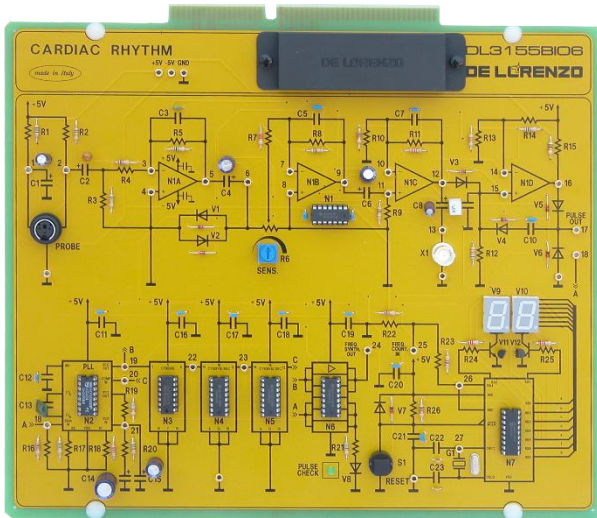




## CARDIAC RHYTHM



**DL 3155BIO6**

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

At every heartbeat the arterial blood pressure raises (systolic period) and the dimension of the tips of the fingers slightly increases, while the higher oxygenation causes the decrease of the optical density of the skin tissue.

During the cardiac relaxation period (diastolic period) the pressure decreases, the density increases and the physical dimension of the tips of the fingers decreases. Since these cyclical variations follow the cardiac rhythm, they can be used to measure the frequency of the peripheral pulsations.

### THEORETICAL TOPICS

- Concept of cardiac rhythm and typical values, in different subjects and in different conditions of the subject
- Measurement of the cardiac frequency
- The use of optical sensors
- Comparator with hysteresis for the processing of the signal provided by the optical sensor
- PLL, frequency dividers, PIC and their role in the measurement and visualization of the cardiac rhythm

### CIRCUIT BLOCKS

- Recordings of the peripheral pulsations in a finger
- Effects of breathing and exercising on the frequency of the pulsations
- Effects of the temperature on the measurement of the frequency of the pulsations

Complete with theoretical and practical manual.

Dimensions of the board: 297x260mm

***This board does not substitute the medical device under study. The results of the experiments have no medical value. They are just for demonstration purposes.***

**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 3155BIO6SW)

**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 2555ALG** - DC power supply  $\pm 5 \pm 15$  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.

