

EXPANSIONS INCLUDED



ICAI

**Application:** ELK can be used with ALL EDIBON units using SCADA. See [www.edibon.com](http://www.edibon.com)

Key features:

- Initiation to the programming field in a practical way with **EDIBON TECHNICAL TEACHING EQUIPMENT**. Real Hardware development environment using **NI LabVIEW™** at engineering R&D levels.
- Open Source Software packages (OSS) custom-developed for each individual unit.
- It will allow the researcher to work with any involved value and parameter without limits.
- It will allow the researcher to manipulate the data acquisition and its subsequent processing.
- It will allow the researcher to change the control algorithms (example: in a thermal process the researcher can change the heating system).
- Real-time display of sensor readings and calculated values.
- Digital variables readings to show process status indicators and alarms.
- Analog and digital control of hardware elements such as valves, pumps, turbines, etc.
- Software Development Kit (SDK): set of libraries and practical exercises based on several examples of incremental complexity.
- Edition of programs or Virtual Instruments (VI).
- Detailed help documentation introducing all the required concepts and supported on learning resources and guided practical exercises.



ISO 9001: Quality Management (for Design, Manufacturing, Commercialization and After-sales service)



European Union Certificate (total safety)



Certificates ISO 14001 and ECO-Management and Audit Scheme (environmental management)



"Worlddidac Quality Charter" and Platinum Member of Worlddidac

## INTRODUCTION

Nowadays, the complexity of real industrial systems and processes requires multidisciplinary engineers able to contribute not only with their specific knowledge but also with the ability of using advanced tools to solve problems efficiently. One of the most used tools worldwide is National Instruments **LabVIEW™**, which provides engineers with powerful tools to easily implement their own measurement, control and automation applications. Consequently, combining expertise and the use of the best tools, engineers will be much better prepared to face industry challenges successfully and to create competitive advantages in an increasingly globalized world.

