



AutoEQ™

Automatic Uplink Equalization System



HIGHLIGHTS

- ▶ Full or Partial Transponder (Complex) Equalization
- ▶ Digitized Transponder Characterization, Plug and Play
- ▶ No External Adjustments Required
- ▶ Easily Upgradable into Existing DM240XR's
- ▶ Closed Loop Equalization using a Plug-In PIIC Receiver
- ▶ Supports all DM240XR Modulation and Frequency Parameters up to 45 MSPS
- ▶ Capable of Multiplexing LNB Power

OVERVIEW

The AutoEQ™ Automatic Uplink Equalization System is the most user friendly satellite communication system equalizer available. Unlike old analog equalizers which are difficult to adjust, the Radyne AutoEQ system is extremely easy to use. Transponder Equalization is done in the digital domain; it is very accurate and can compensate for amplitude and group delay variations that are nearly impossible to compensate for with an analog equalizer.

The AutoEQ™ consists of special software built into the DM240XR coupled with a special digital receiver on a PIIC card. The receiver analyzes the signal path while the software computes the compensating equalizer values. It all happens automatically with a few key pushes.

A remote receiver capability is also supported for those systems where the DM240XR Hub cannot see the return path from the distant end. Remote calibration is done by simply connecting and configuring the Ethernet Control ports of the modulator and remote receiver to a network with internet access. The DM240XR takes care of the rest.

The AutoEQ™ Automatic Uplink Equalization System supports single channel per carrier (SCPC) equalization of group delay and amplitude over the entire satellite frequency range.

AutoEQ™ works with all modulation and coding types supported by the DM240XR (i.e. QPSK, 8-PSK, 16-QAM for DVB-S and QPSK, 8-PSK, 16-APSK, and 32-APSK for DVB-S2). The BER/Bandwidth improvement is greater as the level of modulation increases.

The equalization process is nearly independent of receive signal to noise ratio. Accurate automatic equalization is possible down to the lowest specified levels of Eb/No associated with each modulation and coding type supported by the DM240XR.

The equalizer is based on the generation of complex coefficients. What this means is that it can even compensate for amplitude or group delay that is not symmetric over the carrier frequency spectrum, as would be the case if two independent carriers were placed on one transponder.

Up to 32 sets of equalization parameters can be stored within the DM240XR. This allows a DM240XR to be preconfigured for multiple carriers and multiple transponders.

Should the satellite uplink parameters change, recalibration of the AutoEQ™ can be easily initialized at any time, allowing for maximum flexibility for the uplink earth station.

The end result is greatly improved bandwidth and power utilization of your satellite transponder.

AutoEQ™ Automatic Uplink Equalization System

SPECIFICATIONS

Demodulator Input (PIIC Card Receiver)

| | |
|-----------------|----------------------------|
| Input Frequency | 950-1750 MHz |
| Input power | -45 to -20 dBm |
| Input Impedance | 50 Ohm (Optional 75 Ohm F) |
| Input Connector | SMA-F (Optional F-type) |
| Es/No | 0 dB Min |

LNB DC Inject

| | |
|------------------|--|
| Purpose: | Used to diplex DC Power onto RF RX Connector |
| Input Connector: | PP3-002A 5.5mm x 2.1mm x 9.5mm In-Line DC Power Plug |
| Input Voltage: | 28 Volts Max |
| Input Current: | 0.5 Amps Max |

DM240XR Monitor and Control

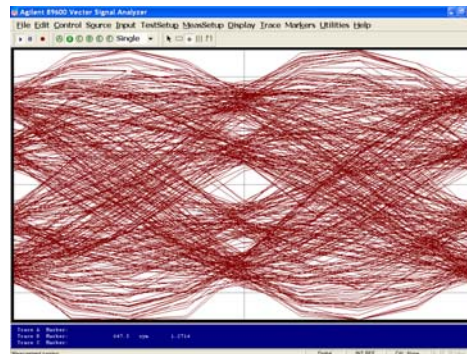
| | |
|-----------------|--------------------------------|
| Equalizer: | Enabled, Disabled |
| RX IF: | 950-1750 MHz |
| EQ Calibration: | Reference Acquire, Calibration |
| EQ Receiver: | Local, Remote |
| EQ Select: | 1-32 Coefficient Sets |
| EQ Rename: | 1-32 Coefficient Sets |
| EQ Delete: | 1-32 Coefficient Sets |
| EQ Restore: | Entire AutoEQ™ Table |

Physical

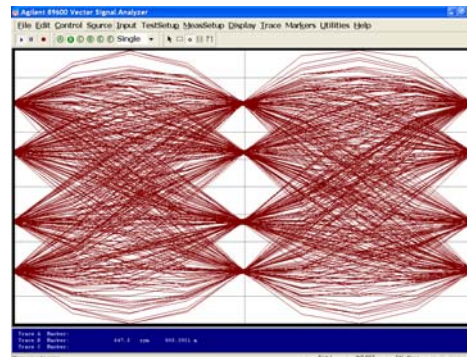
| |
|--|
| Standard Plug-In-Interface Card (PIIC) |
|--|

AutoEQ™ System Performance

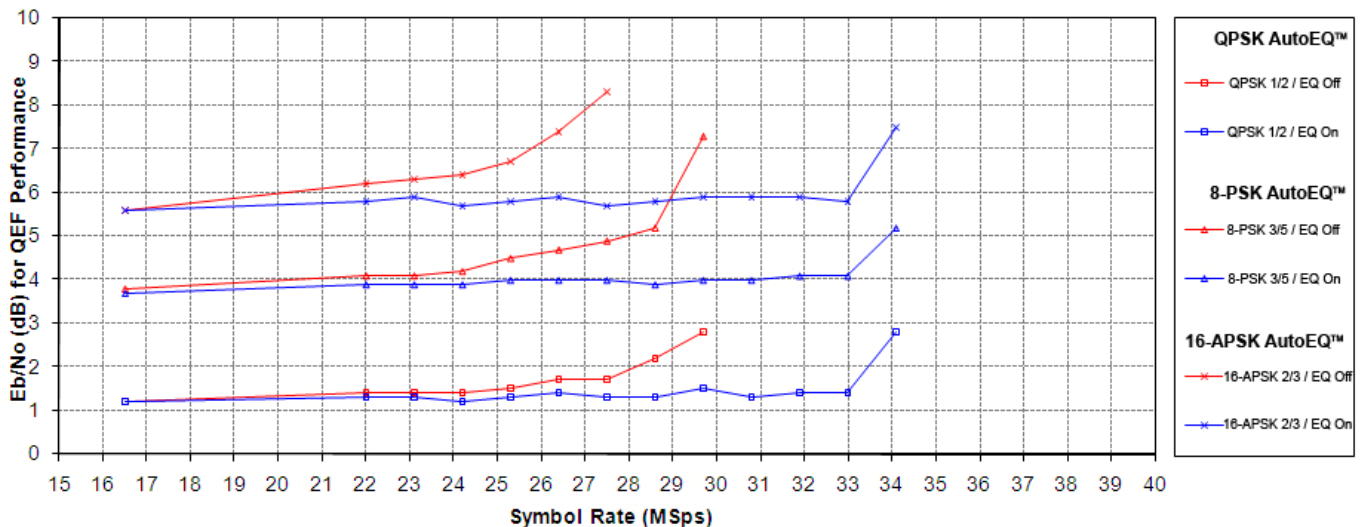
Received 8-PSK Over Typical Satellite Without AutoEQ™



Received 8-PSK Over Typical Satellite with AutoEQ™



AutoEQ™ Performance Comparison Single Carrier on typical 36 MHz Transponder



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