



DEGEM  
SYSTEMS

Com & Telecom

Modern Communication

Fiber Optic Communication

Antennas

Radar

Cellular Communication

Global Position Systems

Satellite Communication

Microwaves

Telecommunication Networks

# MDC-3210

## Modern Communication Training System

### About the product

The MDC Modern Communications product line is designed to provide practical training for engineers and technologists in the fundamentals of analog and digital communications that are the basis of modern communications and telecommunication systems. The prime objective is to study the principles of operation of various communications techniques and their effect on real life signals such as speech, music, data and video.

The training system consists of two service units, a base unit and six different modules:

- MDC-3201 - Audio data acquisition service unit
- MDC-3202 - RF service unit
- MDC-3203 - Base unit and power supply
- MDC-3211 - Audio and data signals
- MDC-3212 - Source encoding and decoding
- MDC-3213 - Baseband transmission and synchronization
- MDC-3214 - Linear modulation and demodulation
- MDC-3215 - Angle modulation and demodulation
- MDC-3216 - Superheterodyne receiver

The above two service units and six modules that plug into the four available slots in the MDC-3203 base unit to quickly configure the system for each experiment. The service units provide virtual instruments for generating and analyzing signals.

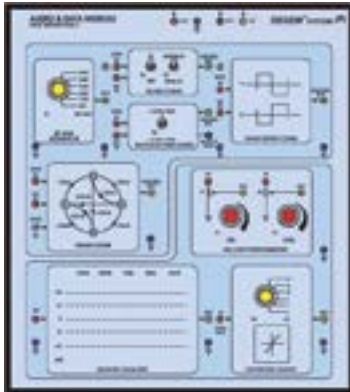
### Courseware

The accompanying courseware for each experiment runs in the MS-WINDOWS environment, offers essential theory, easy to follow step-by-step experiment procedure instructions and verifies answers to multiple-choice questions. The student courseware and instructor guide are written by pedagogical experts in modern communications technology to support every stage of the learning process.

# Modules

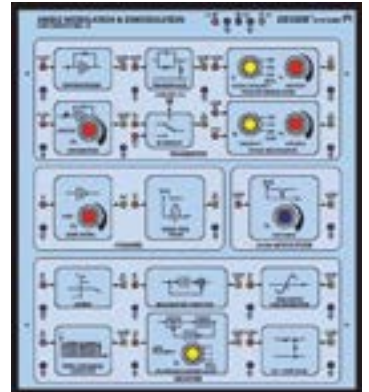
## MDC-3211 Audio and Data Signals

- Types of signals
- Voice signal
- Response of the human ear
- RZ and NRZ codes
- Multilevel PAM
- Manchester & Miller codes



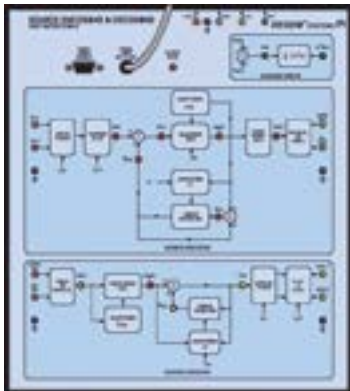
## MDC-3215 Angle Modulation and Demodulation

- Phase modulation techniques
- Correlation of PM and FM
- Analog and digital FM
- Phase modulation techniques
- FM detectors
- Phase locked loop



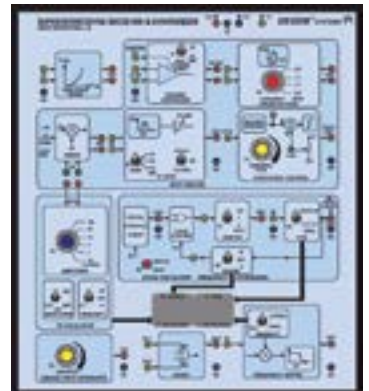
## MDC-3212 Source Encoding and Decoding

- Speech signal characteristics
- Quantization
- Pulse code modulation (PCM)
- Delta modulation (DM)
- Adaptive DM, DPCM
- Time division multiplexing



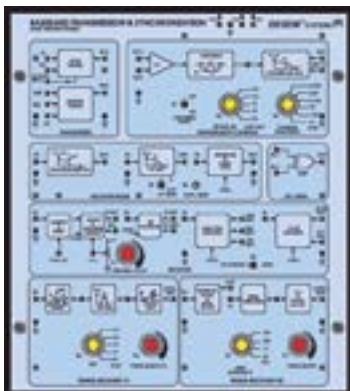
## MDC-3216 Superheterodyne Receiver

- Mixing principle
- Image frequency
- Noise figure and sensitivity
- Selectivity
- Automatic gain control (AGC)
- Local oscillator with a PLL



## MDC-3213 Baseband Transmission & Synchronization

- Twined binary code (TBC)
- AMI code
- Compare AMI with 2B1Q
- ISI and eye patterns
- AMI/2B1Q noise performance
- Timing recovery



## MDC-3201 Audio Data Acquisition Service Unit

- Dual analog inputs
- Dual preamplifiers
- Dual adjustable filters
- 12-bit digital-to-analog and analog-to-digital converters
- Dual preamplifiers
- Audio amplifier, loudspeaker



## MDC-3214 Linear Modulation and Demodulation

- Frequency translation
- Frequency division multiplex
- Amplitude modulation
- Single and double sideband
- Quadrature amplitude modulation
- Correlation receiver



## MDC-3202 RF Service Unit

- Frequency synthesizer
- RF sine generators (2)
- White noise generator
- True RMS meter
- Tunable bandpass filter
- Bit error rate meter



## REQUIRED ACCESSORIES

Specifications are subject to change without prior notice

Personal computer with MS Windows