

VDS130 Vibration Data Source Setup Instructions and Manual



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Revision History

Version	Date	Comments
1.0	15 Sep 2025	First version
A	11 Jan 2026	Utility software phase out
A1	26 Aug 2026	Frequency band correction, doc numbering

1. Getting Started

1.1 Device Connection

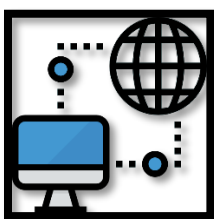
Prepare the following:

- Client device with Internet and a browser (PC, smartphone, etc.)
- The VDS
- 24 VDC power source
- Ethernet cable(s)

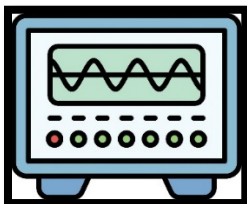
You can either:

- Connect both the client device and the VDS to the same LAN (via Internet or Intranet),
or
- Connect the VDS directly to the client device via ethernet cable

Note: Not all client devices support direct Ethernet connections.



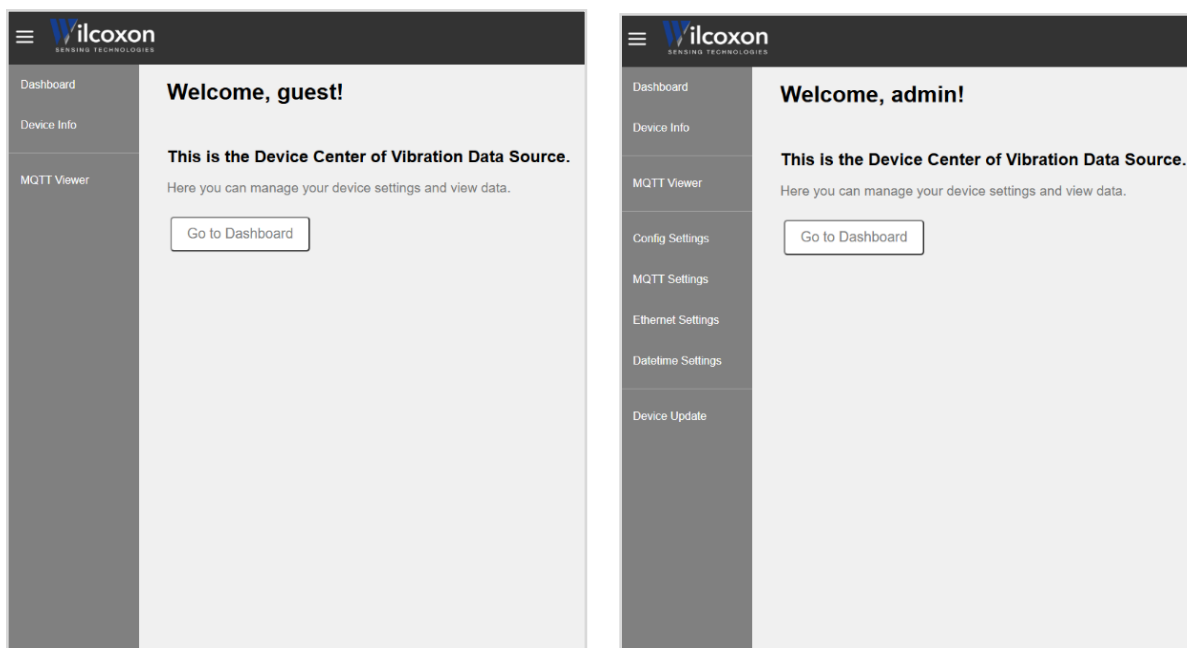
The VDS functions even without a signal input. However, if you have a signal source (a function generator or sensor), you can also connect it to the VDS.



1.2 VDS Device Center

Once powered on, the VDS can be accessed through a web browser via the VDS Device Center interface.

- Note: The settings and update features are only visible to administrators.



