ZTE中兴

ZXSDR R8862A
Macro Remote Radio Unit
Product Description

Hardware Version: HV1.0

LEGAL INFORMATION

Revision History

Serial No.	Publishing Date	Publishing Reason
R1.4	2014-08-20	● Optimized the overall architecture ● Updated "1.2 Functions" and "1.3 Features" ● Updated "Chapter 4 Technical Indices"
R1.3	2014-02-28	Revised the following section: ● 1.5 Models ● 4.2 Radio Performance
R1.2	2014-01-03	Technical specifications have been updated.
R1.1	2013-10-10	Added the following section: ● 1.5 Models
R1.0	2013-09-25	First Edition

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Contents

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About This Manual

Purpose

This manual provides a general description of ZXSDR R8862A, such as its features, functions, architecture, technical indices and so on.

Intended Audience

This manual is intended for:

- Network planning & optimization engineers
- Installation engineers
- Maintenance engineers

What Is in This Manual

This manual contains the following chapters:

Chapter 1, Product Overview	Describes the external view of the product as well as features and functions
Chapter 2, System Architecture	Describes the hardware and software architectures
Chapter 3, Operation and Maintenance	Describes available modes and functions for operating and maintaining the product
Chapter 4, Technical Indices	Describes the technical indices of the product

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Chapter 1
Product Overview

Table of Contents

1.1 External View

For an external view of the ZXSDR R8862A, see Figure 1-1.

Figure 1-1 External View of ZXSDR R8862A
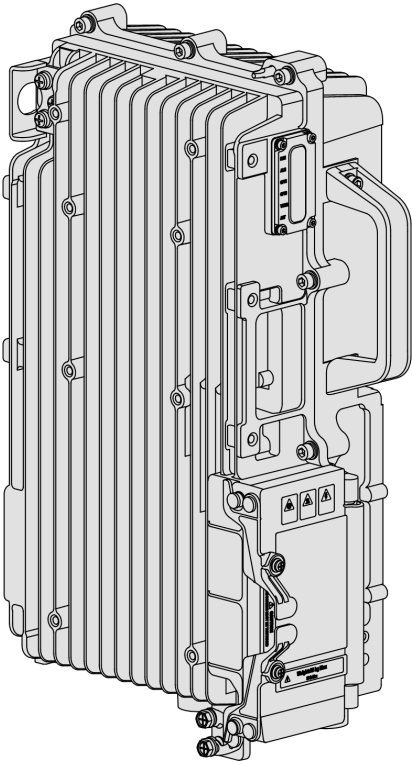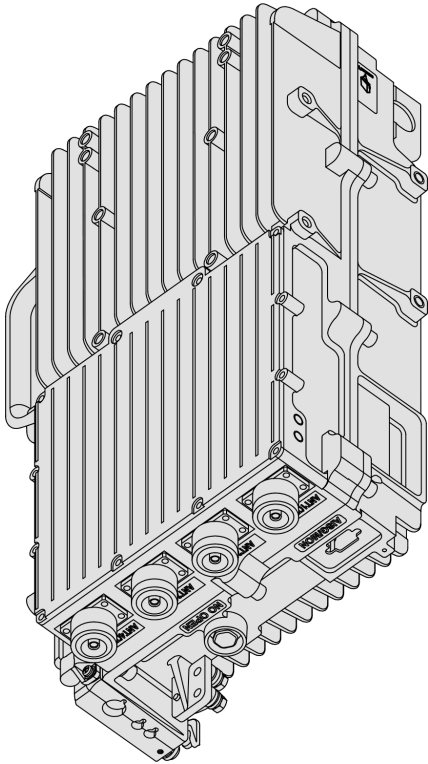
1.2 Functions

The ZXSDR R8862A is an outdoor remote radio unit that works with a BBU to implement radio transmission and radio channel control as a complete base station in its coverage.

For the position of the ZXSDR R8862A (RRU) in radio access networks, see Figure 1-2.

