E1	≤ -81dBm	≤ -81dBm
	16E1	≤ -77.5dBm	≤ -77.5dBm
Frequency Selection	2E1	4 Channel	8 Channel
	4E1	2 Channel	4 Channel
	8E1	1 Channel	2 Channel
	16E1	1 Channel	1 Channel
BER During Normal Propagation		≤ 10^{-10}	≤ 10^{-10}
Receiver Max Input		≤ -10dBm	≤ -10dBm
Receiver Max Input with no BER		≤ -15dBm	≤ -15dBm
Frequency Stability		±10ppm	±10ppm
Gain Flatness (anywhere)		RX: ± 1 dB TX: ± 1dB	
TX & RX Isolation		60dB	
TVS		> 40 kilovolts	
RSSI (BNC)		for Antenna Alignment	

Table 9-2 Digital Line Interface

Data Rate	2,048 Mbps
E1 Connector (ITU-T G.703)	BNC Unbalanced, 75 ohm

	or RJ-48, 120 ohm
Signal BER	LCD Display on IDU

Table 9-3 IDU Structure

IDU LCD		Display of IDU, ODU, Remote, Alarm, Test Item Information
Alarm		Buzzer, LED Indication, LCD Display
LED Indication	FINE	IDU Status
	ALM	Alarm Condition
	TEST	Test Condition
	RMT	Remote Status

Table 9-4 Temperature and Environment

Operating Temperature Range	IDU:-5 to 55 ℃ ODU:-30 to 60 ℃
Humidity	IDU:10%~95% Non-condensing ODU:0%~100%
Altitude	5,000 meters (maximum)

Table 9-5 Network Management System

Operating Method	HyperTerminal/Telnet
Interface	10/100BaseT
Protocol	Exclusive Arbeit NMS

Table 9-6 IF Cable

Link Cable		≤ 100M RG-6 ≤ 200M RG-8
IDU INPUT	Frequency	70MHz
	Stability	50ppm
	Power	-35dBm~-5dBm
	Return Loss	VSWR≦ 1.3
IDU OUTPUT	Frequency	310MHz

	Stability	50ppm
	Power	-4dBm±2dBm
	Return Loss	VSWR≦1.3
Monitoring Signal	Frequency	11.0592MHz
	Stability	50ppm
	Power	150~180mVpp
	Return Loss	VSWR ≦ 1.3

Table 9-7 Power

DC Input	-48VDC (-36~ -72V)
Power Consumption	< 45 watts
AC Input (optional)	100-240VAC 50-60Hz
Connector	Barrier strip, plug-in type

Table 9-8 Service Channel

Telephone	Frequency	300-3400Hz
	Impedance	600 ohm balance
	Interface	RJ-11
Monitoring Data (NMS1)	Bit Rate	≦9600 baud
	Protocol	RS-232
	Interface	DB-9(Female)
Monitoring Data (NMS2)	Bit Rate	≦9600 baud
	Protocol	RS-232
	Interface	DB-9(Male)
Computer Data (AUX1)	Bit Rate	≦9600 baud
	Protocol	RS-232
	Interface	DB-9(Female)
Computer Data (AUX2)	Bit Rate	≦9600 baud
	Protocol	RS-232
	Interface	DB-25(Female)
User Input	Type	Photo-coupled (TTL)
	Interface	DB-26(Female)
	Number	8
	Isolation	3000 VAC(rms)
	LED Power Dissipation	90 mW

User Output	Type	Relay output
	Interface	DB-26(Female)
	Number	4
	Max. switching voltage	125VAC / 60VDC
	Max. switching current	1A

9.2 LCD Alarm Items

Table 9-9 LCD Alarm Items

Alarm	Grade	Status	Explanation
MOD	Critical	Modulation alarm	Modulation malfunctions
DEMOD	Critical	Demodulation lock failure	Demodulation signal loss
EOW	Major	No service between equipments	Incorrect connection data
ODU-POW	Critical	The -48V power supply of IDU malfunctions	The cable between IDU & ODU is short
Link ID	Major	LINK ID at the remote end is different from the user's setting	
MUX	Critical	Receiving lock failure	Even bridging cannot lock the timing
I n-LOS	Warning	IDU cannot detect the input tributary signal	No Traffic input parameters
I n- AIS	Warning	Tributary signal input are all 1's	Traffic input parameters are all 1's
ODU- M/C	Major	IDU cannot monitor ODU	M&C channel between IDU and ODU is down
RSL	Major	Receive signal level alarm	Rx connection is not on the best situation
BER	Major	Bit error rate alarm	Connection is not on the best situation
-5V	Critical	ODU -5V power alarm	
SSPA	Major	Solid state power amplifier is off	
TX-POW	Major	Tx is out of range	Transmitter is abnormal
PLL-TX	Critical	Tx of ODU phase lock LO lose lock	
PLL-RX	Critical	Rx of ODU phase lock LO lose lock	
PA-I	Critical	The current is out of range	SSPA is abnormal