1.3 MQTT Publishing

When the device is powered and connected to the Internet, it automatically publishes data to the MQTT broker according to the MQTT Settings of the VDS.

You can also use the MQTT Viewer in the VDS Device Center to view published MQTT data in JSON format easily (more details in the Instruction of MQTT Viewer below).

1.4 Device Initial Setup and Definitions

1.4.1 Ethernet Settings:

- ◆ DHCP: **Enable**
- ◆ Static IP: **192.168.1.127**
- ◆ Gateway: *[set manually or obtain automatically]*
- ◆ DNS: *[set manually or obtain automatically]*
- ◆ mDNS: **SN.local**

1.4.2 VDS Device Center Entrance:

- ◆ IP: **http://192.168.1.127/**
- ◆ mDNS URL: **http://SN.local/**

(mDNS might be set to SN-2.local or SN-*N.local sometimes)

1.4.3 MQTT Settings:

- ◆ Protocol: **mqtt://**
- ◆ Host: *[user defined]*
- ◆ Port: **8883**
- ◆ Username / Password : *[user defined]* **The username field cannot be left blank.**
- ◆ MQTT Topic: *[user defined]*
- ◆ Client ID: *[fixed]* **SN**
- ◆ SSL/TLS: *[fixed]* **Enabled**
- ◆ Certificate: *[fixed]* **CA signed certificate**

1.4.4 Config Settings: (per channel)

- ◆ **Dynamic data**
- ◆ Input Range: *[selectable]* **[±5V] [±20V]**
- ◆ Bandwidth: *[selectable]* **[1kHz] [2kHz] [5kHz] [10kHz] [20kHz] [40kHz]**
- ◆ Window: *[selectable]* **[Rectangular] [Hanning] [Flattop]**

◆ **Sensor data**

- ◆ Channel Enable: *[selectable]* [Enable] [Disable]
- ◆ Channel Coupling: *[selectable]* [IEPE] [AC] [DC]
- ◆ Sensor Type: *[selectable]* [Acceleration(g)] [Acceleration(gal)] [Acceleration(m/s²)] [Velocity(in/s)] [Velocity(mm/s)] [Velocity(cm/s)] [Displacement(mil)] [Displacement(μm)]
- ◆ Sensor Sensitivity: [1-1000] mV/(Sensor Type unit)

◆ **Acceleration (scalar data)**

- ◆ Display Unit: *[selectable]* [g] [gal] [m/s²]
- ◆ Filter: *[selectable]* [2Hz – 1kHz] [10Hz - 10kHz] [2kHz – 10kHz]
- ◆ Detection: *[selectable]* [RMS] [PEAK]

◆ **Velocity (scalar data)**

- ◆ Display Unit: *[selectable]* [mm/s] [in/s] [cm/s]
- ◆ Filter: *[selectable]* [2Hz – 1kHz] [10Hz – 1kHz] [10Hz - 5kHz]
- ◆ Detection: *[selectable]* [RMS] [PEAK]

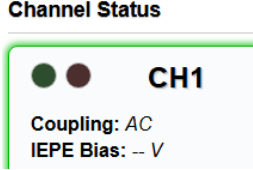
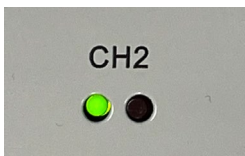
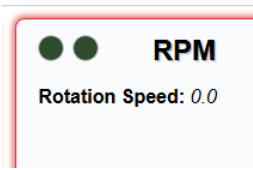
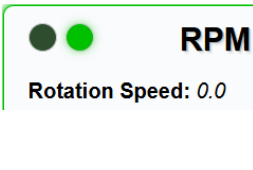
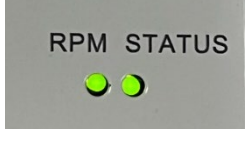
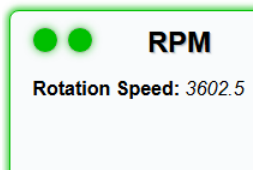
◆ **Displacement (scalar data)**

- ◆ Display Unit: *[selectable]* [μm] [mil]
- ◆ Filter: *[selectable]* [2Hz – 1kHz] [10Hz – 1kHz]
- ◆ Detection: *[selectable]* [RMS] [PEAK]

1.4.5 Datetime Settings: (per device)

- ◆ Auto-set Time: *[toggle Enable to auto-set or Disable to manually set]* [Enable] [Disable]
- ◆ NTP Server: time.google.com
- ◆ Time Zone: *[drop-down or Auto Detect]* (UTC-04:00) America/New_York

1.4.6 LED Indicator Definitions:

	Device LED	Device Center	LED Lights	Definition
Channels			Green light is off and Red light is off	IEPE disabled, AC/DC coupling
			Green light is on and Red light is off	IEPE enabled and normal
			Green light is on and Red light is on	IEPE enabled but error
RPM			RPM light is off and STATUS light is off	RPM error
			RPM (left) light is off and STATUS (right) light is on	RPM normal but RPM value = 0
			RPM light is on and STATUS light is on	RPM normal and RPM value > 0

2. Definition of JSON Content in MQTT Message

Timewave & Spectrum

```
{
  "timestamp": "number(long long)", // Data capture time in Unix timestamp (milliseconds).
  "sampling_frequency": "number(int)", // Sampling rate in Hz.
  "sensor_id": "string", // Identifier of the connected sensor (SN_channel).
  "gateway_id": "string", // Identifier of the VDS device (SN).
  "process_data": { // Processed vibration and diagnostic data.
    "RPM": "number(float)", // Rotational speed in revolutions per minute(RPM).
    "SensorType": "string", // Type of the connected sensor.
    "SensorSensitivity": "number(float)", // Sensitivity of the connected sensor.
    "Acceleration": { // Acceleration measurement.
      "value": "number(float)", // Calculated measurement value.
      "filter": "string", // Frequency filter applied.
      "unit": "string", // Unit of measurement.
      "detection": "string" // Detection method.
    },
    "Velocity": { ... }, // Velocity measurement (Same as acceleration measurement).
    "Displacement": { ... }, // Displacement measurement (Same as acceleration measurement).
    "CrestFactor": { ... }, // Crest factor of signal (Same as acceleration measurement).
    "TruePeak": { ... }, // True peak amplitude measurement (Same as acceleration measurement).
    "StandardDeviation": { ... } // Standard deviation of signal (Same as acceleration measurement).
  }
}
```

Timewave

```
{
  "duration": "number(float)", // Duration of the data period in seconds.
  "Time waveform": "array[number(float)]", // Raw time-domain waveform data points.
}
```

Length = duration * sampling frequency

Spectrum

```
{
  "bandwidth": "number(float)", // Frequency bandwidth of the analysis in Hz.
  "lines": "number(int)", // Number of FFT lines used in spectrum calculation.
  "Power spectrum": "array[number(float)]", // Frequency-domain power spectrum values.
}
```

Length = lines + 1 (the one at 0 Hz)

3. VDS Device Center Instructions

3.1 Accessing the VDS Device Center

Before accessing the VDS Device Center, make sure both the client device and the VDS are on the same network segment.

