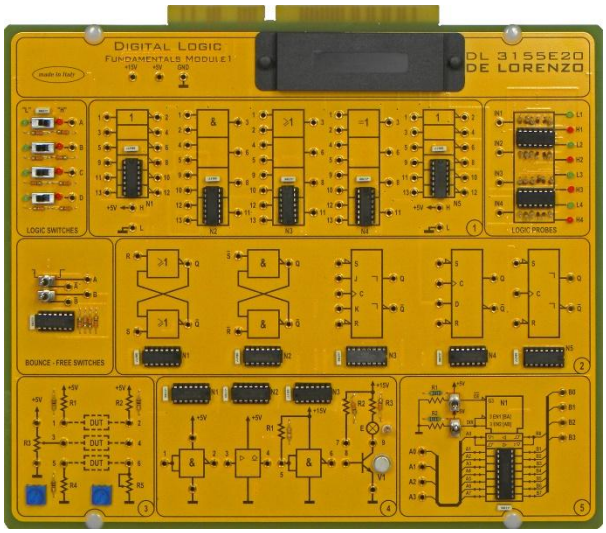
ELECTRONICS

DIGITAL LOGIC FUNDAMENTALS 1



The design and construction of electronic circuits to solve practical problems is an essential technique in the fields of electronic engineering and computer engineering.

With this board the students can study the fundamentals of digital logic, the theorems of Boolean algebra, the logic functions, the karnaugh's maps, the logic gates NOT-AND-OR-NAND-NOR, the flip-flops and the logic families TTL and CMOS

DL 3155E20

THEORETICAL TOPICS

- Ideas of logic: logic connectives and fundamental theorems of the Boolean algebra
- Binary system
- Logic functions
- Algebraic description of the logic networks and the truth tables
- Theorems of the Boolean algebra
- Minimization techniques of logic functions through theorem applications and Karnaugh maps
- Logic gates and truth tables
- Fundamental logic operators
- NOT, AND, OR logic operators
- Operation of the AND and OR operators as control devices in the transfer of logic signals
- OR-EXCLUSIVE logic operator
- Canonical forms of a function
- Graphic representation of functions
- AND - OR - NOT function
- NAND and NOR logic operators
- Operation of the NAND and NOR operators as control devices in the transfer of logic signals and carrying out of logic functions
- Generalities and definition of flip-flop
- S - R flip-flop, with NOR and NAND operators
- J - K flip-flop

CIRCUIT BLOCKS

- AND / NAND
- OR / NOR
- XOR / XNOR
- Open Collector
- SET / RESET Flip-Flop
- D-Type Flip-Flop
- JK Flip-Flop
- Tri-State Output
- TTL / CMOS Comparison
- Data Bus Control

In addition, the Circuit Board contains:

- +5 V regulated supply
- Built-in clock circuit
- Manual input signal control

Complete with theoretical and practical manual.
Dimensions of the board: 297x260mm

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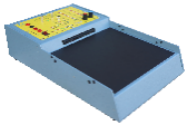
ELECTRONICS

- Master-slave J - K flip-flop
- T and D flip-flops
- Fundamental logic families
- TTL and CMOS families
- Characteristic parameters of the logic gates
- Interfacing of the logic families, outputs and types of TTL circuits
- Interfacing from CMOS to TTL
- Interfacing from TTL to CMOS
- TTL with totem-pole outputs
- The open-collector gates
- Wired-and function Page
- Types of TTL circuits
- Schotty and low power Schotty of advanced type (AS/ALS)
- Interfacing with the bus
- An example of transmitter / receiver for bi-directional bus
- Fault simulation

CAI SOFTWARE:
Each board of the TIME system can be supplied complete with a Student Navigator software that allows students to perform their learning activities through a Personal Computer, without the need for any other documentation.
Ordering code: please add SW after the code of the board (i.e. DL 3155E20SW)



Required:
POWER SUPPLY NOT INCLUDED
Base frame with power supply (completed with connecting cables):

- **DL 3155AL3** - Base frame with power supply and interface to pc and virtual instrumentation
- **DL 3155AL2** - Base frame with power supply and interface to pc

Basic power supply (connecting cables not included):

- **DL 2555ALF** - DC power supply ±5 ±15 0±15 Vdc, 1A
- **TL 3155AL2** - Connecting cables

Choosing this power supply, for the execution of the experiments, it is normally required the use of an oscilloscope and two multimeters.

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