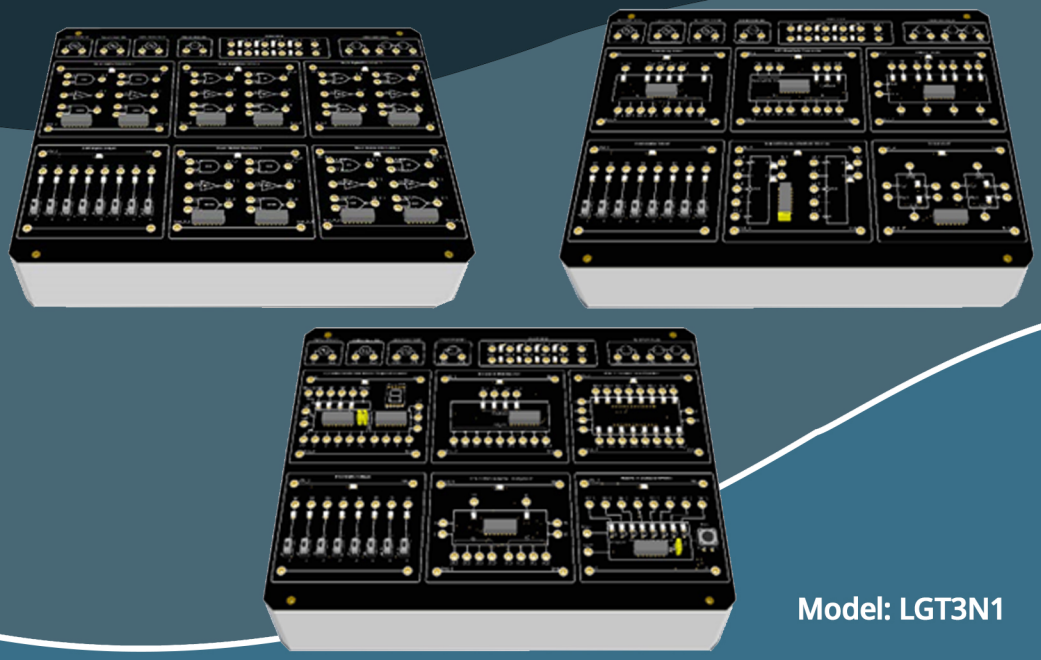
Digital Logic Trainer



Model: LGT3N1

Feature:

- Introduction to Digital Electronic
- Logic Gate (NOT, AND, OR , NAND, NOR, XOR, XNOR)
- Boolean and De Morgan's Sum and Products
- Min-terms and Max-terms
- Karnaugh Mapping
- Binary Additional and Subtraction
- Equivalence and Non Equivalence
- Magnitude Comparators
- Flip/flop
- Binary Counter
- Binary Coded Decimal Encoders\Decoders
- Code and Converters
- Multiplexers/De-multiplexers
- Digital Displays

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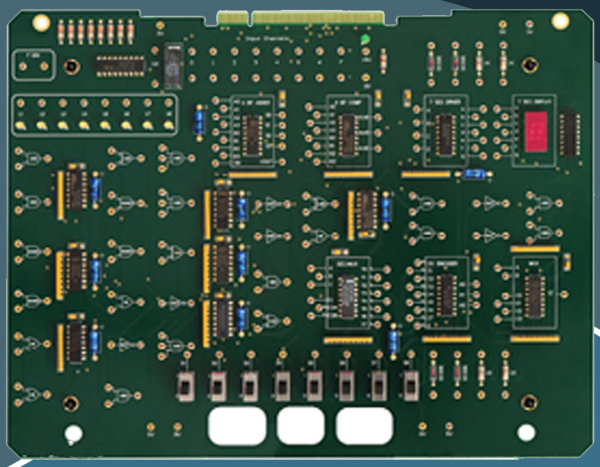
Basic Electronics Series — 12-308 Combinational Logic

