BB2M-EC 2.048 Mbit/s Baseband Modem

Product Concept

The Nokia BB2M-EC is a HDSL baseband modem for 2.048 Mbit/s (E1) full-duplex point-to-point connections on typical subscriber loop distances. The transmission is based on 2-pair dual duplex 2B1Q coding using echo cancelling.

For shorter line lengths, a 1-pair interface is provided. This unique feature on a 2 Mbit/s modem is especially useful, if the availability of subscriber lines is limited or the cost of the second line is high. The BB2M-EC uses Nokia proprietary technology that enables high performance.

Through the use of the advanced coding and filtering techniques the Nokia BB2M-EC can be deployed over the majority of the subscriber loop, and the transmission reliability is, in the order of magnitude, higher than that which can be achieved with repeatered PCM technology. No line conditioning, pair selection or repeaters are needed.

Typical applications range from PBX networking to high-speed LAN interconnection and video applications.

The BB2M-EC features both stand-alone, customer-premises-sited equipment and Nokia 19"-sub-rack-compatible card units. The E1 connection establishment is as easy as the installation of an ordinary voice-band modem or telephone. The BB2M-EC can be used for 2.048 Mbit/s multiplexer/concentrator aggregate connections and for 2.048 Mbit/s tributary customer connections.

Interchangeable DTE Interface Adapters

The BB2M-EC provides an unstructured transparent data interface (G.703, V.11, X.21, V.35 and EIA-530-A) applicable to a variety of standard, manufacturer non-dependent interfaces. The user interface is menu driven and includes a comprehensive diagnostic and monitoring tool for end-to-end testing of the line connection. Should faults occur, the alarm interface has two programmable relay connections to differentiate between urgent and non-urgent alarms according to specific network management requirements.

Technical Highlights

- *2B1Q coding*
- *Echo canceling technique*
- *E1 (2.048 Mbit/s) payload*
- *Extended operational range using 2-pair mode*
- *1-pair full duplex 2 Mbit/s mode up to 3.5 km*
- *Extremely low bit error ratio (10^{-9})*
- *Interchangeable data interfaces*
- *Complies to EMC requirements*
- *Universal alarm interface*

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Product Codes

Stand-alone	T67000
Rack-mounted	T67005

Interfaces

Line interface	
Line code	2B1Q dual duplex
Line interface	1-pair or 2-pair (2-wire or 4-wire)
Line rate	1040 kbit/s (2-pair mode), 2080 kbit/s (1-pair mode)
Signal bandwidth	0...260 kHz (2-pair mode), 0...520 kHz (1-pair mode)
Line impedance	135 ohm
TX power	+13.5 dBm (1.74 Vrms)
Return loss	>16 dB @ 40...500 kHz, 2-pair mode >16 dB @ 80...1000 kHz, 1-pair mode
Delay (one way end-to-end)	max. 300 µs, typical 200 µs
Equipment interfaces	V.11, X.21, V.35, EIA-530-A and G.703/2M
Alarm interface	
Interface type	D-9 connector, two potential free relays
Urgent alarms	Internal fault, DTE off, No line signal, No 4-wire sync, No external clock, Local power off
Non-urgent alarms	Remote power off, Poor line signal quality, Remote test, CT140 ON, CT141 ON, No port adapter

Operational Range

Maximum cable length in the presence of heavy crosstalk noise, ETSI HDSL noise at level of 10 µV/šHz.

Cable diameter and capacitance	0.4 mm 37 nF/km	0.5 mm 40 nF/km	0.6 mm 35 nF/km	0.8 mm 35 nF/km
2-pair mode	2.9 km	4.3 km	5.1 km	6.9 km
1-pair mode	2.1 km	3.0 km	3.3 km	4.3 km

Maximum cable length in the presence of moderate crosstalk noise, ETSI HDSL noise at level of 5 ∝V/ Hz

Cable diameter and capacitance	0.4 mm 37 nF/km	0.5 mm 40 nF/km	0.6 mm 35 nF/km	0.8 mm 37 nF/km
2-pair mode	3.6 km	5.0 km	5.7 km	7.8 km
1-pair mode	2.4 km	3.5 km	3.8 km	5.0 km

Testing

Local loop, Remote loop, Digital loop, V.54 test pattern

Performance Monitoring

Level, Quality, Impulse hits

Mechanical Construction

	Height	*Width*	*Depth*	*Weight*
Stand-alone	55 mm	295 mm	253 mm	2.3 kg
Rack-mounted	262 mm	30.5 mm	165 mm	0.5 kg

Power

	Power Supply	*Power Consumption*
Stand-alone	90 - 264 V (AC) or 20 - 75 V (DC) as option	14 W
Rack-mounted	+5V and ±12 V	9 W

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