How to present TIMS to Professors using TIMS Brochure

Quick reference Cheat Sheet

Please visit

www.emona-tims.com/distributor-training

to watch the video

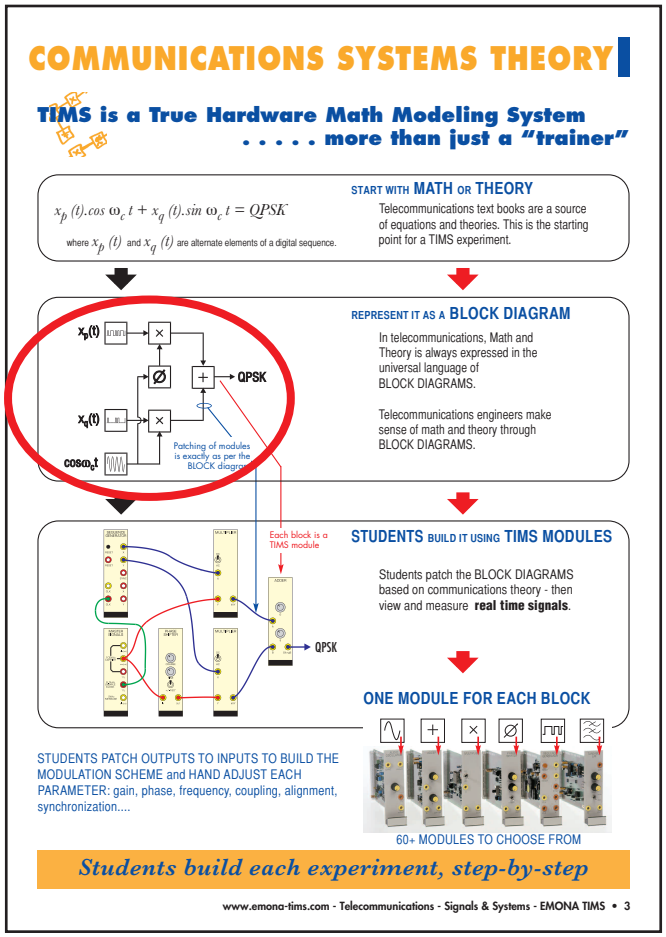
"I would like to introduce you the TIMS Telecoms Engineering Modeling System"

"TIMS is a Laboratary Teaching equipment for Telecommunications and Signals and Systems courses."

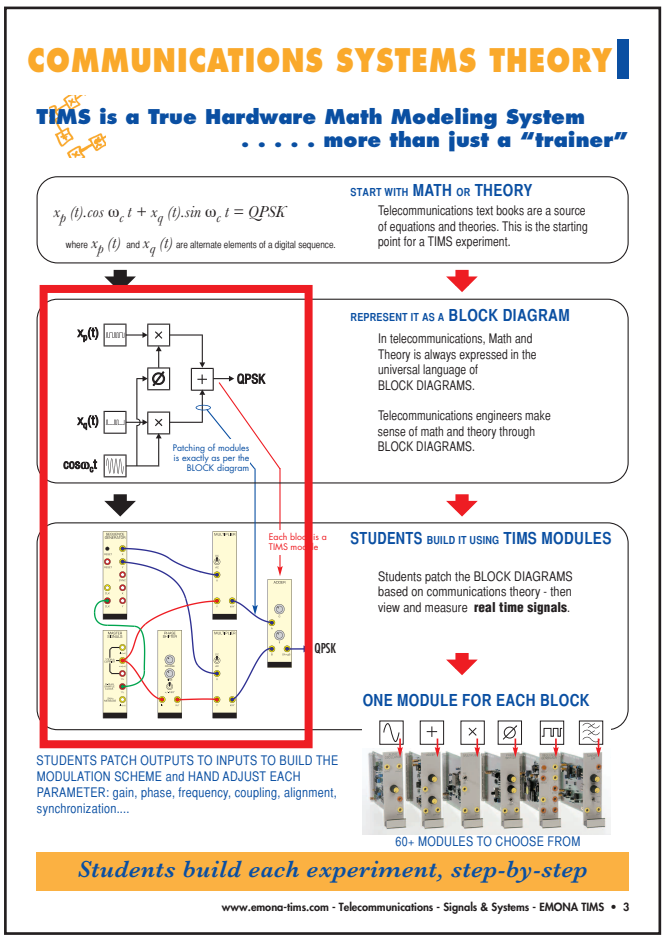
"With TIMS, Students gain real understanding behind the principles of today's and tomorrow's Telecoms technologies."

"TIMS covers more than 200 experiments in fields such as:

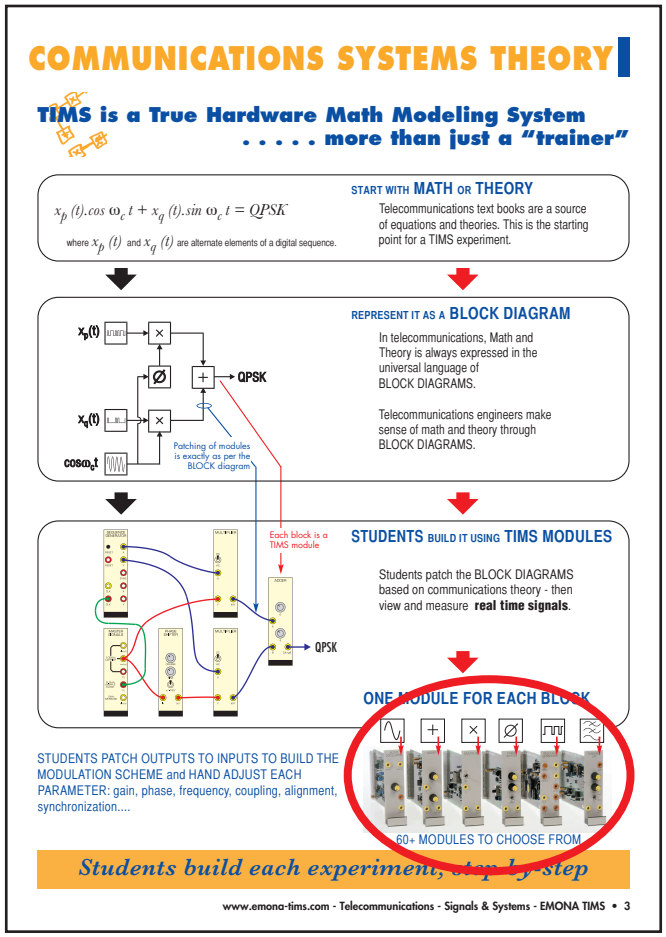
> Wireless Communications
> Signals & Systems
> Digital Signal Processing
> Software Defined Radio
> Fiber Optics
> Student Projects"



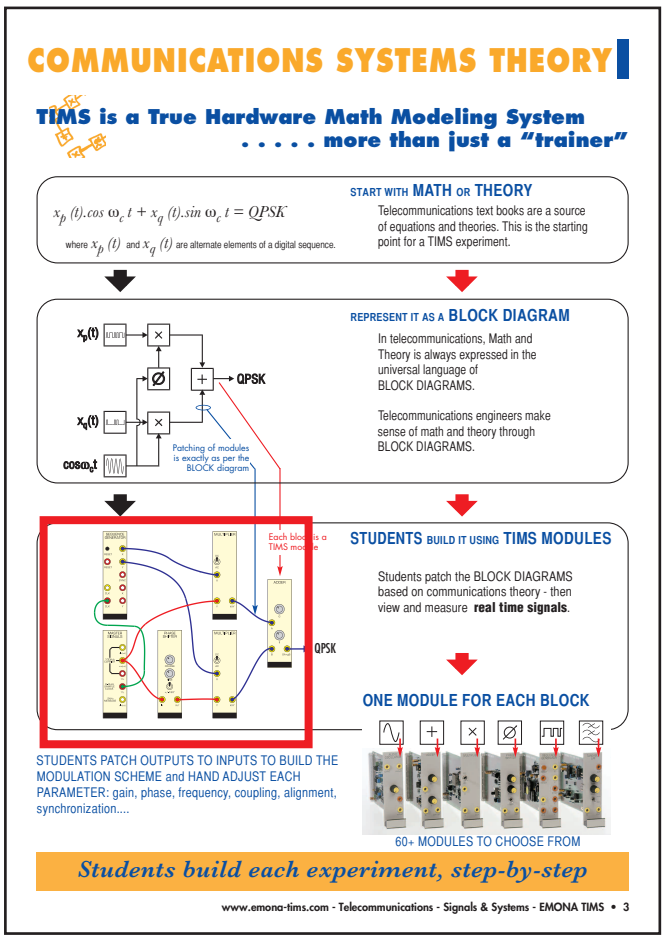
"Telecoms theory and equations are always expressed as BLOCK DIAGRAMS in Text Books."



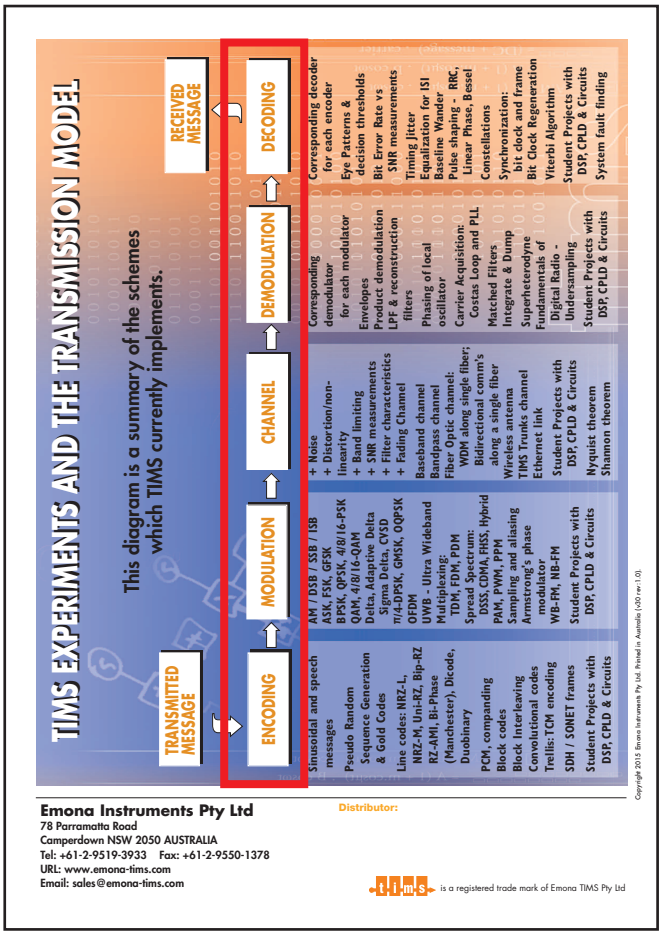
"TIMS Modeling system brings these Block Diagrams to life and students build experiments step by step."



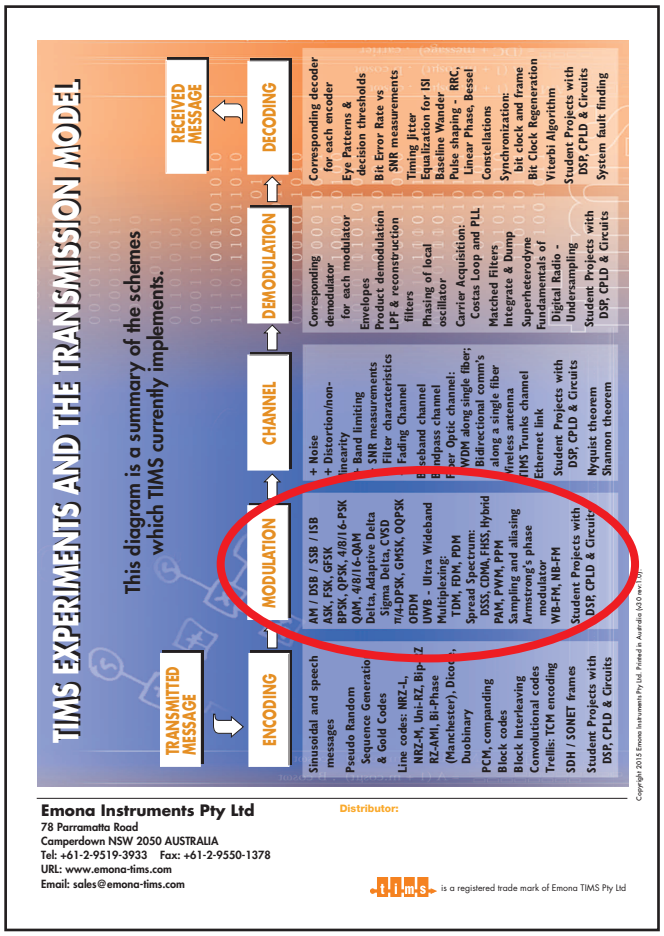
"There is a TIMS hardware module available for each block in the Block Diagram"



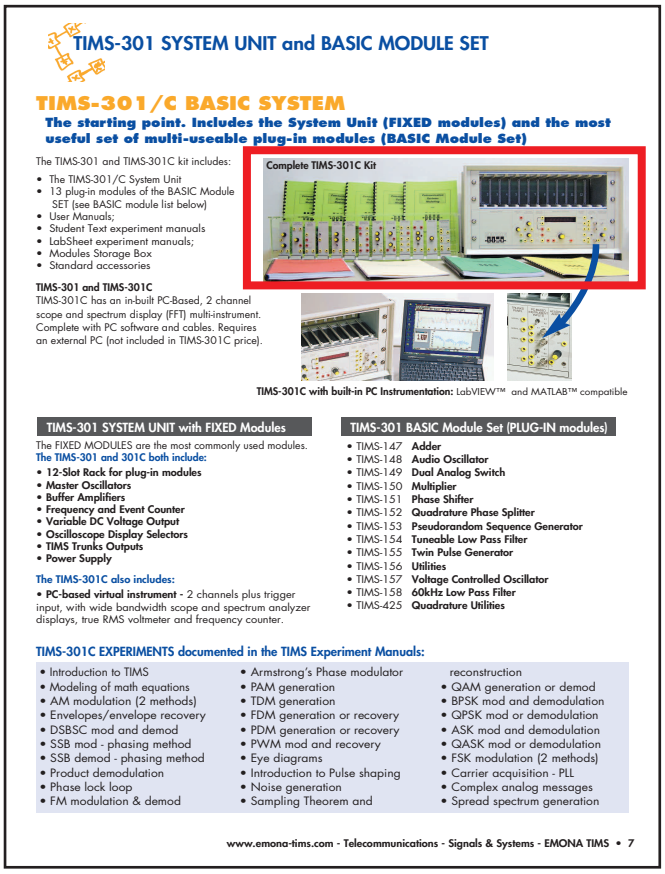
"Students patch the TIMS modules together to build the expiriments based on the Block Diagrams, for hands-on knowledge."



"TIMS experiment capabilities are listed under each components of the Transmission Model."



"The Modulation Box shows that TIMS can cover from the simplest analaog modulation (DSB - Double Side Band) through to the most advanced modulation, OFDM"



TIMS-301 SYSTEM UNIT and BASIC MODULE SET

TIMS-301/C BASIC SYSTEM

The starting point. Includes the System Unit (FIXED modules) and the most useful set of multi-useable plug-in modules (BASIC Module Set)

The TIMS-301 and TIMS-301C kit includes:

- The TIMS-301/C System Unit
- 13 plug-in modules of the BASIC Module SET (see BASIC module list below)
- User Manuals;
- Student Text experiment manuals
- LabSheet experiment manuals;
- Modules Storage Box
- Standard accessories

Complete TIMS-301C Kit

TIMS-301 and TIMS-301C
TIMS-301C has an in-built PC-Based, 2 channel scope and spectrum display (FFT) multi-instrument. Complete with PC software and cables. Requires an external PC (not included in TIMS-301C price).

TIMS-301C with built-in PC Instrumentation: LabVIEW™ and MATLAB™ compatible

TIMS-301 SYSTEM UNIT with FIXED Modules

The FIXED MODULES are the most commonly used modules.
The TIMS-301 and 301C both include:

- **12-Slot Rack for plug-in modules**
- **Master Oscillators**
- **Buffer Amplifiers**
- **Frequency and Event Counter**
- **Variable DC Voltage Output**
- **Oscilloscope Display Selectors**
- **TIMS Trunks Outputs**
- **Power Supply**

The TIMS-301C also includes:

- **PC-based virtual instrument** - 2 channels plus trigger input, with wide bandwidth scope and spectrum analyzer displays, true RMS voltmeter and frequency counter.

