

PRODUCT DESCRIPTION

FOR

HIGH POWER REPEATER

MODEL: MW-BDA-ESMR-50W90





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REPEATER OVERVIEW:

The Bi-Directional Repeater assembly provides an exceptional repeater/booster performance to extend the coverage area of radio communications in buildings and RF shielded environments.

Features such as high linearity power amplifiers are contributing for the overall improved system linearity performances. The unit is based on a duplexed path configuration, having sharp out of band attenuation for improved isolation between the receiving and transmitting paths.

BLOCK DIAGRAM DESCRIPTION:

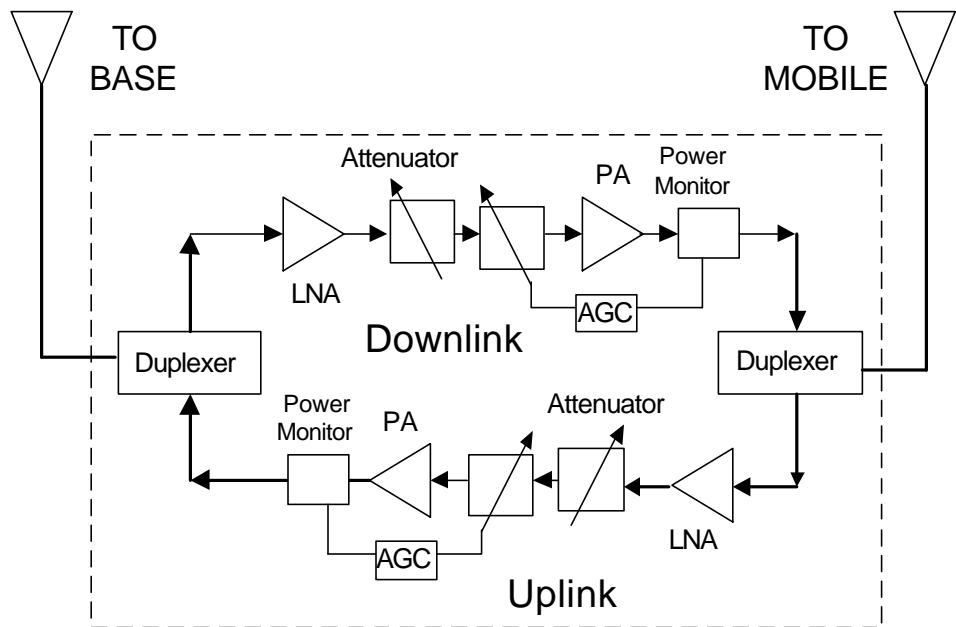
The Repeater Downlink path receives the RF signals from base station, amplifies them and transmits them to the subscriber. The Repeater Uplink path receives the RF signals from the subscriber, amplifies them and transmits them to the base station. Two duplexers frequency separate the signals to the proper amplifying path and isolate the two signals.

For each path two amplifiers do the path signal amplification; a low noise amplifier (LNA) and a high power amplifier. The low noise amplifier has a 30 dB step attenuator to set the gain of the specific path.

REPEATER (BDA) CONNECTION:

The RF connection is made via two type "N" female connectors. The RF connector labeled "Base" is connected to the antenna pointing to the base station, usually a rooftop antenna; this is a directional antenna such as Yagi or Dish antenna of 14 to 18 dBi gain. This antenna is pointed to the base station to get maximum input power. The RF connection labeled "Mobile" must be connected to the antenna pointing into the area to be covered by the Repeater. The remote antenna is usually a directional antenna designated for the coverage requirements.

For indoor applications covering a large building, the RF signals are split using power dividers and distributed to many antennas, usually omni antenna, each covering a floor or a small area.
 such as inside a building or outdoor shaded area.



BDA RF BLOCK DIAGRAM

COMPONENTS DESCRIPTION

LNA +STEP ATTENUATOR AND RF GAIN SETTING

This is a 45dB GAIN unit with a 30 dB step attenuator. The step attenuator is used to reduce the Repeater gain when needed, usually to set proper output power . For proper operation of the Repeater, the isolation between the base station antenna and the mobile antenna should exceed the Repeater gain by at least 12 dB. If the Repeater gain were higher than the isolation between the antennas, oscillation would start and would saturate the amplifier. In this case the repeater's gain is reduced to the required level.

Downlink power amplifier:

This is a 50W 1dB compression amplifier operated at 10W composite output power. The power is limited by AGC mechanism to keep system performance.

The amplifier uses 28VDC, 4AMP. Typ.

Uplink power amplifier:

This is a 16W 1dB compression amplifier operated up to 1W composite output power. The power is limited by AGC mechanism to keep system performance.

The amplifier uses 28VDC, 1.7 AMP. Typ.

AGC FUNCTION

The Repeater has AGC function on both paths that serve to prevent the saturation of the power amplifier. When a high signal is received the AGC circuit detects the amplitude and sends a feedback signal to a variable attenuator, which attenuates the signal level so that the output power of the amplifier does not exceed the preset limit. The green LED on the BDA monitor (AGC Range) illuminates when the power output of the amplifier is within the set limit. An On/Off switch on the connection box enables the AGC function. If the AGC is disabled then the amplifier gives maximum gain.

BDA MONITOR

The BDA monitor circuit monitors the following functions:

RF power transmitted by the power amplifiers.

For the **downlink channel** a red fault LED illuminates if the power is 10 dB below the specified composite power. In normal use the downlink channel continuously transmits RF signals and this LED should be on. When the donor reception from the base is bad this LED turns on to warn that the repeater is not being used efficiently. Another green LED illuminates when the power reaches or exceeds this power (10W). This is used to set the repeater gain. This limit is the same as the AGC limit and is factory preset.

For the **uplink channel** a green indicator LED illuminates when the power reaches or exceeds its composite power (1W). When the isolation between the antennas is bad this LED lits permanently. This LED should turns on only when a near by cellular is used. This limit is the same as the AGC limit and is factory preset.

DC voltage of the channels. The fault LED illuminates when the voltage is below or above the specified limits.

DC current to each of the two LNAs and the uplink power amplifier. If the current is below or above the specified limits then a LED illuminates.



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BDA MONITOR FUNCTIONS

P.S. (Uplink & down link) Illuminates when the Power Supply voltage is below or above its limits.

P.AMP. (Uplink) Illuminates when the uplink Power Amplifier current is above or below its specified limits

P.AMP. (Downlink) Illuminates when the uplink RF Power is 10 dB below the specified composite power.

L.N.A. (Uplink & Downlink) Illuminates when the Low Noise Amplifier current is above or below its specified limits.

AGC Range. (Downlink) This green LED on the downlink path illuminates when the transmitted power reaches or exceeds the AGC set power, which is the maximum specified composite power. For best efficient use of repeater RF power this LED should be on.

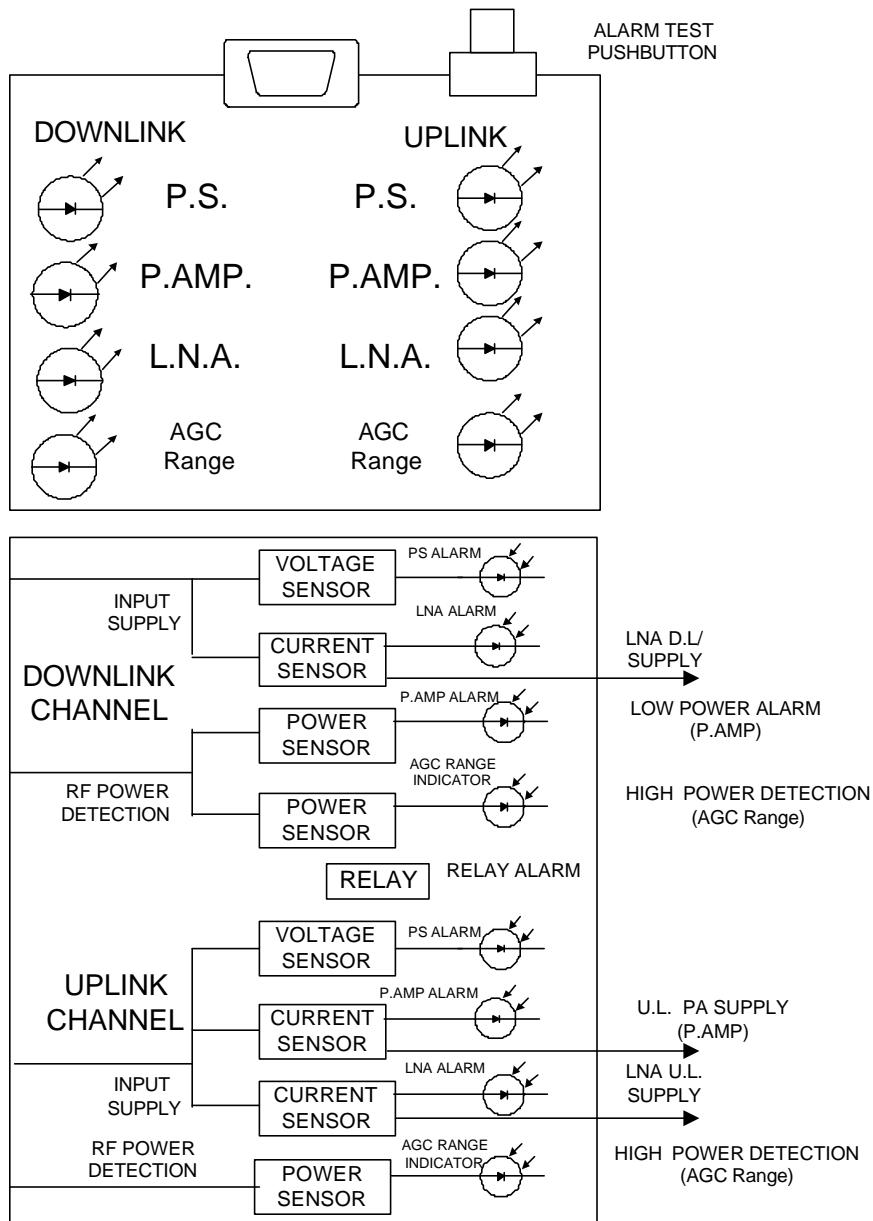
AGC Range. (Uplink) This green LED on the downlink path illuminates when the transmitted power reaches or exceeds the AGC set power, which is the maximum specified composite power. This LED should not be lit permanently. It lights only when a nearby mobile is transmitting.

The **Pushbutton Switch** on the BDA monitor turns on all the alarms. This is used to test the alarm functions of the BDA.

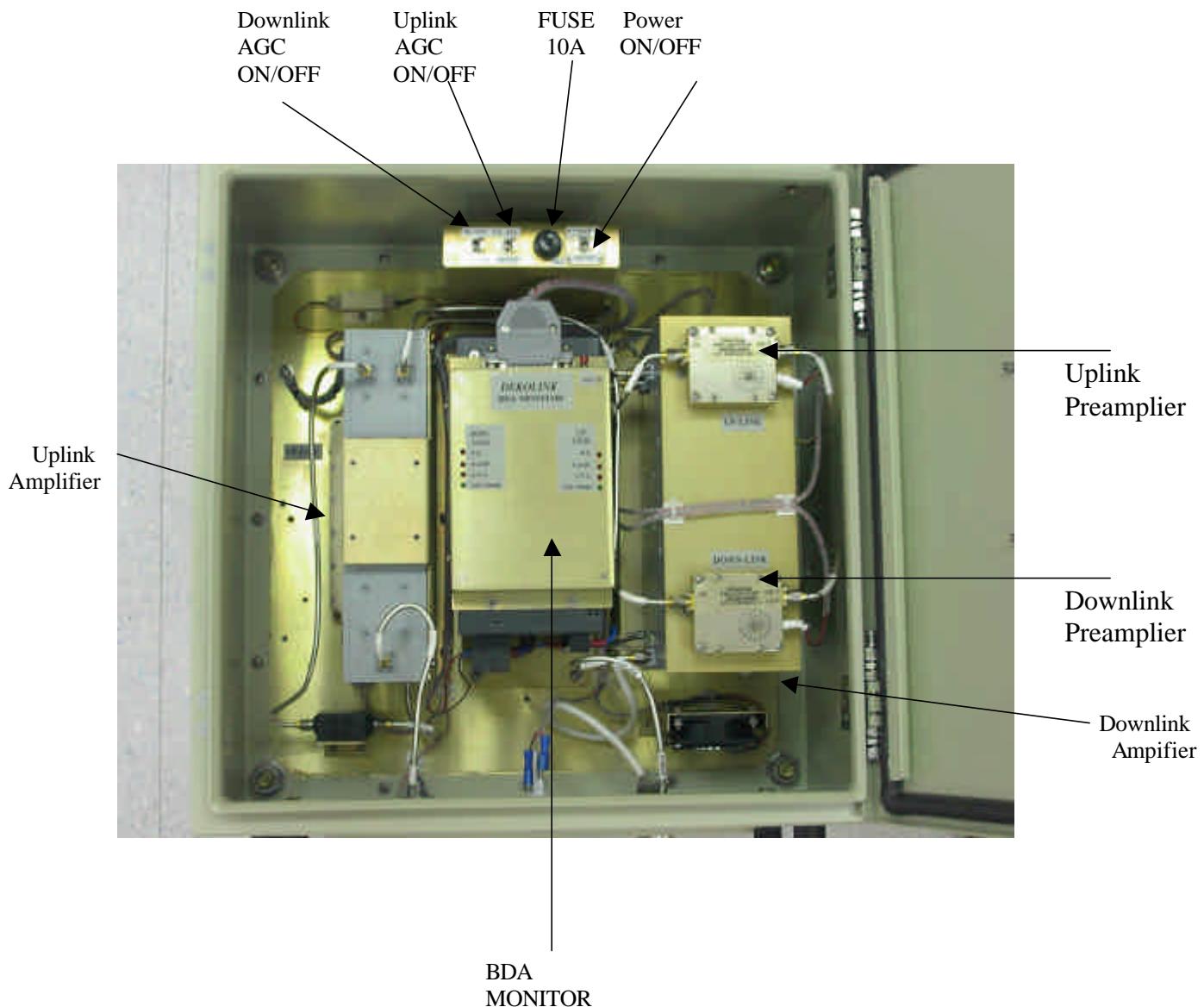
REMOTE ALARM The BDA monitor has a dry contact relay arms output. These contacts are short circuit at no fault and open circuit at any fault or at power loss. This function can be used to operate a modem for remote alarm warning. The relay contacts are connected to pins A and C (small pins) on the alarm connector at the front panel.

BDA MONITOR

BLOCK DIGRAM



MECHANICAL LAYOUT



MECHANICAL OUTLINE

