

4i Platform User Manual



› **4i Platform – User Manual**

4i Platform

Address: 600 Old Pond Road, Suite 505A, 15017 Bridgeville, Pennsylvania USA

Phone: +1 412 257 1505 (sales) / +1 412 221 2080 (support)

Email: sales@4iplatform.com / support@4iplatform.com

Website: www.4iplatform.com

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Introduction

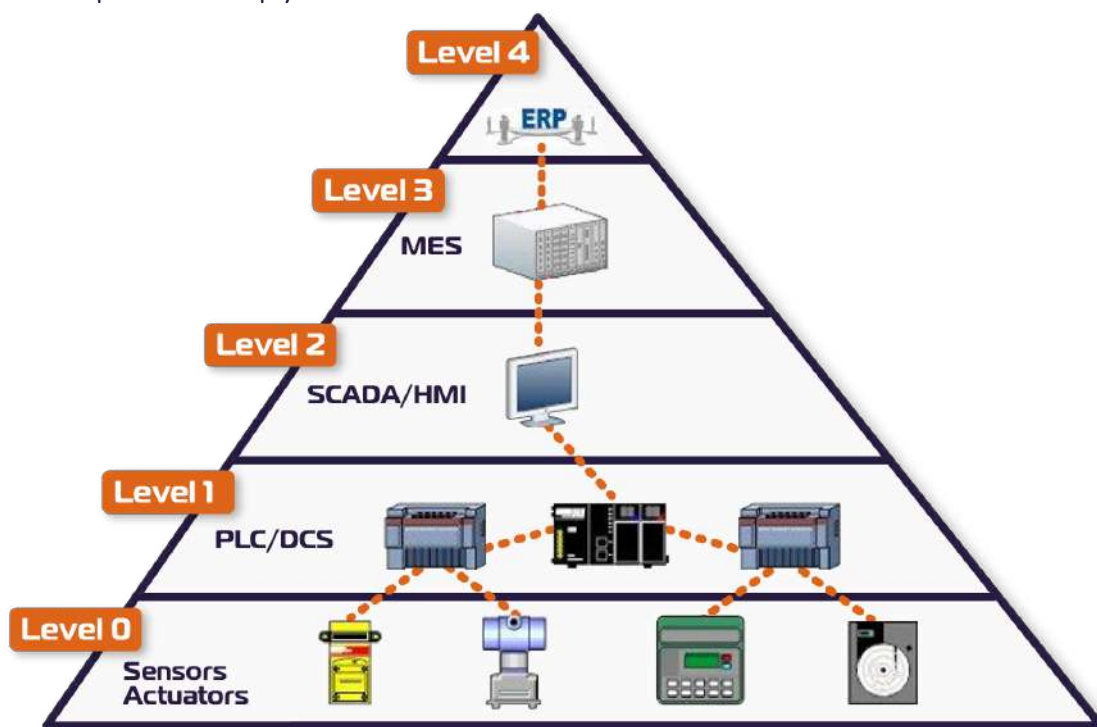
4i Platform provides tools to connect plant sensor data and an execution environment for specific solutions that use that data to generate decision-useful information.

The features that distinguish 4i Platform are:

- › Distributed data acquisition + Centralized information.
- › Tolerance to power, network and equipment availability problems.
- › Scalable at the data, machine, line, plant level.
- › SaaS: Software as a Service.
- › Simple and unified installation and configuration.
- › Integration with existing systems.
- › Low Total Cost.

Typical architecture of industrial information systems

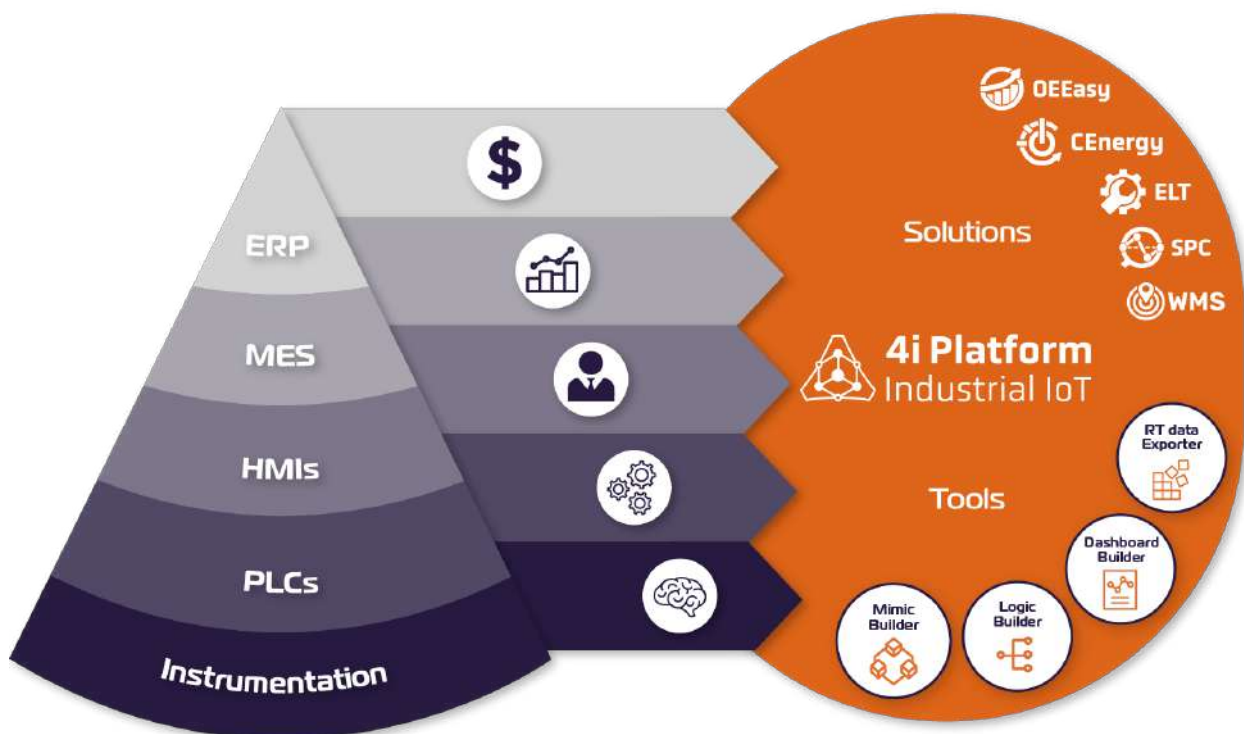
One of the most common ways of representing the information architecture of an industrial plant is a pyramid.



At the base of the pyramid is the layer of sensors and actuators making up what we call Instrumentation or Level 0. Above it are programmable control systems such as PLCs and DCSs which we collectively call **Level 1**. These in turn involve the operating personnel through HMI or SCADA systems (**Level 2**) that can have local, i.e. single-line logics, for example, for recipe management or set-point reference value calculations.

On the other hand, at the top of the pyramid are the company's decision systems, also called Business Intelligence systems such as MES (**Level 3**), which allow management to examine the company's behavior using metrics and the company's operation systems, generically called ERP (**Level 4**), which contemplate activities such as invoicing, inventory management, purchasing, human resources and other functions.

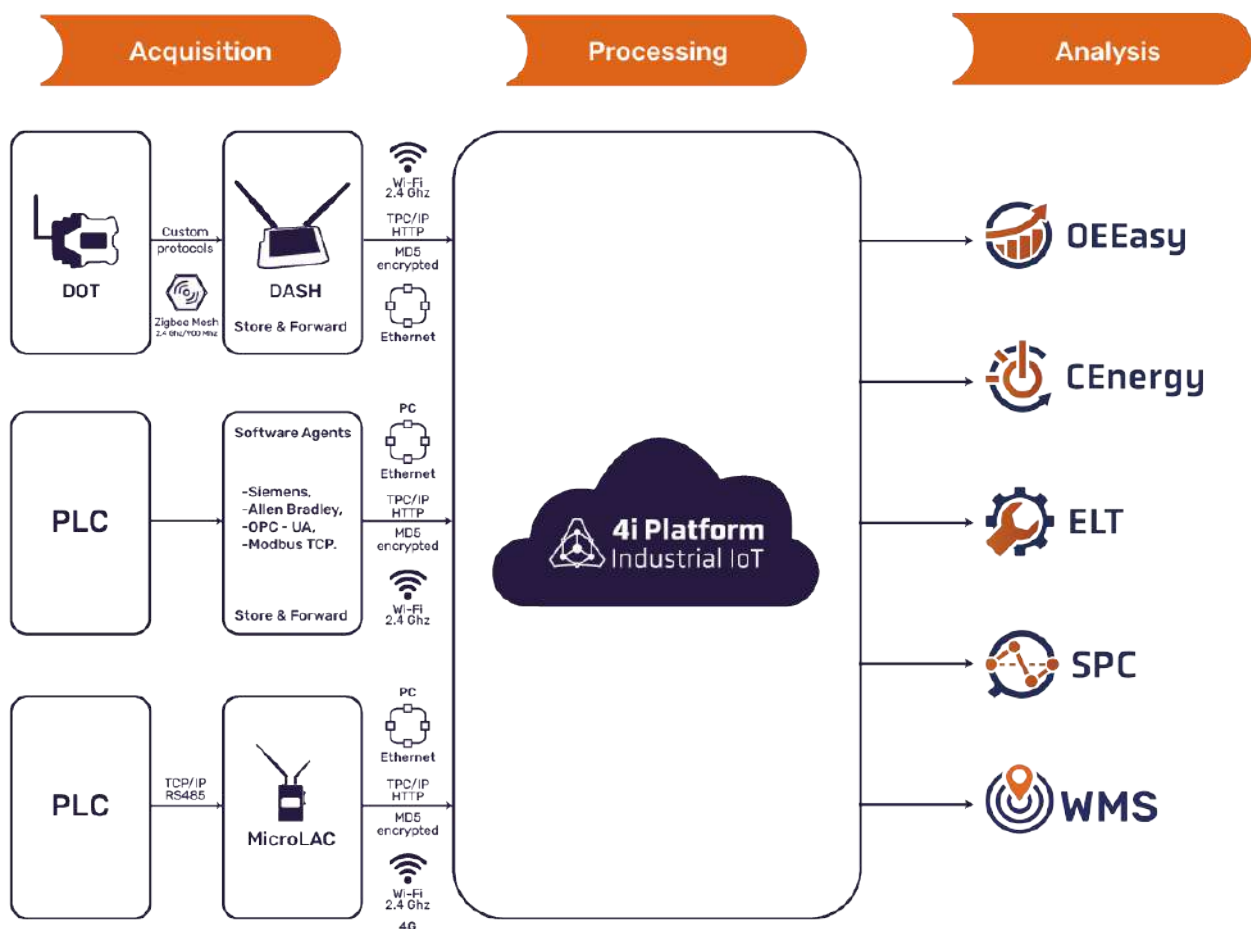
4i Platform provides several types of solutions that connect the information generated by plant equipment at all layers of automation with the decision levels of the enterprise. Distributed acquisition acquires and stores without interfering with existing control systems as well as organizing the information to generate another view of the same information.



