Multi-Radio Access Node (MRAN)

Indoor and Outdoor RF Signal Distribution System

Tecore's Multi Radio Access Node (MRAN) unit has been designed to provide a high power multi-band RF signal distribution system supporting 2G, 3G, 4G, and WiFi technologies simultaneously for both indoor and outdoor wireless applications. The MRAN amplifies the low power RF source signals, providing 50 dBm of transmit power in the downlink for transmission for each active frequency band. The uplink RF path is also amplified over an optical link back to each of the radio receivers. Both the downlink and uplink RF paths of the MRAN utilize coaxial cable and multiband antenna(s).

The MRAN includes six (6) high power broadband amplifiers providing up to 100 watts of transmit power in each of the six different frequency bands encompassing multiple technologies with a simplified user interface for OAM control. The MRAN OAM capabilities include the configuration and control for each of the high powered amplifiers (HPAs) as well as MRAN status and alarm screens. The MRAN supports two standard modes of operation, the first being an integrated Distributed Antenna System (DAS) mode of operation, which allows for direct connection of 3rd party base stations and repeaters. The second mode of operation offers a standalone Multi-technology RAN providing 2G GERAN, 3G UTRAN, and/or 4G EUTRAN from a single MRAN unit.

In the DAS mode of operation, a standard DAS primary HUB configuration is used to interface to the RF signal sources. The output of the DAS HUB is then fed over fiber to the low power Optical Radio Unit (ORU) integrated within the MRAN for high power amplification and distribution of the RF signals.

For the Multi-technology RAN mode of operation, the MRAN is integrated with Tecore's CoreCell-R Radio Shelf. The MRAN CoreCell-R Radio Shelf allows for up to nine (9) low power Software Defined Radios (SDRs) to be deployed within each radio shelf and connected for high power RF distribution by the MRAN. The SDRs may be individually configured to support any frequency band and technology supported by the MRAN.

Tecore has incorporated over 23 years of experience in scalable wireless systems into the design of the MRAN unit. It leverages Tecore's patented iCore portfolio of 3GPP compliant Software Defined Core networking elements and Software Defined Radio access networking elements. The MRAN with its robust capability and cost-effectiveness enables a broad range of wireless applications and may be customized to support customer specific requirements.

Benefits & Features

- Hex-band architecture
- High output power up to 50 dBm per band
- Multiple configuration modes supporting integrated DAS and Multi-technology RAN
- Web based server GUI for MRAN system management
- Remote & local management via web GUI
- P25 Radio RF distribution (optional)
- Single fiber pair for downlink and uplink signals
- Single fiber pair for OAM
- Location based services support (optional)
- Internal or external GPS RF distribution support (optional)
- WiFi 2.4 GHz Wireless Access Point Distribution (optional)

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Specifications

Service Capabilities

- Supports 2G, 3G, and 4G RF signal distribution
- Configurable to support all standard frequency bands & technologies
- Supports SISO & MIMO configurations
- Distributed MRAN / DAS architecture

Integrated Functional Capabilities

- Multi-band & Multi-technology RF distribution
- Multi-band architecture supporting up to 6-bands
- Broadband low-power Optical Radio Unit
- Downlink digital attenuator - 30 db range in 0.5 db steps per band
- Low & High Power RF TX filter architecture with high band rejection
- Low power RX filter architecture with high band rejection
- OAM Micro-controller
- Single SDR (optional)

Frequency Bands Supported - Standard model:

- 700 MHz - Band Classes (BC) 12,13,14,17
- 800 MHz - BC 5, 26
- 1900 MHz - BC 2,25
- 2100 MHz - BC 4
- 2400 MHz - BC 41
- 2.4 GHz - WiFi
- Technologies (GSM, CDMA, UMTS/ HSPA, LTE - FDD, LTE - TDD, WiMAX, WiFi)
- Customizable to specific customer requirements

Operations & Maintenance

- Local or centralized management
- HPA Control: Enable, Disable
- HPA Status: Forward Power, Reverse Power, Input Level, Temperature, Input Voltage, Alarm Status
- HPA Alarm Conditions: ALC Alarm, Low Gain (Loop Fail), VSWR, DC Fail, High Temperature, Over Power
- Remote On/Off power reset capability
- Remote temperature sensors: Heatsink temperature, enclosure temperature
- Tamper Resistant - no exposed screws
- Field Serviceable components - easily maintained
- Dual Security locks
- Operational in minutes

Environmental

- Size - 31h x 21w x 12d inches
- Weight - 115lbs
- Power - 120-240 VAC
- Operating Temperature: -10 to 45C
- Max Power Consumption: 1800 watts