

Digital Communication Trainer

Features:

1. To understand the basic theory of digital communication system.
2. Design and implementation ability training of digital modulator and demodulator.
3. To understand the applications of digital modulator and demodulator.

Curriculum Outlines:

1. Design and implementation of line code encoder and decoder.
2. Design and implementation of PWM and PCM modulators.
3. Design and implementation of DM and ADM modulators and demodulators.
4. Design and implementation of ASK, FSK and PSK modulators and demodulators.



Specifications:

Module One: LT-17600-01

Chapter 1: Line Code Encoder

Experiment 1: Unipolar and Bipolar NRZ Signal Encoder

Type of Signal: TTL, Data Rate: 1 kbps ~ 4 kbps.

Experiment 2: Unipolar and Bipolar RZ Signal Encoder

Type of Signal: TTL, Data Rate: 1 kbps ~ 2.5 kbps, CLK: 2 kHz ~ 5 kHz.

Experiment 3: AMI Signal Encoder

Type of Signal: TTL, Data Rate: 50 bps ~ 250 bps, CLK: 100 Hz ~ 500 Hz.

Experiment 4: Manchester Signal Encoder

Type of Signal: TTL, Data Rate: 100 bps ~ 400 bps, CLK: 200 Hz ~ 800 Hz.

Chapter 2: Line Code Decoder

Experiment 1: Unipolar and Bipolar NRZ Signal Decoder

Type of Signal: TTL, Data Rate: 1 kbps ~ 4 kbps,

Experiment 2: Unipolar and Bipolar RZ Signal Decoder

Type of Signal: TTL, Data Rate: 1 kbps ~ 2.5 kbps, CLK: 2 kHz ~ 5 kHz.

Experiment 3: AMI Signal Decoder

Type of Signal: TTL, Data Rate: 50 bps ~ 250 bps, CLK: 100 Hz ~ 500 Hz.

Experiment 4: Manchester Signal Decoder

Type of Signal: TTL, Data Rate: 100 bps ~ 400 bps, CLK: 200 Hz ~ 800 Hz.

Module Two: LT-17600-02

Chapter 3: PWM Modulator

Experiment 1: uA741 Pulse Width Modulator

Carrier Signal: 1.5 kHz ~ 2 kHz, Audio Signal: 500 Hz.

Experiment 2: LM555 Pulse Width Modulator

Carrier Signal: 5 kHz ~ 10 kHz, Audio Signal: 1 kHz.

Chapter 4: PWM Demodulator

Experiment 1: Pulse Width Demodulator

Carrier Signal: 5 kHz ~ 6 kHz, Audio Signal: 500 Hz ~ 700 Hz.

Module Three: LT-17600-03

Chapter 5 PCM Modulator

Experiment 1: PCM Modulator

Built-in Sample Frequency: 8 kHz,
Built-in Operation Frequency: 2048 kHz, Audio Signal: 100 Hz ~ 2 kHz.

Chapter 6: PCM Demodulator

Experiment 1: PCM Demodulator

Built-in Sample Frequency: 8 kHz,
Built-in Operation Frequency: 2048 kHz,
Audio Signal: 100 Hz ~ 2 kHz.

Module Four: LT-17600-04

Chapter 7: Delta Modulator

Experiment 1: Delta Modulator

Type of Sample Signal: TTL CLK,
Sample Frequency: 32 kHz ~ 256 kHz, Audio Signal: 1 kHz ~ 3 kHz.

Chapter 8: Delta Demodulator

Experiment 1: Delta Demodulator

Type of Sample Signal: TTL CLK,
Sample Frequency: 32 kHz ~ 256 kHz, Audio Signal: 1 kHz ~ 3 kHz.

Module Five: LT-17600-05

Chapter 9: Adaptive Delta Modulator

Experiment 1: Adaptive Delta Modulator

Type of Sample Signal: TTL CLK,
Sample Frequency: 32 kHz ~ 128 kHz, Audio Signal: 500 Hz ~ 1 kHz.

Chapter 10: Adaptive Delta Demodulator

Experiment 1: Adaptive Delta Demodulator

Type of Sample Signal: TTL CLK,
Sample Frequency: 64 kHz ~ 256 kHz, Audio Signal: 500 Hz ~ 1 kHz.

Module Six: LT-17600-06

Chapter 11: ASK Modulator

Experiment 1: XR 2206 ASK Modulator

Carrier Signal: 20 kHz, Data Rate: 1 kbps.

Experiment 2: MC 1496 ASK Modulator

Carrier Signal: 20 kHz ~ 100 kHz, Data Rate: 2 kbps.

Chapter 12: ASK Demodulator

Experiment 1: Asynchronous ASK Demodulator(I)

(Using XR2206 as the modulated ASK signal)

Carrier Signal: 20 kHz, Data Rate: 200 bps ~ 1 kbps.

Experiment 2: Asynchronous ASK Demodulator(II)

(Using MC1496 as the modulated ASK signal)

Carrier Signal: 20 kHz, Data Rate: 200 bps ~ 1 kbps.

Experiment 3: Synchronous ASK Demodulator

Carrier Signal: 100 kHz, Data Rate: 200 bps ~ 2 kbps.

Module Seven: LT-17600-07

Chapter 13: FSK Modulator

Experiment 1: XR2206 FSK Modulator

Data Rate: 200 bps ~ 400 bps.

Experiment 2: SN74124 FSK Modulator

Data Rate: 200 bps ~ 400 bps.

Chapter 14: FSK Demodulator

Experiment 1: FSK Demodulator (I)

(Using XR2066 as the modulated FSK signal)

Data Rate: 200 bps ~ 400 bps.
Experiment 2: FSK Demodulator (II)
(Using SN74124 as the modulated FSK signal)
Data Rate: 200 bps ~ 400 bps.

Module Eight: LT-17600-08
Chapter 15: PSK Modulator
Experiment 1: PSK Modulator
Carrier Signal: 100 kHz, Data Rate: 200 bps.

Chapter 16 PSK Demodulator
Experiment 1: PSK Demodulator
Carrier Signal: 100 kHz, Data Rate: 200 bps.

Optional Function Generator/ Power Supply module: FG-17202
Power Supply: 4 fixed voltage outputs(+/- 5V, +/- 12V), 2 variable voltage outputs (+/- 0 ~15 V)
Low ripple and noise
Function Generator:
Output: 2 CHs
Frequency Range: 10 Hz ~ 100 KHz, 100Hz ~ 1 MHz
Waveforms: TTL pulse, Square, Triangle, and Sinewave
Amplitude: 10 Vp-p
2 built-in 6-digit frequency counters
Overload protection

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