Figure 1-2 ZXSDR R8862A Position in Radio Access Networks
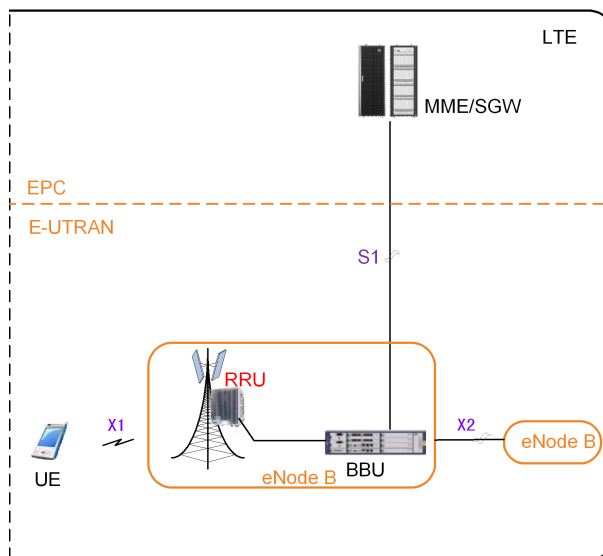
The ZXSDR R8862A provides the following functions:

- Support the configuration of 1.4 MHz/3 MHz/5 MHz/10 MHz/15 MHz/20 MHz scalable bandwidth;
- Band Supported: 850 MHz/1800 MHz/2100 MHz/2600 MHz;
- Support 2T4R (S8500/S1800/S2100/S2600) in one box which can optimize spectrum efficiency greatly and improve network uplink performance;
- Support 64QAM modulation in both downlink and uplink;
- Support transmit power report function for every carrier;
- Support overload protection function for power amplifier;
- Support transmit channel switching on/off function;
- Software failure will not affect the running of BBU and other ones which are connected to it.

1.3 Features

- Multi-Mode RRU

  ZXSDR R8862A is fully software defined. GSM/UMTS/CDMA RRU based on ZXSDR R8862A platform can be upgraded to LTE RRU at the same frequency band through software update only. It supports multi-mode at the same frequency band simultaneously. Therefore, it fully satisfies operators' requirements of hybrid network deployment and long term evolution with lowest cost.

- Wider Bandwidth

  ZXSDR R8862A is based on Multi-Carrier Power Amplifier (MCPA) technology.

- MIMO Supported, Better Performance

  ZXSDR R8862A is based on new compacted RRU platform and high efficiency Power Amplifier technology. As a result, it brings better customer experience, zero footprint and easy deployment.

  It is portable to transport and flexible to install on the pole, tower and wall, thus reducing OPEX.

- Higher Efficiency, Lower TCO

  ZXSDR R8862A's PA efficiency can reach up to 45% (The PA efficiency is different based on different working frequency bands). It supports dynamic adaptive PA power supply due to the output power, which reduces power consumption.

  It is passive thermal dissipation designed, so it is power saving and less noisy.

- Integrated lightning protection unit

  ZXSDR R8862A supports integrated Lightning protection unit (PIB), and the protection level is 20 kA.

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Chapter 2
System Architecture

Table of Contents

2.1 Hardware Architecture

The ZXSDR R8862A consists of a power supply, a transceiver, a power amplifier and a duplexer. For the hardware architecture of the ZXSDR R8862A, see Figure 2-1.

Figure 2-1 ZXSDR R8862A Hardware Architecture
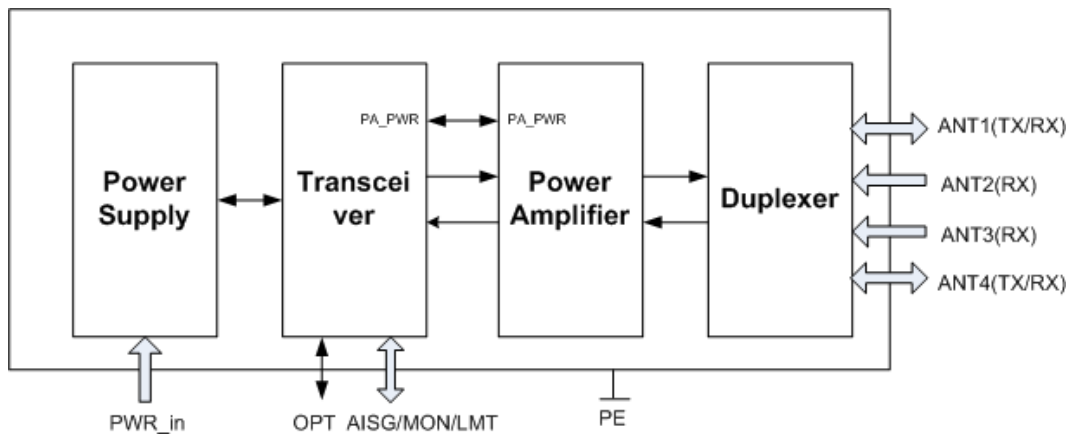
For a descriptions of the ZXSDR R8862A modules, refer to Table 2-1.

