Convolutional Codes

Introduction

Block Codes: Code words are produced on a block by block basis.

In Block Codes, the encoder must buffer an entire block before generating the associated codeword.

Some applications have bits arrive serially rather than in large blocks

Convolutional codes operate on the incoming message sequence continuously in a serial manner

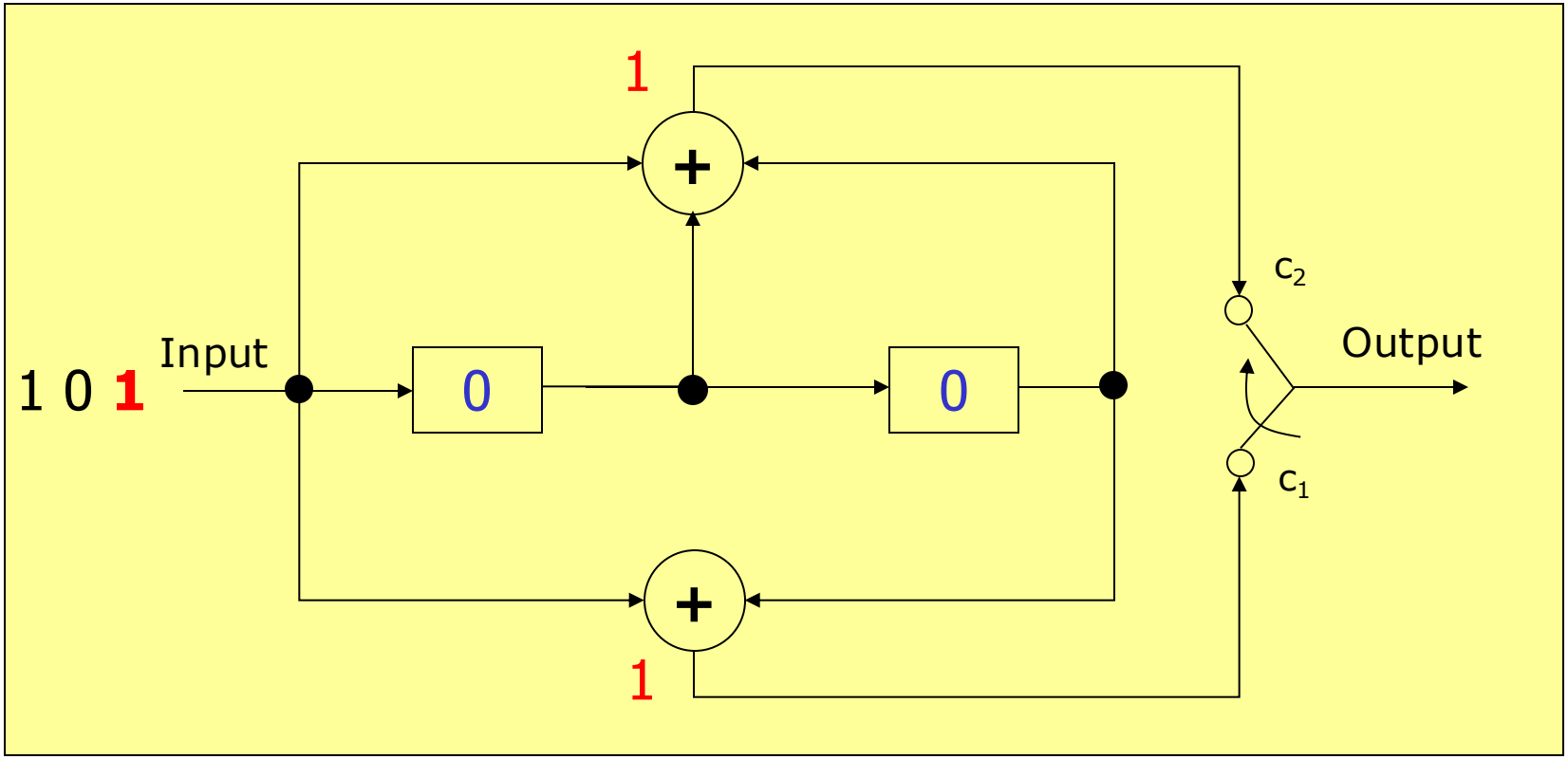
Convolutional Codes Specification

A convolutional code is specified by three parameters (n, k, m), where

- k/n is the *coding rate* and determines the number of data bits per coded bit
- m is called the *constraint length* of the encoder where the encoder has m-1 memory elements

