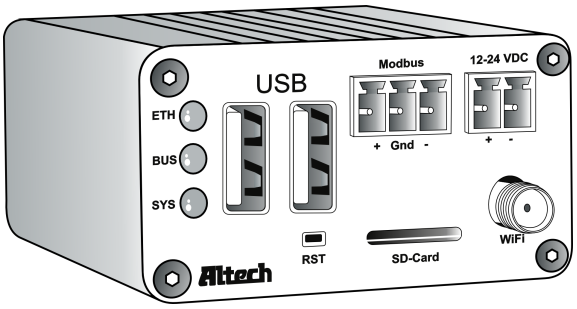
Quick Start

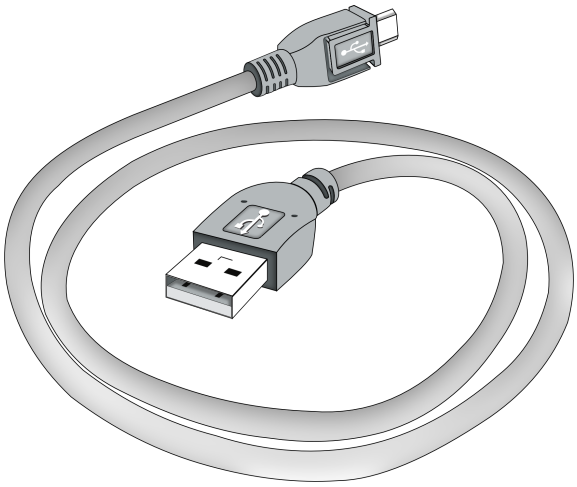
This section is a practical guide that provides efficient solutions to frequently asked questions and problems. Regardless of whether you are a beginner or an experienced user, this guide provides simple help to quickly solve minor problems and improve understanding. The purpose here is to provide the knowledge needed to quickly identify and solve problems with clear instructions.

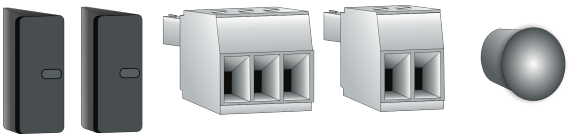
Quick Start Instructions

Package Contents

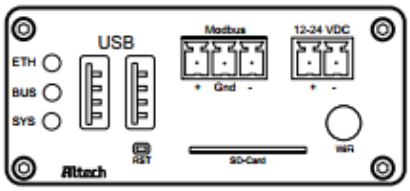
- **1x** Universal Monitor (**DO-1**)
- **1x** USB 2.0 Type-A / USB 2.0 Micro-B Cable
- **1x** Antenna dust cap
- **2x** USB Type-A dust caps
- **1x** 2-pole connector with screw terminals
- **1x** 3-pole connector with screw terminals

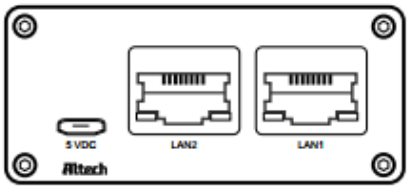




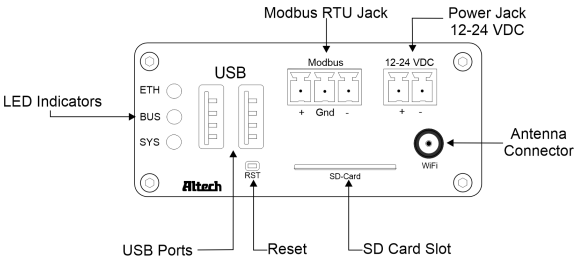


Front and Back View of DO-1

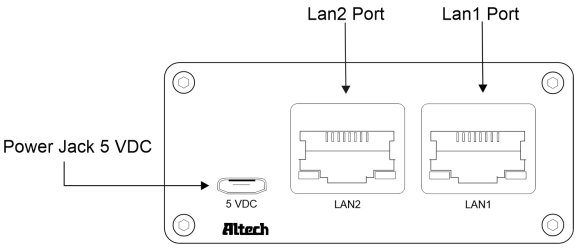




Connectors and Indicators on the DO-1



Front view



Back view

- **LED ETH**: Lights up green when the connection to the Ethernet network is established.
- **LED BUS**: Flashes green in time with the bus cycle time of the internal Modbus.
- **LED SYS**: Flashes red when the **DO-1** is in operation.
- **USB**: USB ports are provided for future use.
- **Modbus RTU Jack**: Connection of the **Modbus RTU** devices to the internal Modbus of the **DO-1**.
- **12-24V DC Power Jack**: Main power supply of the **DO-1**, 12-28V DC voltage.
- **Antenna Connector**: WiFi antenna connection possibility provided for later use.
- **SD Card Slot**: SD card slot for SD cards up to **128 GB**.
- **Reset**: Causes a software restart after an operation of **5 seconds**.
- **Power Jack 5V DC**: Auxiliary power supply 5V DC voltage.
- **LAN1 Port**: Ethernet network connection 1.
- **LAN2 Port**: Ethernet network connection 2.

Setup and Installation

In order to use the functions of the **DO-1** properly, the universal monitor must be connected correctly. The **DO-1** is then operated via a web-based user interface.

Basic connections for the initial setup:

1. Connection of the network cable to the port ‘LAN1’.

2. Connect the **2-wire RS485** cable using the 3-pole connector plug. Ensure correct polarity, ground **A (+)** and **B (-)** as well as the shield of the cable.
3. Connecting the **power supply 12-24V DC** by means of the **2-pole connector plug**. Here also pay attention to correct polarity, **(+)** and **(-)**.

> ℹ️ The 5V USB auxiliary DC power supply should only be connected to the USB Micro-B using the supplied USB cable for testing purposes or as an auxiliary power supply. In case of failure of the main power supply **12-24VDC**, the auxiliary power supply **5VDC** ensures continued operation of the **DO-1**.

> 🚫 The **DO-1** must be operated with a power supply of **12-24V DC**. The use of a power supply with a higher voltage can lead to damage to the device.

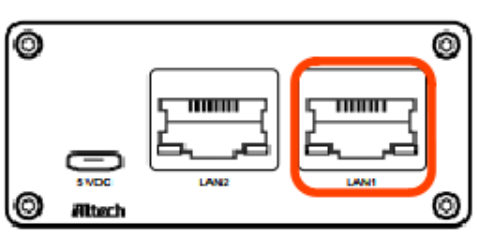
4. After connecting the power supply, the `SYS` LED first flashes for approx. 15 seconds, then the `ETH` LED should light up green.

Accessing the DO-1 Configuration Interface

The **DO-1** configuration interface can be accessed via DHCP or static IP address assignment. By default, **LAN1** is set up as a DHCP client, while **LAN2** is assigned the static IP address `192.168.10.10`.

LAN1 - DHCP | LAN2 – Static IP address

1. Connect an Ethernet cable from **LAN1** on the **DO-1** to a LAN segment in which a **DHCP server** is available.



`</figcaption>`

2. Use our DO-1 Device Finder to locate the current IP address of the **DO-1**. Please read DO-1 Device Finder and follow the described steps.

> ⚠️ The **DO-1** can only be found if the **DO-1** and the computer are on the same network

DO-1 Configuration

The web-based user interface can now be used to set up the **DO-1**. See below the recommended step-by-step sequence [with chapter assignment in the user's manual]:

1. **DO-1 Web Login**

   a) Connect the computer to the same network as the **DO-1**. b) Make sure that the **DO-1** is started properly (see Connecting the **DO-1**). c) Open a web browser on the computer and enter the IP address of the **DO-1** in the command line, e.g., `http://100.75.199.12/`. d) The web portal login page should be displayed.

   The default administrator login credentials are:

   - **Username:** `admin`
   - **Password:** `admin`

> ℹ️ If the IP address of the device is unknown, the **DO-1** can be detected using the DO-1 Device Finder program.

Further recommended steps:

2. Network Settings
3. Check for Software Updates
4. Email and Device Configuration
5. Modbus RTU and TCP Settings
6. Creation of the device templates of the connected Modbus devices
7. Connection of the respective Modbus devices to the Modbus RTU or to newly created Modbus TCP
8. Calculations Setup (if necessary)
9. Alert Setup

10. Action Setup
11. Configuration of Data Logs (if necessary)
12. Creation of the visualized overview (dashboard) of measured values of the connected devices, as well as created alarm functions
13. User and role assignment settings

Restart and Reset to Default Values

The **LEDs**, i.e., indicator lights, serve as visual indicators for the various phases and times. Holding the reset button allows you to initiate the desired change.

1. **Restart**
    - Press and hold the reset button.
    - All **LEDs** go out except for the `power LED`, which remains on continuously.
    - Once the `BUS LED` lights up again, release the **reset button**.
    - The device then restarts.
2. **Reset Values (Default Status)**
    - Proceed as with the restart of the device, but continue to hold down the **reset button**.
    - Once the `ETH LED` also lights up additionally, release the **reset button**.
    - This resets all values, and a new configuration file is created.

> ℹ️ If uncertainties arise, you can safely neutralize the situation by holding the **reset button** until all **LEDs** turn off. The **LEDs** will turn off *after 15 seconds*, and *no changes* will be made to the system.

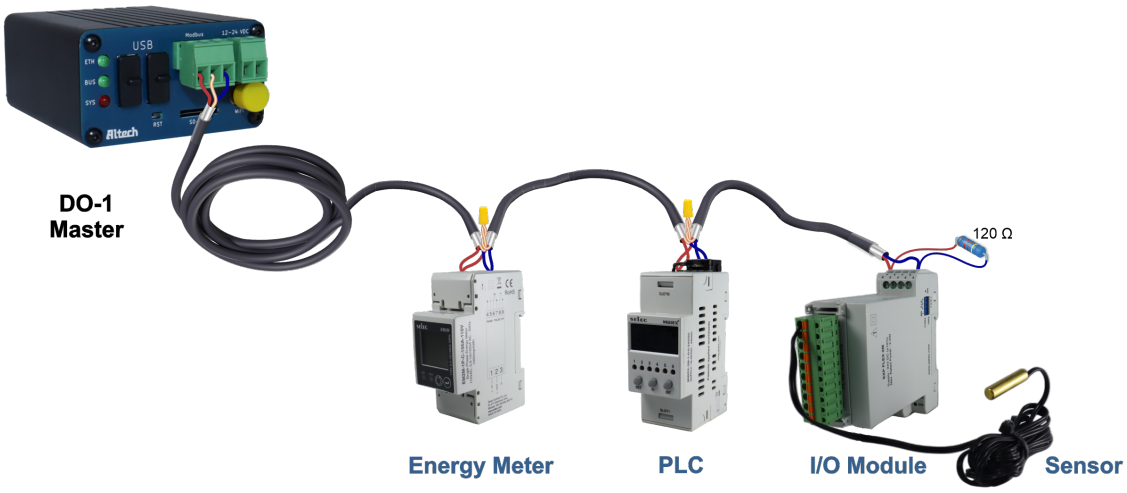
Troubleshooting and Problem Solving

Communication Problems with RS485

Communication errors in a **Modbus RS485 network** can be caused by various factors. In general, most RS485 problems can be divided into two main areas:

1. **Problems with Physical Wire Connections**

   Physical connections are critical for **RS485 communication**. **RS485 devices** require a suitable interface, such as *screw terminals, DB9, or RJ-45 connectors*. Important pin assignments are +, -, and ground (sometimes referred to as A, B, or Tx/Rx+, Tx/Rx-, and ground). RS485 devices are often connected in a *daisy chain* configuration.



   If the network is configured in this way and communication problems or unreliable communication occur, it is essential to perform the following diagnostic tests:

   - **Verification of Physical Connections**
     First, check that all connections are tight and properly fastened. Loose wire connections can cause intermittent communication problems in an **RS485 network**.

   - **Test the RS485 Ports**
     A device in the network could have a faulty **RS485 port**. To check this, the **RS485 devices** should be replaced one by one with working devices, especially in multi-drop RS485 configurations. A faulty serial port on one device can affect communication for all others on the same cable.

   - **Eliminate Electrical Faults**
     Although **RS485** is known for its resistance to electrical interference, the proximity of communication cables to machines or equipment that generate significant electrical interference can be problematic. In such cases, it is advisable to reroute the cables to minimize exposure to the sources of interference.

- **Minimize Ground Loops**
  Ground loops can negatively affect the signal integrity of **RS485** when multiple devices on the **RS485 cable** connect the shield to ground. This interference can disrupt the **RS485** signal. To prevent interference, the cable shield should be grounded at one end only and accidental grounding in the middle of the cable should be avoided.

- **Consider Termination and Impedance Matching**
  A terminating resistor, also known as a termination resistor, is used in **RS485 communication systems** at the end of the line to ensure signal integrity and reliability. **RS485** is a serial communication interface for industrial applications over long distances. It is used to prevent reflections, impedance matching, noise immunity, and to extend the communication range. The exact resistance value may vary, but in most cases, it is **120 Ohm** to match the line impedance.

> ℹ️ The terminating resistor is normally only connected to the ends of the **RS485 line** and not to each device. If you have multiple devices in an **RS485 communication chain**, you should only use the terminating resistor at the ends of the line, not at each device in between.

> ⚠️ **DO-1** only requires one terminating resistor at the end of the line as it already has an integrated **120 Ohm** terminating resistor.

2. **Mismatched Communication Settings**

Common RS485 problems are caused by communication settings that do not match. After confirming the physical connections, you should check the communication settings of all devices on the network. These communication settings mainly include the **RS485 port configurations** on each device.

Data parameters such as:

- Baud rate
- Start bit
- Parity bit
- Stop bit

must be identical for each device on the communication cable.

⚠️ There are many possible setting combinations, but the key rule is to make sure that the settings between the devices match. *Different port configurations often cause communication problems* where a master device receives no response from a slave device.

Overview

General Information

The following section contains essential information on the development and use of the **DO-1 Universal Monitor**, the main alarm functions and the additional options considered.

Use and Advantages of DO-1

The **DO-1** was developed to help companies monitor their buildings, systems and machines in a simple and cost-effective way. By using **DO-1**, monitoring, alarming and evaluation can be carried out without having to resort to expensive and complex systems.

- **Cost-Effective Monitoring:** Companies can monitor their systems without incurring monthly or annual license fees.

- **Versatile Data Collection:** Monitors various parameters, including energy consumption, current, voltage, temperature, humidity, motion, and noise levels.

- **No Special Requirements:** Installation does not require technical expertise or IT specialists.

Communication Protocol

When selecting a communication protocol for industrial applications, various factors must be taken into account. One major challenge is the large number of protocols used by different manufacturers, which are often not compatible.

Key Selection Criteria:

1. Use of a **simple, universal, stable, and interference-resistant** communication protocol that is already being used successfully in the industry.

2. **Widely used** by almost all manufacturers for the myriad of PLCs, VFDs, HMIs, meters, and sensors available on the market.

3. **Compatibility problems should be avoided**, and the integration of devices from different manufacturers should be facilitated.

For this reason, **Modbus RTU** was chosen for the development of the **DO-1**. Sensors and devices can be connected in series in a network, which is very popular for industrial control networks. The **Modbus RTU** communication protocol provides reliable and efficient communication over a 2-wire serial connection **(RS485)**. This connection is easy to set up and maintain, making it a suitable option for use with sensors and data acquisition devices.

Modbus TCP

Modbus TCP is an Ethernet extension of Modbus. If a local Ethernet network (LAN) already exists, the **Modbus TCP** communication protocol can be used to connect sensors and data acquisition devices that have an Ethernet port. If sensors and data acquisition devices only have a 2-wire serial connection, they can still be connected using a suitable RS-485 serial converter. This allows seamless integration into an existing network and provides greater installation flexibility.

This figure shows an example for a **Modbus RTU / TCP network**.

PIC TO BE ADDED

Display and Data Processing

The dashboard for displaying measurement data is easily customizable and user-friendly. It can be displayed on different devices such as desktops, laptops, or tablets in the network (LAN), allowing flexible use.

- **Data Transfer:** Measurement data can be easily transferred to Microsoft Excel or other spreadsheet programs for evaluation.
- **Alerts:** Early warning of errors or malfunctions ensures rapid response and enhances system reliability.

Key Alarm Functions

These functions are essential for quickly detecting and visualizing possible faults or malfunctions.

1. **Early Failure Detection:** Identifies potential faults before they escalate.
2. **Quick Response Time:** Immediate notifications to responsible personnel.
3. **Efficient Error Identification:** Alerts help pinpoint specific errors in monitored devices.
4. **Reduction of Downtime:** Timely detection minimizes disruptions.
5. **Performance Improvement:** Continuous monitoring enhances overall system performance.

If the corresponding values are exceeded or not reached, an alarm is triggered and an e-mail is sent automatically. This e-mail can contain a short message or a report on the situation. It is possible to preset whether the alarm status should be reset automatically when the measured value is back within the tolerance range or whether a manual reset is required. This allows the user to customize the settings to their specific requirements.

Additional Options

Beyond the basic version, the product offers a range of additional options to meet individual needs and requirements. These advanced features enable customized use and provide a higher level of flexibility and performance.

- **WLAN/WiFi:** Wireless connectivity, though susceptible to interference.
- **Bluetooth:** Suitable for localized environmental monitoring.
- **Remote Access (onControl):** Manage devices from anywhere, ensuring seamless access to data and controls.

Coming Soon

- **Cloud Storage:** Securely store and access data from the cloud, providing a reliable backup solution.

Technical Specifications

Supply Specifications

SPECIFICATION	DETAILS
Supply Voltage	12-28V DC (with polarity protection)
Back-up Supply Voltage	5V DC
Maximum Power Consumption	3W (12W max)

Environmental Specifications

SPECIFICATION	OPERATING CONDITIONS
Temperature	-20°C to 50°C (operating), -40°C to 85°C (storage)
Humidity	90% at 35°C (non-condensing)

Mechanical Specifications

SPECIFICATION	DETAILS
Housing	Aluminum
Weight	130g
Protection Rating	IP20

Functional Specifications

SPECIFICATION	DETAILS
Communication Protocol	RS485 - Modbus RTU / TCP

SPECIFICATION	DETAILS
Internal Memory	5 GB
External Memory	MicroSD card up to 128 GB
Memory Retention	Unlimited
Real-Time Clock	Yes, with 30 days battery back-up

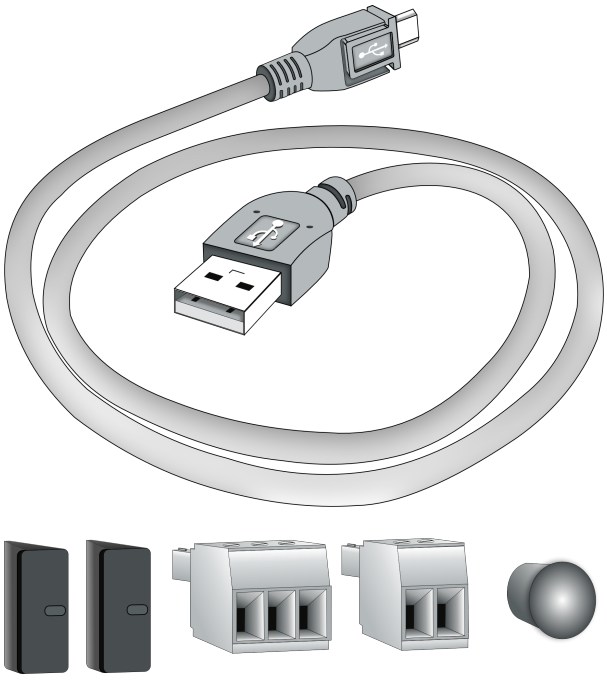
Terminal Connection

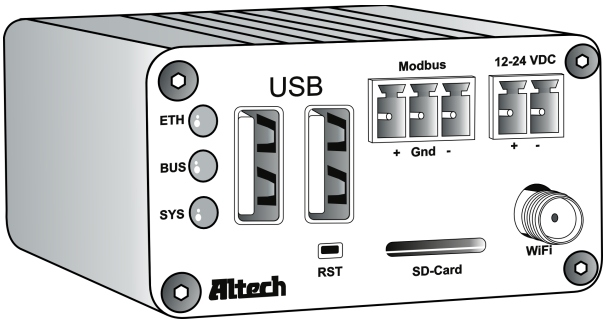
INTERFACE	DETAILS
1x RJ45 10/100 Ethernet (LAN1)	
1x RJ45 10/100/1000 Ethernet (LAN2)	
1x WiFi 802.11 b/g/n with antenna	
2x USB 2.0 Type A (max 1.5A)	
1x MicroSD card	
1x MODBUS (Master)	

DO1 Universal Monitor

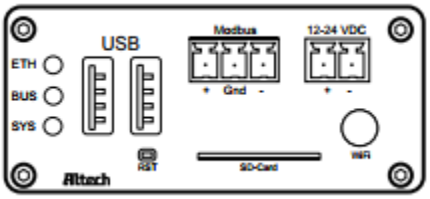
Package Contents

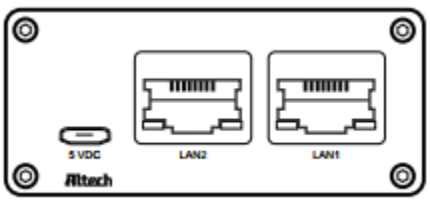
- **1x** Universal Monitor (DO-1)
- **1x** USB 2.0 Type-A / USB 2.0 Micro-B Cable
- **1x** Antenna dust cap
- **2x** USB Type-A dust caps
- **1x** 2-pole connector with screw terminals
- **1x** 3-pole connector with screw terminals



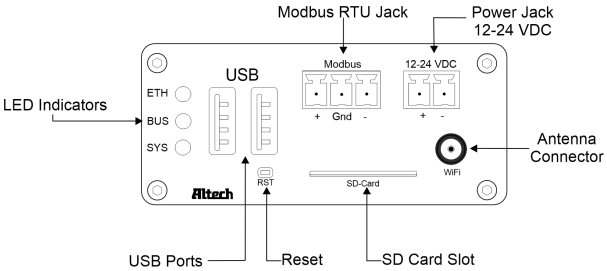


Front and Back View of DO-1

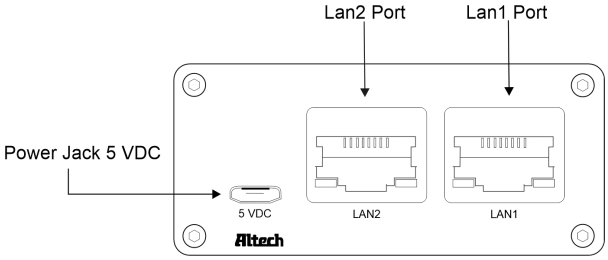




Connectors and Indicators on the DO-1



Front view



Back view

DO-1 Detail Information

COMPONENT	DESCRIPTION
LED ETH	Lights up green when the connection to the Ethernet network is established
LED BUS	Flashes green in time with the bus cycle time of the internal Modbus
LED SYS	Flashes red when the **DO-1** is in operation
USB	USB ports are provided for future use
Modbus RTU Jack	Connection of the Modbus RTU devices to the internal Modbus of the **DO-1**
12-24V DC Power Jack	Main power supply of the **DO-1**, **12-24V D**C voltage
Antenna Connector	WiFi antenna connection possibility provided for later use
SD Card Slot	For SD cards up to **128 GB**
Reset	Causes a software restart after an operation of 5 seconds
Power Jack 5V DC	Auxiliary power supply **5V DC** voltage
LAN1 Port	Ethernet network connection **1**
LAN2 Port	Ethernet network connection **2**

Installation

To use the functions of the **DO-1** properly, the universal monitor must be connected correctly. The **DO-1** is operated via a web-based user interface. This section explains all the necessary information for installing the device and the software.

DO-1 Device Installation

Network Connection and Power Requirements

The **DO-1** must be added to the network via a **LAN connection**. To do this, follow these steps:

1. Connect the Ethernet port on the **DO-1** to the appropriate router using a network cable (RJ45).

2. The **DO-1** must now be connected to an external **12-24 VDC power source** for proper power supply. For details see Technical Specifications.

3. The device is now available on the network and the user interface can be accessed **via the IP address** in the browser. This can be done in all common Internet browsers (Google Chrome, Mozilla Firefox, Microsoft Edge or similar).