Table 2-1 ZXSDR R8862A Module Descriptions

Module	Description
Power Module	The power module supplies power and provides EMC protection.
Transceiver	The transceiver provides digital IF, RF transmitting and receiving, main control, clock control and power amplifier control.
Power Amplifier	This module, integrated with a low-noise amplifier, amplifies downlink RF signals and sends the amplified signals to the duplexer.
Duplexer	This module combines a filter and two duplexers implementing Rx diversity.

2.2 Software Architecture

For the ZXSDR R8862A software architecture, see Figure 2-2.

Figure 2-2 ZXSDR R8862A Software Architecture
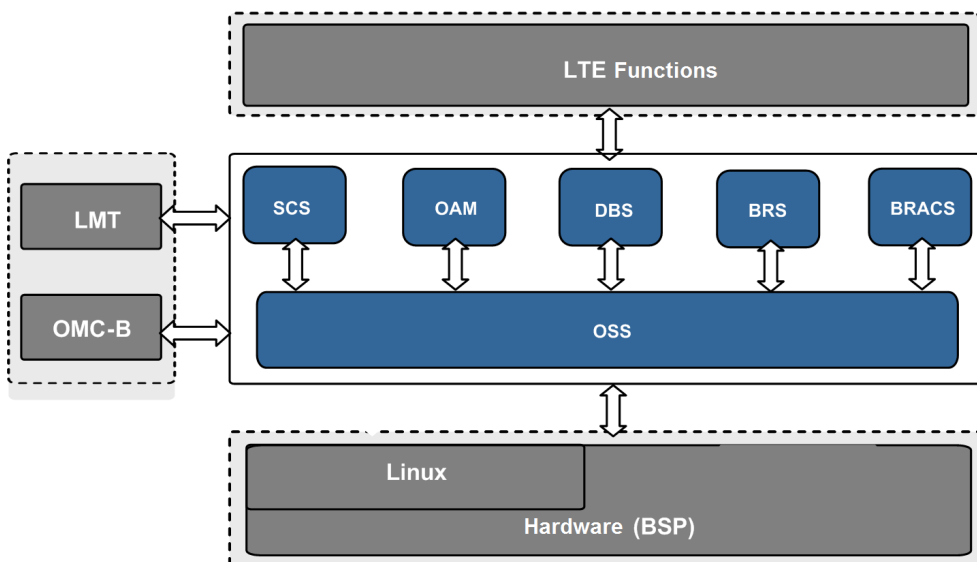
A Linux operating system runs on the hardware platform of the ZXSDR R8862A.The BSP (Board Support Package) contains a suite of software closely related to boards, which support the running of the RTOS (Realtime Operating System) on the boards. The operation support layer of the software system provides the following functions:

- The OSS (Operation Support Sub-system) serves as the support layer of the entire software architecture. It provides a hardware-irrelevant platform on which the software runs to provide basic functions, such as scheduling, timing, memory management, inter-module communication, queue control, monitoring, alarm management, and log management.
- The SCS (System Control Sub-system) controls the power supply and active/standby switchover.
- OAM (Operating and Maintenance) supports configuration management, alarm management, and performance measurement.
- The DBS (Data Base Sub-system) stores and manages data in the system.
- The BRS (Barrier Sub-system) processes protocols for the system.
- The BRACS (Barrier Access Control Sub-system) controls access to the bearer layer.

Chapter 3
Operation and Maintenance

Table of Contents

3.1 Operation and Maintenance Modes

Remote Operation and Maintenance

The ZTE NetNumen U31 Unified Element Management System (EMS) is used to operate and maintain the ZXSDR R8862A remotely. The EMS connects to the BBU to which the ZXSDR R8862A is connected through a CPRI interface, see Figure 3-1.