3.1.1 Demonstration in PC

3.1.2 PC and VDS connected to a router:

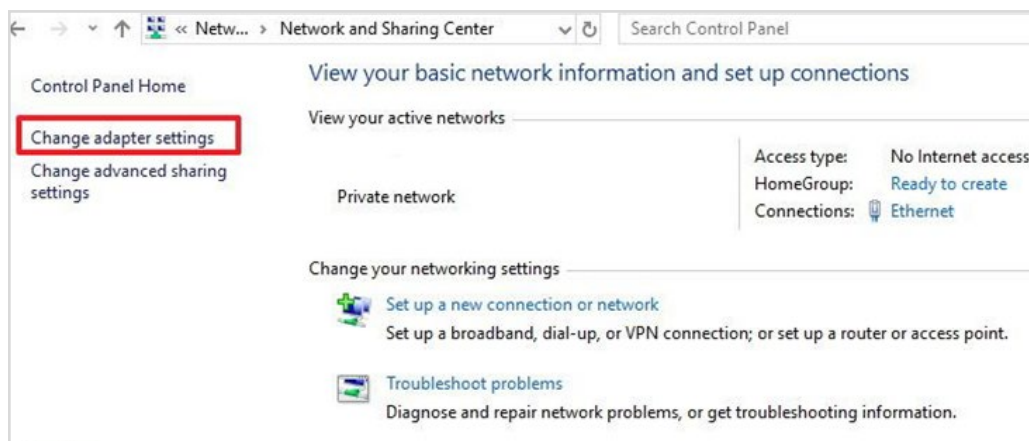
- Make sure VDS default static IP does not conflict with the DHCP pool.
- Enable DHCP on both VDS and PC. When DHCP is enabled, ensure that no incorrect Gateway or DNS settings are configured, as they may override the dynamically obtained network configuration.

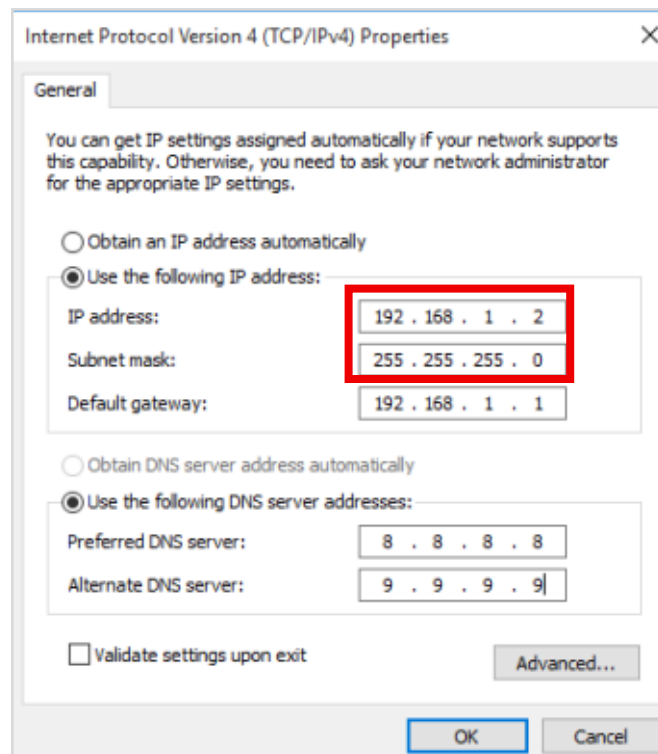
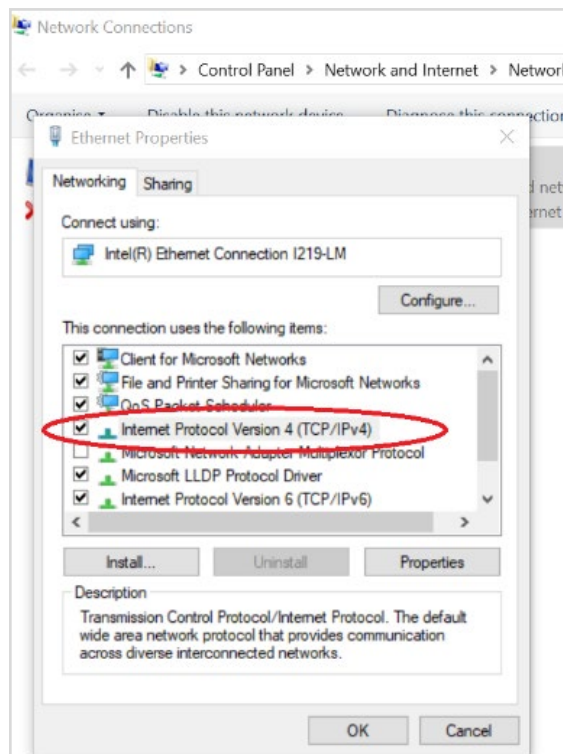
3.1.3 Direct PC Connection:

- Router or DHCP server connections are unavailable.
- Configure the PC network adapter to the same subnet as the device.
- Example:

VDS IP 192.168.1.127, Subnet Mask 255.255.255.0

PC IP 192.168.1.2, Subnet Mask 255.255.255.0





Ethernet Settings

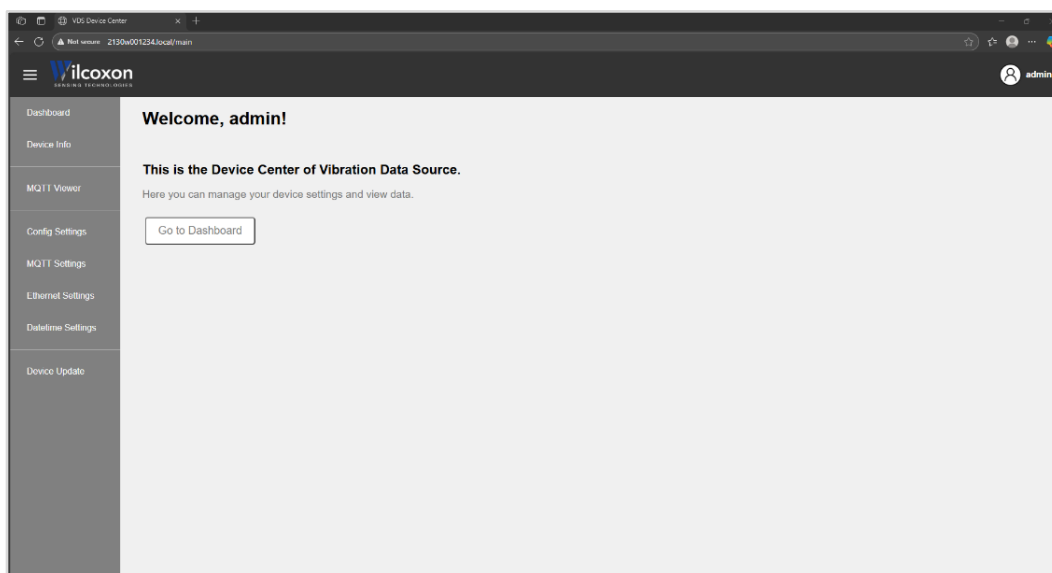
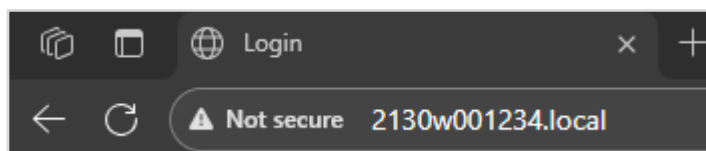
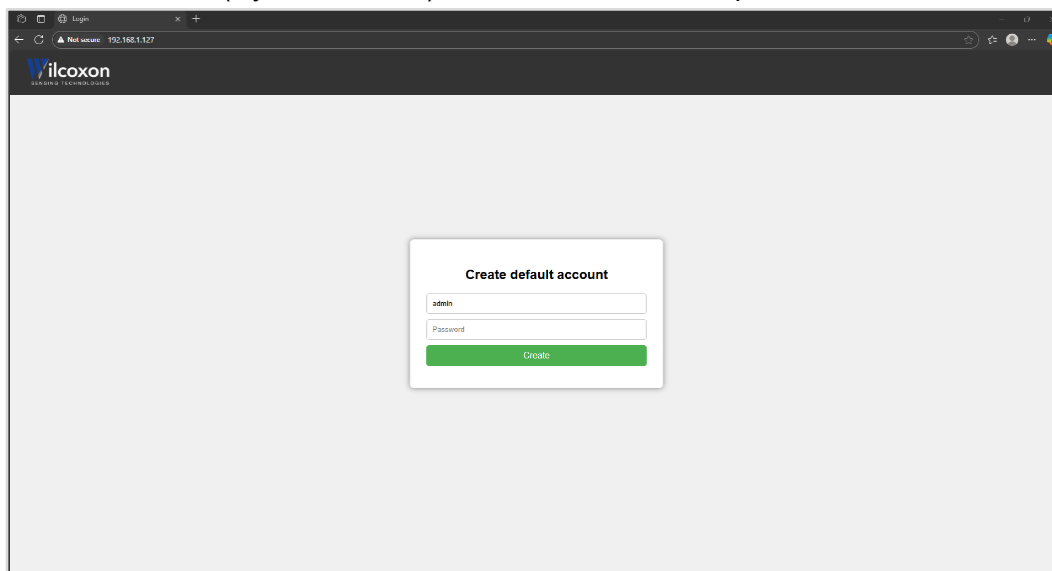
DHCP: ☒

