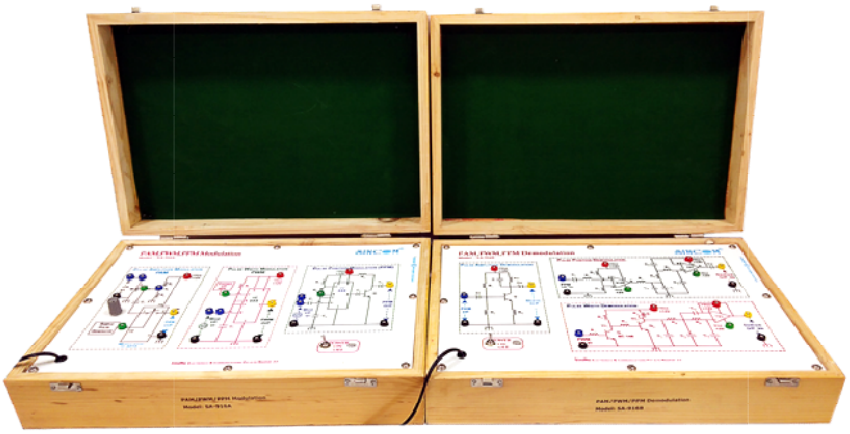
PAM,PWM,PPM Modulation& Demodulation

Model:SA-916



SINCOM SA-916PAM,PWM,PPM Modulation & Demodulationis a widespread all-in-one trainerdesigned to study principles, operation, generation, and detection of Pulse Amplitude Modulated PAM,Pulse Width Modulated PWM and Pulse Position Modulated PPM signals. It has separate modules of PAM, PWM & PPM modulators & demodulators.

PAM Modulation and Demodulation: The PAM modulator employs a CMOS switching IC for the modulating input and sampling pulses, enabling it to generate both single and dual polarity PAM outputswith onboard DC level insertion and a sampling pulse generator, which also accommodates external sampling pulse inputs. Furthermore, it allows for the adjustment of the modulating signal's amplitude, facilitating users in observing how changes in the sampling pulses and modulating input influence the PAM outputs in a more accessible experimental format. The PAM demodulator circuit, which is based on a transistor and includes a noise filter, is responsible for recovering the information (modulating) signal at the receiver end from the applied Pulse Amplitude modulated input signal, thus delivering the AF Demodulated output.

PWM Modulation and Demodulation: The PWM modulator employs a timer IC along with RC components and control voltage to deliver PWM output for the applied AF modulating input and sampling pulse carrier input. Additionally, it features an onboard Sample Pulse generator with facility to connects external sampling pulse inputs, as well as the ability to adjust the depth of the PWM output and observe the variations in the PWM output corresponding to changes in the AF modulating and sampling pulse signals.The PWM demodulator circuit, which is based on transistor, operational amplifier with a noise filter for recovering the information (modulating) signal at the receiver end for the applied Pulse Width modulated input signal, thereby providing the AF Demodulated.

PPM Modulation and Demodulation: The PPM modulator uses a timer IC along with RC components. internally generated carrier signal to deliver PPM output for the applied AF modulating input. Additionally, it features to adjust the depth of the PPM output and observe the variations in the PPM output corresponding to changes in the AF modulating signals.The PPM demodulator circuit, which is based on two operational amplifiers with a noise filter for recovering the information (modulating) signal at the receiver end for the applied Pulse Position modulated input signal, thereby providing the AF Demodulated.

Features

- Very Easy for Operation
- Sampling Pulses on board
- CMOS based PAM modulator with Single and Dual Polarity PAM Output
- IC based PWM and PPM modulator
- Easy to control depth of Modulation
- Stable PAM, PWM, PPM Output
- Precise PAM, PWM, PPM Demodulator circuit
- Noise Filter
- Accurate AF Demodulated Output
- In-Built Fixed regulated DC Power Supply
- A multi-coloured circuit diagram is printed on the front panel of the whiteboard.
- Enclosed in an attractivePoly Coated Imported Pine Wooden cabinet
- Interconnections by 2mm high quality banana sockets and pins.
- Maximum Test points to explore all the corners of experiment

Technical Specifications

AC Mains Power Supply	: 230V ±10%, 50Hz
DC Power Supply	: Regulated ±12V/500mA
Modulation type	: PAM, PWM,PPM
PAM Modulator	: CMOS analog switching IC 4016 based
PWM& PPM Modulator	: Timer IC 555 based circuit
Output	: PAM Single and Dual Polarity, PWM and PPM
DC Insertion	: DC 6V for PAM
Sampling Pulses Generator	: IC 555 and Digital based
Modulation Index Control	: By Potentiometer Under and Over Modulation
Sampling Carrier Frequency	: 100KHZ approx. Internally Generated
Modulating Signal Frequency	: 60Hz -3KHz
Bandwidth	: 3KHz
PAM Demodulator	: BJT CE Amplifier with RC Filters based circuit
PWM Demodulator	: BJT CE Amplifier, OP-AMP IC 741 and RC Filters based circuit
PPM Demodulator	: Two OP-AMP IC 741 and RC Filters based circuit
Noise Filters	: One
Demodulator Output	: AF Demodulated O/P for PAM, PWM & PPM
Weight	: 4kg
Dimensions (mm)	: L 270 x W 390 x H 130 X 2
Interconnections	: 2mm Banana sockets
Operating Temperature	: 0-50^{0}C, 80% RH

Learning Scope

- To study the circuit of Pulse Amplitude Modulation (PAM). To observe & note Single and Dual Polarity PAM output. To observe change in PAM O/P w.r.t change in modulating I/P.
- To study the circuit of Pulse Amplitude Demodulation (PADM). To observe & note the change in demodulated O/P w.r.t change in analog I/P.
- To study the circuit of Pulse Width Modulation (PWM). To observe the change in PWM O/P w.r.t change in modulating signal voltage.

- To study the circuit of Pulse Width Demodulation (PWDM). To observe & note the change in demodulated O/P w.r.t change in modulating AF input.
- To study the circuit of Pulse Position Modulation (PPM). To observe the change in PPM O/P w.r.t change in modulating signal voltage.
- To study the circuit of Pulse Position Demodulation (PPDM). To observe & note the change in demodulated O/P w.r.t change in modulating AF input.
- To plot the PAM, PWM and PPM Waveforms.

Other Instruments Required: Function Generator, Oscilloscope.

Accessories Included: Patch Cords, Instruction Manual and Demo Video.

Subject to Change