Figure 3-1 Remote Operation and Maintenance
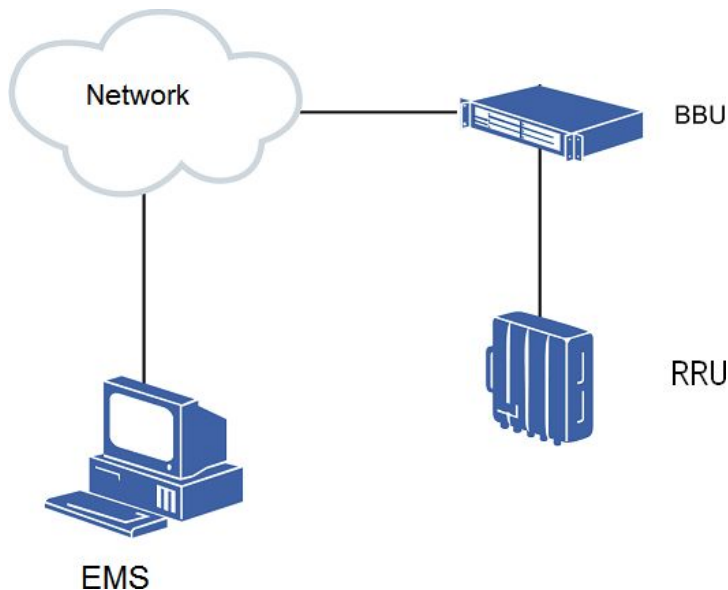
In remote operation and maintenance mode, the EMS connects to an NE through TCP/IP. The EMS can be used to operate and maintain multiple base stations.

Local Operation and Maintenance

In local operation and maintenance mode, an LMT (PC) is connected to the ZXSDR R8862A with an Ethernet cable, see Figure 3-2.

Figure 3-2 Local Operation and Maintenance

The LMT is used for local operation and maintenance of an individual base station. It supports basic operations on the base station, such as power query, power increase and decrease, and calibration.

3.2 Operation and Maintenance Functions

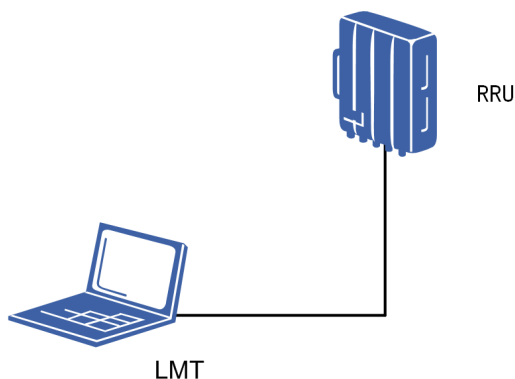The NetNumen U31 Unified Element Management System (EMS) provides a GUI that displays information of all NEs in the entire network on a topology map. A user can view performance data, alarm information, and configuration data of a specific NE, and operate and maintain multiple NEs of the same type on the topology map. NetNumen U31 has the following operation and maintenance functions:

● Configuration management

The configuration management supports dynamic and static configurations of base stations, such as the addition, query, deletion, modification, and data consistency check of physical and radio resources.

● Security management

The security management ensures that only authorized users can perform permitted operations on base stations.

● Performance management

The performance management supports performance analysis, calling trace, and signaling trace.

● Version management

The version management allows users to view hardware and software versions in base stations and download latest versions for software upgrade.

● Fault management

The fault management includes alarm management and diagnostic tests. By using the fault management functions, maintenance personnel can monitor the operational statuses of base stations and collect the information of board and link faults in real time for fault analysis and equipment maintenance.

Chapter 4
Technical Indices

Table of Contents

4.1 Physical Indices

For the ZXSDR R8862A physical indices, refer to Table 4-1.

Table 4-1 Physical Indices

Item	Index
Size (Height × Width × Depth)	422 mm × 218 mm × 133 mm
Weight	< 15 kg
Color	Silver gray

4.2 Environment Indices

For the ZXSDR R8862A environmental requirements, refer to Table 4-2.

Table 4-2 Environment Indices

Item	Index
Temperature	–40°C through 55 °C
Relative Humidity	5% through 95%
Waterproof/Dustproof	IP65
Ground	≤ 5 Ω Earth resistance can be less than 10 Ω in thunder-less area where thunderstorm days is less than 20 per year

4.3 Power Indices

ZXSDR R8862A supports integrated lightning protection module for DC power supply. Its protection level is 20 kA.

For other power indices of the ZXSDR R8862A, refer to Table 4-3.

