TELCOMA
AN ISO CERTIFIED COMPANY

Introduction to

Radio Base Station

Full course at
https://telcomaglobal.com

TELCOMA

TELCOMA
AN ISO CERTIFIED COMPANY

Introduction

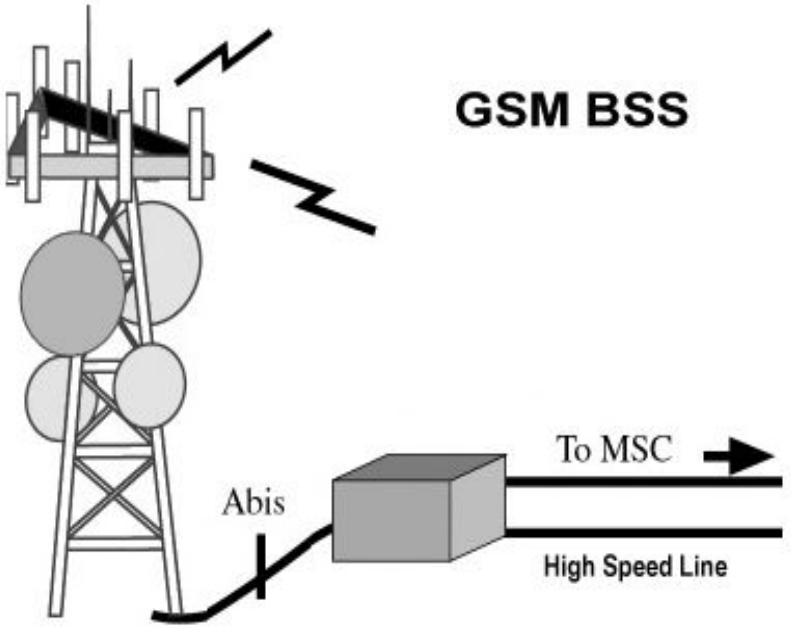
Introduction

1. Global System for Mobile is the second generation technology.
2. It's radio access network consists of two parts i.e. Base Transceiver Station (BTS) and Base Station Controller (BSC) and combination of both is known as Base Station Subsystem (BSS).
3. The BTS and the BSC communicate across the specified Abis interface, enabling operations between components that are made by different suppliers.

(contd...)

Introduction

4. The radio components of a BSS may consist of four to seven or nine cells.
5. A BSS may have one or more base stations.
6. A separate high-speed line is then connected from the BSS to the MSC.



(contd...)

Characteristics of BSS

1. The BSS is responsible for communicating with mobile stations in cell areas.
2. One BSC controls one or more BTSs and can perform inter-BTS and intra-BTS handovers
3. The BTS serves one or more cells in the cellular network and contains one or more TRXs (Transceivers or radio units).
4. The TRX serves full duplex communications to the MS.

(contd...)

Characteristics of BSS

5. The BSC includes the TRAU (Transcoder/Rate Adapter Unit). The TRAU adapts the transmission bit rate of the A-interface (64 kbit/s) to the Abis-interface (16 kbit/s).

(contd...)

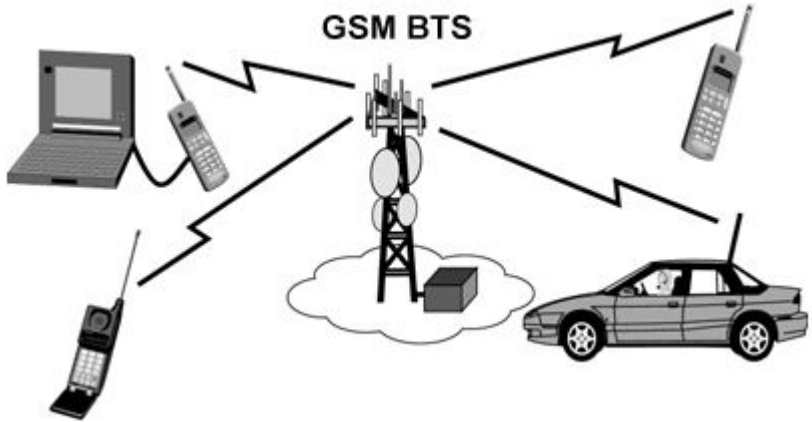
Base Transceiver Station

1. The BTS houses the radio transceivers that define a cell and handles the radio link protocols with the MS.
2. In a large urban area, a large number of BTSs may be deployed.
3. The BTS corresponds to the transceivers and antennas used in each cell of the network.
4. A BTS is usually placed in the center of a cell. Its transmitting power defines the size of a cell.

(contd...)

Base Transceiver Station

5. Each BTS has between 1 and 16 transceivers, depending on the density of users in the cell.
6. Each BTS serves as a single cell.



(contd...)

BTS Functions

1. Encoding, encrypting, multiplexing, modulating, and feeding the RF signals to the antenna
2. Transcoding and rate adaptation
3. Time and frequency synchronization
4. Voice through full- or half-rate services
5. Decoding, decrypting, and equalizing received signals
6. Random access detection
7. Timing advances
8. Uplink channel measurements

(contd...)

Base Station Controller

1. The BSC manages the radio resources for one or more BTSs.
2. It handles radio channel setup, frequency hopping, and handovers.
3. The BSC is the connection between the mobile and the MSC.
4. The BSC also translates the 13 Kbps voice channel used over the radio link to the standard 64 Kbps channel used by the Public Switched Telephone Network (PSTN) or Integrated Services for Digital Network (ISDN).
5. It assigns and releases frequencies and time slots for the MS.

(contd...)

Base Station Controller

6. The BSC also handles inter-cell handover.
7. It controls the power transmission of the BSS and MS in its area.
8. The function of the BSC is to allocate the necessary time slots between the BTS and the MSC.
9. It is a switching device that handles the radio resources.

(contd...)

BSC Functions

1. Control of frequency hopping
2. Performing traffic concentration to reduce the number of lines from the MSC
3. Providing an interface to the Operations and Maintenance Center for the BSS
4. Reallocation of frequencies among BTSs
5. Time and frequency synchronization
6. Power management
7. Time-delay measurements of received signals from the MS.

(contd...)

TELCOMA
AN ISO CERTIFIED COMPANY

Site Description

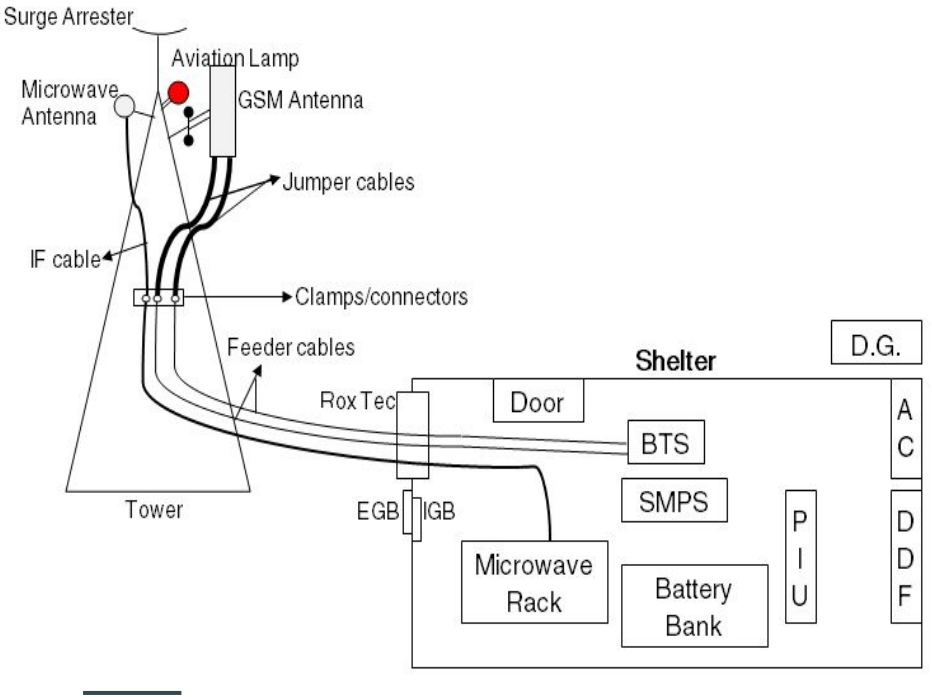
Introduction

1. The site consists of radio components and is also known as Base Station.
2. The site can be of any type from the following, depending on the clutter and traffic:
    a. Ground site
    b. Roof-top tower site
    c. Pole site
    d. Micro site

(contd...)

Description

1. A Base Station consists of a tower, antennas, feeders, and shelter.



(contd...)

Surge Arrester

1. A surge arrester is a device to protect electrical equipment from over-voltage transients caused by external (lightning) or internal (switching) events.
2. It has both a ground terminal and a high-voltage terminal.
3. When a powerful electric surge travels from the power system to the surge arrester, the high voltage current is sent directly to the insulation or to the ground to avoid damaging the system.

(contd...)

Aviation Lamp

1. Aviation lamps are high-intensity lighting devices that are attached to towers and are used as collision avoidance measures.
2. These make towers more visible to passing aircraft and are usually used at night.
3. These lights need to be of sufficient brightness in order to be visible for miles around the structure.

(contd...)

GSM Antenna

1. GSM antenna is one kind of antenna that transmits GSM signal at specified frequency of 850, 900, 1800, 1900, 2100 MHz.
2. GSM opts for directional antennas to transmit signals in a particular direction.
3. Three antennas are used to provide coverage in three sectors and cover the entire 360 degree area.
4. Jumper and feeder cables are used to connect antennas to the BTS rack in the shelter.

(contd...)

GSM Antenna

5. Jumper cables are used from the antenna as these are very tough and it is difficult to bend these cables.
6. Jumper cables are connected to the feeder cables at the middle of the tower using clamp or connector.
7. Antennas are connected to the mount through the tilts.