As can be seen, the information generated in each of the systems that make up the automation pyramid feeds information to the platform. The platform then stores the data information together with the time at which the data occurred in order to reconstruct the history, whether or not at the time the data was generated.

4i Platform: Operational diagram

In the following diagram we can see in detail the modules that compose 4i Platform:



As can be seen from left to right in the diagram, the data travels from the generation source to the end user. The data on its journey is associated with context data such as the time it was acquired, the time it was stored, the validity of the data, as well as other information necessary for the system.

Specially designed hardware equipment, such as DASH and DOT or MicroLAC, is involved in the acquisition and routing stage. In addition to specialized hardware, data is also acquired from software agents that connect to existing equipment.

All these elements operate with a Store & Forward strategy that prevents data

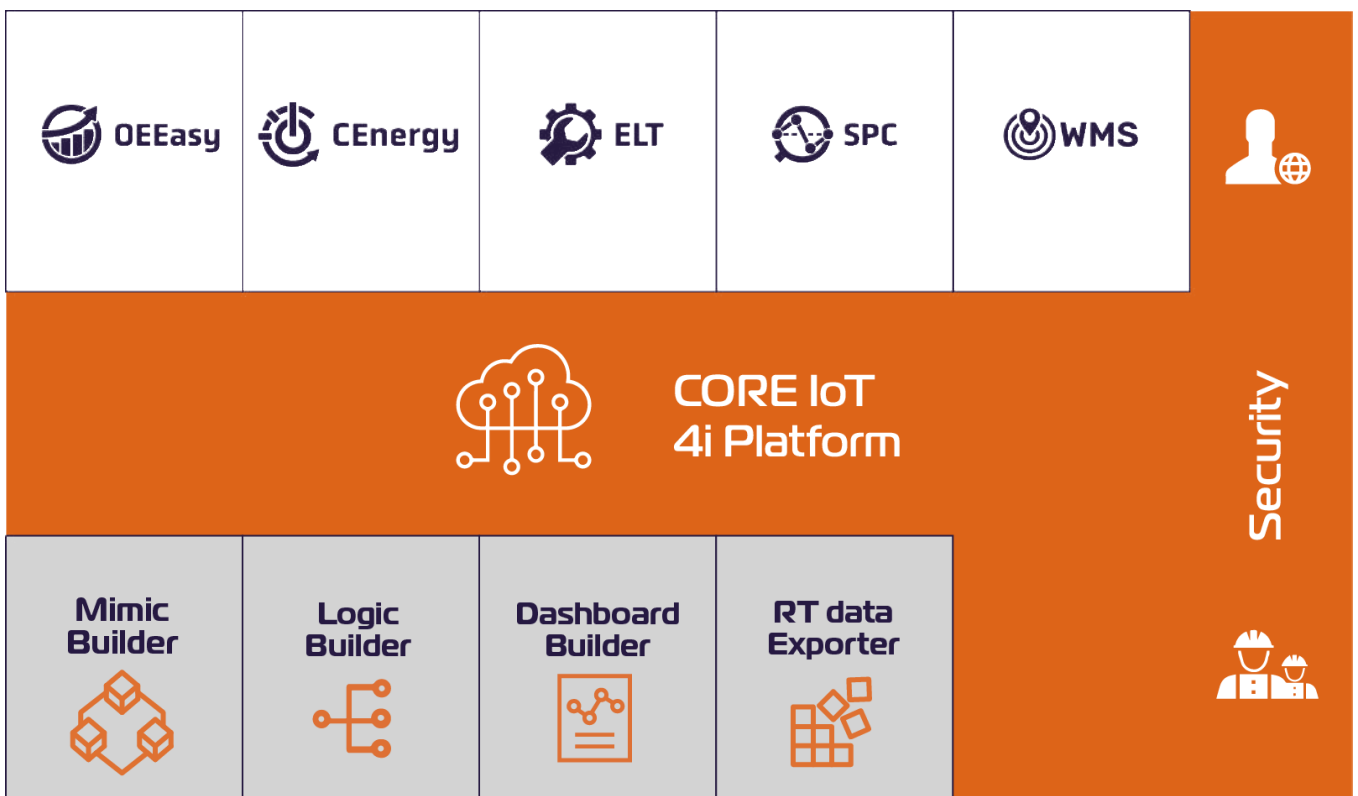
loss even with interrupted communications. At each stage, the systems are able to restore themselves after communications are re-established.

Then, in the storage and processing stages, internal entities are created and stored temporarily so that data can be searched in the past and processed without losing any points in the analysis. All the information is accessible through the solutions that make up the platform.

4i Platform works in a **CLOUD** environment, where the user only needs to connect the DOT/DASH hardware. In the case of having an automation infrastructure, the user only needs to install a software agent on the computer connected to the PLC.

4i Platform: Components

The following table shows its components:



The platform is divided into three main layers: the Core IoT, the Solutions and the Tools.

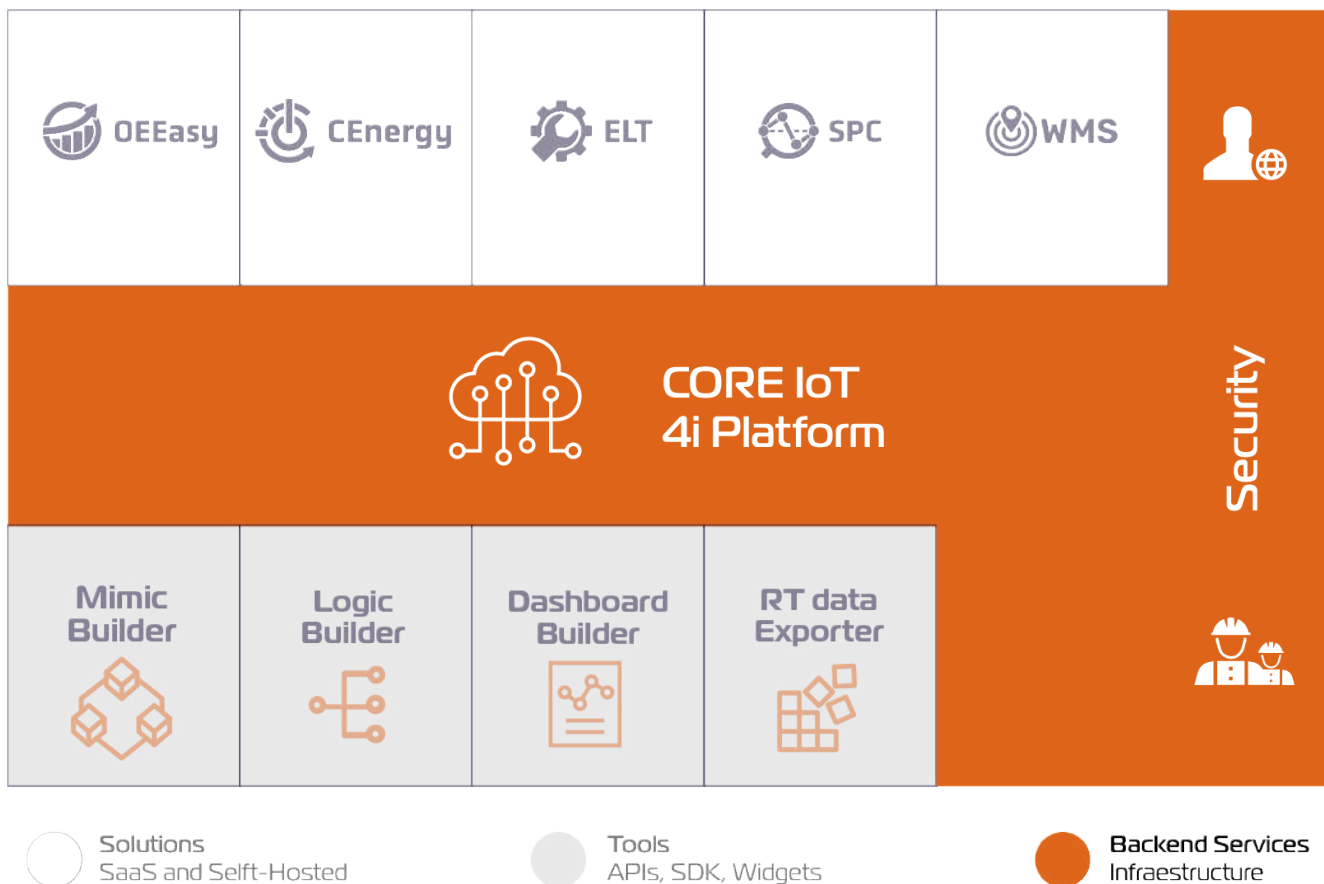
The **Core** is the information acquisition and storage engine. In this layer are solved: acquisition, distributed transport, infrastructure management and security, among others.

The **Solutions** layer allows users to use the data to solve specific needs.

Finally, the **Tools** layer allows the user to expand the functionalities of the applications and in some cases even of the Core itself.

> 4i Platform Core

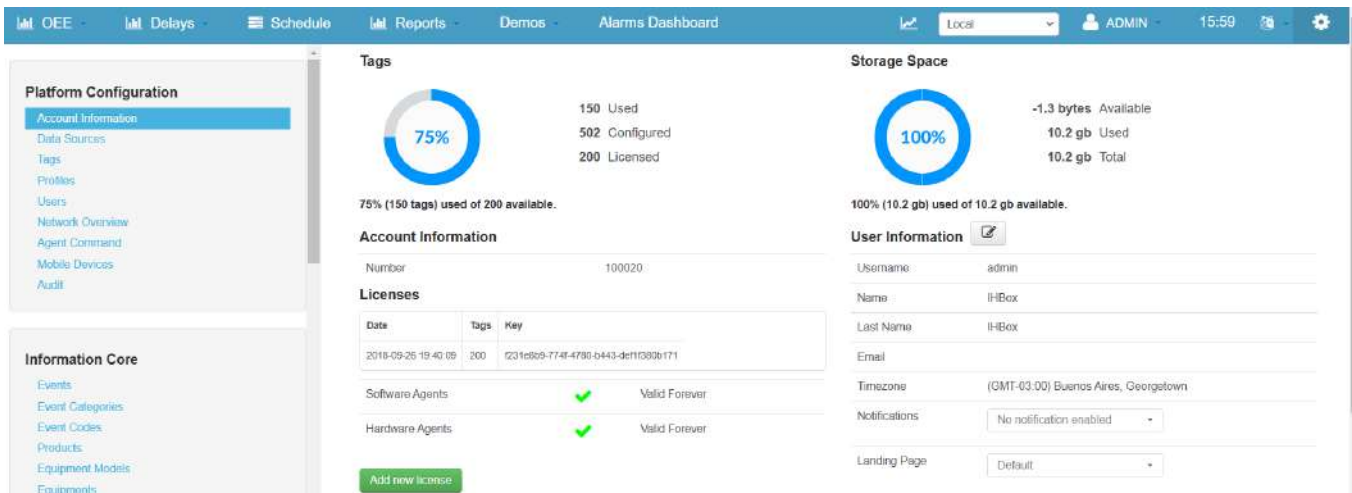
To provide a homogeneous operation and maintenance environment, the platform is divided into layers. The **data acquisition layer** provides a uniform architecture to obtain automatic data from several production lines and store the present and past values in a single database (*Real-Time Database*).



The tasks executed by the Core IoT are the following:

- Connection of the measurement point (agents), e.g. DASH/DOT, MicroLAC, PLC.
- Data storage in standard format, Tag, value, time.
- Acquisition infrastructure control. Agents, solutions and tools.
- Profile and user management.
- System diagnostics.

All these tasks are handled internally in the system and work autonomously. In some cases, configurations are required and that is why the Core IoT has its screens for that functionality. All configuration screens are above the gear icon.



The screenshot displays the 4i Platform configuration interface. The top navigation bar includes OEE, Delays, Schedule, Reports, Demos, and Alarms Dashboard. The main content area is divided into several sections:

- Platform Configuration:** A sidebar menu with options like Account Information, Data Sources, Tags, Profiles, Users, Network Overview, Agent Command, Mobile Devices, and Audit.
- Information Core:** A sidebar menu with options like Events, Event Categories, Event Codes, Products, Equipment Models, and Equipments.
- Tags:** A donut chart showing 75% usage (150 tags used of 200 available). A table lists 502 Configured and 200 Licensed tags.
- Account Information:** A form showing the account number 100020.
- Licenses:** A table with columns for Date, Tags, and Key. It shows two licenses for Software Agents and Hardware Agents, both valid forever.
- Storage Space:** A donut chart showing 100% usage (10.2 gb used of 10.2 gb available).
- User Information:** A form showing user details for 'admin', including Name (IHBox), Last Name (IHBox), Email, Timezone (GMT-03:00 Buenos Aires, Georgetown), Notifications (No notification enabled), and Landing Page (Default).

Core user functionalities:

- Platform Configuration.
- Core Information.
- Tools.
- "About".

The configuration functionalities allow to connect the data sources to the system, called **AGENTS**. Besides connecting, it allows to manage and maintain the **TAGS** associated to those agents. Also, it allows to create the plant infrastructure to be used by the solutions, configure production shifts, user profiles, users, among other things.

› Acquisition Software and Hardware

The **AGENTS** that make up the acquisition layer can be hardware devices, such as the 4i DASH and 4i DOTs, or software components that are installed on existing computers or MicroLACs.

All agents have the ability to run in a distributed manner and to store intermediate data for extended periods of time. The aim is to avoid the loss of data due to problems with the robustness of the network that links them.

The software agent is installed on a PC connected to the same PLC network, allowing to acquire data from it and send it to the 4i Platform cloud for processing.

The PLC Agent component is free of charge and is available in all versions of the 4i Platform subscription.

› PLC Agent Installation

The PLC Agent is downloaded directly from the platform website. Once the download is complete, the installation must be executed:

1. Open an Internet browser on the PC.
2. Go to the configuration area.
3. Select Data Sources.
4. Select Download Agent.
5. Install the application according to the instructions on the screen.
6. When entering in Data Source → Configuration, the new PLC Agent will be displayed, to associate it to the 4i Platform cloud.

If you have any questions about the installation of the agents, please contact us via email at support@4iplatform.com.



Download Agent

Select, download and install a new Agent on your computer. After the installation process is completed, a new Agent will appear on the Data Sources screen. There, you can configure all Agent's parameters.

Available Agents

- Download Agent Novus
- Download Agent OPC
- Download Agent Allen-Bradley
- Download Agent Modbus
- Download Agent Siemens S7

[Download](#) [Close](#)

› 4i DASH

This hardware component behaves as a router (Gateway) between the 4i DOTs wireless network and a network that links it to the 4i Platform cloud. It requires a stable power connection (100-240VAC) and a strategic location in order to communicate with the 4i DOTs network.



There are 3 models of 4i DASH, depending on their connectivity: **Wi-Fi, Ethernet and 4G**. Each one has its own configuration ways to link with the 4i Platform cloud.

Each 4i DASH supports a variable number of 4i DOTs depending on the amount and frequency of data they report. While there is no limitation in the system, the recommendation is to connect a maximum of 5 4i DOTs per 4i DASH.

All 3 versions of the 4i DASH link to an existing 802.3 (Wi-Fi) network to communicate with the 4i Platform cloud. To facilitate local configuration, they offer two interfaces:

- A local (ad-hoc) Wi-Fi network, which can be accessed using a mobile device.
- An RJ45 Ethernet port.

Local configuration of 4i Dash

The local configuration of the 4i DASH aims to define the network parameters and link it to the 4i Platform cloud. The steps to locally configure a 4i DASH using a nearby cell phone, tablet or computer are:

1. Turn on the 4i DASH.
2. Using the cell phone/tablet/PC, search for a wireless network named 4i Dash -xxx (where xxx is a number from 0 to 1000).
3. Connect to the wireless network.
4. Open a web browser and point it to 192.168.1.10.
5. Follow the instructions on the screen.

Once the 4i DASH has been configured, it can be viewed on the platform's website, under Configuration → Data Sources.



The 4i DASH 4G does not need to be configured locally, as it comes pre-configured to connect to the corresponding user account in the cloud.

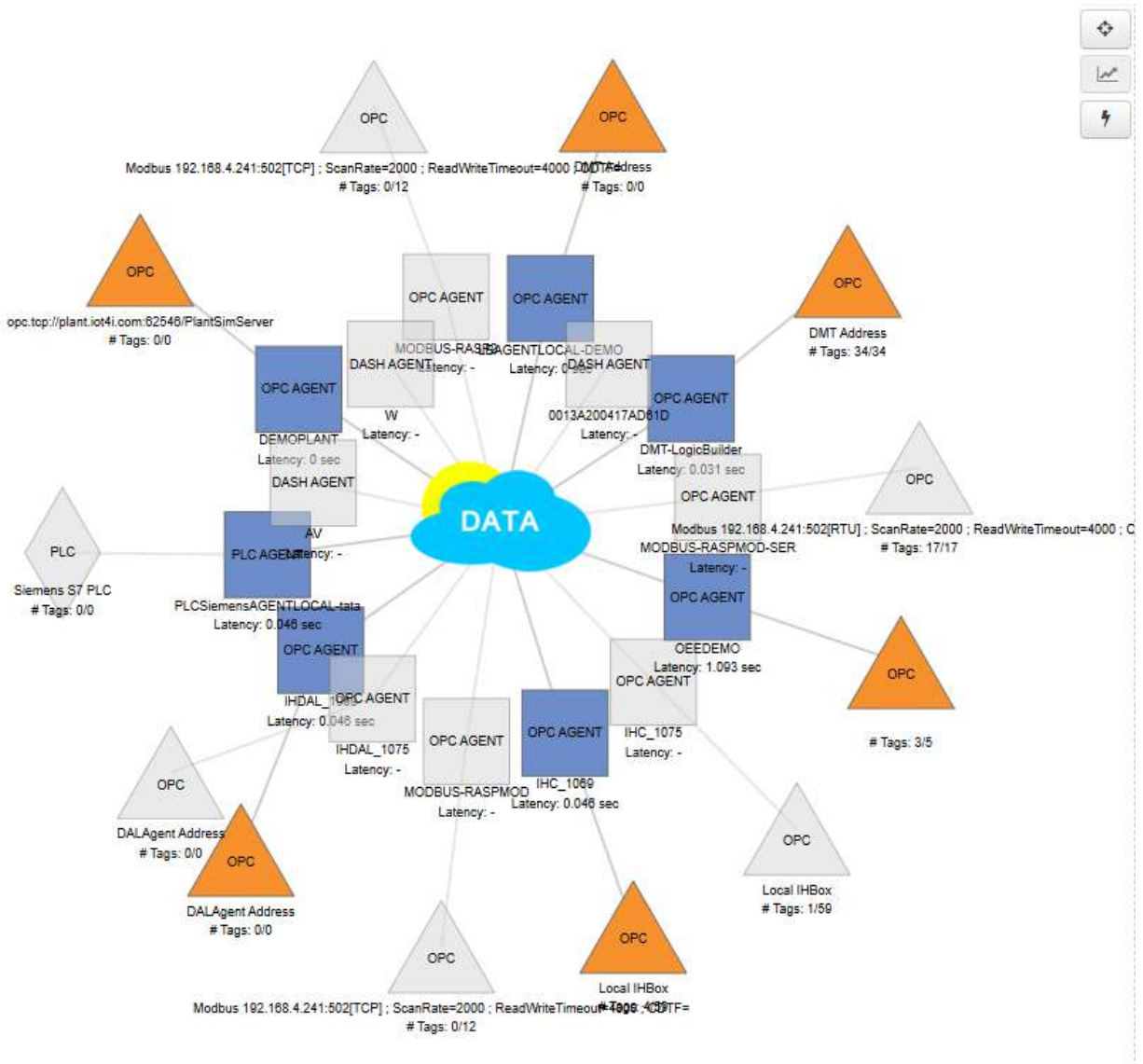
> 4i DOT



This hardware component links directly to field signals via cables and sends the sensed values to a 4i DASH wirelessly. The 4i DOTs are designed to be mounted in electrical cabinets so they feature DIN rail support, 5-24v DC power and detachable field inputs. At the time of purchase, 4i DOTs can be ordered pre-configured to connect to an existing infrastructure in a Plug & Play manner.

The 4i DOTs are equipped with rechargeable batteries that allow them to operate even when they are not powered. The duration of the battery life depends on the acquisition speed and the distance to the rest of the infrastructure.

The wireless network of the 4i DOTs has a mesh-like architecture, i.e. they help each other to transport the information up to the 4i DASH. It is therefore possible to have 4i DOTs strategically located as repeaters to extend the coverage of a 4i DASH.



For normal range 4i DOTs, while the maximum linear distance is 50 meters, a typical distance of 20 meters is estimated (assuming a closed environment including a couple of obstacles such as walls and metal cabinet doors).

There are two versions of 4i DOTs with different characteristics:

DOT TYPE	MODEL	CHARACTERISTICS
Standard	4i-DOT-72124	<ul style="list-style-type: none"> › 7 digital inputs dry contacts. › 2 opto-isolated analog inputs. › Mesh 2.4Ghz connectivity with the 4i DASH. › 50m maximum line of sight distance to the nearest 4i DASH or 4i DOT. › Power supply: 12-24VDC/internal rechargeable battery.
PLC	4i-DOT-844 PLC	<ul style="list-style-type: none"> › 8 digital inputs. › 4 digital outputs. › 4 opto-isolated analog inputs. › 2.4 GHz mesh connectivity with 4i DASH. › Maximum line-of-sight distance of 50m between the 4i DASH and its nearest 4i DOT. › Power supply: 12-24 DC / internal rechargeable battery.

› 4i DOTs to 4i DASH Connection

The default configuration is that there is only one 4i DASH in range of each 4i DOT, so these are connected directly to the 4i DASH without configuration.

In more complex architectures there may be more than one 4i DASH in range of a 4i DOT. In these cases, the 4i DOTs and 4i DASH have an internal parameter that allows them to select a PAN ID (personal area network ID) and to segment the acquisition network.

The 4i DOTs are provided with an LED that indicates the connection status with the corresponding 4i DASH. This LED can be used to assess the health of the connection, as it flashes with luminosity proportional to the signal strength of the 4i DASH.

› **Special agent functionalities**

› **Store & Forward**

The agents have a Store & Forward mechanism to send the data from the source to the server. It works as follows: The agent receives the data and stores it in an internal memory and forwards it to the cloud as bandwidth permits. This mechanism keeps the acquisition running even when the network link between the agent and the Internet is intermittent. Lost" data is recovered using an out-of-band (OOB) strategy, which prioritizes current data.

› **Independent Connection**

Many times measurement points and field devices are dispersed and do not have LAN cabling to connect them. For this case, the platform provides wireless agents such as the 4i DASH that act as routers or data gateways to the main server.

Additionally, this hardware architecture allows data acquisition on machines whose automation systems cannot be altered by contractual or physical provisions. In the latter case, 4i DOT devices are used to connect directly to the sensors, leaving the network and PLC logic unchanged.

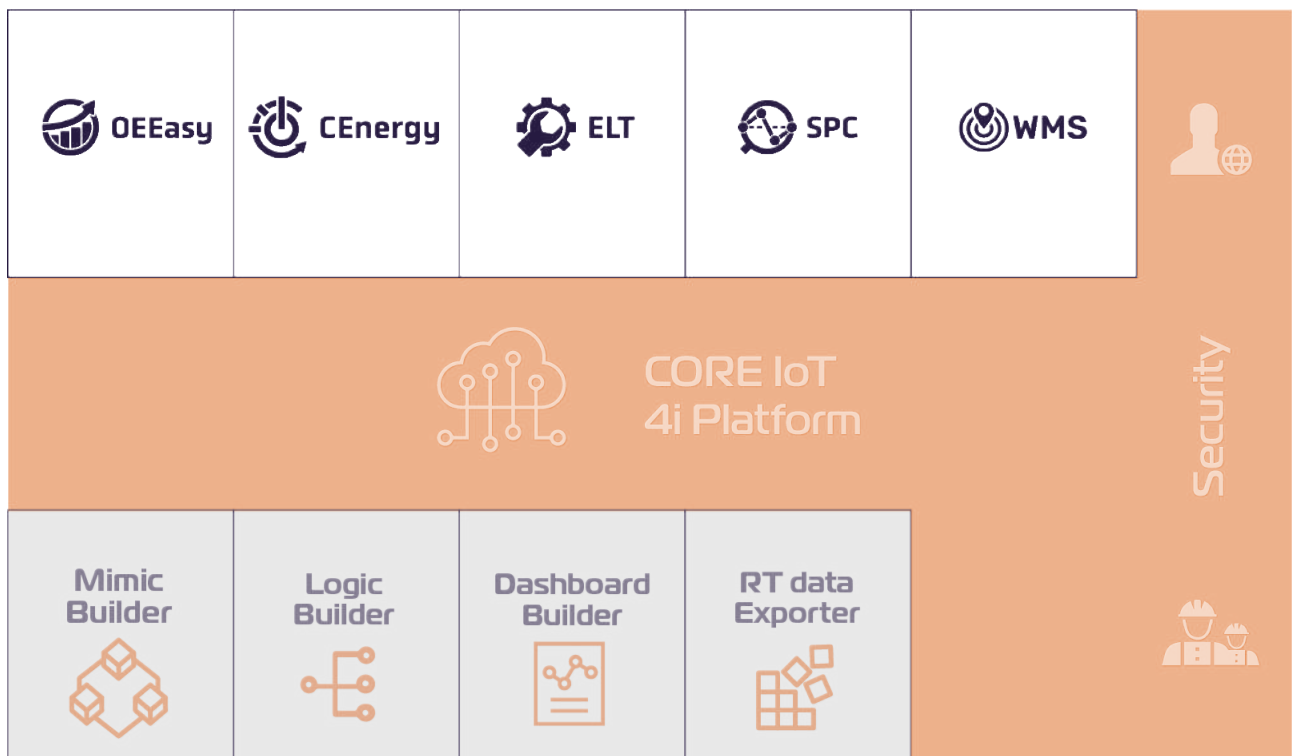
› **Included Features**

The acquisition layer has several functions that are used for system configuration and administration, and for browsing or exporting historical and current data. Examples of these functions are:

- Configuration of data sources.
- Agents configuration.
- TAGS configuration.
- Trending Web and its export tool.

4i Platform: Solutions

4i Platform solutions allow users to transform data into viewable information in reports and export it to other systems.



 **Solutions**
SaaS and Self-Hosted

 **Tools**
APIs, SDK, Widgets

 **Backend Services**
Infrastructure

The available solutions are:

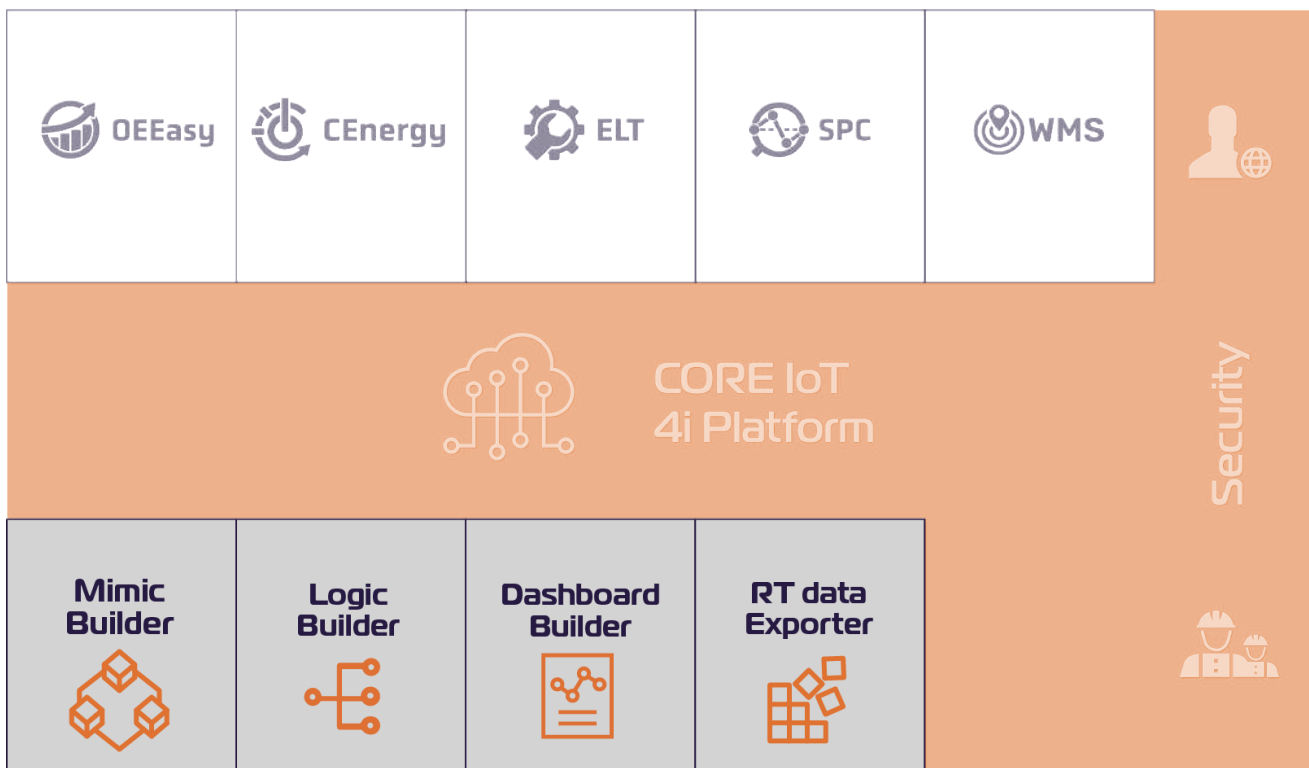
- **OEEasy:** software that allows you to measure and improve equipment efficiency by monitoring OEE in real time. With it, you will be able to identify the causes of productivity losses, detect the reasons for the most frequent production stoppages and implement corrective actions to improve efficiency.
- **CEnergy:** energy management software that allows you to manage the consumption of electricity, water and gas of your equipment in real time. With it, you will be able to identify energy saving areas, detect peaks in production, program alerts and, consequently, implement energy saving measures.

- **ELT:** permite ver el panorama completo del ciclo de vida de las máquinas para tomar medidas preventivas y evitar pérdidas. Con ella, podrá reducir los tiempos de inactividad gracias a la emisión de alertas para el mantenimiento preventivo, mediante el uso de campañas de mantenimiento configurables y reportes de contadores.
- **SPC:** solución que permite controlar la calidad de los productos y procesos. Con ella, podrá monitorizar los procesos de producción en tiempo real e identificar las causas de los defectos por medio del control de parámetros personalizables.
- **WMS:** permite gestionar el inventario y seguimiento de sus activos en tiempo real desde la planta. Podrá administrar múltiples almacenes en diferentes ubicaciones y disponer de operaciones de inventario automáticas y/o manuales.

4i Platform: Tools

The tools available are:

- **Mimic Builder:** Graphical tool used to create screens, mimics and dashboards that can be shared via the web with users.
- **Logic Builder:** This module allows the programming of algorithms and rules using the existing tag database as inputs. It also allows the creation of news tags and the detection of custom events.
- **Dashboard Builder:** Tool to generate reports and reports tailored to your requirements.
- **RT Data Exporter:** This module allows real-time data to be extracted from the acquisition system to an existing relational database.



 Solutions
SaaS and Self-Hosted

 Tools
APIs, SDK, Widgets

 Backend Services
Infrastructure

› Logic Builder

After creating the screen in the menu, the screen can be edited by clicking on the “Open Editor” button. Each screen contains a text editor that auto-refreshes itself when a change in the lines of code occurs. The content will be displayed in the adjacent box.

Screen created

Initially it is located to the right of the text editor showing the result of the programming. This can be expanded for full screen display.

In the right margin are located the commands of the screen:

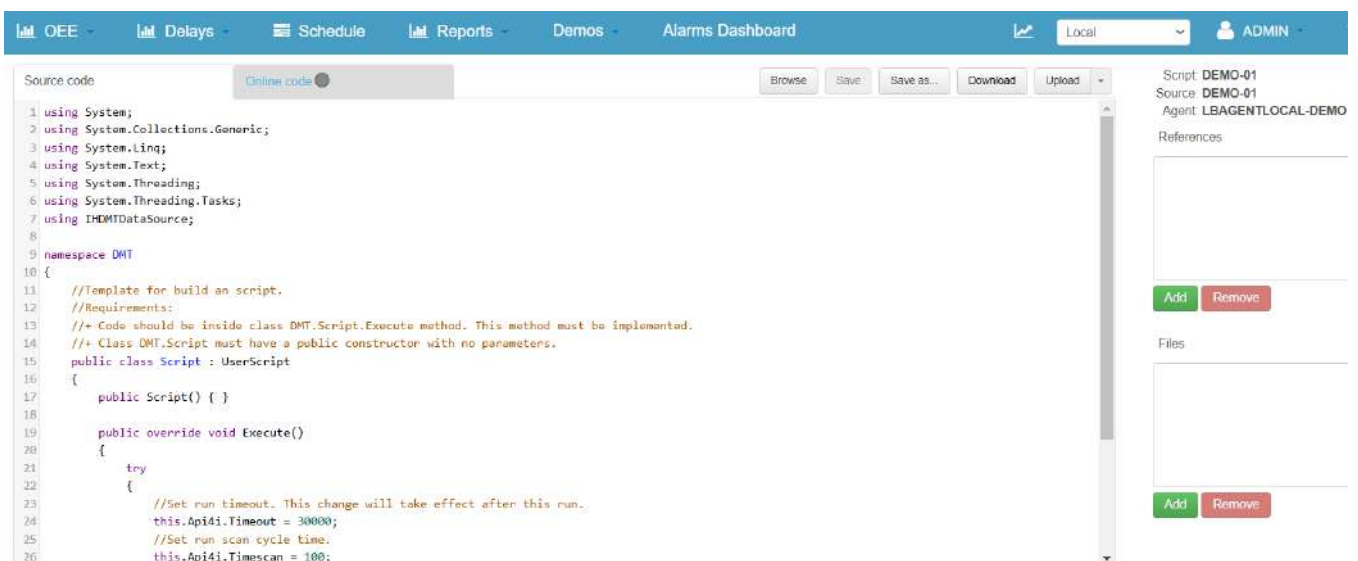
 Displays the content in full screen.

 Insert images.

 Import tags.

 Imports graphics.

 Generates texts on screen.



The screenshot displays the Logic Builder interface. The top navigation bar includes 'OEE', 'Delays', 'Schedule', 'Reports', 'Demos', and 'Alarms Dashboard'. The main area is a code editor with the following C# code:

```
1 using System;
2 using System.Collections.Generic;
3 using System.Linq;
4 using System.Text;
5 using System.Threading;
6 using System.Threading.Tasks;
7 using IHMTDataSource;
8
9 namespace DMT
10 {
11     //Template for build an script.
12     //Requirements:
13     /* Code should be inside class DMT.Script.Execute method. This method must be implemented.
14     /* Class DMT.Script must have a public constructor with no parameters.
15     public class Script : UserScript
16     {
17         public Script() { }
18
19         public override void Execute()
20         {
21             try
22             {
23                 //Set run timeout. This change will take effect after this run.
24                 this.Api4i.Timeout = 30000;
25                 //Set run scan cycle time.
26                 this.Api4i.Timescan = 100;
```

The right-hand panel shows 'Script DEMO-01', 'Source DEMO-01', and 'Agent LBAGENTLOCAL-DEMO'. It includes 'References' and 'Files' sections, each with 'Add' and 'Remove' buttons.

› Mimic Builder

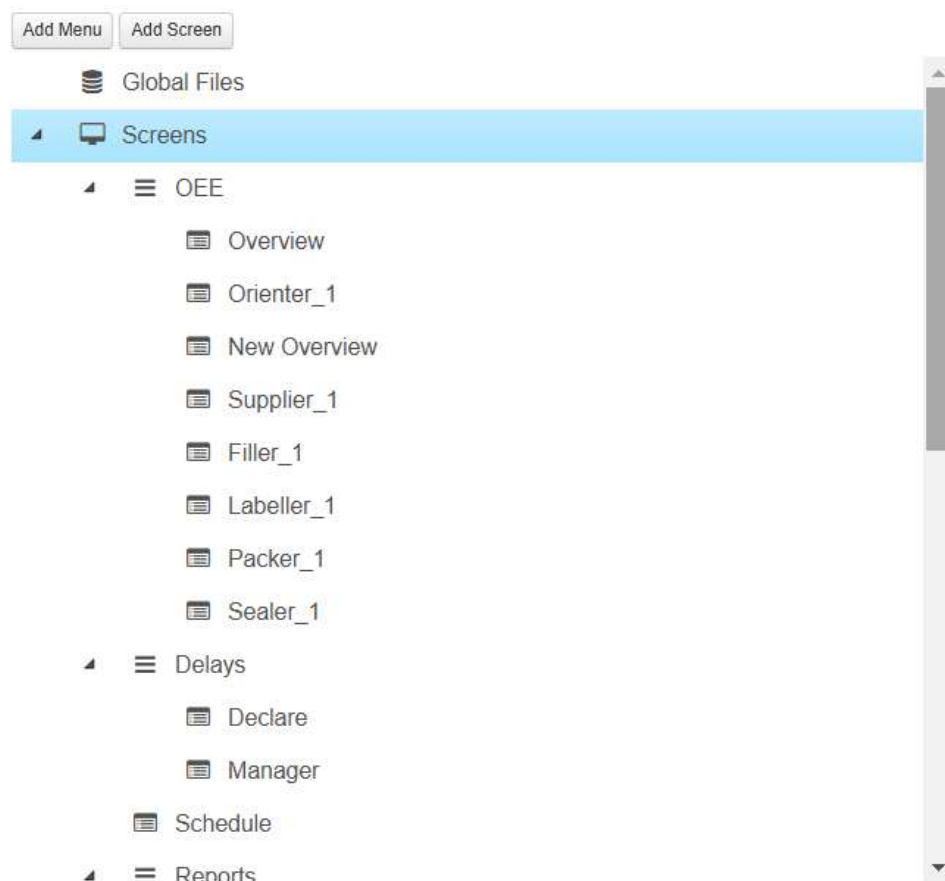
It is a tool that allows the development of screens and/or customization of the information acquired. Mimic Builder can be adapted to the needs required at any given time and with the particularities that the client needs. It requires knowledge of web programming.

Start menu

Initially contains a main drop-down menu in the form of a tree, called Screens, which is not editable in its initial content. To this you can add pages and submenus, which will be editable. Each menu and screen will be identifiable in the main navigation by the icons that represent them:

☰ for menus and 📄 for screens.

Each screen, in its configuration, is assigned a name, a description, an enable box and files to add or download.



Platform Controls

› Trendings

One of the most important tools of the acquisition platform is the possibility of visualizing the temporal evolution of the variables through the use of a grapher embedded in the platform's website.

The Trending Web tool is present in all versions of 4i Platform subscriptions.

Trending Web display components

A Trending contains one or more Panels. Each Panel is a Cartesian chart whose X-axis corresponds to time and whose Y-axis is used with several different scales.

Views

Views are configurations of the trend graph/panels/variables/scales/colors, which can be stored for later use. Views can be personal (they are viewable only by the user who created them), or global (they are viewable by all users). The following detail shows the view selection list:

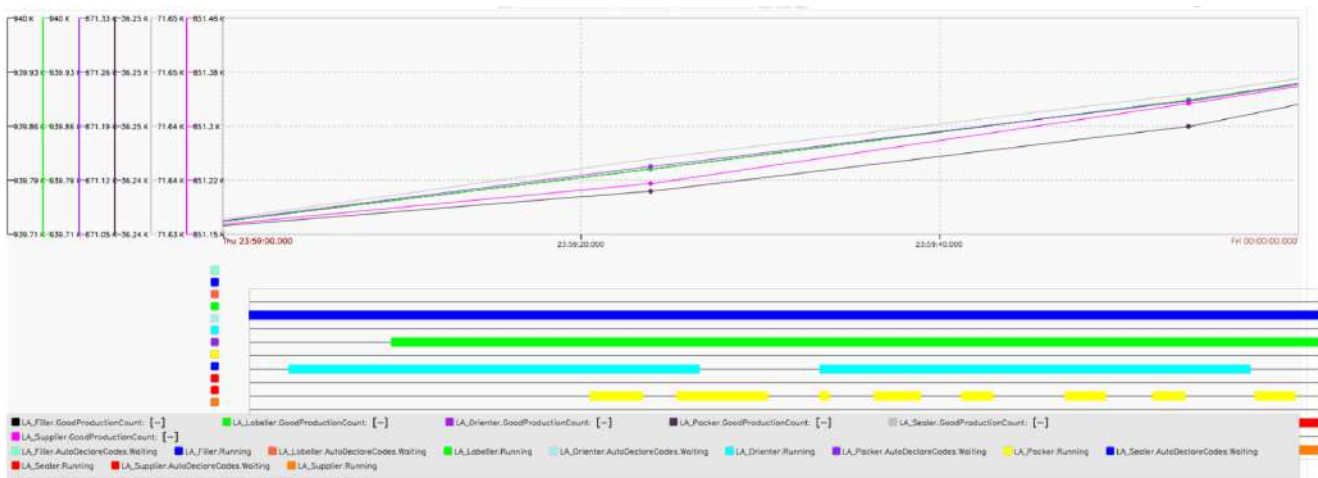


This drop-down list contains the variables that can be animated. To add a new view, drop down the "Views" field and select "add view". In this way, a box opens where we filter the variables to be selected, by double clicking, and they are automatically added to a "Panel".

Panel

Each "Panel" is a Cartesian graph whose "X axis" corresponds to time, and whose

“Y axis” is used with several different scales. It has a configuration box where the maximum, minimum and color values of the graph are detailed. To make the panel values effective, click on the “Apply” button. The trend graph with five panels can be seen below:



Each Panel contains a list of variables and one or more scales. All Panels are synchronized on their X-axis. The scales are determined by the maximum and minimum value set for each variable. If there are variables with identical minimum and maximum values, they will use the same scale.

Below the graph, the time units are shown on the time axis. We can navigate on the time axis by clicking on the graph and dragging sideways, to the right to go forward and to the left to go back. Another way is with the arrows located at the top left of the Panel, with which the graph will move in the periods between the beginning and end of the scale (this data is indicated in red at the bottom of the graph).

In Trendings with many variables, it is convenient to assign the same minimum and maximum values to similar variables to save space, since fewer scales will be drawn.

After selecting the variables to be animated, the time span or range over which the Trend will be plotted must be specified. There are predefined values ranging from 3 minutes to 1 month. If you need to customize this parameter, open the configuration box from the icon to the right of the arrows and select the dates with start and end times for the animation.



In the case of working with old values it is important to know the last time these data were updated on the server.

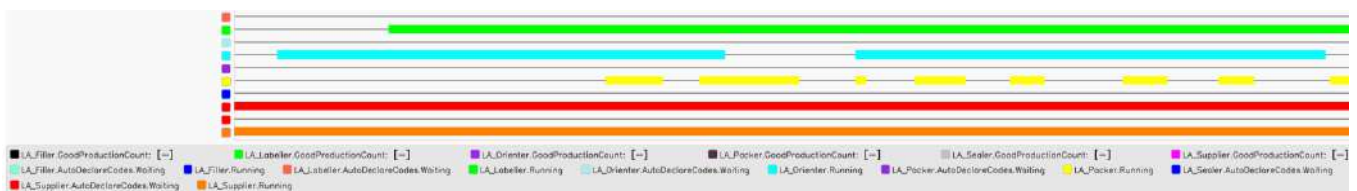
The “Cloud Mode” function is activated by clicking on the cloud-shaped icon, and allows us to visualize the signal value, know its average value and contrast it with its mean value. Clicking on the icon switches its function:



> Variables

In data acquisition, two types of variables are obtained: **analog and discrete variables**. The analog ones take real numerical values, that is, they are expressed with whole numbers and decimals. Thus, they have greater precision or resolution. Discrete variables, on the other hand, have a binary value, 0 or 1.

- Analog variables are plotted at the top of the Panel according to their scale.
- Discrete variables are plotted at the bottom of the Panel, shown as a thick segment when their value is 1, and as a faint line when their value is 0.



The variables have a time stamp that not only allows real-time analysis, but also subsequent analysis and synchronization on the time axis of a Cartesian graph. An example of application is the analysis in a water treatment plant by

measuring flow and pressure. By synchronizing these two variables in a Panel, and considering that the measurement is correct, it will be possible to analyze if there is an obstruction in the process in case of increasing the pressure value and decreasing the flow value.

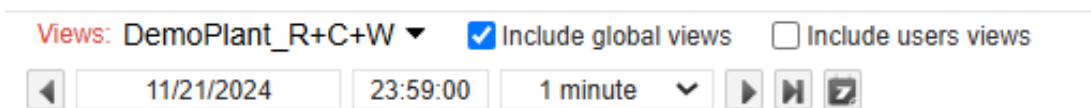
Placing the mouse cursor on a thick segment of a discrete variable will shade the corresponding time interval in the analog variables area.

› Cursor

When the cursor is enabled, by placing the mouse pointer in the graph area, a vertical line (cursor) is drawn and the instantaneous values of each variable at that point in time are displayed.

› Time navigation

The time range allows selecting the time interval to be displayed. The control is based on an initial date and time and a list of predefined intervals like 1 hour, 1 day, etc.



The arrows allow you to move the time scope into the past or future. The time interval moved forward/backward corresponds to half of the displayed interval.

The “Live” date allows you to move the time scope to the current day and time.

The Z icon allows you to define the end date and therefore generate a view with a non-standard time interval.

› Zoom & Pan

The Zoom and Pan controls are similar to those used in the Google Maps application. Using the mouse wheel, you zoom in/out in “X” (time) only. By holding down the left mouse button and moving sideways without changing the mouse

position too much on the Y axis, the Trending pans, that is, changes the start and end date of the time interval without changing the scope. By holding down the left mouse button and moving up/down and to the side (for example, 45 degrees), the Trending begins to draw a rectangle, which when you release the button will become a zoom command in X and Y. To return to the original zoom, you must press the undo button.

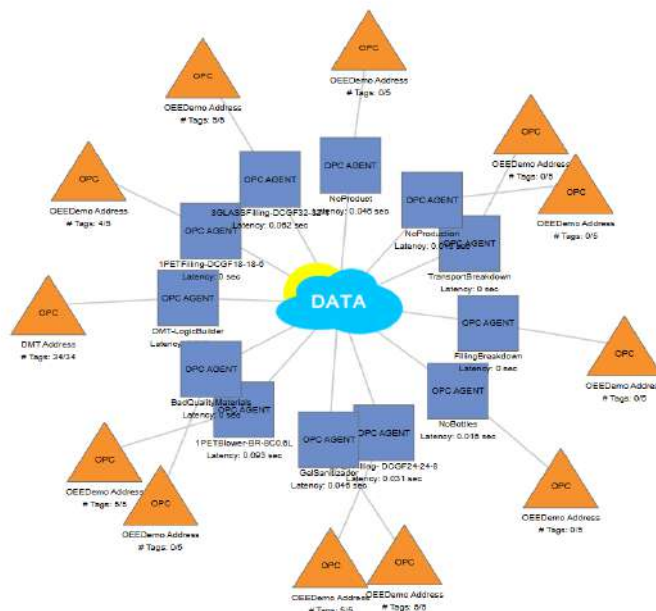
› Other Controls

- **Real Time:** Refreshes the Trending screen every set number of seconds.
- **Tools:** Opens the Panels and Variables configuration window.
- **Save View:** Opens a dialog to save the current view with a name.
- **Export:** Exports the data being viewed to a Microsoft Excel compatible format.
- **Undo/Redo:** Deletes or adds the last change made.



4i Platform: Configuration

- **Network Configuration:** From this screen, the Physical and Wireless network parameters are configured.
- **Network Diagram:** This screen shows a diagram showing the path that the information follows from the Data Source (TAGS) to the server. The TAGS will be visible in a pop-up list when clicking on the Agent and Data Source icons.

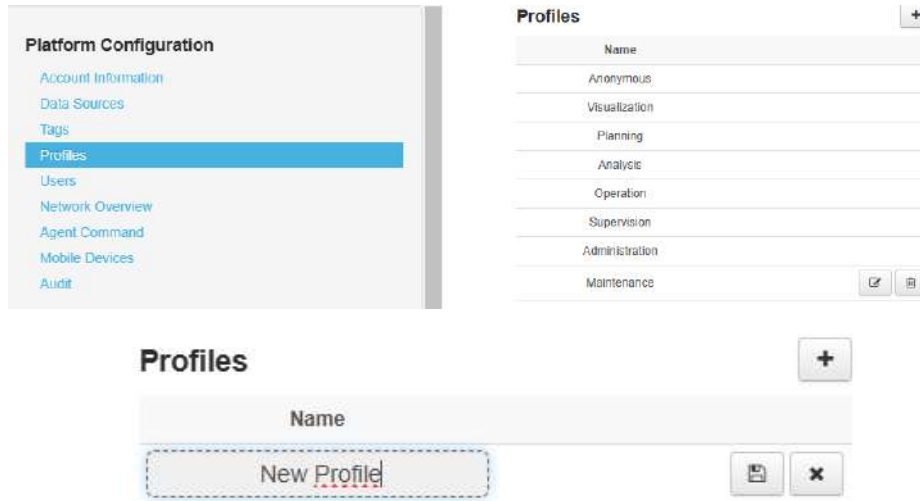


Tags are animated when selected

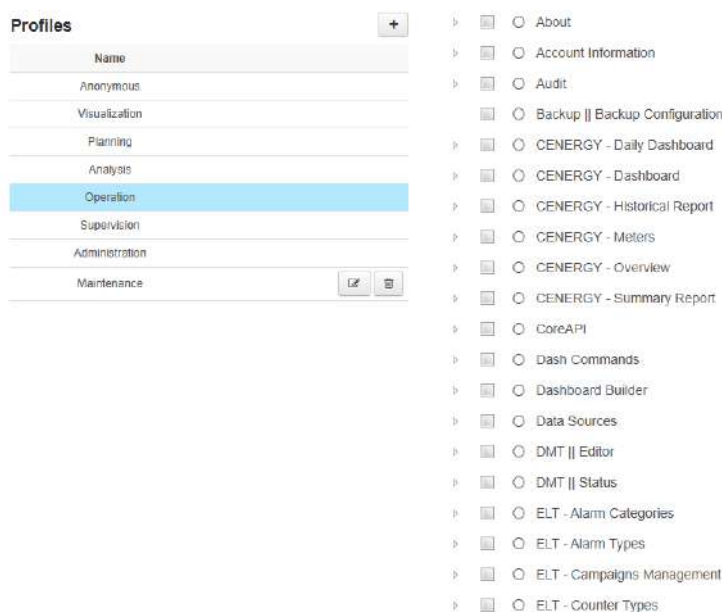


- **Account Information:** This screen displays information about the TAGS, memory, and system information.
- **Users:** From this screen, users are created that will have permissions on the platform. After being created, you must click on the name to access a new configuration screen. Users can belong to one or more profile groups. These groups are created directly by the administrator to simplify permission management. For example, you can create a group of administrators, a group of creators of global views, a group of users with access to certain reports, etc.

- **Profiles:** From this screen, user profiles are created to manage access to the different functions in a hierarchical manner. To create, click on the cross and save by clicking on the diskette icon.



Permission is each of the authorizations given to a user or group to execute one or more restricted functions. 4i Platform and its tools have a series of pre-configured permissions and each solution provides its own.



You can assign attributes and click on the Profile to display the available list. In addition, the possibility of enabling “Single Sign On (SSO)” is available for both Microsoft and Google.

> Information Core

- **Events:** Allows you to record alarms and warnings using “Events”. They are assigned a name, description, model type (status and unique) and their enablement.
- **Event Category:** Allows you to customize events, which can be classified by name, description and color.
- **Event Code:** Organizes Event categories in a drop-down tree under a code, according to their priority and group.

Information Core

- Events
- Event Categories
- Event Codes
- Products
- Equipment Models
- Equipments
- Equipment Events
- Equipment Products

Event Codes

Add Code

- Codes
- Low Rate
 - Low Production Not Responsible

Code [Low Production Not Responsible]

Category

Description

Use tag to autodeclare

Configure Standard Time

Micro Event

Not Visible

Require User

Categories are added to a code by positioning the cursor and right-clicking. After the action, a configuration box opens.

- **Products:** This screen details the Code, Name, Unit, Package and Quantity of the Package that is being processed so that it can be handled by the different solutions.

Add Product Search

Code	Name	Unit	Bundle	Bundle Quantity	
Shampoo - 1	Shampoo - 1		Box	12	
Shampoo - 2	Shampoo - 2		Box	12	
Shampoo - 3	Shampoo - 3		Box	12	

- **Equipment Events:** Create and parameterize a status record from the different types of Events created, which are available to assign to existing equipment under the name of Equipment Events.

The existing types of Equipment Events are:

- Digital Edge Events.
- Digital State Events.
- Analog Change Events.
- Analog Edge Events.
- Custom Events.

Digital Edge Events Add event

Event	Equipment	Tag	Rise Edge	Active	

Digital State Events Add event

Event	Equipment	Tag	Rise Edge	Tag 2	Rise Edge	Active	
AltaPotencia	Generador2	LA_Labeler.Running	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
AltaTemperatura	IntercambiadorA	LA_Packer.Running	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Running Time	Supplier_1	LA_Supplier.Running	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	

Analog Change Events Add event

Event	Equipment	Tag	Lower Threshold	Upper Threshold	Delta	Active	
Cuts	Supplier_1	LA_Supplier.GoodProductionCount			1.00	<input type="checkbox"/>	
Cuts	Orienter_1	LA_Orienter.GoodProductionCount			1.00	<input type="checkbox"/>	
Cuts	Filler_1	LA_Filler.GoodProductionCount			1.00	<input type="checkbox"/>	
Cuts	Sealer_1	LA_Supplier.GoodProductionCount			1.00	<input type="checkbox"/>	
Cuts	Labeller_1	LA_Labeler.GoodProductionCount			1.00	<input checked="" type="checkbox"/>	

Analog Edge Events Add event

Event	Equipment	Tag	Edge	Lower Threshold	Delta	Stabilization Time(ms)	Tolerance	Active
AlarmaEnergia	Generador1	UsedCPU	Any Edge	50.00	1.00	500	5.00	<input checked="" type="checkbox"/>

Custom Events

Event	Equipment	Model Type	Active
	PLANT_1		<input type="checkbox"/>
	PLANT_1		<input type="checkbox"/>
	PLANT_2		<input type="checkbox"/>

- **Equipment Products:** This screen details, in a drop-down tree diagram, the Equipment to assign products to. Clicking on it will open the list with the products available to be associated with the Team. When selecting a product, it shows: SKU Code, Name, Package and quantities of an item. When clicking on the product, you access its general configuration and you can enable/disable, parameterize product quantities per production unit, product quantity per unit of time and percentage of low work rate.

Company

- PLANT_1
 - AREA_1
 - AREA_2
 - LINE_2

Products Only Linked

Associate	Name
<input type="checkbox"/>	Shampoo - 1 - Shampoo - 1
<input type="checkbox"/>	Shampoo - 2 - Shampoo - 2
<input type="checkbox"/>	Shampoo - 3 - Shampoo - 3

- **Host Name:** For software data sources, indicates the name of the PC where the agent is running.
- **IP Address:** Displays the TCP/IP address of the data source.
- **Type:** Indicates the origin of the data source.
- **Connection address:** This is a parameter used by DASH type data sources.
- **Status:** Indicates the status of the data source and can take the following states: *Disconnected*, *Connecting*, *Connected*.
- **Configuration:** Displays the configuration options according to their origin.

Install Local Agent Download Agent

Name	Alias	Last Contact Time	Host Name	IP Address	Type	Connection Address	Status	Agent Notification	
997C2A0C60043977	✓ OPC_2968	2024-11-22 17:26:57	DESKTOP-CIELO	200.16.124.206	OPC	Graybox.Simulator.1	Connected	<input checked="" type="checkbox"/>	Configure ▾ ...
PLCSiemensAGENTLOCAL-A95C2B6302C897D6	✓	2024-11-22 17:26:49	IHBOX-FA82B5	71.182.182.12	PLC	Siemens S7 PLC (ISO over TCP (IP:192.168.1.100,Rack-0,Slot2))	Disconnected	<input checked="" type="checkbox"/>	Configure ▾ ...

At the top of the screen are two buttons for adding data sources. The process for adding a data source depends on the type and may require installing special software.

➤ Data Source

The hierarchical architecture of the system is based on the existence of various data sources that represent different types of agents.

Configuration → Data Sources displays a list of all active data sources:

Platform Configuration

- Account Information
- Data Sources**
- Tags
- Profiles
- Users
- Network Overview
- Agent Command
- Mobile Devices
- Auth#

Install Local Agent Download Agent

Name	Alias	Last Contact Time	Host Name	IP Address	Type	Connection Address	Status	Agent Notification	
997C2A0C60043977	✓ OPC_2968	2024-11-22 17:27:57	DESKTOP-CIELO	200.16.124.206	OPC	Graybox.Simulator.1	Connected	<input checked="" type="checkbox"/>	Configure ▾ ...
PLCSiemensAGENTLOCAL-A95C2B6302C897D6	✓	2024-11-22 17:27:58	IHBOX-FA82B5	71.182.182.12	PLC	Siemens S7 PLC (ISO over TCP (IP:192.168.1.100,Rack-0,Slot2))	Disconnected	<input checked="" type="checkbox"/>	Configure ▾ ...
MODBUS-RASPMOD-SER	✗	2024-07-15 18:13:58	MLAC-8AE799	200.16.125.70	MODBUS	Modbus 192.168.4.241:502[RTU]; ScanRate=2000; ReadWriteTimeout=4000; CDTF=	Connected	<input checked="" type="checkbox"/>	Configure ▾ ...
MODBUS-RASP2	✗	2024-01-22 10:49:34	MLAC-262723	200.16.125.70	MODBUS	Modbus 192.168.4.241:502[TCP]; ScanRate=2000; ReadWriteTimeout=4000; CDTF=	Connected	<input checked="" type="checkbox"/>	Configure ▾ ...

In the configuration screen you can see the data sources table with the following columns:

- **Name:** This is the name of the data source or agent.
- **Alias:** This is a friendly name that the administrator can add to the data source.
- **Last Contact:** This read-only value indicates when the last contact was made with the data source.

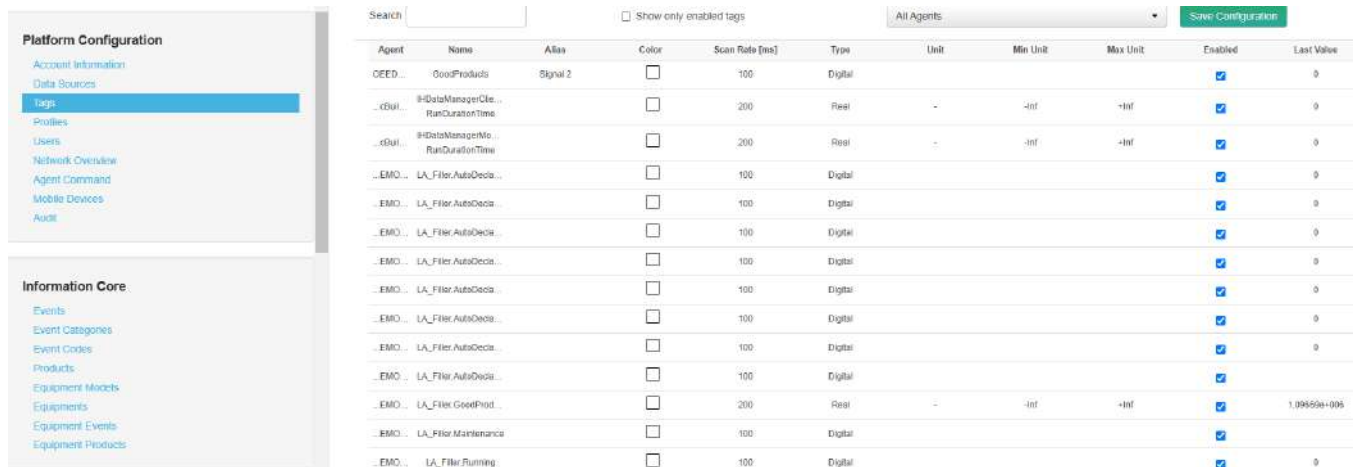
Name	Alias	Last Contact Time
997C2A0C60043977	✓ OPC_2968	2024-11-22 17:29:17
PLCSiemensAGENTLOCAL-A95C2B6302C897D6	✓	2024-11-22 17:29:18
MODBUS-RASPMOD-SER	✗	2024-07-15 18:13:58

› Tags List

Tags are the unit of acquisition. Each data source owns a certain number of tags. Each tag can be managed individually, both in its activation and in its parameters.

Configuration → Tags displays a list of all tags in the system.

Since the number of tags can easily exceed 10,000, some filters are provided to facilitate the search: by keyword, by activation status and by data source.



Agent	Name	Alias	Color	Scan Rate [ms]	Type	Unit	Min Unit	Max Unit	Enabled	Last Value
OEED...	GoodProducts	Signal 2	<input type="checkbox"/>	100	Digital				<input checked="" type="checkbox"/>	0
..GBl...	!!DataManageCle... RunDurationTime		<input type="checkbox"/>	200	Real	-	-Inf	-Inf	<input checked="" type="checkbox"/>	0
..GBl...	!!DataManageMo... RunDurationTime		<input type="checkbox"/>	200	Real	-	-Inf	-Inf	<input checked="" type="checkbox"/>	0
..EMO...	LA_Filter.AutoDeca...		<input type="checkbox"/>	100	Digital				<input checked="" type="checkbox"/>	0
..EMO...	LA_Filter.AutoDeca...		<input type="checkbox"/>	100	Digital				<input checked="" type="checkbox"/>	0
..EMO...	LA_Filter.AutoDeca...		<input type="checkbox"/>	100	Digital				<input checked="" type="checkbox"/>	0
..EMO...	LA_Filter.AutoDeca...		<input type="checkbox"/>	100	Digital				<input checked="" type="checkbox"/>	0
..EMO...	LA_Filter.AutoDeca...		<input type="checkbox"/>	100	Digital				<input checked="" type="checkbox"/>	0
..EMO...	LA_Filter.AutoDeca...		<input type="checkbox"/>	100	Digital				<input checked="" type="checkbox"/>	0
..EMO...	LA_Filter.AutoDeca...		<input type="checkbox"/>	100	Digital				<input checked="" type="checkbox"/>	0
..EMO...	LA_Filter.AutoDeca...		<input type="checkbox"/>	100	Digital				<input checked="" type="checkbox"/>	0
..EMO...	LA_Filter.GoodProd...		<input type="checkbox"/>	200	Real	-	-Inf	-Inf	<input checked="" type="checkbox"/>	1.99859e+005
..EMO...	LA_Filter.Maintenance		<input type="checkbox"/>	100	Digital				<input checked="" type="checkbox"/>	
..EMO...	LA_Filter.Pumping		<input type="checkbox"/>	100	Digital				<input checked="" type="checkbox"/>	0

The table can be edited by simply clicking on the corresponding cell. The fields in the table are as follows:

- **Agent:** Corresponds to the entity that generates the tag, as they appear in the Data Source configuration.
- **Name:** This is the name of the tag. It should not contain spaces or special characters.

- **Alias:** This is additional data for the tag that can be more descriptive than the Name, since this could be defined by the PLC. The characters must be upper and lower case letters without spaces or special characters.
- **Color:** This is the default color with which it is graphed in the Trending Web.
- **ScanRate:** Sampling time. It would correspond to the period in milliseconds in which the tag is modified in the source, but the administrator can change it to a higher or lower value. This value is extremely important because it affects the size of the real-time database (the shorter the scan time, the more disk space the time series will occupy). Although this is the general rule, there are important considerations to make regarding data compression.
- **Type:** Tag data type. 4i Platform supports numeric (double) and digital (bool) data. All numeric data types are treated as double precision on the platform, even if they are integers in the data source.
- **Unit:** This is a data string containing characters to represent the physical unit of the tag. For example: m³, Amperes, etc.
- **Min Unit / Max Unit:** Minimum and maximum values that the tag can take. These values are used as default in the Trending Web scales.
- **Enabled:** Indicates whether the tag is enabled for acquisition. The 4i licensing scheme uses the number of enabled TAGS as a parameter. Therefore, it is possible to have more TAGS declared than those licensed.
- **LastValue:** This read-only value shows the last value read from that tag.

› Storage Size

4i Platform uses an adaptive data compression algorithm that is based on the data type and a historical analysis of the signal. For this reason, it is impossible to calculate the storage used by a variable. The maximum daily storage size of a variable is given by the following formulas:


*For Numeric TAGS: 1980 Mb / Scan Time [milliseconds].
For Binary TAGS: 860 Mb / Scan Time [milliseconds].*

A numeric tag sampled at one second takes up at most 2Mb per day. But the storage size for a typical industrial numeric variable after compression is approximately 750 KB per day.

> Users & Profiles

The Account Information screen displays the current status of the system in terms of available capacity and versions.

Tags



75% (150 tags) used of 200 available.

- 150 Used
- 502 Configured
- 200 Licensed

Account Information

Number: 100020


Licenses

Date	Tags	Key
2018-09-26 19:40:09	200	f231e8b9-774f-4780-b443-def1f380b171

- Software Agents ✔ Valid Forever
- Hardware Agents ✔ Valid Forever

[Add new license](#)

Storage Space



100% (10.2 gb) used of 10.2 gb available.

- 1.1 bytes Available
- 10.2 gb Used
- 10.2 gb Total

User Information

Username: admin

Name: IHBox

Last Name: IHBox

Email:

Timezone: (GMT-03:00) Buenos Aires, Georgetown

Notifications: No notification enabled

Landing Page: Default

> Users System

When entering the platform website, the user must authenticate. Depending on how the system is configured, there may be two options:

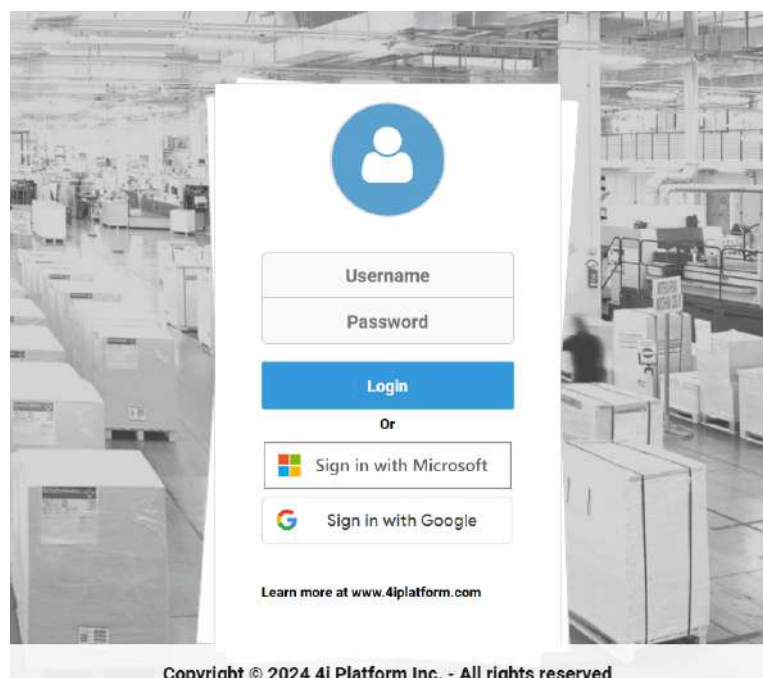
- **Internal Authentication:** In this case, the system administrator must create user accounts for each of the potential users of the system and assign them the

corresponding permissions. User data and the characters of their passwords will be stored on the platform. If the previous session expired, users must specify a username and password when entering the platform site.

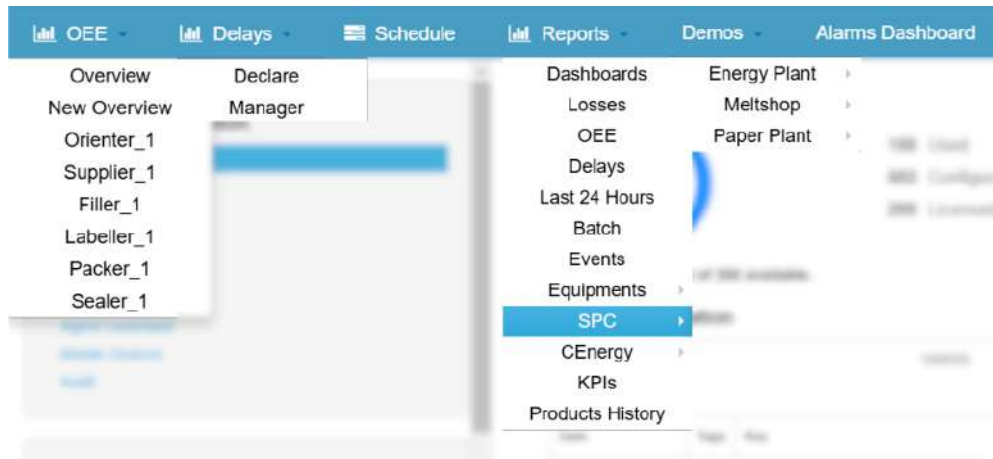
- **Active Directory:** In this case, the system is integrated into an existing Active Directory structure. If users access from a PC included in the domain, they will not need to enter a username and password. The administrator must create accounts and permissions for each Active Directory user who wants to use 4i Platform, and will not need to generate passwords. If the user accesses from a PC that does not belong to the domain, the platform will ask for the credentials and will use them to validate.

› Accesses

4i Platform is accessed from a web browser, where a user interface is provided for configuration and operation. Access and permissions to this website are controlled by a user/password system that may be internal, shared with the plant's Active Directory architecture, or integrated with Microsoft or Google SSO.



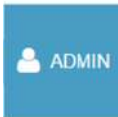
On the left are the submenus added by the solutions to be used:



The following options are located on the right of the top bar:



Access to the Trending Web group tool.



Current user name, logout button.



Language selection (English, Spanish, Portuguese).



Access to the configuration menu.



System time.

› Anonymous Users

Anonymous users are users who do not have a user account in the organization's Active Directory domain services or in a supported federated domain, but who can be invited to participate remotely. By allowing anonymous participation in meetings, you enable anonymous users—users whose identity is verified only through the meeting or conference key. To allow anonymous participation, you must enable it for your organization.



4i Platform

Industrial IoT

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