

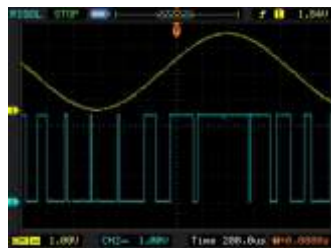
40696 provides an extensive hands on learning on PAM, PPM, PWM and Line Coding Techniques.

Features

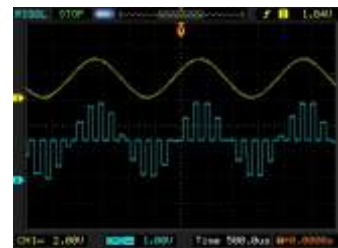
1. Modulator and Demodulator on same board
2. Different type of sampling, Natural, Flat top, sampled and hold
3. On-board DDS Signal Generator for standard and arbitrary signals
4. Selectable sampling frequencies for PAM
5. Selectable Ramp frequencies for PWM and PPM
6. On board 2nd order Butterworth low pass filter
7. SMD LED Indicators
8. Can be issued just like a book for hands-on learnings



Natural Sampled Output



PWM Output



Flat Top Sampled Output

Object

PAM Modulator & Demodulator Study and analysis of :

1. Pulse Amplitude Modulation.
2. Nyquist sampling rate.
3. Natural sampling with different types of message signals at different frequencies.
4. Flat top sampling with different types of message signals at different frequencies.
5. Sample & Hold output with different types of message signals at different frequencies.
6. Under sampling by varying the message frequency and sampling rate.
7. Second order Low Pass Butterworth filter.
8. Pulse Amplitude Demodulation of Sample & Hold output with Second Order Low Pass Butterworth filter.
9. Analyze all these Natural sampling, Flat top sampling and Sample & Hold output simultaneously and observe the difference.

Line Coding Techniques

Study and analysis of:

1. Different Line Coding techniques.
2. Different 8-Bit, 16-Bit and 32-Bit Pattern Generator by changing Pattern selection.
3. NRZ Unipolar coding.
4. NRZ Polar coding.

Note: Specifications are subject to change.

4. RZ Bipolar coding.
5. RZ Unipolar coding.
6. Manchester coding.
7. Analyze all types of Line coding outputs simultaneously and observe differences.

PWM Modulator & De-modulator

1. Pulse Width Modulation.
2. Single bit PWM output by varying the Ramp frequency and signal type.
3. Pulse Width Demodulation.
4. PWM demodulated output by varying the Ramp frequency.
5. Sample & Hold output of demodulated PWM signal.
6. Second order Low Pass Butterworth filter.
7. Analyze the final PWM demodulated output with Second order Low Pass Butterworth filter.

PPM Modulator & De-modulator

1. Pulse Position Modulation.
2. Single bit PPM output by varying the Ramp frequency and signal type.
3. Pulse Position Demodulation.
4. Sample & Hold output of demodulated PPM signal.
5. Second order Low Pass Butterworth filter.
6. Analyze the final PPM demodulated output with Second order Low Pass Butterworth filter.

Technical Specifications

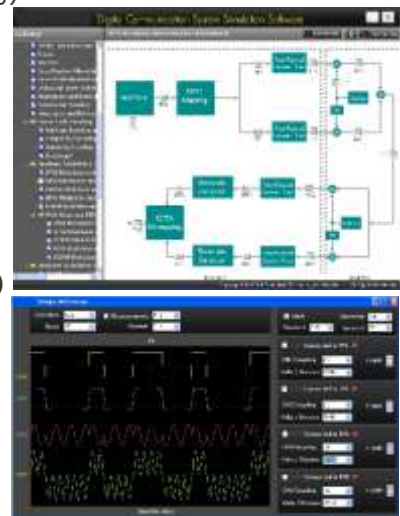
Modulation & Demodulation

Techniques	:	PAM, PWM & PPM Line Coding Techniques
Internal Signal Generator	:	Direct Digital Synthesizer
Types of Signal	:	Sine, Square, Triangle, Arbitrary signals.
Frequency	:	500Hz, 1KHz, 2KHz, 3KHz
External Signal :		
Types of Signal	:	Sine, Square, Triangle, Arbitrary signals
Maximum Input Voltage	:	3Vpp (Max.) +1.5V DC offset
Frequency	:	500Hz to 3.5KHz
Sampling/Ramp Frequencies	:	1.25KHz, 2.50KHz, 5KHz, 9.80KHz, 19.53KHz, 39.06KHz, 78.13KHz
SMD LED Indicators	:	46 nos for DDS signal selection DDS signal frequency selection Sampling selection Technique Selection Interconnect path
Crystal Frequency	:	20MHz
Selection Mode	:	Push switches
Random Data	:	8 Bit/ 16 Bit/ 32 Bit (For line Coding)
Data Frequency	:	500Hz, 1KHz, 2KHz, 3KHz
Test Points	:	29 nos.
Low Pass Filter	:	Cut-off frequency-5KHz
Dimensions (mm)	:	W 326 x D 252 x H 52
Power Supply	:	110V - 260V AC, 50/60Hz
Weight	:	1.5Kg (Approximately)
Operating Condition	:	0-40oC, 85% RH
Included Contents	:	2mm Patch cord - 2nos

Simtel 11 - Digital Communication Interactive Software (optional)

Topics

1. Source: Signal Source, Pulse Generator, Data Generator, Delay
2. Math Operations: Adder, Subtractor, Multiplier
3. Natural and Flattop Sampling
4. Line Encoding and Decoding
5. 2-Channel TDM-PCM Multiplexer



Simtel 11 - Software

Note: Specifications are subject to change.