

CPM Modem for Data Transmission

bc001

The Binary Core bc001 Modem is a CPM modulator/demodulator for data transmission over point-to-point microwave radio links. The bc001 modem is designed for highly non-linear transmitters, and has excellent robustness against phase noise and other channel impairments. Optimized for low-cost devices, bc001 achieves extremely low power consumption.

Features

- 10/100/1000 Ethernet interface.
- Net bit rate 33.94 Mb/s, in 28 MHz channel spacing.
- CPM modulation with GMSK shaping.
- Bandwidth agility (3.5/7/14/28 MHz channel spacing).
- Coherent/non-Coherent parallel demodulator with automatic (or manual) selection.
- Channel encoding based on BCH(255,239) code that substantially improves system gain at the cost of moderate bandwidth expansion.
- Adaptive fractionally-spaced equaliser to face selective fading and adjacent channel interference.
- Only one external clock source required, with maximum frequency 100 MHz.
- ADC and DAC frequency 80 MHz for 28 MHz channel spacing.
- Receiver impairments recovery (I/Q amplitude and phase unbalance).
- Timing recovery with digital re-sampling.
- Automatic carrier frequency control for fast carrier acquisition.

SNR Performance

Figure 1 shows the Bit Error Rate (BER) performance versus E_b/N_0 , where E_b is the energy of the uncoded bit. For comparison, the uncoded BER performance of 4-QAM (dashed line) is shown.

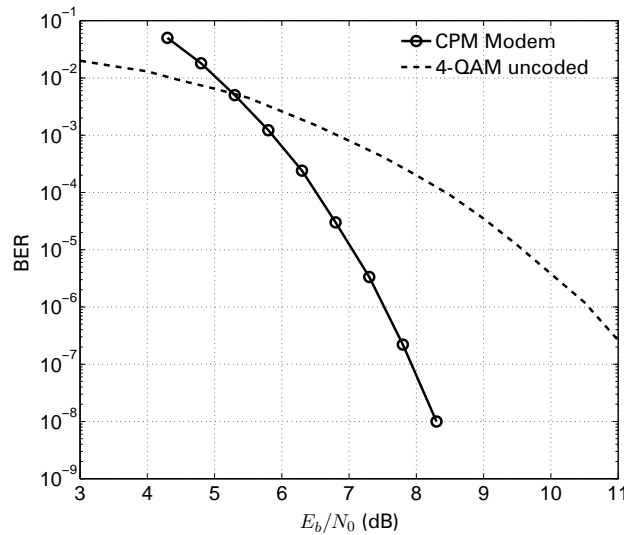


Figure 1: Bit Error Rate performance versus E_b/N_0 of the CPM Modem

Typical integration scheme

The bc001 CPM Modem has to be integrated with an Ethernet Physical Interface 10/100/1000 (PHY), a 100 MHz oscillator, a micro-processor (μP), a Digital-to-Analog Converter (DAC) and an Analog-to-Digital Converter (ADC). Figure 2 shows the typical integration scheme of the CPM Modem.

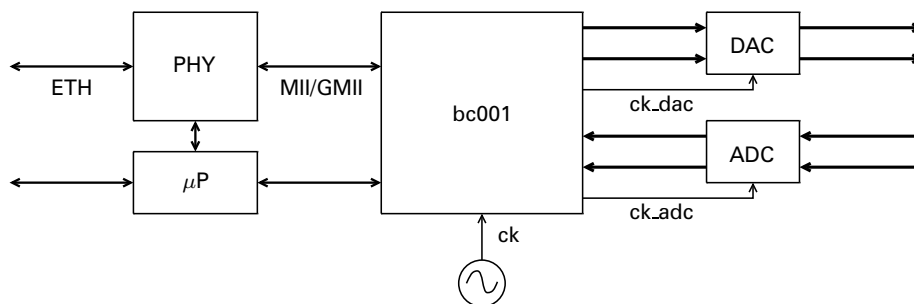


Figure 2: Typical CPM Modem integration scheme