

RD-8132 CDMA REPEATER

USER MANUAL



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0.4 ISSUE CONTROL

Change No.	ENU	Details Of Change
1	1-0-0	First created and issued on 2008-09-24.

0.5 SAFETY NOTICES AND ADMONISHMENTS

This document contains safety notices in accordance with appropriate standards. In the interests of conformity with the territory standards for the country concerned, the equivalent territorial admonishments are also shown.

Any installation, adjustment, maintenance and repair of the equipment must only be carried out by trained, authorised personnel. At all times, personnel must comply with any safety notices and instructions.

Specific hazards are indicated by symbol labels on or near the affected parts of the equipment. The labels that conform to international standards are triangular in shape, and are coloured black on a yellow background. An informative text label may accompany the symbol label.

Hazard labeling is supplemented by safety notices in the appropriate equipment manual. These notices contain additional information on the nature of the hazard and may also specify precautions.

Warning Notices:

These draw the attention of personnel to hazards that may cause death or injury to the operator or others. Examples of use are cases of high voltage, laser emission, toxic substances, point of high temperature, etc.

Alert Notice:

These draw the attention of personnel to hazards that may cause damage to the equipment. An example of use is the case of static electricity hazard.

Caution notices may also be used in the handbook to draw attention to matters that do not constitute a risk of causing damage to the equipment but where there is a possibility of seriously impairing its performance, e.g. by mishandling or gross maladjustment. Warnings and Cautions within the main text do not incorporate labels and may be in shortened form.

Cautions:

The recommend use distance for external antenna is larger than **3.17** meter.

End of section

1 EQUIPMENT DESCRIPTION

The RD-8132 CDMA repeater is designed for CDMA850 networks. Band-specific linear MCPA and filtering effectively amplifies the desired BTS carriers and provides superior out-of-band rejection. The unit can incorporate two adjustable bandwidth segments. Remote configuration and surveillance is possible through Comba's remote control and monitoring system via PC or wireless modem to the OMT/OMC. Internal Li-ion backup battery ensures alarm signals are sent out during power failure. The unit comes in a sealed, cast aluminum enclosure, suitable for operation in all weather conditions.

This is an ideal product for outdoor coverage, especially for rural sides and mountain areas without signal coverage. Site location shall be selected with care to avoid radiation effect to human being though this product is meeting FCC regulation requirement. Any installation, adjustment, maintenance and repair of the equipment must only be carried out by trained, licensed engineer.

1.1 BLOCK DIAGRAM

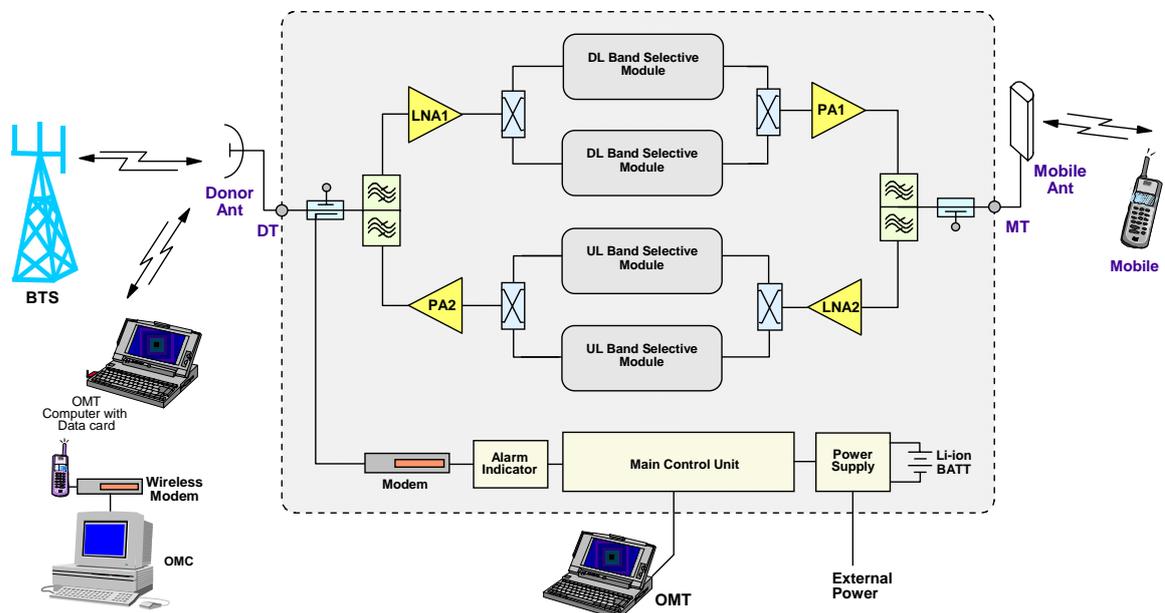


Figure 1: Block Diagram

In the downlink, the signal from the BTS is divided into RX/TX by duplexer in DT end and sent to LNA1, then band selective module for selecting desired signals, followed by PA1 for amplifying the signal, and then to duplexer in MT terminal; finally the signals are sent to the service antenna for signal coverage.

In the uplink, the mobile signals are received by the service antenna. Divided in RX/TX by the duplexer in MT terminal and followed by LNA2, then band selective module for selecting desired signals, followed by PA2 for amplifying. After the duplexer of DT end, the signals are sent to the donor antenna for transmission back to the BTS.

1.2 EQUIPMENT CONSTITUTION

1.2.1 EQUIPMENT ENCLOSURE LAYOUT

Below is the enclosure layout:

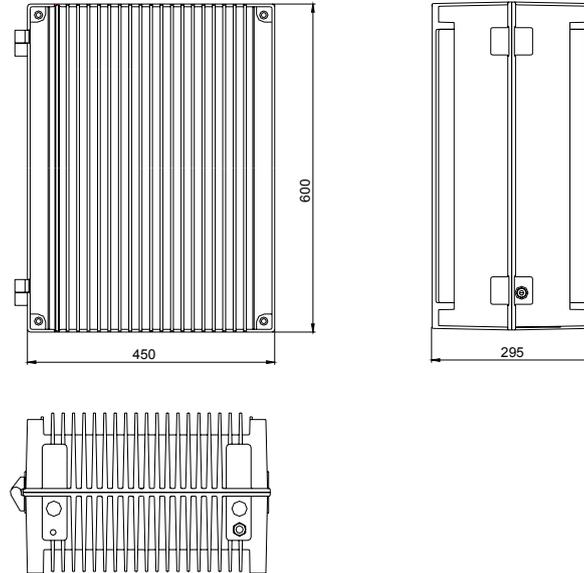


Figure 2: Equipment Enclosure Layout

1.2.2 EQUIPMENT INTERNAL LAYOUT

This system typically consists of the following sub modules.

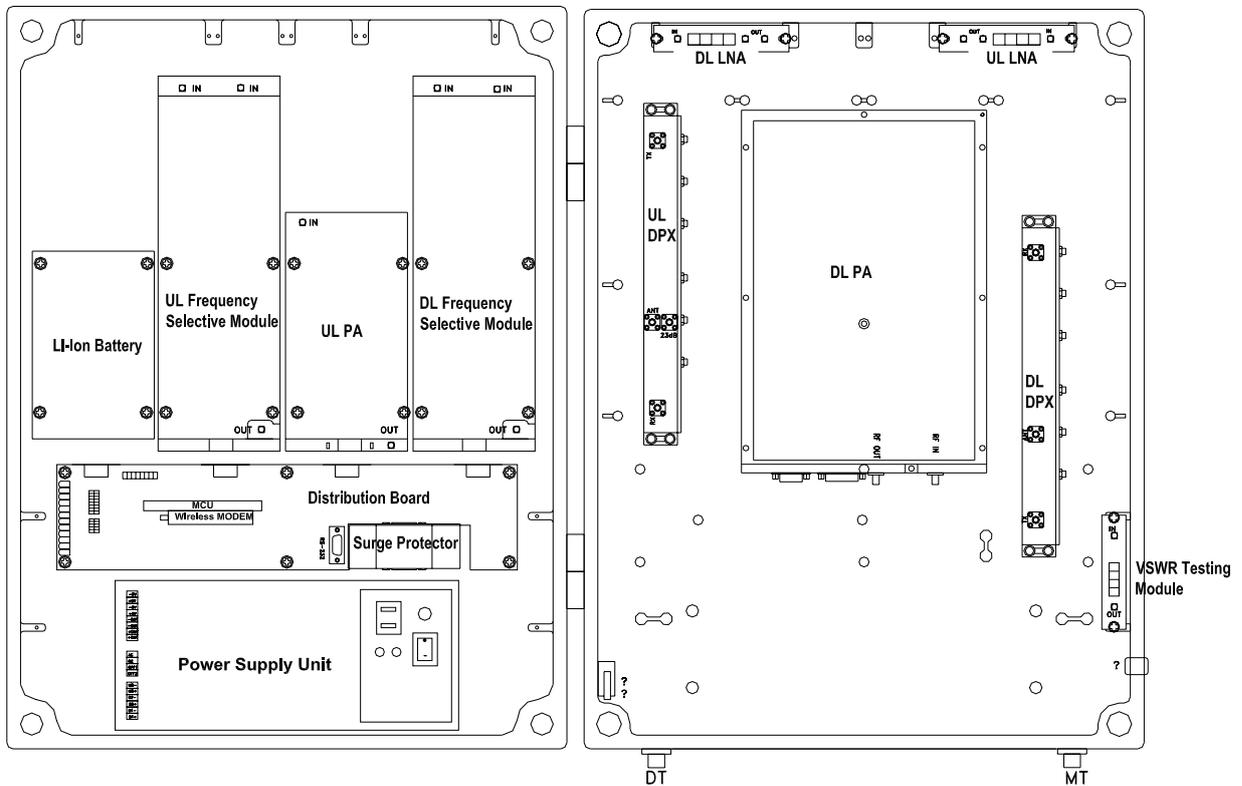


Figure 3: Equipment Internal Layout

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No	Identifier	Functional Description
1	UL Frequency Selective Module	The frequency selective module is used to select desired signals and filter unwanted signals effectively.
2	DL Frequency Selective Module	
3	UL Power Amplifier (PA)	PA fulfils power amplification function.
4	DL Power Amplifier (PA)	
5	Integrated DPX (DT)	Integrated duplexer in DT end is integrated with Low Noise Amplifier to pre-amplify the downlink signal and DL input power testing board to test downlink input power; Integrated duplexer in MT end is integrated with Low Noise Amplifier to pre-amplify the uplink signal and DL VSWR testing borad to test DL VSWR & DL output power.
6	Integrated DPX (MT)	
7	Main Control Unit(MCU)	The MCU is used to monitor and control the operation, it also provide communication interfaces for remote control and supervision. LED indicators on the board provide operation status information.
8	Power Supply Unt (PSU)	The PSU converts the input voltage into a stable DC power for internal functional units and charge the Li-ion battery.
9	Li-ion Battery	The Li-ion battery pack provides back-up power supply for internal modems up to three hours in the event of main power failure.
10	Distribution Board	Each distribution board serves as a distributor for power and internal communication within the equipment. On the distribution board located the following connections: connection to function modules, MCU, RS232 for local commisioning.
11	Surge Protector	The internal surge protectors are to provide protection to the PSU. On the top of each surge protector is a little window, beneath which is a coloured indicator. 'Green' indicates protection is available, and in the event of a fault, the colour will turn to 'Black'. When this occurs, the surge protector has to be replaced. When the equipment is DC powered, no surge protector is required.
12	Wirelss Modem	Wirelss modem is used for remote controlling and monitoring for alarm transmission. It has connection for RF, data and power. There is an indicator LED to show the modem status.

End of section

2 INSTALLATION

2.1 INSTALLATION CHECKLIST AND PREPARATION

2.1.1 REPEATER INSTALLATION CHECKLIST

Installation Location Requirement	Considerations
Power Supply	Provided power cord length is about 4m. Use a dedicated AC breaker or fuse circuit with good access to an earthing point. Here are the power supply options for this repeater: AC100~240V: 100V~240V/47Hz~63Hz
EMC and Interference	Do not locate near large transformers or motors that may cause electromagnetic interference.
Suitable operating environment	-33 °C to +55 °C and maximum 95% relative humidity.

2.1.2 ANTENNA INSTALLATION CHECKLIST

Installation Location Requirement	Considerations
Locate donor antenna in order to receive the most appropriate signal level from the desired BTS and to shield it from other signals at the same time.	Field intensity of receiving site: Typical mobile phone test field intensity $\geq -70\text{dBm}$
Locate the service antenna directed away from the donor cell.	
Always try to maximize isolation between donor antenna and service antenna. $I > G_{\text{max}} - 13\text{dB}$	The isolation must be 13 dB larger than the maximum gain of the repeater in operation.

2.1.3 PREPARATIONS

- Open and check the content of the package received against the packing list. If any external damages, please report to shipping agent. If any items are missing, contact Comba Telecom System.
-

Item	Product Identifier	Qty	Remark	
Mounting Rack	R-9122C8-5140/1	1		
Masonry Bolt	M10x110	8		
U Bolt	M10x85x110	2		
7-pin CPC connector	X14J7P	1		
Allen Key	5.5mm	1		
Equipment Key	N/A	2		
Local Commissioning cable	R-9122C/R-9122AC	1	Mark "9122"	
Equipment Replacement Fuse	T6.3AL250V	2		
OMT Software and User Manual	On CD-Rom	OMT V3.22 or above	1	
Equipment User Manual		This manual	1	

- Prepare installation tools. The following are the recommended tools for new installation:

Tool	Dimension
Electrically operated drill and masonry drill bits	12mm
Ring Spanner	Assorted size: 12~30mm
Allen Key	5.5mm

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Knife for tape or cable stripping	
Multi Meter to check cables, voltages alarms	
PC with supplied OMT or OMC software	
SIM cards both for repeater and modem with SMS (Short Message Service) and CSD (Circuit Switch Data) enabled	
External alarm cable for connection to external alarm terminals	
Fused Power Outlet for repeater	

2.2 ELECTRICAL INSTALLATION

The equipment has been designed for all cables entry from the bottom of the enclosure.

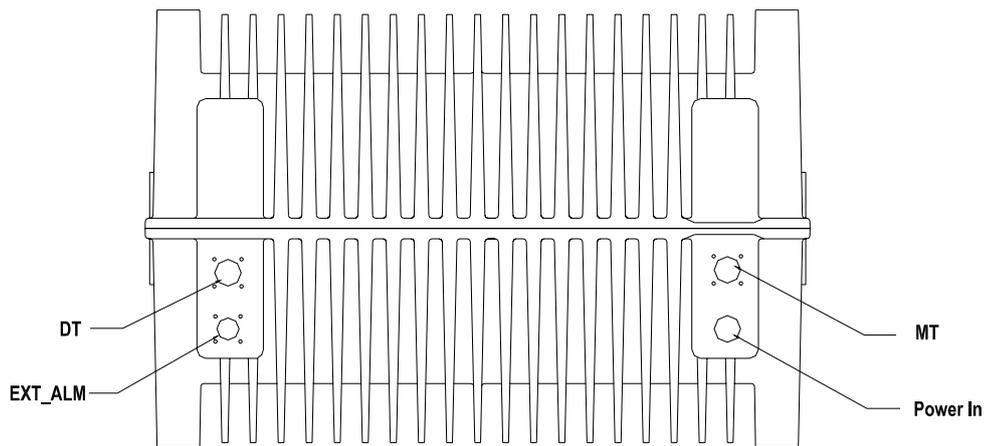


Figure 4: Equipment Connectors

Identifier	Description
DT	N-F connector for connection to donor antenna.
MT	N-F connector for connection to service antenna.
EXT_ALM	7-pin CPC connector for external alarm input connection.
Power In	A pre-installed power cord for connection to power supply.

Here blow is the electrical installation application.

