EXPAND YOUR

ADS Max™ & NI ELVIS™ CAPABILITIES

with **EMONA EXPERIMENT BOARDS**
for **DIGILENT ADS Max, NI ELVIS III, II/+**
and myDAQ / myRIO

Communications   **Signals & Systems**

Fiber Optics   **and more**

NI PRODUCT PARTNER
SINCE 2007

EMONA INSTRUMENTS
www.emona-tims.com

Engaging Students with Hands-on Learning

The EMONA EXPERIMENT BOARDS offer a unique ability to transform abstract concepts in theory, math, digital signal processing, circuit analysis, and signals and systems into tangible, hands-on laboratory experiments.

In progressing through each experiment, students explore the interplay between mathematics, theory, and real electrical signals in a hands-on manner.

Students become engaged, in an environment there they can test and confirm their understanding by trying out "what-if' scenarios, as the EMONA EXPERIMENT BOARDS utilize the unique modular block-diagram design, where each experiment is built by the student.

TEACH YOUR WAY : the EMONA EXPERIMENT BOARDS offer an OPEN ENDED experiment platform, so professors can edit and re-present existing experiment documents or create their own experiments and documents.

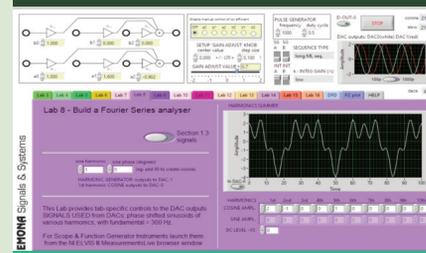# SIGNALS & SYSTEMS EXPERIMENTS for ADS Max, NI ELVIS III and II/+

The **Emona Signals & Systems Explorer**, model ESSB-30, add-on board for the ADS Max, NI ELVIS III & II/+ enables students to patch together continuous time and discrete-time systems in real hardware, for circuit theory, digital signal processing and signals & systems courses.

ESSB-30 Signals & Systems Experiments

Lab 1: Introduction to the NI ELVIS

Lab 2: Introduction to the ESSB-30 board

Lab 3: Special signals – characteristics and applications

Lab 4: Systems: Linear and non-linear

Lab 5: Unraveling convolution

Lab 6: Integration, convolution, correlation & matched filters

Lab 7: Exploring complex numbers and exponentials

Lab 8: Build a Fourier series analyzer

Lab 9: Spectrum analysis of various signals

Lab 10: Time domain analysis of RC networks

Lab 11: Poles and zeros in Laplace domain

Lab 12: Sampling and Aliasing

Lab 13: Getting started with analog-to-digital conversion

Lab 14: Discrete-time filters – FIR

Lab 15: Poles and zeros in the z-plane: IIR forms

Lab 16: Discrete-time filters – practical applications

App A: Table comparing ESSB-30 experiments to popular textbooks

COMPLETE KIT includes Courseware, Software and all accessories

https://www.emona-tims.com/essb
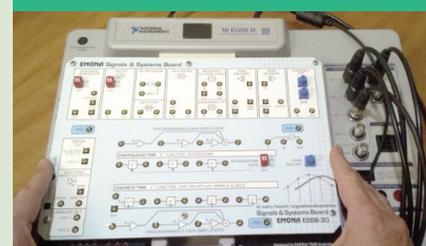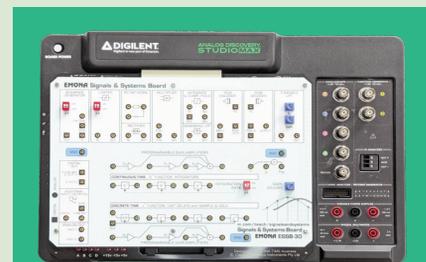
ADVANCED COMMUNICATIONS EXPERIMENTS for ADS Max and NI ELVIS III

The **Emona Wireless Communications Explorer**, model DxIQ-45G, provides educators with all the components, systems, and lab resources needed to conduct project-based experiments in digital and analog telecommunications as well as introductory signals and systems.

