

EMONA TutorTIMS-Cloud Simulation Software

DESIGNED SPECIFICALLY FOR LABORATORY TEACHING

Communications Courses | Signals & Systems Courses

NEW
Enhanced,
3rd Generation
TutorTIMS

ZERO
LEARNING
CURVE



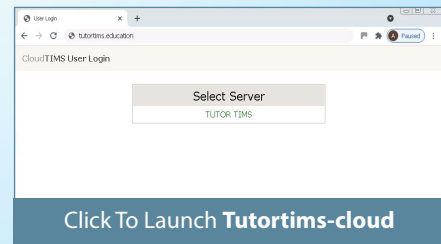
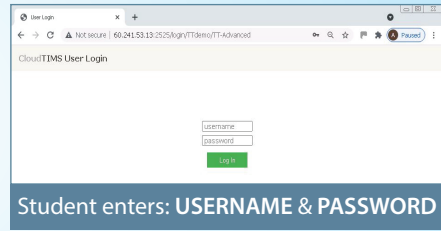
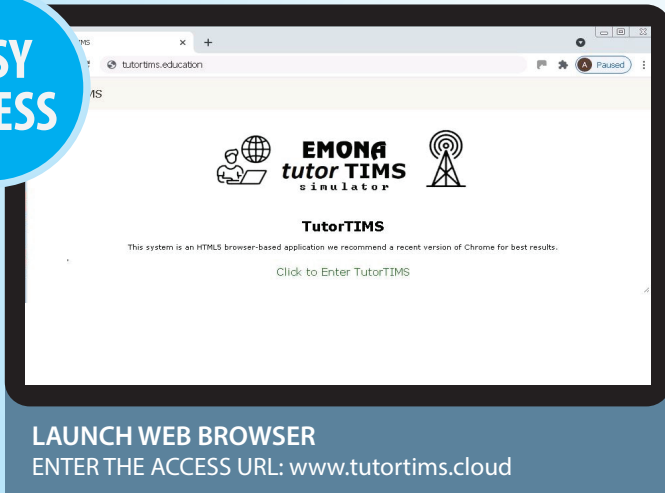
FAST, SIMPLE, EASY ACCESS for STUDENTS

Direct Web Browser Access - immediate on-line access

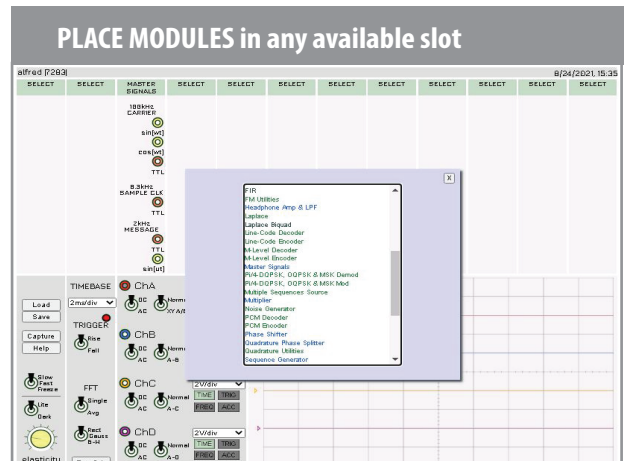
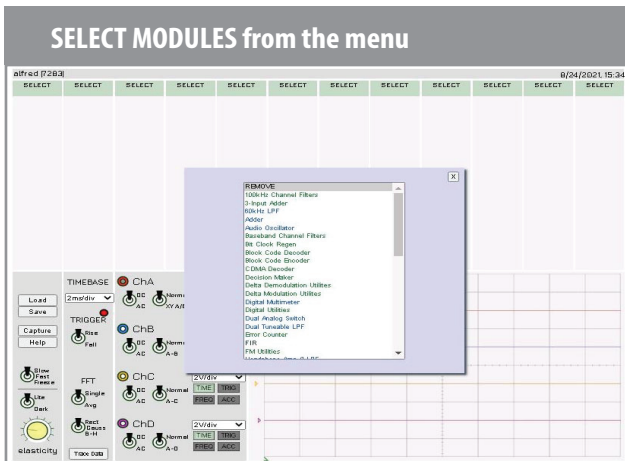


Simple to Launch - no downloads and no files to install

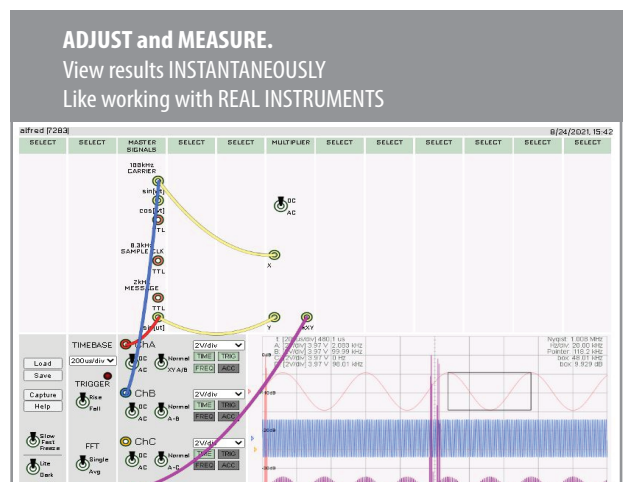
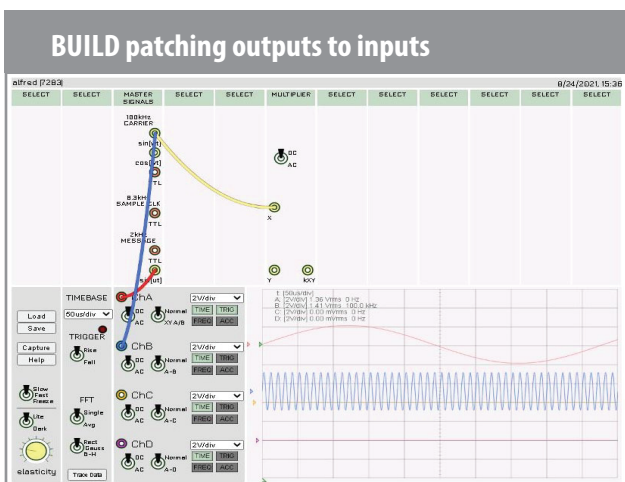
EASY ACCESS



EASILY BUILD EXPEREMENTS with simple point and click interface



ADJUST, MEASURE on the fly, SAVE for later, LOAD saved work



TutorTIMS-Cloud Building Blocks

50+ TIMS Equivalent Modules

100kHz Channel Filters
 3-Input Adder
 60kHz LPF *
 Adder *
 Audio Oscillator *
 Baseband Channel Filters
 Bit Clock Regen
 Block Code Encoder
 Block Code Decoder
 CDMA Decoder
 Decision Maker
 Delta Modulation Utils
 Delta Demodulation Utils
 Digital Multimeter
 Digital Utilities *
 Dual Analog Switch *
 Dual Tuneable LP *

Error Counter
 FIR
 FM Utilities
 Headphone Amp and LPF *
 Laplace
 Laplace Biquad

Line-Code Encoder
 Line-Code Decoder
 M-Level Encoder
 M-Level Decoder
 Master Signals *
 $\pi/4$ -DQPSK, OQPSK, MSK Mod
 $\pi/4$ -DQPSK, OQPSK, MSK Dem
 Multiple Sequences Source
 Multiplier *
 Noise Generator
 PCM Encoder

PCM Decoder
 Phase Shifter *
 Quadrature Phase Splitter *
 Sequence Generator *
 Seq.Gen:Signals & Systems
 SONET STS-1 Mux
 SONET STS-1 Demux
 Speech
 Switch *
 Twin Pulse Generator *
 Utilities *
 Var DCV and Amplifiers *
 VCO *
 VCO/FSK *
 Wideband Oscillator
 z-Biquad
 z-Transform

Focus on Student Learning



Operation Closely Matches TIMS Hardware Equipment

* indicates TutorTIMS-Cloud Basic modules

EASY ACCESS TO ALL TutorTIMS FUNCTIONS

TutorTIMS-Cloud is uniquely easy for students to use. All TutorTIMS-Cloud functions are directly accessible at the front panel display. There are no menu structures and there is no syntax to learn. On-screen HELP available via the front panel switch. No programming is required to build TutorTIMS Telecommunications experiments.

Hardware-like toggle switches & potentiometer knobs

On-screen HELP and MANUALS

LOAD and SAVE experiments, with all connections and settings

Secure screen CAPTURE used for student assessment

Over 50 fundamental building blocks: starting with basic ADDER, MULTIPLIER and OSCILLATOR

Insert and remove modules with a simple RIGHT mouse click

Scope, XY, accumulate and FFT (spectrum) display of both channels

Click & drag cursor measurements

“Signals & Systems” modules include:
 - LAPLACE and
 - z-TRANSFORM

“Expert” modules include:
 - 8 stage FIR module;
 - LAPLACE BIQUAD module;
 - z-BIQUAD module
 - WIDEBAND OSCILLATOR module

Scope and FFT with Rectangular, Gaussian and Blackman-Harris Window functions

TutorTIMS-Cloud Versions

TutorTIMS-Cloud Advanced with Signals & Systems. Licenses: 5 / 15 / 30 / 250 users

