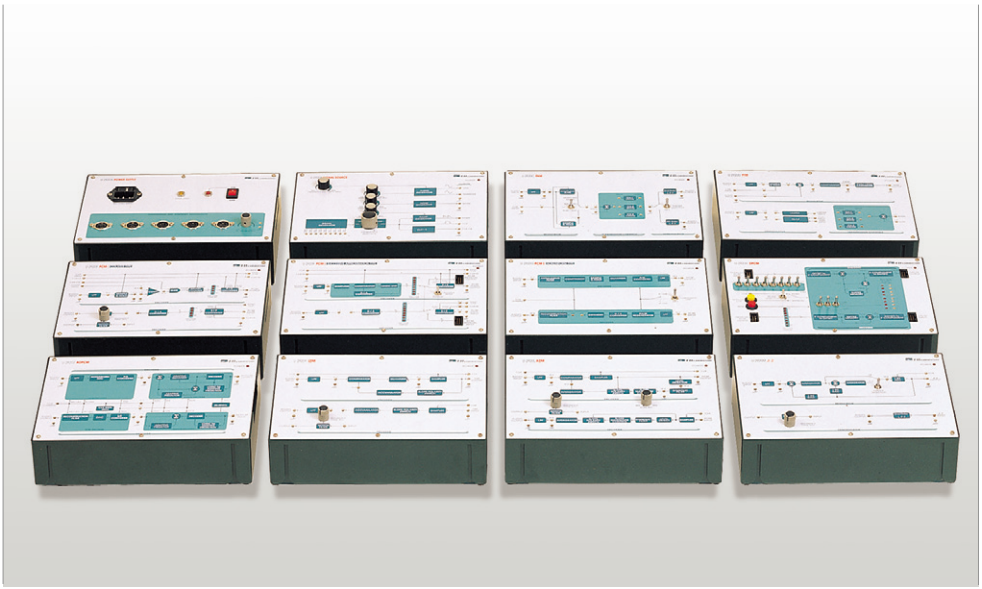
• Communication

PULSE/DIGITAL COMMUNICATION TRAINER

ED-2920

• Modularized by each communicarion type
• PAM, PTM, PCM, DPCM, ADPCM, LDM, ADM, Delta-sigma
• No need to have additional generators (built-in power supply and signal source)
• Can display the test point and measure signals using an oscilloscope



> EXPERIMENTS

- **PAM**
  - » To Understand PAM Signal Generation Which Makes an Example of Natural and Flat-Top
  - » To Know the Impact of Sampling Signal Frequency on PAM Signal At the Time Domain
- **PTM**
  - » To Understand PTM (Pulse Time Modulation) Signal Generation Methods
  - » To Understand PTM Signal Characteristics at the Time Domain
  - » To Understand the Relationship Between PWM Signal and PPM Signal
- **PCM I**
  - » To Understand A/D and D/A Conversion Processes
  - » To Understand the cCounter-type A/D Conversion System
  - » To Understand the Parallel-type D/A Conversion System
- **PCM II**
  - » To Understand the Successive Approximation-type A/D Conversion System
  - » To Understand PCM Signal Transmission Methods
- **PCM III**
  - » To Understand the μ-law and μ-law Companding Characteristic Curves
  - » To Understand the Influence of Companding on Demodulation Signal
- **DPCM**
  - » To Know the Methods of DPCM Signal Generation and Message Signal Demodulation
  - » To Know the Offset Binary Code, 2's Complement Code and Signed Binary Code
- **ADPCM**
  - » To Know the Relationship Between PCM CODEC's Operation Principle and Its Timing
  - » To Know the Relationship Between ADPCM System's Operation Principle and ADPCM Transcoder's Timing Diagram
- **LDM**
  - » To Know LDM Signal Generation and Message Signal Demodulation Methods
  - » To Know the Shapes of Slope Overload Noise and Granular Noise Generated in ΔM System
- **ADM**
  - » To Know ADM Signal Generation and Message Signal Demodulation Methods
  - » To Know the Methods of Oblique Overload Noise Prevention in CVSD Demodulation System
- **Δ-Σ**
  - » To Know Δ-Σ Demodulation Principles and S/N Improvement Methods
  - » To Know the Impact of Oversampling and Noise Shaping On the S/N Ratio at Δ-ΣEemodulation

ACCESSORIES

- Power Cable : 5ea
- AC Power Cord : 1ea
- Connection Cord : 1ea
- Experimental Manual : 1ea

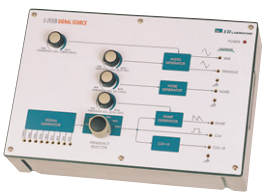
PULSE / DIGITAL COMMUNICATION TRAINER

ED-2920

Experiments Module

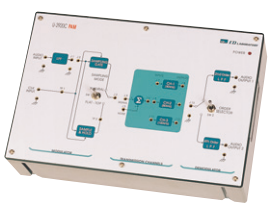
ED-2920A
POWER

- Input Voltage : AC220V, 50/60Hz
- Output Voltage : DC ±15V, ±5V / 500mA (Overcurrent Protection)
- ±5 Variable overload protection circuit(built-in)



