No.	Station	Equip.	Unit	Alarm	Grade	From	To	1
n 1	aa	1	Receiv	-85dBm	Critical	2003-05-02 21:04:17	2003-05-02	
2	aa	1	Far-end	Equipment	Critical	2003-05-02 21:04:17	2003-05-02	
3	aa	1	Mod/D	Demod Ala	Critical	2003-05-02 21:04:17	2003-05-02	
4	bb	1	Test	Local Loo	Critical	2003-05-02 21:09:50	2003-05-02	
5	bb	1	Far-end	Equipment	Critical	2003-05-02 21:19:54	2003-05-02	
6	ъь	1	Far-end	Equipment	Critical	2003-05-02 21:20:18		
Y								
M								
D								
s []								
1								
0								

Figure 8-45: Sort by Date

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

Station	No.	Equip.	Unit	Alarm	Grade	From	
y Station aa	1	1	Mod/D	Demod Ala	Critical	2003-05-02 21:04:17	2003
y Date 🛛 🙀 bb	2	1	Far-end	Equipment	Critical	2003-05-02 21:04:17	2003
1	3	1	Receiv	-85dBm	Critical	2003-05-02 21:04:17	2003
Y Y							
Y							
M							
D							
earch							
ect All							
elete							
Save							
Exit	20						15

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.

Station	No.	Equip.	Unit	Alarm	Grade	From	
tion aa	1	1	Mod/D	Demod Ala	Critical	2003-05-02 21:04:17	2003-
bb	2	1	Far-end	Equipment	Critical	2003-05-02 21:04:17	2003-
	3	1	Receiv	-85dBm	Critical	2003-05-02 21:04:17	2003-
M D Y M D							
th.							
All							
e							
e							
	10000						

Figure 8-47: Select All Alarm Records

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

 $\label{eq:overall Deletion: Press the Select All button and press Delete.$

8.8.2 Event Record

In the **Main Window**, select **System Record** \rightarrow **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)

i	username	time	event	resu
1	Superuser	2003-07	clear all processing test	suco
2	Superuser	2003-07	Interrupt the input traffic of tributary 1 and Insert a PRBS	succ
3	Superuser	2003-07	Add a new station:(name:bb)(type:Terminal Station)(IDU u	suco
4	Superuser	2003-07	Add a new station:(name:aa)(type:Terminal Station)(IDU u	succ
5	Superuser	2003-07	delete station:aa	succ
6	Superuser	2003-07	Add a new station:(name:aa)(type:Terminal Station)(IDU u	succ
<				>

Figure 8-49 Event Record (2)

Save as: buttons allows users to a	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.

	1 milliow					
Ionitor	System Record	System Management	Superuser	Help		
_	Alarm Recor	đ				
	Event Record	1				
	Login Recon	d				
	Report Expo	n				
	N	X			X	
	A	¥				
		3			č	
	5.					

Figure 8-50: Login Record

Select the record you need to delete. Press Delete.

No.	User	Status	Time
	Configuration	Login	2003-04-10 19:41:20
1	Configuration	Log	2003-04-10 19:45:09
1	Superuser	Login	2003-04-10 19:45:41

Figure 8-51: Deleting Login Record

8.8.4 Report Export

In the Main Window, select System Record \rightarrow Record Export. Another initialization window will appear.

Main	1 Window					
Ionitor	System Record	System Management	Superuser	Help		
	Alarm Recor	d				
	Event Record					
	Login Recon	1				
	Report Expo	π				
	S	X			X	
		<u> </u>				
		3			õ	
					The second se	

Figure 8-52: Report Export (1)

Report From/To: Enter the date for reports.

