

EMONA INSTRUMENTS

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November 12, 2014

Dr. Valentine A Aalo

Department of Computer & Electrical Engineering

Florida Atlantic University

777 Glades Road

Boca Raton, Florida 33431

Dear Dr. Aalo,

Proposal for one net*TIMS distance learning telecoms lab experiment system: FAU111214/netTIMS

I would like to thank you for your continued interest in the TIMS telecommunications learning systems. Further to your email request, following is our proposal for a net*TIMS System, which delivers hardware experiments via the Internet. The proposal includes: **(A)** one complete net*TIMS LAB SYSTEM with Basic modules and **(B)** the EVAL-16 kit.

Each TIMS system comes complete with all User and Student Experiment manuals and patching leads.

Please note that this is an initial proposal which can be customized by either adding or removing modules/ experiments to better suit your curriculum requirements and budgets.

Please feel free to contact us if we can assist with any further information.

ITEM	QTY	Each (US\$)	TOTAL (US\$)
A - BASIC net*TIMS - a complete solution			
		EACH	TOTAL
1 net*TIMS LAB SYSTEM including -	1	\$25,270.00	\$25,270.00

1a net*TIMS-Server -

Complete, stand-alone web server.

Net*TIMS-Server is designed to sit on top of the TIMS-301/nt System's case.

Includes two interface ports: (i) one Ethernet connection to the network, and

(ii) one TIMS rack connector to plug into the TIMS-301/nt System Rack.

Includes experiment load function, student administration and student activity tracking.

Will allow at least 10 typical users to be logged-on simultaneously.

Includes over 30 pre-defined experiments and 12 months support & upgrades via email.

net*TIMS-Editor/Professor experiment creation software.

Upgrades of the Server software are via the Ethernet port. Fully solid state.

1b **TIMS 301/nt -**

Ethernet enabled training system, including:

TIMS-301/nt System Unit;

15 x Ethernet enabled Plug-in Modules including -

13 x Basic modules:

TIMS-147R Ethernet-enabled Adder

TIMS-148R Ethernet-enabled Audio Oscillator

TIMS-149 Dual Analog Switch

TIMS-150R Ethernet-enabled Multiplier

TIMS-151R Ethernet-enabled Phase Shifter

TIMS-152 Quad Phase Splitter

TIMS-153R Ethernet-enabled Sequence Generator

TIMS-154R Ethernet-enabled Tuneable LPF

TIMS-155R Ethernet-enabled Twin Pulse Generator

TIMS-156 Utilities

TIMS-157R Ethernet-enabled VCO

TIMS-158R Ethernet-enabled 60 kHz LPF

TIMS-425R Ethernet-enabled Quadrature Utilities

2 x net*TIMS Utility modules:

TIMS-190R Ethernet-enabled Buffers & Var DCV

TIMS-191R Ethernet-enabled Switches

Documentation and accessories:

Communications Systems Modelling with TIMS' student text, 148 x LabSheet Experiments,

net*TIMS User Manual, TIMS Basic Modules and Advanced Modules User Manuals & standard accessories.

1c **TutorTIMS-Basic-R2-Signals & Systems-UNLIMITED** 1

- FOR AUTHORIZING net*tims EXPERIMENTS and student preparation

On-screen version of the TIMS-301 Basic System with Signals & Systems

modules. Intended for student preparation and learning at home and in the lab.

See TutorTIMS brochure for full details.

Includes site license for unlimited distribution to enrolled students.

net*TIMS TOTAL:	\$25,270.00
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1d Shipping charge

\$850.00

TOTAL for net*TIMS (US\$):	\$26,120.00
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- net*TIMS BASIC SYSTEM 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-11 Armstrong`s phase modulator

L-23 Complex analog messages

L-26 ASK - generation

L-28 BPSK - modulation

L-29 BPSK - demodulation

L-30 QPSK - generation

L-31 QPSK - demodulation

L-32 FSK - generation

L-36 Eye patterns

L-48 QAM - generation

L-49 QAM - demodulation

L-12 FM - generation by VCO	L-68 non-linearity & distortion
L-14 FM - demodulation by ZX counting	L-83 customizable digital sequences
L-15 Sampling	L-104 Introductory PAM-TDM
L-17 FDM - frequency division multiplex	L-105 Quadrature amplitude shift keying - QASK
L-18 Phase division multiplex - generate	L-106 Introduction to pulse shaping
L-19 Phase division multiplex - demod	L-107 Noise generation using binary sequences
L-20 PWM - pulse width modulation	L-108 Principles of spread spectrum
L-21 Carrier acquisition - PLL	

B - OPTIONAL Additional net*TIMS-Enabled BASIC & ADVANCED modules

ALL TIMS-100 Basic and TIMS-400 Advanced modules are available as net*TIMS-Enabled "R" version modules.

A suggested choice of additional modules for consideration may include the following TIMS-Eval-Kit list.

2 TIMS-153R Ethernet-enabled Sequence Generator	1	\$463.00	\$463.00
3 TIMS-154R Ethernet-enabled Tuneable LPF	1	\$463.00	\$463.00
4 TIMS-157R Ethernet-enabled VCO	1	\$463.00	\$463.00
5 TIMS-402R Ethernet-enabled Decision Maker	1	\$623.00	\$623.00
6 TIMS-405 Error Counting Utilities	1	\$525.00	\$525.00
<i>NOTE: TIMS-405R is not required as net*TIMS includes an in-built pulse counter. TIMS-405 EX-OR is needed.</i>			
7 TIMS-406R Ethernet-enabled Line-Code Encoder	1	\$623.00	\$623.00
8 TIMS-407R Ethernet-enabled Line-Code Decoder	1	\$623.00	\$623.00
9 TIMS-408R Ethernet-enabled Noise Generator	1	\$623.00	\$623.00
10 TIMS-410R Ethernet-enabled 100kHz Channel Filters	1	\$623.00	\$623.00
11 TIMS-412R Ethernet-enabled PCM Encoder	1	\$623.00	\$623.00
12 TIMS-413R Ethernet-enabled PCM Decoder	1	\$623.00	\$623.00
13 TIMS-420 Bit Clock Regeneration	1	\$525.00	\$525.00
<i>NOTE: TIMS-420R is not required so standard TIMS-420 is be used.</i>			
14 TIMS-422R Ethernet-enabled M-Level Encoder	1	\$623.00	\$623.00
15 TIMS-423R Ethernet-enabled M-Level Decoder	1	\$623.00	\$623.00
16 TIMS-425R Ethernet-enabled Quadrature Utilities	1	\$623.00	\$623.00
17 TIMS-250 Stackable Perspex Module Storage Box	2	\$275.00	\$550.00
18 Additional delivery & Insurance			\$349.00
SUB TOTAL FOR SECTION "B" (US\$):			\$9,568.00

- Additional EXPERIMENTS when the modules from sections "A" and "B" are combined

With the addition of the above modules, items 2 to 16, you can add the following experiments to the BASIC net*TIMS System

L-13 FM - demodulation by PLL	L-40 BER instrumentation
L-24 PCM - encoding	L-41 BER measurement - introduction
L-25 PCM - decoding	L-42 Line coding & decoding
L-27 ASK - demodulation - detailed	L-47 Bit clock regeneration
L-28 BPSK - modulation - detailed	L-50 DPSK
L-29 BPSK - demodulation - detailed	L-55 DPSK & BER
L-30 QPSK - generation - detailed	L-56 Bit clock regen - no fibre, no bandlim, 1 msg

L-33 FSK - envelope demodulation
L-34 Signal constellations
L-37 PRBS messages - detailed
L-38 Detection with the DECISION MAKER
L-39 The noisy channel
L-40 BER instrumentation
L-41 BER measurement - introduction

L-73 data rates & voiceband modems – xmsn
L-82 superheterodyne - intro (single channel)
L-113 SNR - SSB compared with DSBSC
L-114 AM demodulation and SNR
L-115 4/8/16-QAM & 4/8/16-QPSK with BER

TERMS:

- 1) Warranty period is 24 months from date of invoice. Support is co-ordinated by our approved service provider, Shiela Woodson, in Milliken, CO.
- 2) Delivery charge quoted is for a single delivery to the Department.
- 3) Prices quoted exclude State and Federal Taxes.
- 4) Standard Accessories include: one set of User Manuals per System, one copy of the 5 Volume Student Text, Instructors Guide, one copy of the 148 x LabSheet Experiments, all manuals on CD in PDF format, 30 x multi-strand stackable Patch Cords, 3 x BNC to BNC Scope Cables, Stackable Perspex Module Storage Box, Mains Cord.
- 5) Payment Terms: 30 days from date of invoice.
- 6) Availability: 8-12 weeks after receipt of order.
- 7) This quotation originates from Emona's Australian office. The quotation may be accepted by emailing or faxing your order to Emona at sales@qpsk.com or fax 011-61-2-9550-1378. Fax orders sent to the toll free 877-751-0232 fax number will be forwarded to Emona Instruments' Australian office.

Alfred Breznik
Technical Director

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