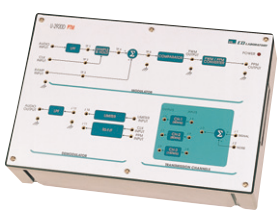
ED-2920B
SIGNAL OUTPUT

- Sinusoidal/Triangular Wave : 200Hz~8kHz, 0.5V~8V
- Ramp Wave : 1, 2, 4, 8, 16, 32kHz, Output 500mV~10Vp-p
- Pulse Wave : 1, 2, 4, 8, 16, 32, 64, 128kHz, 2.08MHz, CLK x 8, Output +5Vp-p
- Noise Generator : 200mV~2Vp-p



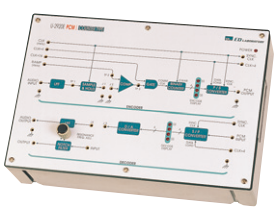
ED-2920C
PAM(Pulse Amplitude Modulation)

- Natural & Sample-and-hold
- 2nd Order & 4th Order Low Pass Filter(fc = 3.4kHz)
- Channel Bandwidth : 40kHz, 80kHz, 160kHz



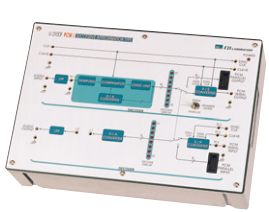
ED-2920D
PAM(Pulse Time Modulation)

- PWM modulation/demodulation
- PTM modulation/demodulation
- Channel Bandwidth : 40kHz, 80kHz, 160kHz



ED-2920E
PCM(Counter-type)

- 4-Bit Counter A/D Converter
- 4-Bit Parallel D/A Converter
- 4-Bit Serial Transfer Mode
- Notch Filter : 300Hz~3.4kHz



ED-2920F
PCM Ⅱ (Successive Approximation-type)

- 8-Bits Successive Approximation A/D Converter
- 8-Bits Parallel D/A Converter
- 8-Bits Parallel/Serial Transfer Mode
- 8-Bits Encode/Decode Display
- Low Pass Filter(fc = 3.4kHz)

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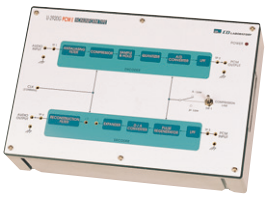
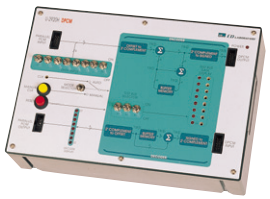


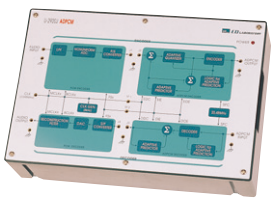
ED-2920G
PCM Ⅲ (Non-Uniform Type)

- 8-Bit Nonuniform A/D Converter
- 8-Bit Parallel D/A Converter
- A-Law/μ-Law Companding
- Low Pass Filter(fc = 3.4kHz)



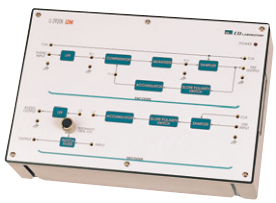
ED-2920H
DPCM(Differential PCM)

- 8-Bit Offset-to-2's Complement Code Conversion
- 8-Bit 2's Complement-to-Signed Code Conversion
- Auto/manual 8-Bit data inputs
- Bus data indication
- Bus data display



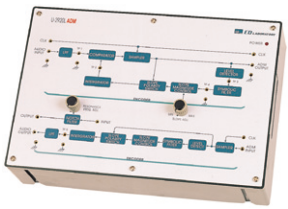
ED-2920J
ADPCM(Adaptive Differential PCM)

- Signal Frequency : 200Hz~3400Hz
- A-law PCM Codec / ADPCM Transcoder
- Short-frame timing PCM Codec / ADPCM Transcoder
- 64kbps transcoding rate ADPCM Transcoder
- Master Clock Frequency : 2.048MHz
- Frame Synchronous Frequency : 8kHz



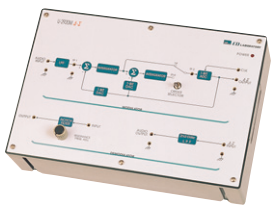
ED-2920K
LDM(Linear Delta Modulation)

- Staircase Approximation Delta Modulation
- Sampling Clock Rate : 8kHz~64kHz
- 4-Bit D/A Converter
- Sampling Clock Rate 8kHz~64kHz
- Low Pass Filter : fc = 3.4kHz
- Notch Filter : 300Hz ~ 3.4kHz



ED-2920L
ADM(Adaptive Delta Modulation)

- CVSD Delta Modulation
- Input Signal Range : ±5Vp-p
- 3-Bit Algorithm
- Sampling Clock Rate : 8kHz~64kHz
- Slope Magnitude Adjustment
- Notch Filter : 300Hz~3.4kHz



ED-2920M
Δ-∑(Delta-Sigma)

- First/Second Noise Shaping
- First/Second Order Integrator
- Over-sampling clock rate : 8kHz~64kHz
- 8th-order Butterworth LPF : fc = 3.4kHz
- Notch Filter : 300Hz~3.4kHz