Static IP: 192.168.1.127 /24

Subnet Mask: 255.255.255.0

3.2 Entering the VDS Device Center

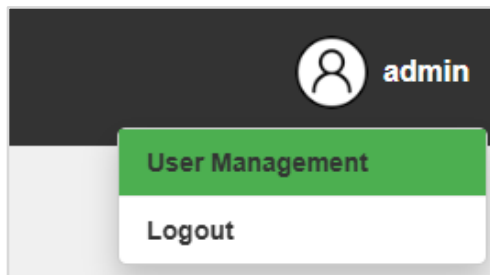
- Use the device's IP (Dynamic/Static) or mDNS address to open the **VDS Device Center**.



- On first use, you must create a **Default Administrator Account**.
- Afterward, additional administrator or standard user accounts can be created.

3.3 Device User Management

- Change your username or password under the User Management section.



User Management

Change Username Change Password User Control

Change Username

New Username

Change Username

User Management

Change Username Change Password User Control

Change Password

Old Password

New Password

Confirm New Password

Change Password

Administrators can:

- Create new accounts
- Delete all user accounts (resets the device to Create Default Account step)

User Management

Change Username Change Password User Control

Create New User

Username

Password

☐ Admin user

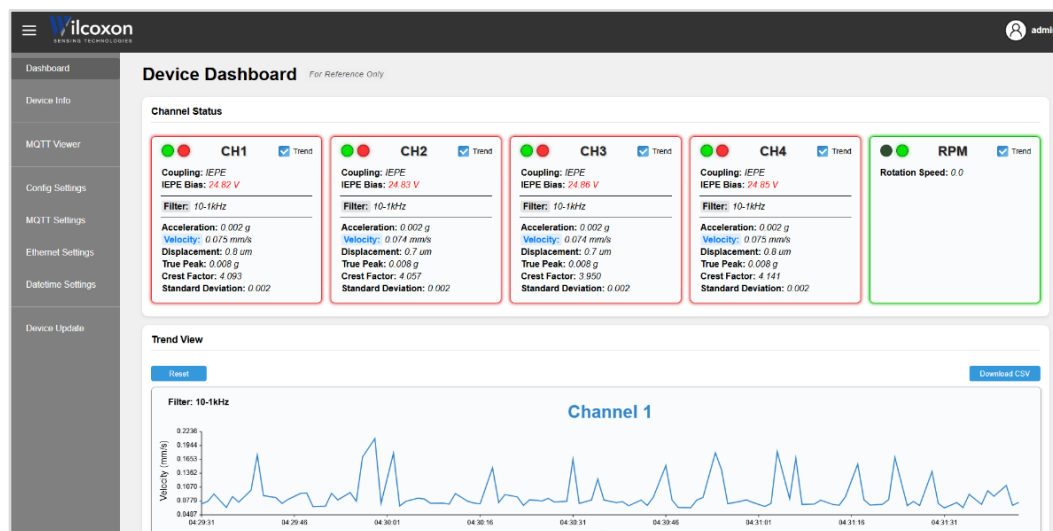
Create User

Delete All User

Delete All Users

3.4 Device Dashboard

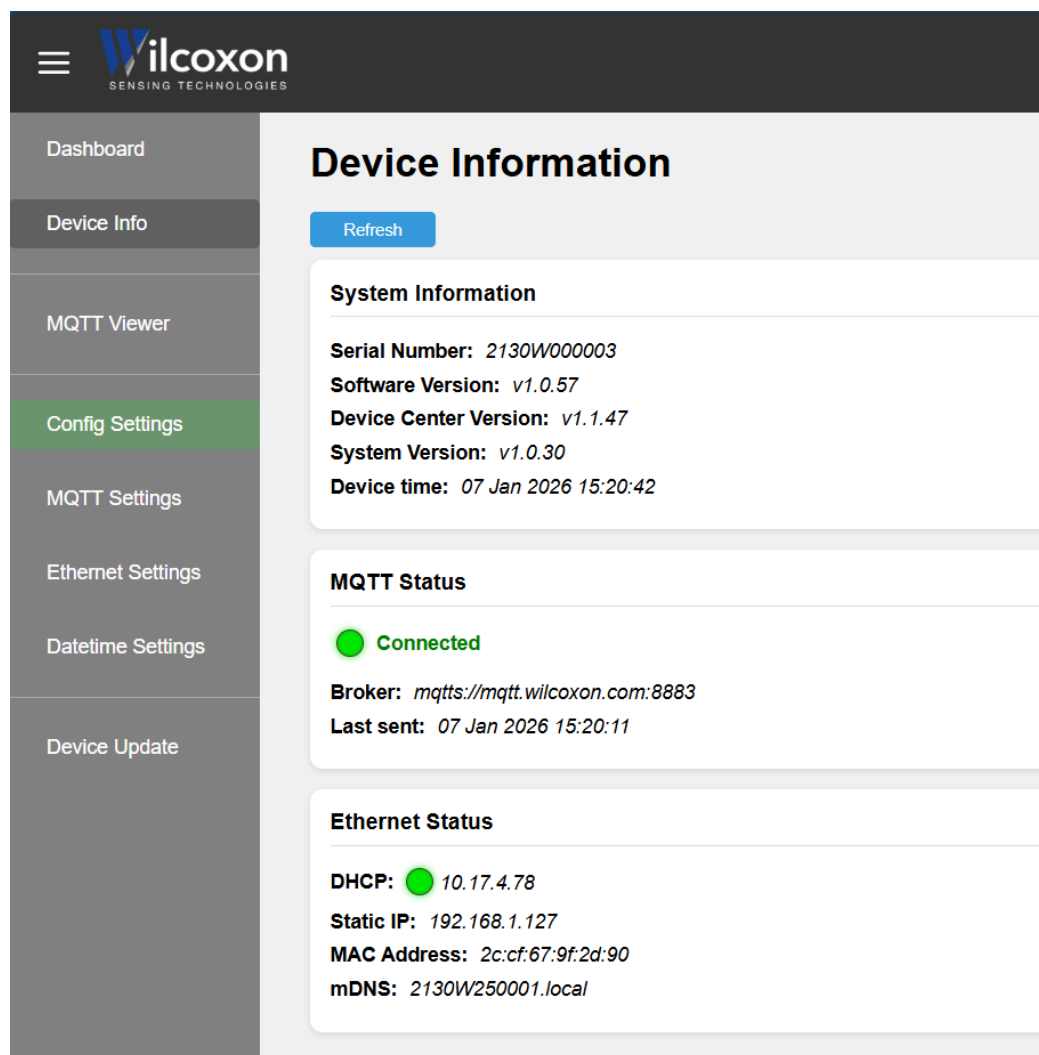
- Access via **Go To Dashboard** on main page or **Dashboard** on sidebar.



