

SENSORS AND SENSORS WITH SPECIAL APPLICATION

Ionuț-Alin Popa, *University of Petroșani, Petroșani, Romania*

Emil Pop, *University of Petroșani, Petroșani, Romania*

Abstract : Choosing a communications network in these current world made it necessary to study in detail the current level of development and implementation of wireless sensor networks. They are the main applications of WSN, sensor networks with applications in chemistry, in the military system, the submission of an application used by multinational armed forces, and types of transducers used in mining and upgrading possibilities of the sensor elements used underground.

Keywords: communications network, military system, transducers, underground.

1. Introduction

Driving a process requires knowledge of information as accurate and as complete physical quantities on the parameters that characterize that process. In the event of non-automated process driven manually by an operator physical quantities that are not accessible to human senses are measured with measuring devices. Based on indications apparatus, the human operator supervises the process and take appropriate decisions.

If an automated process management system is done without human intervention, based on information gathered in the process transducers.

Sensor (sensor element) is the constituent of an automated system or an apparatus that is designed to transform size to be measured with a certain nature, in a signal carrier of information - for the automatic - or a size capable of being perceived by the human operator - for the meter

What is the sensor? It must be said that there is no definition unified and undisputed "sensor", so that leaves much room for interpretation, ambiguities and confusion. Many authors prefer to use the

phrase "sensors and transducers" in which, be put on an equal footing sensor and encoder, using alternative or preferential terms one either believes that one is a hierarchical superior category, including the other. Often also used the term "trap" that increases the question marks, as in French, the term "capteur" is used to refer to the technical elements, which in this book have been called "sensor".

Title sensor comes from the Latin word "sensus" which means sense and before being adopted for technical systems has been used to describe the capabilities of the sense organs of humans and living organisms, to collect and process information from the environment surroundings and transmit them to the brain. In this process physical quantities, non-electric, are converted into electrical signals that the brain can take over and perform and on which coordinate muscle. The biology we meet, largely in mechatronic systems so that it is unnecessary brief overview of human sensory systems, with some comments on their contribution to supervise production processes by man. Level signal is not

compatible, unwrought, with the signal automatically to the operating system. Therefore introduces an element called auxiliary adapter.

In principle, sensor and adapter form a unit called transducer is a basic element of any automated system.

The transducers may thus be defined as a device for converting physical quantities

(temperature, displacement, pressure, force, etc.) into other physical quantities, usually electrical, electrical quantities or of electrical quantities in the other, in order to measure those parameters sizes and information, namely making decisions accordingly.

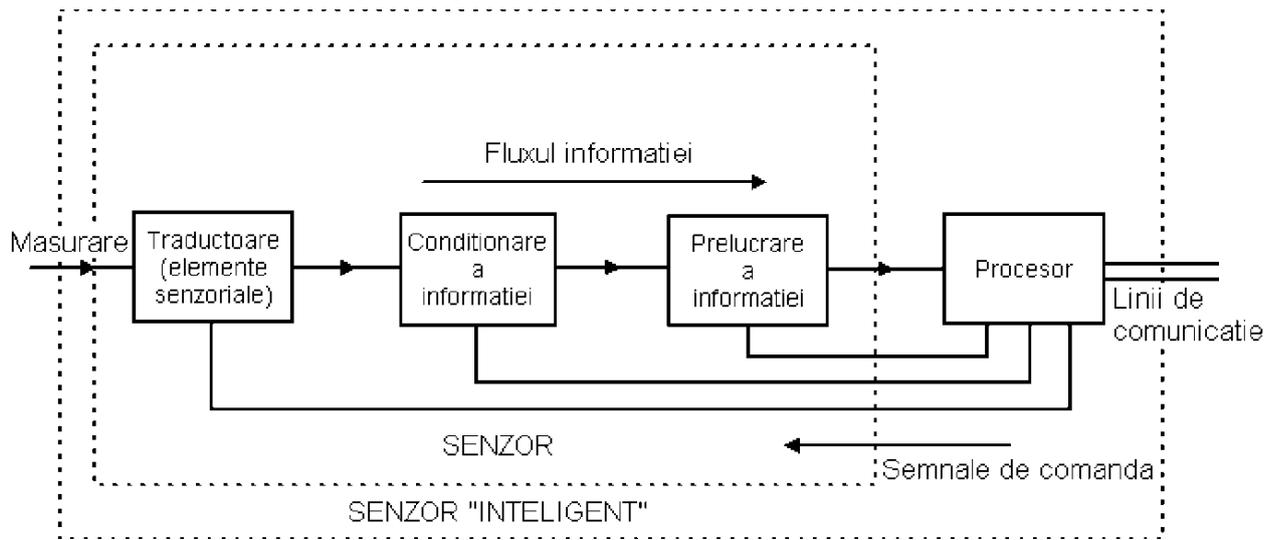


Figure1. Structures of the sensory systems

2. Clasifications

Today there are more than 100 sensors of physical quantities, and if we take into account the different chemical sensors, their number is in the hundreds. Can reveal about 2,000 different types of sensors, offered 100,000 variants worldwide

Great diversity principles of converting physical quantities into electrical quantities, and the solutions for implementing these principles, there are a multitude of criteria for the classification of sensors, one of which will be listed some of the highlights:

Sensors can be classified according to the technologies used to achieve them:

- Ferromagnetic materials technologies;
- Piezo-ceramic material technologies;

-Microelectronics and microsystem technologies;

-Thin stature technologies;

-Thick stature technologies;

-Sintered materials technologies;

-Technologies sheets etc.

Depending on the type of the input physical quantity sensors can be classified into:

- absolute when electrical output signal can represent all possible values of the physical quantity input relative to an origin (reference) selected;

-incremental, when an origin can not be determined for all points within the measuring range, but each measured value is the origin for the next one.

Very important is the classification by type of output measure in:

- analog sensors, for which the output is always proportional to the physical size of entry;

- numerical sensors (digital) output signal that can only take a limited number of discrete values that allow quantification of physical input signal.

Looking the output signal in terms of the number of possible values can be emphasized two distinct classes:

- binary sensors, showing output only two distinct values;

- sensors with a large number of values for measuring a quantity within a certain range; can be analogue or digital.

Another criterion for classification takes into account the number of items transducers and the number of dimensions assigned values measured and classified sensors in angelfish (transducer, size) of vectors (measurements in three orthogonal directions) and matrix (a number of transducers arranged after a matrix mono, bi- or three-dimensional).

Sensors can be classified depending on the area and they are using:

- In industry
- Robotics, flexible manufacturing, quality control, desktop activities etc.
- In Environment
- transports

- In building automation and housing

If the analysis is extended to the different fields of use, can be useful and relevant new classification criteria. For example, if the sensors used in robotics, it is one of the major classifications of properties and parameters based systematization robot.

The two main branches sensors allow the group into two broad categories:

- Internal sensors (called by some authors and intero-receptors), which serve to obtain information related to the operation of the robot, such as the relative position of elements kinematic couplings, linear and angular velocities and accelerations, deformations driveline components etc.
- External sensors (called by some authors and extero-receptors), used for the collection of information on the environment and human robot interaction / environment; serve to identify the presence and determining the type, position, orientation, color or other properties of objects in the environment, the identification of obstacles, the determination of the interaction forces robot / environment.

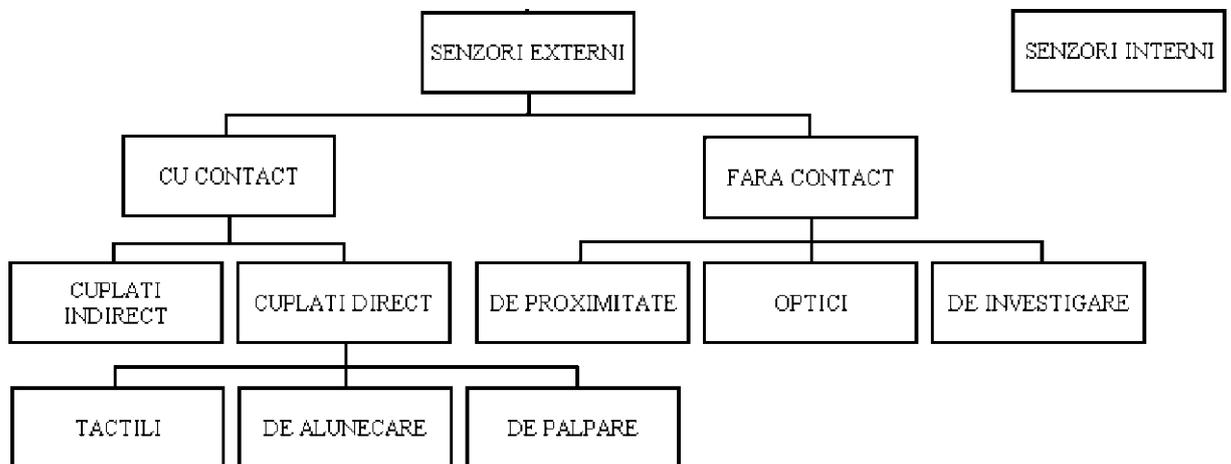


Figure 2.External sensors

Examples sensors and their characteristics:

MMA7361 axis analog accelerometer - sensor three very popular cell phones, PCs

for image stability, for text, games, cameras.



Figure 3. ACS712 current –senzor

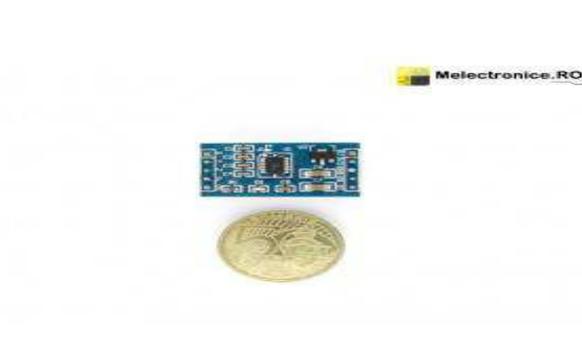


Figure 4. - Infrared sensor detection E18-D80NK



Figure 5.HC-SR04 ultrasonic distance –Senzor

Characteristics:This module measures the distance to obstacles using sonar principle; It is easily interfaced with any microcontroller;It shows two circular holes

made in wiring or mechanical fixing for panel mounting;very popular with examples, libraries and multiple tutorials made and distributed on the Internet;



Figure 6.Pasive infrared senzor

Characteristics:This module is a PIR (Passive Infra-Red) able to detect movement by measuring changes in the infrared spectrum emitted by objects detected; the motion detection sensor will output a signal at terminal type logical "1";

Fresnel lens is used;LDO voltage stabilizer integrated;it interfaces easily with a single output pin; low power consumption;

Sensor Waterproof digital temperature DS18B20



Figure 7. Sensor Waterproof digital temperature DS18B20

Characteristics: DS18B20 is a digital temperature sensor indicating degrees Celsius with 9-bit precision to 12 bits; 1-wire bus communicate, what defines a single wire data (and table) with a microcontroller; Can feed data directly from the wire ("parasitic power"), eliminating the need for an external AC power source (see Datasheet);Each chip

has a unique ID code 64 bit, which allows operation on the same 1-wire bus multiple sensors;Easy to use with a single microcontroller to control more DS18B20 sensors distributed in a larger area;This sensor is a product widely used in data-logging projects and temperature control; Submersible sensor, waterproof;

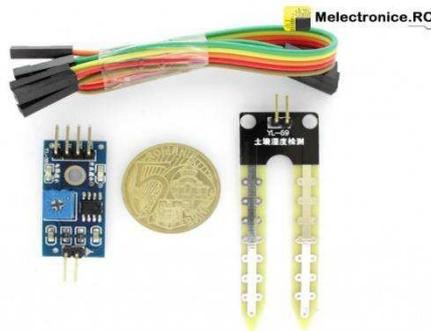


Figure 8. Sensor temperature / humidity DHT11

Characteristics:DHT11 is a module that has an integrated digital temperature sensor and a humidity sensor;Domestic output values are calibrated for a more accurate measurement; it interfaces with any microcontroller via serial communication bus with a thread; Communication up to 20 m;It does not require extra components for operation; low power consumption;very popular with examples, libraries and multiple tutorials made and distributed on the Internet.

When the soil is sufficiently moist, automatic irrigation system will not start or

irrigation in progress will be interrupted; In this way, you can save water and have beautiful and healthy plants. Along with programmers by 1060 solar water C plus, C 1060 plus, C 1030 plus GARDENA soil moisture sensor can open and close the flow of water depending on soil moisture.

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