Module TPS - 3431

Digital Communication Training System

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Technical Characteristics

The trainer is enclosed in a metal case, which has a wide experiment printed circuit board (22 cm x 34 cm). This ensures easy handling and good visibility of the components.

The components are located on the board, which has a silkscreen print of the analytical circuits and component drawings. The central part of the experiment board includes all the circuit block drawings and the all the hands-on components, test points, and banana sockets.

The fixed are located on the top side of the panel under a sturdy transparent cover.

The system includes a built-in power supply with +12V, +5V, and variable DC voltage outlets. An included external low AC voltage power adapter feeds the system.
The system includes:
• ASK modulator
• FSK modulator
• PSK modulator
• DPSK modulator
• QPSK modulator
• Band pass filter
• Envelope detector
• Schmitt trigger amplifiers
• PSK detector
• DPSK detector
• APSK detector
• Data receiver
• Power supply
• SES Lab unit with two-channel scope and function generator, which communicates with a PC for controlling the function generator and displaying the scope's signals, including spectrum analysis
• PC software for SES lab unit

Objectives

This course introduces the student to digital communication. The course provides comprehensive hands-on experiments in measuring digital communication circuits and covers digital parallel to serial data conversion ASK, FSK, PSK, DPSK, QPSK modulation and demodulation, serial to parallel conversion and PLL signal follower.

Description

The system is stand-alone, containing all the necessary electronics components needed for performing the experiments.

The system includes the SES Lab unit with two-channel oscilloscope and a function generator, which communicates with a PC for controlling the function generator and displaying the scope's signals including spectrum analysis.

The built-in function generator also can be operated manually, controlled by the embedded micro-controller. A sine or triangular waveform at a constant or sweep frequency is available.

Experiments

This system enables the student to perform several experiments and covers the following topics:

• Digital data transmission
• Digital data reception
• Data transmission rates
• ASK signal modulation
• FSK signal modulation
• PSK signal modulation
• DPSK signal modulation
• QPSK signal modulation
• Band pass filter and signal detection
• Signal follower
• Envelope detection
• ASK demodulation
• FSK demodulation
• PSK demodulation
• DPSK demodulation
• QPSK demodulation

A teacher guide, a student experiment manual accompany the system