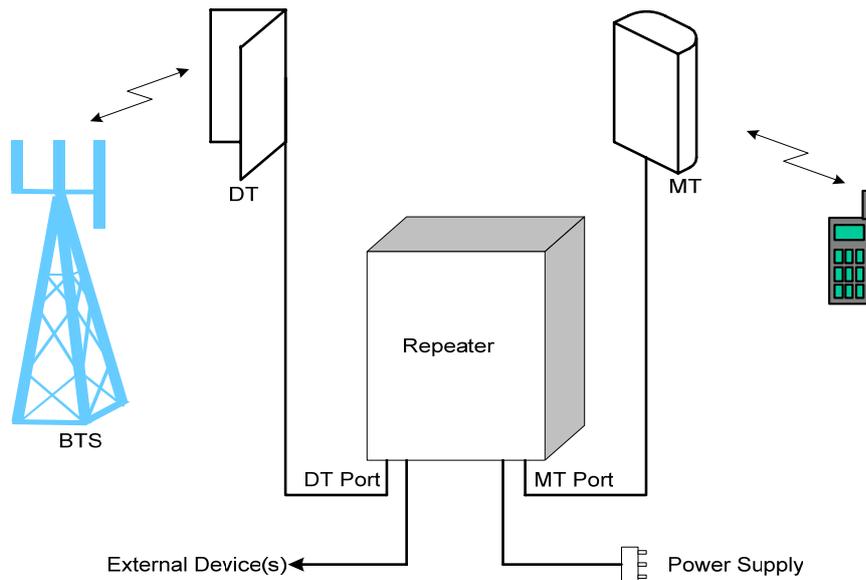


Figure 5: Equipment Connections

2.2.1 GROUNDING CONNECTION

The enclosure must be grounded securely by connecting a copper wire (CSA 16mm²) to the grounding point on the mounting rack, and the other end to a protective ground (i.e. building earth point).

2.2.2 POWER CONNECTION

The system provides power supply options of AC220V/50Hz, AC110V/50Hz. The recommended AC connection has three connections to include earth.

2.2.3 RF CABLE CONNECTION

Connection to donor antenna and mobile antenna is below:

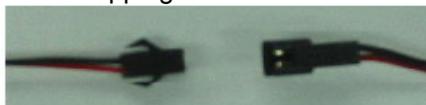
- Donor antenna cable → DT port
- Mobile antenna cable → MT port

2.2.4 LI-ION BATTERY CONNECTION

The method to connect the Li-ion battery is product specific. For the Li-ion battery with switch, which identified as “BAT2” on PSU, please enable the Li-ion battery by switching to “1” and disable by switching to “0”. The Li-ion battery switch is OFF prior to shipment.

For the one without switch, an in-line connector close to the battery pack is used to control the Li-ion battery connection, which is “disconnected” before shipping.

Li-ion battery
in-line connector



Notice: Please enable the Li-ion battery connection after equipment is powered to ensure alarm unit working in the event of power failure.

2.2.5 OMT CONNECTION

With the chassis open, only use the local commissioning cable (R-9122C/R-9122AC) directly connects the serial port of PC to the RS-232 port on the distribution board within the equipment.

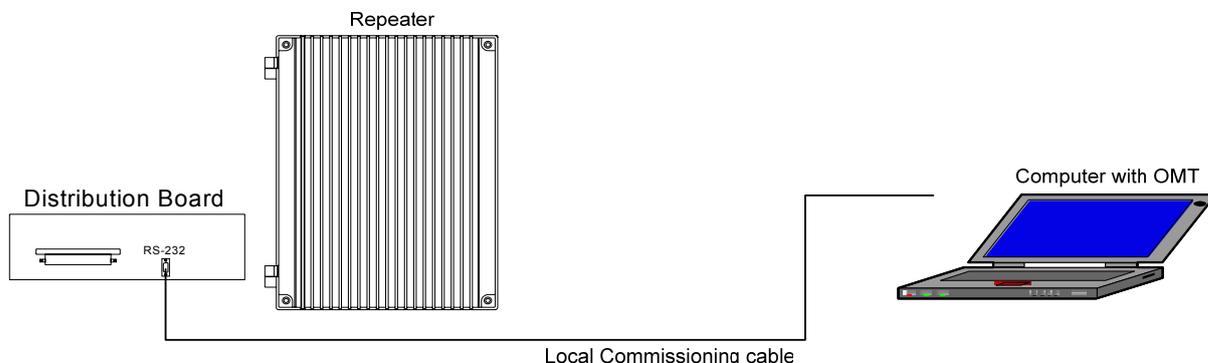


Figure 6: OMT Connection with Chassis Open

2.2.6 EXTERNAL ALARM CONNECTION

Four external alarms INPUT are realized on the EXT_ALM port, this is a 7-pin CPC connector. Pin numberings are shown looking-into the connector on the enclosure.

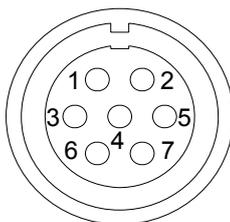


Figure 7: Pins Allocation for EXT_ALM Connector

Pin number	1	2	3	4	5	6	7
Alarm definition	EXT. Alarm 1	EXT. Alarm 2	EXT. Alarm 3	GND	EXT. Alarm 4	Reserved	Reserved

These signals are defined as "TTL/CMOS level", the following voltage are valid as EXT_ALM signals:

Voltage as applied to EXT Alarm Pin	Alarm Condition recognized by system
Low Voltage: 0V to 1.5V	Alarm recognized
High Voltage: 3.5V to 5V	No Alarm recognized

2.2.7 DRIP-LOOP

Comba recommends that every horizontal cable entry to the equipment forms a 'U' before its entry to the equipment. Any accumulated water on the cable will drip down at the bottom of the loop and will not climb up to the equipment.

2.2.8 REMOTE CONNECTION OF OMT USING WIRELESS MODEM

For the equipment equipped with wireless modem, the modem provides the option of remote connection of the equipment to the OMT. The wireless modem implements the link for data and SMS.

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Note: When CDMA modem is used, only SMS function is supported to retrieve alarm information and to provide remote control.

The power and data cables have been factory-connected to the wireless modem. User needs to insert the SIM / UIM card into the wireless modem.

To insert or replace the SIM / UIM card, locate and press down the recessed button (yellow) to eject the SIM / UIM card carrier. Insert the SIM / UIM card and push back the carrier until it is latched in place.

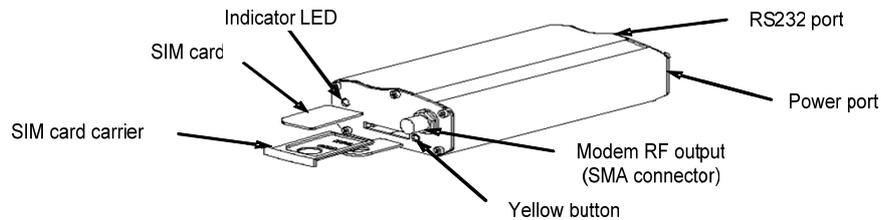


Figure 8: Wireless Modem

The LED indicator on the wireless modem displays the state of the modem:

- LED OFF: equipment power off
- LED ON: equipment power on, no SIM/ UIM card or no connection to antenna
- LED flash slowly: equipment power on, in SMS mode
- LED flash quickly: equipment power on, in data link mode

Note: Data link mode is dependent on service availability from service provider. If it is required, the operator's SIM card must be data-enabled (Circuit Switch Data).

End of section

3 OMT

The equipment can be monitored and controlled by OMT software running on a local PC with local commissioning cable, remote connection to the equipment via wireless GSM / CDMA network.

- OMT software running on a local PC with serial connection to the equipment.
- OMC (optional) software with remote connection to the equipment over wireless GSM / CDMA network.

This chapter is to introduce how to apply local and remote connection to OMT for the first installation, for the detailed OMT information, please refer to OMT user manual and other references.

Notice: The OMC software with remote connection to the equipment over wireless GSM / CDMA network is optional for customers.

3.1 LOCAL AND REMOTE CONNECTIONS TO OMT

After installing OMT software on the PC, connection to the equipment can be done locally or remotely.

Double click the OMT explorer icon, the OMT Explorer main screen window will appear.

3.1.1 LOCAL CONNECTION TO OMT

After database configuration is done successfully, the following window will pop up and select [Local connection via RS-232] for local connection.

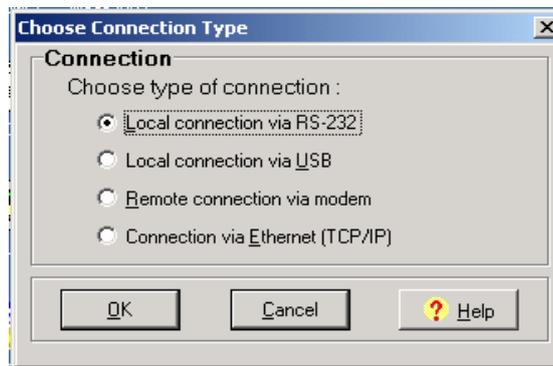


Figure 9: Connection Type

Select the desired communication port and click “OK”, it will enter into the main window of OMT.

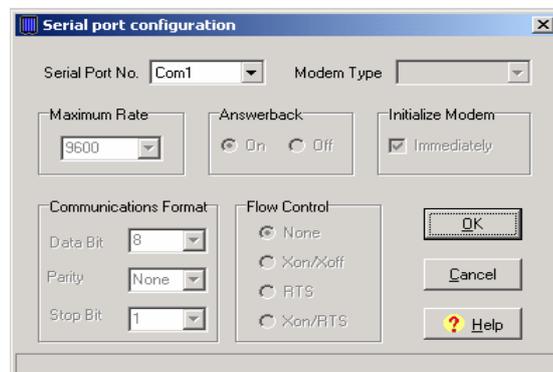


Figure 10: Serial Port Configuration

3.1.2 REMOTE CONNECTION TO OMT

If remote connection is needed, users can select [Remote connection via modem] in connection type window. Select desired serial port and click “OK” in [Serial Port Configuration] window to go to OMT main window and start modem initialization. Click “connect” and the [Remote Connection] window will show up.

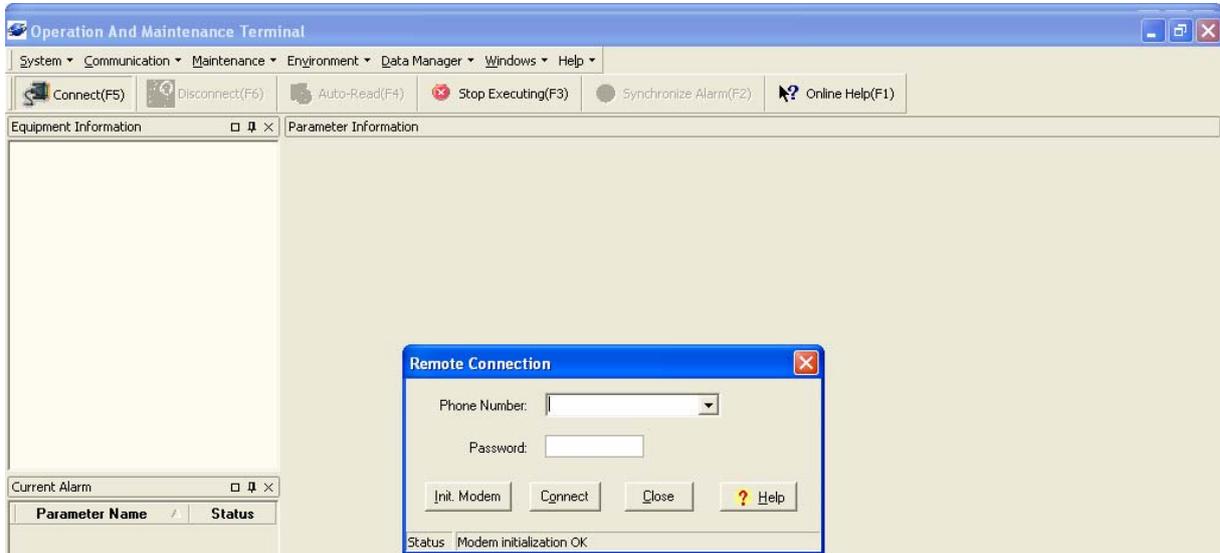


Figure 11: Remote Connection

Config: Enter the correct phone number (Users don't have to enter the password) and click “connect”, it will be connected remotely.

Notice: Please enable the SIM card to support Circuit Switch Data.

3.2 OMT CONFIGURATION

After entering the OMT main screen, click the “Connect” button on the toolbar, to connect the equipment to the OMT. Successful connection will be indicated by a message “Online Ok” and equipment parameters can be read and/or set.

Users can configure the parameters, and then offset the parameters according to desired coverage level and interference to other BTS signals.

OMT parameters include: Common Information, RF Information, Alarm Information, and Properties Information.

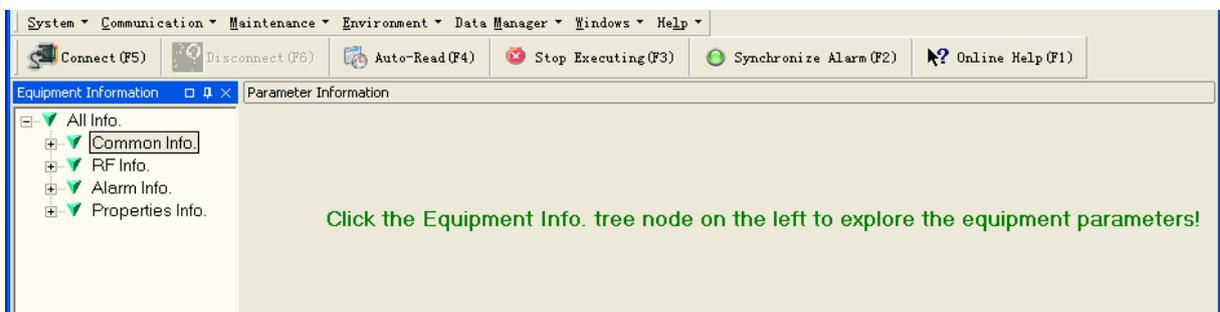


Figure 12: OMT Main Window

3.3 RF PARAMETER

It is recommended to configure the following RF parameters for the first installation.

3.3.1 SWITCH

Switch is to enable/disable power for carrier1,carrier2, RF and self-oscillation. When user checks and sets non-RF parameters, such as checking physical antenna connection, switching off will disable equipment power temporarily to protect PA in operation.

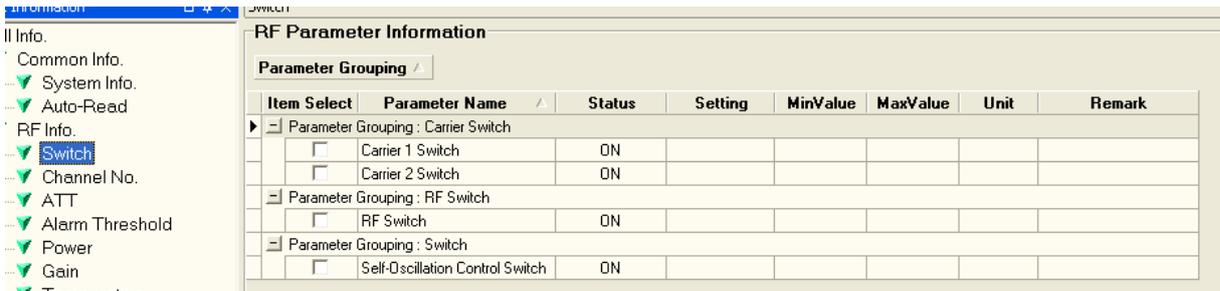


Figure 13: Switch

Config:

Select the required state in setting columns of RF information window for RF switch, then press [Enter] or [Config] button to finish the configuration operation.

3.3.2 CHANNEL NO.

Channel No. includes Low Edge Channel No. and High Edge Channel No of working band 1/ 2. The value in [MaxValue] column is the upper limit of the range, while the value in [MinValue] column is the lower limit of the range.

The UL/DL Channel No.setting range: 1011~1023, 1~779

e.g. Working Band Low Edge Channel No. = 160(874.8MHz)

Working Band High Edge Channel No. = 611(888.33MHz)

Bandwidth=14.76MHz (inclosing 12 channals)

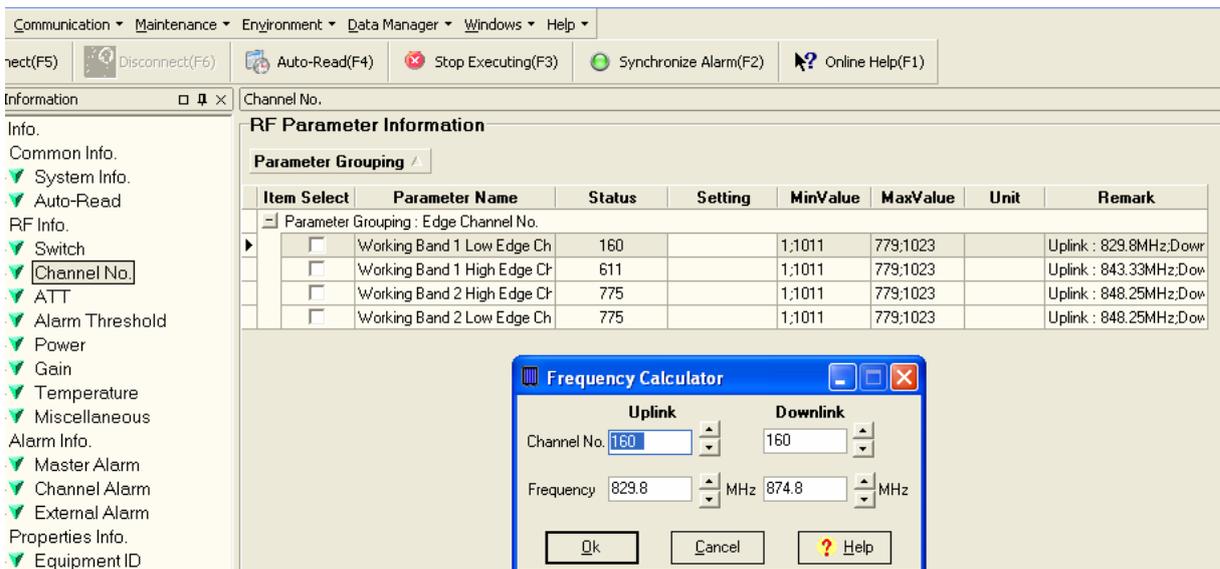


Figure 14: Channel No.

Config:

Enter the required value in setting columns and click [Config] button to finish the configuration operation. There are two methods to insert the channel number:

- Insert the desired channel number (within the setting range) into the [Setting] column directly
- Right click the [Setting] column, the [Frequency Calculator] dialogue window seen as below will pop-up, insert the desired channel number. Then the corresponding frequency will turn up automatically. This function makes it easier for user to configure.

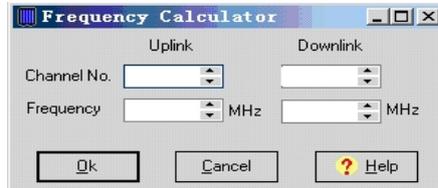


Figure 15: Frequency Calculator

3.3.3 ATT

ATT adjustment includes UL/DL ATT adjustment. The purpose of adjusting the ATT is to adjust system gain.

DL/UL ATT 1/2 setting range: 0~30dB

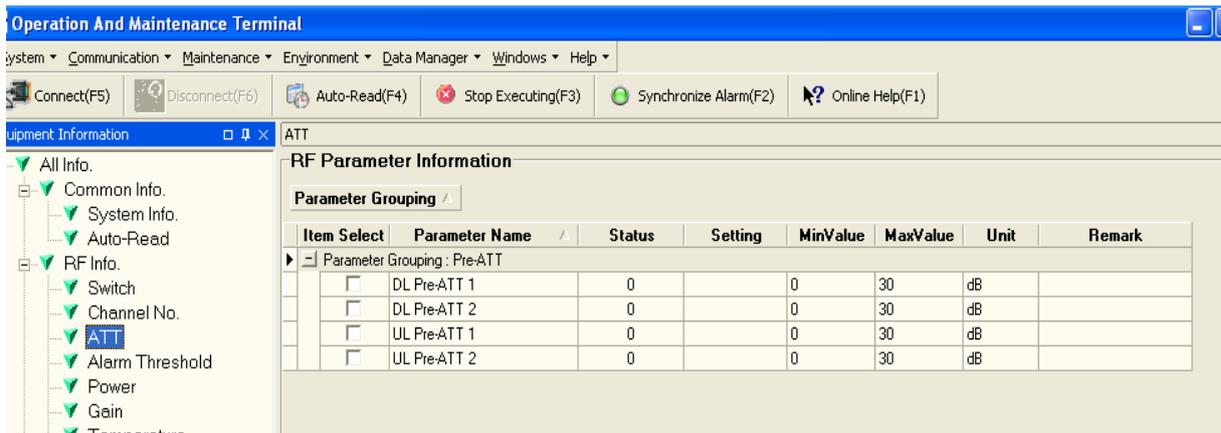


Figure 16: ATT

Config:

Select the required value in setting columns of RF information window for ATT, and press [Enter] or [Config] button to finish the configuration operation.

3.3.4 ALARM THRESHOLD

Alarm Threshold includes Power threshold, Temperature threshold and VSWR threshold.

Users can set alarm threshold according to the specific situation. If the measured value is lower than the threshold lower limit or more than the threshold upper limit, the appropriate alarm will be generated.

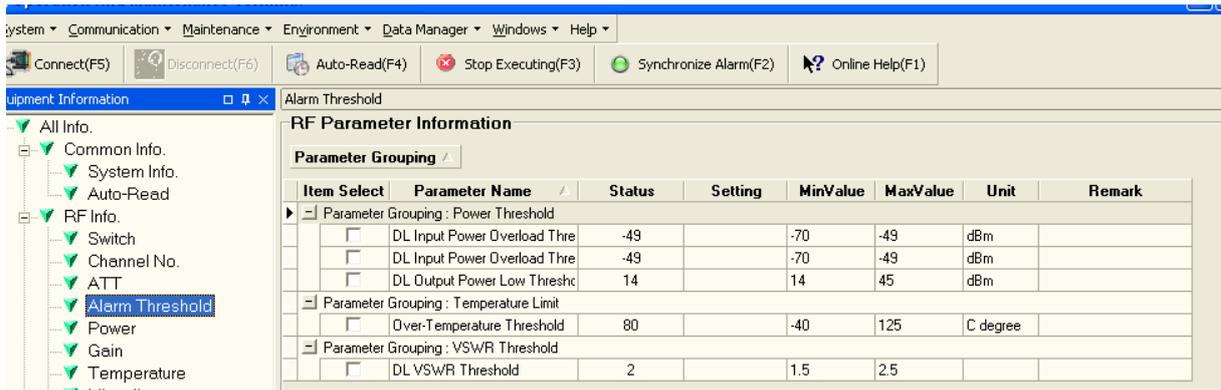


Figure 17: Alarm Threshold

Config:

Enter the required value in setting columns of RF information window for Alarm threshold, and press [Enter] or [Config] button to finish the configuration operation.

Alarm Threshold	Setting Range	Initial Setting
DL Output Power Low Threshold	14~45dBm	14dBm
DL Input Power Overload Threshold	-70~-49dBm	-49dBm
DL Input Power Low Threshold	-70~-49dBm	-49dBm
PA Over-Temperature Threshold	-40~125 °C	80 °C
DL VSWR Threshold	1.5, 2.0, 2.5	2.0

Notice: The input value must be in the range of power threshold. The DL VSWR threshold setting range is available for only three values: 1.5, 2.0 and 2.5.

3.3.5 ALARM INFORMATION

Alarm information operation is to select alarm parameters for monitoring. Alarm parameters include Master Alarm, Channel Alarm and External Alarm.

Click any tree node in [Alarm Info] group, [Alarm Parameter Information] window will appear in the right side. The picture below shows the master alarm information.

Parameter Grouping ▲					
Item Select	Parameter Name ▲	Status	Enable	Update Time	
[-] Parameter Grouping : LNA Alarm					
<input type="checkbox"/>	DL LNA Alarm	Normal	<input checked="" type="checkbox"/>	2008-9-17 15:26:08	
<input type="checkbox"/>	UL LNA Alarm	Normal	<input checked="" type="checkbox"/>	2008-9-17 15:26:08	
[-] Parameter Grouping : Master Alarm					
<input type="checkbox"/>	Door Open Alarm	Alarm	<input checked="" type="checkbox"/>	2008-9-17 15:26:08	
<input type="checkbox"/>	Li-ion Battery Fault Alarm	Alarm	<input checked="" type="checkbox"/>	2008-9-17 15:26:08	
[-] Parameter Grouping : Oscillation Alarm					
<input type="checkbox"/>	Automatic Self-Oscillation Control	Normal	<input checked="" type="checkbox"/>	2008-9-17 15:26:08	
<input checked="" type="checkbox"/>	Self-Oscillation Alarm	Normal	<input checked="" type="checkbox"/>	2008-9-17 15:26:08	
[-] Parameter Grouping : PA Alarm					
<input type="checkbox"/>	DL PA Alarm	Normal	<input checked="" type="checkbox"/>	2008-9-17 15:26:08	
<input type="checkbox"/>	UL PA Alarm	Normal	<input checked="" type="checkbox"/>	2008-9-17 15:26:08	
[-] Parameter Grouping : Power Alarm					
<input type="checkbox"/>	DL Output Power Low Alarm	Normal	<input checked="" type="checkbox"/>	2008-9-17 15:26:08	
[-] Parameter Grouping : Power Supply Alarm					
<input type="checkbox"/>	AC Power Failure Alarm	Normal	<input checked="" type="checkbox"/>	2008-9-17 15:26:08	
<input type="checkbox"/>	DC Power Fault Alarm	Normal	<input checked="" type="checkbox"/>	2008-9-17 15:26:08	
[-] Parameter Grouping : Temperature Alarm					
<input type="checkbox"/>	Over-Temperature Alarm	Normal	<input checked="" type="checkbox"/>	2008-9-17 15:26:08	
[-] Parameter Grouping : VSWR Alarm					
<input type="checkbox"/>	DL VSWR Alarm	Normal	<input checked="" type="checkbox"/>	2008-9-17 15:26:08	

Figure 18: Master Alarm

Alarm Parameter Information					
Parameter Grouping ▲					
Item Select	Parameter Name ▲	Status	Enable	Update Time	
[-] Parameter Grouping : PLL Alarm					
<input type="checkbox"/>	DL Working Channel PLL 1 Alarm	Normal	<input checked="" type="checkbox"/>	2008-9-17 15:26:08	
<input type="checkbox"/>	DL Working Channel PLL 2 Alarm	Normal	<input checked="" type="checkbox"/>	2008-9-17 15:26:08	
<input type="checkbox"/>	UL Working Channel PLL 1 Alarm	Normal	<input checked="" type="checkbox"/>	2008-9-17 15:26:08	
<input type="checkbox"/>	UL Working Channel PLL 2 Alarm	Normal	<input checked="" type="checkbox"/>	2008-9-17 15:26:08	
<input checked="" type="checkbox"/>	[-] Parameter Grouping : Power Alarm				
<input type="checkbox"/>	DL Input Power Overload Alarm 1	Normal	<input checked="" type="checkbox"/>	2008-9-17 15:26:08	
<input type="checkbox"/>	DL Input Power Overload Alarm 2	Normal	<input checked="" type="checkbox"/>	2008-9-17 15:26:08	

Figure 19: Channel Alarm

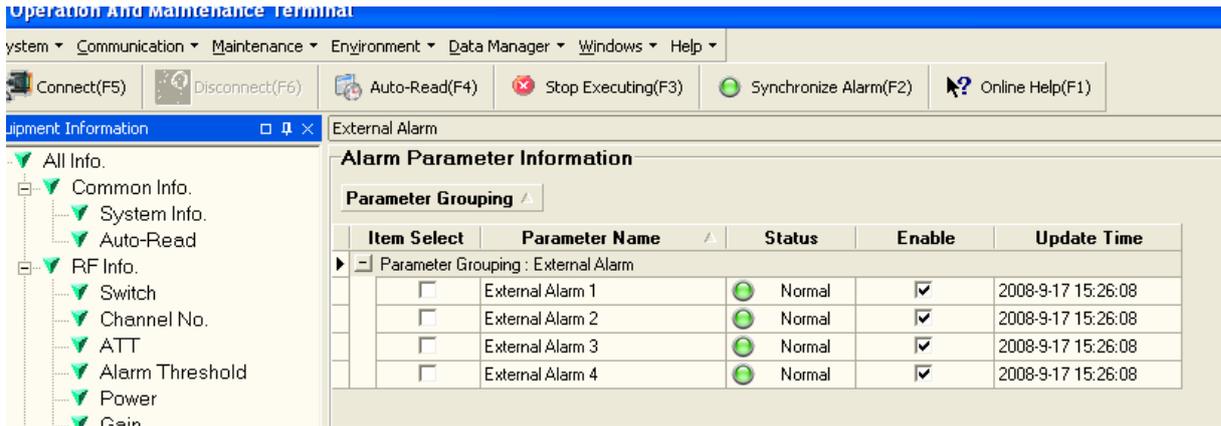


Figure 20: External Alarm

Config:

Tick the check box of [Item select] and [Enable] of the desired parameters and click [config] button to finish configuration operation.



Notice: [Enable] box is to enable the alarm monitoring for system. Only if users enable the alarm by ticking the [Enable] box, the alarms can be monitored by the OMT/OMC.

On the MCU, if any alarm is generated and this alarm is also enabled in [Enable] box, LED H2 turns RED; while it is OFF when normal working. On the OMT/OMC window, [Alarm Status] indicator keeps GREEN if no alarm and turns RED if an alarm is generated.

Please notice that if the desired alarm is not enabled in [Enable] box, even if this alarm is generated, it keeps in GREEN in the OMT/OMC interface and LED H2 on MCU keeps OFF as well.

3.4 PROPERTIES INFO.

3.4.1 EQUIPMENT ID

Equipment ID is to be configured after local commission has been completed, which includes Site ID, and Site Sub ID.

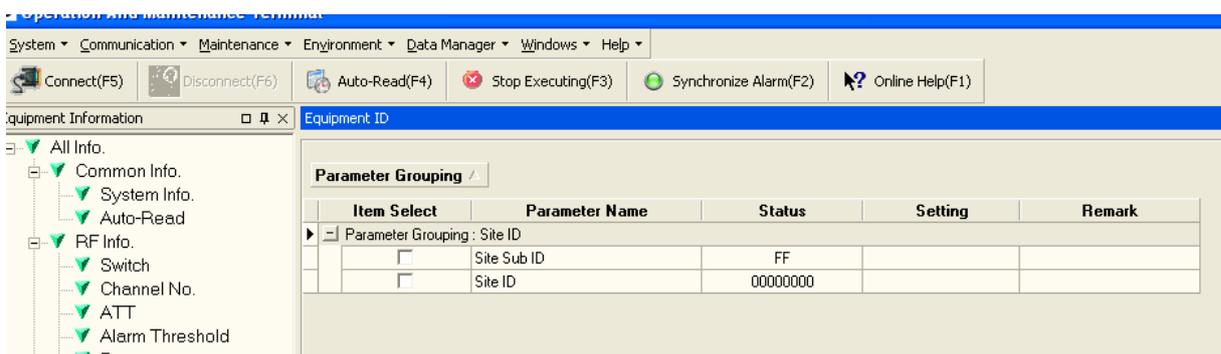


Figure 21: Equipment ID

See the table below for configuration details of each parameter.

Item	Description
Site ID	Site ID is the unique equipment identification. It is a hexadecimal string of eight characters in the range of [00000000~FFFFFFFF]. e.g. 00000000
Site Sub ID	Site Sub ID is used for Master-Slave System. It is the unique identification of each Master/ Slave Unit and is a hexadecimal string of two characters in the range of

	<p>[00~FF]. For the system located with single equipment, the Site Sub ID should be FF. For Master-Slave system, the Site Sub ID for Master Unit is 00, and the Site Sub ID for each Slave Unit is represented in the range of [01~FE] in ascending order. e.g. Master Site ID: 00, Slave Site ID: 01</p>
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3.4.2 COMM. CONFIG

If the equipment is to be monitored by OMC software over Wireless GSM / CDMA network, users must finish the [Comm. Config.] in the next step.