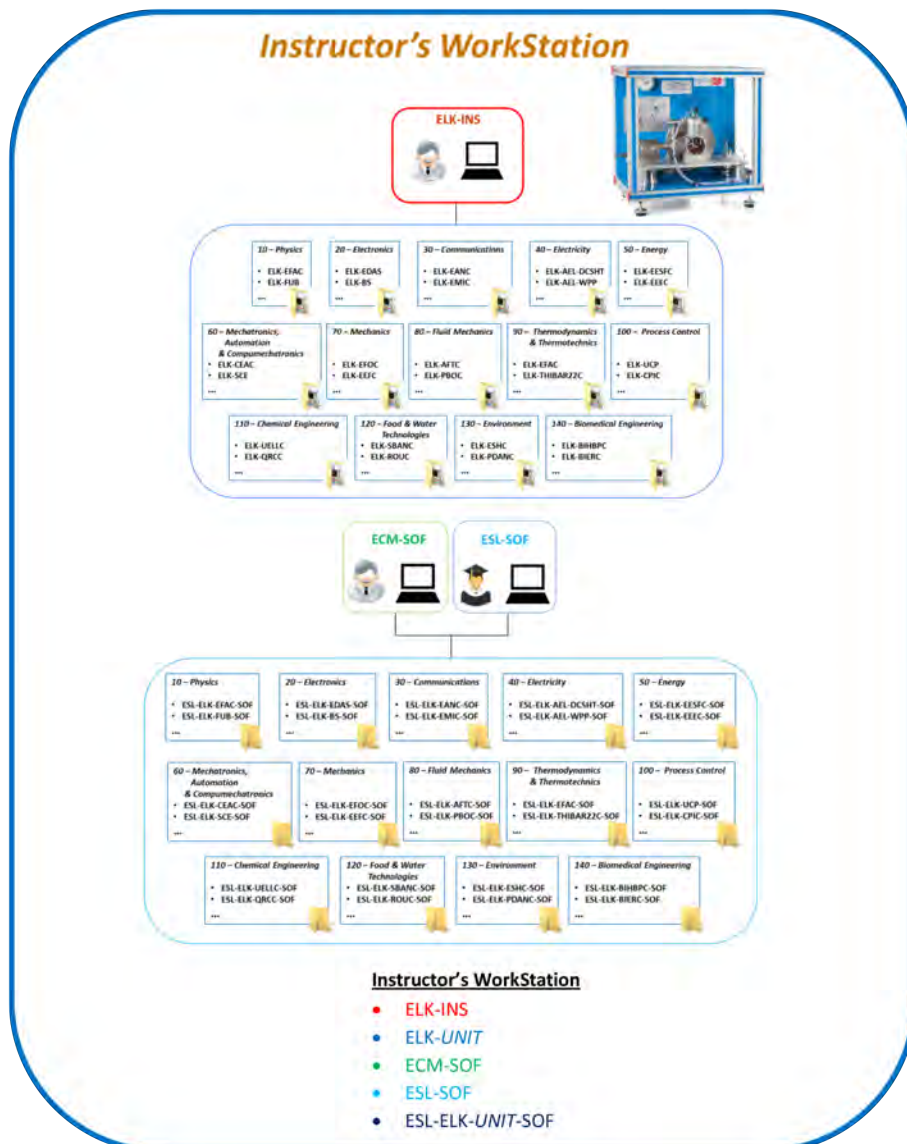
## GENERAL DESCRIPTION

**EDIBON Software Development KIT, Powered by NI LabVIEW™, “ELK”**, is a software package, designed by EDIBON engineers, based on National Instruments **LabVIEW™** environment, offered as an optional item for some **EDIBON ENGINEERING TEACHING EQUIPMENT**. It is a set of instructions and programs (VIs) addressed to users who need to get started in the fields of programming and instruments and hardware control.

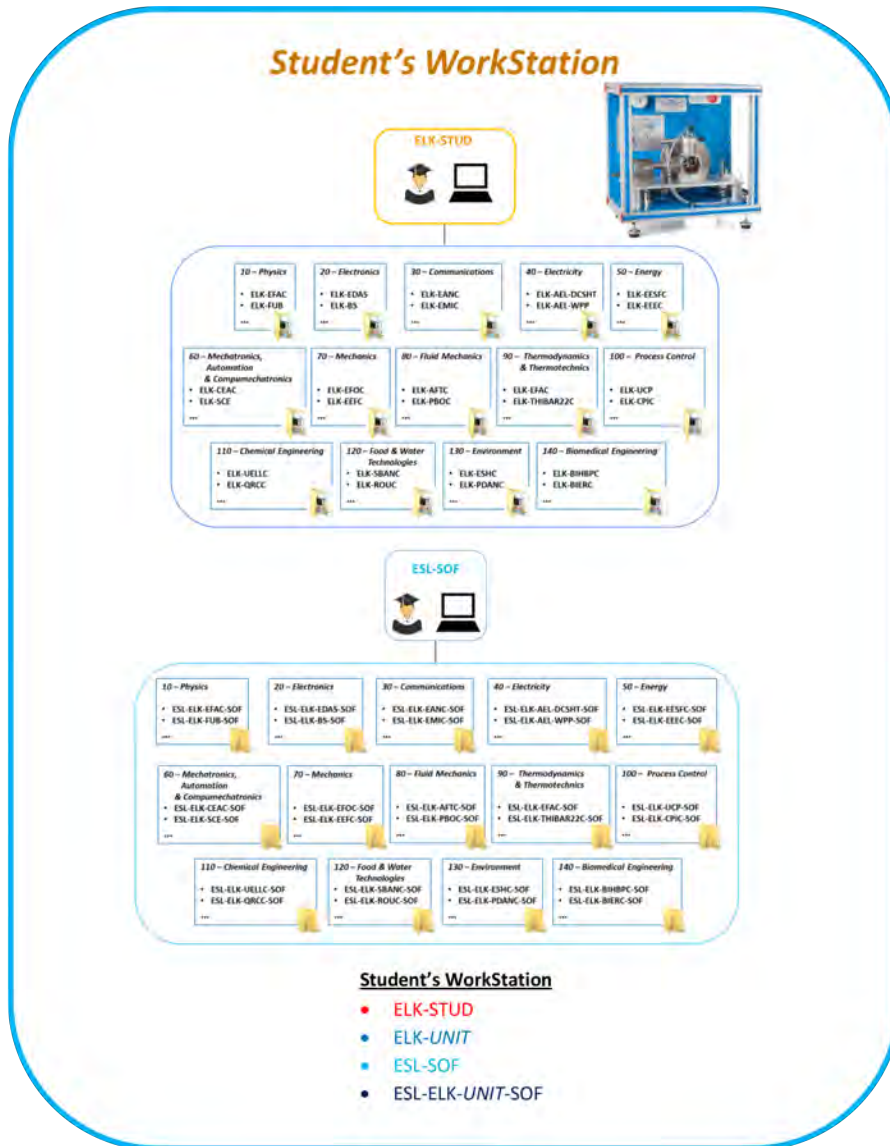
**LabVIEW™** is a development environment specifically designed by EDIBON, for engineers and scientists who want to visualize, create and code engineering systems. It is based on a graphical programming language that uses a dataflow model instead of sequential lines of text, allowing the user to write functional code using a visual layout that resembles the process to be developed.