TutorTIMS-Cloud Basic with Signals & Systems. License: 250 users

TutorTIMS-Cloud Basic: License 250 users

TutorTIMS-Cloud Experiment Capabilities

TIMS LabSheet Experiments

L-01* Introduction to TIMS
L-02* Modelling equations
L-03* DSBSC - generation
L-04 Product demodulation
L-05* AM - amplitude modulation - I
L-06* AM - amplitude modulation - II
L-07* Envelope detection
L-08* SSB generation
L-09* SSB demodulation
L-10 ISB - independent sideband
L-11* Armstrong's phase modulator
L-12* FM - generation by VCO
L-13 FM - demodulation by PLL
L-14* FM - demodulation by ZX counting
L-15 Sampling
L-16 PAM and TDM
L-17* FDM - frequency division multiplex
L-18 Phase division multiplex - generate
L-19 Phase division multiplex - demod
L-20* PWM - pulse width modulation
L-21* Carrier acquisition - PLL
L-23* Complex analog messages
L-24 PCM - encoding
L-25 PCM - decoding
L-26* ASK - generation
L-27 ASK - demodulation
L-28 BPSK - modulation
L-29 BPSK - demodulation
L-30 QPSK - generation -
L-31 QPSK - demodulation
L-32* FSK - generation
L-33 FSK - envelope demodulation
L-34 Signal constellations
L-35 DSSS - spread spectrum
L-36* Eye patterns - intro
L-37 PRBS messages
L-38 Detection with the DECISION MAKER
L-39 The noisy channel
L-40 BER instrumentation
L-41 BER measurement - introduction
L-42 Line coding & decoding
L-43 Delta modulation
L-44 Delta-sigma modulation
L-45 Adaptive delta modulation
L-46 Delta demodulation
L-47 Bit clock regeneration
L-48* QAM - generation

L-49* QAM - demodulation
L-50 DPSK
L-53 Multi-channel fibre - no fibre
L-54 PCM-TDM 'T1' - no fibre
L-55 DPSK & BER
L-56 Bit clock regen in a T1 PCM-TDM
L-57 DPSK and carrier acquisition
L-60 Matched filter detection
L-62 CDMA - introduction
L-63 CDMA - processing gain
L-64 CDMA - 2 channel
L-65 CDMA multichannel (4-ch tx,1 rx)
L-67 CDMA at carrier frequencies
L-68 non-linearity & distortion
L-69 PPM - pulse position modulation
L-70 speech in telecommunications
L72-Multilevel Data
L73-Voiceband Modem
L74-Voiceband Modem-Demod
L76-System Fault Finding
L-77 Frequency synthesis with the PLL
L-78 block code encoding (method 1)
L-80 block code decoding
L-82 superheterodyne - (two channels)
L-84 FM deviation multiplication
L-85 FM and Bessel zeros
L-103 Introduction to OFDM Generation
L-104* Introductory PAM-TDM
L-105* QASK
L-106* Introduction to pulse shaping
L-107* Noise gen using binary sequ
L-108 Principles of spread spectrum
L-113 SNR - SSB compared with DSBSC
L-114 AM demodulation and SNR
L-115 4/8/16-QAM & QPSK with BER
L-144 BER in coherent BFSK - ideal ch
TIMS Student Text Experiments - sample
D2-11 PPM & PWM
D2-12b QAM and 4-PSKD-
13 Multi-level QAM/PSK
D3-01 ISI: PAM & ASK - bl channels
D3-02 equalization for ISI
D3-03 ISI: pulse shaping for bl chl
D3-04 baseline wander & line coding
D3-05 timing jitter in b'lim systems
D3-13 the SONET PCM data frame
D3-14 SONET STS-1 demultiplexing
D3-18 GFSK - Gaussian FSK

D4-01 BER measurement of unipolar NRZ signals in a baseband distortionless chan.
D4-02 BER measurements of bipolar NRZ signals in a baseband distortionless chan.
D4-03 BER measurement of coherent BPSK signalling in an ideal distortionless channel
D4-04 MSK in a passband channel, with BER vs SNR
D4-05 OQPSK in a passband channel, with BER vs SNR
D4-06 PI/4-DQPSK, PI/4-QPSK, OQPSK & MSK: spectra and constellations-
D7-01 BER measurement of Noncoherent BFSK in an ideal distortionless channel
D7-02 BER measurement of Coherent BFSK in an ideal distortionless channel
D7-03 BER measurement of DBPSK in an ideal distortionless channel
Signals & Systems Experiments:
Special signals – characteristics and app's
Modeling linear and nonlinear systems
Unraveling convolution
Comparing responses in the time and frequency domains
A Fourier series analyzer
Spectrum analysis of various signal types
Getting started with poles and zeros in the Laplace domain
Sampling and aliasing
Getting started with analog-digital conversion
Discrete-time filters - Finite Impulse Resp.
Using poles and zeros in the z plane:
Discrete-time filters
Discrete-time filters - practical applications
EXPERT-z_biquad:
z-biquadDemo-1
z-Biquad_Demo_1-stage
z-Biquad_Demo_2-stage
EXPERT-laplace_biquad:
Laplace-biquad
LplceBiqd_1-stgeLPF_spctrmNoise
LplceBiqd_1-stgeLPF_timeDom
EXPERT-FIR:
FIR16_HPF_pulsResp_8ksamp
FIR16_inputNoiseSpect_sampled25k
FIR16_LPF_pulsResp_8ksamp
FIRdemos-1

E&OE Specifications subject to change without notice

* indicates TutorTIMS-Cloud Basic experiment capabilities

Available from:

Emona Instruments Pty Ltd
78 Parramatta Road
Camperdown NSW 2050 AUSTRALIA
Tel: +61-2-9519-3933 Fax: +61-2-9550-1378
URL: www.emona-tims.com
Email: sales@tims.com.au