The Comm. Config information requires to be manually entered by users after successful connection to the equipment.

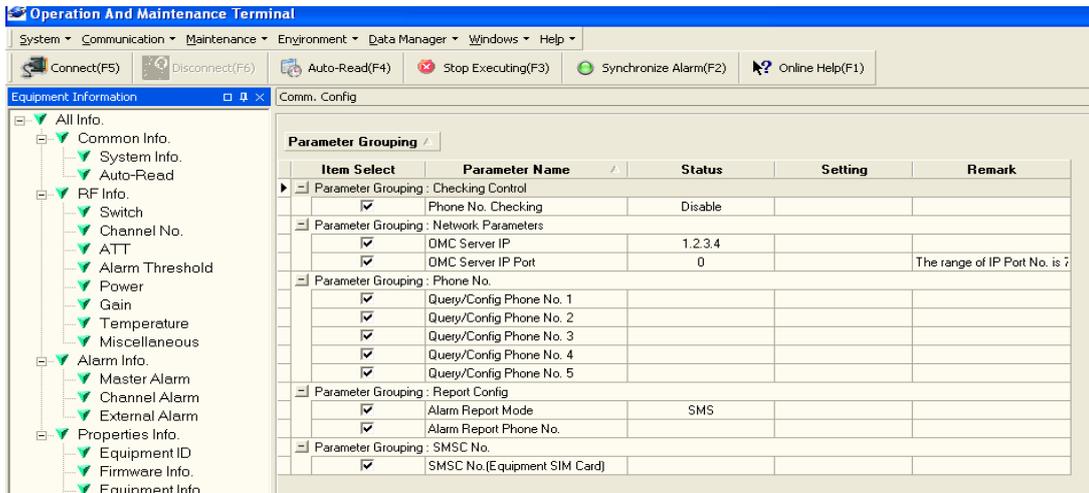


Figure 22: Com. Config.

See the table below for configuration details of each parameter.

Item	Description
Checking Control	Select “Enable” or “Disable” from the drop down menu as shown to enable or disable the Phone Number Authentication feature. Refer to [Phone No.] in details.
OMC Server IP	Based on the current network conditions, users can enter the IP address information of the equipment, which is connected to the OMT/OMC via Ethernet. This connection via Ethernet is not available at this stage.
Phone No.	This is designed for authentication purpose when remote connection via modem is required. It is the phone number to dial the equipment. Only the phone number pre-defined in this field, will it be allowed to dial the equipment. It is required to manually enter the phone number. Up to 5 phone numbers are allowed. The use of phone number authentication can avoid unauthorized use of the OMT. In addition, it can prevent the equipment receiving piles of spam short messages, thus help the operator greatly reduce the cost.
Report Config	The Report No. is the SIM card number of the modem built into the OMC Server computer. The equipment will send alarm SMS to this number. If remote communication is needed via modem, users have to enable SMS mode and set the report phone No. by entering the SIM card number of the equipment built-in modem.
SMSC No.	It specifies the SMS center. Users have to set the service No. of SMSC for the first installation, so that the alarms can be sent to OMC.

4 COMMISSIONING

4.1 PRE-COMMISSIONING TASKS

After equipment installation, perform the following steps before equipment powering and commissioning:

- Check the expected voltage, current and power levels do not violate any ratings.
- Visually inspect the power connection within the equipment. Ensure that the power cable is correctly and securely connected, including grounding wire, RF cable and other cables.
- Check grounding connection and verify that the ground resistance is less than 5Ω.
- Test the antenna system and ensure the echo loss within working frequency is less than -14dB (VSWR<1.5).

4.2 MCU LED INDICATOR AND RESET BUTTON

Diagnostic LEDs and a reset button are located on the MCU; each indicates the status of a particular function:

Identifier	Colour	Indication
H1	Green	MCU operation. Flashes at a rate of 1 flash/sec. Any other flashing rate indicates MCU is faulty, and has to be replaced.
H2	Red	Alarm LED. When ON, it indicates alarm condition.
H3	Red	Wireless modem status. During normal operation, it is OFF. When ON, it indicates faulty wireless modem and no communication will take place.
Reset	N/A	Reset button. Press the reset button to restart the system.

MCU Initialization Procedure

All three diagnostic LEDs of each MCU will flash simultaneously for three times when power is initially supplied to the equipment. Then H1 will keep flashing at the rate of 1 flash/second. H2 will be ON when any alarm occurs. After successful initialization of the wireless modem, H3 will be ON for about two minutes and then turn off; otherwise, it will remain ON to indicate a problem.

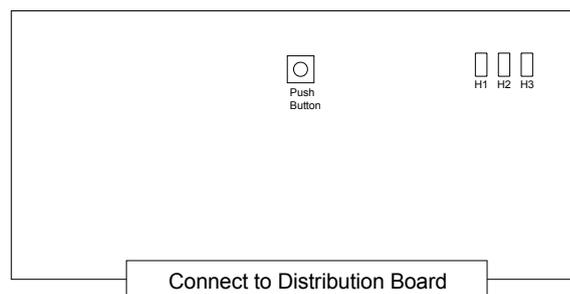
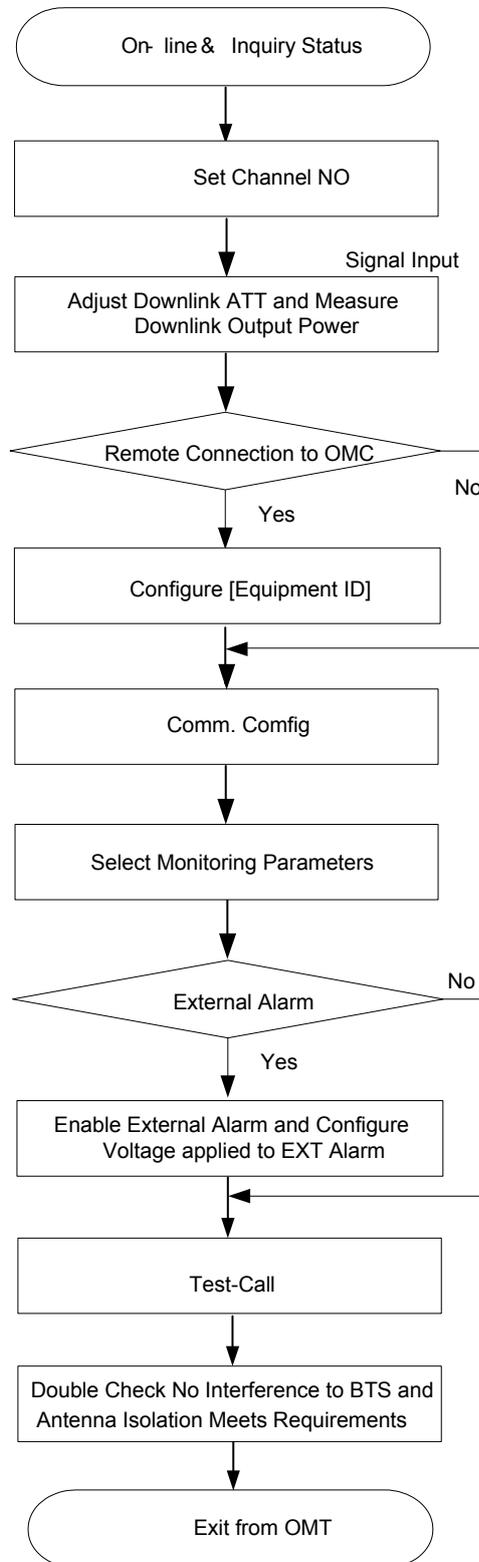


Figure 23: MCU

4.3 COMMISSIONING PROCEDURE

System commissioning can commence after the monitoring system has completed self initialization. The commissioning procedure is as follows:



USER MANUAL FOR RD-8132

Commissioning Tasks	Observation
1. On-line and Inquiry status	<ul style="list-style-type: none"> ● Activate the OMT Main window. The system Initialization will completed in about 2 minutes. ● Click “Connect” button to enquire the repeater’s status. Proceed if there is no alarm; else check the failure and attend to the alarm.
2. Set Channel No.	<ul style="list-style-type: none"> ● Keep RF switch ON and set the channel number of the repeater’s operating frequency.
3. Adjust Downlink Output Power and align donor antenna	<ul style="list-style-type: none"> ● Observe DL input power from measured value. Align the direction of donor antenna until the DL input power reading is maximized. ● Note: To ensure that the measured DL input power is accurate, one should set the DL ATT to “0” before performing the check.
4. Configure [Equipment ID]	<ul style="list-style-type: none"> ● Go to [Properties Info] and set [Equipment ID].
5. Comm. Config	<ul style="list-style-type: none"> ● Enable the power supply by selecting “On” in [RF] -> [Switch]; go to [Properties Info.] -> [Comm. Config.] and set OMC Phones No. , the service No. of SMSC, Report Mode.
6. Select Monitoring Parameters	<ul style="list-style-type: none"> ● Select the equipment controlled and monitored parameters. ● If the external devices are connected to the equipment for management, please enable in the [External Alarm Info.] Interface.
7. Test coverage area field intensity and adjust service antenna.	<ul style="list-style-type: none"> ● Use test-handset to verify field intensity within the coverage area. If needed, realign the service antenna to achieve the desired coverage. ● Note: If during operation, the equipment gain could not be set to maximum or the output power is not high enough due to insufficient donor and service antennas isolation, then the antennas’ position should be changed to increase isolation. If the output power is too high and ALC is activated, then adjust the DL ATT to achieve optimal DL Gain.
8. Verify UL gain and ensure test call produces good voice quality and there is no interfering BTS	<ul style="list-style-type: none"> ● Adjust UL gain and perform test calls. Typically, the UL gain is set around 5dB less than DL gain. Perform test calls in the coverage area while adjusting UL gain if required. ● Note: If the repeater is near the BTS and the test call performance is poor, this may be due to UL noise interference to the BTS. Users can calculate and determine if the repeater UL noise will interfere with the BTS. ● Verify again that there is no unacceptable interference to BTS.

End of section

5 TROUBLESHOOTING

Following installation and commissioning, troubleshooting tasks to handle alarms may be required. Here below is the alarm list of the equipment and diagnosis.

Alarm	Diagnosis
AC Power Failure Alarm	<ul style="list-style-type: none"> ● Check AC power cable and verify AC mains supply is normal. During power failed alarm, DC power supply has no output.
DC Power Fault Alarm	<ul style="list-style-type: none"> ● Check if DC output power is overload or short-circuited, if not, it would be the fault of PSU.
Li-ion Battery Fault Alarm	<ul style="list-style-type: none"> ● Check if the Li-ion Battery connection is correct or any damage of the battery; ● Replace the fault Li-ion Battery if it couldn't be energized.
UL/DL LNA Alarm	<ul style="list-style-type: none"> ● Check power and signal connections of respective modules; ● If the power and signal wire connections are OK, then the respective modules may be faulty; ● Replace the fault modules and return for repair.
UL/DL PA Alarm	
UL/DL PLL Alarm	
DL Output Power Low Alarm	<ul style="list-style-type: none"> ● Reset the output power low threshold; ● Reset the ATT value to increase the Gain; ● Check if Channel No. setting is correct; ● Check the cable connections; ● If alarm can not be cleared, check the equipment.
DL Input Power Overload Alarm	<ul style="list-style-type: none"> ● Eliminate alarm by correct setting of the input power overload threshold; ● Check if the intensity of signal source is large enough; ● If alarm can not be cleared, check the equipment.
Chassis Over-temperature Alarm	<ul style="list-style-type: none"> ● Eliminate alarm by setting of temperature threshold; ● If alarm can not be cleared, apply climatic protection to the equipment.
DL VSWR Alarm	<ul style="list-style-type: none"> ● Check MT antenna system if there is downlink VSWR alarm.
Self-oscillation Alarm	<ul style="list-style-type: none"> ● Check whether the Isolation between donor antenna and mobile antenna is large enough; ● Adjustment to RX/TX antennas can eliminate self-excited oscillation and verify the (I) could be 10dB larger than Gmax.
Door Open Alarm	<ul style="list-style-type: none"> ● Check whether the enclosure door is closed.
External Alarm 1~4	<ul style="list-style-type: none"> ● Check if either of the external devices connected to the equipment is faulty.

Table 1: Alarm List and Diagnosis

End of section

6 APPENDICES

6.1 APPENDIX A: SERVICE POLICY AND RETURN OF EQUIPMENT

The repair of individual units and modules of this equipment is not considered practicable without factory facilities. It is, therefore, the policy of Comba whereby faulty units or modules are returned to the local agent for repair. To enable an efficient, prompt after sales service to be provided for the diagnosis, repair and return of any faulty equipment, please comply with the following requirements.

Items to be sent for repair should be packaged so as to provide both electrostatic and physical protection and a Repair Material Authorization (RMA) should be completed giving the required information. A sample RMA form is provided in Appendix.

This request must be included with the item for repair, items for repair should be sent to the nearest Comba office:

COMBA TELECOM LTD.

Hong Kong Office

Address: 611 East Wing, No. 8 Science Park West Avenue, Hong Kong Science Park, Tai Po, Hong Kong.
Tel: +852 2636 6861 Fax: +852 2637 0966

Singapore Office

Address: No. 1 Kaki Bukit View, #02-10 Techview, Singapore 415941
Tel: + 65 6345 4908 Fax: + 65 6345 1186

Thailand Office

Address: 3rd Floor, T. Shinawatra Building, 94 Sukhumvit Soi 23, Sukhumvit Road, Klongtoeynua,
Wattana, Bangkok 10110
Tel: +66 2664 3440 Fax: +66 2664 3442

India Office

Address: Suite No. 2, E-172, TSH House, Greater Kailash – I, New Delhi – 110 048, India
Tel: + 91 11 4173 9997 / 8 Fax: + 91 11 4173 9996

Sweden Office

Address: Gustavslundsvagen 147, S- 167 51 Bromma, Stockholm, Sweden
Tel: +46 8 25 38 70 Fax: +46 8 25 38 71

Brazil Office

Address: Avenida Engenheiro Luiz Carlos Berrini 1297, cj 122, 04571-090 Brooklin Novo, São Paulo,
Brazil
Tel: +55 11 55050549 Fax: +55 11 55050549 ext 7

Dubai Office

Address: P.O. Box 450583, DUBAI, U.A.E.
Tel: +971 0 4 433 5320 Fax: +971 0 4 422 6774

US Office

Address: Comba Telecom Inc. 2390 Bering Drive, San Jose, CA 95131, USA
Tel: +1 408 526 0180 Fax: +1 408 526 0181

China Office

Address: No.10, Shenzhou Road, Guangzhou Science City, Guangzhou, China
Tel: + 86 20 2839 0000 Fax: + 86 20 2839 0136

6.2 APPENDIX B: RMA (RETURN MATERIAL AUTHORIZATION) FORM



Comba Telecom Ltd.
 611 East Wing, No. 8 Science Park West Avenue, Hong Kong Science Park, Tai Po, Hong Kong
 Tel: +852 2636 6861 Fax: +852 2637 0966

RMA Request Form
 Date: _____

From: _____
 Address: _____
 Tel: _____ Fax: _____
 E-Mail: _____
 ATTN: _____

Product Information:

Item	Model	Serial Number	Return Category	Qty	Problem Description
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Notes:
 1. For 'Return Category' column, please select from **A**: Return of Defective Product, **B**: Return of Trial Sample, or **C**: Return of New and Unused Product.
 2. If **A** or **C** category of return product is chosen, please give short description of the problem or reason for returning.

Transportation Information:
 Location of Product: _____
 Transportation Method: _____
 Shipping Forwarder: _____

Note: Location of Product must be stated, while 'Transportation Method' or 'Shipping Forwarder' can be left blank if not determined.

Signature:

For Comba Use (Only)
 Return Merchandise Authorization Number (RMA#): _____
 Recommended Action:
 Shipment and Handling Cost to be paid by: _____

Approved by: _____

 Date: _____

End of section

End of Document