(contd...)

Microwave Antenna

1. A microwave antenna is a physical transmission device used to broadcast microwave transmissions between two or more locations on a line of sight radio path.
2. Line of sight (LoS) is a type of propagation that can transmit and receive data only where transmit and receive stations are in view of each other without any sort of an obstacle between them.

(contd...)

Shelter

1. A shelter consists of BTS and Microwave rack, SMPS, battery bank, AC, DDF, PIU, RoxTec, EGB, IGB, DG.
2. Cables from the three antennas enter the shelter via a RoxTec and are connected to the TRx cards of the BTS rack.
3. IF cable from microwave antenna enters via RoxTec and is connected to microwave rack.
4. External and Internal ground bars are provided to protect the components of the shelter from short circuit.

(contd...)

Shelter

5. SMPS
    a. A switched-mode power supply is an electronic circuit that converts power using switching devices that are turned on and off at high frequencies, and storage components such as inductors or capacitors to supply power when the switching device is in its non-conduction state.
    b. Switching power supplies have high efficiency and are widely used in a variety of electronic equipment, including computers and other sensitive equipment requiring stable and efficient power supply.

(contd...)

Shelter

6. DDF
    a. A Digital Distribution Frame is the interface when coaxial cable has to be terminated, organized or cross-connected in long-distant transport networks, or in access networks close to subscribers.
7. PIU
    a. Power Interface Unit is an ideal solution for Telecom Sites in areas having wide fluctuations and surges in the mains supply.
    b. PIU System houses all electrical equipment required in the shelter within a rack space of 600mmX500mm and offers an efficiency over 97%.

(contd...)

Shelter

8. Battery bank is provided inside the shelter whose each cell has a capability of providing electricity to all the components when there is electricity cut or power failure.
9. Single cell works for 2-3 hours.
10. Diesel generator is also provided that automatically get started when there is a power cut.
11. AC provides cooling when the temperature of the shelter becomes high.

(contd...)

TELCOMA
AN ISO CERTIFIED COMPANY

RBS 6201 Introduction

Introduction

1. To meet the increasingly complex challenges facing operators today, the RBS 6000 base station family is designed.
2. RBS 6000 is built with tomorrow's technology and at the same provide backwards-compatibility with the highly successful RBS 2000 and RBS 3000 product lines.
3. RBS 6000 base stations offer a seamless, integrated and environmentally friendly solution and a safe, smart and sound roadmap for whatever tomorrow holds.

(contd...)

RBS 6000 Series Key Features

1. Path to sustainability
2. Power on demand
3. Multi-standard
4. Integrated simplicity

(contd...)

RBS 6201-Indoor Macro Base Station

1. The RBS 6201 integrates a complete high-capacity site into a single cabinet employing a simplified cabinet design and an innovative modular building practice.
2. The cabinet contains two radio shelves and all power, transport network and supporting equipment.
3. The RBS 6201 two radio shelves can be equipped with virtually any combination of GSM, WCDMA and LTE, which are available for all common frequencies.

(contd...)

RBS 6201-Indoor Macro Base Station

4. A single radio shelf can provide up to 3×8 GSM or 3×4 MIMO WCDMA or 3×20 MHz MIMO LTE or a combination of above standards.
5. There are simply fewer parts, which are shared across all technologies, making the site easier to install, manage and maintain.

(contd...)

Safe, Smart and Sound Going Forward

1. The entire site-in-cabinet concept is designed to support all technologies in virtually any combination.
2. the RBS 6201 provides space for an additional 3U for common transport network solution.

(contd...)

Safe, Smart and Sound Going Forward

3. The RBS 6201 is a network and site management system that goes far beyond traditional O&M systems.
4. Power is supplied on demand using intelligent algorithms.

(contd...)