System Report : There are <u>5</u> kinds of reports - System 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
System Report Alarm Report- can tick IDU
System Report Alarm Report Alarm Report - can tick IDU
System Report Alarm Report - can tick IDU
System Report - can tick IDU

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.

to: 2003 💌 May 💌 04 💌 File Path: C:Program Files\Arbeit V1.23-test4			OD	Alarm Report IDU Report ODU Report Link Report			Export							
n Name E	min	Addr	Model	Sn	DSC	K Repoi	Alarm	Sn	Save As	Tx Freq	Rx Freq	Tx Power	RSSI	Al
aa	1	1	1+0 4xE1	0316004	001	HDB3	3	580030419000B	3	5750	5834	14	-44	1
bb	1	2	1+0 4xE1	0316001	002	HDB3	0	580030101000A	3	5834	\$750	21	-44	
	n Name E aa bb	n Name Equip. aa l bb l	n Name Equip. Addr. aa 1 1 bb 1 2	n Name Equip. Addr. Model aa 1 1 1+04xE1 bb 1 2 1+04xE1	n Name Equip. Addr. Model Sn aa 1 1 1+0.4xE1 0316004 bb 1 2 1+0.4xE1 0316001	n Name Equip. Addr. Model Sn DSC aa 1 1 1+0.4xE1 0316004 001 bb 1 2 1+0.4xE1 0316001 002	n Name Equip. Addr. Model Sn DSC Coding aa 1 1 1+04xE1 0316004 001 HDB3 bb 1 2 1+04xE1 0316001 002 HDB3	n Name Equip. Addr. Model Sn DSC Coding Alarm aa 1 1 1+04xE1 0316004 001 HDB3 3 bb 1 2 1+04xE1 0316001 002 HDB3 0	n Name Equip. Addr. Model Sn DSC Coding Alarm Sn aa 1 1 1+0 4xE1 0316004 001 HDB3 3 \$80030419000B bb 1 2 1+0 4xE1 0316001 002 HDB3 0 \$80030101000A	n Name Equip. Addr. Model Sn DSC Coding Alarm Sn Channel aa 1 1 1+0 4xE1 0316004 001 HDB3 3 \$80030419000B 3 bb 1 2 1+0 4xE1 0316001 002 HDB3 0 \$80030101000A 3	n Name Equip. Addr. Model Sn DSC Coding Alarm Sn Channel Tx Freq. aa 1 1 1+0 4xE1 0316004 001 HDB3 3 \$80030419000B 3 \$750 bb 1 2 1+0 4xE1 0316001 002 HDB3 0 \$80030101000A 3 \$834	n Name Equip. Addr. Model Sn DSC Coding Alarm Sn Channel Tx Freq. Rx Freq. aa 1 1 1+0 4xE1 0316004 001 HDB3 3 \$80030419000B 3 \$750 \$834 bb 1 2 1+0 4xE1 0316001 002 HDB3 0 \$80030101000A 3 \$834 \$750	n Name Equip. Addr. Model Sn DSC Coding Alarm Sn Channel Tx Freq. Rx Freq. Tx Power aa 1 1 1+0 4xE1 0316004 001 HDB3 3 580030419000B 3 5750 5834 14 bb 1 2 1+0 4xE1 0316001 002 HDB3 0 580030101000A 3 5834 5750 21	Name Equip. Addr. Model Sn DSC Coding Alarm Sn Channel Tx Freq. Rx Freq. Tx Power RSS1 aa 1 1 1+0 4xE1 0316004 001 HDB3 3 580030419000B 3 5750 5834 14 -44 bb 1 2 1+0 4xE1 0316001 002 HDB3 0 580030101000A 3 5834 5750 21 -44

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 Sequipment 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:

Equipment Stat	us	
IDU		
🔿 Mod	🔵 Dem	DSC
🔘 Mux/Demux		
ODU		
🔵 ODU M & C	📀 PLL	-TX 📀 PLL-RX
● SSPA	⊖ PA_	I O TX_POW
Far End		
🔘 Link ID	😑 Equi	pment
Input Traffic		
🔿 Tributary # l	Masked	⊖ Tributary #2 Masked
○ Tributary #3	Masked	O Tributary #4 Masked

Figure 8-60: Equipment Status

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

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 $\pm 2dB$
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

Table 8-3: Equipment Status

Under Information windows > ODU tab:

Information		
Station Name: Equipment: Operation: OK	aa v Model: 1+0 4xEl Equipment 1 v	
© BER: IDU ODU Link	:: 0.00E-7 • RSL: -50 dBm • Equipment Status	on]
Sn: 2400306 RF Channel: Transmit Frequen	512001A Temperature: 39.0 1 Transmit Signal Level: 20 dBm ncy: 2468MHz Receive Frequency: 2405MHz	
ODU temperature	e alarm threshold (centigrade) High 80 Low -30	

```
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:

• Information				
Station Name:	88	- Model: 1+	0 4xE1	
Equipment:	Equipment l 📘	•		
Operation: OK				
O BEF	: 0.00E-7 O	RSL: -50 dBm	 Equipm 	ent Status
			00. 	
1		1	1	
DU ODU Lun	k User I/O	Cross Connect Inte	erval Status (Other Information
Pomoto Equipme	at. Chatian bh	Eminment 1		
Link ID:	l l	Equipment I		
A.T.P.C.	OFF	Expected RSL:	-70dBm	
BER alarm thres	told: 1.00E-3	RSL alarm thresh	old: -80dBm	

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:

Information	
Station Name: aa 🔽 Equipment: Equipment 1 🗸	Model: 1+0 4xEl
Operation: OK	
○ BER: 0.00E-7 ● R:	SL: -50 dBm 💿 Equipment Status
IDU ODU Link User I/O Cro	ss Connect Interval Status Other Information
⊙ Input #1 Not in use	🔿 Input #2 Not in use
O Input #3 Not in use	○ Input #4 Not in use
O Input # 5 Not in use	⊙ Input #6 Not in use
O Input #7 Not in use	O Input #8 Not in use
Relays Ouput #1 Not in use	
Relays Ouput #2 Not in use	
Relays Ouput #3 Not in use	
Relays Ouput #4 Not in use	

Figure 8-63 User I/O Status

Input #n: input port status.

Relays Output #n: output port status.

Under Information windows → Cross Connect tab:

Information				
Station Name:	aa	▼ Model:	1+0 4xE1	
Equipment:	Equipment 1	•		
Operation: OK				
O BEI	R: 0.00E-7 😋	RSL: -50 dB	m 🔍 Equip	ment Status
IDU ODU Lin	k User I/O	Cross Connect	Interval Status	Other Information
Out	Connector 1	Tributary 1		
Out	Connector 2	Tributary 2		
Out	Connector 3	Tributary 3		
Out	Connector 4	Tributary 4		

Figure 8-64 Cross Connect Status

Out Connector n – Tributary n: cross connection status.

Under Information windows → Interval Status tab:

tation Nam	ue: aa 💌	Model:	1+0 4x	El		
Inthusur:	Lqupment I					
peration:	OK					
0.	BER: $0.00E-7$ \bigcirc RSL:	-30 dBn	1 🔍	Equpm	ent Status	
ODU	Link User I/O Cross C	onnect (Interval	Status (Other Inform	atio:
oda	Link User I/O Cross C	onnect [Interval	Status (Other Inform	atio:
ODU	Link User I/O Cross C ntly 2 Invalid Interval. (I	onnect (nterval Ti	Interval me = 90	Status (10 seconds	Other Inform	atio: xpo:
ODU ere are curre Interval	Link User I/O Cross C intly 2 Invalid Interval. (I [hums] to [hums]	onnect (nterval Tr	Interval me = 90 ES	Status) (10 seconds SES	Other Inform) info E BBE 0	atio xpo
ODU ere are curre Interval 1 2	Link User I/O Cross C attly 2 Invalid Interval. (I [hums] to [hums] 12:30:00 to 12:45:00 12:15:00 to 12:30:00	onnect (nterval Ti UAS 0 40	Interval me = 90 ES 0 40	Status) (10 seconds SES 0 40	Other Inform info E BBE 0 0 0	atio xpo
ODU ere are curre Interval 1 2	Link User I/O Cross C attly 2 Invalid Interval. (I [hums] to [hums] 12:30:00 to 12:45:00 12:15:00 to 12:30:00	onnect (nterval Tr UAS 0 40	Interval me = 90 ES 0 40	Status) (0 seconds SES 0 40	Other Inform info E BBE 0 0 0	atio xpo

Figure 8-65 Interval Status

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

Interval info	\mathbf{X}
Interval information	
What is the 15 min interval status? Error performance parameters and objectives for international.	<
1.Interval: The index of the interval status.	
2.Time([h:m:s to h:m:s]): The interval status is the status value in the time period.	j.
	~

Figure 8-66 Interval Info

Under Information windows -> Other Information tab:

Information		
Station Name: Equipment:	aa 💌 Mod Equipment l 💌	del: 1+0 4xEl
Operation: OK		
O BEF	: 0.00E-7 • RSL: -50	0 dBm 🗢 Equipment Status
		Other Information
IDO ODO LIM	k User DO Cross Conne	lect Interval Status Other Information
	BBU Software Ver. :	120311000401
	BBU Product No. :	03110101
	BBU Product No. : TIU Software Ver. :	03110101 031F0001
	BBU Product No. : TIU Software Ver. :	03110101 031F0001

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 \rightarrow Real-time Alarm.

» Main	Window						
lonitor	System Rec	ord S	ystem Management	Superuser	Help		
Netwo	rk Monitor	Ctrl+T					
Real-t	me Alarm						
DialUj)						
Login	ver logout						
Superi	iser logout		_				
Exit S	ystem	Ctrl+X				N	
		1				1	
		2				8	
						1	
	Station b	bEquip	oment 1 is Ok.		bb Equipment 1's BER is 0.00E-7	2003/7/26	5:56 PM

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.

.04-10 20:28:02 .04-10 20:28:01 .04-10 20:28:01
04-10-20:28:01
04 10 00.09.01
4410 20.26.01
04-10 20:28:01

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

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

• Real-ti	ime Alar	m Table				
Station	Equip.	Unit	Alarm	Grade	From	To
			2.399			
					10 mm - 5	8
		Pa	use		Exit	

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 \rightarrow DialUp.

lonitor System	Record Syste	em Management	Superuser	Help		
Network Monit Real-time Alarr	or Ctrl+T a					
DialUp						
Login DialUp logout						
Exit System	Ctrl+X				N	
	0				0	
	19.000 B				A designed	
					_	
					_	
					_	

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.

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

◆ Dial-Up	
Phone Number:	Comm Port 1
	×

Figure 8-72 DialUp (2)

🏶 Dial-Up	
Phone Number: 29105048 Comm Port Select: Comm Port 1	•
Connect Hang-up	
Status	
CONNECT 24000/V44	_
	×

Figure 8-73 DialUp (3)

9 Appendices

9.1 Specifications

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

Table 9-1 Transmitter& Receiver

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 $^\circ \!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$
	ODU:-30 to 60 $^\circ \!\!\! \mathbb{C}$
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
		<u><</u> 200M RG-8
	Frequency	70MHz
IDU INPUT	Stability	50ppm
	Power	-35dBm~-5dBm
	Return Loss	$VSWR \leq 1.3$
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	$VSWR \leq 1.3$

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	Bit Rate	\leq 9600 baud
	Protocol	RS-232
	Interface	DB-9(Female)
Monitoring Data	Bit Rate	\leq 9600 baud
	Protocol	RS-232
	Interface	DB-9(Male)
Computer Data	Bit Rate	\leq 9600 baud
	Protocol	RS-232
(AUXI)	Interface	DB-9(Female)
Computer Data	Bit Rate	\leq 9600 baud
	Protocol	RS-232
(AUX2)	Interface	DB-25(Female)
	Туре	Photo-coupled (TTL)
User Input	Interface	DB-26(Female)
	Number	8
	Isolation	3000 VAC(rms)
	LED Power Dissipation	90 mW

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

9.2 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
	Critical	The 40V neuron cumply of IDU melfunctions	The cable between IDU & ODU is
000-2000	Chucai	The -48V power supply of IDO manufactions	short
	Major	LINK ID at the remote end is different from	
	iviajoi	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
	Major	IDU cannot monitor ODU	M&C channel between IDU and
000-10/0	iviajoi		ODU is down
	Major		Rx connection is not on the best
ROL	iviajoi		situation
DED	Major	Pit error rate alarm	Connection is not on the best
DER	iviajoi		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

Table 9-9 LCD Alarm Items

9.3 LCD Function

Status		LCD Display	Function	Description
	1	Local ID: n	Display the local address	Display the local equipment address
	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
IDU	4	Code: AMI/HDB3	Display or set the model number	Display or set the E1 equipments model number
Info	5	AUX1: RS-232/RS-422	Display or set the protocol	Display the selected protocol
(A)	6	AUX2: ASY-CH/SYN-CH	Display or set the transmission methodology	Display the transmission method
	7	I-Temp: n°C	IDU working temperature	IDU working temperature
	8	Buzzer: On/Off	Buzzer switch	Buzzer switch
	1	RF-CH	Display RF channel	Display the present ODU RF channel
ODU	2	TxL-SET: n dBm	Display the transmit power	Display the transmit power, n = 10~22dBm
