Basic Electronics and Electricity Assembly Kits

edibon

Engineering and Technical Teaching Equipment

M-KITS

System structure

② Assembly Kits

① Common elements

② Assembly Kits

FACO

+

N-M15

M1/KIT

M2/KIT

M3/KIT

M4/KIT

M5/KIT

M6/KIT

M7/KIT

M8/KIT

M9/KIT

M10/KIT

M11/KIT

M12/KIT

M13/KIT

M14/KIT

M16/KIT

M18/KIT

Teaching Technique used

③ **ICAI.** Interactive Computer Aided Instruction Software

EDIBON Classroom Manager (Instructor Software)

+

EDIBON Student Labsoft (Student Software)

+

EDIBON E-Learning Content (Unit Software)

PC required for

④ **EDAS/VIS.** EDIBON Data Acquisition System and Virtual Instrumentation

Data Acquisition Interface Box

+

Data Acquisition Board

+

Data Acquisition and Virtual Instrumentation Software

Teaching Technique used

The complete system includes parts ① to ④ and any part can be supplied individually or additionally. (Common elements + Kit/s are the minimum supply): ① + ②.

www.edibon.com
⮡PRODUCTS
⮡2.- ELECTRONICS

Available assembly kits

-M1/KIT. Direct Current (DC) Circuits Kit.

-M2/KIT. Alternating Current (AC) Circuits Kit.

-M3/KIT. Semiconductors I Kit.

-M4/KIT. Semiconductors II Kit.

-M5/KIT. Power Supplies Kit.

-M6/KIT. Oscillators Kit.

-M7/KIT. Operational Amplifiers Kit.

-M8/KIT. Filters Kit.

-M9/KIT. Power Electronics Kit.

-M10/KIT. Digital Systems and Converters Kit.

-M11/KIT. Digital Electronic Fundamentals Kit.

-M12/KIT. Basic Combinational Circuits Kit.

-M13/KIT. Basic Sequential Circuits Kit.

-M14/KIT. Optoelectronics Kit.

-M16/KIT. Electric Networks Kit

-M18/KIT. Three-phase Circuits Kit.

INTRODUCTION

Present technology requires necessary knowledge of ELECTRONICS and ELECTRICITY in most fields.

Avionics, Autotronics, Domotics, Agrotronics, Physics, Process Chemistry, Health Services, etc., already employ components or even whole systems based on Electronics and Electricity. Thus there is an increasing number of professionals in these and many other fields who need adequate knowledge and training.

Taken this into account, EDIBON has developed the Basic Electronics and Electricity Integrated Laboratory, capable of covering different levels of difficulty. It is based on a series of self-taught modules, each one referring to a specific area of Electricity and Electronics.

GENERAL DESCRIPTION

The purpose of Basic Electronics and Electricity Assembly Kits, "M-KITS" is to provide the students with the necessary elements for creating their own circuits.

What are the parts included in the laboratory?

① Common elements for all kits:
-**FACO. Power Supply.** Using this power supply, training and practices can be done conventionally. This is the most common power supply used with modules.
-**N-M15. Own Development Module.**

② Kits:
Each of them contains:
Assembly and practice manuals (8 manuals supplied).
Set of components and wires necessary for mounting the corresponding practice.
After the **first assembly, all the elements are recoverable**.

③ ICAI. Interactive Computer Aided Instruction Software:
The best help in classroom for both teacher and students.
It includes:

3.1) ECM-SOF. EDIBON CLASSROOM MANAGER (INSTRUCTOR SOFTWARE):
ECM-SOF is the application that allows the Instructor to register students, manage and assign tasks for workgroups, create own content to carry out Practical Exercises, choose one of the evaluation methods to check the Student knowledge and monitor the progression related to the planned tasks for individual students, workgroups, units, etc... so the teacher can know in real time the level of understanding of any student in the classroom.

3.2) ESL-SOF. EDIBON STUDENT LABSOFT (STUDENT SOFTWARE):
ESL-SOF is the application addressed to the Students that helps them to understand theoretical concepts by means of practical exercises and to prove their knowledge and progression by performing tests and calculations in addition to Multimedia Resources. Default planned tasks and an Open workgroup are provided by EDIBON to allow the students start working from the first session. Reports and statistics are available to know their progression at any time, as well as explanations for every exercise to reinforce the theoretically acquired technical knowledge.

3.3) ESL-*UNIT*-SOF. EDIBON E-LEARNING CONTENT FOR EACH UNIT. (UNIT SOFTWARE):
ESL-*UNIT*-SOF, is a set of digital resources created by EDIBON that accompanies each Technical Teaching Unit. The resources can be edited or enriched by the instructor adding others if deems it convenient. The content provided by EDIBON includes a practical manual, evaluation exercises, equations and multimedia support material to assimilate the concepts studied with the units.

④ EDAS/VIS. EDIBON Data Acquisition System and Virtual Instrumentation:
EDIBON has developed this unique data acquisition interface, link between modules and PC, for an adequate visualization of the results yielded by the modules.
The components together (hardware + software) makes the computer work as virtual instruments: oscilloscope, functions generator, spectrum analyzer, transient analyzer, multimeter, logic analyzer and logic generator, with all their features and applications.
It includes:
- Hardware: DAIB. Data Acquisition Interface Box + DAB. Data Acquisition Board.
- Software: EDAS/VIS-SOF. Data Acquisition and Virtual Instrumentation Software.

Complete M-KITS system includes: ① + ② + ③ + ④

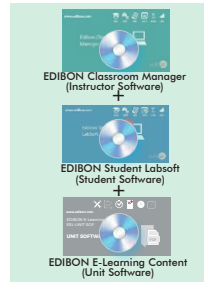**Minimum supply:**   ① Common elements (FACO + N-M15)   + ② Kit/s.

A) ICAI + EDAS/VIS working possibility (complete EDIBON system)

Common elements:
FACO. Power supply.
N-M15. Own Development Module.

Kits
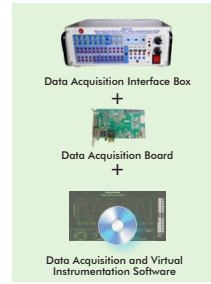
EDIBON Classroom Manager
(Instructor Software)
+
EDIBON Student Labsoft
(Student Software)
+
EDIBON E-Learning Content
(Unit Software)

ICAI.
Interactive Computer Aided
Instruction Software

Data Acquisition Interface Box
+
Data Acquisition Board
+
Data Acquisition and Virtual
Instrumentation Software

EDAS/VIS.
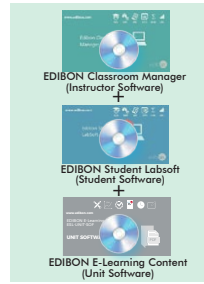EDIBON Data Acquisition System
and Virtual Instrumentation

B) ICAI working possibility

Common elements:
FACO. Power supply.
N-M15. Own Development Module.

Kits

EDIBON Classroom Manager
(Instructor Software)
+
EDIBON Student Labsoft
(Student Software)
+
EDIBON E-Learning Content
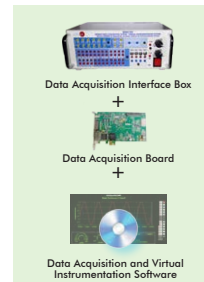(Unit Software)

ICAI.
Interactive Computer Aided
Instruction Software

C) EDAS/VIS working possibility

Common elements:
FACO. Power supply.
N-M15. Own Development Module.

Kits

Data Acquisition Interface Box
+
Data Acquisition Board
+
Data Acquisition and Virtual
Instrumentation Software

EDAS/VIS.
EDIBON Data Acquisition System
and Virtual Instrumentation

D) Simplest working possibility

Common elements:
FACO. Power supply.
N-M15. Own Development Module.

Kits

FACO. **Power Supply**

SPECIFICATIONS

DC Fixed outputs: + 5 V, ± 12 V, 1 A.

DC Variable outputs: ± 12 V, 0.5 A.

AC Outputs: 12 V or 24 V.

Outputs through 2 mm terminals, or connectors Sub-D of 25 pins (2 outputs).

Voltage LED indicators.

Robust construction.

Power: 110/220 VAC

Frequency: 50/60 Hz.

DIMENSIONS AND WEIGHTS

Dimensions: 225 x 205 x 100 mm approx.
(8.85 x 8.07 x 3.93 inches approx.)
Weight: 2 kg approx.
(4.4 pounds approx.)

N-M15. **Own Development Module**
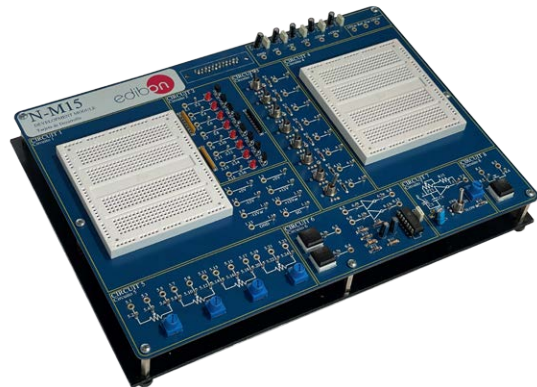
SPECIFICATIONS

Development board.

Power supply connector.

Digital visual display unit.

Logical source.

Set of potentiometers.

Pulse generator and inverters.

Interrupter.

Clock.

DIMENSIONS AND WEIGHTS

Dimensions: 300 x 210 x 45 mm approx.
(11.81 x 8.26 x 1.77 inches approx.)
Weight: 300 g approx.
(0.66 pounds approx.)

M1/KIT. **Direct Current (DC) Circuits Kit**

GENERAL DESCRIPTION

With the Direct Current (DC) Circuits Kit, "M1/KIT", designed by EDIBON, you can begin to study the basic principles of direct current.

PRACTICAL POSSIBILITIES

Measurement managing and checking instruments:
1.- Electronic instrumentation operation. Use of multimeter.
2.- Faults study of F1 in resistance circuit.
3.- Faults study of F2 in resistance circuit.
4.- Theoretical/practical exercises.
Ohm's Law:
5.- Ohm's Law verification.
6.- Power calculation.
7.- Theoretical/practical exercises.
Resistors: characteristics and types:
8.- Resistor measurements.
9.- Faults study of F1 in resistors circuit.
10.-Faults study of F2 in resistors circuit.
11.-Theoretical/practical exercises.
Resistors association and the Wheatstone bridge:
12.-Voltage and current measurement in a circuit with resistors connected in series.
13.-Parallel configuration study.
14.-The Wheatstone bridge.
15.-Faults study of F1 in series resistors circuit.
16.-Faults study of F2 in parallel resistors circuit.
17.-Faults study of F1 in Wheatstone bridge circuit.
18.-Faults study of F2 in Wheatstone bridge circuit.
19.-Theoretical/practical exercises.
Kirchoff's laws:
20.-Kirchoff's first law.
21.-Kirchoff's second law.
22.-Fault study using Kirchoff's law.
23.-Theoretical/practical exercises.
Additional practical possibilities:
24.-Voltage/current dividers.
25.-Batteries and switches.
26.-Power source in series and parallel.
27.-The rheostat and potentiometer.
-Several other exercises can be done and designed by the user.

REQUIRED ELEMENTS (NOT INCLUDED)

- FACO. Power Supply.
- N-M15. Own Development Module.

SPECIFICATIONS

The kit includes:
  Manuals.
  Set of practice wires.
  Switch, two positions.
  Five switches, three positions.
  Red lamp 12 V.
  Button potentiometer 10 K.
  Button potentiometer 500 ohms.
  Resistance 0 (bridge).
  Dos resistances 1.5 K.
  Resistance 100 ohms.
  Five resistances 10 K.
  Resistance 12 K.
  Five resistances 1 K.
  Five resistances 2.2 K.
  Three resistances 2.7 K.
  Resistance 33 ohms.
  Two resistances 330 ohms.
  Four resistances 4.7 K.
  Resistance 470 K.
  Two resistances 680 ohms.

ADDITIONAL RECOMMENDED ELEMENTS (NOT INCLUDED)

Recommended (only one):
- EDAS/VIS-0.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 250,000 samples/s).
                        or
- EDAS/VIS-1.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 1,250,000 samples/s).

DIMENSIONS AND WEIGHTS

Dimensions: 300 x 300 x 200 mm approx.
            (11.81 x 11.81 x 7.87 inches approx.)
Weight: 500 g approx.
            (1 pound approx.)

SIMILAR UNITS AVAILABLE

N-M1. Direct Current (DC) Circuits Module.

M2/KIT. **Alternating Current (AC) Circuits Kit**

GENERAL DESCRIPTION

With Alternating Current (AC) Circuits Kit, "M2/KIT", designed by EDIBON, you can start to study the basic principles in alternating current.

PRACTICAL POSSIBILITIES

Alternating signal characteristics. Instruments:
1.- Waveforms study in AC.
2.- Faults study of F1 in the circuit#1 (Waveform circuit).
3.- Faults study of F2 in the circuit#1 (Waveform circuit).
4.- Relation between peak values and RMS for sinusoidal waves.
5.- Resistance in a sinusoidal alternating current.
6.- Measurements using the oscilloscope.
7.- Voltage and current phase angles for resistors in sinusoidal alternating current.
8.- Sinusoidal AC resistors in series.
9.- Sinusoidal AC resistors in parallel.
10.-Theoretical/practical exercises.

Behaviour of AC capacitors and inductors:
11.-Capacitance with square waveform and sinusoidal input current.
12.-Inductance with square waveform and a sinusoidal input voltage.
13.-Reactive reactance, Xc, variations with the frequency.
14.-Faults study in capacitors.
15.-Reactive capacitance variations with the capacitance.
16.-AC capacitors in parallel.
17.-AC capacitors in series.
18.-AC capacitors as voltage dividers.
19.-Inductance in an AC circuit.
20.-Inductive reactance variations with the inductance.
21.-Inductors in series in an AC circuit.
22.-Theoretical/practical exercises.

Basic theorems and capacitance and inductance circuits:
23.-AC resistor-capacitor circuits in series.
24.-AC resistor-capacitor circuits in parallel.
25.-AC resistor-nductor circuits in series.
26.-Study of Fault 1 in the circuit#3 (Reactive mixed circuits).
27.-Study of Fault 2 in the circuit#3 (Reactive mixed circuits).
28.-AC resistor-inductor circuits in parallel.
29.-Theoretical/practical exercises.

RLC Circuits:
30.-Resistance-capacitance filters.
31.-Filters inductive resistance.
32.-Theoretical/practical exercises.

Resonance:
33.-AC L-C circuits in parallel with low impedance source.
34.-Faults study of F1 in the resonance circuit.
35.-Faults study of F2 in the resonance circuit.
36.-AC L-C circuits in parallel with high impedance source.
37.-Circuit frequency response and bandwidth.
38.-AC R-L-C circuits in series.

39.- Theoretical/practical exercises.
The transformer:
40.-Intermediate frequency transformers.
41.-Transformer with load.
42.-Current measurement in the secondary transformer with charge.
43.-Theoretical/practical exercises.
-Several other exercises can be done and designed by the user.

SPECIFICATIONS

The kit includes:
  Manuals.
  Set of practice wires.
  Three coils 100 mH.
  Four coils 10 mH.
  Three coils 68 mH.
  Ceramic capacitor 220 pF.
  Ceramic capacitor 470 pF.
  Three capacitors POLY 100 nF.
  Capacitor POLY 10 nF.
  Capacitor POLY 1 nF.
  Capacitor POLY 220 nF.
  Two capacitors POLY 22 nF.
  Capacitor POLY 470 nF.
  Capacitor POLY 47 nF.
  Variable capacitor 5.5 - 65 pF.
  Nine switches, two positions.
  Eight switches, three positions.
  Resistance 10 ohms.
  Three resistances 100 ohms.
  Resistance 100 K.
  Nine resistances 10 K.
  Thirty resistances 1 K.
  Seven resistances 2.2 K.
  Resistance 270 ohms.
  Resistance 3.3K.
  Four resistances 330 ohms.
  Five resistance 4.7 K.
  Three resistances 470 ohms.
  Four resistances 680 ohms.
  Transformer 2.8 VA.
  Red lamp 12 V direct current.
  Button potentiometer 10 K.
  Button potentiometer 500 ohms.
  Rresistance 0 (bridge).
  Two resistances 1.5 K.
  Resistance 12 K.
  Three resistances 2.7 K.
  Resistance 33 ohms.

M2/KIT. **Alternating Current (AC) Circuits Kit**

REQUIRED ELEMENTS (NOT INCLUDED)

- FACO. Power Supply.
- N-M15. Own Development Module.

DIMENSIONS AND WEIGHTS

Dimensions: 300 x 300 x 200 mm approx.
            (11.81 x 11.81 x 7.87 inches approx.)
Weight: 500 g approx.
            (1 pound approx.)

ADDITIONAL RECOMMENDED ELEMENTS (NOT INCLUDED)

Recommended (only one):
- EDAS/VIS-0.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 250,000 samples/s).
                                    or
- EDAS/VIS-1.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 1,250,000 samples/s).

SIMILAR UNITS AVAILABLE

N-M2. Alternating Current (AC) Circuits Module.

M3/KIT. **Semiconductors I Kit**

GENERAL DESCRIPTION

With Semiconductors I Kit, "M3/KIT", designed by EDIBON, the basic concepts of diodes can be studied, at the same time as the student will be asked to carry out a series of assemblies on the practice board to consolidate his knowledge of PN-type junctions, uses of the diode as a rectifier, Zéner diodes, etc.

PRACTICAL POSSIBILITIES

Characteristics of the PN junction:
1.- Study of the diode.
2.- Faults study in diodes.
3.- Theoretical/practical exercises.
The diode as a rectifier element:
4.- Half wave rectifier.
5.- Faults study in rectifier circuit.
6.- Bridge rectifier.
7.- Faults study in bridge rectifier.
8.- Theoretical/practical exercises.
The Zener diode:
9.- Voltage regulator with a Zener diode.
10.-Faults study in Zener circuit.
11.-Theoretical/practical exercises.
Study and characteristics of the transistor:
12.-Study of the transistor.
13.-Faults study in the transistor.
14.-Theoretical/practical exercises.
Transistor characteristics operating as a switch:
15.-Study of the transistor as a switch.
16.-Theoretical/practical exercises.
Common emitter amplifier:
17.-Study of the common emitter NPN amplifier.
18.-Faults study in amplifier circuit.
19.-Study of the common emitter PNP amplifier.
20.-Theoretical/practical exercises.
Additional practical possibilities:
21.-Voltage doubler.
22.-Power supply filtering.
-Several other exercises can be done and designed by the user.

