

DATA CONCENTRATOR

SACI-RTU

USER MANUAL FOR WEB APPLICATION

About the Handbook

This document addresses all the information regarding the correct use of the SACI-RTU web application.

The portal consists of different modules that cover their corresponding functionalities, the configuration established by the user can modify certain functionalities that are detailed in the manual.

For any questions regarding this document, software or equipment, please contact your SACI product supplier.

This document applies to the model:

- SACI-RTU v1.0

EU Regulation 2023/1542 concerning batteries and waste batteries requires that, from 18 February 2027, all products placed on the market incorporating portable batteries shall ensure that

those batteries are readily removable and replaceable by the end-user at any time during the lifetime of the product. This requirement does not apply to this equipment (SACI-RTU) as it falls within the exceptions set out in Article 11(3) of Regulation (EU) 2023/1542, as clarified in Commission Notice C/2025/214, since it is a product whose main function is to collect and supply data and the purpose of the battery is to maintain the integrity of that data.

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1 Description of the Manual

This document provides the essential information for the proper use of the user portal. Each module of the system is described in detail, accompanied by images that illustrate its functionalities and guide the user in its correct use.

2 Software Description

The portal has a simple and intuitive interface that facilitates access and use of its functionalities. The application is organized by modules, allowing the user to access the corresponding information in a structured way.

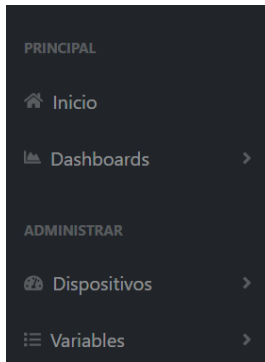
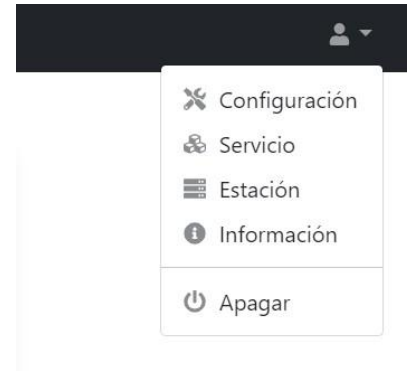
As it is a web application, it can be accessed from any computer using a browser, using the address configured in the system. The platform allows the modification of operating parameters, incorporating controls and validators that ensure correct data entry and minimize errors in the reading of information.

The equipment models, variables and templates are configured by default, as are the parameters for connecting to the different ports for data extraction. Any update made to the portal is automatically recognized by the system, guaranteeing the correct reading and processing of the information.

3 General Menu

The portal is organized by a menu of general options, located at the top and side of the interface. The header bar allows you to access the following functionalities:

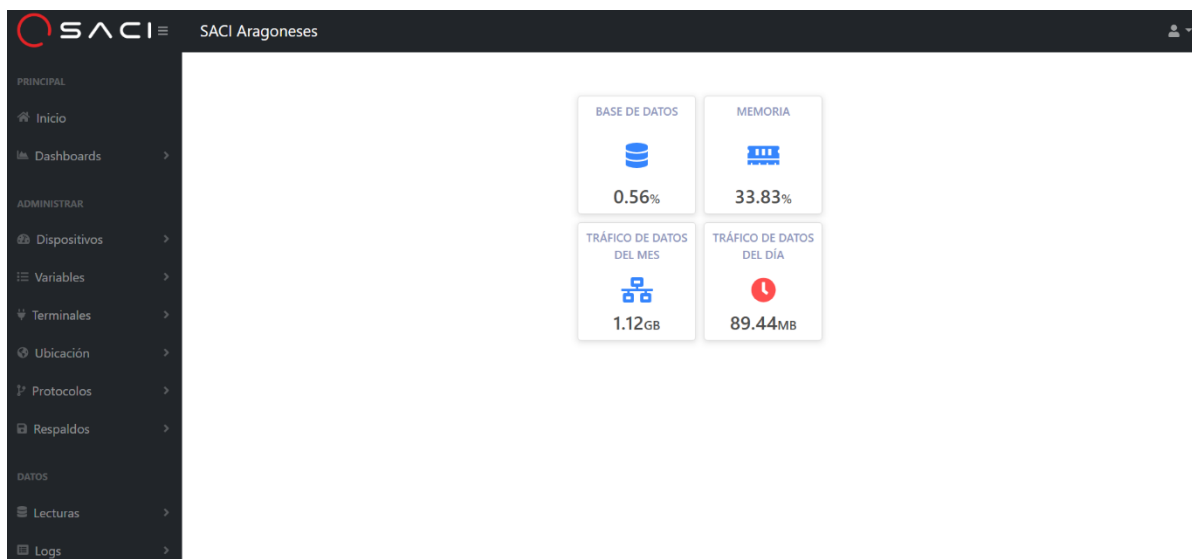
- **Settings:** Access the system settings screen.
- **Service:** Allows you to start, pause, or stop the service in charge of reading data.
- **Station:** Displays the associated station information.
- **Information:** Presents the details of the system model.
- **Power Off:** Provides options to shut down or restart your computer.

*Side menu**Top Menu*

The side menu presents the system modules, each with submenus that allow access to the corresponding screens. Selecting an option will populate the screen with the relevant information.

4 Home Screen

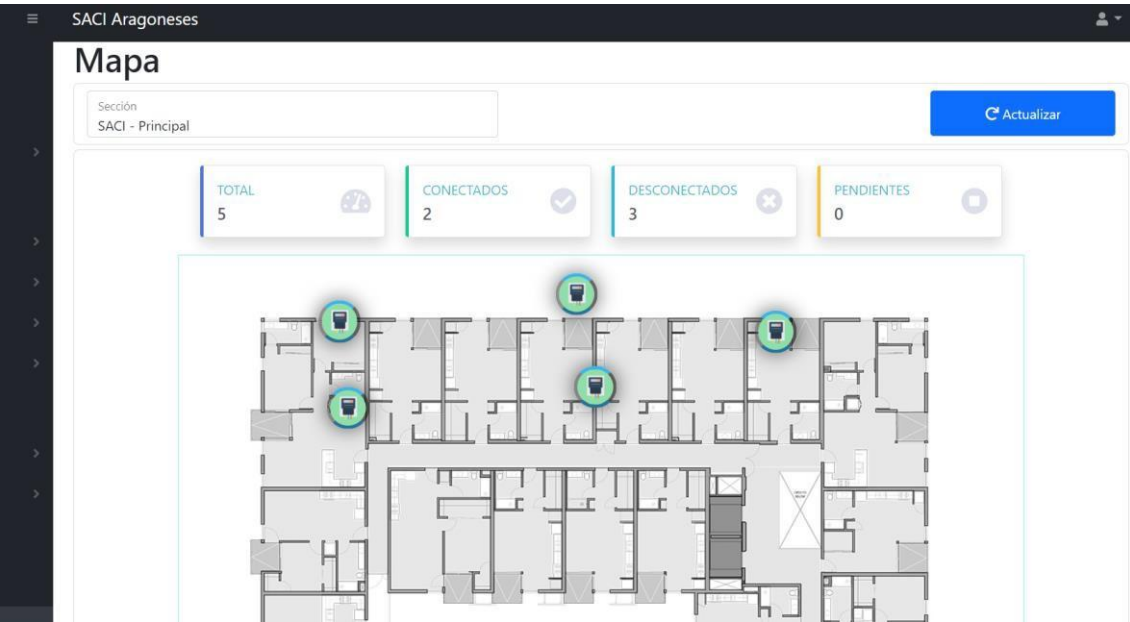
When accessing the portal from the browser, the initial screen will load by default. It displays a window with information about the system's consumed resources. At the top, information about the space consumption in the system database, the use of the computer's RAM memory and at the bottom the daily and monthly network traffic is displayed.



5 Dashboards Module

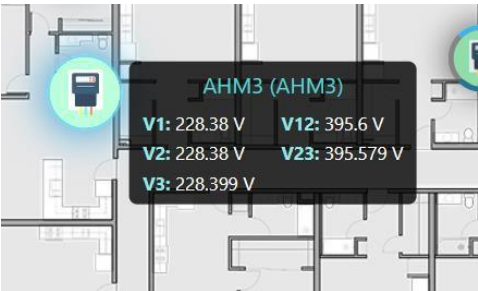
5.1 Map Display

This screen shows the various available sections, each accompanied by an image representing the layout of the section or the location of the assigned equipment. In the example below, the device view includes an indicator in the header with the number of configured, connected, and unconnected devices.



Hovering over any of the machines will display a preview of the top variables and their most recent values.

To add a team, hover over the desired position within the section image and click. A window will open with the list of available devices; Press the "+" button to add the equipment. The screen will automatically refresh showing the new device.



Device with its Main Variables

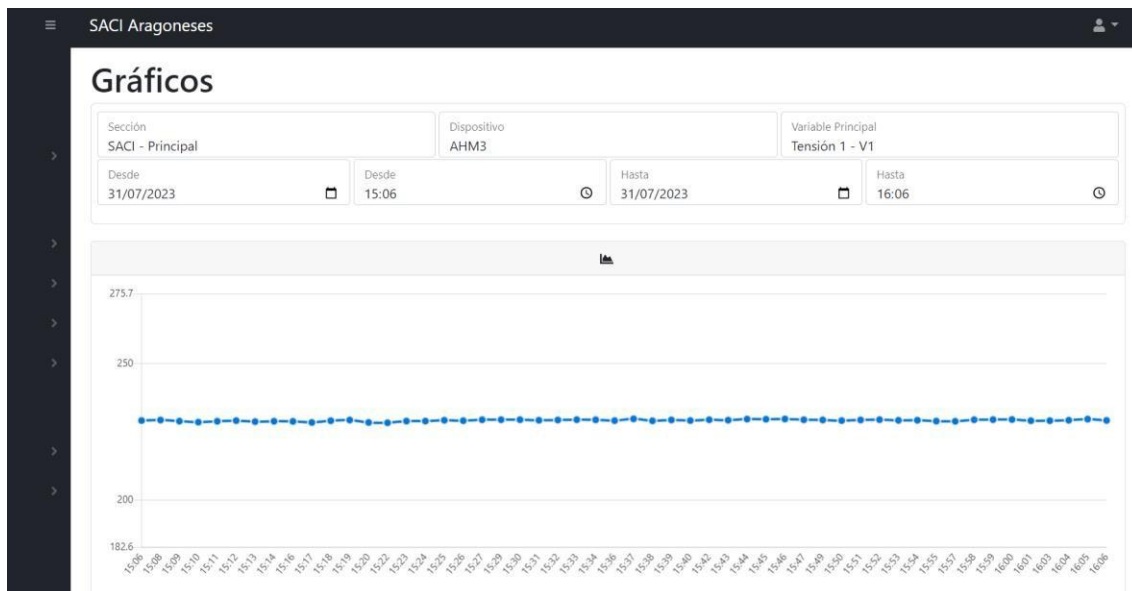


Add Devices Window

5.2 Graphics Display

On this screen, the header includes filters that allow you to consult the graphic information precisely. Every time the user modifies a filter, the screen is automatically updated.

At the bottom there is a line graph, where the horizontal axis represents the time of recording the measurements and the vertical axis indicates the ranges corresponding to the values obtained.



6 Devices Module

This module includes the screens for the administration and configuration of the devices registered in the system.

6.1 Equipment Display

Screen that displays the information of the equipment registered in the system with its most relevant data.

SACI Aragoneses

Equipos

+ Agregar

Resultados

10

Registros por página

Buscar...

Equipo	Modelo	Tipo	Configuración	Ubicación	Estado	
M2DWIFI-2	M2DWIFI-2	CONTADOR DE ENERGÍA	Configurado	SACI	Activo	
SAM3001-02	SAM3001	ANALIZADORES	Configurado	SACI	Activo	
SAM3001-03	SAM3001	ANALIZADORES	Configurado	SACI	Activo	
SAM3001-04	SAM3001	ANALIZADORES	Configurado	SACI	Activo	
SAM3001-05	SAM3001	ANALIZADORES	Configurado	SACI	Activo	
SAM3001-06	SAM3001	ANALIZADORES	Configurado	SACI	Activo	
SAM3001-07	SAM3001	ANALIZADORES	Configurado	SACI	Activo	
AHM3	AHM3	ANALIZADORES	Configurado	SACI	Activo	

When you press the **"Add"** button, a window will open with the necessary fields to enter the equipment data. Clicking 'Save' will automatically refresh the screen.

Each registered device can be modified; in the list of devices, the **"Edit"** button allows you to open a window with the existing information, which the user can update as needed.

onesses

Equipos

+ Agregar

Resultados

10

Registros por página

Buscar...

Equipo	Modelo	Tipo	Configuración	Ubicación	Estado	
M2DWIFI-2	M2DWIFI-2	CONTADOR DE ENERGÍA	Configurado	SACI	Activo	
SAM3001-02	SAM3001	ANALIZADORES	Configurado	SACI	Activo	
SAM3001-03	SAM3001	ANALIZADORES	Configurado	SACI	Activo	
SAM3001-04	SAM3001	ANALIZADORES	Configurado	SACI	Activo	
SAM3001-05	SAM3001	ANALIZADORES	Configurado	SACI	Activo	
SAM3001-06	SAM3001	ANALIZADORES	Configurado	SACI	Activo	
SAM3001-07	SAM3001	ANALIZADORES	Configurado	SACI	Activo	
AHM3	AHM3	ANALIZADORES	Configurado	SACI	Activo	

Detalles

¿Desea guardar los datos del formulario antes de cerrarlo?

Nombre

Identidad

Descripción (Opcional)

Modelo

Terminal Conexión

Plantilla de Variables

Ubicación

Si no guarda, los cambios se perderán.

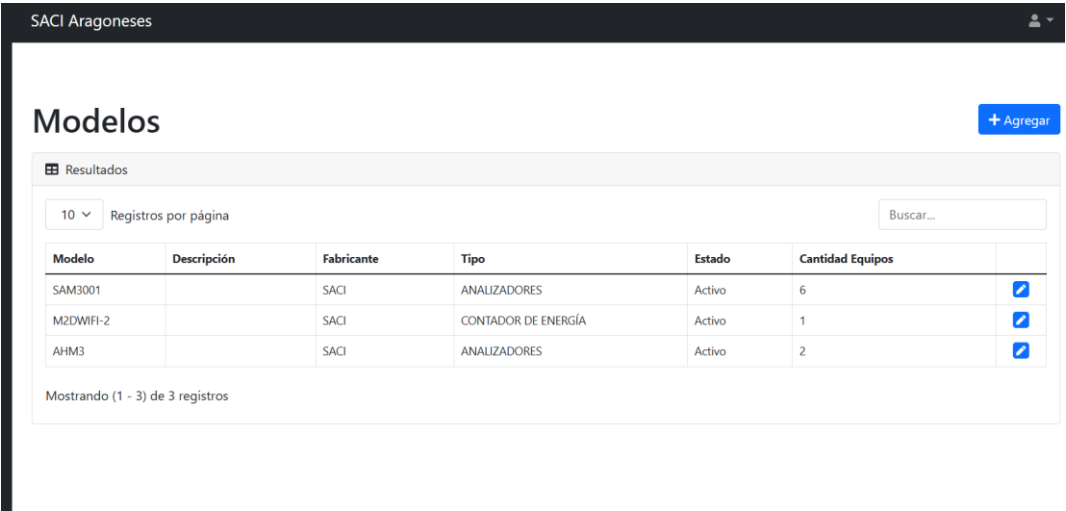
Cancelar

Guardar

6.2 Model Display

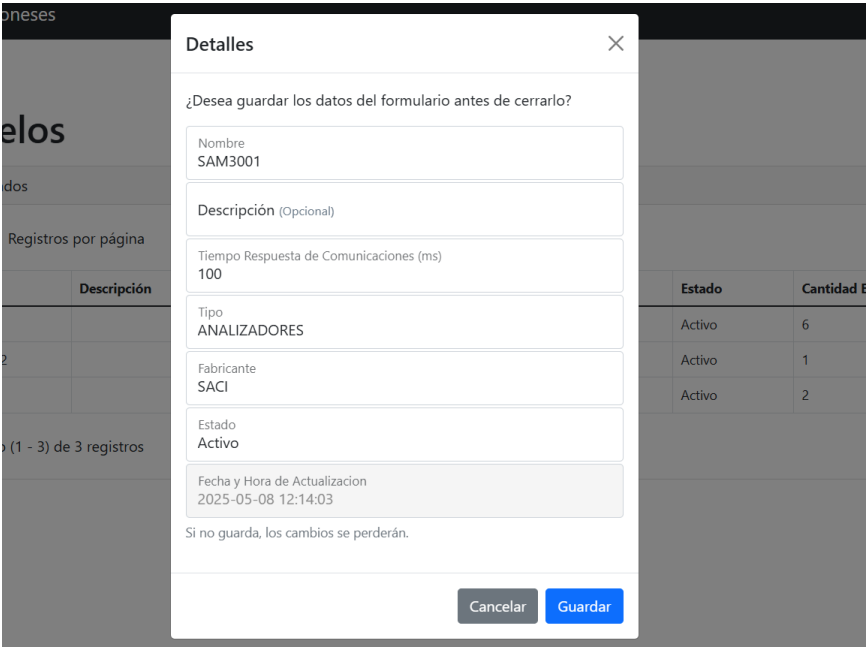
Screen showing the equipment models registered in the system, including their most

relevant data.



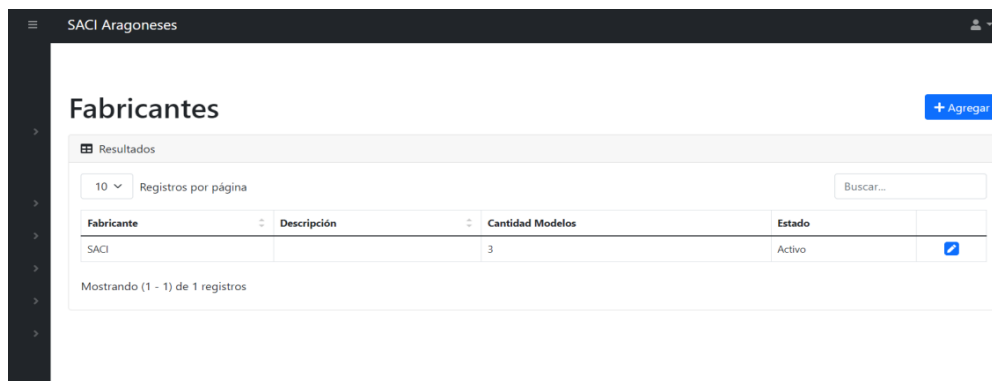
When you press the **"Add"** button, a window will open with the necessary fields to enter the equipment data. When you click **"Save"**, the screen will automatically refresh.

Each registered model can be modified; in the list of models, the **"Edit"** button allows you to open a window with the existing information, which the user can update as needed.



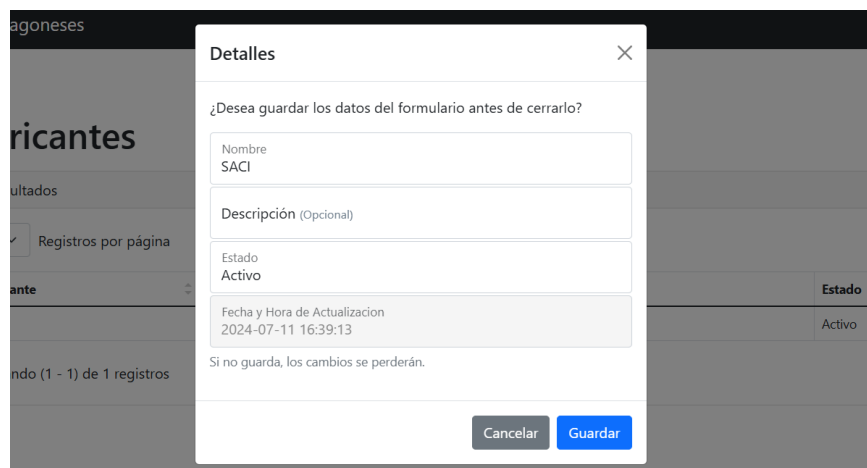
6.3 Manufacturer Display

Screen showing the equipment manufacturers registered in the system, along with their most relevant data.



Pressing the **"Add"** button will open a window with the fields needed to enter the manufacturer's data. When you click **"Save"**, the screen will automatically refresh.

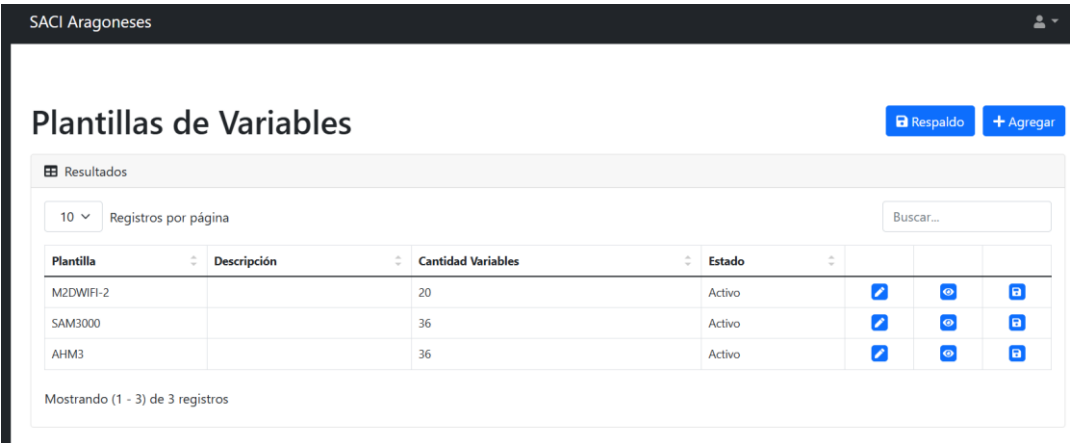
Each registered manufacturer can be modified; in the list of manufacturers, the **"Edit"** button allows you to open a window with the existing information, which the user can update as needed.



7 Variables Module

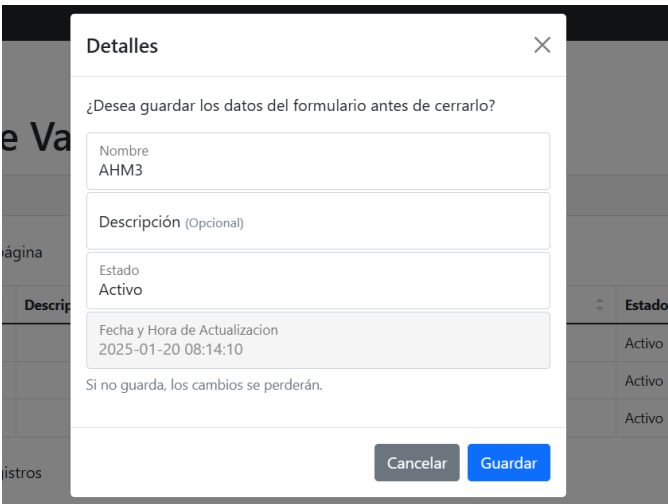
7.1 Variable Templates Screen

Screen that shows the variable templates registered in the system, along with their most relevant data.



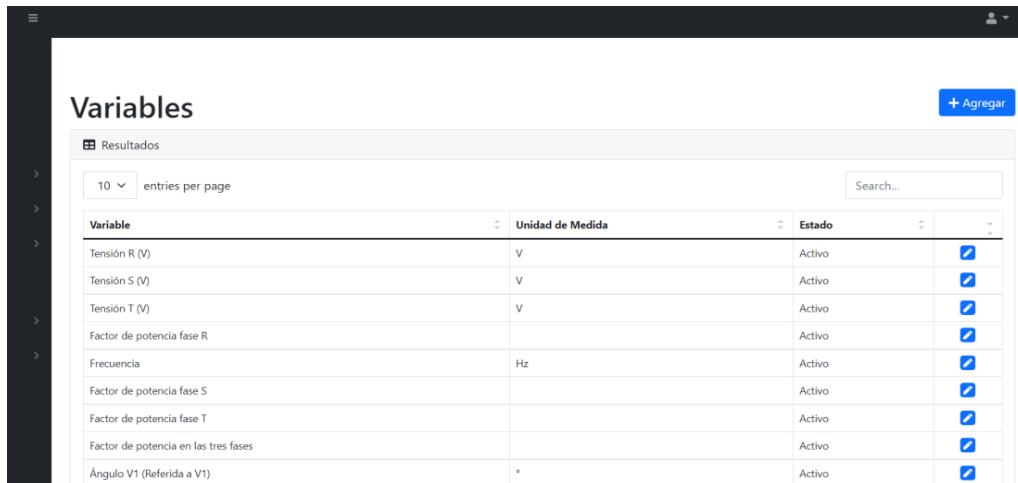
When you click on the **"Add"** button, a window will open with the necessary fields to enter the template data. When you click **"Save"**, the screen will automatically refresh.

Each registered template can be modified; in the list of templates, the **"Edit"** button allows you to open a window with the existing information, which the user can update as needed.



7.2 Variables Screen

Screen that shows the variables registered in the system, along with their most relevant data.



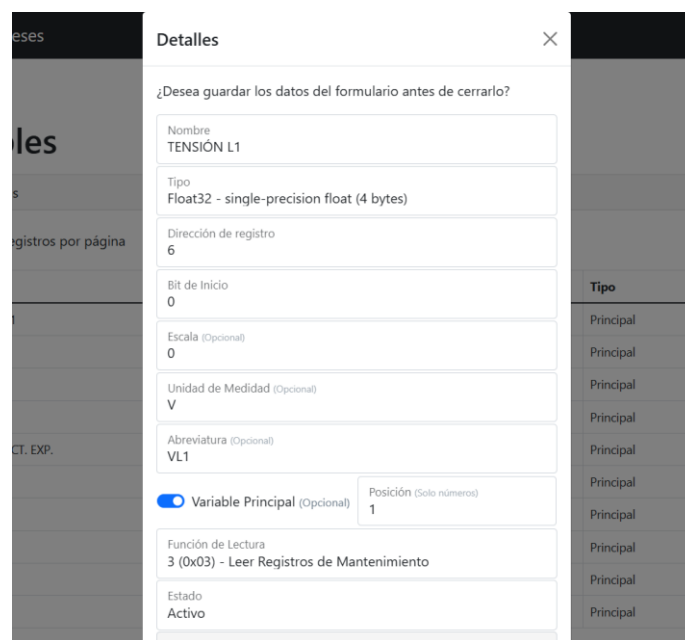
Variables + Agregar

Resultados

10 entries per page Search...

Variable	Unidad de Medida	Estado	
Tensión R (V)	V	Activo	☒
Tensión S (V)	V	Activo	☒
Tensión T (V)	V	Activo	☒
Factor de potencia fase R		Activo	☒
Frecuencia	Hz	Activo	☒
Factor de potencia fase S		Activo	☒
Factor de potencia fase T		Activo	☒
Factor de potencia en las tres fases		Activo	☒
Ángulo V1 (Referida a V1)	*	Activo	☒

When you click on the **"Add"** button, a window will open with the necessary fields to enter the variable data. When you click **"Save"**, the screen will automatically refresh. Each registered variable can be modified; in the list of variables, the **"Edit"** button allows you to open a window with the existing information, which the user can update as needed.



Detalles ×

¿Desea guardar los datos del formulario antes de cerrarlo?

Nombre
TENSIÓN L1

Tipo
Float32 - single-precision float (4 bytes)

Dirección de registro
6

Bit de Inicio
0

Escala (Opcional)
0

Unidad de Medida (Opcional)
V

Abreviatura (Opcional)
VL1

☒ Variable Principal (Opcional) Posición (Solo números)
1

Función de Lectura
3 (0x03) - Leer Registros de Mantenimiento

Estado
Activo

Tipo

Principal

Principal

Principal

Principal

Principal

Principal

Principal

Principal

Principal

Principal

8 Terminal Module

8.1 Connections Screen

Screen showing the connections registered in the system along with their most relevant data. In the connection list, the **"Parameters"** button provides direct access to the connection parameter configuration screen.

SACI Aragonese

Conexiones

+ Agregar

Resultados

10 Registros por página

Buscar...

Conexión	Descripción	Puerto	Tipo	Estado	Cantidad Dispositivos		
ETHERGATE-3_EQ_SAM	ETHERGATE-3 PARA SAM3001	TCP/IP	TCP/IP	Activo	6		
M2DWIFI-2		SERIAL	Serial	Activo	1		
TCIL2-TCP		TCP/IP	TCP/IP	Activo	0		
AHM3 TCP	ANALIZADOR DE REDES	TCP/IP	TCP/IP	Activo	1		

Mostrando (1 - 4) de 4 registros

When you click on the **"Add"** button, a window will open with the necessary fields to enter the connection data. When you click **"Save"**, the screen will automatically refresh. Each registered connection can be modified; in the list of connections, the **"Edit"** button allows you to open a window with the existing information, which the user can update as needed.

Detalles

¿Desea guardar los datos del formulario antes de cerrarlo?

Nombre
TCIL2-TCP

Puerto
TCP/IP

Descripción (Opcional)

Estado
Activo

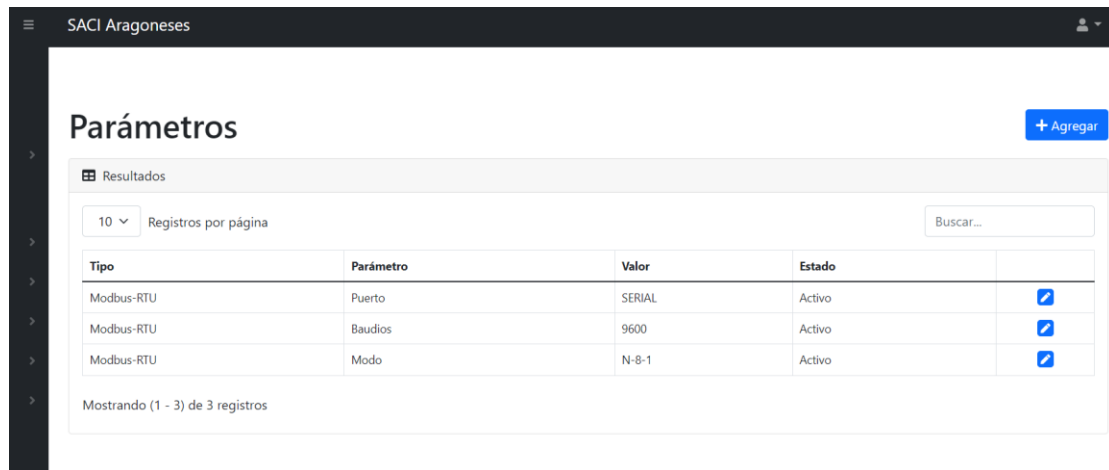
Fecha y Hora de Actualización
2025-02-25 10:06:49

Si no guarda, los cambios se perderán.

Cancelar Guardar

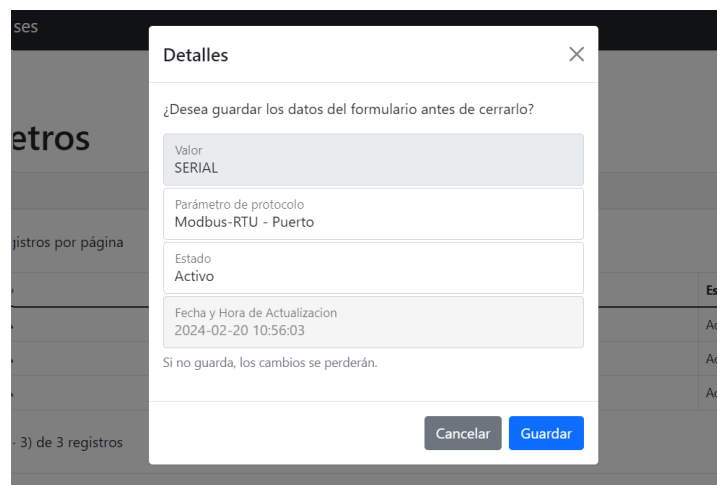
8.2 Connection Parameters Display

Screen showing the connection parameters recorded in the system, along with their most relevant data.



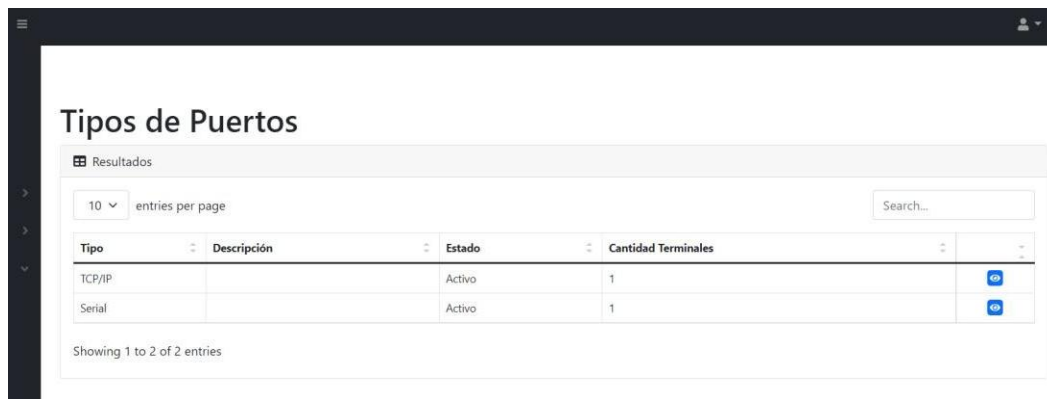
Pressing the **"Add"** button will open a window with the necessary fields to enter parameter data. When you click **"Save"**, the screen will automatically refresh.

Each registered parameter can be modified; in the parameter list, the **"Edit"** button allows you to open a window with the existing information, which the user can update as needed.



8.3 Connection Parameters Display

Screen that displays the information of the types of ports registered in the system.



Tipos de Puertos

Resultados

10 entries per page Search...

Tipo	Descripción	Estado	Cantidad Terminales
TCP/IP		Activo	1
Serial		Activo	1

Showing 1 to 2 of 2 entries

When you press the button to display the list of ports, a window will open with the equipment assigned to the corresponding port.



Puertos

Listado de puertos

Puerto	Estado	Cantidad de Equipos
SERIAL	Activo	1

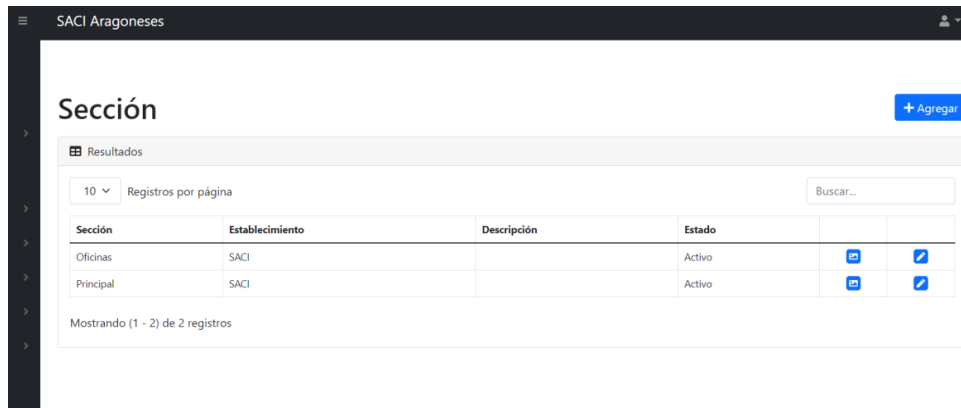
Cancelar

9 Location Module

The present module corresponds to the administration and configuration of the sections and locations where we are going to assign the system equipment.

9.1 Section Screen

Screen that displays the information of the sections registered in the system with their most relevant data. It allows you to update the data and add an image of the section if necessary, a very useful functionality for the Map of the Dashboard module.



Sección [+ Agregar](#)

Resultados

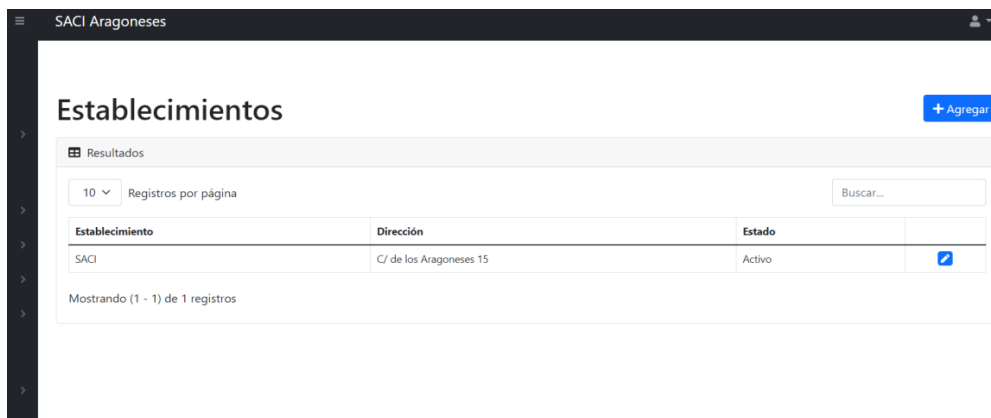
10 Registros por página

Sección	Establecimiento	Descripción	Estado		
Oficinas	SACI		Activo		
Principal	SACI		Activo		

Mostrando (1 - 2) de 2 registros

9.2 Establishment Screen

Screen that displays the information of the establishments registered in the system with their most relevant data. It allows you to update the details of the establishment if necessary.



Establecimientos [+ Agregar](#)

Resultados

10 Registros por página

Establecimiento	Dirección	Estado	
SACI	C/ de los Aragoneses 15	Activo	

Mostrando (1 - 1) de 1 registros

10Readings Module

10.1 Device Reading Screen

It allows you to view the list of equipment configured in the system. Each record includes a button that, when pressed, redirects to an intermediate screen with the updated data of the main variables.

SACI Aragoneses

Lectura de Dispositivos

Resultados

10 Registros por página

Equipo	Modelo	Estado	
M2DWIFI-2	M2DWIFI-2	Activo	
SAM3001-02	SAM3001	Activo	
SAM3001-03	SAM3001	Activo	
SAM3001-04	SAM3001	Activo	
SAM3001-05	SAM3001	Activo	
SAM3001-06	SAM3001	Activo	
SAM3001-07	SAM3001	Activo	
AHM3	AHM3	Activo	

10.2 Device Reading Screen

This screen allows you to visualize the data of the main variables of the equipment, with the option of refreshing the information manually. At the top is the **"Reading Detail" button**, which when pressed redirects to the screen with the detailed readings of the equipment.

SACI Aragoneses

Lectura General del AHM3

 Actualizar  Detalle de Lecturas

Resultados

10 Registros por página

THD IL3: 8.93 A	POTENCIA S1: 30.684 kVA
POTENCIA S3: 29.916 kVA	CORRIENTE L1: 108.912 A
S TOTAL: 83.351 kVA	TENSIÓN L2: 230.22 V
FACTOR PF1: 0.942	TENSIÓN L3: 229.149 V
FACTOR PF2: 0.895	TENSIÓN L12: 229.149 V
FACTOR PF3: 0.923	TENSIÓN L23: 397.82 V
FACTOR DE POTENCIA: 0.921	TENSIÓN L31: 398.39 V
FRECUENCIA: 49.963 Hz	CORRIENTE L2: 100.68 A
ENERGIA ACTIVA IMP: 1164045.75 kWh	CORRIENTE L3: 103.5 A
ENERGIA ACTIVA EXP.: 0 kWh	POTENCIA P1: 28.559 kW

10.3 Detailed Readings Screen

This screen allows you to view the detailed records of the readings and their associated variables. The user can view the information by adjusting the header parameters according to the desired date and time.

SACI Aragoneses

Valores de AHM3

Desde 18/09/2025 Desde 08:05 Hasta 18/09/2025 Hasta 09:05 [Consultar](#)

Resultados

10 Registros por página

Variable	Valor	Unidad de Medida	Fecha Actualizacion
TENSIÓN L1	228.039	V	2025-09-18 09:05:26
Q TOTAL	24.767	kvar	2025-09-18 09:05:26
POTENCIA Q3	9.168	kvar	2025-09-18 09:05:26
POTENCIA Q2	8.411	kvar	2025-09-18 09:05:26
POTENCIA Q1	7.188	kvar	2025-09-18 09:05:26
P TOTAL	77.351	kW	2025-09-18 09:05:26
POTENCIA P3	24.167	kW	2025-09-18 09:05:26
POTENCIA P2	27.239	kW	2025-09-18 09:05:26
POTENCIA P1	25.944	kW	2025-09-18 09:05:26
CORRIENTE L3	114.683	A	2025-09-18 09:05:26

11Log Module

11.1 Data Extraction Screen

This screen allows you to view the detailed logs of the data reading logs, as part of the control of the system. The user can view the information by adjusting the header parameters according to the desired date and time.

SACI Aragoneses

Extracción de Datos

Desde 17/09/2025 Desde 09:09 Hasta 18/09/2025 Hasta 09:09 [Consultar](#)

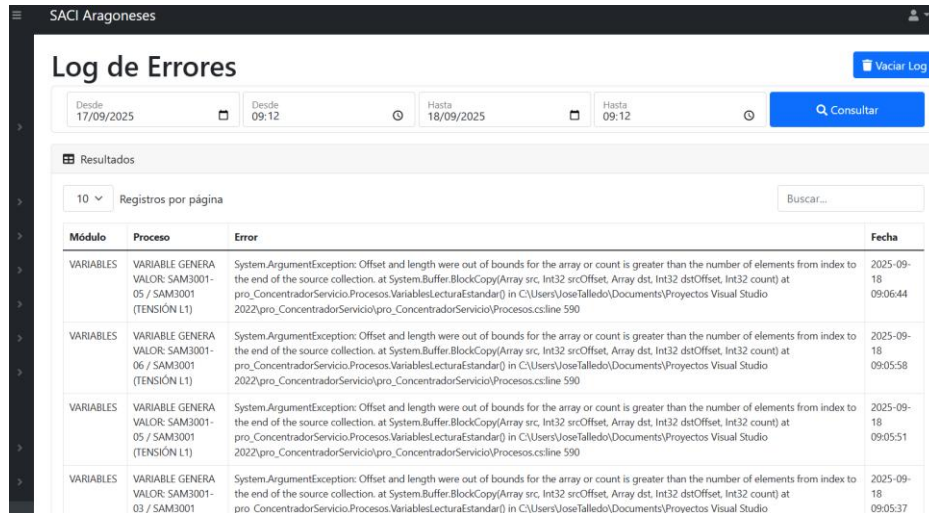
Resultados

10 Registros por página

Cantidad Equipos	Cantidad Variables	Lecturas Exitosas	Fecha Inicio	Fecha Fin
8	250	250	2025-09-18 09:04:33	2025-09-18 09:05:26
8	252	252	2025-09-18 08:59:10	2025-09-18 09:00:00
8	252	252	2025-09-18 08:54:11	2025-09-18 08:55:01
8	252	252	2025-09-18 08:49:47	2025-09-18 08:50:44
8	252	252	2025-09-18 08:44:20	2025-09-18 08:45:10
8	252	252	2025-09-18 08:39:20	2025-09-18 08:40:10
8	252	252	2025-09-18 08:34:21	2025-09-18 08:35:11
8	252	252	2025-09-18 08:29:22	2025-09-18 08:30:11
8	252	252	2025-09-18 08:24:53	2025-09-18 08:25:42
8	252	252	2025-09-18 08:19:53	2025-09-18 08:20:43

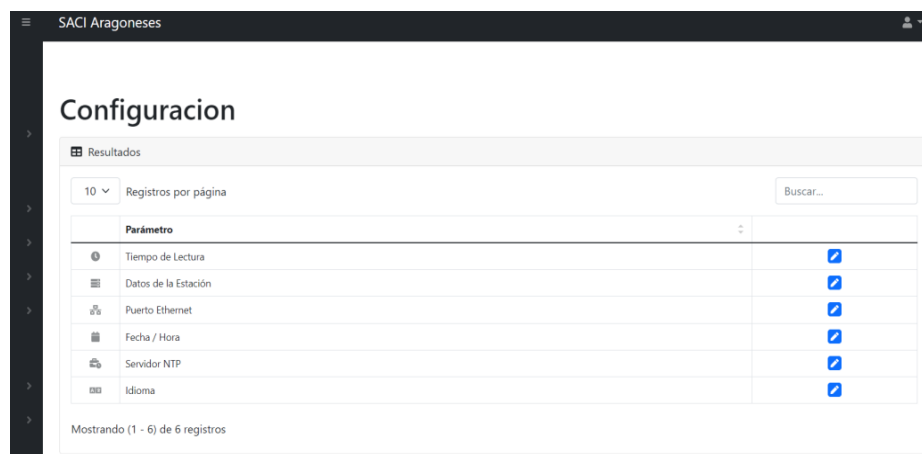
11.2 Error Log Screen

This screen allows you to view detailed logs of error logs, as part of system control. The user can view the information by adjusting the header parameters according to the desired date and time.



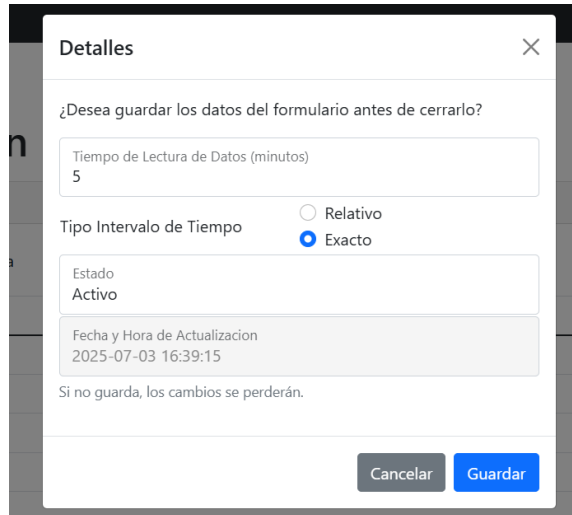
12 Configuration Module

Screen whose main function is the control and configuration of the system.



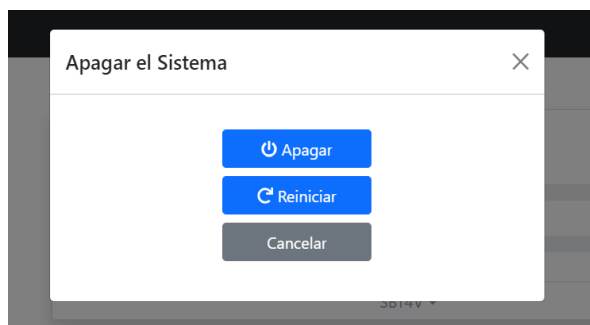
- **Reading Time:** Time interval for the recording of equipment data, these times can be relative or exact.
- **Station Data:** Allows you to update the logo and name of the workstation.
- **Ethernet Port:** Allows you to view the configuration of the Ethernet port of the computer.

- **Date/Time:** Sets the date, time, and time zone of the computer.
- **NTP Server:** Allows you to configure the NTP server address for the synchronization of the date and time of the computer.
- **Language:** Allows you to change the language of the web portal.



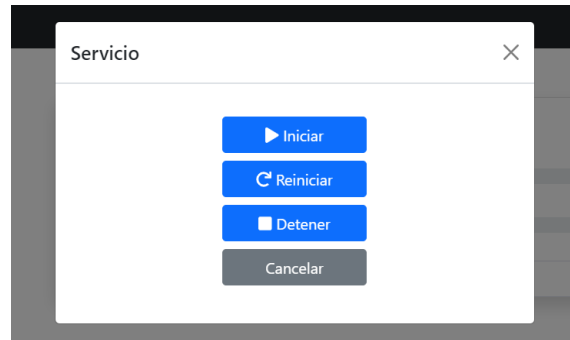
13 System Shutdown Process

Functionality that allows you to shut down or restart your computer as needed.



14 System Service Shutdown Process

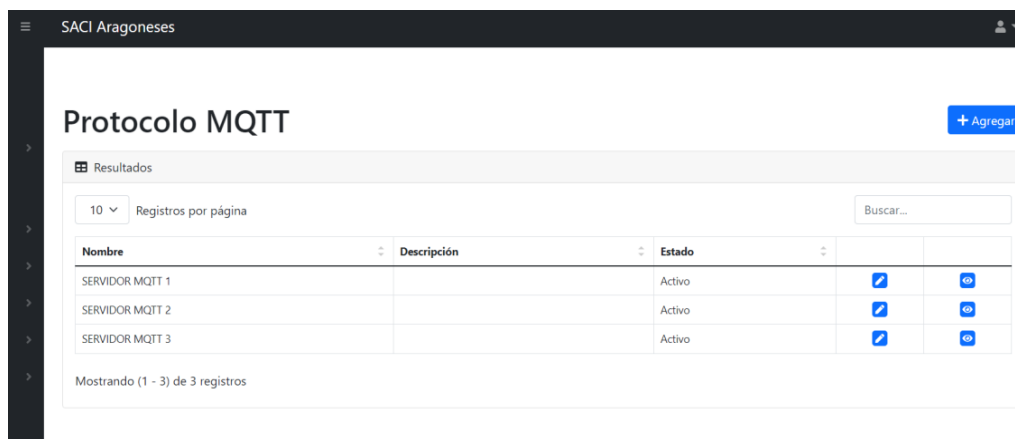
Functionality that allows you to shut down, restart, or stop your computer as needed.



15MQTT Protocol

The Hub has an MQTT module that allows you to configure the server, the data structure and the sending of information to different recipients.

When accessing the module, a main screen will be displayed with basic information about the configured MQTT servers, their status, fields to edit the data and the possibility to define the equipment templates by assigning their data structure.

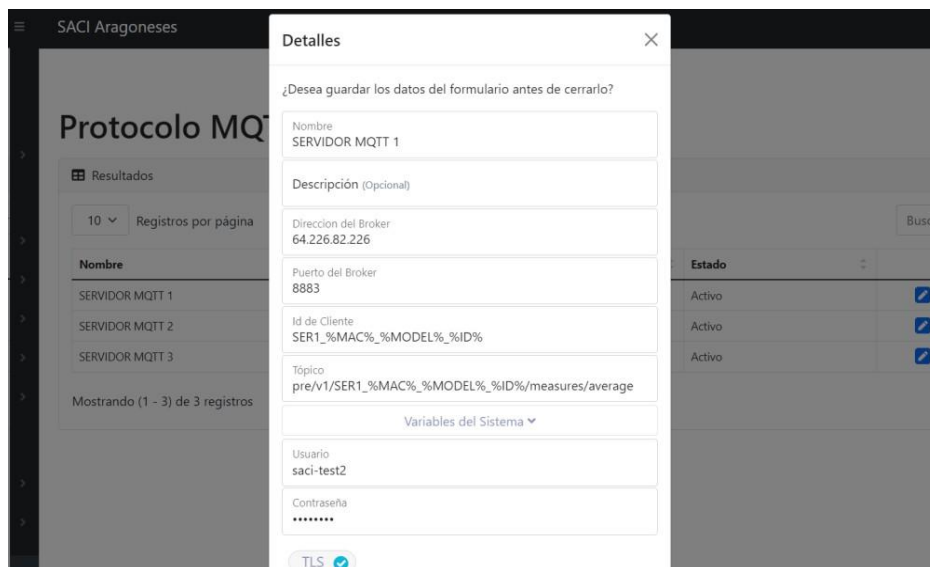


15.1 MQTT Server Configuration

On the main screen of the module is the **"Add"** button, which when clicked opens a window with different fields for the configuration of the servers to which the data will be sent. The configuration fields are detailed below:

- **Name:** Allows you to assign a name to the server according to the user's preference.
- **Description:** Optional field to detail or describe the server.
- **Broker Address:** Defines the address or URL of the server that will receive the data.

- **Broker Port:** Server communication port.
- **Client ID:** The identifier of the client who will publish the data; system variables can be used as part of its structure.
- **Topic:** Corresponding topic for publishing the data.
- **User:** User with access for data publishing.
- **Password:** User access password.
- **TLS Option:** Enables secure communication using the TLS protocol.
- **Client Certificate Option:** Enables the fields to enter the contents of the client's certificate and its key.
- **Server Certificate Option:** Enables the field to enter the contents of the server certificate.
- **Client Certificate Content:** Allows you to select and load the contents of the client certificate in the window.
- **Client Key Contents:** Allows you to select and upload the contents of the client certificate key.
- **Server Certificate Contents:** Allows you to select and upload the server certificate content.



SACI Aragoneses

Protocolo MQTT

Resultados

10 Registros por página

Nombre
SERVIDOR MQTT 1
SERVIDOR MQTT 2
SERVIDOR MQTT 3

Mostrando (1 - 3) de 3 registros

Detalles

¿Desea guardar los datos del formulario antes de cerrarlo?

Nombre
SERVIDOR MQTT 1

Descripción (Opcional)

Dirección del Broker
64.226.82.226

Puerto del Broker
8883

Id de Cliente
SER1_%MAC%_%MODEL%_%ID%

Tópico
pre/v1/SER1_%MAC%_%MODEL%_%ID%/measures/average

Variables del Sistema

Usuario
saci-test2

Contraseña

☒ TLS

Estado

Estado	Acción
Activo	☒
Activo	☒
Activo	☒

15.2 System Variables for Publishing Data

The user can define the "Customer ID" and "Topic" fields according to their convenience, including system variables to parameterize based on the following values:

- **ID_UNIQUE:** Unique Identifier of the Equipment.
- **DEVICE_NAME:** Name of the configured computer.
- **ID:** Identity of the configured computer.
- **MODEL:** Model of the configured equipment.
- **LINE_PORT:** Description of the type of port to which the computer is connected.

- **STATION_NAME:** Name of the Hub.
- **MAC:** MAC address of the Hub.

Variables del Sistema ▾	
%ID_UNIQUE%	Identificador Único del Equipo
%DEVICE_NAME%	Nombre del Equipo
%ID%	Identidad del Equipo
%MODEL%	Modelo del Equipo
%LINE_PORT%	Línea de Comunicación
%STATION_NAME%	Nombre del Concentrador
%MAC%	MAC del Concentrador
NOTA: Las variables solo aplican para los campos (Id de Cliente, Tópico).	

The "%" **symbol should be used** as part of the variable format. Below is an example of its use in the corresponding fields:

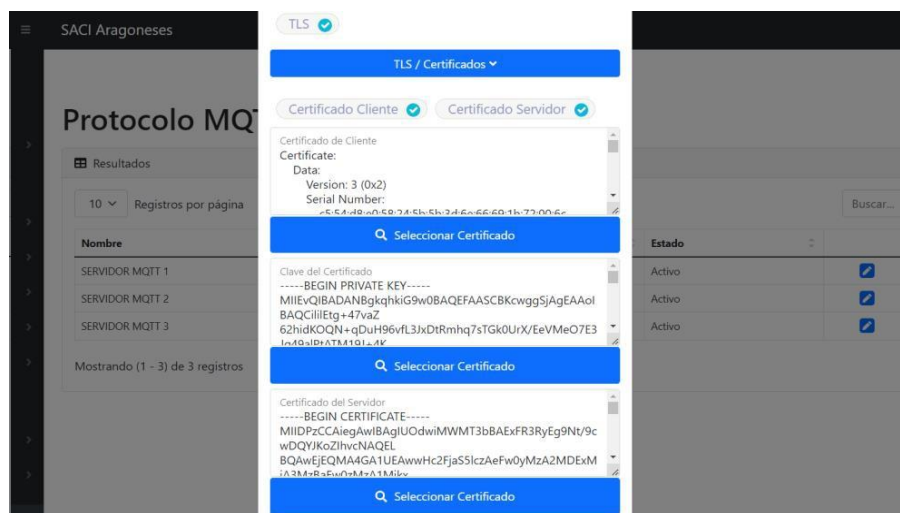
%DEVICE_NAME%

Id de Cliente
 SER1_%MAC%_%MODEL%_%ID%

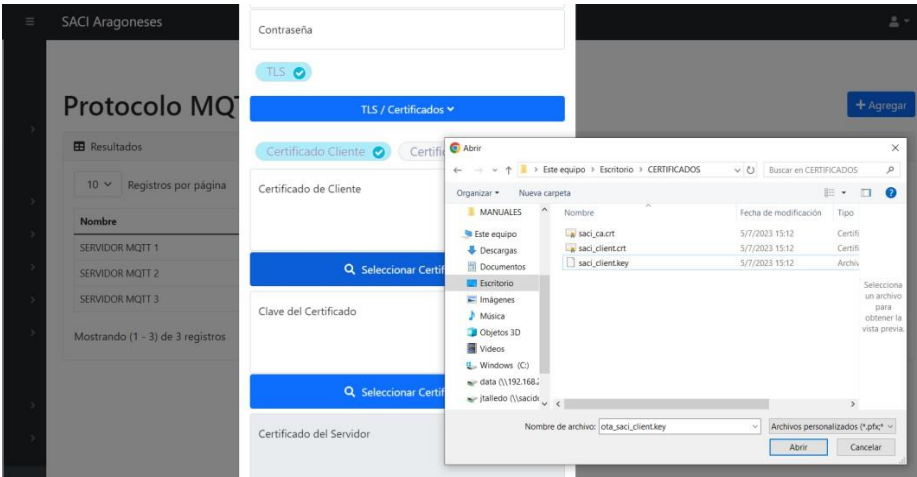
Tópico
 pre/v1/SER1_%MAC%_%MODEL%_%ID%/measures/average

15.3 Certificate Configuration

The "TLS" option enables certificate configuration parameters. When activated, you can select "Client Certificate" to enter the fields corresponding to the certificate and its key. For its part, the "Server Certificate" option allows you to enter or select the CA or server certificate in the corresponding field. You can use all existing certificate extension types or enter the content directly into the fields, as shown in the image below.



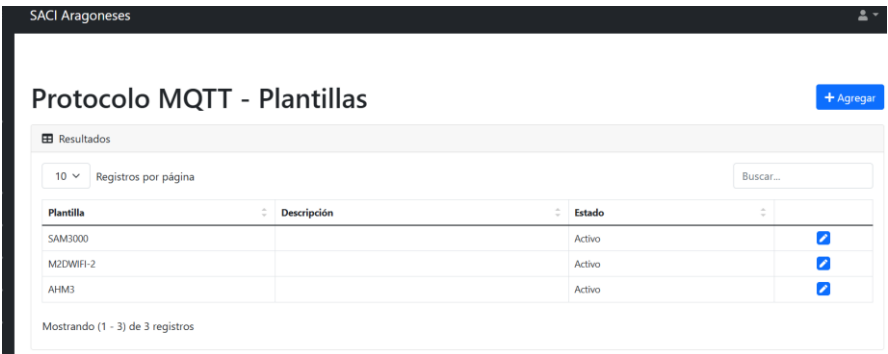
The certificate fields allow you to enter the content directly or select the corresponding file, as shown in the following image:



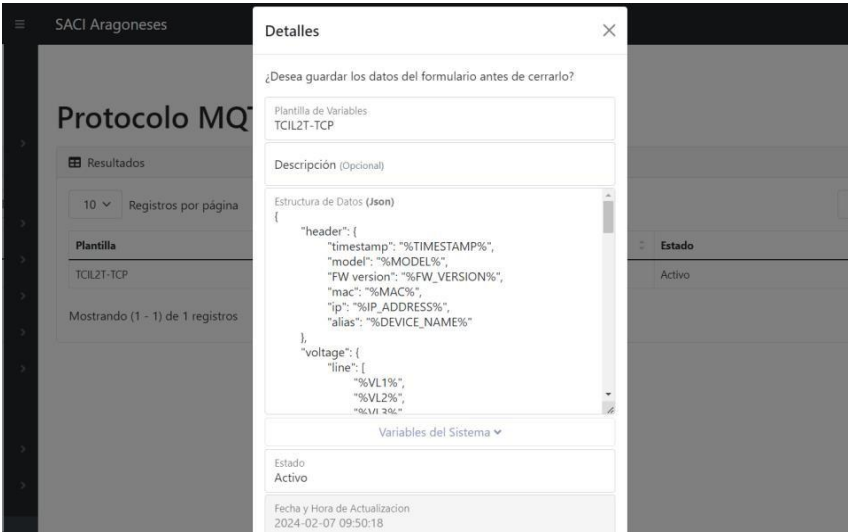
15.4 Template Configuration and Data Structure

After the target MQTT server is configured, variable templates containing associated devices can be added. In this way, the data of all devices assigned to a template will be sent to the corresponding MQTT server.

This screen shows the configured templates with basic information, along with the option to edit their values, as seen in the image below.



At the top is the **"Add" button**, which when clicked opens a window with the fields to select the



"Variable Template", the description and the structure of the data to be sent. This same window is also used to edit the values according to the user's preference.

15.5 System Variables for Data Structure

The data structure to be sent contains different user-configured values in the variable templates of each computer. The system incorporates extra variables to add them to the structure as part of the control of the information that the MQTT server will receive.

The symbol "%" should be used as part of the format of the variables. The following are the variables of the system with their corresponding format:

- **ID_UNIQUE:** Unique Identifier of the Equipment.
- **DEVICE_NAME:** Name of the configured computer.
- **ID:** Identity of the configured computer.
- **MODEL:** Model of the configured equipment.
- **LINE_PORT:** Description of the type of port in which the equipment is connected.
- **STATION_NAME:** Name of the Hub.
- **IP_ADDRESS:** Hub IP address.
- **MAC:** MAC of the Hub.
- **FW_VERSION:** Firmware version of the Hub.
- **TIMESTAMP:** Timestamp of the Hub.

"%DEVICE_NAME%"

Variables del Sistema ▾	
%ID_UNIQUE%	Identificador Único del Equipo
%DEVICE_NAME%	Nombre del Equipo
%ID%	Identidad del Equipo
%MODEL%	Modelo del Equipo
%LINE_PORT%	Línea de Comunicación
%STATION_NAME%	Nombre del Concentrador
%IP_ADDRESS%	IP del Concentrador
%MAC%	MAC del Concentrador
%FW_VERSION%	Firmware del Concentrador
%TIMESTAMP%	Marca de Tiempo

15.6 Data Structure

Each template assigned to the server contains a user-defined data structure and will be sent separately with the information from each associated computer. The structure must comply with the **JSON** data format; otherwise, the portal will notify that the structure is invalid.

The data structure allows the use of **System Variables (Point 15.5)** and **Team Variable Templates (Point 7)**, both subject to a specific format. System variables are defined by the hub, while equipment variables are defined by the user when entering data in the **"Abbreviation"** field.

When defining the data structure, the user must indicate in the JSON layout the location where each value will be replaced. The "%" symbol should be used as part of the variable format. Here's an example for both types of variables:

System Variables**"%DEVICE_NAME%"****Equipment Variables****"%VL1%"**

The system will load and replace values in the JSON only if they are correctly defined in the structure and variable template. The following image shows an example of a data structure in the corresponding JSON format:

```
{
  "header": {
    "timestamp": "%TIMESTAMP%",
    "model": "%MODEL%",
    "FW version": "%FW_VERSION%",
    "mac": "%MAC%",
    "ip": "%IP_ADDRESS%",
    "alias": "%DEVICE_NAME%"
  },
  "measures": {
    "V1": "%VL1%",
    "FQ": "%VFQ%",
    "EP+": "%AEIMP%"
  }
}
```