Surya DMR Simulcast System

- Higher Frequency Efficiency
- Smooth Roaming and Handover
- Dynamic Voting
- Analog/Digital Self-adaptive
- Smart Subnetting and Patching

DMR
DIGITAL MOBILE RADIO ASSOCIATION

DS-6310
DMR Simulcast System

Surya DMR Simulcast System (DS-6310) is developed on the basis of the Digital Mobile Radio (DMR) Tier II standard, by following a set of principles such as simultaneous broadcasting, large coverage and smooth analog-to-digital migration. It can fully meet the requirements of the users who need an easy to set up, easy to use and reliable communication network with even one pair of frequency over a wide area.

Architecture

Surya DMR simulcast system consists of MSO (Mobile Switching Office), Base Station , Dispatch System, NMS, Service Terminals and Bearer Network. One MSO supports up to 100 Base Stations or 200 carriers. A single DMR simulcast Base Station can support up to 2 carriers.
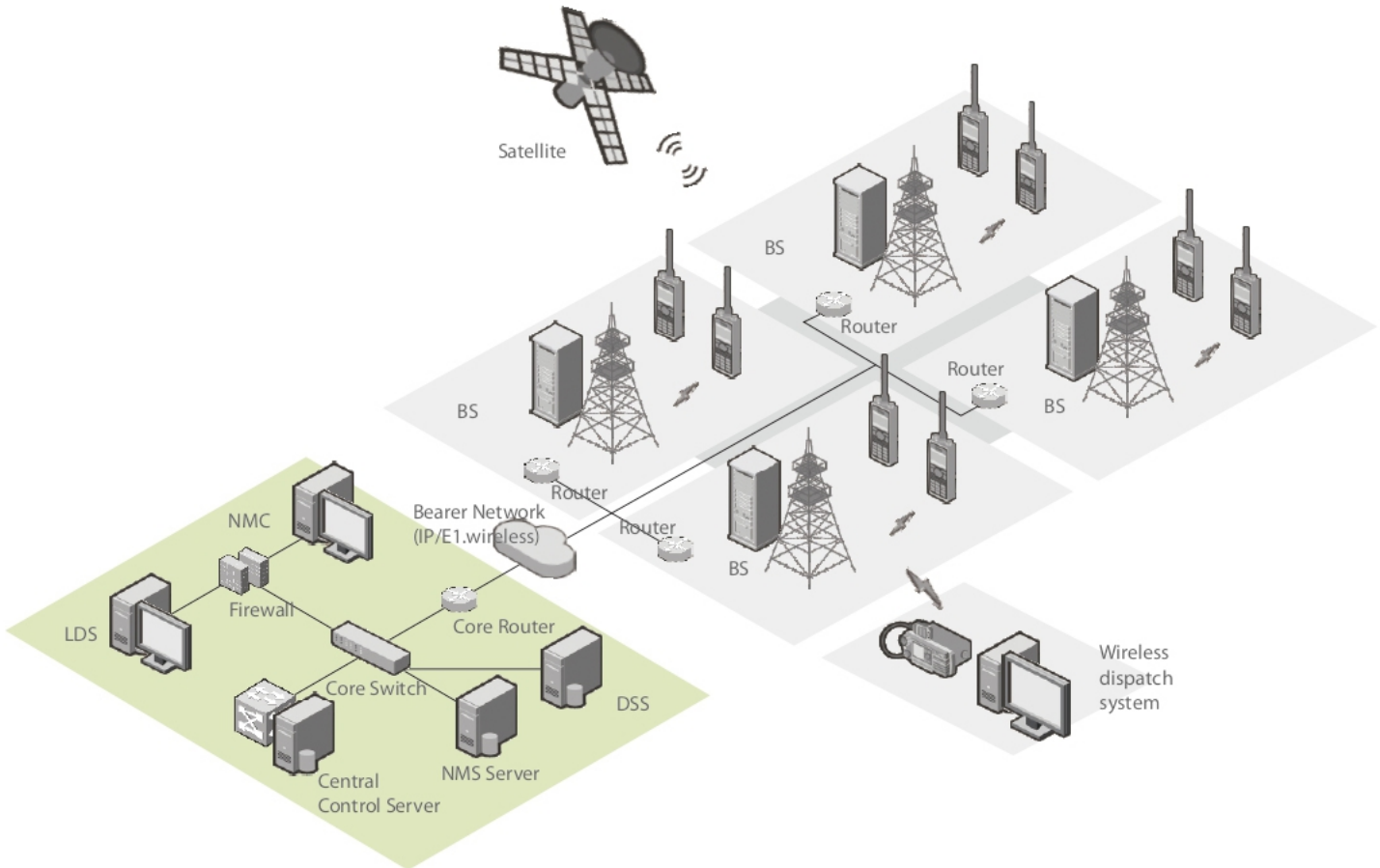

DS-6310 Base Station Overview

Single Carrier BS (8U)

❶ Built-in Router

❷ Synchronized Expansion Unit

❸ Transceiver (RD98XS)

❹ Power Unit & Duplexer

- Compact design, high integration, easy for delivery and deployment.

- Module structure for faster maintenance and modules replacement.

Key Features

Surya Spectrum Efficiency

- Simulcast technique reduces to a single pair of frequency needed (one for TX and one for RX) regardless the number of BSs in the network.

- DMR two-slot TDMA technique supports 2 simultaneous communications on a single 12.5 kHz radio channel.

TDMA

DMR Radio 1 DMR Radio 2 DMR Radio 3 DMR Radio 4

12.5 KHz Radio Channel

BS1   f1   f1   BS3

f1

BS2
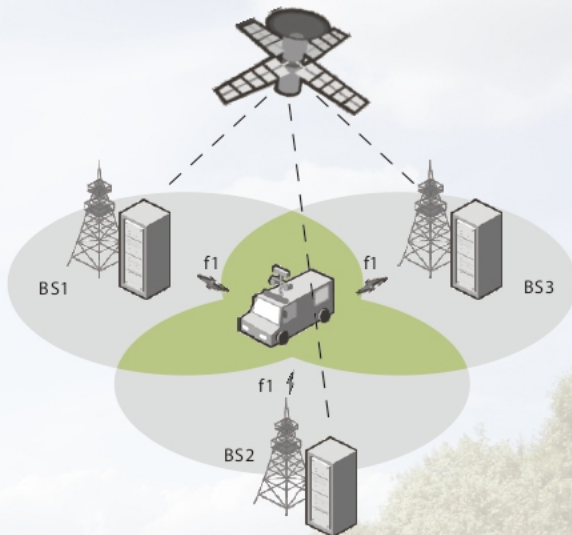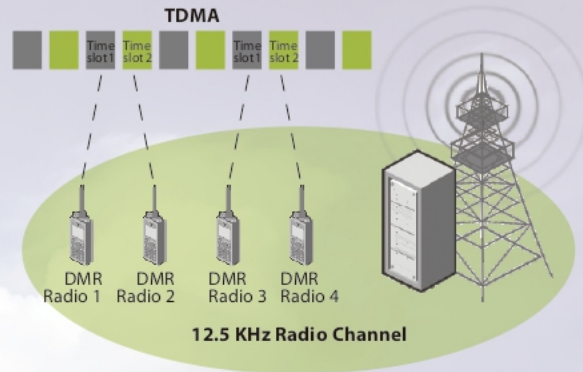
Smooth Roaming and Handover

- In simulcast system, the radio is capable of roaming and handover seamlessly between different BSs , the ongoing communication can continue normally during handover.

Dynamic Voting

- Simulcast system can provide good voice preformance in overlap area as radios in overlap area can awlways receive the best voice frame through dynamic voting.

- As a voting center, MSO is used to analyze each voice frame received from Base Stations in real time. The best voice frame will be extracted and sent to radios.

Flexible Networking

- The IP-based architecture enables flexible networking.

- Multiple transmission links can be used between BS and MSO, such as IP, E1, Microwave, wireless bridge, etc.

- The standard SIP and RTP are used to interconnect with other systems such as PSTN system, DMR trunking system.