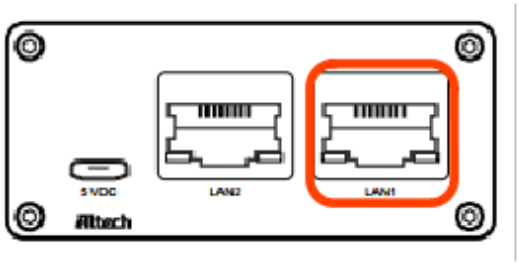
Accessing the configuration interface

The **DO-1** configuration interface can be accessed via ***DHCP*** or ***static IP*** address assignment. By default, **LAN1** is set up as a **DHCP client**, while **LAN2** is assigned the **static IP address 192.168.10.10.**

LAN1 - DHCP | LAN2 – Static IP address

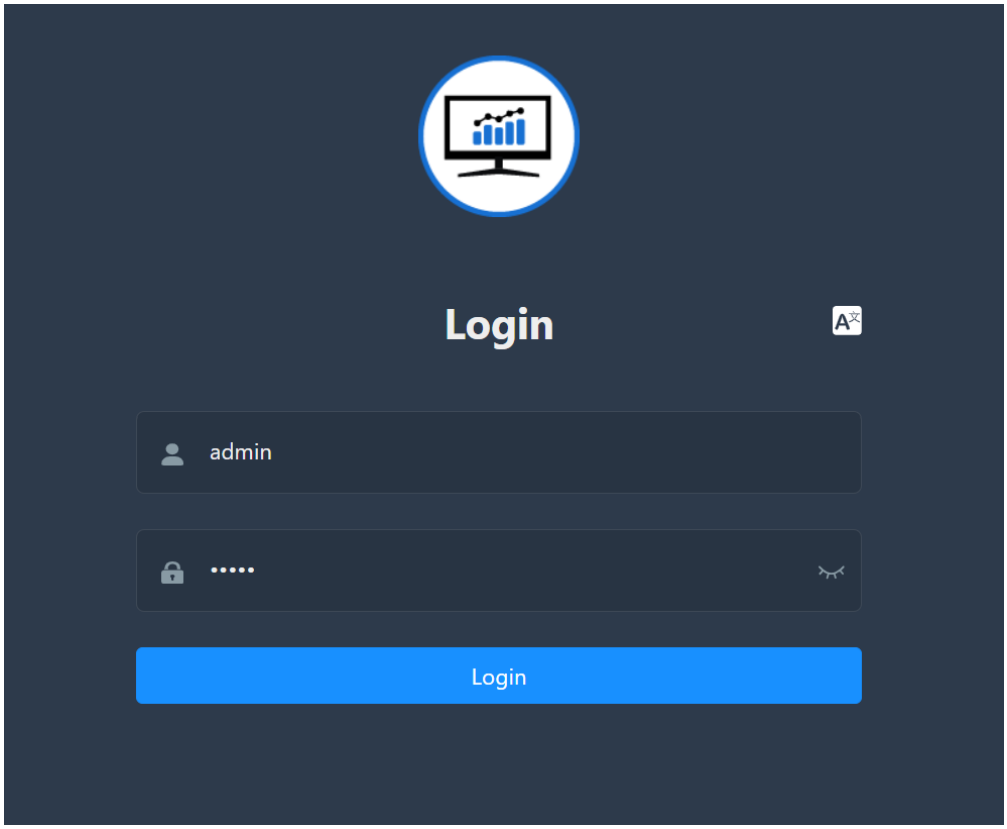
1. Connect an **Ethernet cable** from **LAN1** on the **DO-1** to a LAN segment where there is a

DHCP server in place.



2. Use our Device Finder to locate the current IP address of the **DO-1**. ***Please read*** DO-1 Device Finder and follow the described steps.

3. The default web browser installed on your computer will open and display the **DO-1** login page:



4. Type `admin` in the Username and Password fields. Click `Login`.

⚠️ The **DO-1** can only be found if the **DO-1** and the computer are on the same network.

Access via DO-1 Device Finder

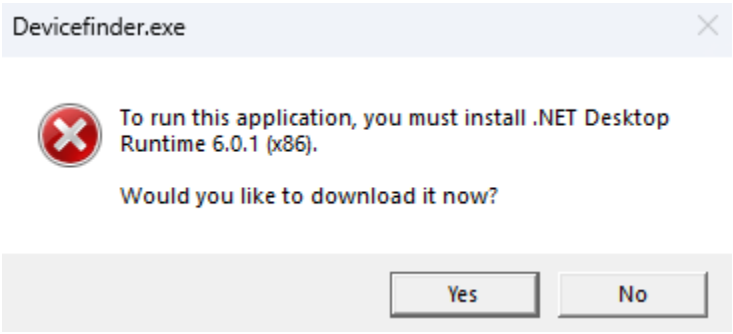
The **DO-1** Device Finder program was developed to simplify the search for the **DO-1** if the IP address of the device is unknown. To do this, proceed as follows:

The **Device Finder** desktop program can be downloaded here.

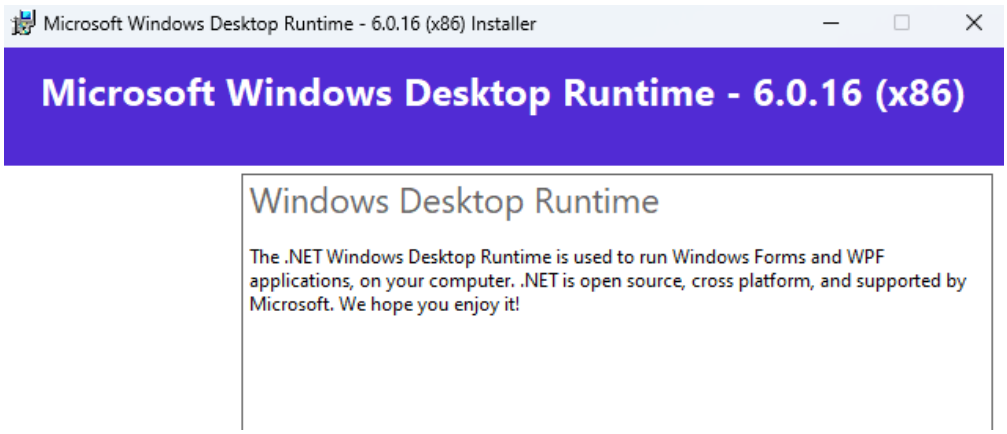
Installation

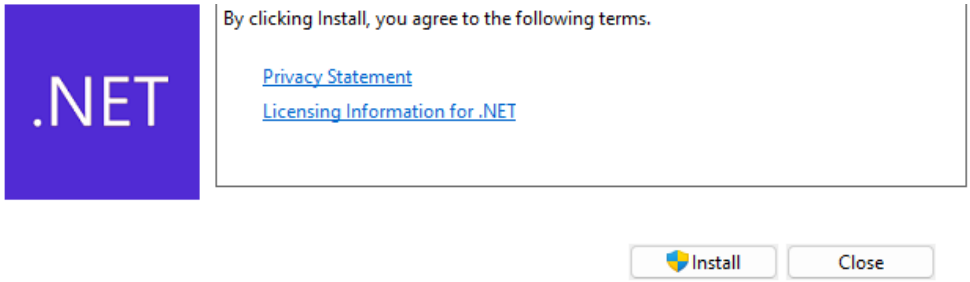
Download the program and extract the ZIP file. The program can then be started directly from the extracted folder.

⚠ To be able to run the program, make sure that you have the latest version of MS Windows Runtime installed. If you receive the following error message when opening the program, follow the instructions below:



a) Windows Desktop Runtime must first be updated or installed by following the installation process:





b) After successful installation, the **DO-1 Device Finder** can be started from the extracted folder.

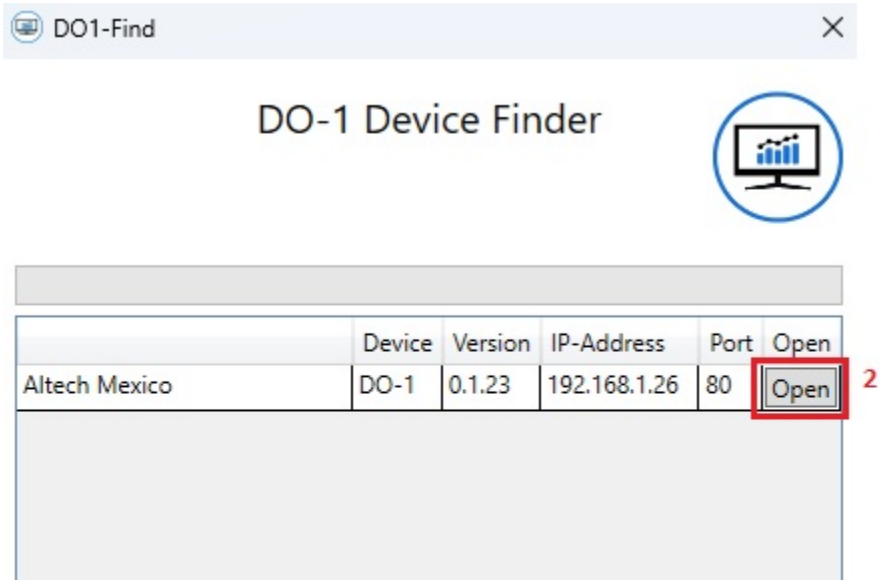
> If you have a security program that recognizes the **DO-1 Device Finder** as a threat, please follow the instructions of your security program to classify it as trustworthy

Usage

To start the program from the extracted folder, double-click on this icon:

1. Click on the button `Search` to start the search process. The details of the devices are then displayed in the list in the program.

2. By clicking the function `Open` the default web browser installed on your computer will open and display the **DO-1** login page.




Search
1

Web Login

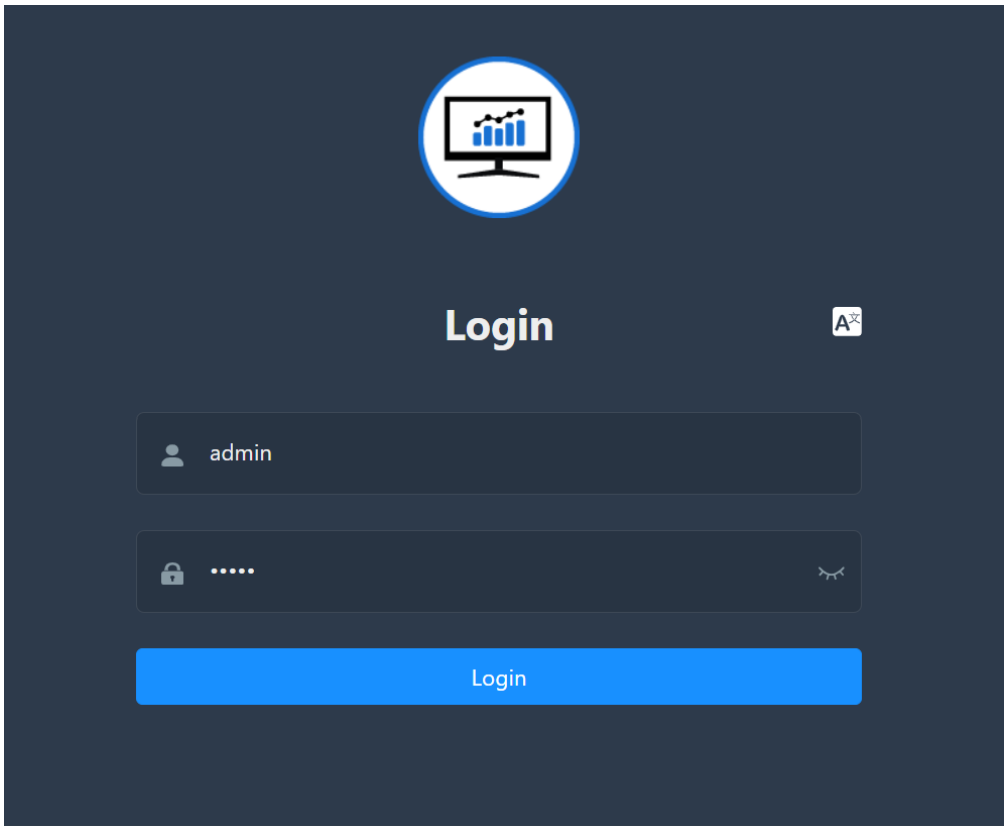
If the IP address is known, the user interface can be accessed directly via the HTTP/HTTPS request in the web browser. To do this, open the web browser and enter the IP address in the command line:

e.g. `http://192.168.10.10/`

For the first login, please enter the following credentials:

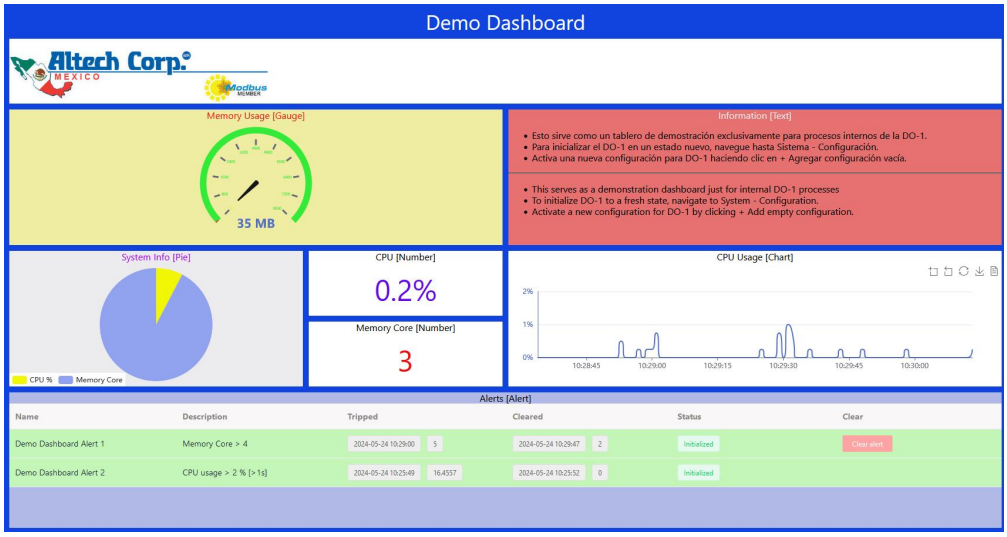
- Username: `admin`
- Password: `admin`

Click on “Login” to start the session.



⚠ The password should be changed in the user profile settings after the first login.
Please see: Change password

After logging in, you will see the following view, which shows a demonstration of a possible dashboard:

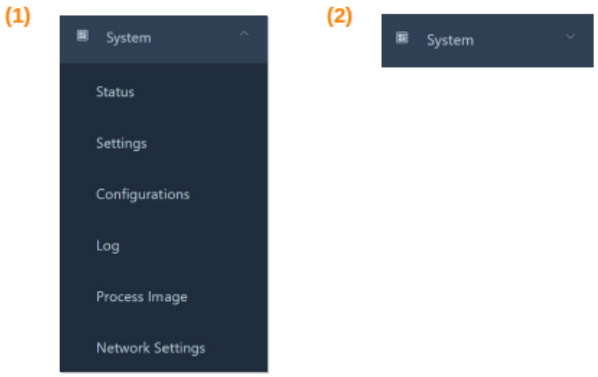


Menu Navigation and Functions

The basic structure of the DO-1 user interface consists of 7 main menu items:

- **Homepage**: Individual dashboard using the connected devices on the DO-1.
- **System**: Status display, system settings and configuration options, system logs, process images, and network settings.
- **Dashboard**: Configuration of the evaluation views, display in an overview list, and the option to view the created views separately in a preview.
- **Data logging**: Definition of parameters to record information, statuses, or events. A preview allows the saved data to be displayed and the files to be downloaded for further processing and analysis.
- **Device**: Display of Modbus RTU information, as well as creation of new Modbus TCPs , library of device templates, and creation of connected devices in the system.
- **Data Automation**: Define and configure custom calculations, set alarm conditions to generate notifications and actions when certain conditions are met.
- **Permission**: Settings to manage the access rights and roles of users.

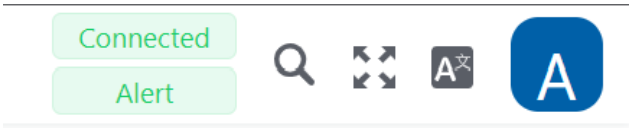
All these menu items contain submenus which can be expanded (1) or collapsed (2) by clicking on the respective menu item.



In addition, the main menu can be shown or hidden by clicking on this symbol:

General Operating Instructions

In addition to the main menu, there are other functions in the basic structure of the user interface. These are also available on every page and are located at the top right.



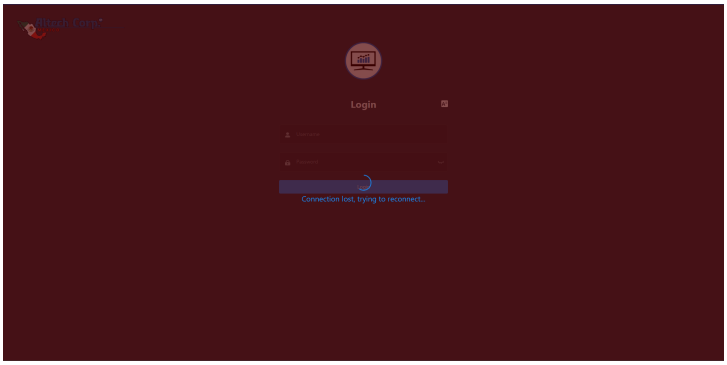
Status Display

This shows whether the **DO-1** has been successfully connected and whether alarms have occurred. Alarms can only occur once the first devices have been registered in the system and the corresponding alarm messages have been configured.

- **Connection/Alert green**: The **DO-1** is connected and there are no existing alerts.
- **Alert red**: Alerts are present.

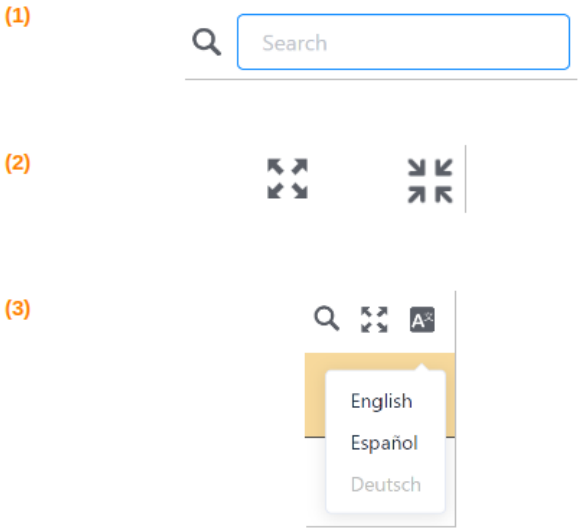
Interrupted connection:

If there is a network failure or the power supply is interrupted, access to the user interface is disconnected. The website turns red and an attempt is made to re-establish the connection:



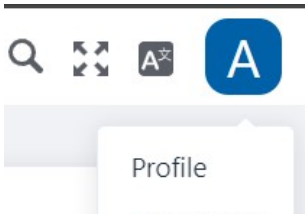
Additional Functions

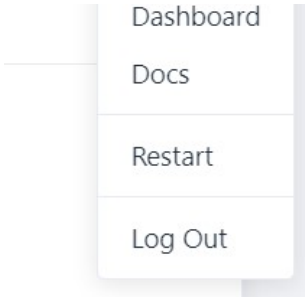
On the page header you may: **(1)** Search for content in the web portal, **(2)** Enable or disable full screen mode,**(3)** Change the desired language (currently English, German, Spanish can be selected).



User Options

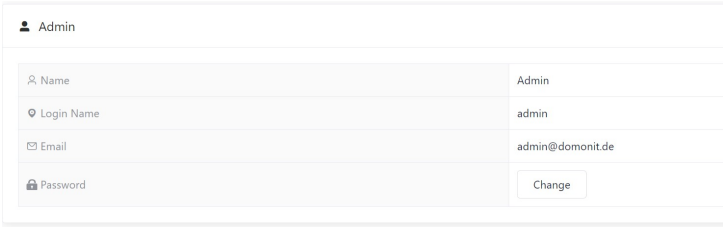
The icon at the top right-hand corner of the menu bar takes you to your own user options:





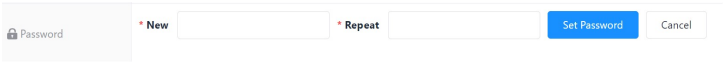
Profile

Direct link to your own user profile. By clicking the “Profile” option, you will be redirected to your own profile page. Here you will find the basic information and can also change the password for your own user. It is recommended to change the default password “admin” after the first login to ensure the security of your account.



Change password

1. Access profile via the user options.
2. Click on the Change button to the right of password in the table.
3. Enter a new password under “New”.



4. Enter this password again in the “Repeat” field.
5. Click on “Set password” to store the new password for your own profile.

Dashboard/Home

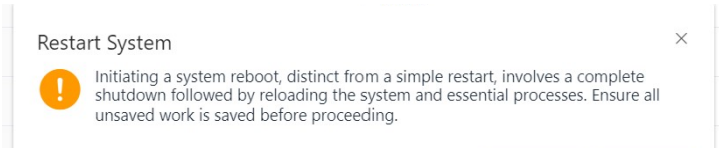
Direct link to the dashboard/start page of the configuration currently in use.

Docs

Direct link to the online help section. Clicking on the “Docs” function opens the following website in a new tab: DO-1 Documentation. Here you will find all relevant documents, device templates, and further information about the DO-1 Universal Monitor.

Restart / Log out

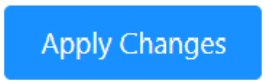
Restarting the device or restarting the user interface. When you click on this function, a pop-up window appears with a warning and two restart options:



- **Reboot**: The Universal Monitor **DO-1** is shut down completely and restarted.
- **Restart**: This restarts the user interface and all busses, as well as the configuration.
- **Log out**: Regular log out from the user interface.

Manage Changes

⚠️ *After changes have been made to the device settings, the **Apply changes** button appears at the top right of the page. This must be clicked to actively apply the changes to the system.*

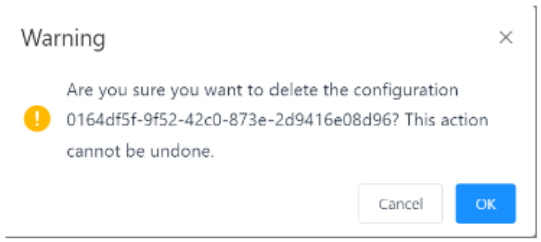


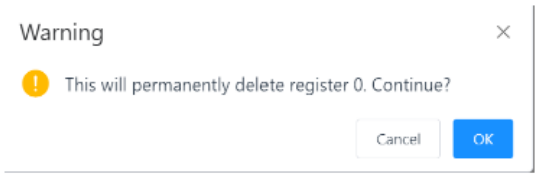
The changes are only applied by clicking this button. If a change requires a restart, a prompt to restart the device is displayed.

Deletion of Entries

When deleting an entry in the various functions of the **DO-1**, a warning message appears which must be confirmed in order to permanently delete the entry. If this message is not confirmed, the entry is retained.

Example warning pop-ups:





Function: System

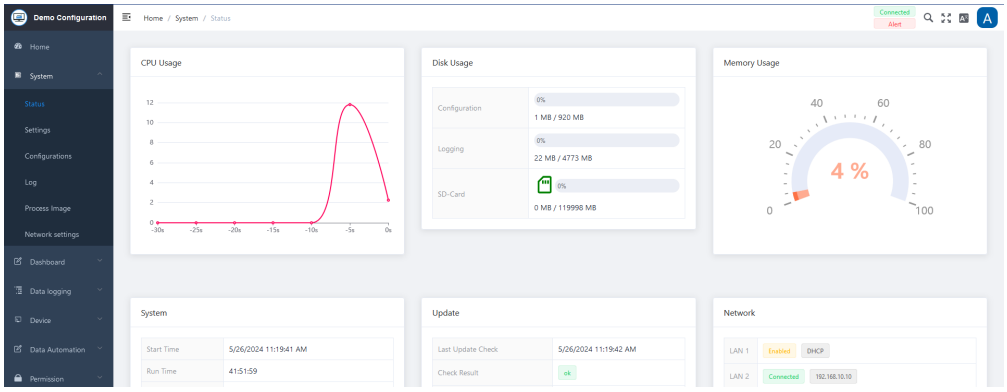
System design with precision. This chapter explains the various options for monitoring, managing, and configuring the **DO-1** operating system. For example, the status overview of the system, general settings, the option to create additional configurations, access to the system log, or network settings.