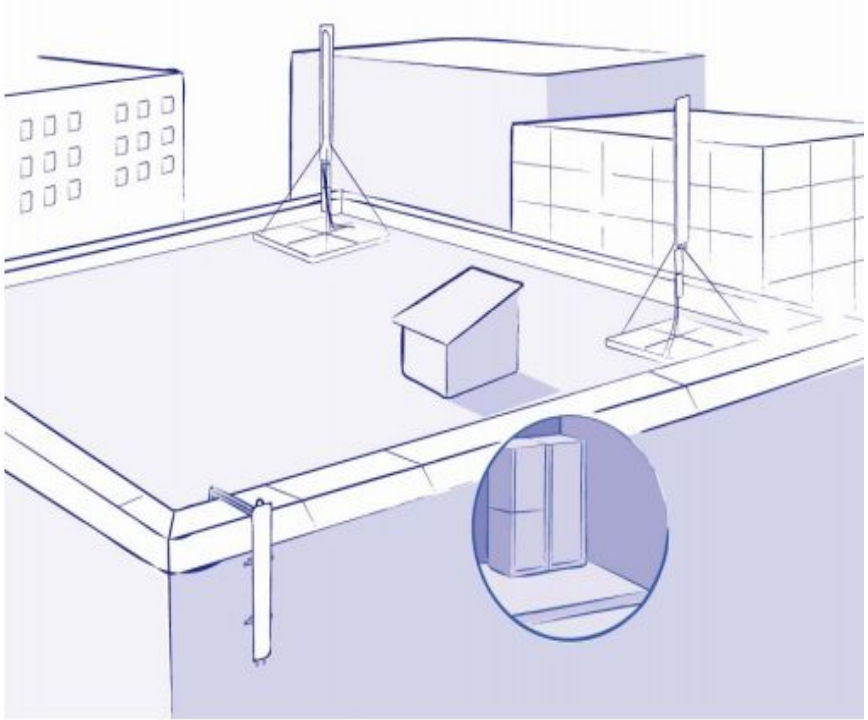
RBS 6201-Typical Deployment Scenarios

1. RBS 6201 supports high capacity, multi-standard applications in a single footprint.
2. A complete site including high-capacity multi-standard radio, transport network equipment, and battery backup fits in a footprint measuring just 600 mm by 400 mm.
3. The RBS 6201 is a solution that can be used throughout the entire radio network where bit rate, coverage, and capacity are essential for a successful implementation.

(contd...)

RBS 6201-Typical Deployment Scenarios

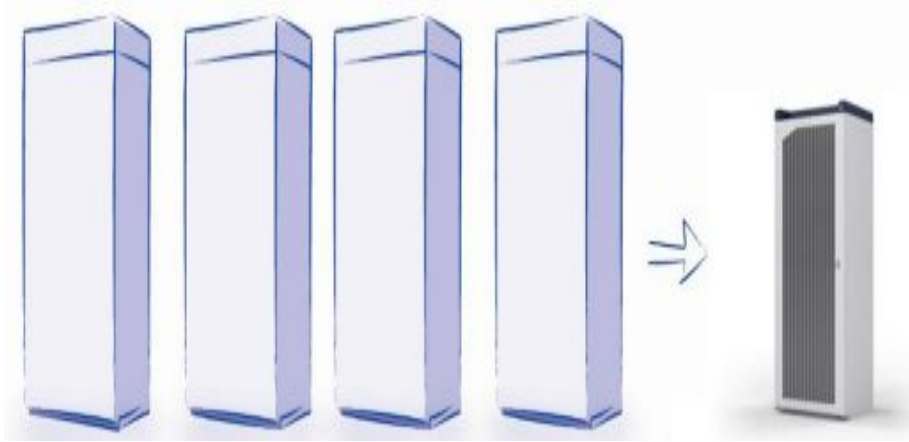
4. Metropolitan Indoor Site
    a. The implementation of an RBS 6201 results in an efficient use of site footprint.
    b. In a modernization scenario, capacity is increased without the need to expand the site footprint.



(contd...)

RBS 6201-Typical Deployment Scenarios

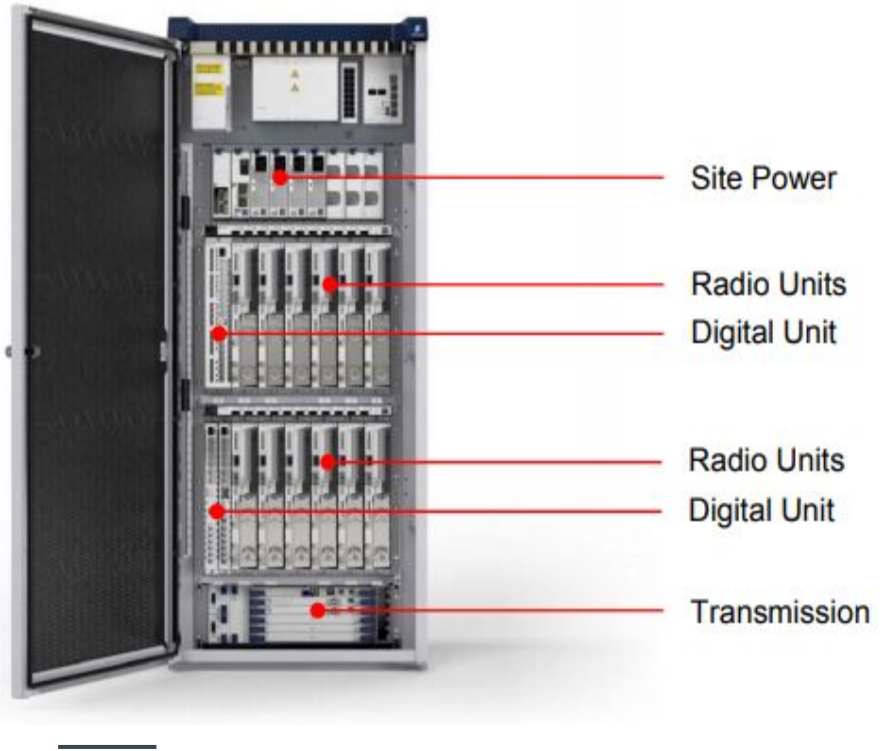
5. Migrating to RBS 6201
    a. The RBS 6000 series ensures efficient migration to new functionality for existing cabinets and sites.
    b. Due to the high radio capacity that RBS 6201 provides it can replace multiple old base stations.



