

Systems for Industrial Automation

The **industrial automation system** is a combination of software, hardware and communications infrastructure that allows real-time data acquisition from the production process and its management and optimization. Siviko OOD is a certified integrator of **Ignition SCADA 7.9**, which is the most innovative and powerful industrial platform in the world, while being among the most affordable.



The industrial control system helps in three main ways:

- Greater **productivity** and lower costs;
- **Data collection** from production for analysis and optimization, and connection to business planning and logistics systems;
- Helps to introduce and comply with **standards and quality control** through production traceability and procedures;

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The industrial automation system may include four main sub-systems:



SCADA

Supervisory Control And Data Acquisition - system for monitoring, control and collection of production data.



MES

Management Execution System - system for production planning, control and management.



EMS

Energy Management System – energy management system of electricity, water, air, gas, etc.

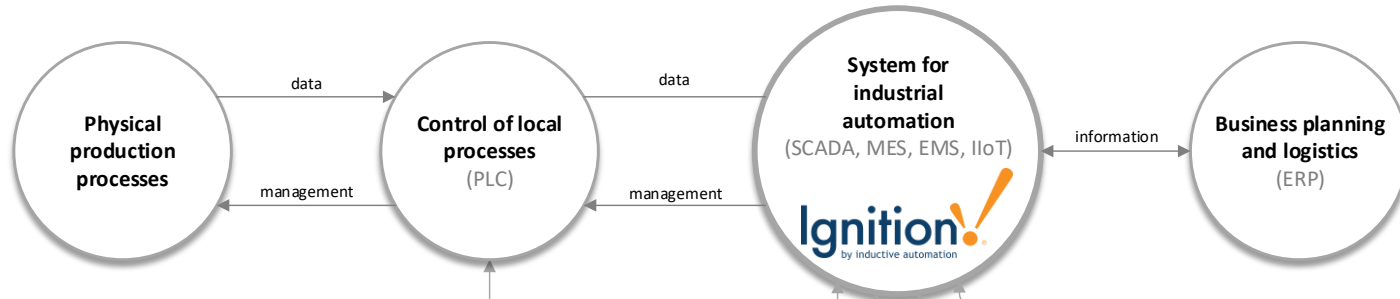


IIoT

Industrial Internet of Things – enables the acquisition and accessibility of far greater amounts of data, at far greater speeds and efficiency than before by decoupling devices from applications.

What is an Industrial Automation System?

The industrial automation system is a combination of software, hardware and communications infrastructure that allows real-time data acquisition from the production process and its management and optimization.



Programmable logic controller (PLC) – is a robust computer that is designed to work in harsh environments and adapted to the needs of the production process. These devices are a major data source for the industrial automation system.



SCADA (Supervisory Control and Data Acquisition) is a supervisory and data collection system, which allows the management of production processes and the collection and analysis of data.

- It **connects with the machines and installations** in the production and allows the input of data by the employees.
- Shows **real-time measurements** via graphical interface.
- Allows **centralized and local process management** in real time.
- Keeps historical data on measured values.

MES (Manufacturing Execution System) – This system allows the planning and management of the entire production process.

The main functionalities of the typical MES system include:

- **Planning and traceability of the production process** in real time;
- **Traceability and production efficiency statistics and downtime monitoring;**
- **Quality control and management;**
- **Managing and storing machine settings and recipes;**

EMS (Energy Management System) – an energy management system that includes electricity measurement, forecasting and cost analysis and power quality analysis. It may also include Costs related to water, gas, air, etc.

IIoT (Industrial Internet Of Things) – is a network of intelligent computers, devices, and objects that collect and share huge amounts of data. It enables the acquisition and accessibility of far greater amounts of data, at far greater speeds, and far more efficiently than before. It also decouples devices from applications.

What are the benefits?

The main benefits of the industrial automation system are **increased productivity, data extraction from the production process and better quality control.**

Productivity

- **Optimization of the cost** of materials, labor and energy.
- **Enhanced productivity** through complete or partial automation of certain processes, improved material flow and less process interruption.
- **Quick input or recording of settings** on particular machines, which saves time and errors. Real time tracking for deviations from settings and corrections.
- **Faster training** and putting into operation of new workers.
- **Prevention** of serious industrial accidents and incidents.
- **Preventive maintenance** of machines as a result of data analysis. Less unplanned interruptions.

Data

- **Faster problem solving** based on collected data and analyzed information.
- Enhances the **ability to make informed decisions.**
- **No paper document**, which reduce manual data entry in the ERP system and limits the communication errors.
- **Control and traceability of primary materials** (connection with scales, flowmeters, etc.), work-in-process and finished products.
- **Exact forecasting of electricity consumption**, which enables bargaining for better tariffs on the free electricity market.
- Real time information for **order status and production output.**

Quality

- **Reduction of waste** due to quicker response to alarm events, more precise control of settings and greater automation.
- **Facilitated quality control** of different types of processes
- **Traceability of the entire production** and quick access to historical data - route cards and input materials.
- Help in compiling **8D reports** and other methods by finding the root cause of a problem.
- Help with **introducing and adhering to various standards**, including:
 - ISO 9001:2015 и ISO 9001:2008
 - ISO 14001:2004
 - ISO 50001:2011

Presenting Ignition SCADA

Ignition is unlimited, so at the affordable price of a single server license you can easily get all your data, implement any industry application, and have an unlimited number of customers - **all from one universal industrial platform.**

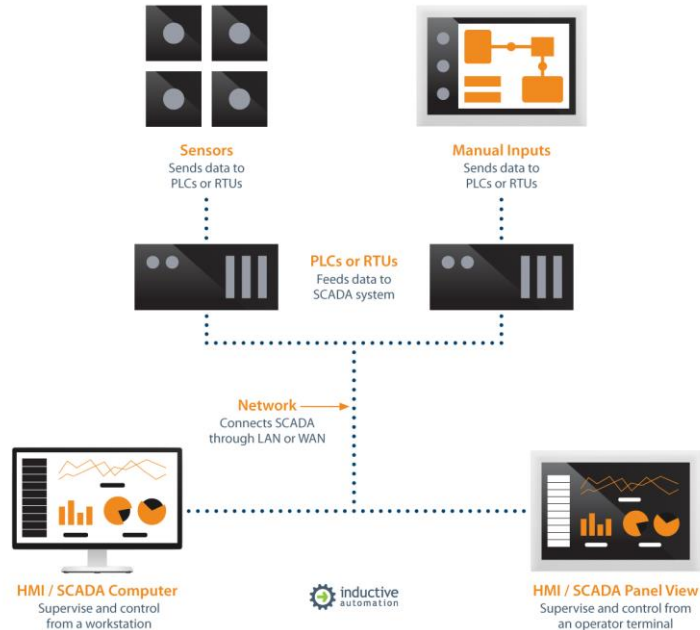
- Ignition is a powerful and affordable industrial software with fully integrated modules for creating complete SCADA, MES, EMS and IIoT solutions.
- Provides easy connectivity to external systems, databases and controllers and other hardware devices and machines regardless of manufacturer.
- Ignition SCADA is being developed by **Inductive Automation**, an independent company founded in 2003 and based in California, USA.
- 44% of the largest US companies (the 100 largest Fortune companies) use Ignition SCADA as well as thousands of other customers in over 100 countries around the world..
- It is used in a variety of industries:
 - Chemical industry
 - Energy, plumbing and other infrastructure
 - Machinery and Manufacturing,
 - Metallurgy and plastics,
 - Grain-storage and agriculture,
 - The Food and Beverage Industry,
 - Transport, Logistics and Warehouses,
 - Others

Some of the companies using Ignition SCADA



Server-Centric Web-Based Deployment

Ignition has an **unique server-centric web-based deployment model**. With Ignition, you can instantly web-launch an unlimited number of zero-install, full runtime clients on virtually any device. The central Ignition gateway can be on one central server or distributed across several servers, located on premise, in the cloud, or a combination of both. You can even put Ignition all the way out to the edge of the network.



- **Sensors** - for temperature, position, weight, speed, frequency, pressure, electrical parameters, counting input, etc.
- **Manually Inputs** - input and visualization of data from local devices - computers, tablets and more.
- **PLCs and Remote Peripherals (RTUs)** - collects sensor data and manages various actuators (engine, pump, cylinder, etc.)
- **Network** – with cable or wireless
- **SCADA Computer** – a personal computer that serves a particular task and has a definite physical location. Often it is also a server.
- **HMI (Human Machine Interface)** – man-machine interface. Graphic visualization on a monitor, tablet, phone, or other device.

Various functionalities

Numerous applications based on Ignition SCADA can be developed according to the specific needs. These are just some of them.



The current state of the whole production and individual machine can be seen at a glance at memo charts.



Manages and tracks key processes through predefined algorithms and boundary values.



Alarms for events and accidents. Traceability of the reaction when removed.



Loading, storing and managing settings (recipes) on machines and tracking their correct application.



Energy management of electricity, water, air, gas and others. Quality indicators of power supply..



It facilitates operators' work through guides, boundaries and blocking of wrong commands. Improves quality and reduces accidents.



Traceability and material flow management - stocks, current status of orders, inputs, etc.



Tracking performance of machines and operators. Maintenance management.



Tracking the work, condition and location of tools used in production.



Production data is stored digitally and is easily accessible for review and analysis. Statistical data.



Reports and information on the production process produced automatically.



Makes a link between the data generated in production and the ERP system..

Conventional SCADA



- | | |
|---|---|
| <ul style="list-style-type: none">• Based on one operating system - Windows | <ul style="list-style-type: none">• Multiplatform - Windows, Linux, MAC OS |
| <ul style="list-style-type: none">• Closed for communication only to specialized devices - specific PLC models, IO modules, etc. | <ul style="list-style-type: none">• Independent platform. Open for communication with devices from various manufacturers: Wago, Siemens, Allen Bradley, Omron, all MODBUS devices and more. |
| <ul style="list-style-type: none">• Closed connection to a single database | <ul style="list-style-type: none">• Open links with a large number of databases - MySQL, MS SQL, Oracle DB and etc. As a consequence - easy communication with external systems such as ERP. |
| <ul style="list-style-type: none">• Licensing based on number of clients (users), number of tags (points of information) or number of connections with external devices. Extensions are charged separately. | <ul style="list-style-type: none">• Server license - unlimited number of clients (users), unlimited number of tags (information points), unlimited connections with external systems. It is limited only by the server resources. |
| <ul style="list-style-type: none">• A conventional graphical interface that is pre-set and does not scale to the resolution of the screen | <ul style="list-style-type: none">• High performance HMI - Enhanced interface and customizable display scaling according the screen resolution |
| <ul style="list-style-type: none">• Local access only from the computer on which the system is installed. | <ul style="list-style-type: none">• Web based - could launch from any device with a web browser and internet connection - a computer, a tablet, a smartphone, and so on. |
| <ul style="list-style-type: none">• More difficult to develop or expand the system because of the limitations of working with other databases | <ul style="list-style-type: none">• A modular system that can be varied to customer needs - from a small system for a specific need, to a system covering every aspect of production. |
| <ul style="list-style-type: none">• It is not flexible and does not have modules, slow installation and integration. Difficult to update the software. | <ul style="list-style-type: none">• Centralized system management, easy to upgrade and extend |
| <ul style="list-style-type: none">• Based on technology from the 1990s | <ul style="list-style-type: none">• A modern platform. An SSL communication certificate is used, making the system extremely secure. |



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