Info	3 SSPA: On/Off		Set the PA to ON/OFF	Set the PA to ON/OFF
(B)	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

Table 9-10 LCD Function

				Perform loopback test from IF interface for		
	6	IF-Loop: En/Dis	Set IF Loopback	the convenience of testing the IDU's		
				stability		
				Perform loopback test from RF interface for		
	7	RF-Loop: En/Dis	Set RF Loopback	the convenience of testing the IDU's		
				stability		
	8	Close-Test: Y/N	Close all test	Y: close N: cancel		
	1	Romoto ID: n	Display the remote address	Display the address of the remote		
	1	Remote ID. II	Display the remote address	equipment; n=1~255		
Pemote	2	P Status: OK/Loss	Display the system current	Test: remote end in test mode Normal:		
Info	2	R-Status. OR/Loss	working status	normal working condition		
	3	Far and OK/Loss	Display the connection status	OK: in connection		
	5		of remote end	Loss: remote monitor function lost		
	1	R-AUX2:	Display remote ALIX2 status	Display remote AUX2 status		
	4	ASY-CH/SYN-CH				
	1		Display remote dialup modem	Display if any remote dialup modem is		
			status	connected or not		
	2	SVS Conf. 1+ 0	Display system configuration	Display if there is any standby support		
			standby mode	Display in there is any standby support		
Config	3	TX: Active	Display transmitting status	Display in Active or Standby mode		
Info(E)	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

	2E1							
Channel		ТХ		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		

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

(Frequency Unit: MHz / QPSK)

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

	2E1							
Channel		ТΧ		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)

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

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

Channel	4E1					
	тх	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)
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	8E1							
Channel	тх			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)

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

(Frequency Unit: MHz / QPSK)

	2E1							
Channel		ТХ		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		

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

		2E1					
Channel		ТХ			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	

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

(Frequency Unit: MHz / QPSK)

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

	4E1						
Channel	тх			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)

	4E1						
Channel	ТХ			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	

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

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

(Frequency Unit: MHz / QPSK)

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

	8E1					
Channel	ТХ		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)

	16E1					
Channel	ТХ		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)

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

9.5 ODU IF & RF Status

9.5.1 2.4GHz Status







Figure 9-2 Side B IF & RF Status

9.5.2 5.8GHz Status





9.6 The Definition of Pins

	Description
00-3	Description
1	
2	Transmitted data (OUTPUT)
3	Received data (INPUT)
4	
5	GND
6	
7	Request to send (INPUT)
8	
9	NC

Table 9-25 DB9 female pins of NMS1

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



U-Bracket[6]

Figure 9-5 Part accessories





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
Туре		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	Ф60cm
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) FL₁ is the feeder loss of the transmit side (in dBm) G₁ is the gain of the transmit antenna (in dB) G₂ is the gain of the receive antenna (in dB) FL₂ is the feeder loss of the receive side (in dB) L_P is the Path loss, defined by: L_P (dB) = 96.6 + 20 log₁₀F + 20 log₁₀D 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