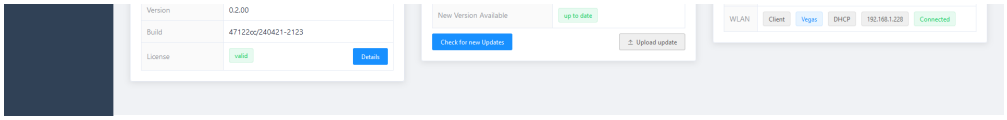
Overview

- Status
- Settings
- Configurations
- System Log
- Process Image
- Network Settings

Status: Visual representation of internal processes

The current status and performance of the system can be tracked here in real-time. By regularly updating the data, you always receive up-to-date information about the performance of the system. All relevant system information can also be found here.





Status Overview

CPU Usage

Displays the current utilization of the central processing unit in a diagram.

Disk Usage

Displays the percentage of memory usage of the hard disk. Subdivided into:

- Configuration
- Logging
- SD card

Memory Usage

Displays the percentage utilization of the memory.

System

Contains all currently relevant system information:

- Start time
- Runtime
- Version
- Name of the setup
- Device ID

Updates

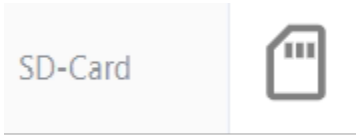
Displays the latest update information. You can search for new updates by clicking on the button.

Network

Displays the current network information; LAN and Port 2 information.

SD-Card Status

The SD card symbol shows the current status in different colors. Please see the table below.

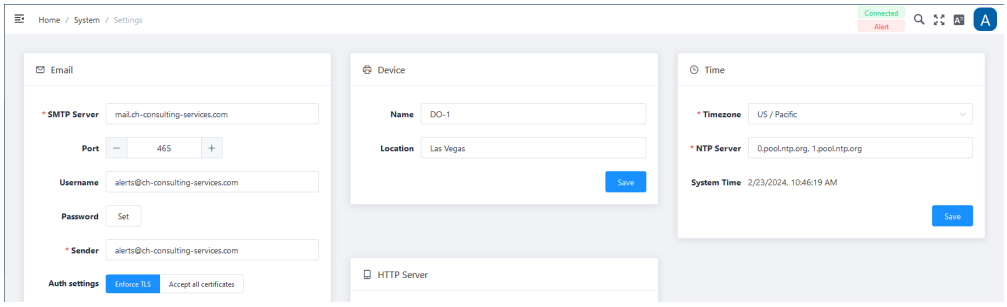


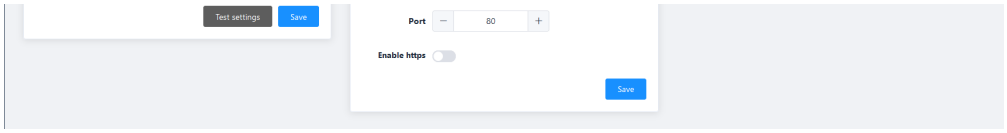
COLOR	STATUS DESCRIPTION
Grey	No SD card inserted
Orange	New SD card, but it needs to be formatted before it can be used. To do this, move the mouse over the icon and click to start formatting
Blue	Once formatting has been started, a blue symbol is displayed for the duration of formatting
Green	The SD card is ready for use. A bar indicates how much percentage of the card is used
Red	Error – Appears to be an error in the system, please contact the admin

Settings: Storing e-mail and device information

The necessary information must be stored in the settings to enable the sending of e-mails for notifications from the system.

⚠️ These settings should be made by the administrator and, if necessary, specific information should be requested from the network administrator.





Email Specifications

FIELD	DESCRIPTION
SMTP Server *	Enter the corresponding SMTP server ID; you can usually find the address of your SMTP email server in the Account or Settings area of your e-mail program; e.g. smtp.gmail.com
Port	Enter the corresponding SMTP port; Typical standard SMTP-Ports are 25 or 587
User name	Enter the corresponding user name
Password	Enter the corresponding password for this user
Sender E-Mail *	Enter the sender e-mail address; e.g. john.doe@gmail.com
Auth. Settings	Select whether the encryption protocol (TLS) should be used and/or whether all certifications should be accepted when sending. Typical port for TLS use is 587.

Note: All fields marked with * are mandatory.

The Test settings function can be used to check whether the entries can be executed successfully.

Device

FIELD	DESCRIPTION
Name	Enter an individual device name
Location	Enter the exact location of the device; e.g. server room Göttingen

Time

FIELD	DESCRIPTION
Time zone	Select the time zone (drop-down) where the device is connected.

FIELD	DESCRIPTION
NTP Server	Already preset and is set automatically when the time zone is selected
System time	Displays the current date and time

HTTP Server

FIELD	DESCRIPTION
Port	Set the corresponding port via +/- or direct input.
Enable HTTPS	Activation via slider. It establishes a secure connection and encrypts data and passwords, making them inaccessible to other network users.

Click on Save at the bottom of each input box to secure the entries.

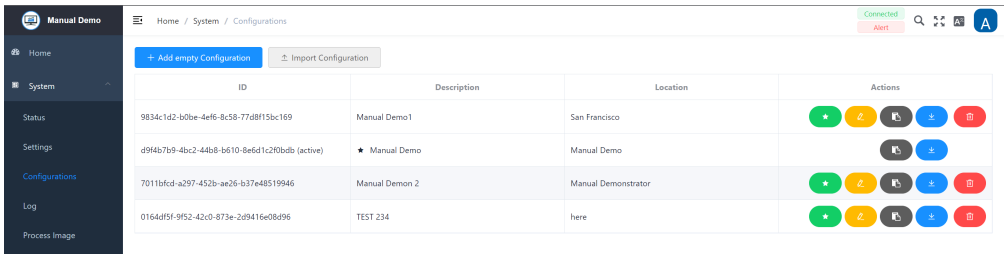
Configurations: Creation and management of system configurations

This function offers the option of creating or importing additional configurations, i.e. different configurations can be created and selected and used for the same **DO-1**.

Some examples where this function is particularly useful:

- To control and monitor different machines
- When a test and a production environment are in use
- ...

The basic version of the **DO-1** contains the “Manual Demo” configuration.



The ✓ in front of the name indicates the configuration currently in use. The only options for

this configuration are Copy or Download.

Actions

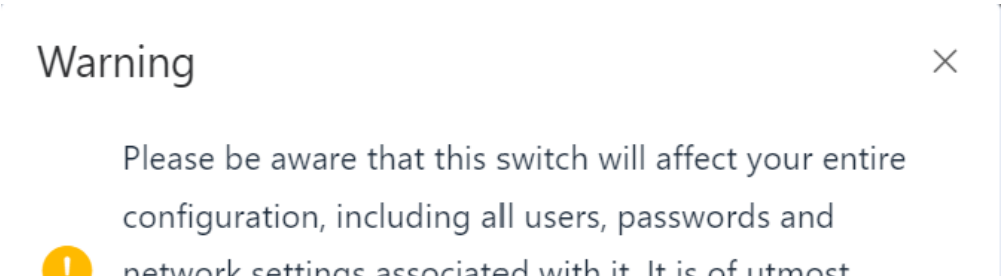
ACTION	DESCRIPTION
▶️	Configuration to be executed; if you want to display and use a different configuration, select it by clicking on the green button.
✏️	The created or imported configuration can be edited by clicking on the yellow button. This action is only available if the configuration is not the active configuration.
📋	This creates a copy of this configuration. Available for all configurations.
⬇️	Download the created configuration externally to your own computer. Available for all configurations.
🗑️	Deletion of the corresponding configuration. This action is only available if the configuration is not the active configuration.

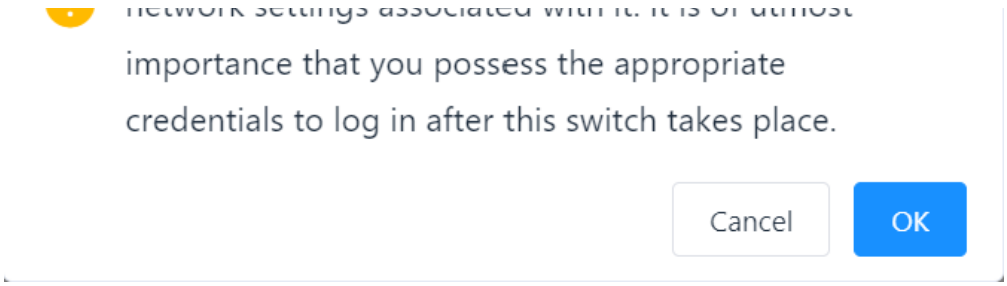
IMPORTANT: Please note urgently when changing to a different configuration:

- User and password settings may have changed.
- Network settings may have changed, which affects the IP address of the DO-1 and may need to be redetermined.
- If the Device Finder is used: Restart the Device Finder and/or press “Search” again to determine the current IP address.

Warning pop-up window:

If you switch to a different configuration, the following warning is displayed:

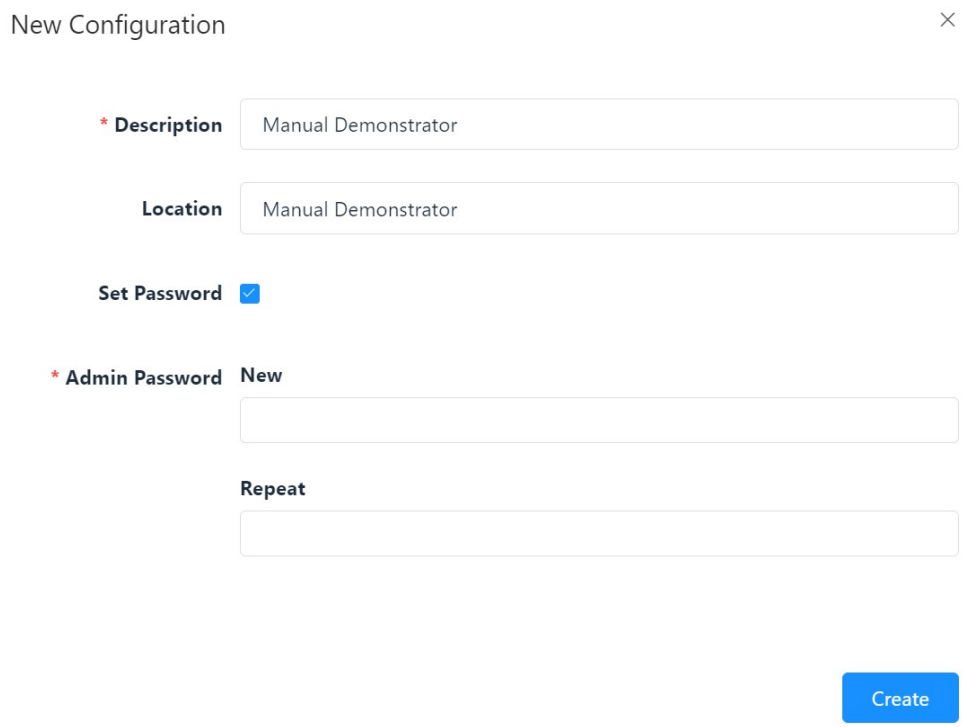




To make the change, this message must be confirmed by clicking OK.
Click on Cancel to retain the current configuration.

Add Configuration

Clicking on Add empty configuration opens a window with the following entry mask.



New configuration – Settings

FIELD	DESCRIPTION
Description *	Individual entry, is used for later identification in the selection list
Location	Individual entry, optional, can be helpful for your own overview

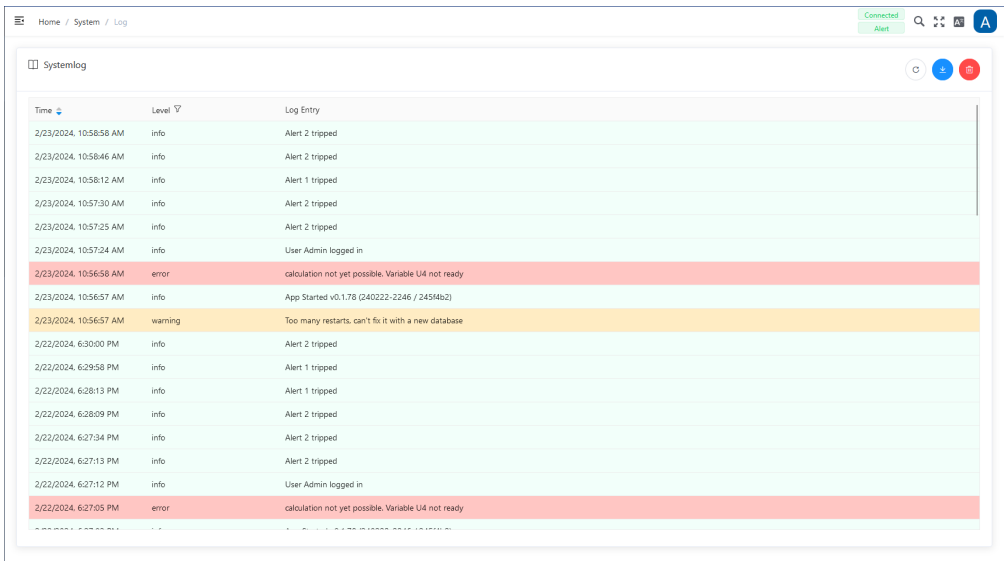
FIELD	DESCRIPTION
Set Password	If the checkbox is ticked, two additional fields are displayed that require a password to be entered. The entries in these two fields must be identical!
Admin Password New *	Input field for the password, no password rules prescribed
Repeat *	For security reasons, the password must be entered again here

Note: All fields marked with * are mandatory.

By clicking on Create, the new configuration is created and is available for selection and editing in the listing.

System Log: Recorded information on programs and system functions

System log: Recorded messages about programs and system functions. The system log records all events and activities of the **DO-1**. This includes error messages, warnings, user activities and other relevant information. The information it contains supports troubleshooting, security monitoring and the optimization of resource usage.



The following functions are available for the system log:

FUNCTION	DESCRIPTION

FUNCTION	DESCRIPTION
Reload	Updates the log
Download	To save the entire system log in a file locally on the computer
Delete	Deletes the entire current system log. (A warning message must be confirmed)

Process Image: Operational monitoring and control

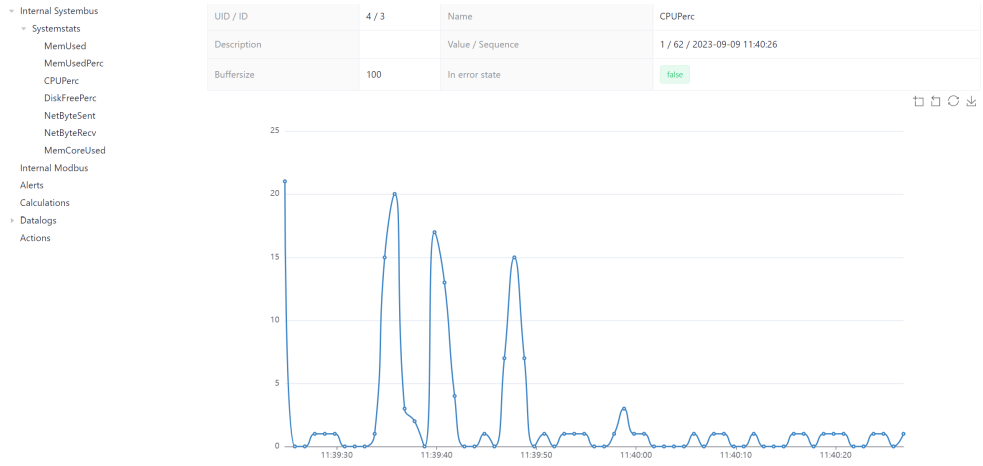
On this page you can view all active processes of the **DO-1**. Process maps are critical for operators, engineers and control systems to effectively monitor and manage devices as they provide real-time insight into the device's behavior and performance. This information is valuable for maintaining operational efficiency, diagnosing problems and making informed decisions regarding the operation of the device.

The integrated menu at the top left contains the selection of the main functions with the corresponding sub-processes. These are supplemented by further entries in the respective areas with additional views such as alarms, calculations and measures.

Internal menu:

- Internal System Bus
  - System Stats (detailed views of: memory usage and capacities, CPU usage, NetByte information)
- Internal Modbus
- Alerts
- Calculation
- Data Logging
- Actions

Example CPUPerc (CPU usage):



Additional Functions

- Selecting ‘Reload Process Image’ synchs the browser to the backend.

- Select ‘Restart Process Image’ to stop and restart all internal processes. This may be necessary if a new device has been added to the **DO-1** but does not yet appear in the overview.

- The toolbar on the right-hand side offers additional functions for each process screen view. If you move the mouse pointer over the icons, the respective description is displayed.

(From left to right):

1. Enables the current view to be enlarged in detail.
2. Resets the last magnification.
3. Resets the diagram to the original state and rebinds the data.
4. Downloads a snapshot of the diagram as a png image.

Network Settings – Configuration and

Administration

The information required to configure and manage the device's network connections is stored in the network settings. The following important parameters can be configured and customized here:

- Default gateway
- DNS server
- LAN (Ports 1, 2)
- Wireless LAN (WLAN)

> ℹ️ These settings only apply to the WLAN and **DO-1**'s two LAN ports. **Not for the Modbus TCP configuration**, please see 'Add a Modbus TCP Device'

Default Gateway

Select which Gateway is to be set as default.

DNS Server

Enter the DNS server addresses; several entries are possible, by clicking on [+] another field appears, [trash bin] deletes an entry.

LAN Tab

Ports as Switch

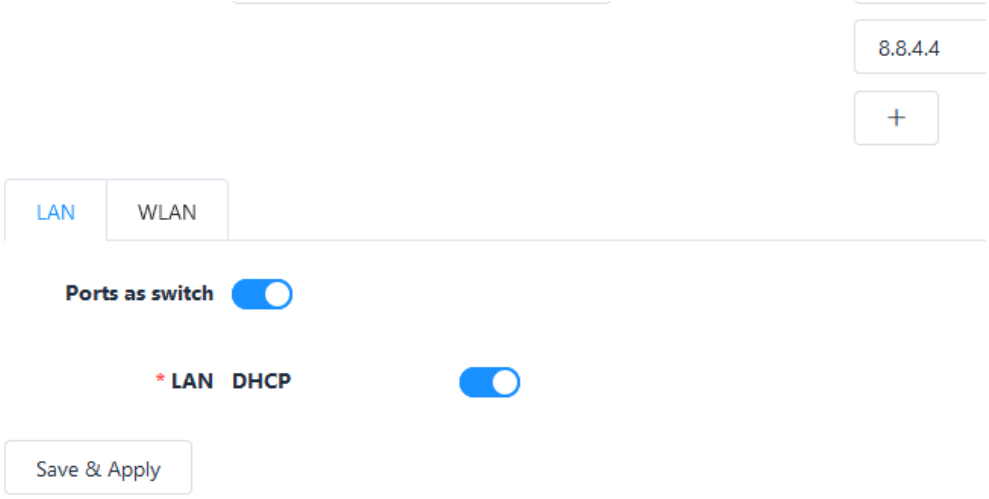
Enable/disable via slider function.

> ℹ️ *It must be activated if both connections participate in the same broadcast domain!*

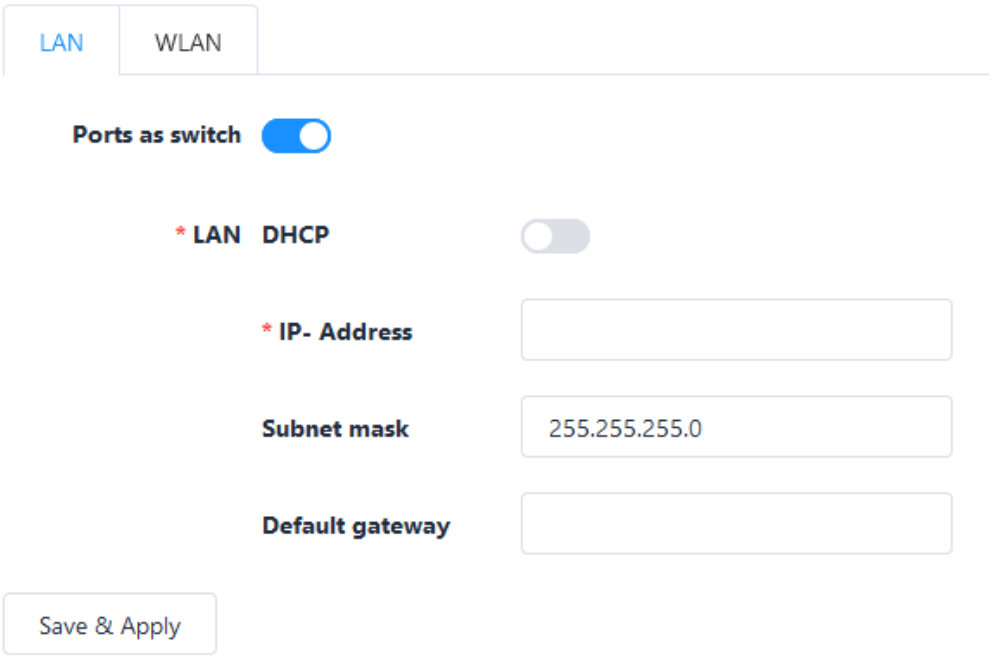
If enabled refer to **LAN DHCP** settings.

LAN DHCP

Enable/disable via slider function; *If DHCP is enabled*: based on the client-server principle, it ensures that connection-seeking devices automatically obtain a reusable network address and all other relevant parameters. **Always** check the Default Gateway and DNS servers settings.



If LAN DHCP is not enabled; all necessary information (IP-Address, subnet mask, default gateway) needs to be entered manually.



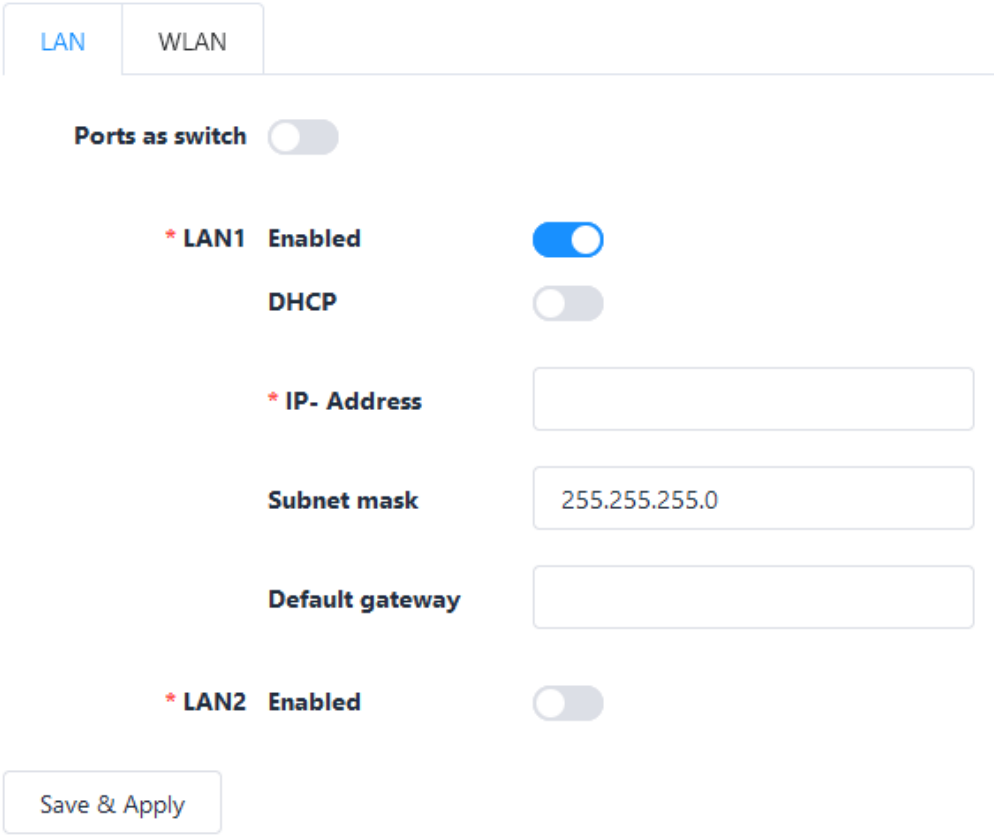
Click **Save & Apply** to secure the entries.

If Ports as switch is not enabled; You can proceed with **LAN 1** and **LAN 2** as follows:

LAN1

Enable/disable via slider function; **DHCP is used per default**. Always check the **Default Gateway** and **DNS Server** settings.

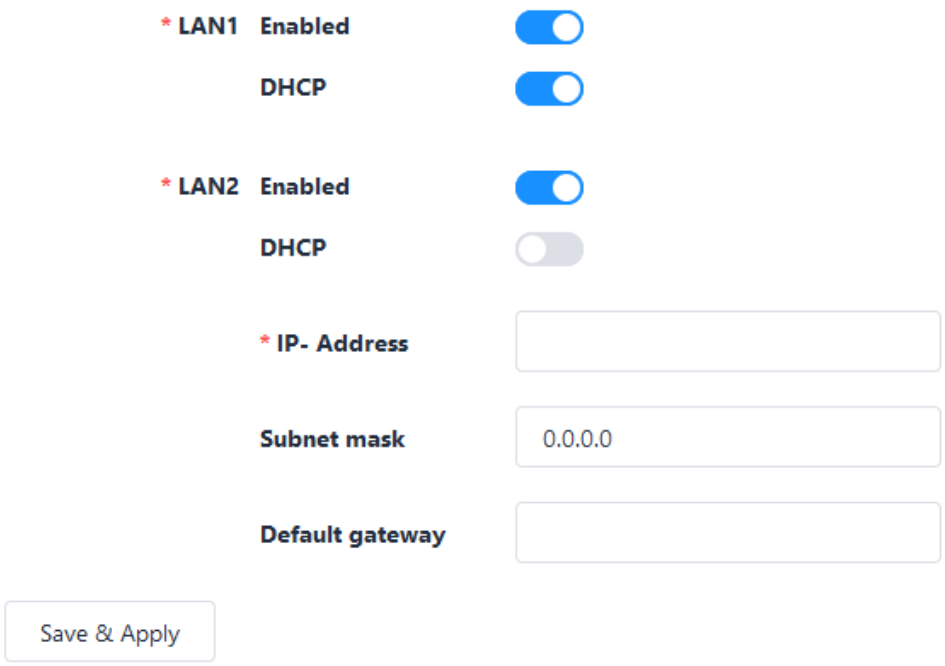
Additionally, the Dynamic Host Configuration Protocol (DHCP) can also be disabled, via slider function. Then all necessary information (IP-Address, subnet mask, default gateway) must be entered manually.



LAN2

Enable/disable via slider function; **DHCP is disabled per default**. All necessary information (IP-Address, subnet mask, default gateway) must be entered manually.

Additionally, the **Dynamic Host Configuration Protocol (DHCP)** can also be enabled via slider function. Always check the **Default Gateway** and **DNS Server** settings.



Click **Save & Apply** to secure the entries.

WLAN Tab

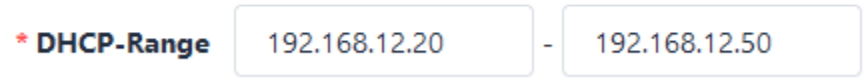
This function is only available if the corresponding license is obtained!

WLAN enabled

Enable/disable via slider function; *If WLAN function is enabled*; you can choose between **Access Point** or **Client**:

Access Point (set per default)

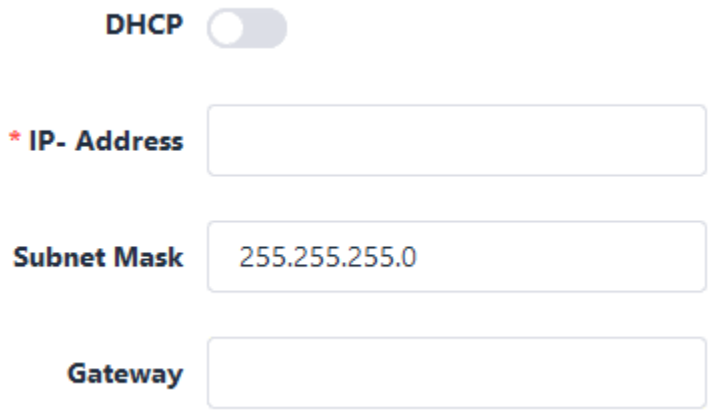
- **SSID ***: Enter a SSID name (**DO-1** per default)
- **Password**: Click on *Set* to assign a password and proceed with a corresponding entry.
- **ID-Address**: Default setting: IP 192.168.12.10
- **Subnet Mask**: Default setting: 255.255.255.0
- **DHCP-Server**: Enable/disable via slider function. If enabled; Determine the range for the IP address to be detected.



Client

- **SSID ***: Select the corresponding SSID
- **Password**: Click on Set to assign a password
- **DHCP**: Enable/disable via slider function.; *DHCP is used per default*. Always check the **Default Gateway** and **DNS Server** settings.

If not enabled; IP-Address and default gateway need to be entered manually.



Click on **Save & Apply** to secure the entries.

Note: All fields marked with * are mandatory!

Function: Dashboard

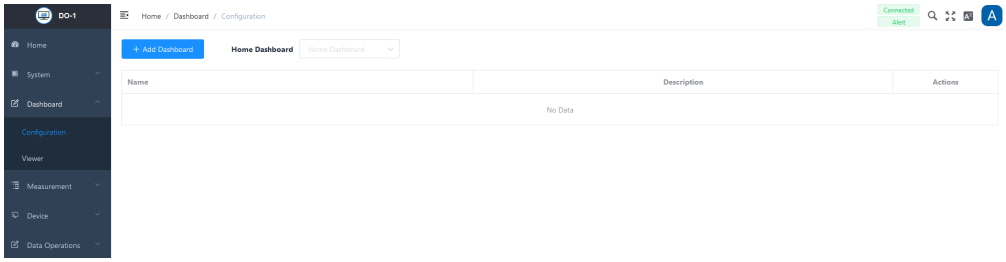
Precise monitoring and efficient use of resources

This chapter explains the Dashboard function of the **DO-1** user interface. Dashboards are a powerful tool for improving data visualization, monitoring and analysis, which in turn can lead to more informed and efficient use of resources. Digital monitoring and visualisation of connected devices by creating individual graphical overviews, one of which can be set as the start page. It is also possible to preview the views that have already been created.

Overview:

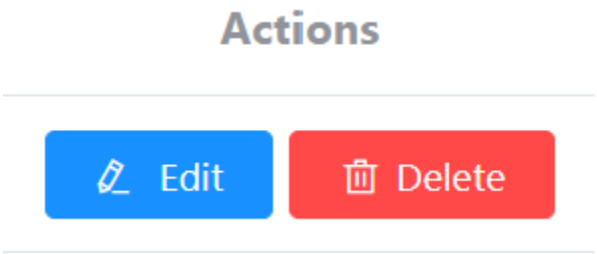
Configuration: Creating and editing Dashboards

By clicking *Configuration* in the submenu it will open the dashboard overview page. This page contains a list view, which then displays the dashboards after you have created them yourself.



The following actions are available for created dashboards:

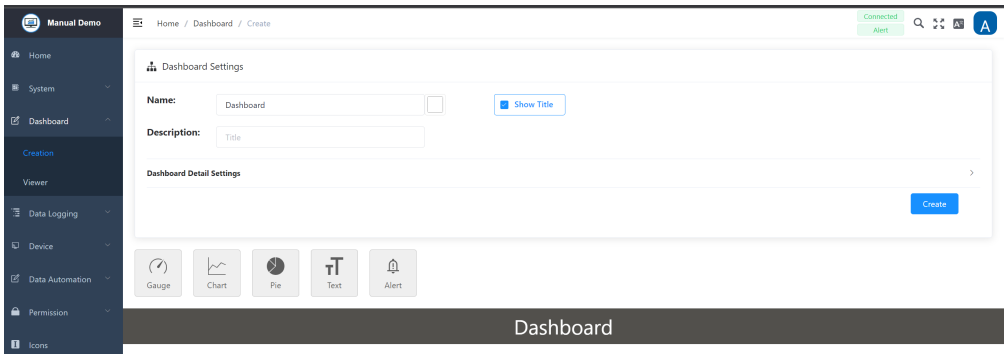
ACTION	DESCRIPTION
Edit	Opens the data entry for editing of the settings.
Delete	Removes the order from the system. (A warning notice must also be confirmed)



Note: Before you can create a new overview, the corresponding devices must be stored in the **DO-1**. All information on this can be found in the *Device* chapter.

Add Dashboard

A click on **Add Dashboard** opens an entry screen. The basic information is stored in the upper part and the desired graphical elements are added in the lower part.



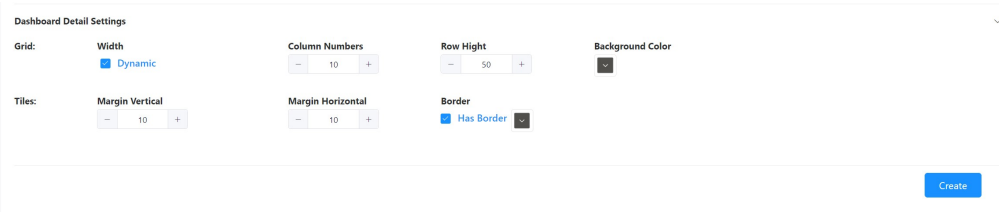
Dashboard Settings

FIELD	DESCRIPTION
Title	Enter a name for the respective dashboard
Color tile	Optional; The RGB color scheme offers the option of assigning a color to the title, clicking on it opens another window for color selection
“Show Title”	Optional; Specify whether the title, i.e. the name, should be displayed by clicking on the checkbox to enable/disable it

FIELD	DESCRIPTION
Description	Optional; Any description can be added here, such as detailed information about this specific dashboard and the devices being monitored

⚠️ *The names of the dashboards must be different from each other. Duplicate entries are not possible.*

By clicking on **Dashboard Detail Settings** or the arrow on the right-hand side, the view settings can be displayed and edited. The dashboard graphic is based on a grid view. Changing the values changes the distance between the individual graphic elements. The values are given in pixels. Colors and margins can also be adjusted.



Functionality: Dynamic

If this function is activated, the view is adjusted automatically - alternatively, the size can also be set manually. This function ensures that the view is displayed appropriately on a mobile device.

Once the data has been customized to your needs, click on the **Create** button to save the dashboard.

Changes and new creation with existing entries

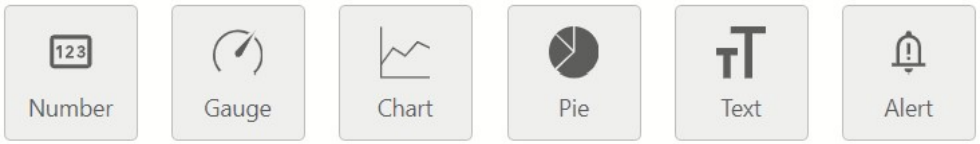
When making subsequent changes to overviews already created, it is possible to save them or to use the entries made for a new creation. The following buttons appear on the right

below the basic input screen instead of Create:

> ⚠️ *To save new data from an existing overview, the name must be changed, as there can be no duplicate entries.*

Graphical Elements

A selection of graphical elements is available to display the live data on the dashboard. By clicking on the respective tile, any number of items can be added and selected individually.



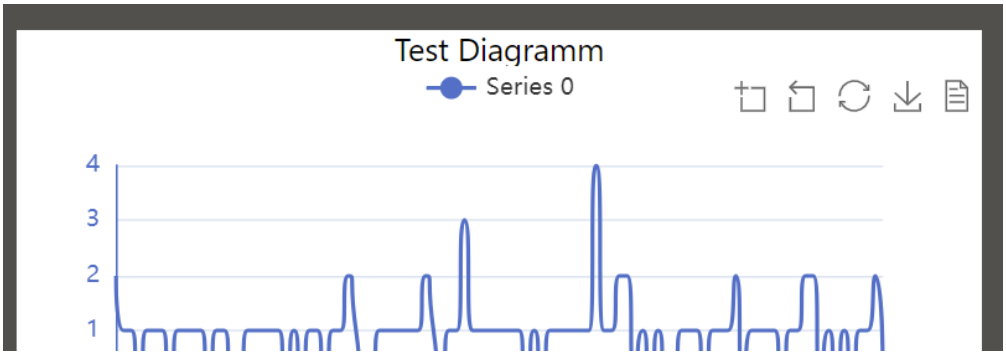
Additional functions

In addition to the individual settings of the elements, you can use the following functions directly on the dashboard:

- **Drag & Drop**: The added elements are freely movable and can therefore be easily arranged.

- **Determine size directly**: The size of the element can be adjusted directly with the mouse:

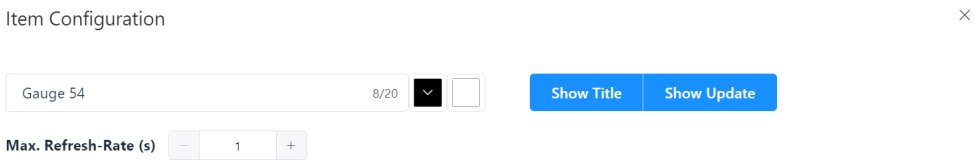
  1. Select the bottom right-hand corner of the element with a mouse click or touchpad.



2. Hold down the left mouse button or the touchpad and use the pointer to adjust the size to your own requirements.

General item configuration

Double-click on one of the added items to open another window with the respective configuration options. The design of the respective element can be customized. The input mask for the respective basic information is usually identical:



Item Configuration – Basic InformationHold down the left mouse button or the touchpad and use the pointer to adjust the size to your own requirements.

FIELD	DESCRIPTION
Title	Assigning a designation
1. Color tile	Color selection for the title
2. Color tile	Color selection for the background of the element
“Show Title”	Optional; specify whether the title, i.e. the name, should be displayed by clicking on the checkbox to enable/disable it
“Update Indicator”	Optional; If this function is selected, a colored dot flashes in the top left corner of the element to indicate that the value is being updated.
Max. Refresh rate (S)	Optional; definition of the seconds for the value update - This is particularly important in relation to the computing power, depending on the values displayed. This field is not available for the text element!

Saving, copying and removing elements

In addition to the general information on the element, the following actions are also

standardized:

Delete Item: Leads to removal of the element, a warning must be confirmed.

Copy Item: Duplicates the element, which can be helpful when creating further elements.

Confirm: Saves all entries made.

Failure of Devices/Sensors for Measured Value Acquisition

If the “Meter”, “Diagram” or “Circle” display options are selected in the dashboard for a measuring device or sensor and the Modbus simultaneously detects that the corresponding measuring device or sensor is missing or has failed, the following symbol appears in the tile of the respective element at the top right-hand edge.

The following color coding must be distinguished:

- **Orange (flashing)**: No data is being received. Connection must be checked.
- **Red (flashing)**: The device has been removed from the **DO-1** system.

2.2 Detail Settings

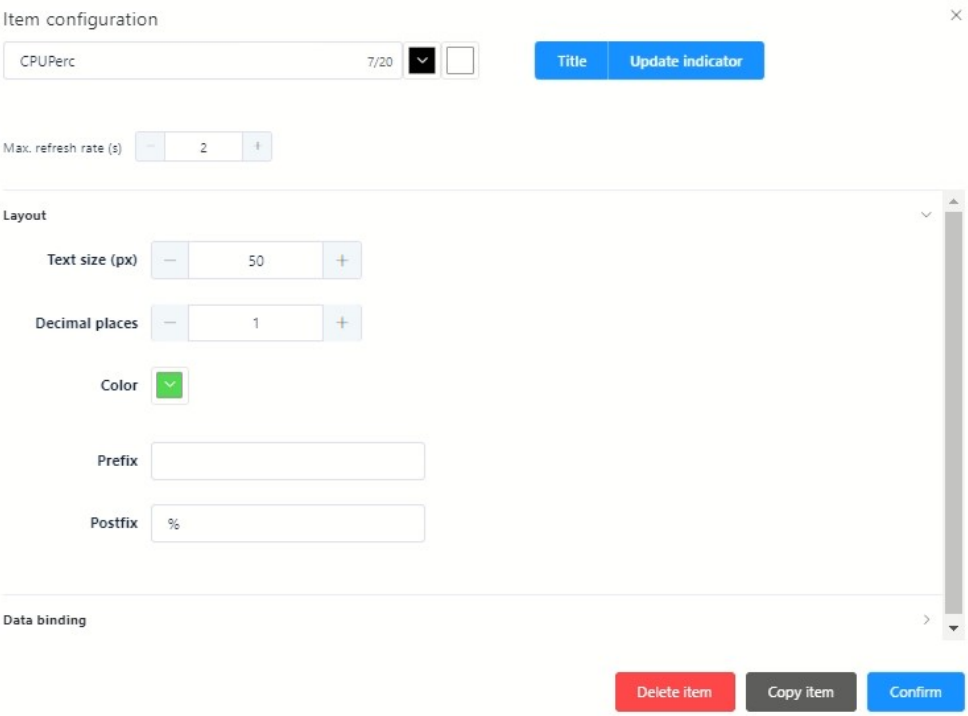
In addition to the basic information, the graphical layout and the data binding for each element have to be defined or texts can be added. The following section explains the configuration options for all six elements.

Element: Number

This element is used to display measured values digitally. You can decide whether you want to display percentages or other value definitions.

Layout

All graphical details for the number element can be adjusted under Layout. Open the settings in the sub-menu by clicking on the bar or drop-down menu symbol.



Element Number - Layout Settings

- **Text size (px)**: *Individual*; Enter a value or use **+/-** to adjust the size. The value is in pixels.
- **Decimal places**: *Individual*; Enter a value or use **+/-** to set the decimal places, if necessary.
- **Color**:_ Individual_; Set the color for the value by clicking the title and choosing from the

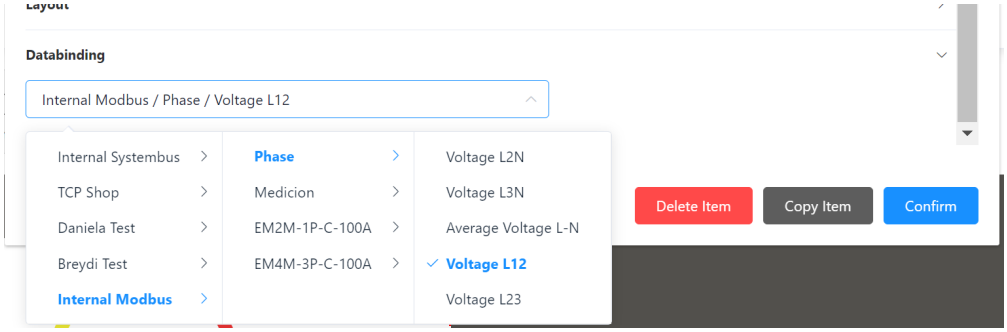
color board.

- **Prefix**: *Individual*; Entry before the displayed value.
- **Postfix**: *Individual*; Entry after the displayed value.

Data Binding

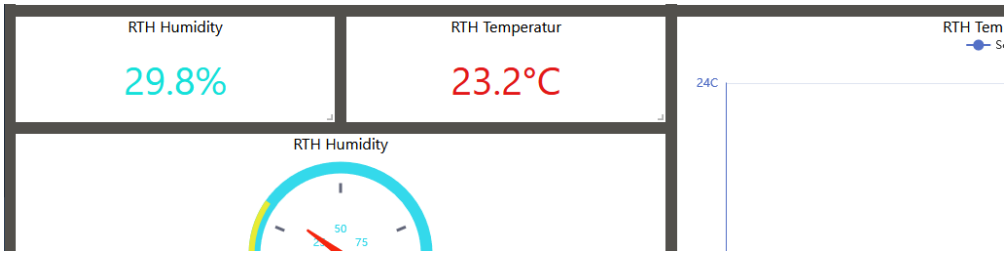
Under Data connection, the corresponding link to the connected devices is defined via a selection menu. All processes of the **DO-1** as well as all stored devices, created calculations, and alarms are available in this selection and are thus linked to the element and mapped:

1. Click on *Data connection* or the arrow on the right to display a drop-down menu.
2. Click to select the appropriate data link from the drop-down menu.



3. By clicking **Confirm**, all entries are saved.

Example Number element:

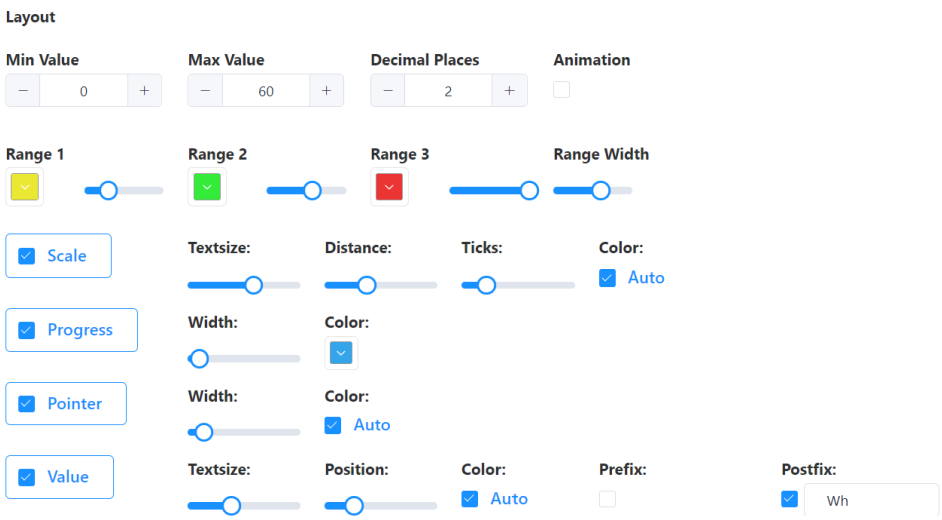


Element: Gauge

This element is used to display various states or values. The layout can be customized to suit your individual needs.

Layout

Clicking on **Layout** opens the display settings for the element Gauge. It allows customization of the display and addition of various graphical details.



Element Gauge – Layout Settings

- **Values**: Min./Max Value adjustment by entering numbers directly or by clicking on **+/-**; depending on the connected devices and which values are to be displayed.
- **Decimal Places**: Definition by direct number input or click on **+/-**; specification of the decimal places to be displayed.
- **Animation**: The animation can be activated/deactivated by ticking the box below.
- **Colors**: Range 1, 2, 3; Depending on which values of a connected device are to be displayed, the color range can be enlarged or reduced; range width can be adjusted proportionally using a slider, colors can be individually customized.
- **Range Width**: Maximum 20, use the slider to adjust the value.

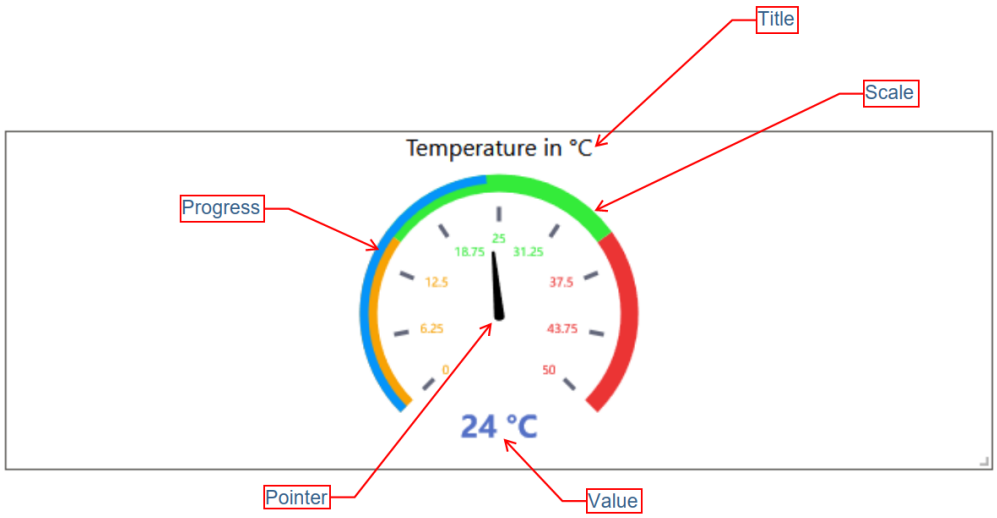
Detail Elements (to be selected by ticking the corresponding box)

- **Scale**: Adjustment of text size, spacing, marker, and color of the scale.
- **Progress**: Adjustment of width and color.
- **Pointer**: Adjustment of width and color.
- **Value**: Adjustment of the text size, position, and desired color. Depending on the connected devices, you can activate the Pre- or Postfix function to display the measured value designation.

Data Binding

The data connection is the same as for the Chart element.

