Automation

When we talk about automation, we are talking about creating a mechanism that performs a task with as little human intervention as possible. For this to be possible, it is necessary to program some specific equipment that can carry out checks, decision-making and task accomplishment.

It is important to point out that it is necessary for the projects to be flexible and robust to adapt to different local realities, trying to maintain, whenever possible, low cost and easy maintenance.

An example is the automation of greenhouses, as you can see in a Course Completion Work (CCW) from the Jorge Street Technical School. To view it (click here).

Internet of Things (IoT)
The Internet of Things (IoT) describes a set of physical objects embedded in sensors, software and other technologies with the aim of connecting and exchanging data with other devices and systems over the internet. These devices range from common household objects to sophisticated industrial tools.

Many technologies made IoT possible, including:

- Access to low-cost and low-power sensor technology;
- Connectivity;
- Cloud computing platforms;
- Machine learning; and
- Conversational Artificial Intelligence (AI).

With advances in machine learning and advanced analytics, and access to large and varied amounts of data stored in the cloud, companies can gain insights faster and easier.

Among the sectors that benefit from the IoT we can mention: Manufacturing, automotive, transport and logistics, retail, public sector, healthcare, security, agriculture, among others.

In Brazil, by means of Decree 9,854 of June 25, 2019, the National Plan for the Internet of Things was instituted. To view it (click here).

What is Arduino?
Arduino is a very versatile electronics prototyping platform that is widely used by students, hobbyists and professionals from the most diverse areas. The main purpose of Arduino is to make accessing electronics prototyping easier, cheaper and more flexible. The simplest versions of the board use a microcontroller from the Atmel AVR family and a programming language based on C/C++. With it, it is possible to create various projects in electronics, from the simplest to intermediate applications such as Internet of Things (IoT), Robots, Home or Industrial Automation Systems, Alarms and others.

Sensors
There are several sensors on the market, it is important to evaluate them for their resolution, sensitivity and accuracy. They are used in several sectors such as medicine, agriculture, robotics and industry and are important for collecting information for decision making. Some sensor examples:

Soil Moisture Sensor: It is used to detect and measure soil moisture variation. Example: LM393 controller with operating voltage 3.3 – 5VDC.

Temperature Sensor: It is used to measure the ambient temperature. Example: LM35DZ integrated circuit with operating voltage from 4 to 40 VDC and measuring range 0º to 100º C.

Water Level Detector Sensor: It is used to measure water level in a container and can also be used as a rain detector. Example: Does not use controller, with operating voltage from 3 to 5VDC and operating humidity from 10% to 90%.

Other Modules
Wifi Module: It is used to connect to networks. Example: ESP8266 controller with operating voltage 3.3VDC supporting 8002.11 b/g/n networks and data rate from 250kbps to 2Mbps.

Timer Relay: Allows you to set the time the appliance is on, as well as to establish repetitions according to the chosen program. Example: Digital LCD Timer Relay Module XY-LJ02 with operating voltage: 6 – 30 VDC.

Solar Panel: Allows you to use solar energy as a source of energy. Example: Mini Module Solar Panel Panel with maximum voltage of 6V and power 1W.