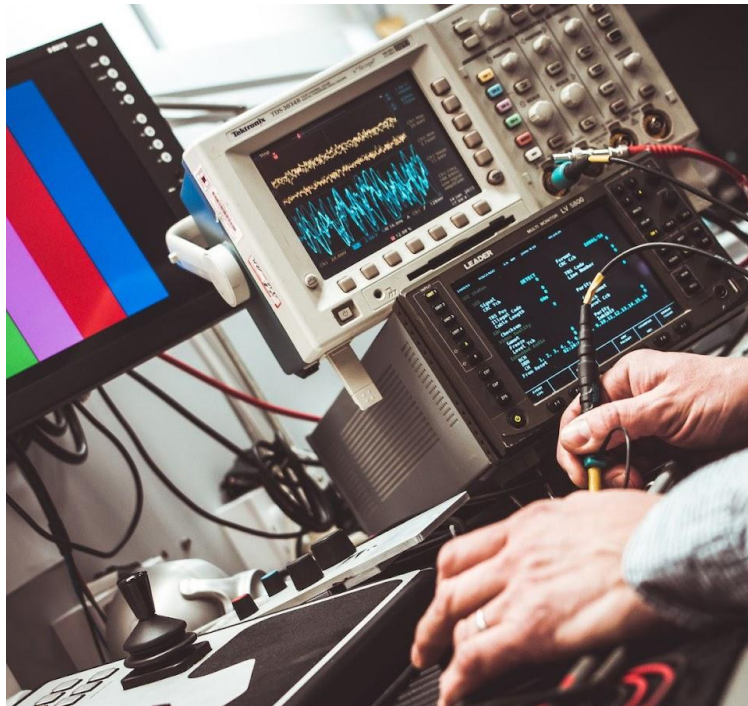


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A Guide To Data Acquisition System - TMCS



A GUIDE TO **DATA ACQUISITION SYSTEM**

A [data acquisition system](#) is a system that consists of a computer, measurement devices, and sensors. Processing acquired data requires a data acquisition system, which gathers the information needed to comprehend electrical and physical processes.

For the purposes of engineering or scientific research, data acquisition systems can collect information about a real-world system and store it in an understandable, retrievable manner.

Essential components of Data Acquisition System:

Sensors:

Interacting with the entity being measured is the primary function of sensors and transducers. They convert physical phenomena like light, temperature, pressure, position, sound, etc. into a measurable signals like Voltage & Current.

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Signal Conditioners:

The electrical signals collected by the sensors may be distorted by noise or interference and require processing before they can be used. Sometimes the signals are too weak for the data acquisition system to pick up. As a result, supplementary circuitry is employed for signal optimization. A signal conditioner is a technical term for this additional hardware. Therefore, signal conditioning is the act of making the signals as error-free as possible.

Analog-to-Digital Converters:

This DAQ module is responsible for digitizing analog inputs. It is the function of this chip to take information from its surrounding environment and translate it into discrete levels that a computer can understand.

Software Application ([NI LabVIEW](#)):

[NI LabVIEW](#) is well equipped for creating DAQ applications and it also supports many hardware devices. Within a manufacturing environment, LabVIEW is widely used for automated product testing, becoming the standard for the industry. Possible Integration with multiple hardware platforms makes LabVIEW the a Preferred Software development platform for engineers, designers and research scientists.

Parameters Measured on [DAQ System](#):

Many different parameters can be measured using a [data acquisition system](#), including the following:

- * Current
- * Voltage
- * Strain
- * Frequency or time interval
- * Pressure
- * Temperature
- * Distance
- * Vibration
- * Angles
- * Digital signals
- * Weight

Benefits of [DAQ System](#):

- * Accurate
- * Flexible
- * Scalable
- * Programmable

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DAQ Applications:

Automotive:

In order to ensure that the manufactured automobile parts are of the highest quality, [data acquisition software](#) & equipments are used.

National Instruments:

The [data acquisition](#) (DAQ) devices offered by [National Instruments](#) are organized into distinct groups to facilitate the quick and simple selection. Types of these systems, such as temperature and strain, or common form factors, are used to quantify them.

Aerospace Defense:

[Data acquisition](#) products are used by virtually every aerospace industry and flight testing facility. These systems can function in a wide variety of contexts and conditions. Every [DAQ system](#) is put through its paces in the lab, in the telemetry control room, on the engine test stand, and on the flight line to make sure it performs as well as it needs to.

There are a wide variety of uses for these systems, including monitoring direct analog inputs or digitized parameters being tele-metered from an aircraft to a ground monitoring station, flight testing, range safety, missile testing, maintenance, and troubleshooting on (or next to) an aircraft, electromechanical testing in an aircraft hangar, component testing & validation, structural testing on military vehicles, and more.

Electronics:

The electronics sector makes use of [data acquisition systems](#). They are used to measure heat output, resistance, conductivity, magnetic, etc., all of which play a role in electrical design.

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