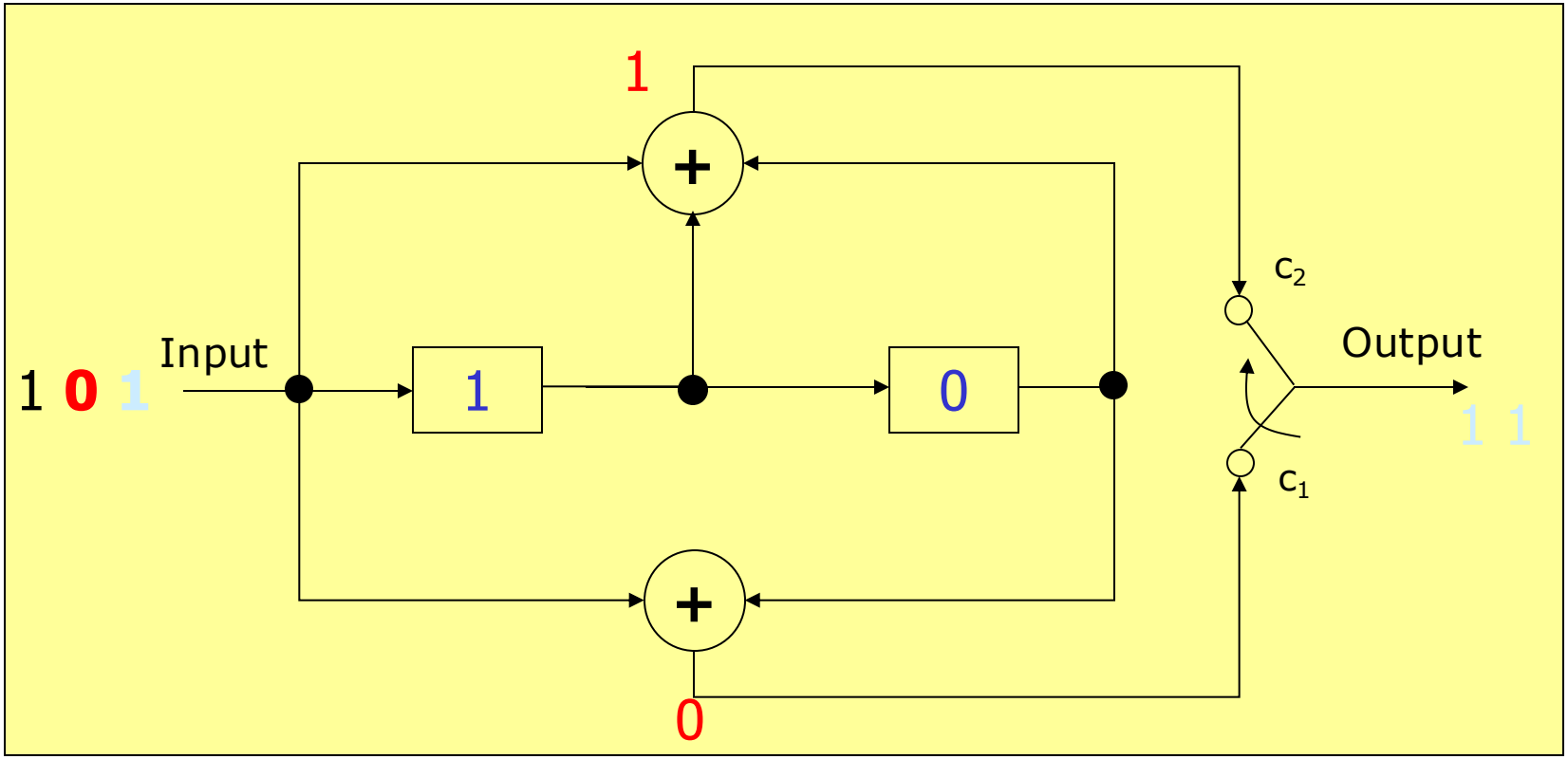
Convolutional Encoder: Example

Rate ½ Convolutional Encoder



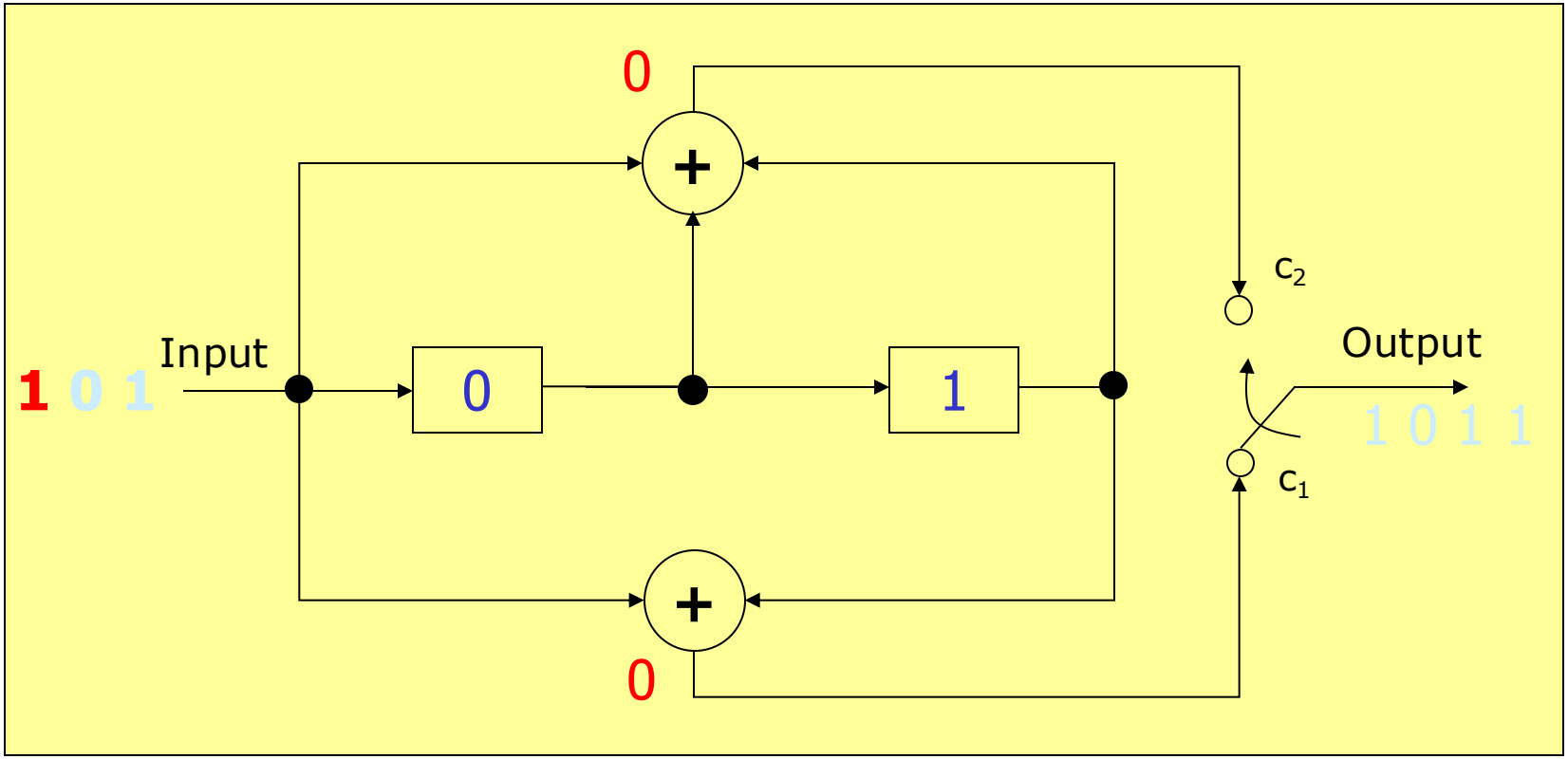
Convolutional Encoder: Example