9.3 LCD Function

Table 9-10 LCD Function

Status	LCD Display		Function	Description
	1	Local ID: n	Display the local address	Display the local equipment address
IDU Info (A)	2	EOW No.: n	Display the service number	Display the local equipment's service phone number
	3	IDU Type: nXE1	Display the activity measure	Display the number of E1 equipments
	4	Code: AMI/HDB3	Display or set the model number	Display or set the E1 equipments model number
	5	AUX1: RS-232/RS-422	Display or set the protocol	Display the selected protocol
	6	AUX2: ASY-CH/SYN-CH	Display or set the transmission methodology	Display the transmission method
	7	I-Temp: n℃	IDU working temperature	IDU working temperature
	8	Buzzer: On/Off	Buzzer switch	Buzzer switch
ODU Info (B)	1	RF-CH	Display RF channel	Display the present ODU RF channel
	2	TxL-SET: n dBm	Display the transmit power	Display the transmit power, n = 10~22dBm
	3	SSPA: On/Off	Set the PA to ON/OFF	Set the PA to ON/OFF
	4	O-Temp: n℃	ODU working temperature	ODU working temperature
	5	ATPC: On/Off	ATPC switch	Increase power when RSL level drops
	6	RSLtrig: n dBm	RSL threshold	RSL set to switch on ATPC standard
Test Item (C)	1	Tri-Loc-Loop Tn-L-Lp: En/Dis	Set Local Loopback	Perform loopback test in the local end for the convenience of testing the local end equipment's stability
	2	Tri-Rem-Loop Tn-R-Lp: En/Dis	Set Remote Loopback	Perform loopback test in the remote end for the convenience of testing the link system stability
	3	Tri-TX-PRBS Tn-PRBS: En/Dis	BER test	Use Pseudo Random Code to test the E1 signal transmission
	4	Ber-Clear:	Clear all accumulated Ber	Clear all accumulated Ber on starting the Ber test
	5	Count-Add:	Display all accumulated BER	Display all currently accumulated BER on starting the Ber test

	6	IF-Loop: En/Dis	Set IF Loopback	Perform loopback test from IF interface for the convenience of testing the IDU's stability
	7	RF-Loop: En/Dis	Set RF Loopback	Perform loopback test from RF interface for the convenience of testing the IDU's stability
	8	Close-Test: Y/N	Close all test	Y: close N: cancel
Remote Info (D)	1	Remote ID: n	Display the remote address	Display the address of the remote equipment; n=1~255
	2	R-Status: OK/Loss	Display the system current working status	Test: remote end in test mode Normal: normal working condition
	3	Far-end OK/Loss	Display the connection status of remote end	OK: in connection Loss: remote monitor function lost
	4	R-AUX2: ASY-CH/SYN-CH	Display remote AUX2 status	Display remote AUX2 status
Config Info(E)	1	MODEM: On/Off	Display remote dialup modem status	Display if any remote dialup modem is connected or not
	2	SYS-Conf: 1+ 0	Display system configuration standby mode	Display if there is any standby support
	3	TX: Active	Display transmitting status	Display in Active or Standby mode
	4	RX: Active	Display receiving status	Display in Active or Standby mode
	5	Power: -36 ~ -72V	Display input power	Display input power
	6	Date: Year/Month/Day	Display current date	Display current date
	7	Time: Hour/Min/Sec	Display current time	Display current time

9.4 Spread Spectrum List

Table 9-11 2.4GHz Spread Spectrum List (2E1, Side A)

Channel	2E1					
	TX			RX		
	Left	Middle	Right	Left	Middle	Right
1	2461.5	2465	2468.5	2399.5	2403	2406.5
2	2466.5	2470	2473.5	2404.5	2408	2411.5
3	2471.5	2475	2478.5	2409.5	2413	2416.5
4	2476.5	2480	2483.5	2414.5	2418	2421.5

(Frequency Unit: MHz / QPSK)

Table 9-12 2.4GHz Spread Spectrum List (2E1, Side B)

Channel	2E1					
	TX			RX		
	Left	Middle	Right	Left	Middle	Right
1	2399.5	2403	2406.5	2461.5	2465	2468.5
2	2404.5	2408	2411.5	2466.5	2470	2473.5
3	2409.5	2413	2416.5	2471.5	2475	2478.5
4	2414.5	2418	2421.5	2476.5	2480	2483.5

(Frequency Unit: MHz / QPSK)

Table 9-13 2.4GHz Spread Spectrum List (4E1, Side A)

Channel	4E1					
	TX			RX		
	Left	Middle	Right	Left	Middle	Right
1	2461	2468	2475	2398	2405	2412
2	2471	2478	2485	2408	2415	2422

(Frequency Unit: MHz / QPSK)

Table 9-14 2.4GHz Spread Spectrum List (4E1, Side B)

Channel	4E1	
	TX	RX

	Left	Middle	Right	Left	Middle	Right
1	2398	2405	2412	2461	2468	2475
2	2408	2415	2422	2471	2478	2485

(Frequency Unit: MHz / QPSK)

Table 9-15 2.4GHz Spread Spectrum List (8E1, Side A)

Channel	8E1					
	TX			RX		
	Left	Middle	Right	Left	Middle	Right
1	2460	2474	2488	2396	2410	2424

(Frequency Unit: MHz / QPSK)

Table 9-16 2.4GHz Spread Spectrum List (8E1, Side B)

Channel	8E1					
	TX			RX		
	Left	Middle	Right	Left	Middle	Right
1	2396	2410	2424	2460	2474	2488

(Frequency Unit: MHz / QPSK)

Table 9-17 5.8GHz Spread Spectrum List (2E1, Side A)

Channel	2E1					
	TX			RX		
	Left	Middle	Right	Left	Middle	Right
1	5814.25	5816	5817.75	5730.25	5732	5733.75
2	5818.25	5820	5821.75	5734.25	5736	5737.75
3	5822.25	5824	5825.75	5738.25	5740	5741.75
4	5826.25	5828	5829.75	5742.25	5744	5745.75
5	5830.25	5832	5833.75	5746.25	5748	5749.75
6	5834.25	5836	5837.75	5750.25	5752	5753.75
7	5838.25	5840	5841.75	5754.25	5756	5757.75
8	5842.25	5844	5845.75	5758.25	5760	5761.75

(Frequency Unit: MHz / QPSK)

Table 9-18 5.8GHz Spread Spectrum List (2E1, Side B)

Channel	2E1					
	TX			RX		
	Left	Middle	Right	Left	Middle	Right
1	5730.25	5732	5733.75	5814.25	5816	5817.75
2	5734.25	5736	5737.75	5818.25	5820	5821.75
3	5738.25	5740	5741.75	5822.25	5824	5825.75
4	5742.25	5744	5745.75	5826.25	5828	5829.75
5	5746.25	5748	5749.75	5830.25	5832	5833.75
6	5750.25	5752	5753.75	5834.25	5836	5837.75
7	5754.25	5756	5757.75	5838.25	5840	5841.75
8	5758.25	5760	5761.75	5842.25	5844	5845.75

(Frequency Unit: MHz / QPSK)

Table 9-19 5.8GHz Spread Spectrum List (4E1, Side A)

Channel	4E1					
	TX			RX		
	Left	Middle	Right	Left	Middle	Right
1	5814.5	5818	5821.5	5730.5	5734	5737.5
2	5822.5	5826	5829.5	5738.5	5742	5745.5
3	5830.5	5834	5837.5	5746.5	5750	5753.5
4	5838.5	5842	5845.5	5754.5	5758	5761.5

(Frequency Unit: MHz / QPSK)

Table 9-20 5.8GHz Spread Spectrum List (4E1, Side B)

Channel	4E1					
	TX			RX		
	Left	Middle	Right	Left	Middle	Right
1	5730.5	5734	5737.5	5814.5	5818	5821.5
2	5738.5	5742	5745.5	5822.5	5826	5829.5
3	5746.5	5750	5753.5	5830.5	5834	5837.5
4	5754.5	5758	5761.5	5838.5	5842	5845.5

(Frequency Unit: MHz / QPSK)

Table 9-21 5.8GHz Spread Spectrum List (8E1, Side A)

Channel	8E1					
	TX			RX		
	Left	Middle	Right	Left	Middle	Right
1	5815	5822	5829	5731	5738	5745
2	5831	5838	5845	5747	5754	5761

(Frequency Unit: MHz / QPSK)

Table 9-22 5.8GHz Spread Spectrum List (8E1, Side B)

Channel	8E1					
	TX			RX		
	Left	Middle	Right	Left	Middle	Right
1	5731	5738	5745	5815	5822	5829
2	5747	5754	5761	5831	5838	5845

(Frequency Unit: MHz / QPSK)

Table 9-23 5.8GHz Spread Spectrum List (16E1, Side A)

Channel	16E1					
	TX			RX		
	Left	Middle	Right	Left	Middle	Right
1	5816	5830	5844	5732	5746	5760

(Frequency Unit: MHz / QPSK)

Table 9-24 5.8GHz Spread Spectrum List (16E1, Side B)

Channel	16E1					
	TX			RX		
	Left	Middle	Right	Left	Middle	Right
1	5732	5746	5760	5816	5830	5844

(Frequency Unit: MHz / QPSK)

9.5 ODU IF & RF Status

9.5.1 2.4GHz Status

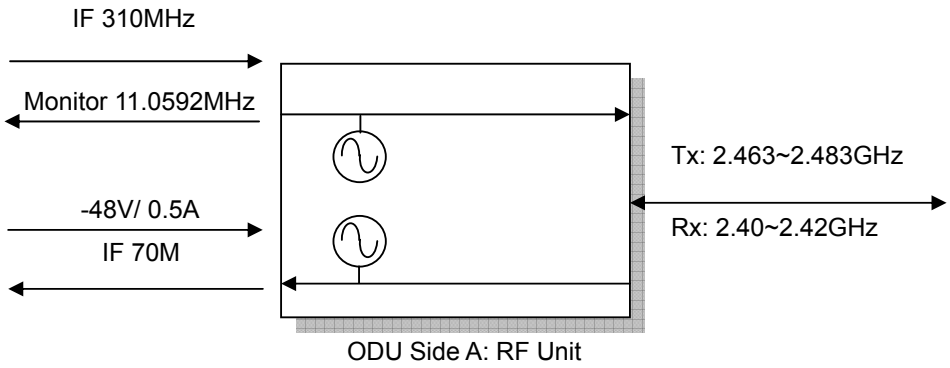

Figure 9-1 Side A IF & RF Status

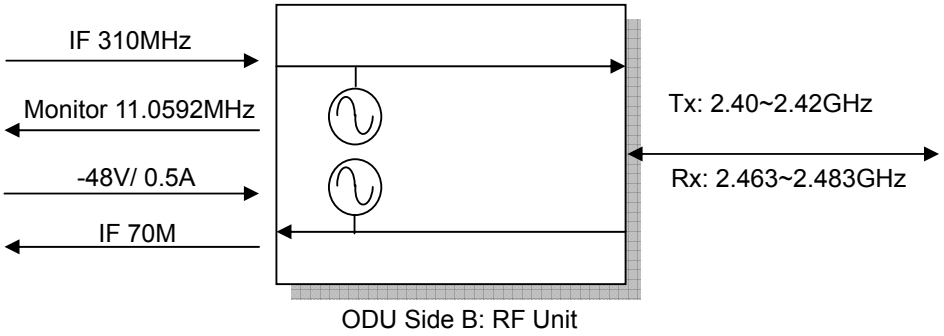

Figure 9-2 Side B IF & RF Status

9.5.2 5.8GHz Status

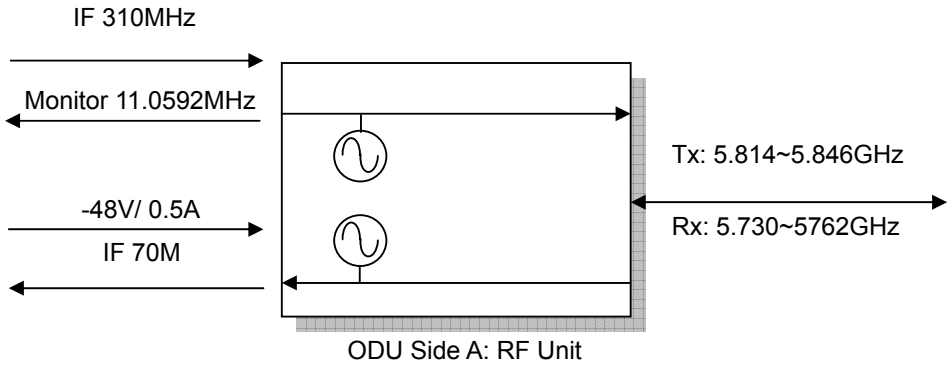

Figure 9-3 Side A IF & RF Status

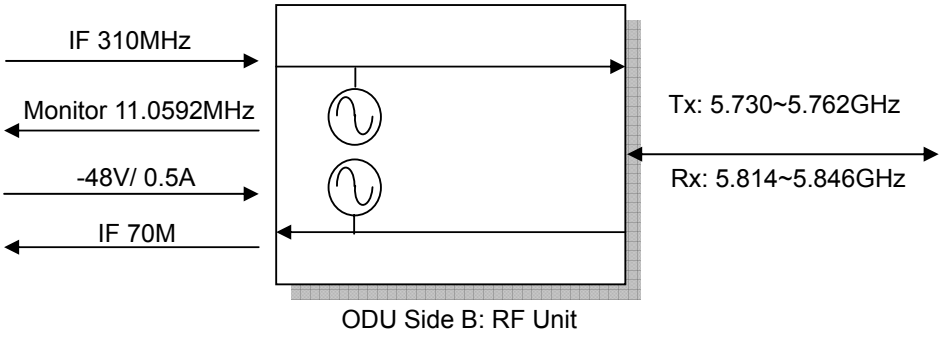

Figure 9-4 Side B IF & RF Status

9.6 The Definition of Pins

Table 9-25 DB9 female pins of NMS1

DB-9	Description
1	
2	Transmitted data （OUTPUT）
3	Received data (INPUT)
4	
5	GND
6	
7	Request to send (INPUT)
8	
9	NC

Table 9-26 DB9 male pins of NMS2

DB-9	Description
1	Received Line Signal Detector (INPUT)
2	Receive data (INPUT)
3	Transmit data (OUTPUT)
4	
5	GND
6	DCE Ready (INPUT)
7	
8	
9	NC

Table 9-27 DB9 female pins of AUX1 (V.28)

DB-9	Description
1	NC
2	TXD (OUTPUT)
3	RXD （INPUT）
4	
5	GND
6	
7	
8	
9	

Table 9-28 DB9 female pins of AUX1 (V.11)

DB-9	Description
1	NC
2	TXD- (OUTPUT)
3	RXD+ (INPUT)
4	
5	GND
6	
7	TXD+ (OUTPUT)
8	RXD- (INPUT)
9	

Table 9-29 DB26 pins of USER I/O

DB-26	Description
1	Input 3
2	GND
3	Input 4
4	Output 1C
5	Output 1NC
6	Output 1NO
7	Output 3C
8	Output 3NC
9	Output 3NO
10	Input 2
11	Input 5K
12	Input 5A
13	Input 6K
14	Input 6A
15	Input 7K
16	Input 7A
17	Input 8K
18	Input 8A
19	GND
20	Input 1
21	Output 4NO
22	Output 4NC
23	Output 4C
24	Output 2NO
25	Output 2NC
26	Output 2C

Table 9-30 DB25 pins of AUX2

DB-25	Description
1	GND

2	TX+ （OUTPUT）transmit data+
3	RX+ (INPUT) receive data+
4	
5	
6	
7	GND
8	
9	RC- (OUTPUT) receive clock-
10	
11	
12	TC- (OUTPUT) transmit clock-
13	
14	TX- (OUTPUT) transmit data-
15	TC+ (OUTPUT) transmit clock
16	RX- (INPUT) receive data-
17	RC+ (OUTPUT) receive clock+
18	
19	
20	
21	
22	
23	
24	
25	

9.7 Installation Guide

9.7.1 Parts of ODU assembly

Nut[1]

Split Washer[2]

Flat Washer[3]

Hex Screw[4]

ODU Fastening Assembly

Part	Q'TY
Nut[1]	4
Split Washer[2]	8
Flat Washer[3]	8
Hex Screw[4]	4
Mounting Bracket[5]	2
U-Bracket[6]	2

Mounting Bracket [5]

U-Bracket[6]

