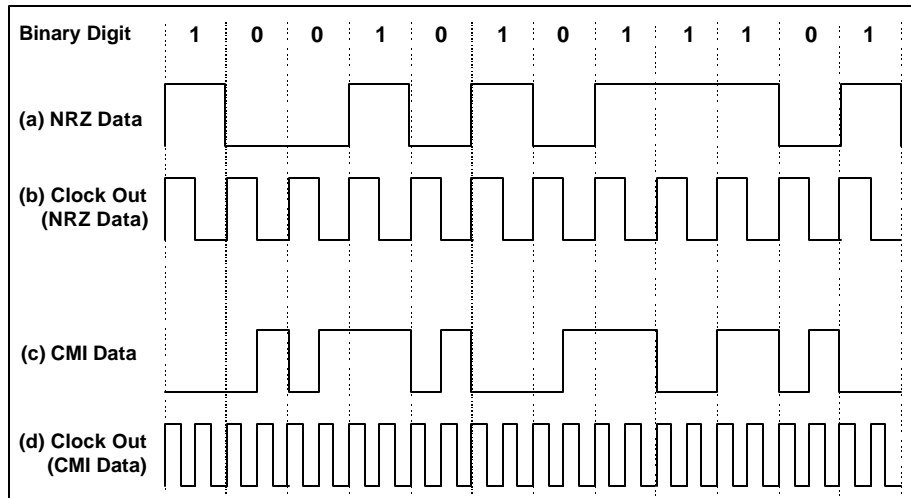# TRU-600A
Code Mark Inversion (CMI) Input Data

Introduction

The TRU-600A is a high performance, timing recovery module designed to extract a clock signal from an incoming digital data stream. The device provides an output clock signal along with a retimed and regenerated data stream. Through the use of advanced SAW Filter technology the TRU-600A provides the timing recovery function with full and consistent compliance to SONET, SDH and NTT jitter requirements.

The primary application of the TRU-600A device is the extraction of a clock signal from an incoming Non-Return to Zero (NRZ) data stream. This data type is often utilized in optical telecom transmission. An example is shown in Figure 1(a). NRZ data is a 1B1B code with one line bit for each associated binary bit. Although initially designed for NRZ timing recovery applications, it may be applied for other data formats.

CMI Input Data

In addition to NRZ data formats, the TRU-600A device is also commonly applied for clock extraction of input CMI data streams. CMI data is a 1B2B data format with two line bits for each associated binary bit.

As illustrated in Figure 1(c), a CMI low is represented by a positive transition in the center of the bit period. A CMI high is represented by no transition within the bit period, but with alternating polarity for each bit period. (A CMI low is transmitted as a 01, while a CMI high is either 11 or 00).

Because the TRU-600A was originally intended for NRZ applications, it will interpret an incoming CMI data stream as a NRZ stream at twice the binary rate. For this reason, when using the TRU-600A in CMI applications, the device should be tuned to twice the binary rate of the CMI data.

For example, a TRU-600A @ 311.040 Mb/s would be used to recover a clock signal from an input 155.52 Mb/s CMI data stream. Also note for CMI applications, that the resulting recovered clock will be twice the binary rate and may require division by 2.

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