Rate ½ Convolutional Encoder



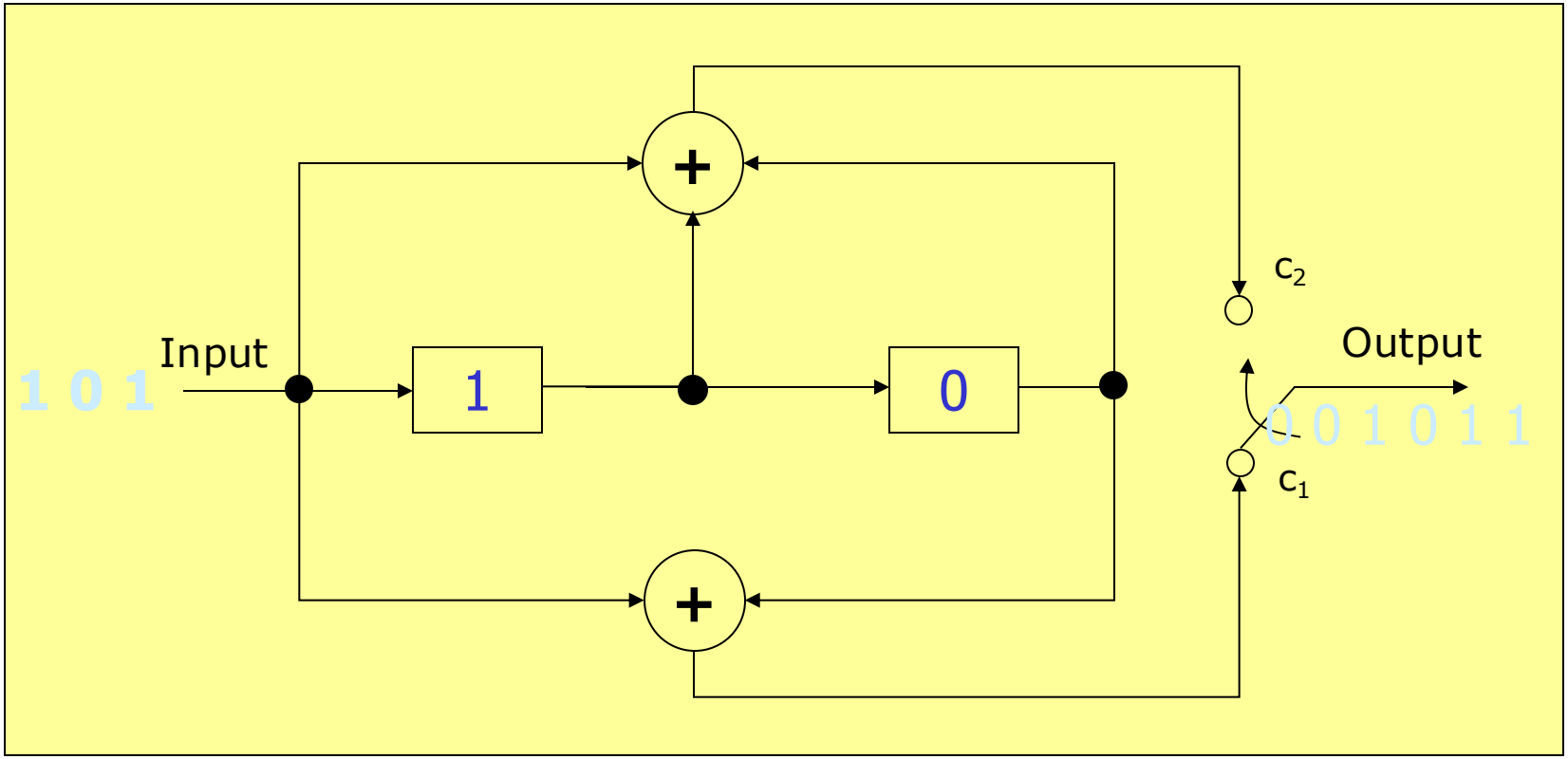
Convolutional Encoder: Example

Rate ½ Convolutional Encoder

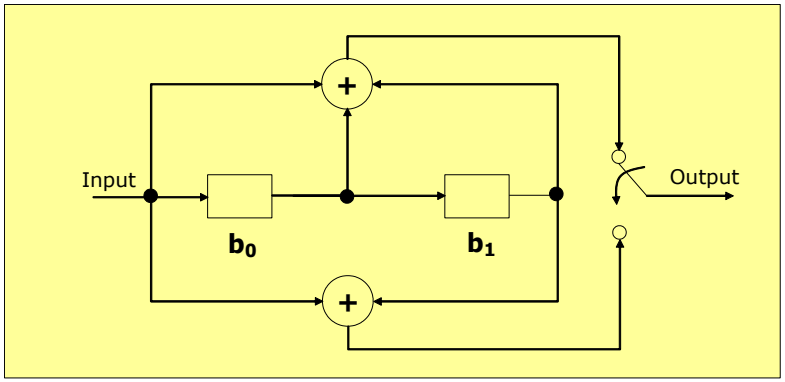


Convolutional Encoder: Example

Rate ½ Convolutional Encoder



State Diagram Representation



States (b_0b_1)	
s_0	00
s_1	10
s_2	01
s_3	11