REQUIRED ELEMENTS (NOT INCLUDED)

- FACO. Power Supply.
- N-M15. Own Development Module.

ADDITIONAL RECOMMENDED ELEMENTS (NOT INCLUDED)

Recommended (only one):
- EDAS/VIS-0.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 250,000 samples/s).
                          or
- EDAS/VIS-1.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 1,250,000 samples/s).

SPECIFICATIONS

The kit includes:
    Manuals.
    Set of practice wires.
    IC LM358.
    Ceramic capacitor 2.2 nF.
    Bypass ceramic capacitor 100 nF.
    Capacitor ELCO 10 µF.
    Capacitor ELCO 100 µF.
    Three multi-layer capacitors 1µF.
    Capacitor POLY 1nF.
    Five switches, two positions.
    Switch, two positions.
    Four diodes 1N4001.
    Four diodes 1N4148.
    Two red led diodes.
    ZENER diode 5 V.
    ZENER diode 6 V.
    Two button potentiometers 10 K.
    Resistance 1.5 K.
    Eight resistances 10 K.
    Two resistances 120 K.
    Resistance 12 K.
    Five resistances 1 K.
    Resistance 2.2M.
    Three resistances 22 ohms.
    Resistance 22 K.
    Resistance 270 K.
    Resistance 27 K.
    Resistance 3.9 K.
    Resistance 4.7 K.
    Resistance 470 ohms.
    Resistance 7.5 K.
    Six transistors.

DIMENSIONS AND WEIGHTS

Dimensions: 300 x 300 x 200 mm approx.
                    (11.81 x 11.81 x 7.87 inches approx.)
Weight: 500 g approx. (1 pound approx.)

SIMILAR UNITS AVAILABLE

N-M3. Semiconductors I Module.

M4/KIT. **Semiconductors II Kit**

GENERAL DESCRIPTION

With Semiconductors II Kit, "M4/KIT", designed by EDIBON, semiconductors can be studied by extending the knowledge acquired in the basic module "M3/KIT".

PRACTICAL POSSIBILITIES

Complementary transistors pair:
1.- Complementary transistors pair.
2.- Transistors pair with alternating signal.
3.- Faults study of the complementary transistors pair.
4.- Theoretical/practical exercises.
Darlington configuration:
5.- Darlington configuration.
6.- Faults study of the Darlington configuration.
7.- Theoretical/practical exercises.
Differential amplifier:
8.- Differential amplifier.
9.- Faults study in the differential amplifier.
10.-Theoretical/practical exercises.
Study and characteristics of the JFET transistor:
11.-JFET characteristics.
12.-Faults study with the JFET transistor.
13.-Theoretical/practical exercises.
Analog switch:
14.-Analog switch.
15.-Theoretical/practical exercises.
Direct coupled amplifier:
16.-Direct coupled amplifier.
17.-Faults study in an amplifier coupled directly.
18.-Theoretical/practical exercises.
-Several other exercises can be done and designed by the user.

REQUIRED ELEMENTS (NOT INCLUDED)

- FACO. Power Supply.
- N-M15. Own Development Module.

ADDITIONAL RECOMMENDED ELEMENTS (NOT INCLUDED)

Recommended (only one):
- EDAS/VIS-0.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 250,000 samples/s).
or
- EDAS/VIS-1.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 1,250,000 samples/s).

SPECIFICATIONS

The kit includes:
  Manuals.
  Set of practice wires.
  Three ceramic capacitors 1µF.
  Ceramic capacitor 100 pF.
  Bypass ceramic capacitor 100 nF.
  Three capacitors ELCO 100 µF.
  Five switches, two positions.
  Five diodes.
  Button potentiometer 10 K.
  Two button potentiometers 1 K.
  Button potentiometer 5 K.
  Resistance 1.5 K.
  Four resistances 100 ohms.
  Two resistances 100 K.
  Eight resistances 10 K.
  Resistance 11 K.
  Two resistances 12 K.
  Six resistances 1 K.
  Resistance 1M.
  Two resistances 4.7 K.
  Three resistances 47 K.
  Resistance 560 ohms.
  Seven transistors.
  Transistor BC557.
  Two transistors BF256A.

DIMENSIONS AND WEIGHTS

Dimensions: 300 x 300 x 200 mm approx.
        (11.81 x 11.81 x 7.87 inches approx.)
Weight: 500 g approx.
        (1 pound approx.)

SIMILAR UNITS AVAILABLE

N-M4. Semiconductors II Module.

M5/KIT. Power Supplies Kit

GENERAL DESCRIPTION

With the Power Supplies Kit "M5/KIT", designed by EDIBON, symmetrical voltage regulators, operation of fixed, symmetrical and switched-mode power supplies as well as rectification (conversion of an AC voltage to a DC voltage) can be studied.

PRACTICAL POSSIBILITIES

Rectification:

1.- Rectification.

2.- Bridge rectifier.

3.- Theoretical/practical exercises.

Fixed voltage sources:

4.- Power supply with the Zener diode.

5.- Stabilization through Zener and Transistor.

6.- Faults study in "Stabilization through Zener and transistor".

7.- Protection against overcurrents.

8.- Protection against overvoltages.

9.- Faults study of "Protection against overcurrents".

10.-Theoretical/practical exercises.

Symmetrical voltage power sources:

11.-Symmetrical source; 78XX regulator.

12.-Symmetrical source; 79XX regulator.

13.-Theoretical/practical exercises.

Voltage regulators with integrated circuits:

14.-Adjustable regulator; LM317.

15.-Faults study in adjustable LM317 regulator.

16.-Adjustable L200 regulator.

17.-Faults study in adjustable L200 regulator.

18.-Theoretical/practical exercises.

Introduction to switched power supplies:

19.-Switching technique.

20.-Switching technique. PWM.

21.-Switching technique. Boost.

22.-Theoretical/practical exercises.

Additional practical possibilities:

23.-Voltage Feedback.

24.-DC-DC converter.

-Several other exercises can be done and designed by the user.

SPECIFICATIONS

The kit includes:

Manuals.
Set of practice wires.
Three coils 100 µHz.
IC LM2575T.
IC LM2577T.
IC LM358.
IC NE555.
Two bypass ceramic capacitors 100 nF.
Capacitor 1000 µF.
Three capacitors 470 µF.
Multi-layer capacitor 1µF.
Capacitor POLY 10 nF.
Capacitor POLY 330 nF.
Three capacitors TANTALO 10 µF.
Four switches, two positions.
Seven diodes.
Diode 1N4148.
Three diodes SB140.
Two diodes ZENER 8.2 V.
Fuse 1 A.
Two fuse supports CI.
Button potentiometer 10 K.
Two button potentiometers 1 K.
Two button potentiometers 500 K.
Button potentiometer 5 K.
Radiator.
Regulator.
Regulator 7912.
Regulator L200.
Regulator LM317.
Resistance 1 ohms.
Two resistances 100 ohms.
Two resistances 100 K.
Resistance 12 ohms.
Two resistances 1 K.
Two resistances 2.2 K.
Resistance 2.7 ohms.
Resistance 220 ohms.
Resistance 2 K.
Resistance 330 ohms.
Resistance 5.1ohms.
Resistance 560 ohms.
Thyristor C106.
Transistor BC547.
Transistor mosfet.
Two transistors TIP121.

M5/KIT. **Power Supplies Kit**

REQUIRED ELEMENTS (NOT INCLUDED)

- FACO. Power Supply.
- N-M15. Own Development Module.

DIMENSIONS AND WEIGHTS

Dimensions: 300 x 300 x 200 mm approx.
     (11.81 x 11.81 x 7.87 inches approx.)
Weight: 500 g approx.
    (1 pound approx.)

ADDITIONAL RECOMMENDED ELEMENTS (NOT INCLUDED)

Recommended (only one):
- EDAS/VIS-0.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 250,000 samples/s).
or
- EDAS/VIS-1.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 1,250,000 samples/s).

SIMILAR UNITS AVAILABLE

N-M5. Power Supplies Module.

M6/KIT. Oscillators Kit

GENERAL DESCRIPTION

With the Oscillators Kit, "M6/KIT", designed by EDIBON, the different oscillators can be studied: RC and LC network oscillators, Wein bridge, Colpitts, Hartley and the astable multivibrator.

PRACTICAL POSSIBILITIES

RC and LC nets oscillators:
1.- RC net oscillator.
2.- LC net oscillator.
3.- Faults study with RC and LC net oscillators.
4.- Theoretical/practical exercises.

Wien bridge oscillator:
5.- Wien bridge.
6.- Faults study on the Wien bridge oscillator.
7.- Theoretical/practical exercises.

Colpitts oscillator. Hartley oscillator:
8.- Colpitts oscillator.
9.- Hartley oscillator.
10.-Faults study with the Colpitts oscillator.
11.-Theoretical/practical exercises.

Astable multivibrator:
12.-Astable multivibrator.
13.-Faults study with an astable multivibrator.
14.-Theoretical/practical exercises.

555 Timer:
15.-Astable multivibrator.
16.-Faults study of 555 timer.
17.-Theoretical/practical exercises.

-Several other exercises can be done and designed by the user.

REQUIRED ELEMENTS (NOT INCLUDED)

- FACO. Power Supply.
- N-M15. Own Development Module.

ADDITIONAL RECOMMENDED ELEMENTS (NOT INCLUDED)

Recommended (only one):
- EDAS/VIS-0.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 250,000 samples/s).
                              or
- EDAS/VIS-1.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 1,250,000 samples/s).

SPECIFICATIONS

The kit includes:
   Manuals.
   Set of practice wires.
   Two coils 10 mH.
   Coil 1mH 5 MM.
   IC NE555.
   IC TL072.
   Thre bypass ceramic capacitors 100 nF.
   Four capacitors POLY 1 μF.
   Eight capacitors POLY 100 nF.
   Five capacitors POLY 10 nF.
   Capacitor POLY 2.2 nF.
   Two capacitors POLY 4.7 nF.
   Two diodes.
   Two button potentiometers 1 K.
   Button potentiometer 500 K.
   Button potentiometer 5 K.
   Two resistances 0.
   Two resistances 100 K.
   Four resistances 10 K.
   Two resistances 15 K.
   Two resistances 1 K.
   Resistance 1 M.
   Six resistances 2.2 K.
   Resistance 220 K.
   Two resistances 22 K.
   Two resistances 470 ohms.
   Three transistors.

DIMENSIONS AND WEIGHTS

Dimensions: 300 x 300 x 200 mm approx.
                    (11.81 x 11.81 x 7.87 inches approx.)
Weight: 500 g approx.
                    (1 pound approx.)

SIMILAR UNITS AVAILABLE

N-M6. Oscillators Module.

M7/KIT. **Operational Amplifiers Kit**

GENERAL DESCRIPTION

With Operational Amplifiers Kit, "M7/KIT", designed by EDIBON, the different amplifiers can be studied: inverting, non-inverting, additive, differential and comparators.

PRACTICAL POSSIBILITIES

Operational amplifier characteristics:
1.- Operational amplifier study.
2.- Closed-loop output compensation voltage.
3.- Operational amplifier fault study.
4.- Theoretical/practical exercises.
The inverting amplifier:
5.- Inverting amplifier study.
6.- Inverting amplifier fault study.
7.- Theoretical/practical exercises.
The non-inverting amplifier:
8.- Study of the non-inverting amplifier.
9.- Voltage follower.
10.-Fault study in the non-inverting amplifier.
11.-Theoretical/practical exercises.
The adder amplifier:
12.-Adding amplifier study.
13.-Faults study in the adding amplifier.
14.-Theoretical/practical exercises.
The differential amplifier:
15.-Differential amplifier study.
16.-Differential amplifier fault study.
17.-Theoretical/practical exercises.
Comparators:
18.-Comparator study.
19.-Comparators fault study.
20.-Theoretical/practical exercises.
Additional practical possibilities:
21.-Attenuator.
22.-Voltage divider.
23.-Open-loop operation.
-Several other exercises can be done and designed by the user.

SPECIFICATIONS

The kit includes:
Manuals.
Set of practice wires.
IC LM318.
IC OP07.
Six IC UA741 operational amplifiers.
Sixteen bypass ceramic capacitors 100 nF.
Six switches, two positions.
Two button potentiometers 100 K.
Button potentiometer 50 K.
Two button potentiometers 5 K.
Vertical multi-turn potentiometer 10 K.
Resistance 100 ohms.
Six resistances 100 K.
Three resistances 10 K.
Two resistances 15 K.
Two resistances 1 K.
Two resistances 200 K.
Resistance 300 K.
Three resistances 30 K.
Two resistances 50 K.

REQUIRED ELEMENTS (NOT INCLUDED)

- FACO. Power Supply.
- N-M15. Own Development Module.

ADDITIONAL RECOMMENDED ELEMENTS (NOT INCLUDED)

Recommended (only one):
- EDAS/VIS-0.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 250,000 samples/s).

or

- EDAS/VIS-1.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 1,250,000 samples/s).

DIMENSIONS AND WEIGHTS

Dimensions: 300 x 300 x 200 mm approx.
(11.81 x 11.81 x 7.87 inches approx.)
Weight: 500 g approx.
(1 pound approx.)

SIMILAR UNITS AVAILABLE

N-M7. Operational Amplifiers Module.

M8/KIT. **Filters Kit**

GENERAL DESCRIPTION

With Filters Kit, "M8/KIT", designed by EDIBON, the different types of filters can be studied: RC and LC, in "T" type configuration, active filters and also study associations of one and others in order to be able to practice with more complex filters, to obtain other filters with certain desired characteristics (low-pass filter, high-pass, band-pass and eliminated band).

PRACTICAL POSSIBILITIES

RC and LC filter responses:
1.- Frequency response.
2.- Low-pass filter.
3.- High-pass filter.
4.- LC Circuit.
5.- Faults study in low-pass filter.
6.- Faults study in high-pass filter.
7.- Theoretical/practical exercises.
T-shaped filter:
8.- Filter with double T link.
9.- Signal generator circuit.
10.-Faults study in RC filters with double T.
11.-Theoretical/practical exercises.
Active filters:
12.-Low-pass filter with load.
13.-Low-pass filter with an operational amplifier.
14.-High-pass filter with load.
15.-High-pass filter with an operational amplifier.
16.-The attenuation is cumulative.
17.-Use of operational amplifier.
18.-Faults study in active filters.
19.-Theoretical/practical exercises.
Association of filters:
20.-Behaviour of the filter.
21.-Filtering of a distorted signal.
22.-Filter in cascade, low pass filter and high pass filter.
23.-Filter in parallel.
24.-Faults study in filters.
25.-Theoretical/practical exercises.
Additional practical possibilities:
26.-Band-pass and band-stop filters.
-Several other exercises can be done and designed by the user.

REQUIRED ELEMENTS (NOT INCLUDED)

- FACO. Power Supply.
- N-M15. Own Development Module.

ADDITIONAL RECOMMENDED ELEMENTS (NOT INCLUDED)

Recommended (only one):
- EDAS/VIS-0.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 250,000 samples/s).
            or
- EDAS/VIS-1.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 1,250,000 samples/s).

SPECIFICATIONS

The kit includes:
   Manuals.
   Set of practice wires.
   IC TL071.
   IC TL072.
   IC TL084.
   Capacitor POLY 1 µF.
   Ten capacitors POLY 100 nF.
   Four capacitors POLY 10 nF.
   Five capacitors POLY 1nF.
   Five capacitors POLY 2.2 nF.
   Capacitor POLY 4.7 nF.
   Four switches, two positions.
   Four diodes 1N4148.
   Button potentiometer 1 K.
   Three resistances 100 K.
   Nine resistances 10 K.
   Resistance 12 K.
   Nine resistances 15 K.
   Resistance 1 K.
   Resistance 1 M.
   Four resistances 2.2 K .
   Resistance 2.7 K.
   Resistance 220 K.
   Resistance 22 K.
   Four resistances 27 K.
   Thirteen resistances 3.3 K.
   Two resistances 3.9 K.
   Three resistances 4.7 K.
   Two transistors.

DIMENSIONS AND WEIGHTS

Dimensions: 300 x 300 x 200 mm approx.
               (11.81 x 11.81 x 7.87 inches approx.)
Weight: 500 g approx.
               (1 pound approx.)

SIMILAR UNITS AVAILABLE

N-M8. Filters Module.

M9/KIT. **Power Electronics Kit**

GENERAL DESCRIPTION

With Power Electronics Kit, "M9/KIT", designed by EDIBON, the operation of MOSFET transistors, thyristors, TRIACs, etc. can be studied.

PRACTICAL POSSIBILITIES

The bipolar power transistor:
1.- Study of the power transistor.
2.- Faults study in the power transistor.
3.- Theoretical/practical exercises.
The MOSFET transistor:
4.- Study of the MOSFET transistor.
5.- Faults study in the MOSFET transistor.
6.- Theoretical/practical exercises.
The thyristor:
7.- Study of the thyristor.
8.- Faults study of the thyristor.
9.- Theoretical/practical exercises.
The UJT transistor and trigger circuits of the thyristor:
10.-Study of the trigger circuits of the thyristor.
11.-Study of insulation circuits.
12.-Theoretical/practical exercises.
The TRIAC:
13.-Study of the TRIAC.
14.-Practical assembly of the TRIAC.
15.-Theoretical/practical exercises.
Additional practical possibilities:
16.-Half/Full wave control.
-Several other exercises can be done and designed by the user.

REQUIRED ELEMENTS (NOT INCLUDED)

- FACO. Power Supply.
- N-M15. Own Development Module.

ADDITIONAL RECOMMENDED ELEMENTS (NOT INCLUDED)

Recommended (only one):
- EDAS/VIS-0.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 250,000 samples/s).
or
- EDAS/VIS-1.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 1,250,000 samples/s).

DIMENSIONS AND WEIGHTS

Dimensions: 300 x 300 x 200 mm approx.
          (11.81 x 11.81 x 7.87 inches approx.)
Weight: 500 g approx. (1 pound approx.)

SPECIFICATIONS

The kit includes:
   Manuals.
   Set of practice wires.
   IC 4N33.
   IC LM311.
   IC NE555.
   Three bypass ceramic capacitors 100 nF, 50 V.
   Two multi-layer capacitors 1 µF, 25 V.
   Three switches, two positions.
   Two DIAC.
   Four diodes 1N4001.
   Diode 1N4148.
   Four diodes ZENER 15 V.
   Diode ZENER 8.2 V.
   Photo-resistance.
   Red lamp 12 V direct current.
   Four button potentiometers 100 K.
   Button potentiometer 10 K.
   Button potentiometer 5 K.
   Two resistances 1 ohm.
   Resistance 1.8 K.
   Two resistances 100 ohms.
   Resistance 100 K.
   Resistance 10 K.
   Resistance 120 ohms.
   Resistance 15 K.
   Six resistances 1 K.
   Resistance 2.2 K.
   Resistance 220 ohms.
   Three resistances 390 ohms.
   Three resistances 4.7 K.
   Resistance 47 ohms.
   Two thyristors.
   Pulse transformer.
   Transistor BC327.
   MOSFET transistor.
   Two transistors.
   Transistor VN10LM.
   Two TRIAC.

SIMILAR UNITS AVAILABLE

N-M9. Power Electronics Module.

M10/KIT. **Digital Systems and Converters Kit**

GENERAL DESCRIPTION

With Digital Systems and Converters Kit, "M10/KIT", designed by EDIBON, the behaviour of BCD/Binary counters, comparators and analogue integrators can be studied, as well as analogue/digital conversion and vice versa.

PRACTICAL POSSIBILITIES

Analog switching. Bistable, astable and monostable family:
1.- Characteristics of an analog switch chip.
2.- Faults study of F1 in the analog multiplexer.
3.- Faults study of F3 in the analog multiplexer.
4.- Characteristics of a Latch integrated circuit type S-R.
5.- Faults study of F2 in the bistable.
6.- Characteristics of an astable integrated circuit.
7.- Faults study of F8 in the astable.
8.- Characteristics of a monostable integrated circuit.
9.- Theoretical/practical exercises.

Binary/BCD counters & 7-segments displays:
10.-Characteristics of a 74ALS193 binary up/down counter and a 7-segment display.
11.-Faults study of F6 in the binary counter.
12.-Characteristics of the BCD up/down counter and 7-segment display.
13.-Faults study in the BCD counter.
14.-Theoretical/practical exercises.

Comparators and analog integrators:
15.-Characteristics of an analog comparator.
16.-Analog integrator.
17.-Faults study of F7 in the analog integrator.
18.-Triangular wave generation.
19.-Theoretical/practical exercises.

A/D and D/A conversion:
20.-D/A converter.
21.-A/D converter.
22.-Theoretical/practical exercises.

Applications:
23.-Random number generator.
24.-Measuring the time between two events.
25.-Theoretical/practical exercises.

Additional practical possibilities:
26.-Synchronous/asynchronous counter.
-Several other exercises can be done and designed by the user.

SPECIFICATIONS

The kit includes:
  Manuals.
  Set of practice wires.
  Array seven resistances 100 ohms. (Encapsulated DIP 14).
  IC 74ALS00.
  IC 74HC14.
  IC 74LS123.
  IC 74LS192.
  IC 74LS193.
  IC 74LS279.
  IC AD 558.
  IC ADG508 ACJ.
  IC CA3140.
  IC HEF4543BP.
  IC LM311.
  Two IC NE555.
  Twp ceramic capacitors 10 nF.
  Twenty-two bypass ceramic capacitors 100 nF, 50 V.
  Four capacitors ELCO 100 µF.
  Capacitor ELCO 33 µF.
  Multi-layer capacitor 68 nF.
  Capacitor POLY 1.5 µF.
  Two capacitors POLY 1 µF, RASTER 5 mm.
  Capacitor POLY 100 nF.
  Capacitor POLY 33 nF.
  Capacitor tantalo 68 µF.
  Elbow connector.
  Fifteen switches, two positions.
  Eight LED red diodes.
  Display 7 segments common cathode.
  Thirteen button potentiometers 10 K.
  Button potentiometer 500 ohms.
  Button potentiometer 5 K.
  Two push buttons 1CIR.
  Five resistances 100 ohms.
  Two resistances 100 K.
  Two resistances 1 K.
  Resistance 1 M.
  Resistance 22 K.
  Eight resistances 300 ohms.
  Two resistances 4.7 K.
  Resistance 600 ohms.
  Four transistors.

M10/KIT. **Digital Systems and Converters Kit**

REQUIRED ELEMENTS (NOT INCLUDED)

- FACO. Power Supply.
- N-M15. Own Development Module.

DIMENSIONS AND WEIGHTS

Dimensions: 300 x 300 x 200 mm approx.
(11.81 x 11.81 x 7.87 inches approx.)
Weight: 500 g approx.
(1 pound approx.)

ADDITIONAL RECOMMENDED ELEMENTS (NOT INCLUDED)

Recommended (only one):
- EDAS/VIS-0.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 250,000 samples/s).
or
- EDAS/VIS-1.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 1,250,000 samples/s).

SIMILAR UNITS AVAILABLE

N-M10. Digital Systems & Converters Module.

M11/KIT. Digital Electronic Fundamentals Kit

GENERAL DESCRIPTION

With Digital Electronic Fundamentals Kit, "M11/KIT", designed by EDIBON, numbering systems, logic circuits, TTL gates, CMOS, Boolean algebra, etc. can be studied.

PRACTICAL POSSIBILITIES

Numbers systems:
1.- Voltage measurement in a circuit of sources.
2.- Faults study in the source circuit.
3.- Theoretical/practical exercises.
Logical circuits:
4.- Logical diode.
5.- Fault study in sources.
6.- Logic with transistor and diodes.
7.- Faults study in transistor/diode circuit.
8.- Theoretical/practical exercises.
TTL gates:
9.- Basic function gates.
10.- Faults study in TTL circuit.
11.- Faults study in logic gates.
12.- Theoretical/practical exercises.
CMOS gates:
13.- Basic function gates.
14.- Faults study in CMOS circuit.
15.- Theoretical/practical exercises.
Boolean algebra and logical functions:
16.- Study of use of circuit#3 (TTL logical gates).
17.- Theoretical/practical exercises.
Open collector gates:
18.- Study of the use of circuit#5 (Open collector gates).
19.- Theoretical/practical exercises.
Others types of integrated gates:
20.- Study of simple operations with a Schmitt Trigger inverter.
21.- Operation study of a three-state buffer.
22.- Study of the fault in the circuit#7 (Three-states).
23.- Theoretical/practical exercises.
Additional practical possibilities:
24.- JK Flip-Flop.
25.- Control of data bus.
-Several other exercises can be done and designed by the user.

REQUIRED ELEMENTS (NOT INCLUDED)

- FACO. Power Supply.
- N-M15. Own Development Module.

ADDITIONAL RECOMMENDED ELEMENTS (NOT INCLUDED)

Recommended (only one):
- EDAS/VIS-0.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 250,000 samples/s).
                            or
- EDAS/VIS-1.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 1,250,000 samples/s).

SPECIFICATIONS

The kit includes:
  Manuals.
  Set of practice wires.
  Two array eight resistances 330 ohms. (Encapsulated DIP 16).
  IC 4001BP.
  IC 74LS00.
  IC 74LS04.
  IC 74LS07.
  IC 74LS08.
  IC 74LS126.
  IC 74LS14.
  IC 74LS28.
  IC 74LS32.
  IC 74LS86.
  IC TP4011B.
  Twelve bypass ceramic capacitors 100 nF, 50 V.
  Six switches, two positions.
  Four switches, two positions.
  Two diodes 1N4148.
  Two diodes BAT 85.
  Twelve LED red diodes.
  Button potentiometer 5 K.
  Ninety-five test points.
  Resistance 100 ohms.
  Twelve resistances 10 K.
  Three resistances 1K.
  Four resistances 330 ohms.
  Two resistances 4.7 K.
  Switch eight ways.
  Five transistors.

DIMENSIONS AND WEIGHTS

Dimensions: 300 x 300 x 200 mm approx.
                   (11.81 x 11.81 x 7.87 inches approx.)
Weight: 500 g approx.
                   (1 pound approx.)

SIMILAR UNITS AVAILABLE

N-M11. Digital Electronics Fundamentals Module.

M12/KIT. Basic Combinational Circuits Kit

GENERAL DESCRIPTION

With Basic Combinational Circuits Kit, "M12/KIT", designed by EDIBON, encoders, decoders, multiplexers, demultiplexers, digital comparators and arithmetic and logical operations can be studied.

PRACTICAL POSSIBILITIES

Encoders:
1.- Study of an encoder.
2.- Faults study in the encoder.
3.- Theoretical/practical exercises.
Decoders:
4.- Study of a decoder.
5.- Faults study in the decoder.
6.- Theoretical/practical exercises.
Multiplexers:
7.- Study of a multiplexer.
8.- Faults study in the multiplexers.
9.- Theoretical/practical exercises.
Demultiplexers:
10.-Study of a demultiplexer.
11.-Faults study in demultiplexers.
12.-Theoretical/practical exercises.
Digital comparators:
13.-Study of a comparator.
14.-Faults study in a comparator.
15.-Theoretical/practical exercises.
Arithmetic and logic operations:
16.-Study of an adder.
17.-Faults study in the arithmetic and logic operations.
18.-Study of a parity generator.
19.-Faults study in the parity generator.
20.-Theoretical/practical exercises.
-Several other exercises can be done and designed by the user.

SPECIFICATIONS

The kit includes:
  Manuals.
  Set of practice wires.
  Three array four individual resistances 3 ohms.
  IC 74HC14.
  Two IC 74HC193.
  IC 74LS139.
  IC 74LS148.
  IC 74LS151.
  IC 74LS280.
  IC 74LS283.
  IC 74LS48.
  IC 74LS85.
  Ten bypass ceramic capacitors 100 nF.
  Ten switches, two positions.
  Switch, two positions.
  Two diodes.
  Nineteen LED red diodes .
  Four push buttons 1 CIR.
  Seven resistances 10 K.
  Seven resistances 330 ohms.
  Four resistances 4.7 K.
  Seven transistors.

REQUIRED ELEMENTS (NOT INCLUDED)

- FACO. Power Supply.
- N-M15. Own Development Module.

ADDITIONAL RECOMMENDED ELEMENTS (NOT INCLUDED)

Recommended (only one):
- EDAS/VIS-0.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 250,000 samples/s).
                              or
- EDAS/VIS-1.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 1,250,000 samples/s).

DIMENSIONS AND WEIGHTS

Dimensions: 300 x 300 x 200 mm approx.
                    (11.81 x 11.81 x 7.87 inches approx.)
Weight: 500 g approx.
                    (1 pound approx.)

SIMILAR UNITS AVAILABLE

N-M12. Basic Combinational Circuits Module.

M13/KIT. **Basic Sequential Circuits Kit**

GENERAL DESCRIPTION

With Basic Sequential Circuits Kit, "M13/KIT", designed by EDIBON, all types of bistables, counters, flip-flops, synchronous sequential circuits and the operation of memories can be studied.

PRACTICAL POSSIBILITIES

Bistables:
1.- Bistables.
2.- Bistable S-R using NAND gates.
3.- Practical performance.
4.- Faults study in the bistables.
5.- Theoretical/practical exercises.
Shift registers:
6.- Shift registers.
7.- Faults study of the shift registers.
8.- Theoretical/practical exercises.
Counters:
9.- Steps to be followed for the assembly of a counter.
10.-Faults study of the counters.
11.-Theoretical/practical exercises.
Synchronous sequential circuits:
12.-Practice of the synchronised.
13.-Faults study of the synchronised sequential circuits.
14.-Theoretical/practical exercises.
Memories:
15.-Theoretical/practical exercises.
-Several other exercises can be done and designed by the user.

SPECIFICATIONS

The kit includes:

Manuals.

Set of practice wires.

Array four individual resistances 10 K.

Array eight resistances 10 K.

Array eight resistances 330 ohms.

IC 74HC14.

IC 74LS04.

IC 74LS08.

Two IC 74LS112.

IC 74LS279.

IC 74LS74.

IC 74LS86.

Ten switches 1 CIR, two positions.

Twelve LED red diodes.

Push button 1 CIR.

Resistance 100 ohms.

Seventeen resistances 10 K.

Twelve transistors.

REQUIRED ELEMENTS (NOT INCLUDED)

- FACO. Power Supply.
- N-M15. Own Development Module.

ADDITIONAL RECOMMENDED ELEMENTS (NOT INCLUDED)

Recommended (only one):
- EDAS/VIS-0.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 250,000 samples/s).
                            or
- EDAS/VIS-1.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 1,250,000 samples/s).

DIMENSIONS AND WEIGHTS

Dimensions: 300 x 300 x 200 mm approx.
                   (11.81 x 11.81 x 7.87 inches approx.)
Weight: 500 g approx.
                   (1 pound approx.)

SIMILAR UNITS AVAILABLE

N-M13. Basic Sequential Circuits Module.

M14/KIT. **Optoelectronics Kit**

GENERAL DESCRIPTION

With Optoelectronics Kit, "M14/KIT", designed by EDIBON, the main light emitters and liquid crystal displays (LCD), photoconductive cells, fibre optics, infrared, etc. can be studied.

PRACTICAL POSSIBILITIES

Light transmitters and liquid crystal display (LCD):
1.- Light transmitters.
2.- Bargraph.
3.- LCD display and 7-segment display.
4.- Faults study in light transmitters and liquid crystal display.
5.- Theoretical/practical exercises.
Photo-conducting cells:
6.- Light dependent resistors.
7.- Alarm.
8.- Faults study on the photo-conducting cell.
9.- Theoretical/practical exercises.
Fiber optics:
10.-Fiber optics practice.
11.-Faults study using fiber optics.
12.-Theoretical/practical exercises.
Infrared:
13.-Circuit with infrared diodes.
14.-Faults study of the infrared diodes.
15.-Theoretical/practical exercises.
-Several other exercises can be done and designed by the user.

REQUIRED ELEMENTS (NOT INCLUDED)

- FACO. Power Supply.
- N-M15. Own Development Module.

ADDITIONAL RECOMMENDED ELEMENTS (NOT INCLUDED)

Recommended (only one):
- EDAS/VIS-0.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 250,000 samples/s).
                          or
- EDAS/VIS-1.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 1,250,000 samples/s).

DIMENSIONS AND WEIGHTS

Dimensions: 300 x 300 x 200 mm approx.
                  (11.81 x 11.81 x 7.87 inches approx.)
Weight: 500 g approx. (1 pound approx.)

SIMILAR UNITS AVAILABLE

N-M14. Optoelectronics Module.

SPECIFICATIONS

The kit includes:
    Manuals.
    Set of practice wires.
    Array seven resistances 470 ohms. (Encapsulated DIP 14).
    BARGRAPH.
    Two IC 74LS390.
    IC HEF4543.
    IC LM311.
    IC LM3914.
    IC TL072.
    IC TL074.
    Printed circuit EBC14-35-95.
    Capacitor ELCO 2.2 μF.
    Capacitor POLY 1 μF.
    Two capacitors POLY 100 nF.
    Eight switches 1 CIR, two positions.
    LED yellow diode.
    LED red diode.
    Display seven segments common cathode.
    Photoreceptor.
    Phototransmitter.
    LCD.
    LDR NOR P-12.
    Two button potentiometers 100 K.
    Button potentiometer 10 K.
    Button potentiometer 5 K.
    Push button 1 CIR.
    Infrared receptor.
    Two resistances 100 ohms.
    Six resistances 100 K.
    Ten resistances 10 K.
    Resistance 11 K.
    Two resistances 1 K.
    Resistance 1 M.
    Resistance 2.2 K.
    Resistance 2.2 M.
    Resistance 220 K.
    Three resistances 330 ohms.
    Resistance 470K.
    Two resistances 560 ohms.
    Resistance 5 K.
    Two SWEET SPOT.
    Two fibre optic terminals.
    Infrared transmitter.
    Buzzer.

M16/KIT. **Electric Networks Kit**

GENERAL DESCRIPTION

With the Electric Networks Kit, "M16/KIT", designed by EDIBON, it is possible to understand the principles of Ohm's Law, Norton's and Thévenin's Theorem, Wheatstone bridge operation, superposition theorems or star/delta transformation and vice versa.

PRACTICAL POSSIBILITIES

Ohm's law:

1.- Calculation of the internal resistance of a continuous source.
2.- Faults study in an internal resistance.
3.- Internal resistance calculation of an alternating source.
4.- Theoretical/practical exercises.

Electrical power:

5.- Power transferred by a DC source to load.
6.- Power transferred to a load by an AC source.
7.- Theoretical/practical exercises.

Power supplies combination:

8.- DC+AC assembly.
9.- Error study in the circuit, DC assembly.
10.-DC+AC assembly.
11.-Theoretical/practical exercises.

Thèvenin's and Norton's theorems:

12.-Thèvenin and Norton equivalent circuits.
13.-Theoretical/practical exercises.

Superposition theorem:

14.-Application of the superposition theorem.
15.-Faults study in the superposition circuit.
16.-Theoretical/practical exercises.

Star/triangle transformation:

17.-Resistance measurement between terminals.
18.-Theoretical/practical exercises.

Wheatstone bridge:

19.-Calibration of a Wheatstone bridge fed by a DC source.
20.-Faults study in the Wheatstone bridge circuit.
21.-Wheatstone bridge calibration fed by an AC source.
21.-Theoretical/practical exercises.

Additional practical possibilities:

23.-Millman's theorem.
-Several other exercises can be done and designed by the user.

REQUIRED ELEMENTS (NOT INCLUDED)

- FACO. Power Supply.
- N-M15. Own Development Module.

SPECIFICATIONS

The kit includes:

Manuals.
Set of practice wires.
Coil 1 mHr.
Ceramic capacitor 10 nF.
Ceramic capacitor 47 nF.
Four switches 1 CIR, two positions.
Button potentiometer 10 K.
Resistance 1 W.
Two resistances 2.2 K.
Two resistances 4.7 K.
Eight resistances 1 K.
Resistance 1.5 K.
Two resistances 10 K.
Two resistances 100 W.
Resistances 3.3 K.
Two resistances 330.
Three resistances 470.
Resistance 6.8 K.
Resistance 680.
Two resistances 220.

ADDITIONAL RECOMMENDED ELEMENTS (NOT INCLUDED)

Recommended (only one):
- EDAS/VIS-0.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 250,000 samples/s).

or

- EDAS/VIS-1.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 1,250,000 samples/s).

DIMENSIONS AND WEIGHTS

Dimensions: 300 x 300 x 200 mm approx.
(11.81 x 11.81 x 7.87 inches approx.)
Weight: 500 g approx.
(1 pound approx.)

SIMILAR UNITS AVAILABLE

N-M16. Electric Networks Module.

M18/KIT. **Three-phase Circuits Kit**

GENERAL DESCRIPTION

The Three-phase Circuits Kit, "M18/KIT", designed by EDIBON, is used to study the generation of three-phase systems, load balancing between phases, operation of three-phase rectifiers, etc.

PRACTICAL POSSIBILITIES

Generation of a three-phase system:

1.- Checking of the three-phase system.

2.- Calculation of the voltage values.

Three-phase load in star and triangle:

3.- Triangle/star equivalence.

4.- Decompensation of the star.

5.- Out-phase between voltage and current (reactance).

6.- Measurement of the power factor.

7.- Correction of the power factor.

Synchronism detector:

8.- Out-phase generation between waves.

9.- Detection of out-phase between waves.

Phase-sequence detector:

10.-Waves in direct sequence.

11-Waves in inverse sequence.

Three-phase rectifier:

12.-Half-wave three-phase rectifier.

13.-Full-wave three-phase rectifier.

-Several other exercises can be done and designed by the user.

REQUIRED ELEMENTS (NOT INCLUDED)

- FACO. Power Supply.
- N-M15. Own Development Module.

ADDITIONAL RECOMMENDED ELEMENTS (NOT INCLUDED)

Recommended (only one):
- EDAS/VIS-0.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 250,000 samples/s).

or

- EDAS/VIS-1.25. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 1,250,000 samples/s).

SPECIFICATIONS

The kit includes:

Manuals.

Set of practice wires.

Six coils 1 mH.

Six coils 68 mH.

Five capacitors 1 nF.

Eleven capacitors 100 nF.

Five capacitors 100 nF.

Three resistances 100 K.

Five resistances 10 K.

Two potentiometers 10 K.

Potentiometer 10 K.

Four potentiometers 2 K.

Three resistances 150 K.

Ten resistances 1 K.

Four resistances 330 K.

Potentiometer 1 K.

Three potentiometers 1 K.

Nine diodes 1N4148.

Nine capacitors 1 nF.

Ten capacitors 2.2 nF.

Capacitor 22 nF.

Capacitor 33 nF.

Resistance 82 K.

Three resistances 990 K.

DIMENSIONS AND WEIGHTS

Dimensions: 300 x 300 x 200 mm approx.
(11.81 x 11.81 x 7.87 inches approx.)
Weight: 500 g approx.
(1 pound approx.)

SIMILAR UNITS AVAILABLE

N-M18. Three-phase Circuits Module.
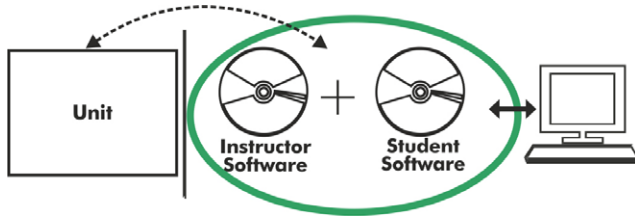
With no physical connection between unit and computer (PC), **this complete software package consists of an Instructor Software (EDIBON Classroom Manager -ECM-SOF) totally integrated with the Student Software (EDIBON Student Labsoft -ESL-SOF).** Both are interconnected so that the teacher knows at any moment what is the theoretical and practical knowledge of the students.
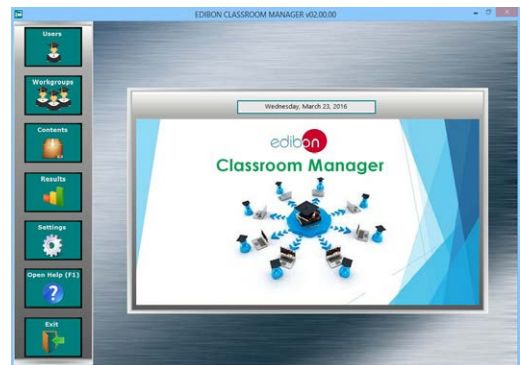

Instructor Software

- ECM-SOF. EDIBON Classroom Manager (Instructor Software).

ECM-SOF is the application that allows the Instructor to register students, manage and assign tasks for workgroups, create own content to carry out Practical Exercises, choose one of the evaluation methods to check the Student knowledge and monitor the progression related to the planned tasks for individual students, workgroups, units, etc... so the teacher can know in real time the level of understanding of any student in the classroom.

Innovative features:

• User Data Base Management.

• Administration and assignment of Workgroup, Task and Training sessions.

• Creation and Integration of Practical Exercises and Multimedia Resources.

• Custom Design of Evaluation Methods.

• Creation and assignment of Formulas & Equations.

• Equation System Solver Engine.

• Updatable Contents.

• Report generation, User Progression Monitoring and Statistics.

ECM-SOF. EDIBON Classroom Manager (Instructor Software) Application Main Screen
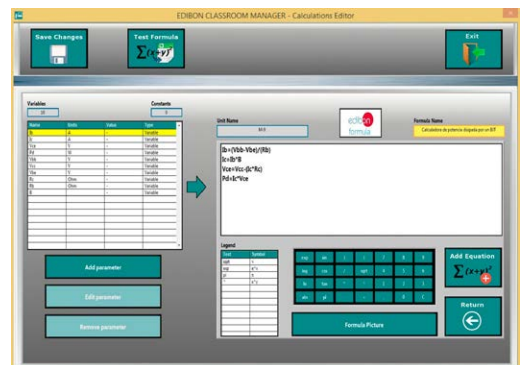
ECAL. EDIBON Calculations Program Package - Formula Editor Screen
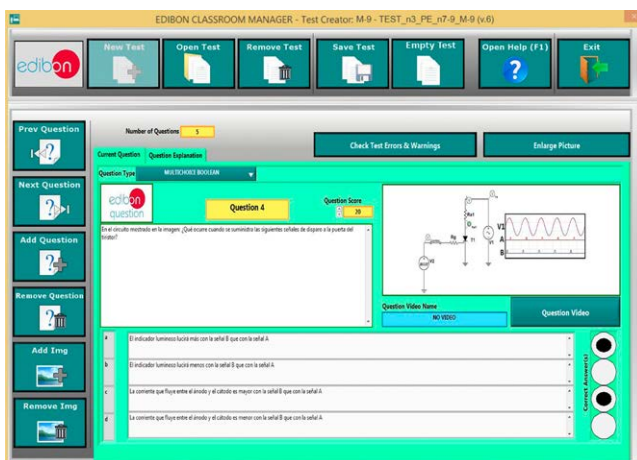
ETTE. EDIBON Training Test & Exam Program Package - Main Screen with Numeric Result Question

ERS. EDIBON Results & Statistics Program Package - Student Scores Histogram

www.edibon.com

- ESL-SOF. EDIBON Student Labsoft (Student Software).

ESL-SOF is the application addressed to the Students that helps them to understand theoretical concepts by means of practical exercises and to prove their knowledge and progression by performing tests and calculations in addition to Multimedia Resources. Default planned tasks and an Open workgroup are provided by EDIBON to allow the students start working from the first session. Reports and statistics are available to know their progression at any time, as well as explanations for every exercise to reinforce the theoretically acquired technical knowledge.

Innovative features:

• Student Log-In & Self-Registration.

• Existing Tasks checking & Monitoring.

• Default contents & scheduled tasks available to be used from the first session.

• Practical Exercises accomplishment by following the Manual provided by EDIBON.

• Evaluation Methods to prove your knowledge and progression.

• Test self-correction.

• Calculations computing and plotting.

• Equation System Solver Engine.

• User Monitoring Learning & Printable Reports.

• Multimedia-Supported auxiliary resources.

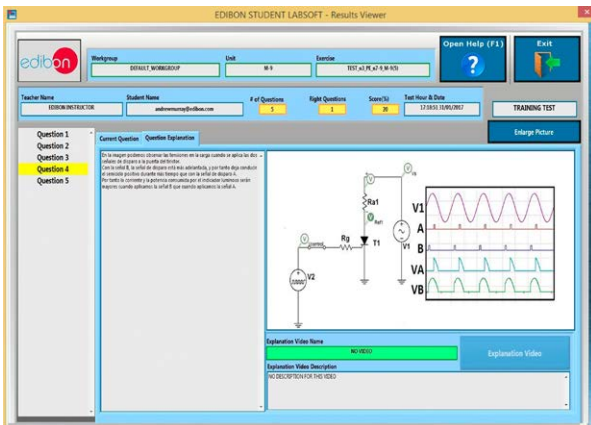For more information see ICAI catalogue. Click on the following link:

www.edibon.com/en/interactive-computer-aided-instruction-software
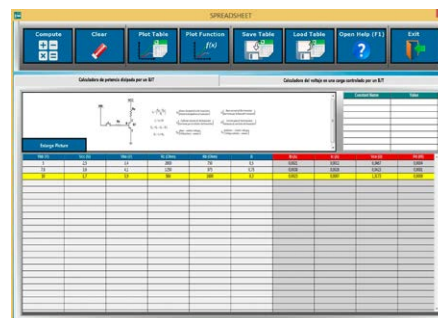

ESL-SOF. EDIBON Student LabSoft (Student Software)
Application Main Screen
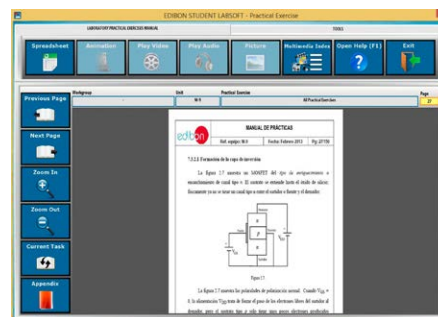
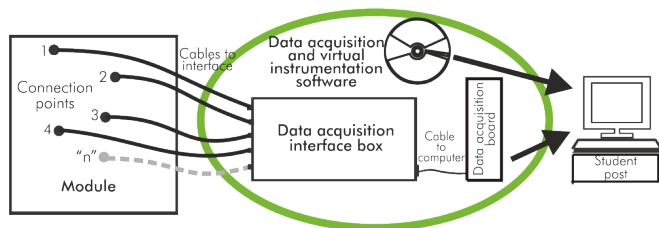EPE. EDIBON Practical Exercise Program Package Main Screen

ERS. EDIBON Results & Statistics Program Package - Question Explanation

ECAL. EDIBON Calculations Program Package Main Screen

Available Student/Kit Softwares

-ESL-M-KITS-SOF. EDIBON Student LabSoft for Basic Electronics and Electricity Assembly Kits.

EDAS/VIS is the perfect link between the modules and the PC. With the EDAS/VIS system, information from the modules is sent to the computer. There, it can be analyzed and represented.

We easily connect the data acquisition interface box (DAIB) to the modules with the supplied cables (connection points are placed in the modules). Like any other hardware, the DAIB is connected to the PC through the data acquisition board (DAB), and by using the data acquisition and virtual instrumentation software the student can get the results from the undertaken experiment/practice, see them on the screen and work with them.

This EDAS/VIS System includes DAIB + DAB + EDAS/VIS-SOF:

- DAIB. Data Acquisition Interface Box:

Metallic box. Dimensions: 310 x 220 x 145 mm approx. (12.2 x 8.6 x 5.7 inches approx.)

Front panel:

16 analog inputs (1 block with **12 voltage channels** and 1 block with **2 current channels** (4 connections)).

Sampling velocity **1,250,000 samples per second** for **EDAS/VIS-1.25 version**.

Sampling velocity **250,000 samples per second** for **EDAS/VIS-0.25 version**.

2 analog outputs.

24 digital inputs/outputs, configurable as inputs or outputs, with 24 state led indicators. These digital inputs/outputs are grouped in three ports of eight channels (P0, P1 and P3).

4 digital signal switches 0-5 V.

2 analog signal potentiometers 12 V.

Main ON/OFF switch.

DAIB

Inside: Internal power supply of 12 and 5 V. Potentiometer.

Back panel: Power supply connector. SCSI connector (for data acquisition board).

Connecting cables.

- DAB. Data Acquisition Board:

<u>For EDAS/VIS-1.25 version. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 1,250,000 samples/s):</u>

PCI data acquisition board (National Instruments) to be placed in a computer slot.

Analog input:

Number of **channels**= **16** single-ended or 8 differential. **Resolution=16 bits**, 1 in 65536.

Sampling rate up to: 1,250,000 S/s (samples per second). Input range (V)= ±10 V.

Data transfers=DMA, interrupts, programmed I/0. Number of DMA channels=6.

DAB

Analog output:

Number **channels=2**. **Resolution=16 bits**, 1 in 65536. **Max. output rate up to: 900 KS/s.**

Output range(V)= ±10 V. Data transfers=DMA, interrupts, programmed I/0.

Digital Input/Output:Numbers of channels=**24 inputs/outputs. Port 0 up to 8 MHz.**

Timing: **Counter/timers=2**. Resolution: Counter/timers: 32 bits.

<u>For EDAS/VIS-0.25 version. EDIBON Data Acquisition System and Virtual Instrumentation (speed: 250,000 samples/s):</u>

Sampling rate up to: 250,000 S/s (samples per second).

Analog output: Max. output rate up to:10 KS/s.

**Digital Input/Output:** Number of **channels=24 inputs/outputs. Port 0 up to 1 MHz.**

Rest of characteristics are the same than EDAS/VIS-1.25 version.

- EDAS/VIS-SOF. Data Acquisition and Virtual Instrumentation Software:

Compatible with actual Windows operating systems. Amicable graphical frame.

Configurable software allowing the temporal/frequency representation of the different inputs and outputs. Visualization of a voltage of the circuits on the computer screen.

It allows data store in a file, print screens and reports of the signals at any time.

Measurement, analysis, visualization, representation and report of results.

EDAS/VIS-SOF
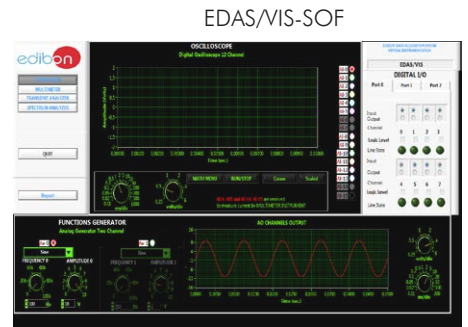
Set of Virtual Instruments:

- <u>Oscilloscope:</u>

  Channels: 12 simultaneous. Maximum input voltage: ± 10 V.

  All 12 input channels could be scaled to compare signal with different voltage levels.

  "Math Menu" with operations as addition, subtraction, multiplication and division, between any of the 12 oscilloscope channels.

- <u>Function generator:</u>

  Two independent signal generators, for sinusoidal, triangular, saw tooth and square.

  Channels: 2 (allowing working simultaneously). Maximum output voltage: ± 10 V.

  It includes a graph where an output signal for each channel is shown.

- <u>Spectrum analyzer:</u>

  Channels: 12 (simultaneous). Max. voltage: ± 10 V. Spectrum analyzer: based on the FFT.

- <u>Multimeter:</u>

  Voltmeter (Channels: 12 (simultaneous). Max. voltage: ± 10 V RMS).

  Ammeter (Channels: 2 (simultaneous). Max. ampere: 500 mA RMS per channel).

- <u>Transient analyzer</u>.

- <u>Logic analyzer:</u>

  Number of Input channels: 8. TTL Voltage Level.

  Clock source: 3 different sources.

  This instrument allows receiving as far as 8 digital signal simultaneously at 1 or 8 Mbps

  (depending the version).

- <u>Logic generator:</u>

  Number of transmission channels: 8. TTL voltage level.

  This instrument allows generating up to 8 digital simultaneous signals of 1 or 8 Mbps (depending of the version).
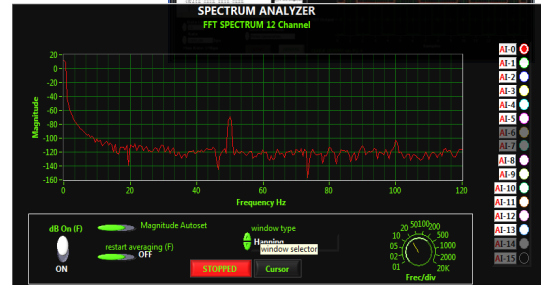
Sampling velocity 1,250,000 samples per second **for EDAS/VIS-1.25 version**.

Sampling velocity 250,000 samples per second **for EDAS/VIS-0.25 version.**

Manuals: This system is supplied with the following manuals: Required Services, Assembly and Installation, Interface and Software, Starting-up, Safety, Maintenance & Practices Manuals.

For more information see **EDAS/VIS** catalogue. Click on the following link:

www.edibon.com/en/edibon-data-acquisition-system-and-virtual-instrumentation

IMPORTANT!

Only one EDAS/VIS is needed for all electronic boards or modules. One EDAS/VIS is needed for each student work place. The EDAS/VIS allows to work with several electronic boards or modules simultaneously.

REPRESENTATIVE: