

COM-1028 ->COM-1027 -> COM-1005

Test conditions:

- 1 Mbit/s 2-MSK, 0 center frequency
- ideal channel: noiseless, no frequency error

Back to back digital modem operations can be verified at baseband. The FSK modulator is configured in signal generator test mode whereby a periodic 2047-bit sequence is being transmitted. The end to end BER is measured using the COM-1005 module.

The settings file 1028_1027_1005.stn can be imported using the FileImport function at the ComBlock Control Center.

The screenshot displays the ComBlock Control Center software interface. The main window shows a tree view with the following components:

- COM1028 FSK/GFSK/MSK/GMSK Digital Modulator
- COM1027 FSK/MSK/GFSK/GMSK Digital Demodulator
- COM1005 Bit Error Rate Measurement

Three configuration dialog boxes are overlaid on the main window:

- COM1028 FSK/GFSK/MSK/GMSK Digital Modula...:** Symbol rate: 999999.046 Symbols/s; Center frequency: 0 Hz; Signal amplitude: 255 range 0 - 255; Modulation: MSK; M-ary number: 2-FSK (1 bit/symbol); Modulation index: 0.5 range 0 - 7.9; Test mode: internal PRBS-11 test sequence; Output: to most ComBlocks, format unsigned.
- COM1027 FSK/MSK/GFSK/GMSK Digital Demod...:** Symbol rate: 999999.046 Symbols/s; Center frequency: 0 Hz; M-ary number: 2-FSK (1 bit/symbol); Modulation index: 0.5 range 0.125 - 4.0; Spectrum inversion: ; disable AFC: ; Input Format: unsigned input (default).
- COM1005 Bit Error Rate Me...:** All register values in HEX; Status Registers: Register 1 : 00, Register 2 : 00, Register 3 : 00, Register 4 : 00, Register 5 : 01, Register 6 : FF, Register 7 : 03, Register 8 : 00, Register 9 : 00, Register 10: 98, Register 11: 23, Register 12: 5D, Register 13: 05.

Proper operation can be verified as follows

(a) using an oscilloscope probe:

COM-1005 TP1 is high, indicating synchronization with the 2047-bit periodic test pattern

COM-1005 TP3 is low, showing no bit error pulse

COM-1005 TP4 shows regular periodic start of frame pulses every 2047 bits = 208.8 us.

(b) from the ComBlock control center check the BER (COM-1005 status).

It will show no bit errors (REG 1 through 4) and the synchronization bit (REG5 bit0) is high.

(c) from the ComBlock control center check the demodulator lock status (COM-1027 status, Register REG16 = 3, indicating both signal power detection and AFC lock.

Register REG12/13/14 should show a frequency error centered around zero with small variations (typically between 0xFF0000 and 0x00FFFF)

(d) The COM-1027 demodulator 'sees' the following MSK-modulated inputs, visible via ComScope trace 1 signal 1 and trace 2 signal 1. The blue/red traces are the In-band and Quadrature components of the complex input signal respectively.