DxIQ-45G Telecoms Experiments

Lab 1: Introduction to the EMONA Communications Board

Lab 2: Modeling equations

Lab 3: FFT and Spectra

Lab 4 & 5: Amplitude Modulation & Amplitude Demodulation

Lab 6: DSBSC Modulation and Demodulation

Lab 7: SSB Modulation and Demodulation

Lab 8 & 9: FM Modulation & FM Demodulation

Lab 10, 11, 12: FSK, BPSK & QPSK

Lab 13: Introduction to DSSS

Lab 14: Eye patterns, SNR and BER measurements

Lab 15: Principles of OFDM

Lab 16: Sampling, PAM and Nyquist

Lab 17: Carrier regeneration with Costas Loop

Lab 18: ASK Modulation and Demodulation

Lab 19: Principles of Superheterodyne

EXPERIMENTS UNDER DEVELOPMENT - COMING SOON
Lab 20: Introducing SDR using AM, FM, PM
Lab 21: SDR principles with IQ modulation and constellations
Lab 22: QPSK, MSK, OFDM implementation in SDR

COMPLETE KIT includes Courseware, Software and all accessories

https://www.emona-tims.com/dxiq

FIBER OPTICS EXPERIMENTS for ADS Max, NI ELVIS III and II/+

The **Emona Fiber Optics Explorer**, model ETT-211 FOTEx add-on board for the ADS Max, NI ELVIS III & II/+ offers students hands-on experience in electrical communications, introduction to optics and fiber optics and fiber optic communications.

ETT-211 FOTEx Fiber Optics Experiments

**SECTION 1 – Introduction to the TIMS Hardware**
Introduction to the NI ELVIS test & FOTEx board

SECTION 2 – Electrical Communications
PCM, Sampling , Nyquist in PCM, TDM, Line coding and bit clock regeneration

SECTION 3 – Fiber Optic Communications

Analog fiber optic communications
PCM-TDM 'T1' implementation
Fiber optic bi-directional communication
Wavelength division multiplexing (WDM)

COMPLETE KIT includes Courseware, Software and all accessories

https://www.emona-tims.com/fotex
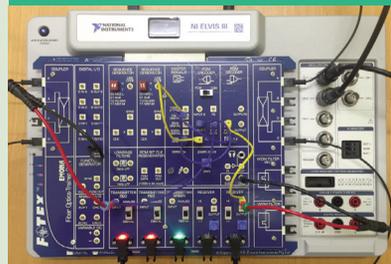
COMPREHENSIVE COMMUNICATIONS EXPERIMENTS for NI ELVIS II/+

Multi-Experiment Single Board Telecommunications Trainer for the popular NI ELVIS™ II/+ Platform. Plugs into the NI ELVIS™ platform, operating in local mode and remotely under full LabVIEW™ control.

ETT-202 DATEx Comms Experiments

VOLUME 1 – **Introductory Experiments**
22 experiments, 406 pages, covering basic analog and digital modulation:

> AM, DSB, SSB, FM, Sampling, PCM, ASK, FSK, BPSK,
> QPSK, Direct Sequence Spread Spectrum, SDR
> undersampling.

VOLUME 2 – **Advanced Experiments**
18 experiments, 338 pages, covering advanced telecommunications theory topics:

> Noise in AM, TDM, Armstrong, PWM, Carrier acquisition,
> SNR and Eye diagrams, PCM and SNDR, GFSK, Line
> Coding and Clock Regen, Delta Mod, Delta-Sigma Mod,
> PN Spectra, FM Harmonic Multiplier.

VOLUME 3 – **Controlling DATEx via LabVIEW Code & LabVIEW SFP**
Remote control of DATEx via SFP. LabVIEW programming examples and projects.

COMPLETE KIT includes Courseware, Software and all accessories

https://www.emona-tims.com/datex

ADD-ON BOARDS for NI myDAQ and NI myRIO

Signals & Systems for NI myDAQ

Bring Signal Processing Theory and Signals & Systems classes to life with myDSP: a hands-on, real-time myDAQ application board.
Implement the FIR and IIR filters described in textbooks using the power of the myDAQ suite of signal sources and measuring instruments & analyzers.
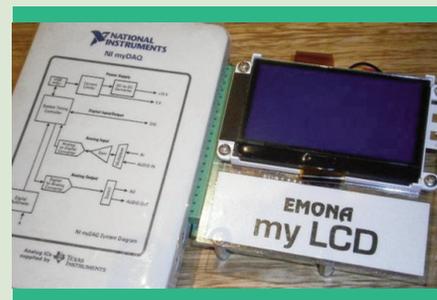
https://www.emona-tims.com/mydsp
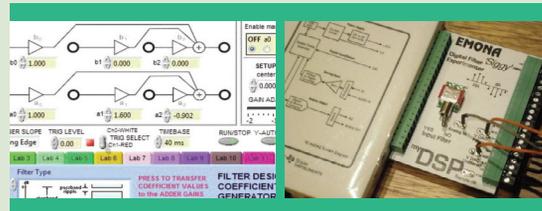
Graphical LCD for NI myDAQ & myRIO

Plug-in a fast response, high contrast 128x64 pixel graphic LCD directly to myDAQ™.

• Enhance your myDAQ™ applications with a
  local graphic display panel.
• Image data is fully defined by your LabVIEW™ code.

https://www.emona-tims.com/myglcd

Also available from:

Specifications and experiment topics subject to change without notice.