**EDIBON ENGINEERING TEACHING EQUIPMENT** is a powerful learning tool that combined with **LabVIEW™** development environment allows users to acquire and control processes, measure variables, display sensors and actuators graphically, etc. from currently used **real and authentic hardware**, apart from studying common processes and industrial systems. Additionally, every **ENGINEERING TEACHING EQUIPMENT** is supplied by **EDIBON** with **SCADA** control application. Thus, the user can carry out practical exercises, check acquisitions and signals status, compare collected data, develop potential applications, etc.

The following picture shows the included items in a Instructor’s post incorporating the “ELK” software package:



Similarly, the following picture shows the included items in a Student's post incorporating the "ELK" software package:



SPECIFICATIONS

- **EDIBON Software Development KIT** requires:
  - ✓ EDIBON TECHNICAL TEACHING EQUIPMENT.
  - ✓ LabVIEW™ license 2019 or later, 32 bits.
  
- **EDIBON Software Development KIT** includes (\*):
  - ✓ Practical exercises to get started with LabVIEW™ development environment.
  - ✓ Practical exercises to get started with EDIBON TECHNICAL TEACHING EQUIPMENT.
  - ✓ A set of programs (VIs) to study the processes and fields of study applied to EDIBON TECHNICAL TEACHING EQUIPMENT.
  - ✓ A set of programs (VIs) to edit or customize a SCADA application.
  - ✓ A set of programs (VIs) to create a SCADA application.

(\*) The content may vary depending on the equipment supplied.

About 1,000 EDIBON units using SCADA, can use the **EDIBON Software Development KIT, Powered by NI LabVIEW™, “ELK”**, in the following areas:

- 1.- PHYSICS
- 2.- ELECTRONICS
- 3.- COMMUNICATIONS
- 4.- ELECTRICITY
- 5.- ENERGY
- 6.- MECHATRONICS, AUTOMATION & COMPUMECHATRONICS
- 7.- MECHANICS
- 8.- FLUID MECHANICS
- 9.- THERMODYNAMICS & THERMOTECHNICS
- 10.- PROCESS CONTROL
- 11.- CHEMICAL ENGINEERING
- 12.- FOOD & WATER TECHNOLOGIES
- 13.- ENVIRONMENT
- 14.- BIOMEDICAL ENGINEERING

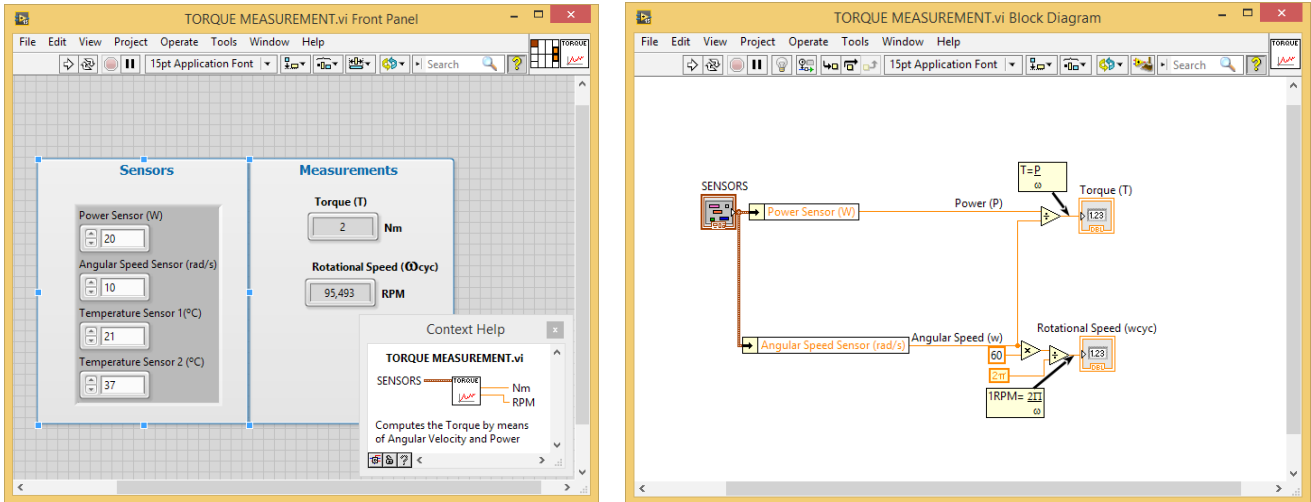
See [www.edibon.com](http://www.edibon.com)

