MMR Host Block Diagram

Cellular telephone systems transmit signals in two directions between base transceiver station (BTS) and mobile stations (MS) within the signal coverage area. If weak signal transmissions occur within the coverage area because of indoor applications, topological conditions or distance from the transmitter, extension of the transmission range can be achieved by means of an optical distribution system. Such a system contains an optical master unit and several remote units. The remote units are connected to the master unit with optical links, which must have an optical loss of less than 10 dB. The optical transmission uses WDM-systems with a wavelength of 1550 nm in the uplink and 1310 nm in the downlink. An auto-leveling function for compensating different fibre losses is implemented to maintain a constant gain in the downlink and uplink paths.

The MMR master unit, which is the link between the remote units and BTS, is comprised of two signal chains. In the uplink direction, the optical signals from the remote units (transmitted via optical fibres) are converted into RF signals
by the transceiver. Then, they are forwarded via a frequency separation unit denominated as duplexer to the BTS. In the downlink direction, the signals from the BTS are forwarded to the duplexer where the RF signals are converted into
optical signals by the transceiver and finally are transmitted via optical fibres to the remote units.

The downlink gain from the duplexer input to the MMR remote output is approximately 30 dB. Depending upon the number of RF carriers, the RF input level to the duplexer is in the range of 0 dBm to +10 dBm. External attenuators would be used to reduce the output power from the BTS to these levels.

In the uplink path the system gain from the MMR remote unit to the BTS input should be in the range of -5 dB to 0 dB. Setting the uplink system gain to these values will insure that the signal levels present at the BTS input receiver would be of the same level as seen by the input of MMR unit and not cause the BTS receiver from being overdriven. Typical signal level input range to the BTS will be -40 dBm to -100 dBm.