TIMS-301 BASIC Module Set (PLUG-IN modules)

- TIMS-147 **Adder**
- TIMS-148 **Audio Oscillator**
- TIMS-149 **Dual Analog Switch**
- TIMS-150 **Multiplier**
- TIMS-151 **Phase Shifter**
- TIMS-152 **Quadrature Phase Splitter**
- TIMS-153 **Pseudorandom Sequence Generator**
- TIMS-154 **Tuneable Low Pass Filter**
- TIMS-155 **Twin Pulse Generator**
- TIMS-156 **Utilities**
- TIMS-157 **Voltage Controlled Oscillator**
- TIMS-158 **60kHz Low Pass Filter**
- TIMS-425 **Quadrature Utilities**

TIMS-301C EXPERIMENTS documented in the TIMS Experiment Manuals:

- Introduction to TIMS
- Modeling of math equations
- AM modulation (2 methods)
- Envelopes/envelope recovery
- DSBSC mod and demod
- SSB mod - phasing method
- SSB demod - phasing method
- Product demodulation
- Phase lock loop
- FM modulation & demod
- Armstrong's Phase modulator
- PAM generation
- TDM generation
- FDM generation or recovery
- PDM generation or recovery
- PWM mod and recovery
- Eye diagrams
- Introduction to Pulse shaping
- Noise generation
- Sampling Theorem and reconstruction
- QAM generation or demod
- BPSK mod and demodulation
- QPSK mod or demodulation
- ASK mod and demodulation
- QASK mod or demodulation
- FSK modulation (2 methods)
- Carrier acquisition - PLL
- Complex analog messages
- Spread spectrum generation

"TIMS system is available as standard kits that include the main frame unit, a selection of TIMS Modules, and the experiment manuals."

TIMS IMPLEMENTS ALL OF THIS AND MORE

Select your curriculum from the experiment list below.

TIMS DOCUMENTED EXPERIMENTS:

- Adaptive Delta Modulation
- AM - Amplitude Modulation
- Amplifier Overload
- Armstrong's Phase Modulator
- ASK - Modulation & Demodulation
- Baseline Wander and Line Coding
- BER Instrumentation & measurement
- Bit Clock Regeneration
- Block Coding and Decoding
- Block Coding Gain
- Block Coding - error correcting
- BPSK - Introduction
- BPSK and BER
- Broadcasting - AM and FM
- Carrier Acquisition - PLL
- CDMA - 2 Channel
- CDMA - Introduction
- CDMA - Multichannel
- CDMA - Processing Gain
- CDMA at Carrier Frequencies
- Complex Analog Messages
- Convolutional Coding
- Costas Loop
- Delta Demodulation
- Delta Modulation
- Delta-sigma Modulation
- Digital Signal Recovery with the Decision Maker
- Digital Noise in Baseband & Bl... Coded Channels
- DPSK and BER
- DPSK and Carrier Acquisition
- DSBSC - Generation & Demodulation
- DSSS - Spread Spectrum
- Envelopes and Envelope Detection
- Equalization for ISI
- Eye Patterns & BER
- Fading, Multi-path Channel
- FDM - Frequency Division Multiplex
- FHSS: Fast & Slow Hopping
- FHSS and Bit Error Rate Performance
- FHSS: Hybrid DSSS/FHSS System
- Fiber Optic Transmission, Splitting and Combining
- Fiber Optic - Bidirectional Transmission
- Fiber Optic - WDM Transmission
- FM - Demodulation by PLL
- FM - Demodulation by Zero Crossing Counting
- FM - Deviation Multiplication
- FM, Wideband - Generation by VCO
- FM - Synchronous Demodulation
- FM and Bessel Zeros
- Frequency Synthesis with the PLL
- FSK - Generation & Envelope Demodulation
- NEW BFSK - coherent signalling & BER
- NEW BFSK - non-coherent signalling & BER
- Introduction to DSP
- GFSK - Gaussian FSK
- ISB - Independent Sideband
- ISI: PAM & ASK in band-limited channel
- Line-Coding & Decoding
- Matched Filter Detection
- MSK, OQPSK, π/4-QPSK,π/4-DQPSK
- Modeling Equations
- Modem: Binary Data via Voiceband
- Modem: Multi-Level Data via Voiceband
- Modem: Data Rates & Voiceband Modems
- Multi-channel Digital Fiber Link
- Multi-level QAM & PSK
- NEW Multi-path - Time-invariant fading channel characteristics
- NEW Multi-path - ISI rejection in DS SS
- Noisy Channel
- Noise Generation - Binary Sequences
- OFDM Principles - Introduction
- NEW OFDM, Cyclic Prefix & PAPR
- NEW OFDM & Channel Equalisation with BER Measurement
- NEW OFDM in band limited, multipath, time-invariant channel with BER measurements
- NEW OFDM - IDFT, Complex Exponent & Complex Quad Signals
- PAM & TDM
- Parseval's Theorem: Harmonic & Non-harmonic Signals
- PCM & Bit Clock Regeneration
- PCM Encoding &Decoding
- PCM TDM
- PCM-TDM 'T1' Implementation
- PDM - Phase Division Multiplex
- PLL - Phase Lock Loop
- Power Measurements
- PPM - Pulse Position Modulation
- PRBS Messages & Sequence Synchronization
- Product Demodulation
- Pulse Shaping - Introduction
- Pulse shaping for band-limited channels
- PWM - Pulse Width Modulation
- Random Variables & AWGN
- NEW Radar signals: Constant-frequency pulse, Linear-frequency modulated pulse, Coherent train of LFM pulses, Phase-coded pulse, Coherent train of identical Unmodulated pulses, Stepped-frequency pulse
- QAM - Generation &Demodulation
- QAM and 4-PSK
- QASK - Modulation & Demodulation
- QPSK - Modulation & Demodulation
- NEW QPSK - BER of Coherent QPSK in distortionless channel
- Sampling & Reconstruction
- Sampling with Sample-&-Hold
- Signal Analysis: relationship between time and frequency domains
- Signal Constellations 4/8/16QAM and 4/8/16PSK
- SNR in AM Demodulated Signals
- SNR performance of SSB and DSBSC
- SONET - TDM and Byte Interleave Mux
- SONET Data Frame
- SONET transmission via an optical link
- Spread Spectrum Principles
- Spread Spectrum: Direct Sequence, Frequency Hop, Time Hop Hybrid FH-DS, FH-CDMA,
- Speech in Telecommunications
- SSB Generation and Demodulation
- SSB Linear Amplifier Measurements
- Superheterodyne
- System fault finding
- TCM - Coding Gain
- TCM - Trellis Coding
- TDM
- Timing jitter in Band Limited Channels
- UWB - Pulse Shapes & Spectra
- UWB - with BER
- UWB - Multiband Modulation
- UWB - Multiple Access Orthogonal Pulse Modulation with MHP
- UWB - OOK, PPM, BPM & OPM
- Wave Analyzer - Spectrum Analysis
- Weaver's SSB Mod and Demodulator

SIGNALS & SYSTEMS EXPERIMENTS MANUALS:

- Special Signals - characteristics and applications
- Modeling Linear and Non-linear Systems
- Unraveling Convolution
- NEW Integration, correlation & matched filters
- NEW Exploring complex numbers and exponentials
- Comparing Responses in the Time and Frequency Domains
- A Fourier Series Analyzer
- Spectrum Analysis of Various Signal Types
- Poles and Zeros in the Laplace Domain
- Sampling and Aliasing
- Analog-Digital Conversion
- Discrete-Time Filters - Finite Impulse Response
- Poles and Zeros in the z plane: Discrete-time Filters
- Discrete-time Filters - Practical

STUDENT PROJECT CAPABILITIES:

- Building electronic circuits with the **TIMS-820 Wire-wrapping Project Module**
- Implementing functions in a CPLD with the **TIMS-830 Programmable Digital Project Module**
- Solderless breadboarding of electronic circuits with the **TIMS-840 Circuit Experimenter**
- Programming DSP implementation with the **TIMS-DSP-6713 Module**

NOTE: This list is constantly expanding as new modules are released and new experiments are written.

"TIMS can be completely customised to suit your curriculum, by selecting the experiments which match the course being taught"