## POSSIBLE PRACTICAL EXERCISES

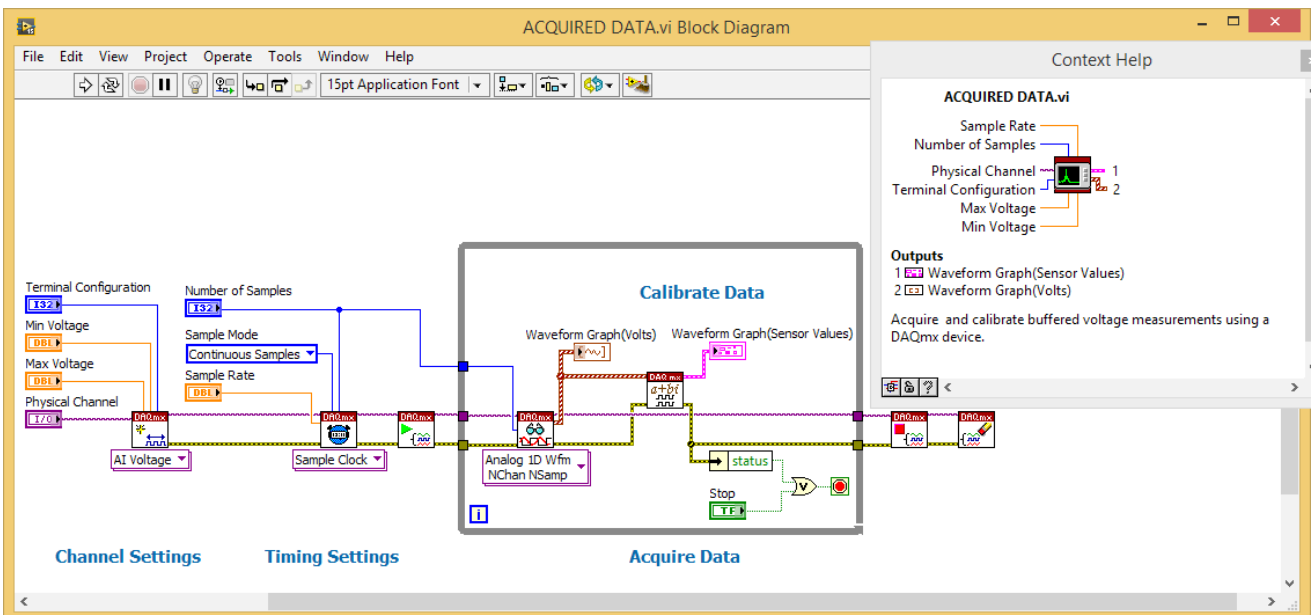
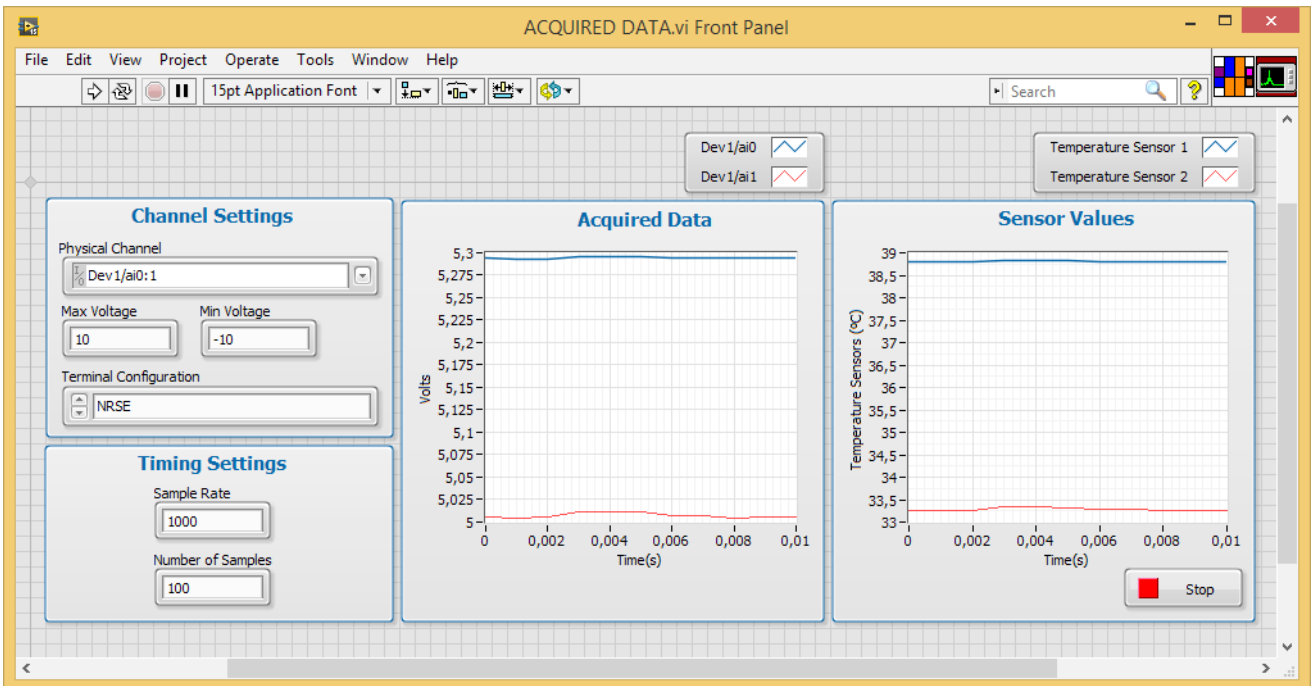
- 1.- Basic practical exercises to **get started with LabVIEW™** and build simple applications.
- 2.- Basic practical exercises to **get started with EDIBON TECHNICAL TEACHING EQUIPMENT**.
- 3.- **Specific applications** intended for the study of several engineering areas, such as Fluid Mechanics, Thermodynamics, Process Control, Chemical Engineering, Power Systems, Renewable Energies, etc.
- 4.- **Numerical and calculation practical exercises** to perform complex mathematical operations, create and edit your own formulas and to obtain characteristic process parameters and variables.
- 5.- **Data acquisition practical exercises** to develop your custom supervision and control applications as well as to adjust its main parameters, such as sampling frequency, amount of data, number of signals to manage and more.
- 6.- **Sensor calibration practical exercises** to properly scale measurements using engineering units. Possibility of applying new calibration methods for any sensor.
- 7.- **Signal processing practical exercises**. Possibility of implementing your custom signal processing algorithms.
- 8.- **Signal filtering practical exercises** to study transients, refine data and remove unwanted components, such as noise.
- 9.- **Signal plotting practical exercises** to implement different graphical representations of the acquired signals, calculations and process variables in order to observe trends, patterns and variations in real time.
- 10.- **Automatic control practical exercises** to implement open/closed loop control algorithms reaching a higher level in the unit operation and automation. Examples: PID, ON/OFF Control, PWM, etc.
- 11.- **DSC (Datalogging and Supervisory Control) practical exercises** to log, view and manage historical data as well as to customize your own alarms & data reports.
- 12.- **Fault simulation practical exercises** to reproduce hardware breakdowns and their symptoms in a safe way, without any real damage. Additionally, possibility of incorporating your custom simulated faults.
- 13.- **Hardware security elements management practical exercises** to incorporate and supervise additional protections for EDIBON TECHNICAL TEACHING EQUIPMENT.
- 14.- **User interface design practical exercises** to customize the general appearance and layout of your own application.

# EDIBON LABVIEW™ KIT MAIN SCREENS

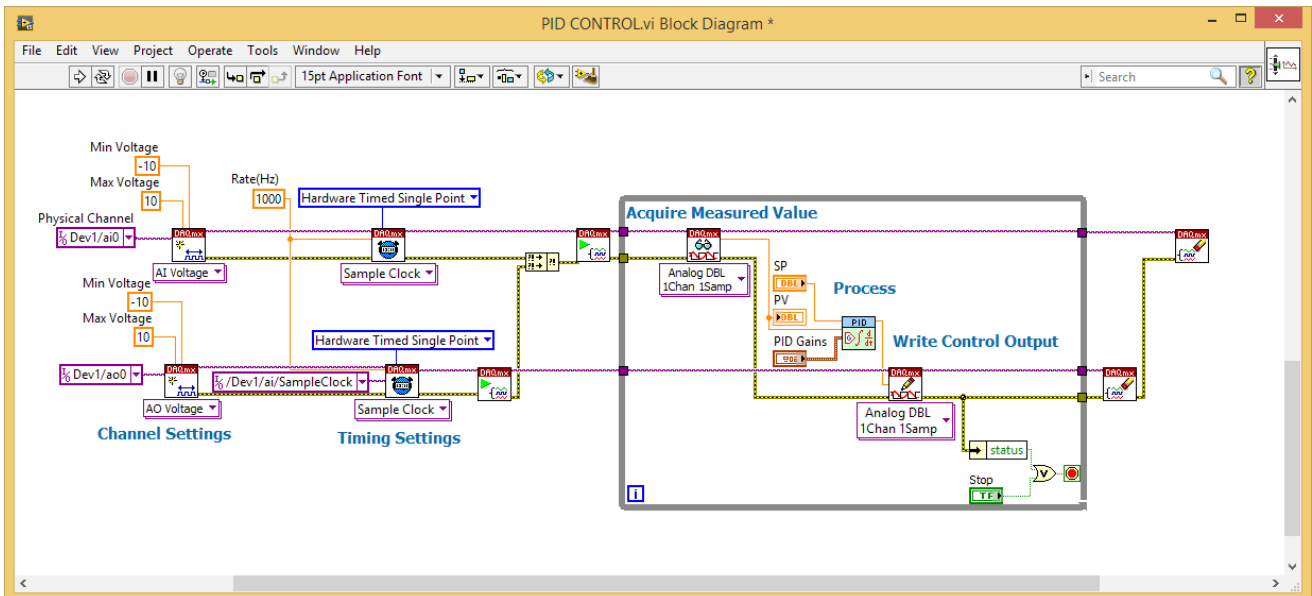
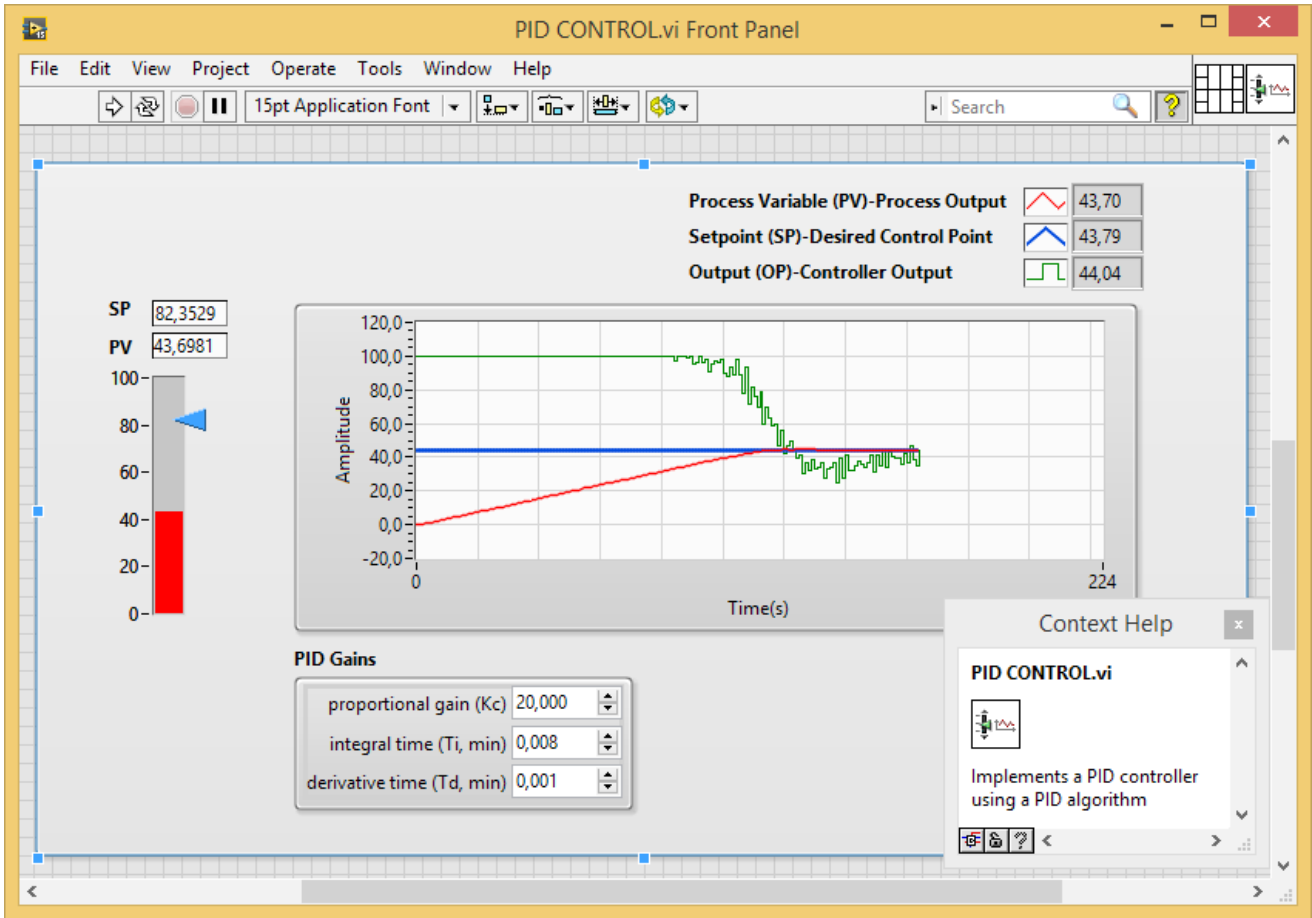
Parameter calculation - Customizable calculation application



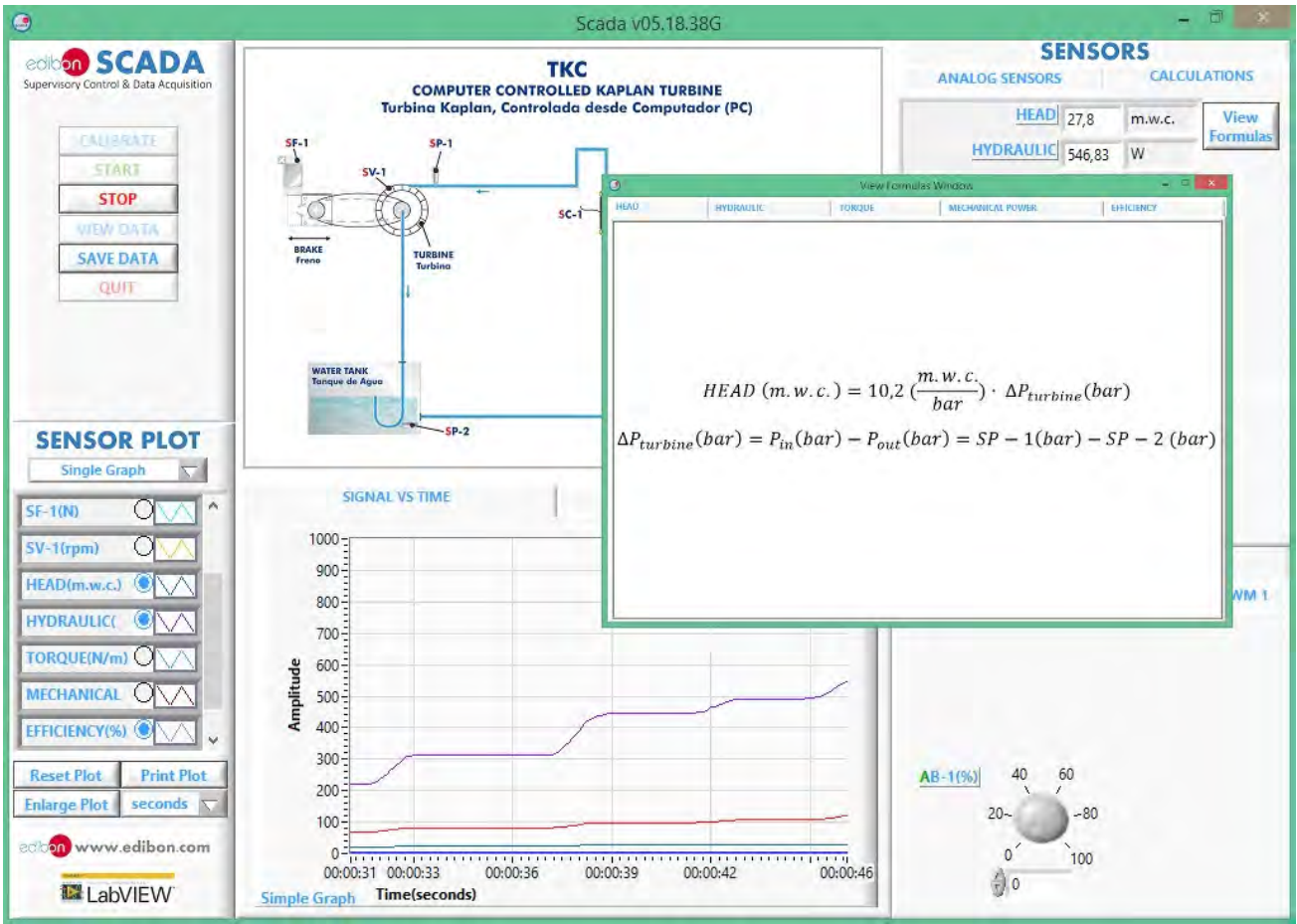
Representation of processes and variables of the system - Customizable acquisition application



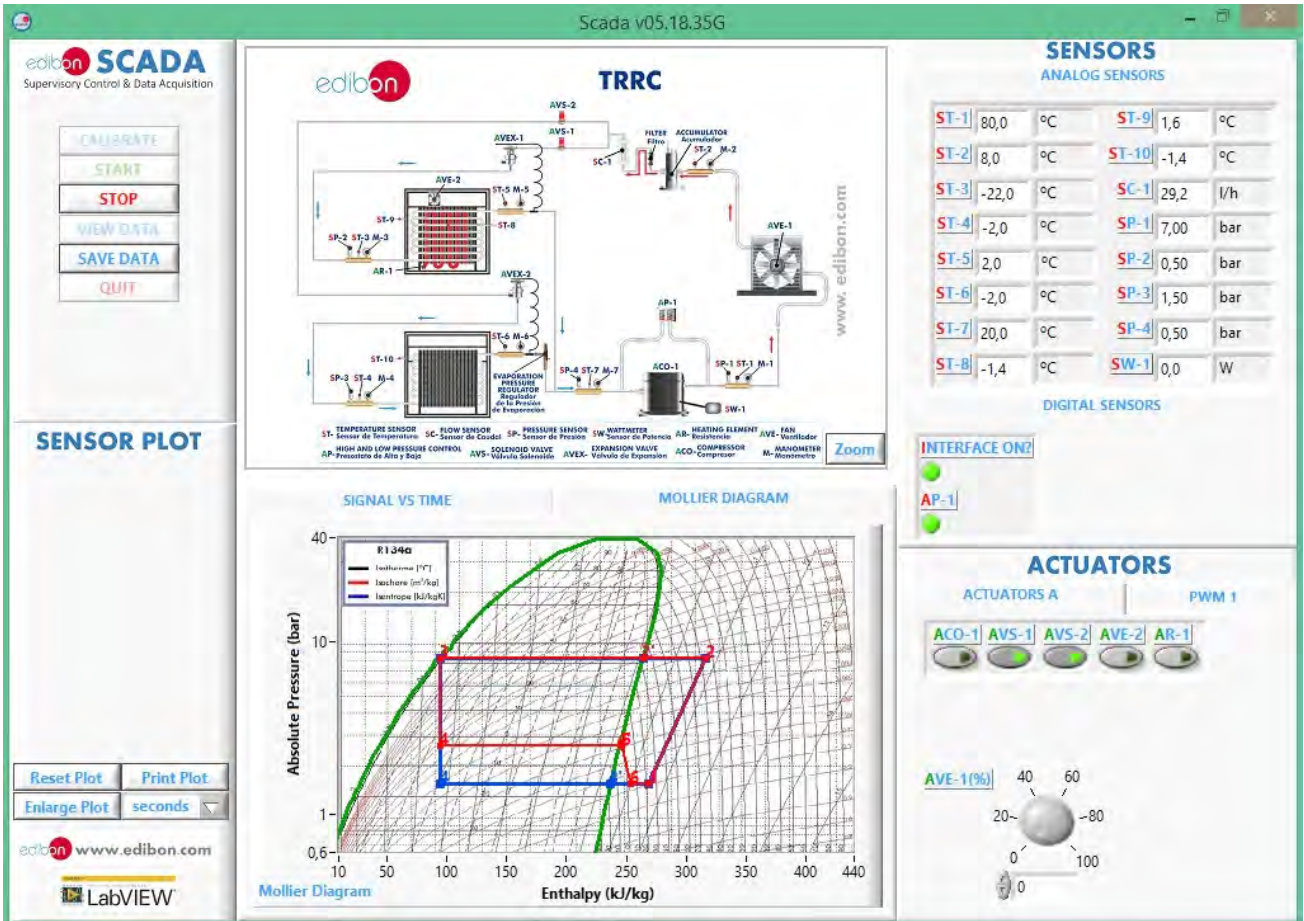
PID control algorithms to study open/closed control loops - Customizable control application



Process parameters calculation - Example of SCADA application developed by EDIBON<sup>(1)</sup>



Representation of variables and processes of the system - Example of SCADA application developed by EDIBON<sup>(1)</sup>



(1) EDIBON SCADA application is supplied with EDIBON Software Development KIT, Powered by NI LabVIEW™, “ELK”, but without its source code. It is displayed just as an example of a real SCADA application



## ORDER INFORMATION

- Contact EDIBON Sales Force to consult prices and availability of:
  - ✓ Practical exercises and set of programs (VIs).

## ELK KIT EXPANSIONS

- [ECR. EDIBON Industrial Modular System with NI CompactRIO.](#)

### EDIBON **SCADA** System with NI **CompactRIO**

- ✓ Advanced Monitor and Supervisor Platform
- ✓ Programmable Real Time Control Architecture
- ✓ Precisely and Truthfully Timed Data Acquisition



EDIBON  
CompactRIO  
Interface



NI CompactRIO

\* Specifications subject to change without previous notice, due to the convenience of improvement of the product.



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REPRESENTATIVE: