



DEGEM  
SYSTEMS

Electronics

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Industrial semiconductors  
Optoelectronic semiconductors  
Electrical control circuits  
Operational amplifiers  
Power amplifiers  
Power supplies  
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Motor and generator control  
Motor speed control  
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3-phase motor control  
Sensors & actuators  
Automotive charging & ignition  
Logic components  
Demultiplexers, decoders & adders  
Sequential logic  
555, ADC & DAC circuits  
Logic families  
AM & FM transmission  
Digital modulation  
Digital signal conversion  
Optical communications  
CAN-BUS systems  
Introduction to 8-bit, 16-bit (AVR) and 32 bit (ARM) microcontrollers  
Programmable logic device

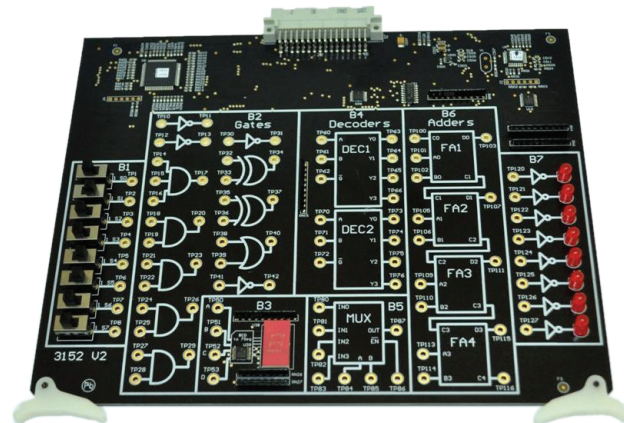
# EB-3152

## Multiplexers, Decoders and Adders

The EB-3152 Multiplexers, Decoders and Adders board is a comprehensive instructional module designed to introduce the student to the basic concepts of various decoders, creating a logic function with a decoder, multiplexers and their use in implementing logic functions and binary arithmetic implementation to students in high schools, technical schools and colleges.

The module contains various practical circuits with which the student can perform a number of meaningful experiments, which help reinforce the student's comprehension of the related concepts. The individual circuits and the required test equipment can be quickly wired by using the provided patch cords to connect the relevant 2-mm jacks. Students perform a minimal amount of wiring, thereby reducing the setup time and the possibility of a wiring error while increasing the time available for training. Manually inserted faults modify the circuits under test to provide valuable true-to-life troubleshooting exercises, which develop diagnostic skills.

A comprehensive student experiment manual provides essential theory and clearly details the experiment procedure. Optional courseware enhances the learning procedure testing the student's level of competence after reviewing the theory and then evaluates all answers to questions to test the student's level of achievement at the end of each experiment. The student may learn in the standalone mode or under the optional DCML (Degem Computer Managed Laboratory), which allows the instructor to monitor student and class progress and records pertinent records in a database for future retrieval.



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# Specifications

## DESCRIPTION

The EB-3152 printed circuit board is designed to minimize circuit wiring time when setting up experiments. The board dimensions are 220 x 180 mm is powered by the EB-3000 base unit. The board plugs into the EB-3000 base unit via a 48-pin industrial connector.

All components are mounted on the printed circuit board and the schematic diagrams of all circuits are silk-screened to help the student identify components and system operation. The printed circuit board is solder masked for long life. The components mounted on the board are protected with a plastic cover that is permanently mounted on the EB-3000 base unit.

All major signals can be accessed from the 2-mm jacks to simplify connections within the circuit and to test equipment. The printed circuit board can be stored in the supplied binder for convenient storage.

## EXPERIMENTS COVERED

### Constructing a decoder

- Basic concepts
- Creating a decoder to implement a logic function

### IC decoder

- Binary, BCD and 3-8 decoder
- Primary and secondary decoder
- Create the truth table for a dual 2-4 decoder
- Create a 3-8 decoder from a dual 2-4 decoder

### Use a decoder to implement a function

- Implement a function with a decoder
- Wired-OR decoder
- Reduced logic function by Implement a function with a dual 2-4 decoder

### Multiplexer

- Basic concepts
- 1-of-n multiplexer
- Write the truth table for multiple logic functions using a multiplexer

### Implement functions with a multiplexer

- Basic concepts
- Implement a logic function based on a multiplexer

### Troubleshooting

- 8 different fault-finding exercises

## REQUIRED ACCESSORIES

EB-3000 workstation with built-in digital multimeter, oscilloscope and patch cords

## OPTIONAL ACCESSORIES

- Personal computer with MS-Windows
- DCML Degem Class Management Software

## INSTRUCTIONAL MATERIALS

The experiment manual was written by pedagogical experts who train technicians in electronics technology. The student manual contains essential theory and a detailed procedure for each experiment and is available in hardcopy or electronic book formats.