EXPERIMENT #8 Time Division Multiplexing

INTRODUCTION

Time division multiplexing (TDM) is a communications process that transmits two or more streaming digital signals over a common channel. The transmitter accepts the input from each individual end user, breaks each signal into segments, and assigns the segments to the composite signal in a rotating, repeating sequence. The composite signal thus contains data from multiple senders. The individual signals are separated out by means of a circuit called a demultiplexer, reassembled and routed to the proper end users. Each individual data stream is reassembled at the receiving end based on the timing.

Laboratory Procedure

- Set up Figure 1. to test a typical example for time sharing in PAM the time-division multiplexing (TDM) system. Set Sample time ← 1/1000 for all modules, and Simulation stop time ← 1.
- Set $m1(t) = sin(2\pi t)$, $m2(t) = 0.6cos(6\pi t)$.
- Try to generate a TDM signal s(t) with sampling rate fs = 10 Hz on each signal and half-width pulse shape, by changing the settings of Pulse Generators and Delay. The Delay module right shifts the input signal for k sample points, if we set it as Delay length (Value) \leftarrow k.
- Plot the output signal. where m1(t) = sin(2πt), m2(t) = 0.6cos(6πt). Try to generate a TDM signal s(t) with sampling rate fs = 10 Hz on each signal and half-width pulse shape, by changing the settings of Pulse Generators and Delay. Hint The Delay module right shifts the input signal for k sample points, if we set it as Delay length (Value) ← k.



Figure 1: Two channel TDM system

Report:

- 1. How to choose the sampling rate in TDM system.
- 2. Discuss the multiplexing procedure.