Example Gauge element:

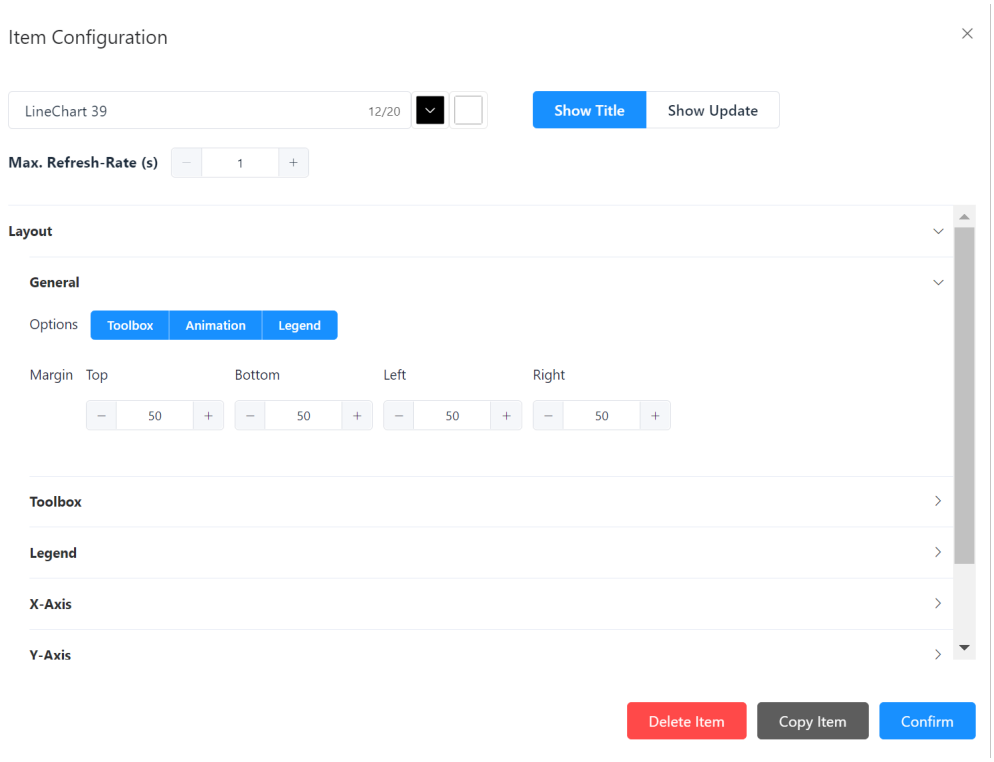


Element: Line Chart

This element is used to display quantitative values over a specified time interval. The layout can be customized to suit your individual needs.

Layout

All graphical details for the diagram element can be adjusted under Layout. To edit the basic settings, the respective sub-items (General, X-axis, Y-axis) must be expanded by clicking on each of them. Within the area General, further options can be added to the view in the element.



Element Line Chart – Layout Settings

- **General**: *Options*: Toolbar, Animation (in the element), Legend, Margin: Definition of the margins of the diagram, values in pixels.

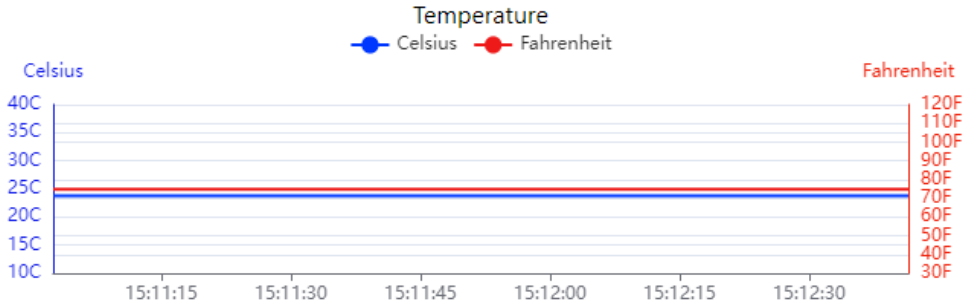
- **Toolbar**: Defining the position in the element. Appears when *Toolbar* has been selected under General options.

- **Legend**: Defining the position in the element. Appears when *Legend* has been selected under General options.

- **X-Axis**: Definition of the date and time format and the axis division.

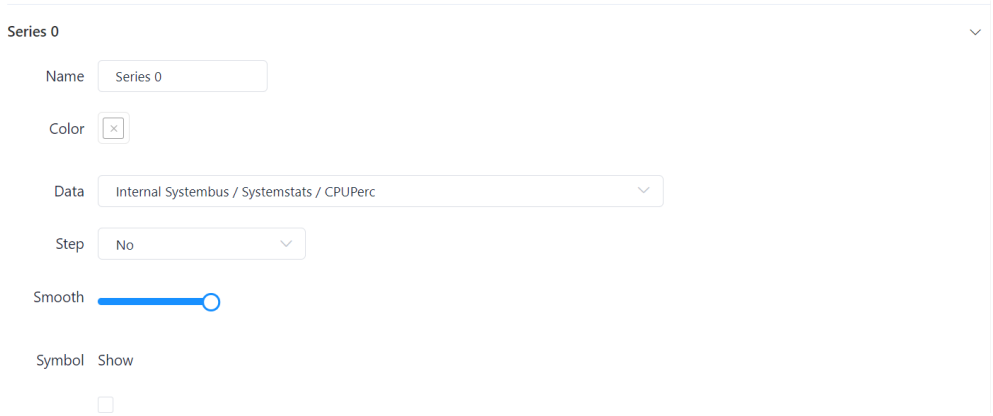
- **Y-Axis**: Up to two axes can be added to the view; two separate y-axes are placed on the

left and right side of the chart, where each axis can represent different units of measurement. This makes it possible to display two different data sets with different value ranges in one diagram.



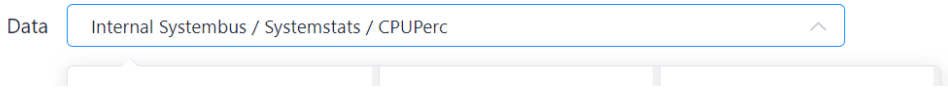
Data Binding

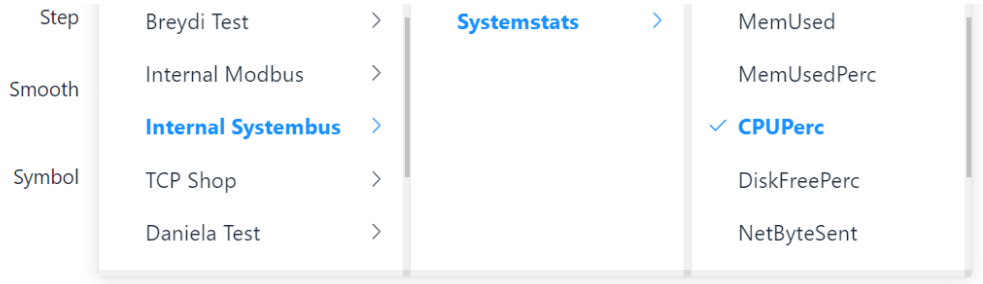
The series to be displayed in the diagram are defined under data binding. These series reflect the data from the corresponding source. Any number of series can be added.



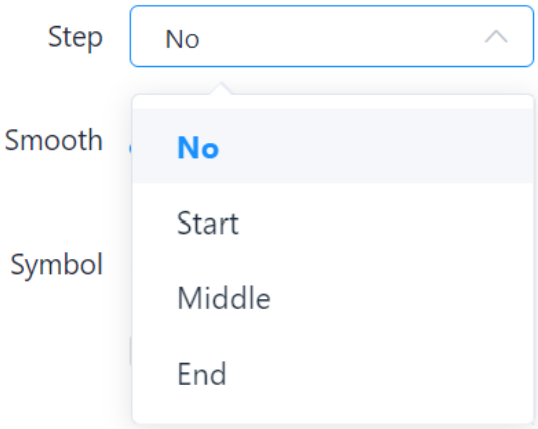
Element Line Chart - Series Settings

- **Name**: Assigning a designation.
- **Color tile**: Automatically preset, the color can be changed as desired by clicking on the tile.
- **Data**: Drop-down selection menu, click to select the corresponding data source.



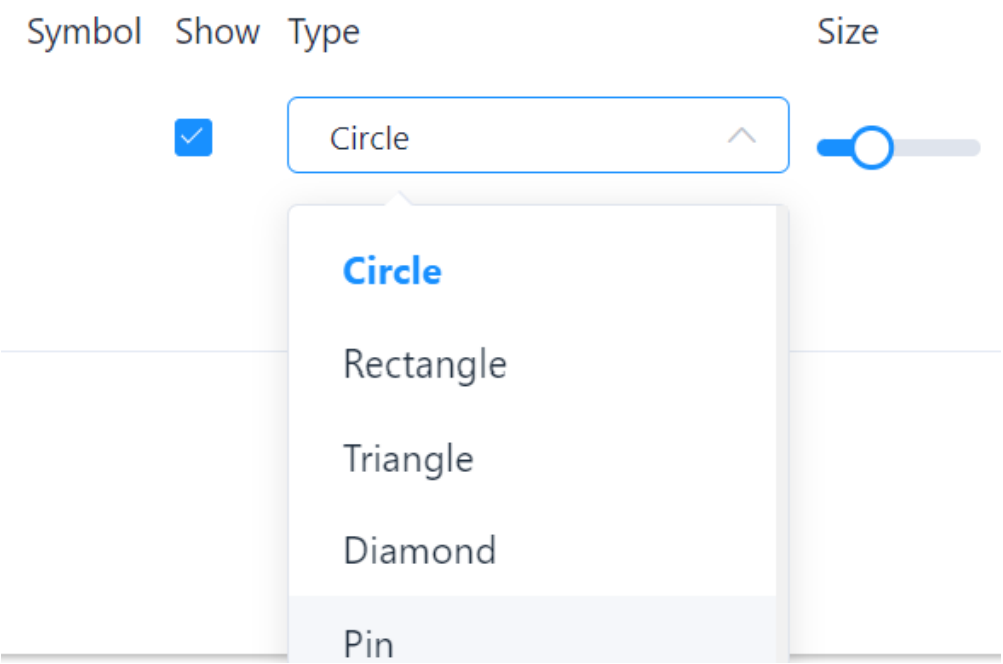


- **Step**: Determining the step change.



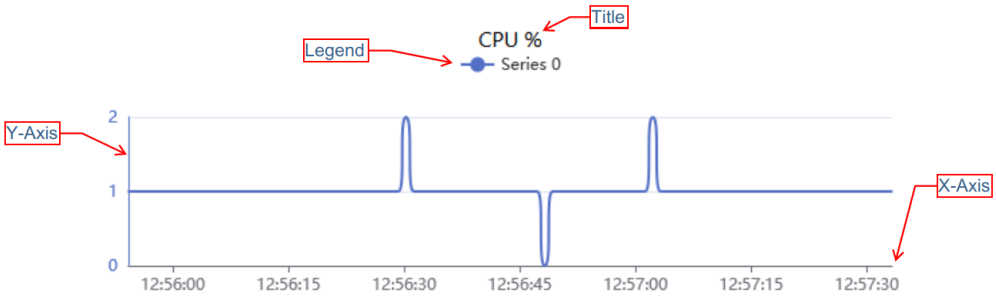
- **Smooth**: Set the degree of smoothing using the slider (Interpolation - a curve with a lower curvature).

- **Symbol**: Optional, Box activates drop-down selection; various shapes to choose from.

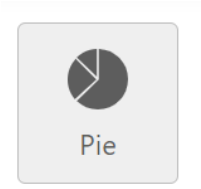


Each series can be deleted again by clicking Remove series. All entries made are then saved by clicking on Confirm.

Example Line Chart element:



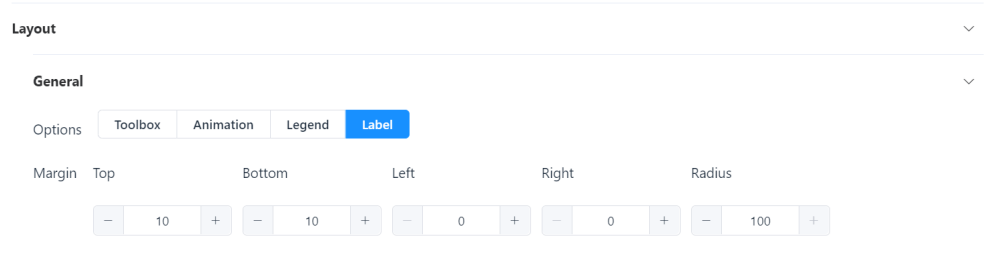
Element: Pie Chart



This element is used to show a parts-to-whole relationship for categorical data, including ordinal and nominal data. The layout can be customized to suit your individual needs.

Layout

All graphical details for the pie chart can be adjusted under **Layout**. To edit the settings, the general sub-item must be expanded by clicking on it. Further view options can be added with a mouse click.



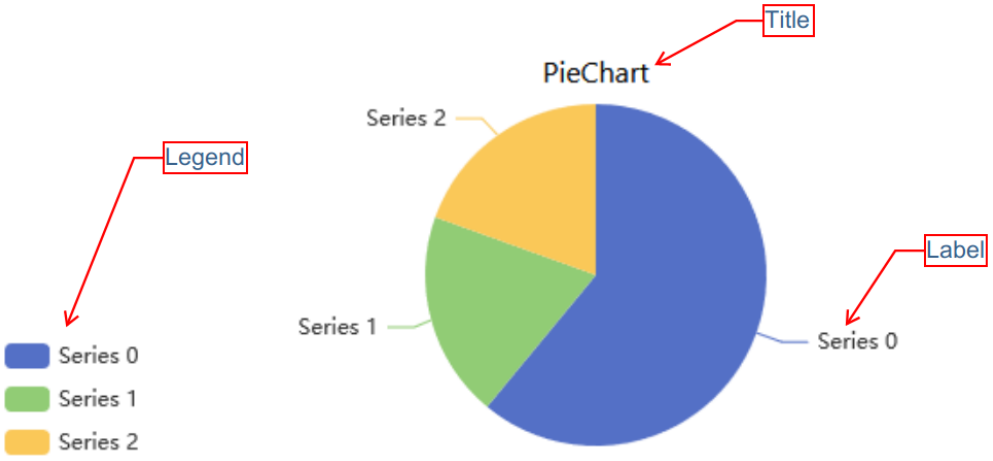
Element Pie Chart - Layout Settings

- **General**: Options can be activated with a click. Toolbox, Legend - if active, then highlighted in blue. Further setting options appear below when selected.
- **Animation**: *If active*, a flowing and continuous visualization of the value changes is displayed in the graphical representation.
- **Label**: *If active*, the name of the respective area is displayed in the graphical representation on the dashboard.
- **Margin**: Setting the limit of the pie chart, values in pixels, set via **+/-** or enter the number yourself.

Data Binding

The data connection is the same as for the Line Chart element.

Example Pie Chart element:

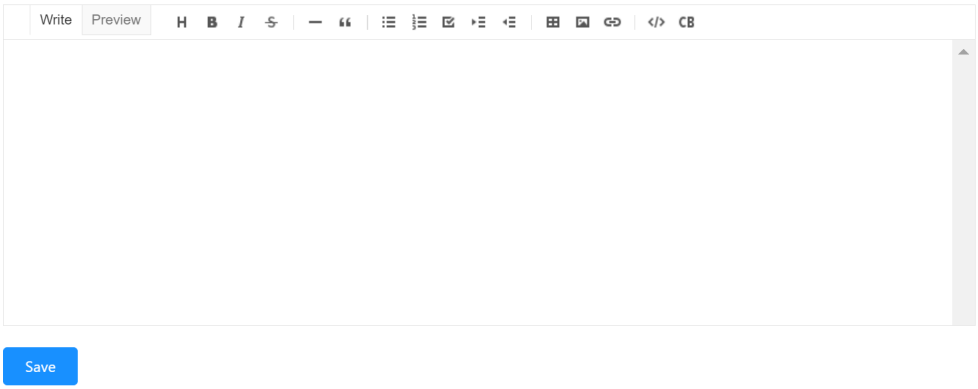


Element: Text Box

Text

This element is used to display all kinds of text entries on a dashboard. The layout can be customized to suit your individual needs.

The **Text** element contains an editor tool that can be used in a similar way to Microsoft Word to display descriptions, lists, images, links, etc.



You can write or insert texts and have various functions available in the menu bar of the text box. Among other things, you can display the text size, bold, italics, or even strikethrough text. You can highlight quotes, key points, step sequences, or even display a task list. Tables and images can be inserted. Alternatively, you can also write in a programming language.

> ℹ️ *The Text element is not suitable for displaying measured values or other data. For this purpose, the Number, Gauge, Line Chart, or Pie Chart elements are available.*

> ⚠️ *The entries are only saved if you click on **Save** (on the left under the text box)!*

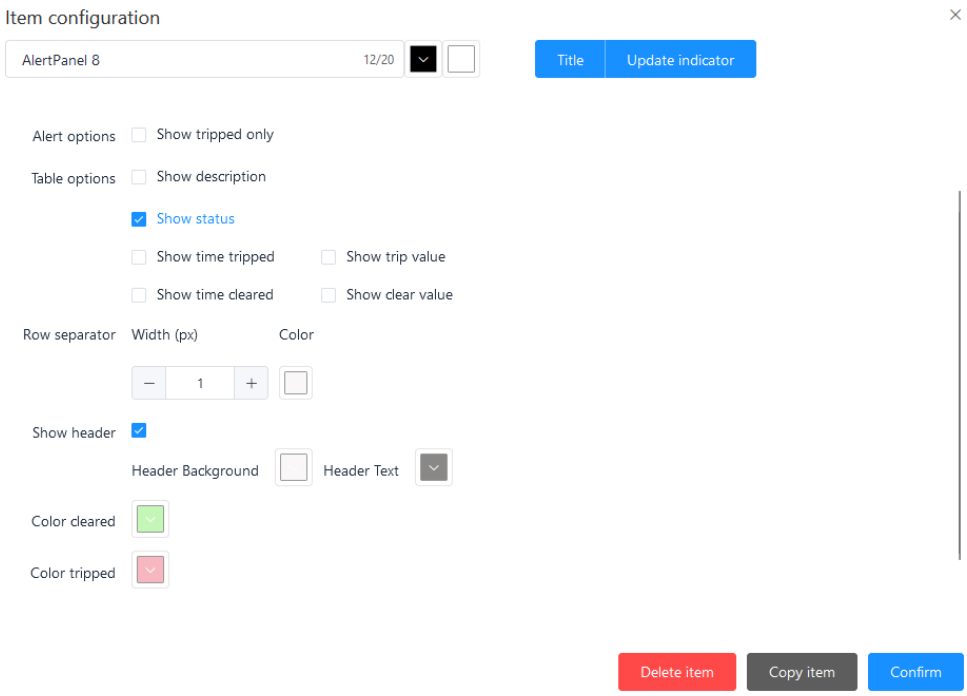
Example Text element:

Element: Alert

This element is used to display the occurring alerts on the dashboard. The layout can be customized to suit your individual needs.

Layout

All graphical view details for the Alarm element can be adjusted under Layout. To edit the settings, the submenu must be expanded by clicking on it. Further table options can be added by ticking the corresponding boxes.



Element Alert – Layout Settings

- **Alert Option**: View option can be selected by ticking the checkbox - “Show tripped only”; then alerts are displayed when they are tripped.

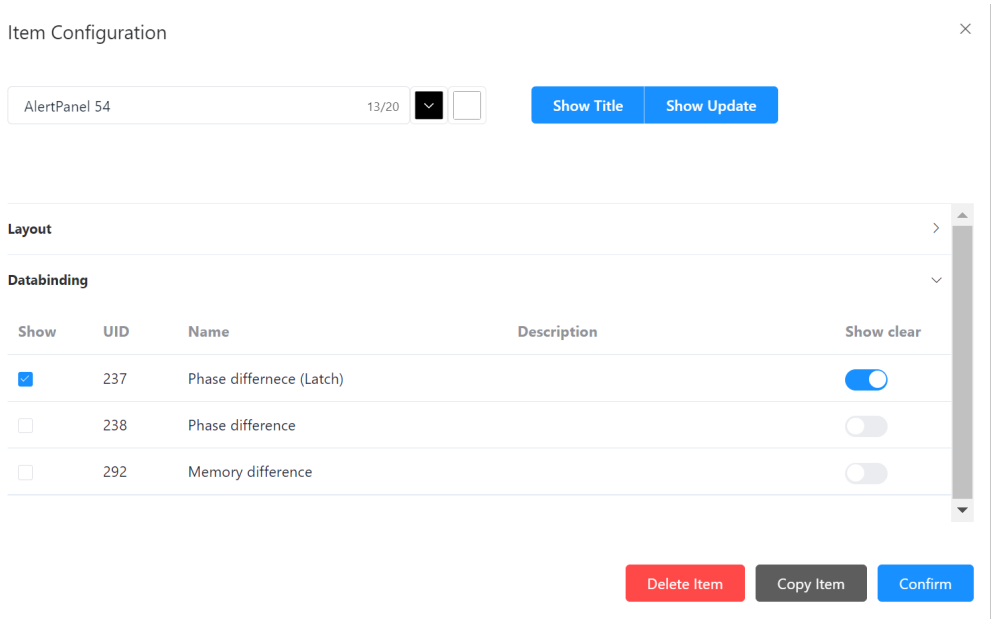
- **Table Options**: Various view options can be added by activating the checkbox: “Show description”, “Show Status”, “Show time tripped”, “Show trip value”, “Show time cleared”, “Show clear value”.

- **Row Separator**: Definition of the spacing between the individual lines, values in pixels. Color can be adjusted individually via the function of the box.

- **Header**: By ticking the checkbox, the title of the element is displayed on the dashboard, and the color of the letters and the background can also be adjusted by clicking on the corresponding color box.

Data Binding

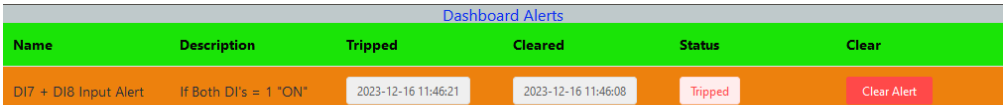
Under Data binding, you can add the alerts stored in the system that you want to display in the element on the dashboard. To do this, click to show the area and click to add the desired alerts.

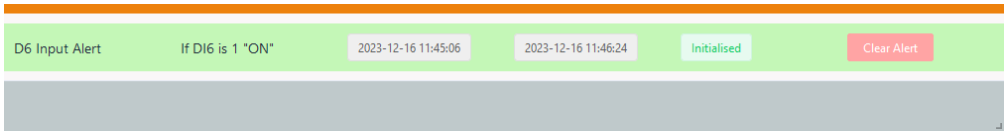


Element Alert – Data Binding

- **Show**: Selection of the alarm message to be displayed in the element on the display panel.
- **UID**: Code number of the created alert.
- **Name**: Title of the created alert.
- **Description**: If a description has been entered, this is also displayed.
- **Display delete function**: Activation via digital slide control; it is possible to add a delete function for the respective alarm to the element in the dashboard.

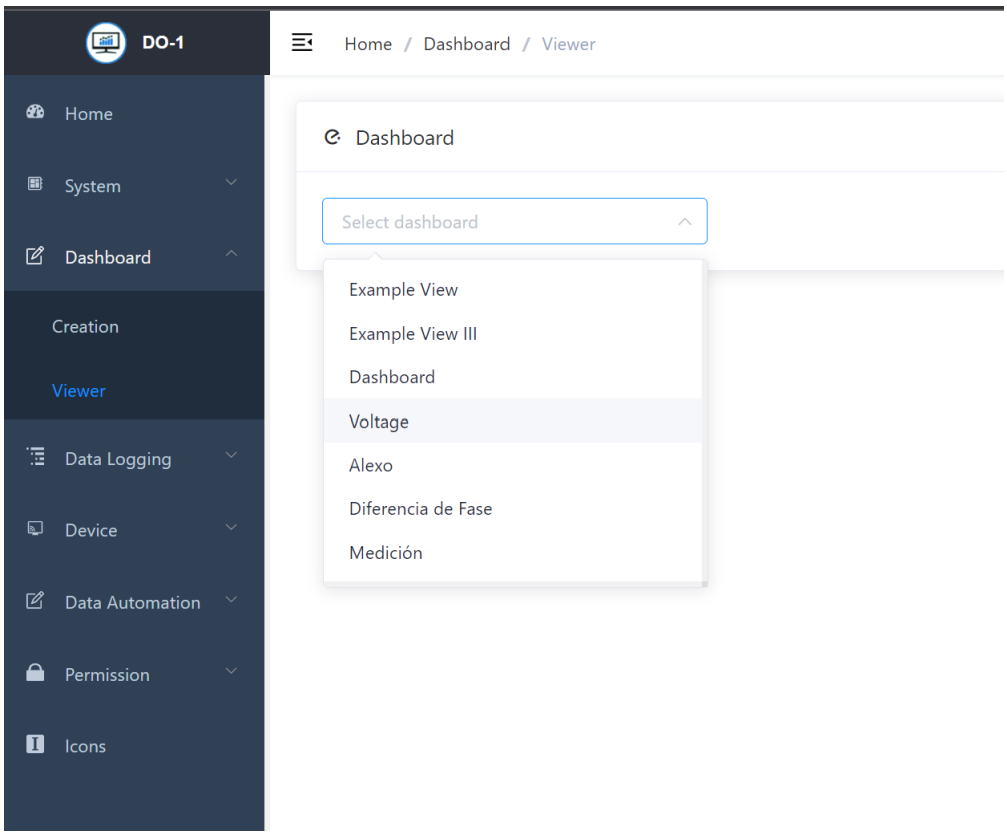
Example Alert element:



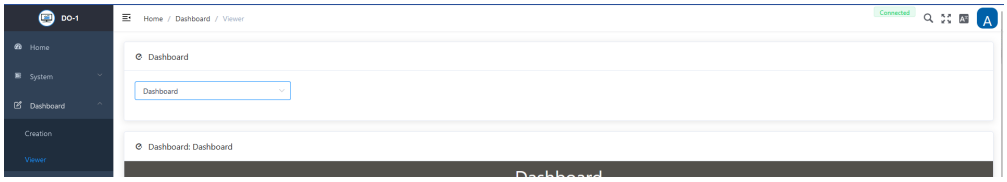


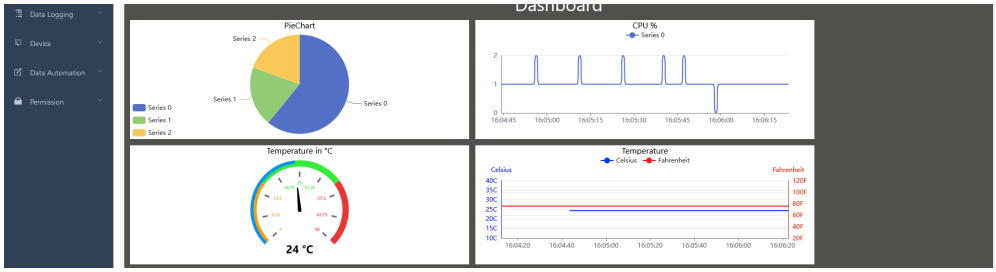
Viewer: Preview of the Created Dashboards

As soon as a new dashboard has been created, the corresponding dashboard can be selected for preview via a drop-down menu. This provides a quick insight into the appearance and arrangement of the graphical elements. The preview function helps to check whether the overviews meet expectations before they are shared with other users or set as the start page.



Example View




Data Logging
Device
Data Automation
Permission
Dashboard
PieChart
Series 2
Series 1
Series 0
Series 0
Series 1
Series 2
CPU %
Series 0
2
1
0
16:04:45
16:05:00
16:05:15
16:05:30
16:05:45
16:06:00
16:06:15
Temperature in °C
24 °C
Temperature
Celsius
Fahrenheit
Celsius
Fahrenheit
40C
35C
30C
25C
20C
15C
10C
120F
100F
80F
60F
40F
20F
16:04:20
16:04:40
16:05:00
16:05:20
16:05:40
16:06:00
16:06:20

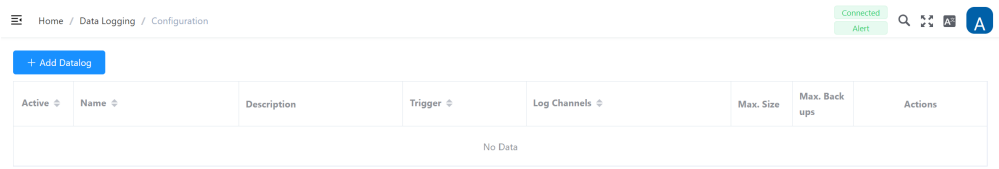
Function: Data Logging

Reliable basis for data-driven decisions

This chapter explains an essential function of the **DO-1** - Data Logging. The creation of logs makes it possible to record certain events or actions, which can be helpful for fault diagnosis, among other things. The saved data can then be viewed and downloaded for further processing.

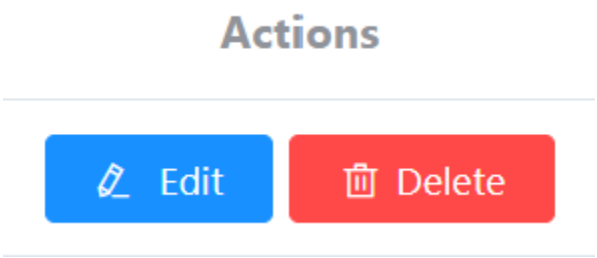
Configuration – Add and edit data log tasks

Clicking on **Configuration** opens the main page of this function. Once log tasks have been created, they appear in a list view. The tasks can be subsequently edited at any time.



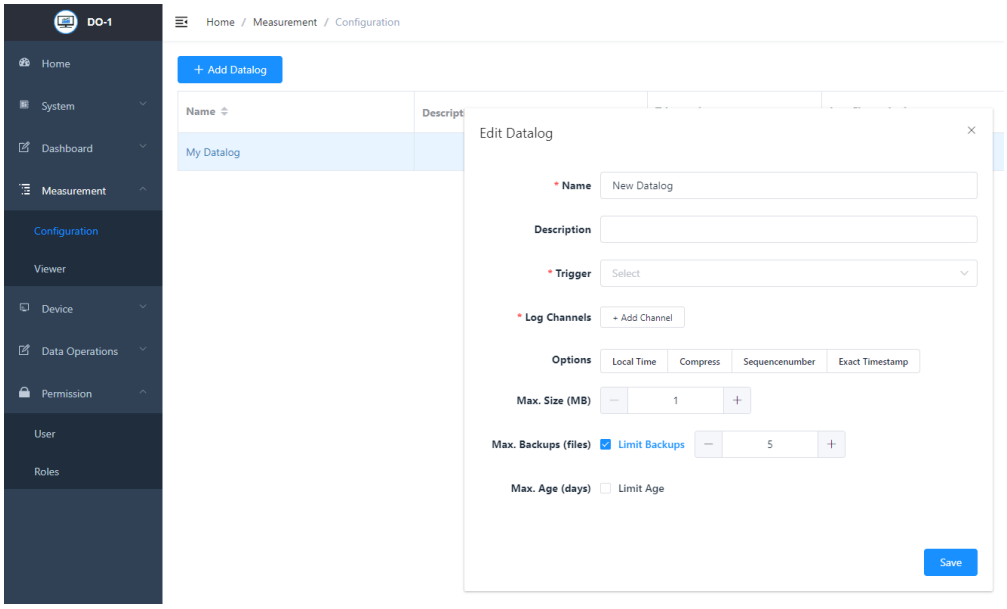
The following actions are available for log tasks that have been created:

ACTION	DESCRIPTION
Edit	Opens the data entry for editing the settings
Delete	Removes the order from the system. (A warning notice must also be confirmed)



Adding a job for a data log

Click on **Add data log** to open another window with the following entry mask.



Edit data log - Settings

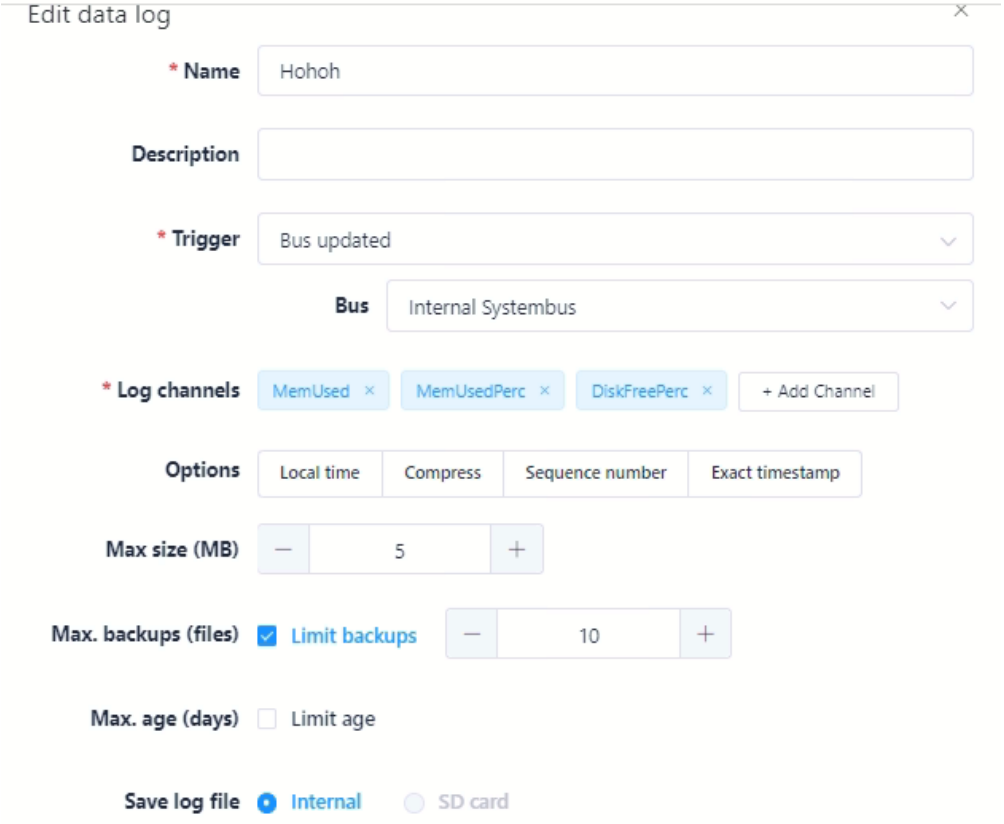
FIELD	DESCRIPTION
Name *	Individual; Assignment of a name for the data log
Description	Optional; any description can be added here, including more detailed information about the data log.
Trigger *	Specify what exactly should trigger the calculation. Several areas are available for selection via a drop-down menu: **System based:** Bus updated, Bus failure, Device updated, Register updated, Buffer full. If selected, the respective location (bus, device, register) must be selected in an additional field. **Data automized:** Calculation completed, alarm triggered, Alarm cleared, Alert triggered or cleared. If selected, the respective calculation or alarm must be selected in another field. **Time based:** Runs every...; Specify frequency and time of day (dd, hh:mm:ms) when the calculation is to run. Runs at...; Specify exact timing (seconds, minutes, hours, day, month) for the calculation.
Log channels *	Add the corresponding location channels. This is necessary for the trigger to work. You can add several channels via Add channel
Options	Several options can be added to the order to obtain detailed information that may be necessary for the evaluation of the data. **Local time:** The time is logged in the local time zone instead of UTC (Coordinated Universal Time) **Compression:** Sends log-file(s) to a gzip compressed file format

FIELD	DESCRIPTION
	Sequence number: In addition to the measured value, the sequence number of the measured value is logged. **Exact timestamp:** Adds the exact time an event was recorded to the log-file.
Max. Size (MB)	Define the maximum file size in megabytes
Max. backup (files)	Define the maximum backup copies
Max. Age (days)	Limitation possible; if you activate the limitation, a limitation of the maximum days must be entered.

Note: All fields marked with `*` are mandatory.

⚠ Precise information on the triggering event for data storage is particularly important. This includes details such as the source of the measured value in question (e.g. the specific sensor or data acquisition device), the triggering of a specific alarm or the result of a specific calculation that precedes this storage process.

Example for a data log task:



Click on **Save** to secure all entries made for the data logging task.

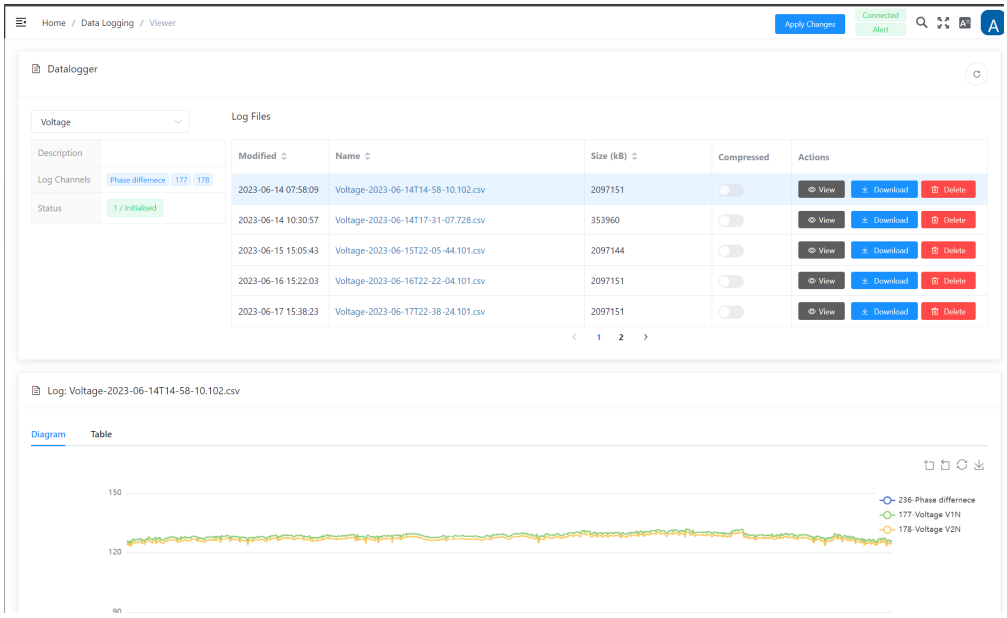
Viewer – Access the saved data logs

The Viewer provides access to the saved data for the individual jobs. Use the drop-down menu on the top left to select the relevant job and, in addition to the general information (description, channels and status), all log files that have already been created are displayed chronologically.

The following actions are available here:

ACTION	DESCRIPTION
View	Displays a corresponding graphic in the lower screen
Download	Downloads the data file in .csv (comma-separated values) format
Delete	Allows the data file to be removed

Example of a data log overview:



Function: Device

Efficient device management

This chapter explains the Device function on the **DO-1** user interface, where you will find all the necessary information about **Modbus RTU** , the creation of Modbus **TCPs** , the template library, and the registration of connected devices in the system.

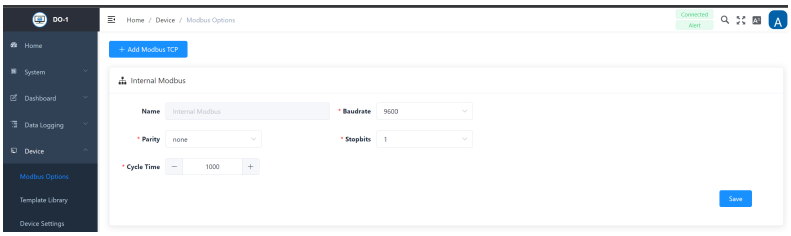
⚠️ *After changes have been made to the device settings, the **Apply changes** button appears at the top right of the page. This must be clicked to actively apply the changes to the system.*

Overview:

- Modbus Options: RTU and TCP
- Template Library - Specifications for the connected Modbus devices
- Device Settings: Connection of the connected devices to Modbus RTU / TCP

Modbus Options: RTU and TCP

The data for the Internal Modbus RTU is displayed under the Modbus Options menu item and can be partially customized.



The name of the internal Modbus RTU and its settings are already stored.

Internal Modbus RTU - Settings

FIELD	DESCRIPTION
Name	Interner Modbus – *not modifiable!*
Baud rate *	Determining the baud rate, use the drop-down functionality to select the right rate. **IMPORTANT!** *It should be noted that all devices need to be operated in the same way.*
Parity *	Definition of the network parities: none, even, or odd.
Stop Bits	Select **1** or **2**

FIELD	DESCRIPTION
Cycle Time	Specification of the time limit for the duration of a cycle.

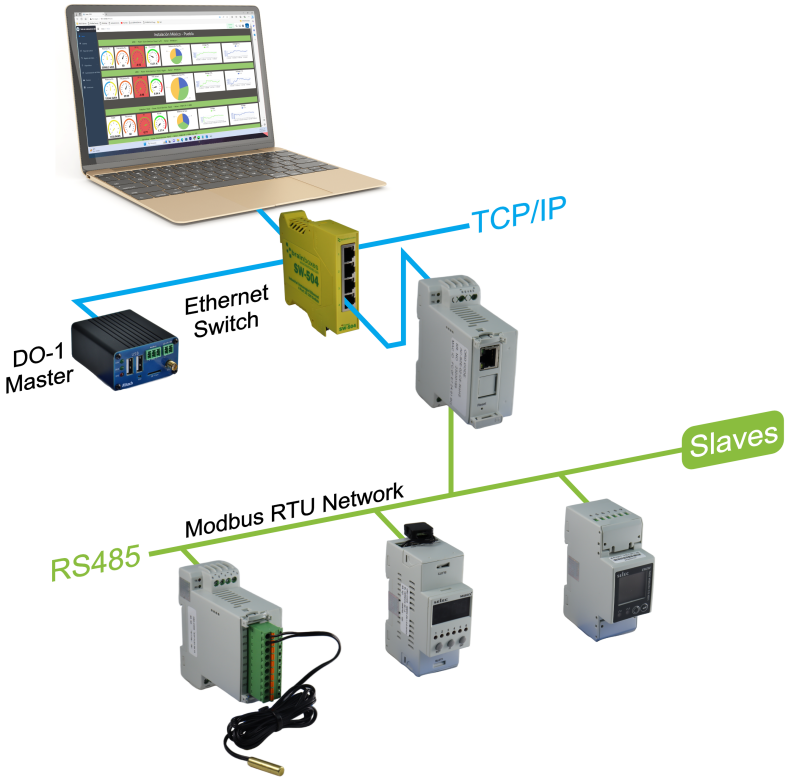
Note: All fields marked with `*` are mandatory.

> If necessary, the settings (except for the name) can be adjusted.

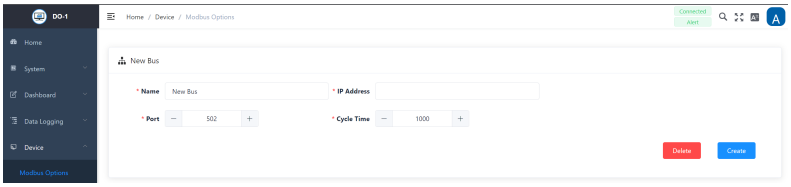
Click on **Save** to update the details.

Add Modbus TCP

If data acquisition devices are connected to the ****Local Area Network (LAN)**** but not directly to the **DO-1**, a separate ***Modbus TCP*** must be created.



Click on **Add Modbus TCP** to open an input mask in which the settings for ***Modbus TCP*** can be entered:



New Bus - Modbus TCP

FIELD	DESCRIPTION
Name *	Specifying the bus
IP-Address *	Enter the corresponding IP address of the connected Modbus TCP device
Port *	Enter the port information of the connected Modbus TCP device
Cycle Time *	Specification of the time limit for the duration of a cycle

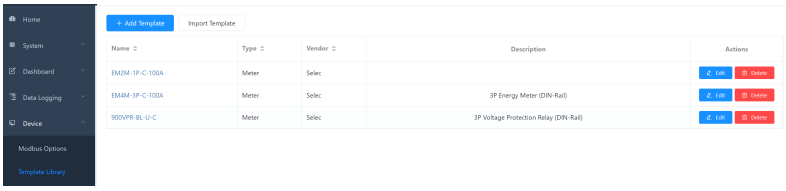
Note: All fields marked with `*` are mandatory.

The following actions are available for the entries:

ACTION	DESCRIPTION
Create	Creates the entries in the system.
Delete	Removes the entry from the system. (A warning notice must also be confirmed) **IMPORTANT!** If devices are already assigned to the created Modbus TCP, the entry cannot be deleted. To do this, the corresponding devices must first be removed from the Modbus TCP in the Device settings menu item. When deleting, a warning notice appears which must be confirmed. The deletion process is final and cannot be undone.

Template Library – Specifications for the connected Modbus devices

Clicking on **Template Library** opens the main overview page of the library. The necessary device templates including their registers are created here so that they can be assigned to the connected devices accordingly.



You can choose from a variety of device templates and there is also the option of importing device templates using a further function.

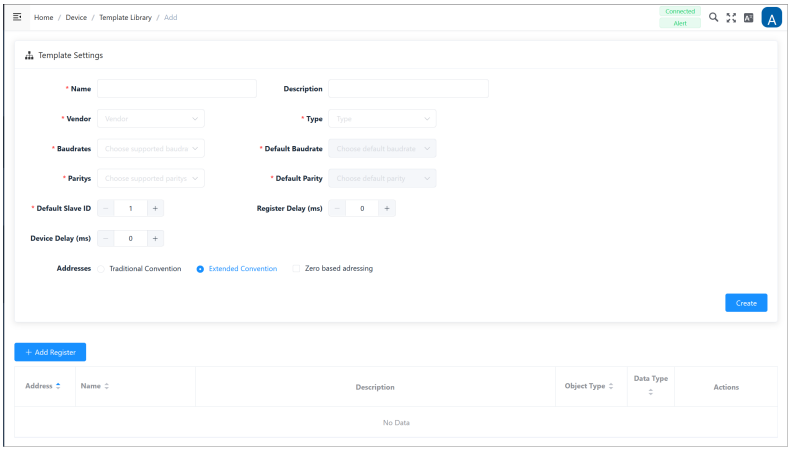
The following actions are available for existing/created templates:

ACTION	DESCRIPTION
Edit	Opens the data entry for editing the details.
Delete	Removes the template from the system. (A warning notice must also be confirmed)

Add Device Template

In order to be able to select information about connected devices, the corresponding information must first be stored in the system. If the device is not yet included in the existing template library, a new device template must be created.

Click on **Add template** to display the following entry mask:



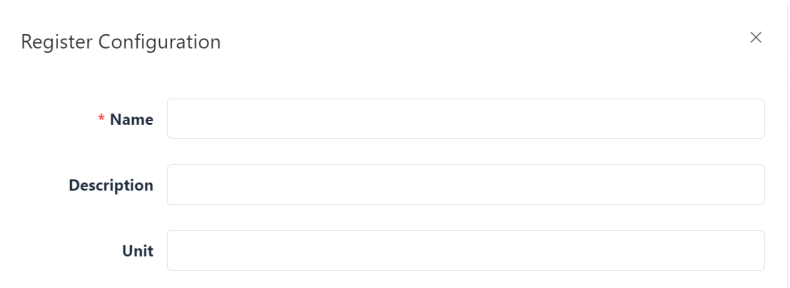
Add template - Settings

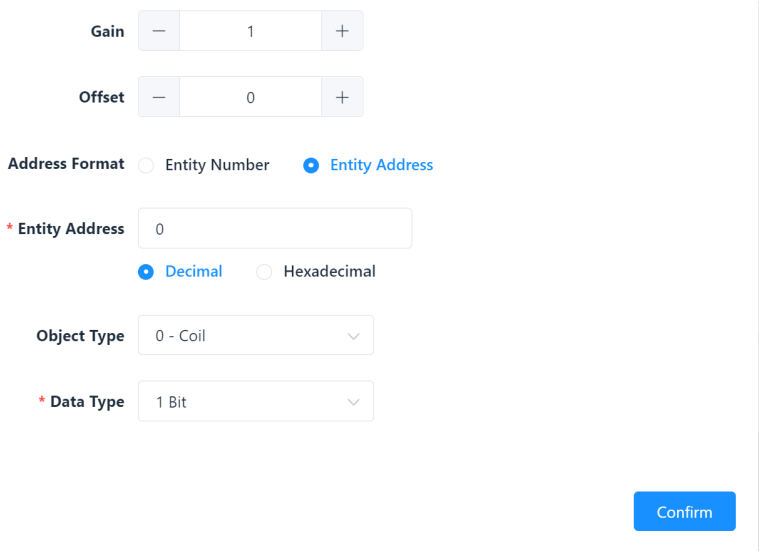
FIELD	DESCRIPTION
Name *	Enter the name of the device template
Description	Any description can be added here, including a more detailed description of the device.
Vendor *	Input/selection of the device manufacturer (e.g. Selec, ...)
Type *	Input/selection of the device type (e.g. meter, sensor, PLC, I/O module)
Baud rate *	Selection of all supported baud rates (e.g. 9600, 19200, etc.)
Default Baud rate *	After selecting the supported baud rates, select the standard baud rate here, which is specified in the data sheet.
Parity *	Selection of parity: none, even, odd.
Default Parity *	After selecting the supported parity, select the standard parity here, which is specified in the data sheet.
Default Slave-ID *	Refer to the data sheet of the device for the default setting.
Register Delay	Refer to the data sheet of the device for the setting.
**Device Delay **	Refer to the data sheet of the device for the setting.
Addresses	Definition of addressing: traditional convention, extended convention, addressing on a zero basis.

