



### Specifications:-

#### **Digital Communication Training System is based on VLSI and DSP platform**

- In-built internal data generator : 256 Bit
- Type of Encoding & Decoding: 1bit, 2bit, 3bit, 4bit
- Type of Modulations & Demodulations: ASK, FSK,
- BPSK, DBPSK, QPSK, DQPSK, p/4 QPSK, OQPSK, Mary ASK, M-ary FSK, MSK, 8-PSK, 8-QAM, 16-PSK, 16-QAM
- Constellation (Vector) pattern for respective modulation
- In-built Mixed Signal Oscilloscope (2CH Analog + 8CH Digital) software for real-time signal analysis
- Training System has more than 30 test points which will help students to observe the signal on
- Oscilloscope and Logic Analyzer PC to PC interface with interactive messaging software
- More than 30 experiments can be performed

### Scope of Learning

- Bit Clock and serial data
- Symbol Clock
- ASK modulation
- ASK demodulation
- FSK modulation
- FSK demodulation
- BPSK modulation
- BPSK constellation
- BPSK demodulation
- Differential encoding of serial data for modulation
- Differential decoding of serial data after demodulation

*Note: Specifications are subject to change, Photos shown above are Indicative, Actual Product can Vary.*



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- DBPSK modulation
- DBPSK demodulation
- 2-bit encoding and two channel (Inphase and Quadrature) modulation techniques
- QPSK modulation
- QPSK constellation
- QPSK demodulation
- 2-bit differential encoding of serial data for modulation
- 2-bit differential decoding of serial data after demodulation
- DQPSK modulation
- DQPSK demodulation
- OFFSET QPSK modulation
- OFFSET QPSK constellation
- OFFSET QPSK demodulation
- p/4 QPSK modulation
- p/4 QPSK constellation
- p/4 QPSK demodulation
- M-ary ASK modulation
- M-ary ASK demodulation
- M-ary FSK modulation
- M-ary FSK demodulation
- Half sinusoid wave shaping for MSK modulation
- MSK modulation
- MSK demodulation
- 3-bit encoding of serial data for modulation
- 3-bit decoding of serial data after demodulation
- 8-QAM modulation
- 8-QAM constellation
- 8-QAM demodulation
- 8-PSK modulation
- 8-PSK constellation
- 8-PSK demodulation
- 4-bit encoding of serial data for modulation
- 4-bit decoding of serial data after demodulation
- 16-QAM modulation
- 16-QAM constellation

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- 16-QAM demodulation
- 16-PSK modulation
- 16-PSK constellation
- 16-PSK demodulation

### Technical

- Frequencies : 1.6 KHz, 3.2 KHz, 10 KHz, 20 KHz Clock generator with variable
- Step frequencies : 1.6 KHz, 3.1 KHz, 10 KHz, 20 KHz Data Pattern length of 256 bit
- Encoding Techniques : 1bit, 2bit, 3bit, 4bit
- Modulation Techniques :ASK, FSK, BPSK, DBPSK, QPSK, DQPSK, p/4 QPSK, OQPSK, M-ary ASK, M-ary FSK, MSK, 8-PSK, 8-QAM, 16-PSK, 16-QAM,
- Decoding Techniques : 1bit, 2bit, 3bit, 4bit
- De-Modulation Techniques : ASK, FSK, BPSK, DBPSK, QPSK, DQPSK, /4 QPSK, OQPSK, M-ary ASK, M-ary FSK, MSK, 8-PSK, 8-QAM, 16-PSK, 16-QAM
- Built-in Mixed Signal Oscilloscope: MSO (DSO + 8 Channel Logic Analyzer) software
- Real-time Sampling : 25MSPS
- Memory Depth : 4K Per Channel
- Trigger Sources :CH1, CH2
- Vertical Resolution : 8bit
- Math :Addition, Subtraction, Multiplication
- Waveform Interpolation : Linear
- Power Supply : 110-220 V AC  $\pm 10\%$ , 50/60Hz
- Operating Conditions : 0-40 C, 80% RH

### Analog Communication

- Fourier analysis
- Amplitude Modulation: Standard Amplitude Modulation, DSBSC Modulation, SSB Modulation
- Frequency Division Multiplexing
- Frequency Modulation: Direct Modulation, Indirect Modulation
- Pulse Modulation: Pulse Amplitude Modulation, Pulse Width Modulation, Pulse Position Modulation
- Phase Locked Loop
- Super Heterodyne Receiver

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