iCODING™
technology incorporated

S2000
DVB-RCS Compliant
Turbo Decoder

Version 1.0 - 17th October 2001   Product Brief
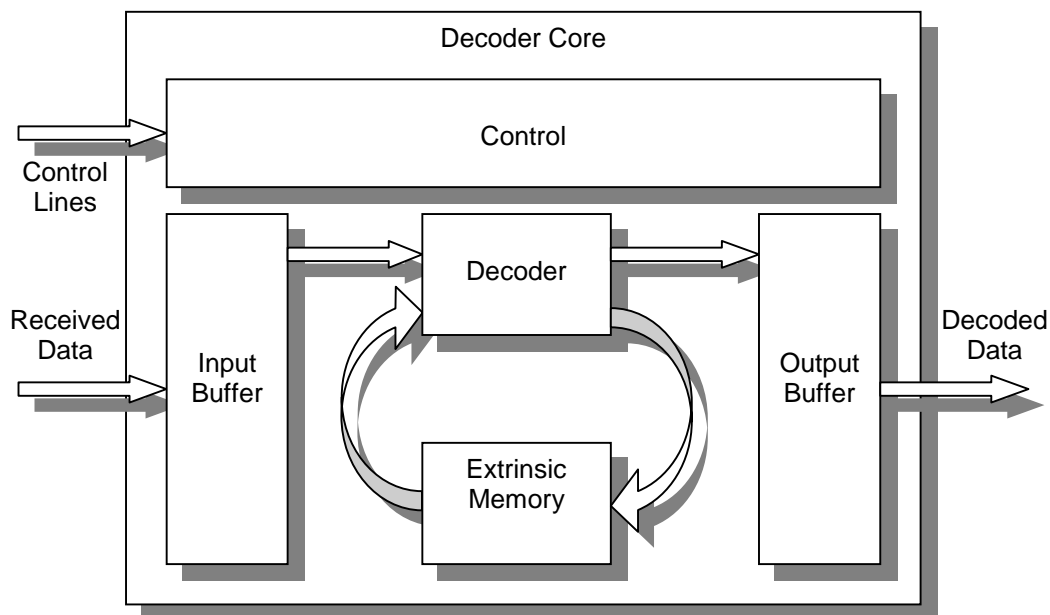
General Description

The iCODING DVB-RCS Compliant Turbo decoder is one of the world's most advanced FEC cores. It outperforms many other comercially realizable FEC codes including Block Turbo Codes to give your communications application the excellent FEC performance.

This core represents the decoder portion of the DVB-RCS codec and in normal operation must be coupled with the iCODING S2001 DVB-RCS Turbo Encoder for complete communications. The highly efficient design allows complete implemention within a Xilinx XCV400E, without the need for external memory while still providing up to 9 Mbit/second performance.

The core implements a highly advanced rate 2/3 constituent code that eliminates the so called "error floors" resulting in the ability to achieve Quasi-Error Free (QEF) performance for small frame sizes. Performance of the convolutional based turbo code typically outperforms block turbo codes by .5 to 1.5 dB for most code rates and requires less memory.

Features

- Xilinx Alliance Core Qualified
- Drop-in module for Virtex™-E, Virtex™ –II FPGAs
- No external memory required
- Implements the full DVB-RCS standard decoder for code rates $\geq$ ½.
- 12 small frame sizes available (96 to 1728 bits), switchable at run-time
- 5 code rates available (1/2, 2/3, ¾, 4/5, 6/7), switchable at run-time
- Supports data rates up to 9 Mbit/s (Virtex™-E-8 device, operating at 3 iterations)
- Supports data rates up to 15 Mbit/s (Virtex™ –II-5 device, operating at 3 iterations)
- Low Gate Count
- Achieves Quasi-Error Free QEF performance (BER 10^{-10} and lower) for small frame sizes.
- Simple single clock operation

Configuration

The S2000 is available as a Xilinx Alliance Virtex-E or Xilinx Virtex-II core. Alternatively it can be customised as an ASIC core.

The following frame sizes and code rates are supported:

FRAME SIZES (BYTES)	FRAME SIZES (BITS)
12	96
16	128
53	424
55	440
57	456
106	848
108	864
110	880
188	1504
212	1696
214	1712
216	1728

S2000 Frame Sizes

CODE RATES
1/3 (Optional)
2/5 (Optional)
½
2/3
¾
4/5
6/7

S2000 Code Rates

For more information on this product, please contact

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