(contd...)

Hardware Architecture

1. The main hardware components are:
   a. Radio shelf
   b. Power shelf
   c. Transport shelf
   d. Enclosures



(contd...)

TELCOMA
AN ISO CERTIFIED COMPANY

RBS 6201 Radio Shelf

Introduction

1. The RBS 6000 family uses the following main radio components for GSM, WCDMA and LTE:
    a. RU-Radio Unit
        i. Transceiver (TRX)
        ii. Transmitter (TX) amplification
        iii. Transmitter/Receiver (TX/RX) duplexing
        iv. TX/RX filtering
        v. Antenna supervision support

(contd...)

Introduction

b. DU-Digital Unit
    i. Control processing
    ii. Clock distribution
    iii. Synchronization from transport network i/f or GPS
    iv. Baseband processing
    v. Transport network interface
    vi. RU interconnects
    vii. Site Local Area Network (LAN) and maintenance interface

(contd...)

Introduction

2. The radio shelf in RBS 6000 base stations supports a wide variety of RU and DU for all main frequency bands and any combination of RF technologies.
3. Each radio shelf supports up to 6 RU and a fully configured RBS 6201 can house up to 12 RU.

(contd...)

Radio Unit Architecture

1. The RU consists of a filter and a multi-carrier power amplifier.
2. The radio has a up to 20 MHz bandwidth and up to 60 W of output power, available with hardware activation keys in steps of 20 W.
3. The antenna system interfaces with a TX/RX port and an RX port.
4. The radio (RUS) can transmit two standards simultaneously.
5. The RU contains co-siting ports.
6. The antenna jumper cable that interfaces the RU should have a 90 degree bend 7/16 connector.

(contd...)

Radio Unit for GSM

1. Two GSM variants are offered:
    a. One low to mid-capacity (2 TRXs per radio)
    b. One high-capacity version with (4 TRXs per radio).
2. The low to mid capacity radio, RUG, consists of two GSM TRXs, one hybrid combiner, two duplex filters, and two bias injectors.
3. The radio supports 2×45 W uncombined or 2×20 W combined configurations.

(contd...)

Radio Unit for GSM

4. Up to six RU can be installed in one radio shelf, enabling up to 12 TRXs per radio shelf or 24 TRXs in an enclosure with two radio shelves.
5. The low to mid capacity radio also supports supreme coverage mode by use of Transmitter Coherent Combining (TCC), which provides an increased cell radius for the downlink, 76 W.
6. 4-way RX diversity can be configured to compensate the uplink when TCC is used.

(contd...)

Radio Unit for GSM

7. The high-capacity radio, RUS, consists of four GSM TRXs and a 60 W Multicarrier Power Amplifier (MCPA).
8. High-capacity GSM radio configurations such as 3×8 require only two antenna branches per sector when the MCPA version is used.
9. Statistical use of power over the TRXs gives 4x20 W per RUS.
10. A mixed mode of low to mid and high capacity RU can be used for a coverage/capacity RBS site.

(contd...)

Radio Unit for WCDMA

1. The RU for WCDMA is an evolution of the current RU/FU concept, which combines the previously separate RU and Filter Unit (FU) in one unit.
2. The radio supports 60 W of output power with a bandwidth of 20 MHz.
3. Each unit is capable of handling four cell carriers in both downlink and uplink.
4. Multiple RU can be combined to create various single- or dual-band configurations with 1-6 sectors and 1-4 carriers.

(contd...)

Radio Unit for WCDMA

5. With two units per sector the radio is prepared to support MIMO, transmitter diversity, and 4-way RX diversity.
6. It also supports 3GPP/AISG-compatible Tower-Mounted Amplifier (TMA)/Antenna System Controller (ASC)/RET Interface Unit (RIU).
7. VSWR (Voltage Standing Wave Ratio) is supported for antenna supervision.

(contd...)

Radio Unit for LTE

1. Supports 60W output power with a bandwidth of 20 MHz.
2. Multiple RU can be combined to create various single- or dual-band configurations with 1-6 sectors and 1-4 carriers.

(contd...)

Multi Standard Radio (RUS)

1. The RUS supports 60W output power for any standard with a bandwidth of up to 20 MHz.
2. Each unit is capable of handling four cell carriers in both downlink and uplink.
3. Multiple RU can be combined to create various single- or dual band configurations with 1-6 sectors and 1-4 carriers.
4. With two units per sector the radio is prepared to support MIMO, transmitter diversity, and 4-way RX diversity.

(contd...)

Multi Standard Radio (RUS)

5. It also supports 3GPP/AISG-compatible Tower-Mounted Amplifier (TMA)/Antenna System Controller (ASC)/RET Interface Unit (RIU).
6. VSWR is supported for antenna supervision.

(contd...)

Digital Unit for GSM

1. The Digital Unit GSM (DUG) can control up to 12 GSM carriers.
2. The DUG comes in two variants, DUG 10 supports RUG whereas DUG 20 supports RUS and RRUS.
3. The DUG supports the cross-connection of individual time slots to specific TRXs and extracts the synchronization information from the Pulse-Code Modulation (PCM) link to generate a timing reference for the RBS.

(contd...)

Digital Unit for GSM

4. The DUG supports:
    a. E1/T1 transmission interface
    b. Baseband processing (DUG 20)
    c. Link Access Procedures on D-Channel (LAPD) concentration /multiplexing
    d. Dualband e.g. 3x2 900 + 3x2 1800 with one DUG
    e. Abis optimization
    f. Multi-drop (cascading)
    g. Synchronized radio network, through an external GPS receiver
    h. Transceiver Group (TG) synchronization
    i. Site LAN

(contd...)

Digital Unit for WCDMA

1. The Digital Unit WCDMA (DUW) comes in three variants, depending on capacity demand.
2. The DUW contains the baseband, control, and switching, as well as the Iub and Mub interfaces.
3. The DUW can handle different time varying traffic mixes consisting of voice circuit-switched data, packet-switched data, and high-speed data such as HSPA.

(contd...)

Digital Unit for WCDMA

4. Baseband resources are pooled in the DUW and the number of Channel Elements (CE) and high-speed data capacity can be optimized to fit operator requirements for user type and number of services.
5. The baseband capacity is pooled independently of sectors and frequencies, and up to two baseband pools can exist (two DUW units) in the same node.

(contd...)

Digital Unit for WCDMA

6. The baseband complies with 3GPP standards and is fully integrated with the same Operation and Maintenance (O&M) system as the RBS 3000 family
7. The software can be downloaded through the Operations Support System for Radio and Core (OSS-RC) interfaces, either locally or through the Radio Network Controller (RNC), and is stored in non-volatile memory in the RBS.

(contd...)

Digital Unit for WCDMA

8. The DUW stabilizes the clock signal extracted from the transport network connection or optional external GPS equipment and uses it to synchronize the RBS.
9. The DUW provides:
    a. ATM connectivity
    b. A gigabit Ethernet or (100/1000 Base-T Ethernet)
    c. Channelized STM-1 transport network interface
    d. Four IMA capable E1/T1/J1 ports

(contd...)

Digital Unit for LTE

1. The Digital Unit for LTE (DUL) comes in one variant.
2. The DUL contains the baseband, control, and switching, as well as the S1 and Mub interfaces for LTE RBSs.
3. The DUL supports different time-varying traffic mixes over the LTE high-speed data interface.
4. The baseband capacity is pooled independently of sectors and frequencies, and up to two baseband pools can exist (two DUL units) in the same node.

(contd...)

Digital Unit for LTE

5. The baseband complies with 3GPP standards and is fully integrated with the same O&M system as the RBS 3000 family.
6. The software can be downloaded through the OSS-RC, either locally or through an access gateway, and is stored in non-volatile memory in the RBS.
7. The DUL stabilizes the clock signal extracted from the transport network connection or optional external GPS equipment and uses it to synchronize the RBS.

(contd...)

Digital Unit for LTE

8. The DUL provides:
    a. Full IP connectivity
    b. A gigabit Ethernet transport network interface

(contd...)

TELCOMA
AN ISO CERTIFIED COMPANY

RBS 6201 Power System & Battery Backup

RBS Power System

1. The RBS power system is a modern efficient solution for delivering power to the RBS and in the evolution the system will also be able to deliver power to other equipment at the site.
2. The system uses high-density Power Distribution Units (PDU) controlled by circuit breakers.
3. Software algorithms can switch off AC and DC units and other components temporarily not in use to save energy and increase battery capacity.

(contd...)

RBS Power System

4. The site power system, which eliminates the need for a separate site power plant, can charge batteries.
5. The RBS power system can use either AC or DC power.
6. The AC power system can control power to selected units by means of applications.

(contd...)

RBS Power System

7. The tolerant rectifiers (PSU AC) allow large voltage variations, which eliminates the need for external voltage stabilizers.
8. The RBS can run directly on −48 V DC or, by means of DC/DC converters (PSU DC), on +24 V DC or −60 V DC.

(contd...)

Improved Efficiency of Integrated Power System

1. New RBS power system with an improved efficiency
2. Intelligent standby operation of one or more PSUs
3. Selective shutdown of units

(contd...)

BBU 6201

1. In case of moderate battery backup needs, a small battery backup unit can be installed under the RBS.
2. This means that a complete site, including transport network equipment, power and backup, is managed on one normal RBS footprint.
3. The systemís battery capacity ranges from 48V/40 Ah up to 48V/190 Ah.

(contd...)

BBU 6201

4. The BBU acts as a base frame of the RBS and hence adds very little work to the site installation.
5. The BBU is prepared for a quick and easy connection to the RBS.

(contd...)

BBS 6201

1. For demanding backup requirements, a larger battery rack (RBS size) is preferred.
2. The BBS 6201 can support up to 680 Ah (–48V) in one cabinet.
3. 680 Ah gives up to 18 h backup time.
4. Several RBS cabinets can share the capacity of one BBS.

(contd...)

Climate System

1. The basic principle for the climate system is that any unit that needs cooling has to request it from the Support Control Unit (SCU).
2. The main advantage of this is that the fans in the cooling system always work at an optimized level, which means that for any given operational condition, the RBS has minimal power consumption with minimal noise generation.

(contd...)

SCU Functions

1. Control of fan speed and fan status
2. Interface for smoke detector, external alarms, cabinet lamp, doorswitch and heaters
3. Generate cold-start signal
4. Cabinet memory
5. Transient protected EC-bus ports for external connections
6. The SCU communicates through the EC-bus.

(contd...)

TELCOMA
AN ISO CERTIFIED COMPANY

RBS 6201 Site System Units

Antenna System and TMA

1. RBS 6000 supports advanced antenna systems to improve the radio performance.
2. Often there are multiple antennas to cater for sectorisation, diversity branches, and various frequency bands.
3. Adjustable antennas, for example, using RET of the vertical antenna beam direction.
4. TMAs are used to eliminate feeder loss on the uplink and also improve the receiver sensitivity for the whole RBS 6000 system.

(contd...)

Antenna System and TMA

5. Main-remote base station allows the entire radio to be placed near the antenna, and thereby avoid feeder loss on both uplink and downlink.
6. The RBS 6000 Site Concept will provide support for the wide and growing variety of antenna systems, independently of the specific radio technology inside the RBS 6000 cabinet.
7. RBS 6000 will support future development of 3GPP and AISG protocols and backward compatibility will also be included.

(contd...)

3GPP/AISG 2.0, Communication Protocol

1. RBS 6000 support the 3GPP / AISG 2.0 protocol to control Antenna Line Devices, ALDís, such as:
    a. RET units
    b. RIUs
    c. Premium TMAs
2. The RET unit is unique for every antenna vendor.

(contd...)

3GPP/AISG 2.0, Communication Protocol

3. It is a device that is used for optimization of the radio network performance, by enabling remote control of the vertical tilt angle of the antenna beam direction.
4. The operator can control the tilt via OSS-RC.
5. RIU, is an advanced Bias-T mounted on the feeder close to the antenna, forwarding power and control commands to RET units on antennas.

(contd...)

3GPP/AISG 2.0, Communication Protocol

6. The Premium TMAs shall be used when operators want both UL-amplification and RET control.
7. The Premium TMAs have a built in RIU and are enhanced to utilize the full functionality of 3GPP/AISG 2.0 protocol.
8. Both the Premium TMAs and RIU will be capable to handle any future features in the antenna system as long as it is based on 3GPP/AISG protocol.

(contd...)

Support Alarm Unit

1. The optional Site Alarm Unit (SAU) monitors and controls customer equipment.
2. The SAU can handle up to 32 external alarms and four output control ports.

(contd...)

75–120 Ohm Balun & GPS

1. The balun converts 75 Ohm to 120 Ohm electrical transport network interfaces and includes OVP.
2. The RBS can be optionally connected to a GPS unit, which is used for synchronization of the RBS.

(contd...)

TELCOMA
AN ISO CERTIFIED COMPANY

Transport Network Functionality

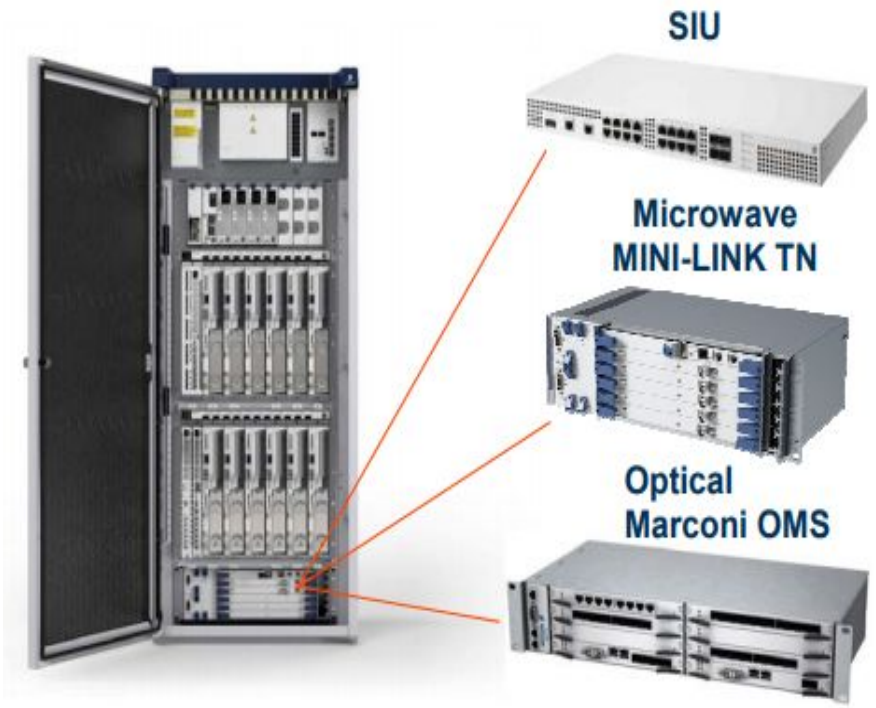
Introduction

1. With the introduction of the RSB 6000 family, there is fully integrated support for any type of transport network media (microwave, optical fiber or copper) in combination with various technologies (IP/Ethernet, ATM, PDH/SDH, next gen SDH, xDSL etc.), redundancy schemes, aggregation methods and other functionalities that supports the Operatorís choice of solution.

(contd...)

Introduction

2. Since the Operatorís mobile backhaul solution is often unique and depends on the Operatorís requirements and market conditions, the RBS 6000 is provided with extra space that can be equipped with a wide range of alternative transport solutions by means of RAN-Transport portfolio.



(contd...)

SIU

1. The SIU is a 1U high 19 inch wide mobile site router.
2. The Site Integration Unit (SIU) acts as a cell-site gateway combining and optimizing all traffic from site to maximize usage of backhaul resources.
3. In addition it supports connection of modern Ethernet based surveillance, alarm and other site equipment without requiring an extra line to the site.
4. Towards the backhaul network it supports Ethernet, IP and PDH networks with both single and redundant circuits.

(contd...)

SIU Applications

1. Abis Local Connectivity
2. Transport sharing
3. IP over E1/T1
4. Security Gateway
5. Cellsite router

(contd...)

MINI-LINK TN

1. MINI-LINK TN has a complete offering with indoor units to support all needed site configurations from small edge-nodes to more complex aggregation nodes.
2. The solution is flexible to carry any protocol (Ethernet, ATM, SDH and PDH) and integrated with powerful protection mechanisms.
3. As a result, the MINI-LINK TN matches the RBS 6000 family well in capacity and functionality.

(contd...)

OMS

1. The OMS 800 and OMS 1400 can be integrated into RBS6201 and RBS6102.
2. The OMS 800 (Access-Edge) and 1400 (Metro-Edge) products are multiservice (Ethernet and TDM technology based) devices for grooming and transporting of packet data and voice (TDM) traffic in a Metro Access Network.
3. OMS 800 products are small compact (1U) solutions with up-link transport based on NG-SDH with Ethernet. OMS 1410 is a compact (2U) hybrid solution that can either have uplink based on SDH or Ethernet.

(contd...)

TELCOMA
AN ISO CERTIFIED COMPANY

Installation, Operation & Maintenance

Introduction

1. RBS 6000 is connected to OSS-RC management system and provides functionality for fault, configuration, performance, and security management for all supported standards (GSM, WCDMA and LTE).
2. The RBS 6000 model consists of both system-specific data and shared data.
3. The OSS-RC visualizes the RBS 6000 data in both logical and physical views.

(contd...)

Introduction

4. It is possible to visualize all RBS 6000 parts or only resources connected to a certain system.
5. Alarms from the RBS 6000 supervision functionality are transferred to the OSS-RC and presented in an unambiguous way, one alarm for each fault.

(contd...)

Installation

1. Before installation the RBS site is prepared with AC power, antennas, feeders, transport network equipment, and earth grounding.
2. All internal RBS cabling and software are installed at the factory.

(contd...)

Software and Configuration

1. The RBS 6000 family software platform provides generic support for the application software and includes an execution platform with operating system and O&M infrastructure.
2. RBS application software handles the RBS hardware and is built on the software platform.

(contd...)

Flexibility

1. Functionality is implemented primarily through software.
2. Functional allocation in the RBS is software controlled by the configuration parameters stored in a database file.
3. The benefit is that one shared hardware platform can be configured to match individual needs.

(contd...)

Expansion

1. The hardware and software of the RBS can be prepared for functionality and capacity that is not in use.
2. New configurations may be applied without affecting cells in operation or calls in progress.
3. Future enhancements can in many cases be implemented without affecting installed hardware.
4. RBS capacity is expanded by adding activation keys for baseband resources, carriers and output power.

(contd...)

Tools

1. All software necessary for management is integrated in the RBS, including graphical user interfaces and documentation, are accessible from the network element itself.

(contd...)

Fault Handling

1. All hardware units in the RBS have a built-in self-test functionality executed at startup.
2. Information about the installed hardware can be retrieved locally or remotely from the RBS, which makes it easy to generate an inventory list including all installed equipment.
3. Fault handling includes functions to restart software modules, parts of boards, boards, and, if necessary, the entire RBS.

(contd...)

Fault Handling

4. The overall ambition of fault handling is to deliver as high performance as possible with minimal effect on traffic at any given time.

(contd...)