Introduction

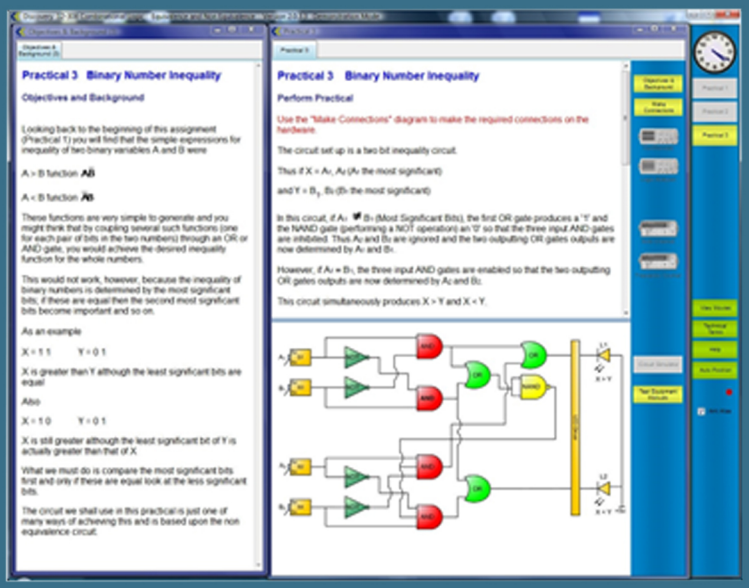
With over 50 years of experience in the design, manufacture and supply of high quality educational products, Feedback's 12-300 series of innovative workboards and Discovery software set new standards in the teaching of basic electronics.



The 12-308 board provides an introduction to combinational digital logic systems using pre-constructed circuit elements that may be connected in different ways to perform the assignments. The board connects to the NI ELVIS II/II+ console which provides power and signal acquisition.

Teaching material and pc based instrumentation are delivered by Feedback's own Discovery software, which teaches the student the necessary theory in order to complete the practical experiments. On-screen instructions guide the student through the set-up of the boards and the use of the on-screen instrumentation enables students to observe parameters in real time and to record their results.

Discovery software provides a flexible and versatile learning environment where students can use the available resources in ways that are most suitable for them. This makes the 12-300 series suitable for a wide range of courses including degree foundation and vocational learning.



Screen showing the Feedback interactive Discovery software, enabling the student to learn the principles of the subject and then implement practical experiments using on-screen instruments.

Combinational Logic

Combinational Logic describes the branch of electronics in which the output of a given digital network is always a predetermined function of the input. These circuits are implemented with devices called logic gates which perform the operations of Boolean algebra, which enable basic arithmetic operations to be carried out.

It is assumed that the student has some knowledge of the principles of digital electronics (from using the introduction to digital electronics board 12-307). The student is introduced to combining logic gates together and learns how to manipulate Boolean algebra expressions. This leads onto techniques for reducing logic gate count for a given circuit using Karnaugh mapping and De Morgan's theorem.

The student is able to refer to the "Concepts" section of the Discovery software to reinforce their understanding of the principles of the subject before conducting the practical experiments.

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Basic Electronics Series — 12-308 Combinational Logic

Familiarisation
Practical 1: Navigating the Discovery Software
Practical 2: Introduction to the Logic and Digital Systems work-boards
Practical 3: Introduction to the Basic Logic Circuits work board and the components on it
Practical 4: Test circuit to check function of the Combinational Logic work-board

Logic Gates and Boolean Algebra
Practical 1: NOT, AND, NAND, OR and NOR Logic Gates
Practical 2: Working with Logic Gates
Practical 3: Substituting Logic Gates
Practical 4: Boolean Algebra and Logic Gates

Boolean and De Morgan's Theorem
Practical 1: De Morgan's Theorem
Practical 2: More Boolean Algebra
Practical 3: De Morgan's Sum and Products

Minterms and Maxterms
Practical 1: Minterms
Practical 2: Maxterms

Karnaugh Mapping
Practical 1: Karnaugh Maps (Two Variables)
Practical 2: Karnaugh Maps (Three Variables)
Practical 3: Karnaugh Maps (More than three variables)
Practical 4: Redundant States

Binary Addition and Subtraction
Practical 1: Binary Addition (Half Adder)
Practical 2: Binary Addition (Full Adder)
Practical 3: Binary Addition (Multi Digit Numbers)
Practical 4: Binary Subtraction

Equivalence and Non Equivalence
Practical 1: Practical Template
Practical 2: Binary Number Equality
Practical 3: Binary Number Inequality

Magnitude Comparators
Practical 1: One Bit Magnitude Comparator
Practical 2: Four Bit Magnitude Comparator

Binary Coded Decimal Encoders\Decoders
Practical 1: Binary Coded Decimal (BCD) Encoders
Practical 2: 8 to 3 line Priority Binary Coded Decimal (BCD) Encoder
Practical 3: 2 to 4 line Binary Coded Decimal (BCD) Decoder
Practical 4: 3 to 8 line Binary Coded Decimal (BCD) Decoder

Code and Converters
Practical 1: Code Conversion

Multiplexers/Demultiplexers
Practical 1: Multiplexers
Practical 2: Multiplexer Integrated Circuits
Practical 3: Demultiplexer Circuits

Digital Displays
Practical 1: Seven Segment Displays

Programmable Logic Devices (PLD) Introduction
Practical 1: Introduction to PLDs

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