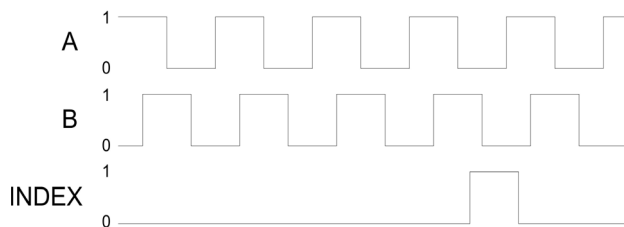


# QNET MECHATRONIC SENSORS BOARD FOR NI ELVIS

Demonstrate the fundamentals of interfacing with the most commonly used analog and digital sensors, using NI ELVIS platform and LabVIEW™ software.

### INTRODUCE STUDENTS TO SENSORS AND THEIR APPLICATIONS

One of the topics covered in a typical introductory mechatronics course is understanding and application of sensors commonly used in today's industry. The QNET Mechatronic Sensors board introduces students to various sensors measuring pressure, deflection, infrared light, magnetism, temperature etc.; their advantages and limitations. Designed exclusively for NI ELVIS platform and LabVIEW™ software, the board also exposes students to measurement and calibration fundamentals.



The Encoder courseware chapter includes exercises where students learn to analyze A, B and Index encoder signals.

### HOW IT WORKS

The QNET Mechatronic Sensors board features ten different sensors, including strain gauge, piezo vibration sensor, rotary potentiometer, pressure sensor, thermistor, long range ultrasonic and infrared sensors, short range magnetic field and reflective optical position sensors and encoder; and a snap action switch. Students learn fundamentals of interfacing with these sensors, including how to collect data from sensors, calibrate sensors, and use them to identify natural frequency of material.



NI Part No. 751423-01

[System specifications on reverse page.](#)

### QNET MECHATRONIC SENSORS WORKSTATION COMPONENTS

- QNET Mechatronic Sensors board
- NI ELVIS II or ELVIS II+
- ABET-aligned course resources with comprehensive lab exercises, fully documented system models, and pre-designed VIs

### ACCELERATE DISCOVERY WITH NI ELVIS PLATFORM

The NI Educational Laboratory Virtual Instrumentation Suite (NI ELVIS) presents a modular teaching platform suitable for any engineering lab. Integrating 12 most commonly used instruments, including an oscilloscope, digital multimeter, function generator, dynamic signal analyzer in one device allows for quick and easy measurement, design and prototyping in an educational laboratory setting.

### BUILD A COMPLETE MECHATRONICS LAB

Four Quanser add-on boards for NI ELVIS cover arguably the most important technical hardware-focused skills in mechatronics: sensing, actuation, inter-device communication and integration of these concepts in an actual mechatronic system. With the QNET Mechatronics board family, you can give students a great lab experience and prepare them to take on high fidelity mechatronic application and design challenges.

QNET Mechatronic Actuators



QNET Mechatronic Interfacing



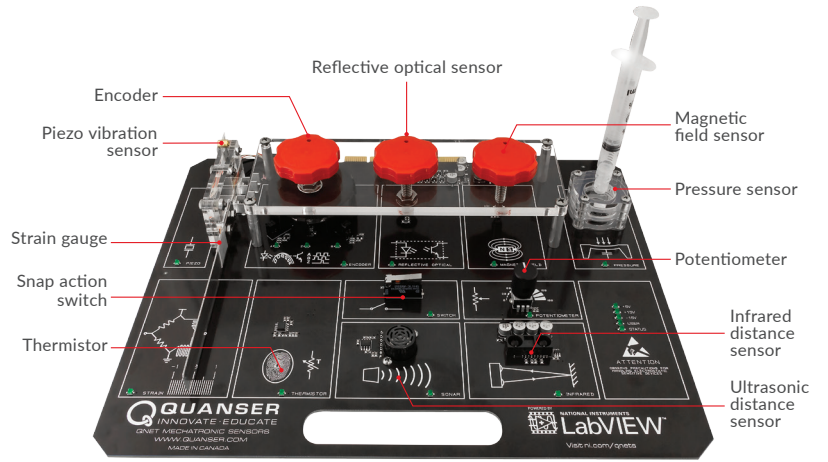
QNET Mechatronic Systems



For the full range of Quanser QNET boards, visit [www.ni.com/qnets](http://www.ni.com/qnets)

# SYSTEM SPECIFICATIONS

## QNET MECHATRONIC SENSORS BOARD



### FEATURES

- 10 types of sensors; 1 switch including:
  - Strain gauge
  - Piezo vibration sensor
  - Rotary potentiometer
  - Pressure sensor
  - Thermistor
  - Ultrasonic distance sensor
  - Infrared distance sensor
  - Magnetic field sensor
  - Reflective optical sensor
  - Encoder
  - Snap action switch
- Built-in PCI connector for NI ELVIS II /ELVIS II+ for quick and easy lab setup
- Fully compatible with LabVIEW™
- Comprehensive digital course resources aligned with ABET requirements
- Additional community-created resources available on [www.QuanserShare.com](http://www.QuanserShare.com)

### COURSEWARE TOPICS COVERED

- Sensor behavior
- Calibration
- Using sensors to identify natural frequency of material
- Strain gauge to measure deflection
- Piezo film sensor to measure vibration
- Rotary potentiometer to measure position
- Pressure and thermistor sensors
- Long range sensors: ultrasonic and infrared distance
- Short range sensors: magnetic field and reflective optical
- Encoders
- Switch debouncing

### DEVICE SPECIFICATION

Strain gauge nominal resistance	350 ± 2% Ω
Pressure transducer range	60 to 165 ±2 kPa
Thermistor nominal resistance at 25°C	47000 ± 5% Ω
Ultrasonic distance measuring range	15.24 to 645.16cm
Ultrasonic distance resolution	±2.54 cm
Infrared distance sensor measuring range	10 to 150cm
Reflective optical sensor recommended sensing distance	6.35 deg
Potentiometer mechanical angle range	280 deg

#### About Quanser:

Quanser is the world leader in education and research for real-time control design and implementation. We specialize in outfitting engineering control laboratories to help universities captivate the brightest minds, motivate them to success and produce graduates with industry-relevant skills. Universities worldwide implement Quanser's open architecture control solutions, industry-relevant curriculum and cutting-edge work stations to teach Introductory, Intermediate or Advanced controls to students in Electrical, Mechanical, Mechatronics, Robotics, Aerospace, Civil, and various other engineering disciplines.