Analog/Digital Self-adaptive

- Simulcast Base Station channels support working both in analog and digital mode, to ensure smooth migration from analog to digital network.

- Digital or analog mode is automatically selected based on the incoming signals.
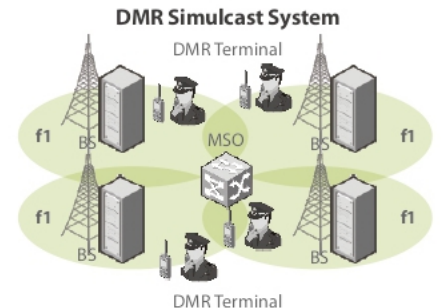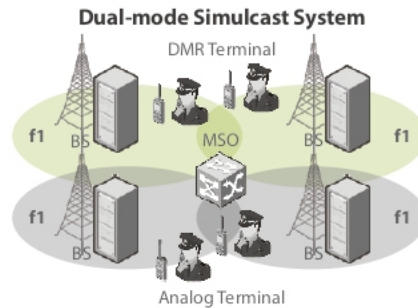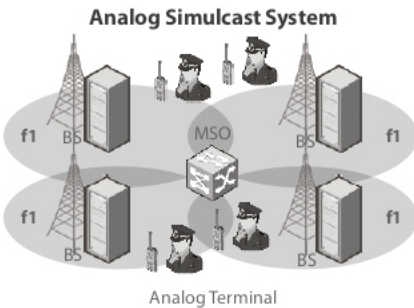
Smart Subnetting and Patching

- According to management requirements, DMR simulcast system can be divided into different subnets by Base Station or by time slot of channel unit in each Base Station. Each subnet can work as a independent simulcast system.

- Different subnets can be patched to make a larger subnet temporarily according to the requirements.
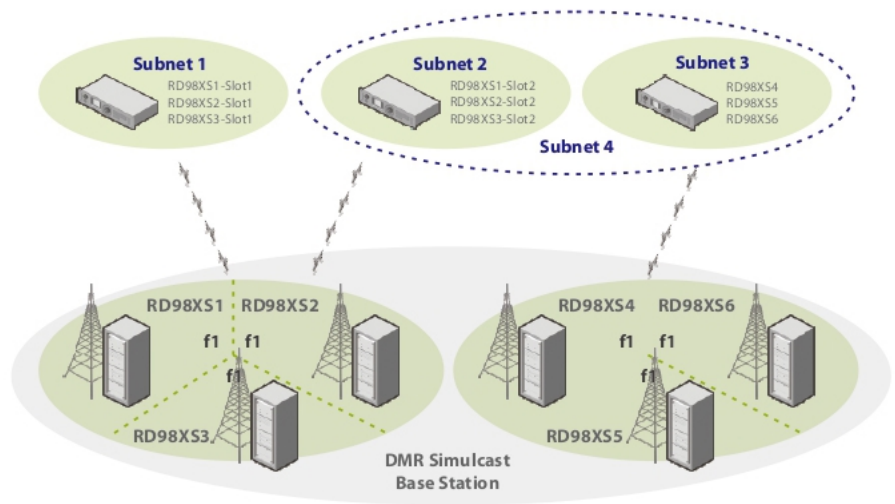
Dedicated GPS Channel

- In order to increase the GPS data transmission capability, a dedicated GPS channel can be used in DMR simulcast Base Station.

Versatile Services

- Voice services: individual call, group call, all call, emergency call, broadcast call, dispatcher call, PSTN call, etc.

- Data services: text message, status message, emergency alert, GPS data polling, AVL, etc.

- Advanced services: end-to-end encryption, late entry, discreet listening, voice recording, etc.

Long Time GPS Holdover

- In case of GPS failure, the Base Station supports a holdover of 48 hours via the internal synchronization reference, ensure the simulcast service maintain normal.

Open API

- Open API for further service development, such as dispatch service, network management service and GIS service.

Network Management System

The network management system is composed of server and clients. It is designed to remotely manage and control the simulcast system.
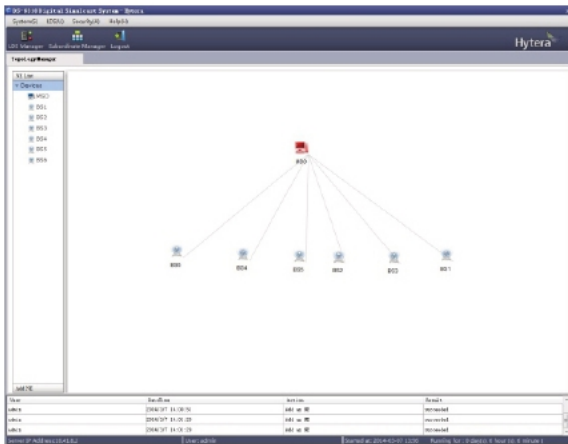
- Various management capabilities: system configuration management, fault management, security management, topology management, etc.

- Support SNMP.

- Adopt C/S structure to support multi-user operation.

- Provide API for further development.

Dispatching System

The dispatching system is designed for efficient communication, management and dispatching of professional users in Surya DMR simulcast system. Surya can provide both wireless dispatch system and wired dispatch system for the simulcast system.

- **Voice Service**
  Individual call, group call, broadcast call, emergency call, etc.

- **Data Service**
  Text message, status message, GPS Polling and emergency alert.

- **Automatic Vehicle Location (AVL)**
  -Multiple maps (Google map or MapInfo) support.
  -Terminal location real-time tracking & display.
  -Track playback.
  -Geo-fencing.

- **Other Service**
  Stun/revive,voice recording,subnet patching, E2E encryption, etc.

DMR Simulcast Terminals

- The most complete DMR simulcast terminals portfolio. Portable radio PD5 serial, PD6 serial, PD7 serial, X1e and X1p, mobile radio MD65X, MD78X, intrinsically-safe radio PD79X Ex.

| MD78X | PD70X | PD78X | PD79X Ex | X1e | X1p |

| PD50X | PD56X | PD60X | PD66X | PD68X | MD65X |

For more information,

Please visit: www.suryatel.com

or contact our local dealers and sales representatives.

Specifications

General	Operating Frequency	VHF: 136–174MHz; UHF3: 330–400MHz; UHF1: 400–470MHz
	Standard Compliance	DMR Tier II
	BS Capacity per MSO	100
	Carrier Capacity per MSO	200
	Subnet Capactiy	99
	Carrier Capacity per BS	1 or 2
	Channel Spacing	≥12.5kHz
	Duplex Spacing	VHF≥5.3MHz ; UHF1/UHF3≥10MHz
	Multi-access Method	TDMA
	Modulation	4FSK (index: 0.27)
	Modulation rate	9.6Kbps/carrier
	Full Load Power Consumption	Single-carrier BS ≤200W; Dual-carrier BS ≤400W
	Operating Temperature	−30℃ to 60℃
	Storage Temperature	−40℃ to 85℃
	Operating Humidity	5% to 95%RH
	Dimensions (H*W*D)	Single-carrier BS:355*425*482.6mm; Dual-carrier BS:900*600*600mm
	Weight	Single-carrier BS ≤50kg; Dual-carrier BS ≤110kg

Receiver	Static Sensitivity	-118dBm@BER5%
	Blocking	≥84dB
	Co-channel Rejection	−12 to 0dB (12.5kHz)
	Adjacent Channel Selectivity	≥60dB (12.5kHz)
	Intermodulation Response Rejection	≥70dB
	Spurious Emission	≤−57dBm@100kHz

Transmitter	TX Power	1 to 50W (adjustable)
	Output Power Tolerance	Normal: ±1.5dB; Extreme: −3 to +2dB
	Modulation Accuracy	5%
	Frequency Offset	±16Hz
	Adjacent Channel Power Rejection	≤60dB (12.5kHz)
	Spurious Emission	9kHz to 1GHz: TX: ≤−36dBm @ 100kHz ； Standby: ≤−57dBm@100kHz 1GHz to 12.75GHz: TX: ≤−30dBm@1kHz ； Standby: ≤−47dBm@1kHz

All specifications are subject to change without notice due to continuous development.

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