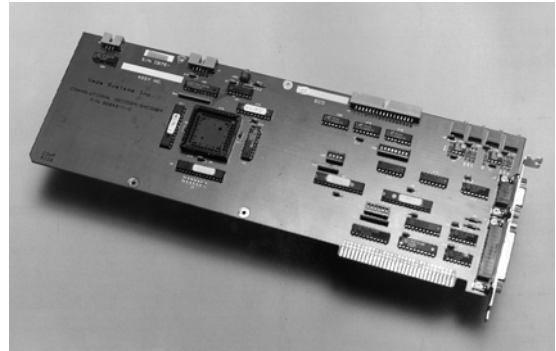


## PC-Based Convolutional (Viterbi) Decoder/Line Driver Board TCON330-300

### Features

- Rate 1/2 and Rate 1/3 Convolutional Decoding
- Greater than 5 dB maximum Coding Gain
- Programmable Alternate Symbol Inversion
- Programmable Symbol Swap
- Compatible with TSNC-300-005 Model Bit Sync or External Source
- Built-in Programmable Convolutional Encoder
- TTL, Bipolar, and RS-422 Differential Outputs
- Optional Interleaver/Deinterleaver
- Occupies a Single-Card Slot



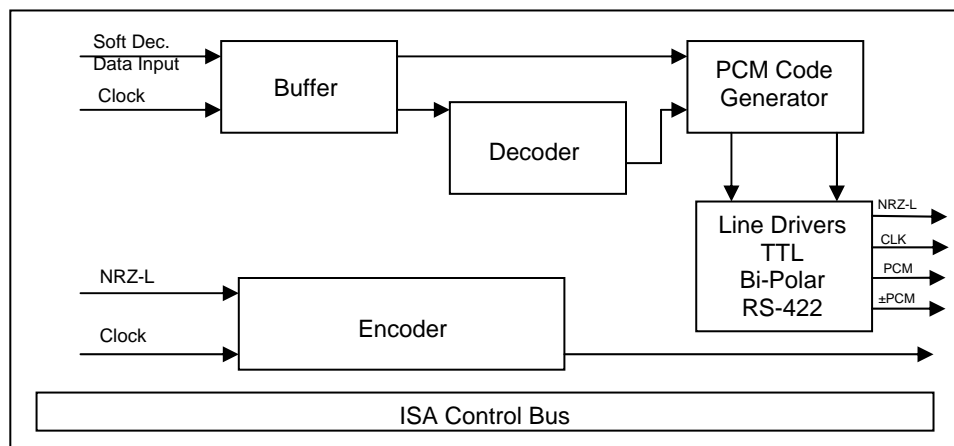
### Introduction

The Convolutional (Viterbi) Decoder/Line Driver Board is the perfect solution to performance problems in noisy signal environments. The TCON decoder module provides better than 5 dB encoding gain. Maximum error correction flexibility is provided with programmable support for Rate 1/2 Encoding/Decoding, Rate 1/3 Encoding/Decoding (optional), alternate symbol inversion, JPL, and NASA symbol formats, data scrambling, and interleaving (optional).

Data is accepted from either a companion PCM Bit Synchronizer installed in the same chassis or it may be accepted from an external bit sync. Data is accepted in hard or 3-bit soft decision format and is applied to the decoder circuitry. The module uses the industry standard Q1650 device manufactured by Qualcomm, Inc. The decoder processes data if it is enabled, or bypasses it if it is not, and sends it to the PCM Code Generator and Line Drivers. Both 50-ohm TTL and bipolar outputs are provided for data and clock outputs. Outputs include fixed NRZ-L data, programmable-phase clock and programmable PCM data.

The module also includes a fully programmable, independent on-board convolutional encoder. The encoder accepts NRZ-L data and clock from an external data source and is programmed to check all features of the decoder. Independent operation of and access to the encoder make it suitable for board, system, and transmission-link tests.

Occupying a single ISA card slot, the decoder is suitable for any operational environment. It may be plugged into any standard personal computer, ruggedized, portable, or lab rack-mount. The technical reference manual included with the TCON Module provides complete installation, programming, and other technical information.



<b>Decoder</b>	Input Type	1-bit, hard-decision data; 3-bit soft-decision data, sign magnitude
<b>Input Signals</b>	Decoder Rates	Programmable: rate 1/2 and rate 1/3 (optional)
<b>Decoder Polynomials</b>	Polynomials:	G1 = 171, Octal Length: 7
<b>Polynomials &amp; Constraint Length</b>	G2 = 133, Octal G3 = 165, Octal (Rate 1/3 only)	
	Clock Level	Data input; accompanied by coherent 0° clock TTL -compatible
	Alternate Symbol	Programmable inversion of G2
	Inversion Data	(compliant with CCSDS recommendations)
	Symbol Swap	Programmable G1 first or G2 first
	Operating Range	10 bits to 20 MHz; option to maximum 40 MHz
	Differential Data	Programmable differential decoding
	Scrambled Data	Programmable descrambling, two modes: CCITT V.35 and modified CCITT V.35 (STD)
<b>Decoder Output Signals</b>	Data Selectable PCM	NRZ-L (fixed); TTL, RS-422, Bipolar NRZ-L/M/S, BiØ-L/M/S, DM-M/S, RNRZ-L ±9/11/15
	Clocks Level	0,90,180, 270° (all fixed); TTL, RS-422 TTL compatible into 50 ohm load, RS-422 differential, Bipolar adjustable ± 1V to ± 3V
	Soft Decision	3-bit sign magnitude w/0° clock; TTL, RS-422
<b>Encoder Input Signals</b>	Code	NRZ-L
<b>Impedance/Level</b>	Clock	0° clock, coherent with NRZ-L input
<b>Operating Range</b>	High (10 Kohms TTL) 10 bps to 10 MHz (clock input); options to 20 MHz;	Operation completely independent of decoder portion of the board
<b>Encoder Output Signal</b>	Encoder Rates	Programmable: rate 1/2, rate 1/3 (optional)
	Encoder Polynomials/ Constraint Length	Polynomial:G0 = 171 octal length: 7G1 G1= 133, octal G2 = 165, octal (rate 1/3 only)
	Alternate Symbol	Programmable inversion of G2 symbol (per CCSDS coding recommendations)
	Inversion Data	Programmable G1 first or G2 first
	Symbol Swap	Programmable differential encoding
	Differential Data	Programmable differential encoding
	Scrambled Data	Programmable descrambling, two modes: CCITT V.35 and modified CCITT V.35 (STD)
	Output Code	Serial convolutional NRZ-L, encoded per selected features
	Output Level	TTL, capable of driving 50-ohm load
<b>Electrical &amp; Environmental</b>	Form Factor	Occupies single full-length ISA slot.
	Temperature	0 °C to 50 °C (operating), -20 °C to 80 °C (storage)
	Power	.4A@5 VDC, .1A@12 VDC, .1A@;-12 VDC