Note: All fields marked with `*` are mandatory.

By clicking on **Create**, the entries are saved and the template is created and is now available for further editing in the list view of the main page.

In the lower half, the register entries are made, which can also be found in the manufacturer's instructions. Click on **Add register** to open a small window with the corresponding entry mask.





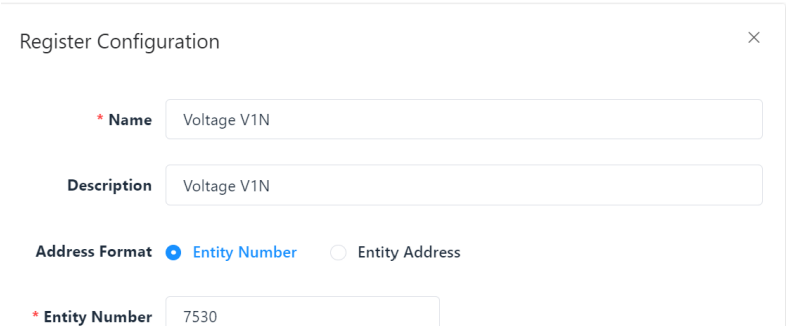
Register Configuration - Settings

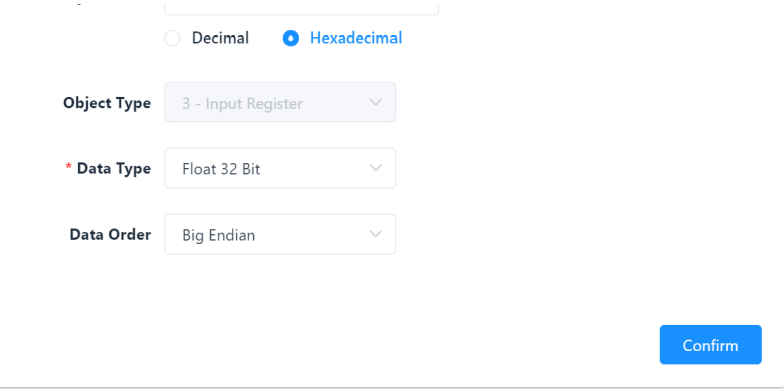
FIELD	DESCRIPTION
Name *	Assignment of the register name
Description	Any description can be added here, including more detailed information on the register.
Address Format	Selection of whether the register number or the register address of the unit is used.
Entity Number *	Field appears when the "Unit number" format is selected; enter the corresponding number, decimal or hexadecimal.
Entity Address	Field appears when the "Unit address" format is selected; enter the corresponding address, also numeric, decimal or hexadecimal.
Object Type	Selection only possible with previous format selection "Unit number"; 0-Coil, 1-Discrete Input, 3-Input Register, 4-Holding Register.
Data Type *	Definition of the bits, depending on the previous selection of the object type, the corresponding bit selection is available here.
Data Order	Appears only if the "Unit address" format is selected; selection options: Little Endian, Big Endian, Little Endian Reversed, Big Endian Reversed.

Note: All fields marked with `*` are mandatory.

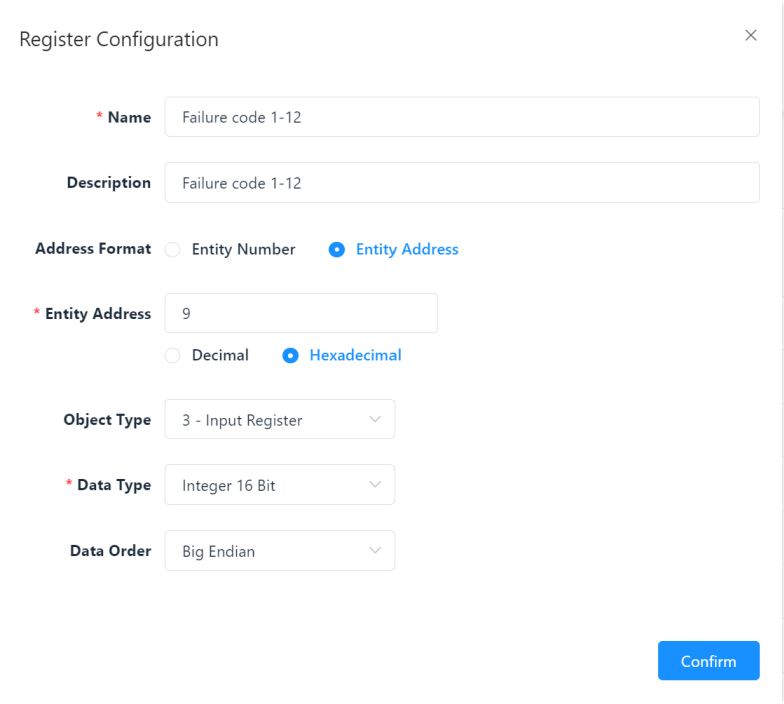
Two examples of possible register entries:

1. **Entity Number**





2. **Entity Address**



Once all the details have been entered, the respective register is saved by clicking on **Confirm**. After registers have been created, they are included in the register list of the corresponding template.

The following actions are available for entered registers:

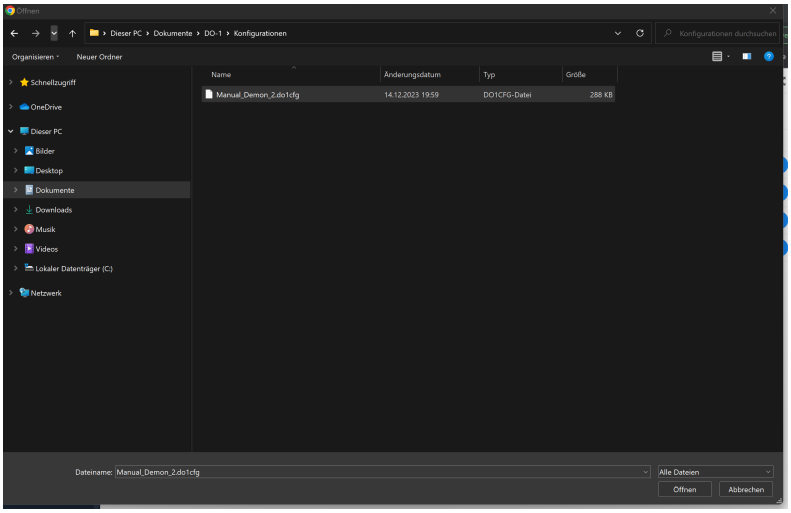
ACTION	DESCRIPTION
Edit	Opens the data entry for editing the details.
Delete	Removes the register from the system. (A warning notice must also be confirmed) **IMPORTANT!** *This process must be repeated for all required sensors and measured value recording devices; otherwise, errors or incorrect value determinations may occur.*

Import Template

If device templates are available externally, they can be uploaded separately. Proceed as follows:

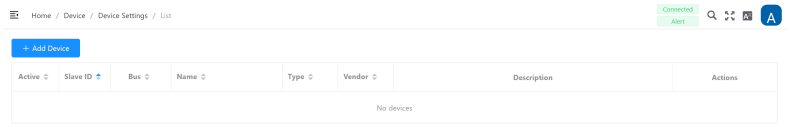
1. Click on the **Import template** button.

2. The Explorer window of the computer opens.
3. Select the corresponding file from the folder or area of your own computer.
4. Click on **Open** at the bottom right – the template is now stored in the library.



Device Settings: Connection of the connected devices to Modbus RTU / TCP

A click on **Device Settings** opens the main overview page. All information about the connected devices must be stored here. Initially, the list view on the main page does not yet contain any entries.



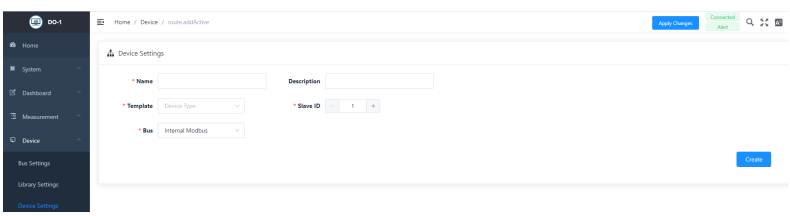
Additional Function: Active

This function can be used to deactivate or reactivate stored devices in the **DO-1**. To do this, operate the slider with a mouseclick.

Add Device

If a device has been connected to the **Modbus RTU** or **TCP**, the device must be created in the system so that the corresponding data storage can be configured via the **DO-1**. The details of the device and its register must already be available in the template library before the device can finally be created under this function.

Clicking on **Add device** opens the following input screen:



Add Device - Settings

FIELD	DESCRIPTION
Name *	Individual; Assigning a device name
Description	Optional - Any description can be added here, including more detailed information about the device.
Template *	Selection of the template with all relevant, necessary information on the device, where the corresponding registers are also stored.
Slave ID *	Specification of the numerical identifier in the network that is assigned to the device.
Bus *	Selection of the Modbus to which the device is connected.

Note: All fields marked with `*` are mandatory.

To save the entries, click on **Create**.

The following actions are available for created devices:

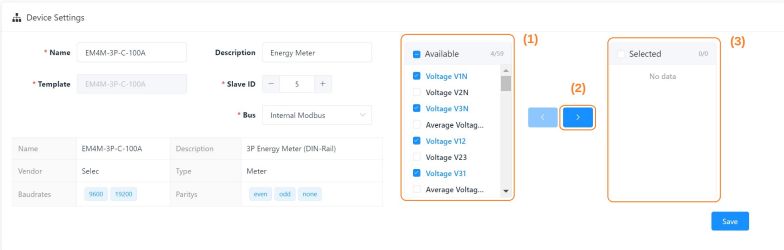
ACTION	DESCRIPTION
Edit	Opens the data entry for editing the details.
Delete	Removes the device from the system. (A warning notice must also be confirmed)

The registers saved in the device template must then be selected. Two further fields appear on the right-hand side. The “Available” list contains all the registers saved in the template.

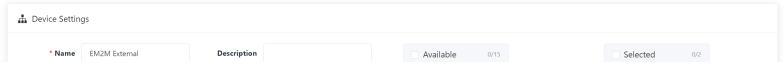
Selecting Active Registers

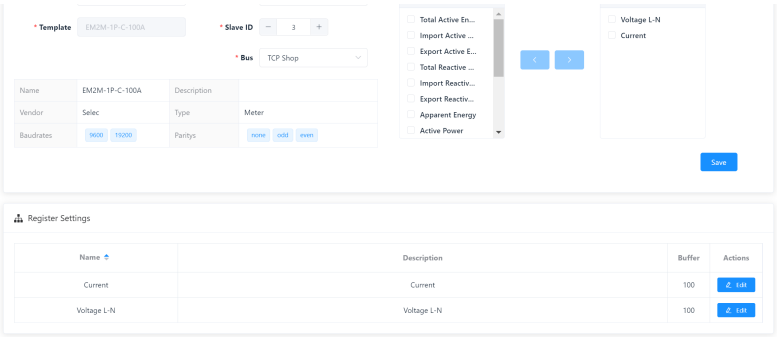
To select the active registers, proceed as follows:

1. Select the relevant tabs from the Available (1) list by clicking on them. It is also possible to select all available tabs by ticking the box in front of Available.
2. Use the assignment function (2) (click on the arrow button) to transfer the registers to Selected (3).
3. The selected registers then appear in a list view below the input screen.
4. Click on **Save** to secure the selection. This also works in reverse for the Selected box to remove the tabs from the selection.

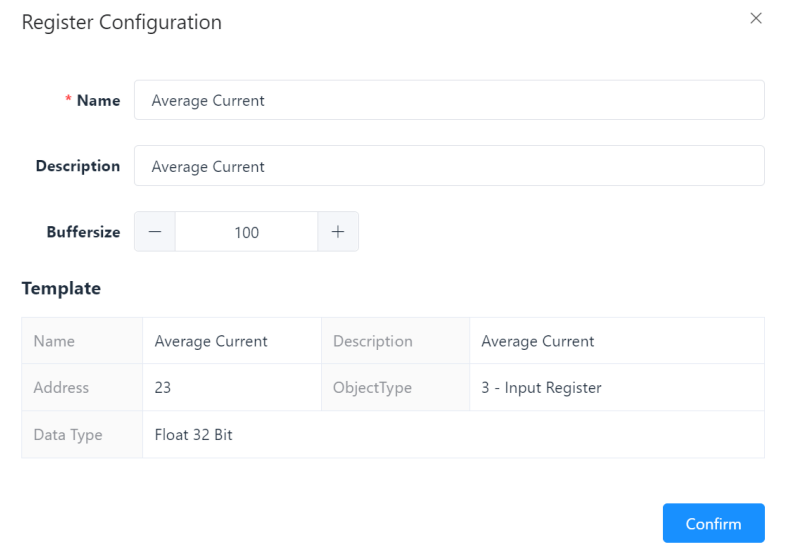


Here is an example that shows a complete device entry for a Selec Meter:





You can change the name, description, and buffer size of the Register afterward at any time by clicking on **Edit**.



Edit Register - Settings

FIELD	DESCRIPTION
Name *	This name was assigned when the template was created, but can be changed.
Description	A description may have already been added when the template was created. This can be edited.
Buffer size *	The buffer size follows a specific specification. This can be viewed in the dealer information. If necessary, it can be adjusted here. To do this, enter the value or change it by clicking +/- .
Template *	Displays the data from the corresponding device template.

Note: All fields marked with `*` are mandatory.

Click on **Confirm** to secure the changes.

Function: Data Automation

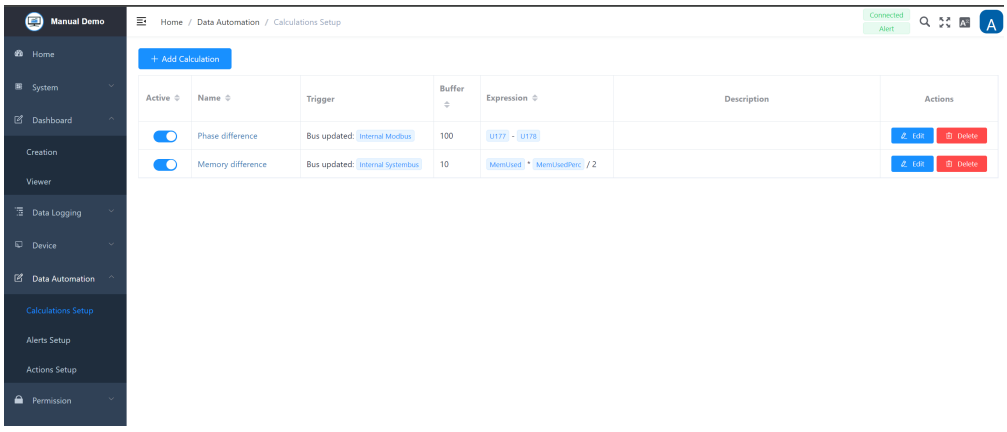
Optimisation of work processes and increase in productivity

This chapter explains the Data Automation function, how to create calculations, set up alarms and define appropriate measures. By using these functions, it is possible to react more quickly to events. Analyses of machine data are helpful for informing users about anomalies at an early stage.

Overview:

Calculations Setup

Clicking on the submenu item *Calculations Setup* takes you to the following overview page. Once calculations have been created, they appear in a list view. The calculations can be subsequently edited at any time.



Add Calculation

Clicking on the **Add calculation** function opens another window with an input screen. All data required for the individual calculation must be entered here.

Edit Calculation - Settings

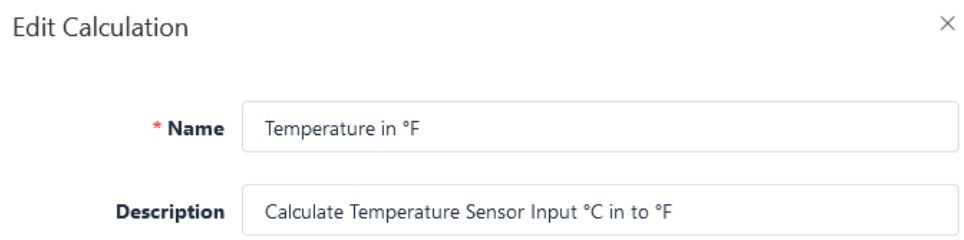
FIELD	DESCRIPTION
Name *	Assigning a name
Description	Optional; Enter a description for easier identification
Buffer size *	Definition of number of intermediate storage of values, default 10
Equation *	Selection of the variables created using the search function, designations defined by the system, definition of the equation
Trigger *	Specify what exactly should trigger the calculation. Several areas are available for selection via a drop-down menu
Enable compression	Operate slider via mouse click, if activated; the value of the variable does not change and no new data point is generated, but the previous value is always used
Persistent	Operate slider via mouse click, if activated; values of the variables are retained and not deleted
Enable initialization	Operate slider via mouse click, Assignment of an initial value or initial state of a variable that contains 0 in an equation at the start of the calculation

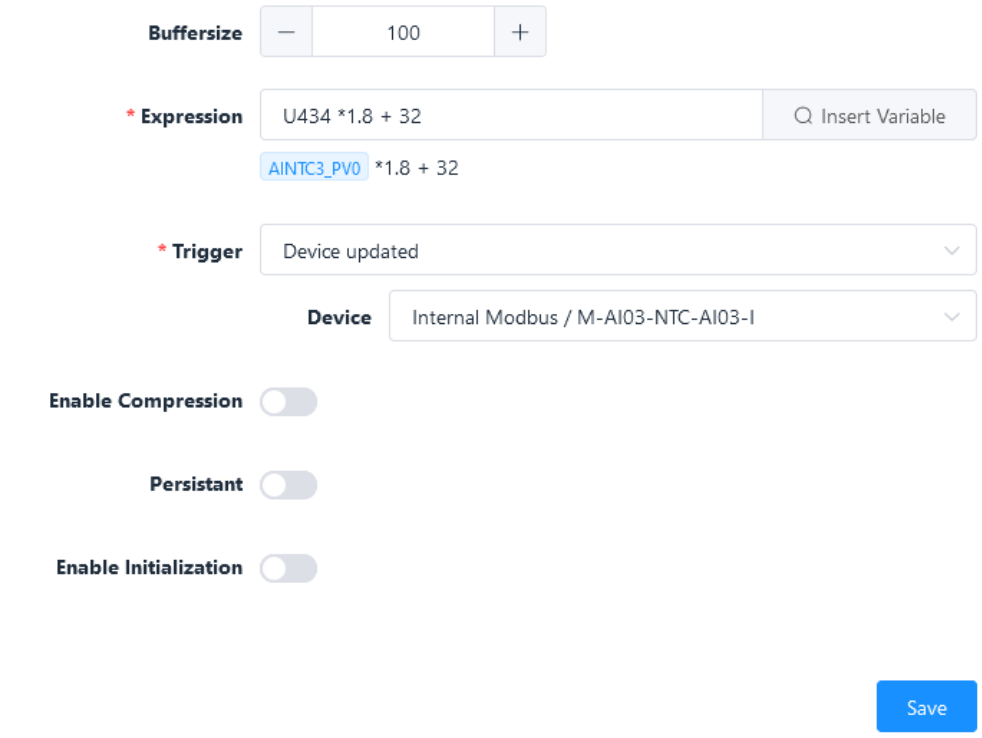
Note: All fields marked with `*` are mandatory.

The following actions are available for created calculations:

ACTION	DESCRIPTION
Edit	Opens the data entry for editing the details
Delete	Removes the device from the system. (A warning notice must also be confirmed)

Example Calculation:

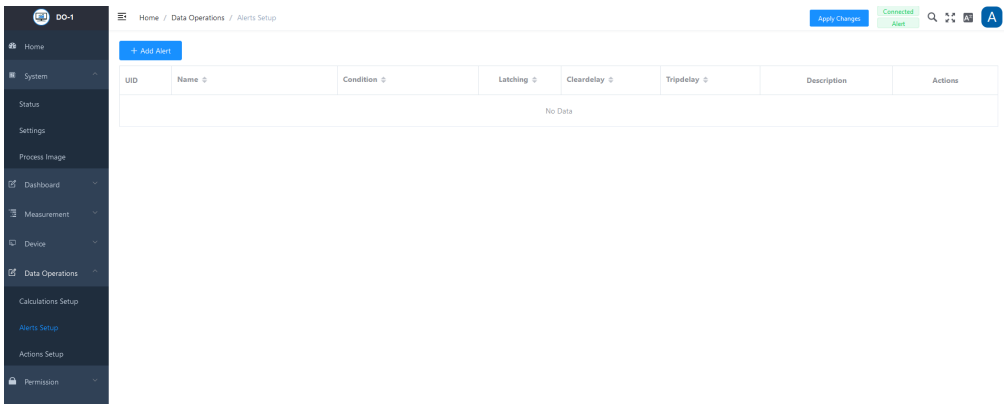




⚠ After changes have been made to the device settings, the **Apply changes** button appears at the top right of the page. This must be clicked to actively apply the changes to the system.

Alerts Setup

Clicking on the submenu item *Alerts Setup* takes you to the main overview page. Once alerts have been created, they appear in a list view. The entries can be subsequently edited at any time.



Add Alert

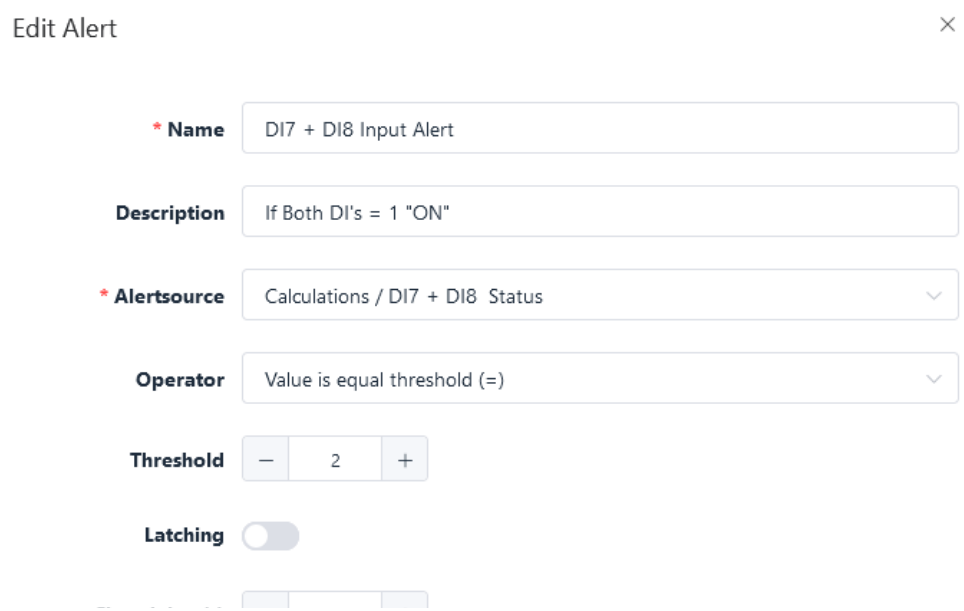
Click on **Add alarm** to open another window with an input screen. All the necessary settings for the corresponding alarm must be entered here.

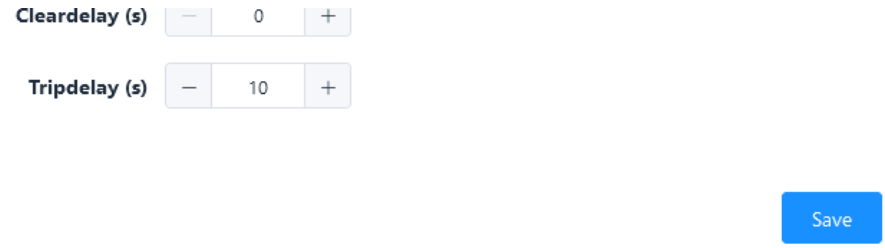
Edit Alert - Settings

FIELD	DESCRIPTION
Name *	Enter an individual designation
Description	Enter a description for more precise identification
Source *	Definition of the starting point for the alarm message
Operator *	Definition of the formula when the alarm message should be triggered
Threshold *	Specification of the value above or below which the alarm is to be triggered
Latching	Operate the slider via mouse click; if active, the current status is retained even after the input signal that triggered it has been removed
Clear delay (S)	Definition of the seconds after which the delay is to be cancelled
Trip delay (S)	Definition of the seconds after which the alert should be triggered again

Note: All fields marked with `*` are mandatory.

Example Alert:





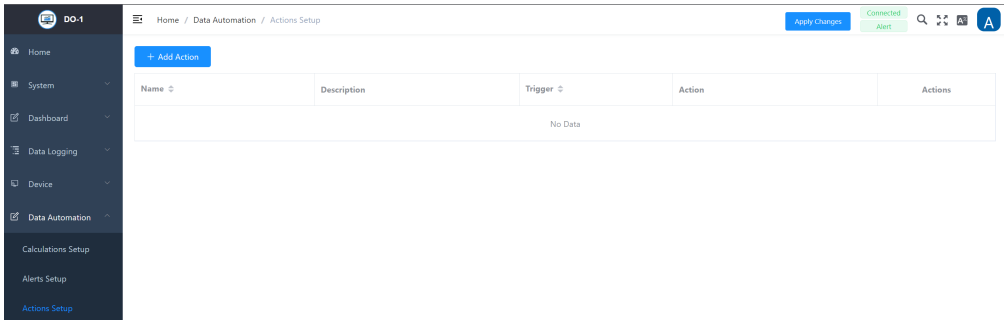
The following actions are available for created alerts:

ACTION	DESCRIPTION
Edit	Opens the created alert for editing the details
Delete	Removes the alert from the system. (A warning notice must also be confirmed)

⚠ *After changes have been made to the device settings, the **Apply changes** button appears at the top right of the page. This must be clicked to actively apply the changes to the system.*

Actions Setup

Clicking on the submenu item *Actions Setup* takes you to the main overview page. Once actions have been created, they appear in a list view. The entries can be subsequently edited at any time.



Add Action

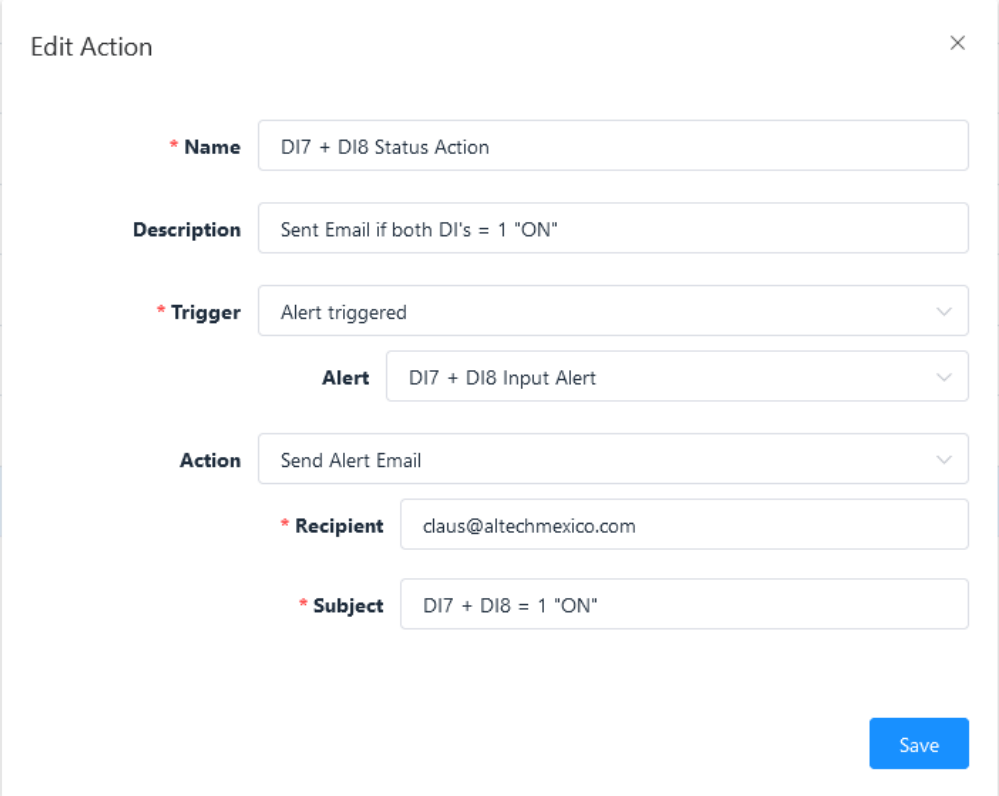
By clicking on **Add Action** another window with an entry masks opens. Here all necessary information for the action are to be entered. There are several trigger and action options to choose from:

Edit Action - Settings

FIELD	DESCRIPTION
Name *	Enter a designation
Description	Enter a description for more precise identification
Trigger *	Specify what exactly should trigger the action. Several areas are available for selection via a drop-down menu
Action *	Select from drop-down list

Note: All fields marked with `*` are mandatory.

Example Action task:



The following actions are available for created actions:

ACTION	DESCRIPTION
Edit	Opens the created action for editing the details
Delete	Removes the action from the system. (A warning notice must also be confirmed)

⚠️ *After changes have been made to the device settings, the **Apply changes** button appears at the top right of the page. This must be clicked to actively apply the changes to the system.*

Function: Permissions

Settings for assigning users and roles

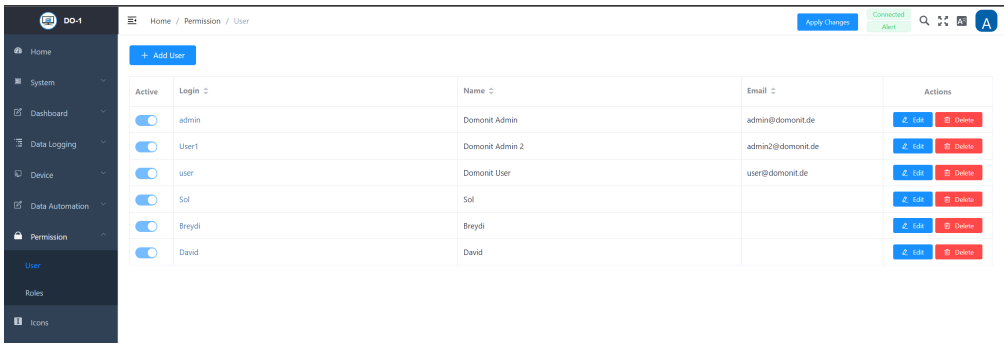
This chapter explains the user and role creation functions. These offer the option of creating additional users and corresponding roles. This can only be done by the respective administrator of the **DO-1** and is not available in the normal user view.

Overview:

- User
- Roles

User

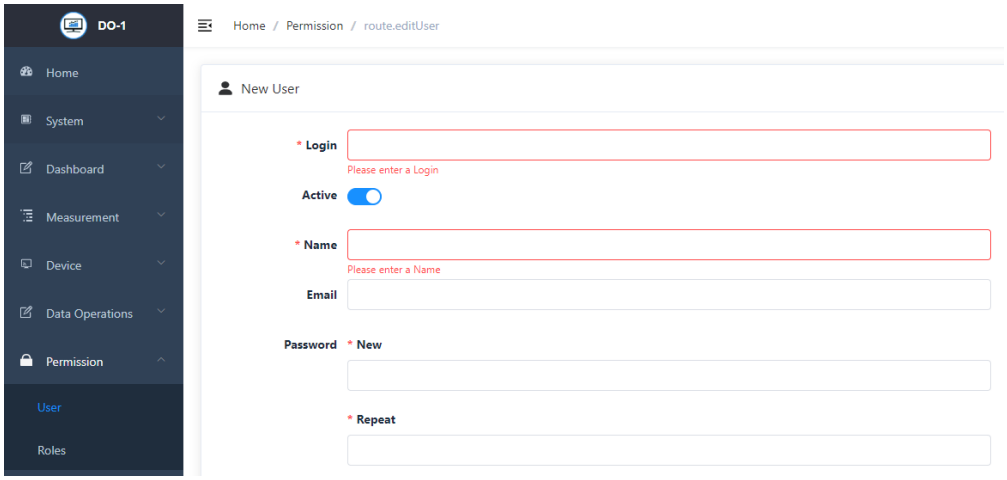
This page shows the created users in a list view. When you first log in, the administrator is already created; all other users still need to be created. It is also possible to create several administrators.



Add User

Clicking the Add User button opens an input screen in which all the necessary information for a new user can be entered. The upper section contains the user data, while the lower section contains the default settings for the evaluation view for the start page, the user role

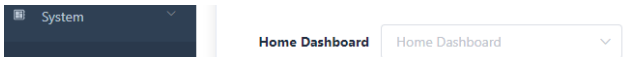
and the authorizations of the respective user.

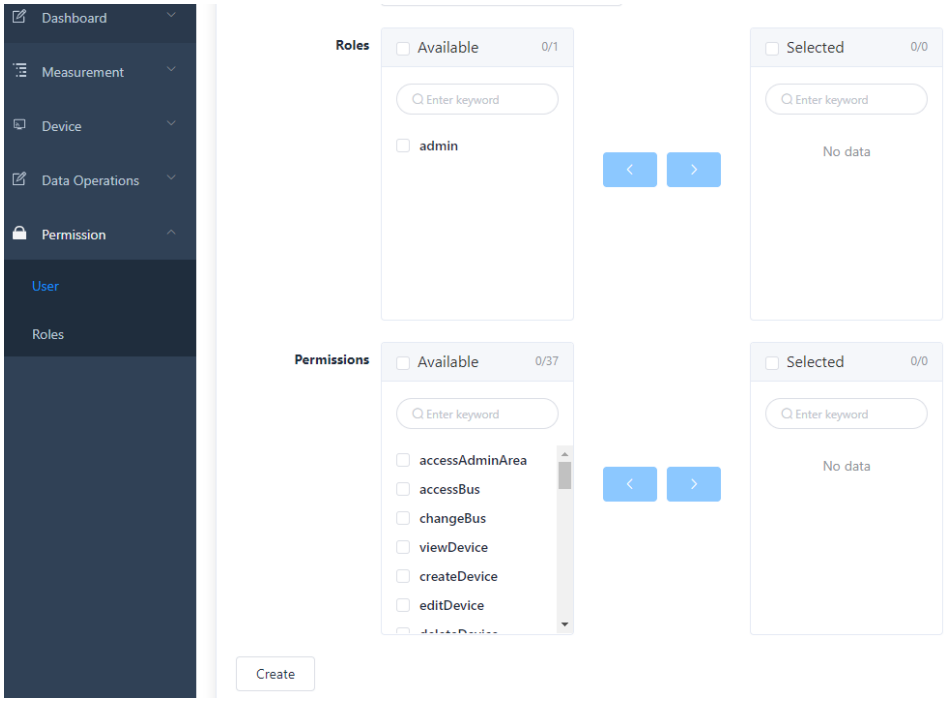


New User- Settings

FIELD	DESCRIPTION
Login *	Enter an individual login name for the user
Active	Activation/deactivation by means of a digital slider; thus the user is set active or inactive
Name *	Enter the name
Email *	Enter the corresponding e-mail address
Password - New *	Definition of a password, there are no rules for assigning passwords
Password - Repeat *	Enter the password again, there are no rules for assigning passwords
Home Dashboard	A home Dashboard can be pre-selected from existing dashboards
Language	A default language can be selected for the user (English/German/Spanish)
Roles	From the “Available” box, select the corresponding role and add it to the “Selected” box by clicking the arrow button to the right
Permissions	From the “Available” box, select the corresponding permission and add it to the “Selected” box by clicking the arrow button to the right

Note: All fields marked with `*` are mandatory.

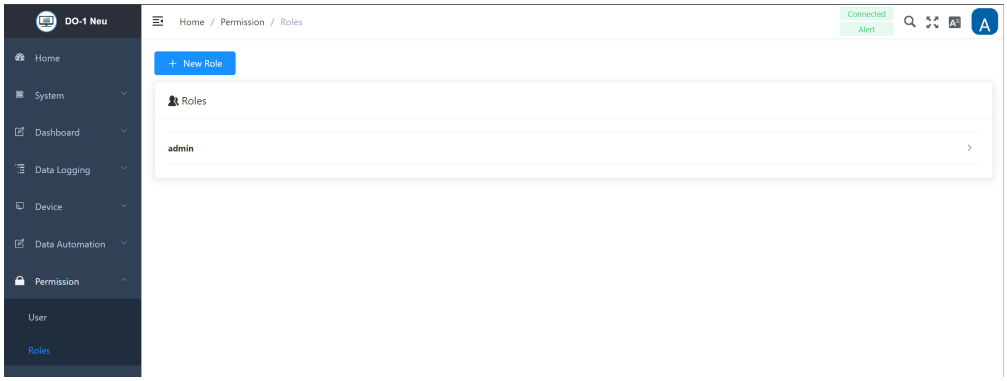




Click on **Create** to save all user settings.

Roles

Clicking on the menu item *Roles* takes you to the overview page of the roles in the system. The **Admin** role is preset by default. The administrator is responsible for the settings and changes to the **DO-1** and can assign specific roles with individual permissions here. The admin role cannot be changed.



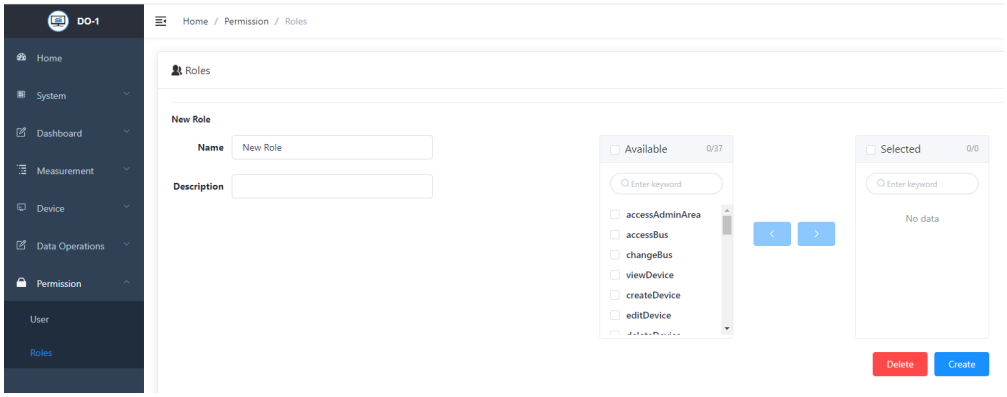
Add new role

Clicking on **Add role** opens an entry screen in which all the necessary details for a new role have to be entered. The available permissions are displayed in the “Available” box and can be

assigned accordingly.

New role – Settings

FIELD	DESCRIPTION
Name	Enter an individual login name for the user
Description	*Activation/deactivation by means of a digital slider*; thus the user is set active or inactive
Permissions	From the “Available” box, select the corresponding permission and add it to the “Selected” box by clicking the arrow button to the right



Click on **Create** to save all entries. Click on **Delete** to erase the entries.

If a role needs to be edited, just open the role by clicking on it and save the entries by clicking on **Save**.

> *To edit or delete an existing role, the user needs to have the necessary permissions. It is recommended that this can only be done by the admin.*

Restart and Reset to default values

While restarting the **DO-1** device, the LEDs, i.e. indicator lights, serve as visual indicators for the various phases and times. Holding the reset button allows you to initiate the desired change.

Restart

1 Press and hold the reset button

All LEDs go out except for the power LED, which remains on continuously

2 Once the `BUS LED` lights up, release the reset button

The device then restarts

Reset Values (Default Status)

1 Press and hold the reset button

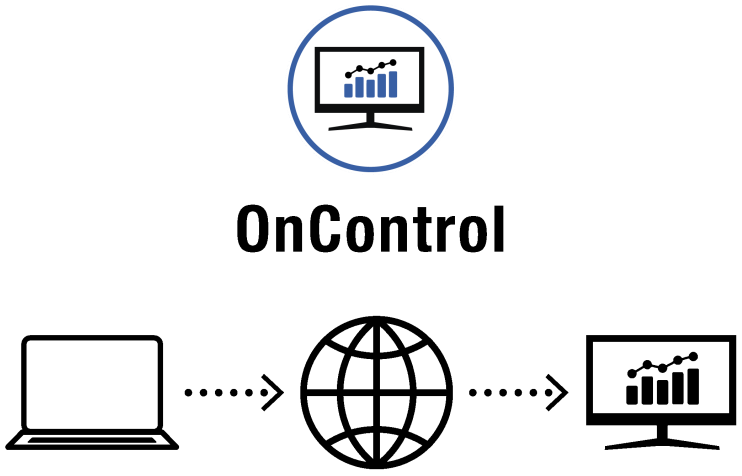
All LEDs go out except for the power LED, which remains on continuously

2 Once the `BUS LED` and `ETH LED` lights up, release the reset button

This resets all values, and a new configuration is created

ℹ️ *If uncertainties arise, you can safely neutralize the situation by holding the reset button until all LEDs turn off. The LEDs will turn off after 15 seconds, and no changes will be made to the system.*

OnControl – Access your DO-1 from anywhere



General Information

OnControl is your remote access solution for the **DO-1 Universal Monitor**. Monitor your connected Modbus devices in real-time, even when you're on the go. Stay informed about the status of your devices and receive timely alerts to address any issues.

Be safe! None of your company's crucial data is stored in the cloud. All company data of your building, plant, or machinery is stored locally on your **DO-1 Universal Monitor**. The internet is used only to provide a one-to-one connection from your internet browser to your **DO-1 Universal Monitor**. A completely safe, secure, and encrypted connection between your browser and a **DO-1** is established to ensure nobody will have access to your crucial company data.

Be shareable! OnControl makes it simple to securely share your devices with others. With just a few clicks, you can grant access to your devices and control permissions, all while ensuring data and privacy remain protected. Whether collaborating with team members or providing remote support, OnControl ensures seamless and secure sharing, tailored to your needs.

Be alert! Check the connection status of any Modbus devices that the **DO-1** is connected to, and all activity affecting your building, plant, or machinery. Receive notifications from your Modbus networks in real-time the moment they occur. Customizable notifications allow you to configure them to suit you or your organization's needs.

Be organized! Single account login allows you to monitor all your Modbus networks without having to switch accounts. Streamlined navigation allows users to easily switch between **DO-1** devices.

Be mobile! All of the data from OnControl is now in a single tool, enabling you to monitor your Modbus network's health from anywhere, at any time. Optimization for mobile devices allows for easy viewing while you are on the move.

Be *OnControl*! Easily accessible event logs for every Modbus device to assist you in making tough decisions even when you are out of the office. In-depth monitoring allows you to check the connection status of any device the **DO-1** is connected to, and all activity affecting your building, plant, or machinery.

Getting Started

1. To get started with OnControl, you need to have a **DO-1 Universal Monitor** and an active internet connection additionally you need to have access to the **DO-1** Webinterface.
2. ## Create an OnControl account
3. ## Set your DO-1 to pairing mode
4. ## Pair your DO-1 with your OnControl account

Access your DO-1 from anywhere

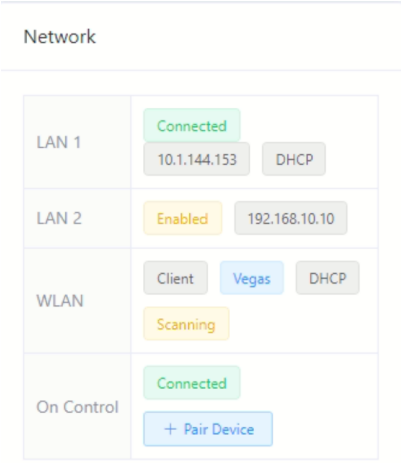
Create an OnControl account

Go to OnControl and create an account. You can use your email address or your Google account to sign up.

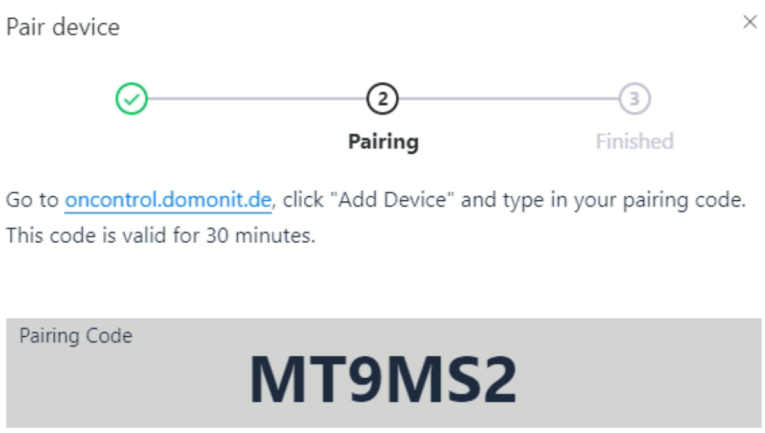
If you're using your email address, you'll receive an email with a link to verify your account. Click on the link to verify your account. If you already have an account, you can log in with your credentials.

Set your DO-1 to pairing mode

To pair your **DO-1** with your OnControl account, you need to set your **DO-1** to pairing mode. To do this, go to the **DO-1** Webinterface and navigate to the `System` → `Status` item. Click on the `+ Pair Device` button to start the pairing procedure.

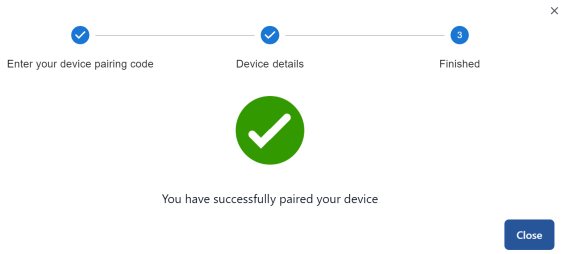


Once you've enabled the pairing mode, you can add it to your OnControl account by the pairing code displayed on the **DO-1** Webinterface.



Pair your DO-1 with your OnControl account

Back in your OnControl account, click on the `+ Pair Device` button in the upper left corner and enter the pairing code displayed on the DO-1 Webinterface.



After you've entered the pairing code, follow the web process in the pop-up window to complete the pairing process. Now, your **DO-1** is paired with your OnControl account. You can now access your **DO-1** from anywhere.

> ⚠️ If a device is already paired to a certain **OnControl** account, the device *can not be paired* to a different **OnControl** account.

Troubleshooting

The `+ Pair Device` button is not visible in the DO-1 Webinterface

This issue can have multiple causes. Please check the following:

1. **Check the DO-1 firmware version:** The pairing feature is available starting from firmware version 0.2.10. If you have an older firmware version, please update your **DO-1** to the latest version.

2. **Check the DO-1 user account:** Make sure you are logged in as an administrator. Only administrators can pair devices.

3. **Check the internet connection:** Make sure the **DO-1** is connected to the internet. The pairing feature is only available when the **DO-1** is connected to the internet.

4. **Check the DO-1 pairing status:** Make sure the **DO-1** is not already paired with another **OnControl account**. If the **DO-1** is already paired with another account, it cannot be paired with a different account.

Index

Terms

TERM	BRIEF
DHCP	Domain Host Control Protocol
DNS	Domain Name Server
Static IP	Dedicated Internet Protocol Address assigned to a device on network
RS485	Serial communication interface for industrial applications over long distances
Baud Rate	Data transmitted at bits/second
Start Bit	Prepares reciever for arrival of data
Parity bit	Indicates parity, used to check the integrity of data.
Stop bit	Resets state to enable triggering of next sequence
Internal Modbus RTU	Remote Terminal Unit for serial communication on modbus network
LAN	Local Area Network (LAN). A collection of devices connected in one physical location, such as a building, office, or home.
HMI	Human Machine Interface
VFD	Variable Frequency Drive
PLC	Programmable Logic Controller
TCP	Transmission Control Protocol, Network standard to establish connection between two network sockets.
Internal System Bus	Limited to the CPU Architecture
Master (Client)	Recieves requests and delegats to ‘Slave’ units, central unit, controller
Slave (Server)	subordinate to master unit, responsible to process requests sent from Master
SMTP	Secure Mail Server

TERM	BRIEF
Port	A unique numeric identifier for a connection endpoint to direct data to a specific service

Registers

REGISTER TYPE	ADDRESS RANGE	DESCRIPTION
Coils	00001 - 09999	Binary outputs (ON/OFF), read or write
Discrete Inputs	10001 - 19999	Binary inputs (ON/OFF), read-only
Input Registers	30001 - 39999	Analog inputs (16-bit), read-only
Holding Registers	40001 - 49999	Analog outputs or configurations (16-bit), read/write

DATA Order

ORDERS	DESCRIPTION
Big Endian	The most significant byte (MSB) is stored first at the lowest memory address.
Little Endian	The least significant byte (LSB) is stored first at the lowest memory address.
Big Endian Reversed	Byte order is stored as Little Endian, but with the higher-order bytes placed first in memory.
Little Endian Reversed	Byte order is stored like Big Endian, but the least significant byte is placed first in memory.