

In today's modern digital high speed communication systems, primary consideration is to achieve modulation with power spectrum of acceptable bandwidth and constant amplitude of the modulated signal. Some of the most efficient modulation techniques are MSK and GMSK/GFSK. They are part of the Constant Phase Frequency Shift Keying (CPFSK) modulation family with a constant envelope. Since the modulated signal has constant amplitude, an efficient RF amplifier of class C can be used to minimize power consumption, an important consideration for battery-powered units.

TechBook Sciencetech 2809 is an ideal platform to study & experiments different topics like Minimum Shift Keying (MSK), Gaussian Minimum Shift Keying (GMSK), Frequency Shift Keying (FSK), Gaussian Frequency Shift Keying (GFSK) etc. which are the part of the Continuous Phase Frequency Shift Keying technique. TechBook 2809 also includes the study of AWGN noise & BER measurement. Built-in data acquisition system will help user to analyze the signals using real-time software.

Features

- MSK, GMSK, FSK, GFSK modulator and demodulator system in a handy TechBook
- User friendly real-time control & acquisition software for detail study of the time domain signals
- Analysis in digital time, analog time & frequency domain
- Built-in reconfigurable AWGN noise generator for analysis of noise gain effect on the signal
- On-board BNC connector for analog I-Q signal analysis and external use
- Reconfigurable data rate
- Reconfigurable modulation index h
- Built-in digital data pattern generator
- Measurement of BER with internal digital data pattern generator
- Interface USB
- Matlab interface utility

Scope of Learning

- MSK Modulation & Demodulation complete study, measurement & analysis in time & frequency domain
- GMSK Modulation & Demodulation complete study, measurement & analysis in time & frequency domain
- FSK Modulation & Demodulation complete study, measurement & analysis in time & frequency domain
- GFSK Modulation & Demodulation complete study, measurement & analysis in time & frequency domain
- AWGN Channel noise study & measurement of SNR for respective modulation
- BER measurement under AWGN channel noise condition

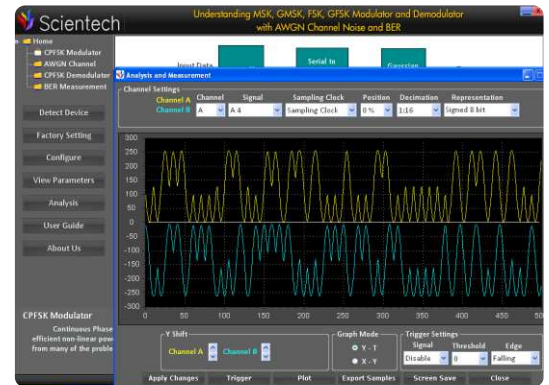
Technical Specifications

- Modulations: Continuous Phase FSK (CPFSK), Minimum Shift Keying (MSK), Gaussian Frequency Shift Keying (GFSK), Gaussian Minimum Shift Keying (GMSK) etc.
- Software programmable data rate up to 10 / 20 / 30 10Mbps
- Software programmable 2, 4, 8 array FSK
- Software programmable modulation index h (0 to 10)
- On-board digital data pattern generator as a test pattern
- Gaussian Filter BT product is $BT = 0.3$
- Built in real-time data acquisition system with time domain signal analysis
- Additive White Gaussian Noise with Normal distribution up to 4.5 times the standard deviation using Box-Muller algorithm
- Two channel Additive White Gaussian Noise Generator with 10 bits/sample/channel
- I & Q Channel DACs-10 bit@ Sampling rate 125 MSPS maximum
- Anti aliasing low pass filter with 3dB bandwidth of I & Q channel filter: Sallen Key 6-pole Butterworth with cut-off frequency 13MHz
- BER measurement using actual bit errors with a known digital data test sequence at the transmitter end
- More than 10nos. of test points and 2 BNC connector for analysis using external Oscilloscope & Spectrum Analyzer
- Mains Supply : 110-220 V AC, 50/60Hz
- Operating Conditions : 0-40° C, 80% RH
- Weight : 2 Kg (approximately)

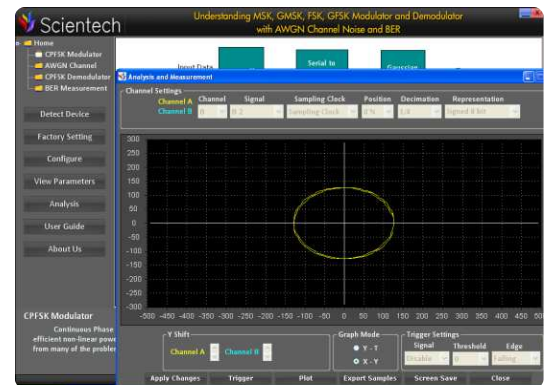
Included Accessories

- TechBook Power Supply, Power Cord & Patch Cord : 1 no.
- Host to Device USB cable : 1 no.
- BNC to BNC cable : 2 nos.
- Optional

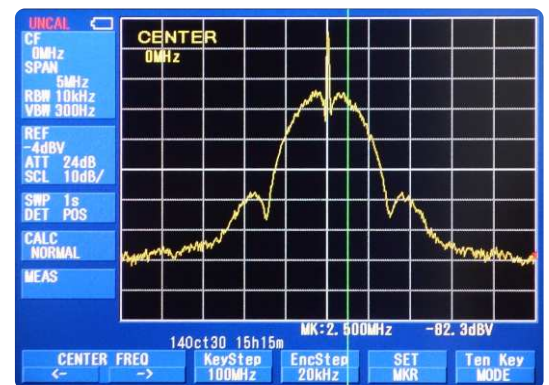
Handheld Spectrum Analyzer - Micronix MSA 458



MSK I-Q Modulated signal



MSK Constellation signal



GMSK with BT=0.3 Spectrum on Spectrum Analyzer