Figure 9-5 Part accessories

9.7.2 ODU Installation Diagram

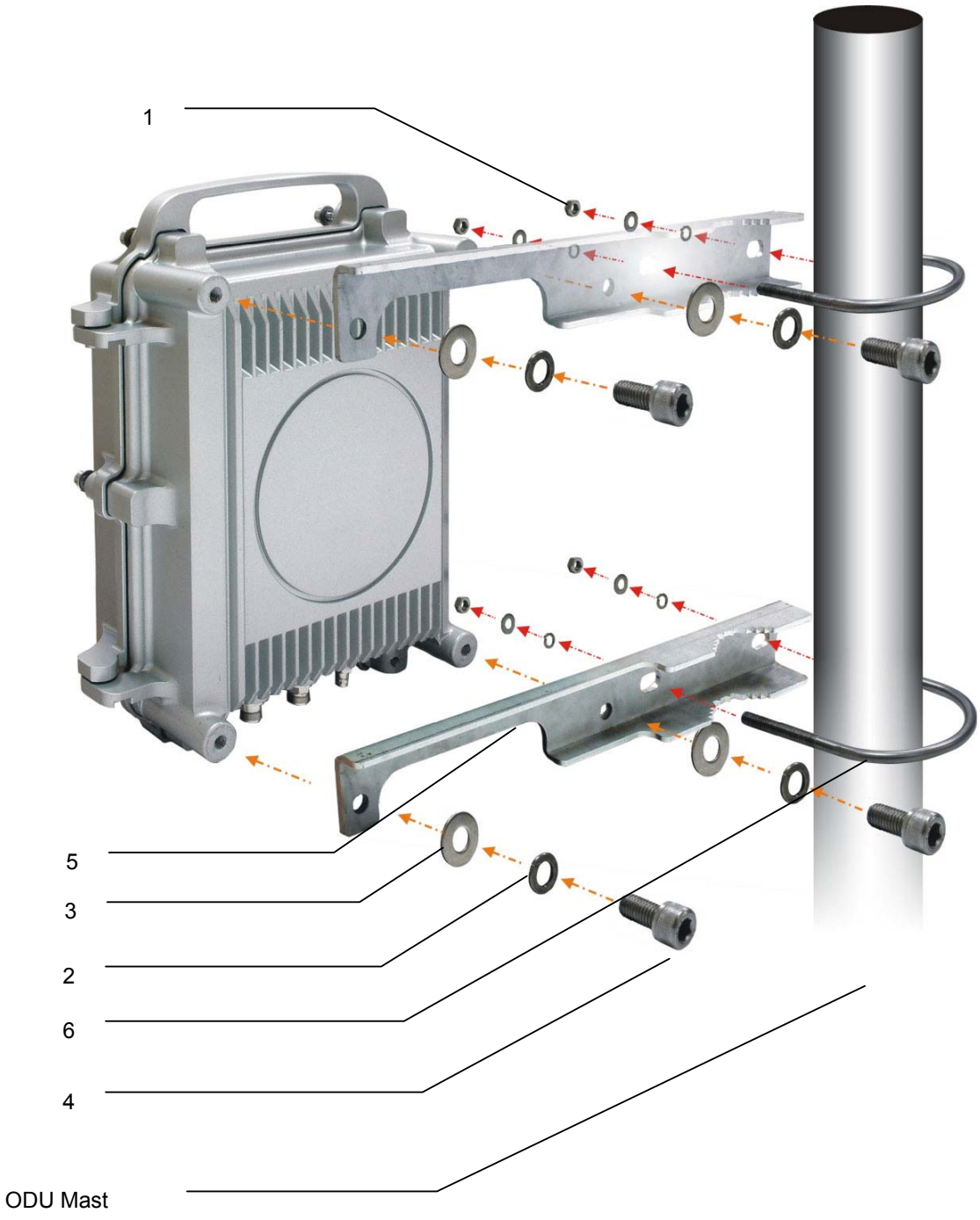

Figure 9-6 ODU Installation Diagram

9.7.3 IDU+ODU Quick Installation

For RJ-48/BNC Type

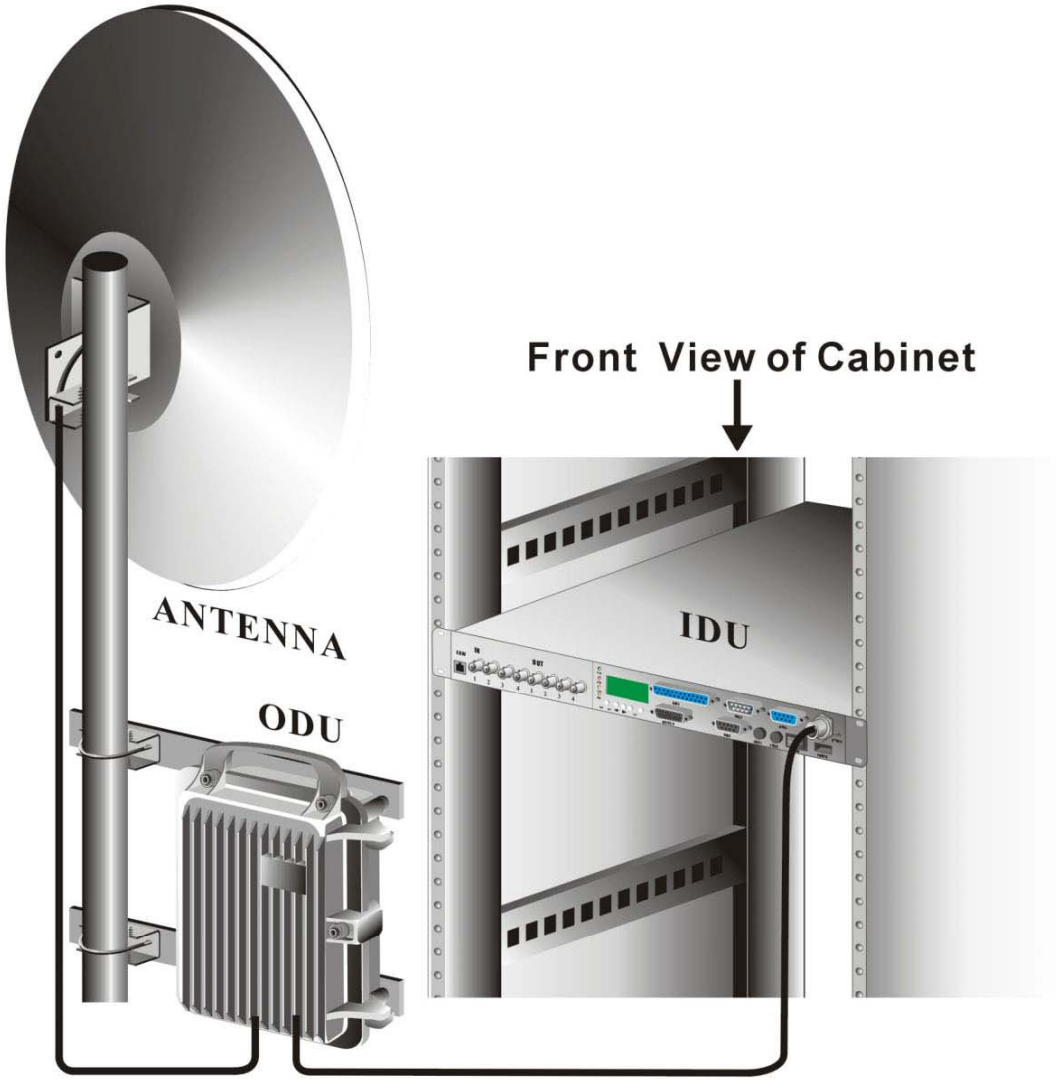

Figure 9-7 IDU & ODU Connection Diagram

9.7.4 Antenna Installation

Prerequisite: We have passed FCC certification of our system with following antennas. We strongly suggest that you should use the same antenna to avoid unexpected problems occurred in the operation.

			
Model Number.		**KBNT5822-16**	**KBNT5828-25**
Frequency		**5725~5875MHz**	**5725~5875MHz**
Gain(dBi)		**22**	**28.5**
Type		**Panel**	**Solid Dish**
Polarization		**Horizontal, vertical**	**Horizontal, vertical**
Beamwidth	**Hor.**	**6**	**6**
	Ver.	**6**	**6**
VSWR		**≦1.4**	**≦1.15**
Dimensions(mm)		**350*350*37,1.2kg**	**Φ60cm**
Connector		**N-male**	**N-type**

Step1: Mount your antenna and ODU in the appropriate position. The correct position depends on your needs. You should also take the distance between antenna and ODU into consideration. The distance is larger, then you need a longer cable to connect which usually stands for higher cable loss.

Step2: Turn off you power of the system.

Step3: Correctly connect your cable between ODU and antenna.

Step4: Turn on the power of the system with SSPA function off. Try to adjust antenna angle by checking the LED light number or RSSI voltage to achieve the best performance. This step would decrease the power to the minimum level so that it won't harm the installer.

Step5: When best performance is achieved, then turn on the SSPA function to make the transmission better to avoid air interference or weather attenuation. Then the antenna installation is completed.

9.8 RSL and Link Budget

The received signal level (RSL) can be estimated using the following formula:

RSL (dBm) = $P_{out} – FL_1 + G_1 + G_2 – FL_2 – L_P$

where: P_{out} is the transmitter output power (in dBm)

FL_1 is the feeder loss of the transmit side (in dBm)

G_1 is the gain of the transmit antenna (in dB)

G_2 is the gain of the receive antenna (in dB)

FL_2 is the feeder loss of the receive side (in dB)

L_P is the Path loss, defined by:

L_P (dB) = $96.6 + 20 \log_{10}F + 20 \log_{10}D$

where: F = Frequency in GHz (1.5, 2.4 or 5.8)

D = Distance of path in km

This link budget is very important for determining any potential problems during installation. If you have calculated the expected RSL, you can see if it has been achieved during installation, and troubleshoot if necessary.

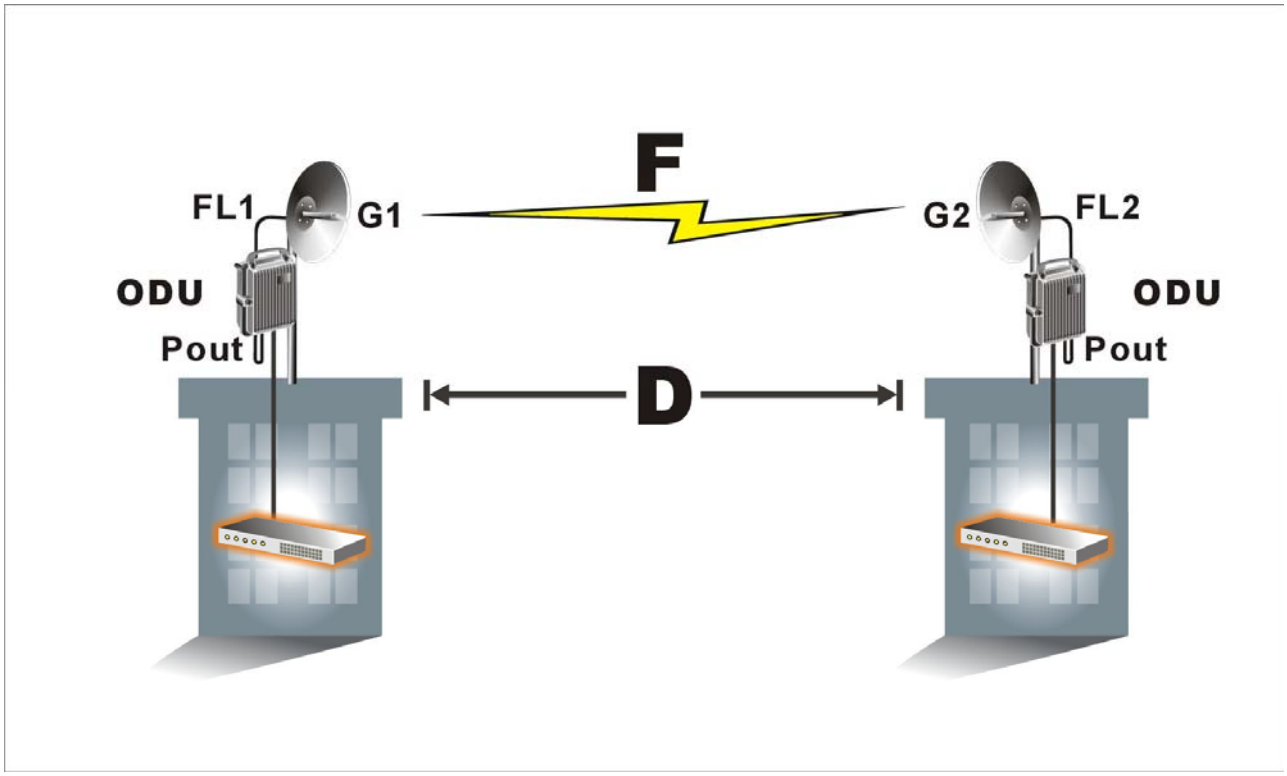

Figure 9-8 RSL and Link Budget