

**Sciencetech 2120 Error Detection and Correction - Cyclic Code** is designed to provide the conceptual knowledge of code correction and detection by adding the redundant bits to actual bit pattern, which are used to represent the code word. Error detection is the ability to detect the presence of errors caused by noise or other impairments during transmission from the transmitter to the receiver. Error correction is the additional ability to reconstruct the original, error-free data.

A Cyclic Redundancy Check (CRC) is a type of function that takes as input a data stream of any length, and produces as output a value of a certain space, commonly a 32-bit integer. The term CRC denotes either the function or the function's output. A CRC can be used as a checksum to detect accidental alteration of data during transmission or storage. CRCs are popular because they are simple to implement in binary hardware, are easy to analyze mathematically, and are particularly good at detecting common errors caused by noise in transmission channels.

The selection of generator polynomial is the most important part of implementing the CRC algorithm. The polynomial must be chosen to maximize the error detecting capabilities while minimizing overall collision probabilities. The most important attribute of the polynomial is its length i.e. the number of the highest nonzero coefficient, because of its direct influence on the length of the computed checksum.

### Features

- On-board data and code clock generation
- On-board data generator
- BCD rotary switches for data selection
- LED numeric display
- Multiple data rate and code rate selection
- Seven bit code for four bit running or static data
- Single bit error detection and correction

### Scope of Learning

- Study of Cyclic Encoding and Decoding of BCD bit sequence
- Study of Error Detection & Correction of bits sequence

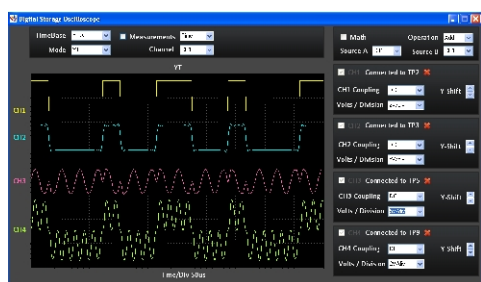
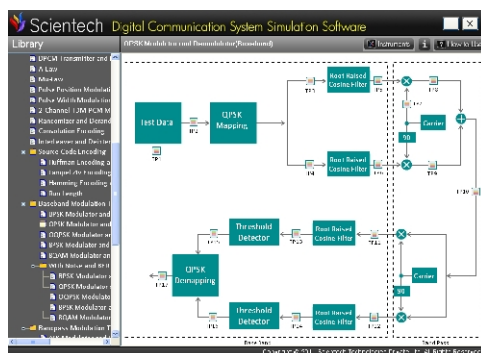
### Technical Specifications

Crystal Frequency	:	4.096 MHz
Data Rates	:	16 KHz, 8 KHz, 4 KHz, 2 KHz and 1 KHz
Code Rates	:	32 KHz, 16 KHz, 8 KHz, 4 KHz and 2 KHz
Word Length	:	4 bits
Code Length	:	7 bits code and 1 stuffed bit
Data Format	:	NRZ (Not Return to Zero)
Test Points	:	45 nos.
Interconnections	:	2 mm Sockets
Internal Operating Voltage	:	+ 5V DC
Dimensions (mm)	:	W 326 x D 252 x H 52
Power Supply	:	110V - 260V AC, 50/60Hz
Weight	:	1 Kg. (approximately)
Operating Conditions	:	0-40°C, 85% RH
Product Tutorial	:	Online

### Included Accessories

Patch cord 8"	:	20 nos.
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### Simtel 11 - Digital Communication Interactive Software (optional)



### Topics

- Source: Signal Source, Pulse Generator, Data Generator, Delay
- Math Operations: Adder, Subtractor, Multiplier
- Natural and Flattop Sampling
- Line Encoding and Decoding
- Delta Modulator and Demodulator
- Adaptive Modulator and Demodulator
- Sigma Delta Modulation and Demodulation
- PCM Transmitter and Receiver
- DPCM Transmitter and Receiver
- DPCM Transmitter and Receiver
- A-Law and MU-Law
- Pulse Position Modulation and Demodulation
- Pulse width Modulation and Demodulation
- 2-Channel TDM-PCM Multiplexer

For more details refer Simtel 11 Catalog