Table 4-3 Power Indices

Item	Index	
Power supply	DC: -48 V (-37 V – -60 V DC) AC: 220 V / 110 V (90 V – 280 V AC)	
Power consumption	R8862A S8500	Typical: 210 W Maximum: 430 W
	R8862A S1800	Typical: 220 W Maximum: 450 W
	R8862A S2100	Typical: 215 W Maximum: 440 W
	R8862A S2600	Typical: 215 W Maximum: 360 W

4.4 Performance Indices

Bandwidth

ZXSDR R8862A supports all LTE bandwidth: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz and 20 MHz

Operation Frequency Band

For the operation frequency band of ZXSDR R8862A, refer to Table 4-4.

Table 4-4 Operation Frequency Band

Type	Operation Radio Frequency Band
R8862A S8500	50 MHz (Tx: 866 MHz~880 MHz, Rx: 821 MHz~835 MHz)
R8862A S1800	1800 MHz ● Type1: Tx: 1805 MHz~1860 MHz; Rx: 1710 MHz~1765 MHz ● Type2: Tx: 1825 MHz~1880 MHz; Rx: 1735 MHz~1785 MHz ● Type3: Tx: 1825 MHz~1875 MHz; Rx: 1730 MHz~1780 MHz
R8862A S2100	2100 MHz (Tx: 2110 MHz~2170 MHz, Rx: 1920 MHz~1980 MHz)
R8862A S2600	2600 MHz (Tx: 2620 MHz~2690 MHz, Rx: 2500 MHz~2570 MHz)

ToC Output Power

For the ToC output power of ZXSDR R8862A, refer to Table 4-5.

Table 4-5 ToC Output Power

Type	PA Output Power	TOC Output Power
R8862A S8500	2×75 W	2×60 W
R8862A S1800	2×75 W	2×60 W
R8862A S2100	2×75 W	2×60 W
R8862A S2600	2×50 W	2×40 W

Receiver Sensitivity

For the receiver sensitivity of ZXSDR R8862A, refer to Table 4-6.

Table 4-6 Receiver Sensitivity

Type	1R @ LTE	2R @ LTE	4R @ LTE
R8862A S8500	-106.6 dbm	-109.4 dbm	-112.2 dbm
R8862A S1800	-106.4 dbm	-109.2 dbm	-112 dbm
R8862A S2100	-106.4 dbm	-109.2 dbm	-112 dbm
R8862A S2600	-106.4 dbm	-109.2 dbm	-112 dbm

4.5 Reliability Indices

For the reliability indices of ZXSDR R8862A, refer to Table 4-7.

Table 4-7 Reliability Indices

Item	Index
MTBF	DC: ≥322,000 hours AC: ≥312,000 hours
MTTR	1 hour
Availability	DC: ≥99.999689% AC: ≥99.999679%
Down duration	DC: ≤1.632 min/year AC: ≤1.685 min/year

4.6 Electromagnetic Compatibility Indices

For the ZXSDR R8862A electromagnetic compatibility indices, refer to Table 4-8.

4-3

Table 4-8 Electromagnetic Compatibility Indices

Item	Index
National/International Standard	YD/T 1595.2-2007
	ETSI EN 301 489-01,ETSI EN 301 489-23
	ETSI EN 300 386–V1.3.2
	(CISPR22) Class B
	Directive 1999/5/EC (R&TTE)

4-4

Figures

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Tables

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Glossary

64QAM
  - 64 Quadrature Amplitude Modulation

BBU
  - Baseband Unit

BSP
  - Board Support Package

CDMA
  - Code Division Multiple Access

CPRI
  - Common Public Radio Interface

DBS
  - Database Subsystem

GSM
  - Global System for Mobile Communications

IP
  - Internet Protocol

LMT
  - Local Maintenance Terminal

MCPA
  - Multi-Carrier Power Amplifier

MIMO
  - Multiple-Input Multiple-Output

MTBF
  - Mean Time Between Failures

MTTR
  - Mean Time To Recovery

OAM
  - Operating and Maintenance

OPEX
  - Operating Expenditure

OSS
  - Operation Support Subsystem

PC
  - Personal Computer

V

RRU
  - Remote Radio Unit

RTOS
  - Real-Time Operating System

SCS
  - System Control Subsystem

TCO
  - Total Cost of Ownership

TCP
  - Transmission Control Protocol

UMTS
  - Universal Mobile Telecommunication System

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