- Each channel card shows two indicators synced with hardware LEDs.
- Use the checkbox to toggle the display of channel trend charts.
- The **Reset** button clears all historical trend data (for admin user only).
- The **Download CSV** button downloads the historical trend data of the selected channel charts.

3.5 Device Information

- Access via **Device Info** on sidebar.

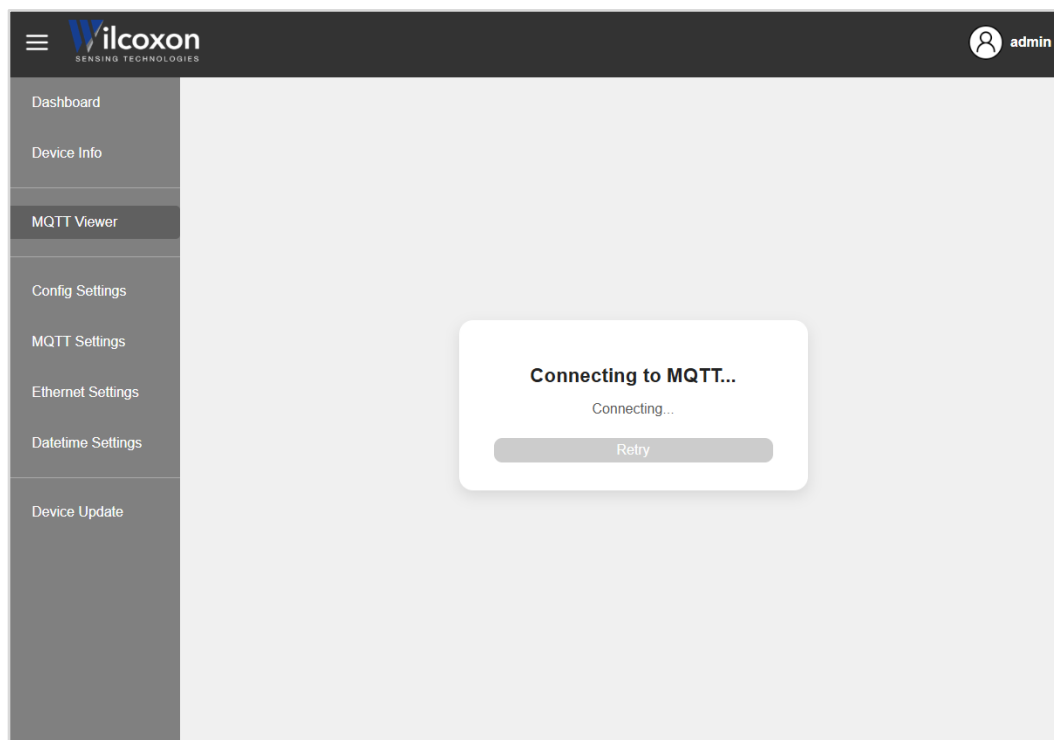


The screenshot shows the Wilcoxon web interface. On the left is a sidebar with navigation links: Dashboard, Device Info, MQTT Viewer, Config Settings (highlighted in green), MQTT Settings, Ethernet Settings, Datetime Settings, and Device Update. The main content area is titled 'Device Information' and features a 'Refresh' button. It contains three sections: 'System Information' with details like Serial Number (2130W000003), Software Version (v1.0.57), Device Center Version (v1.1.47), System Version (v1.0.30), and Device time (07 Jan 2026 15:20:42); 'MQTT Status' showing a green 'Connected' status, Broker (mqtt://mqtt.wilcoxon.com:8883), and Last sent time (07 Jan 2026 15:20:11); and 'Ethernet Status' showing DHCP (10.17.4.78), Static IP (192.168.1.127), MAC Address (2c:cf:67:9f:2d:90), and mDNS (2130W250001.local).

- Data refreshes only when the page is opened or when **Refresh** is clicked.

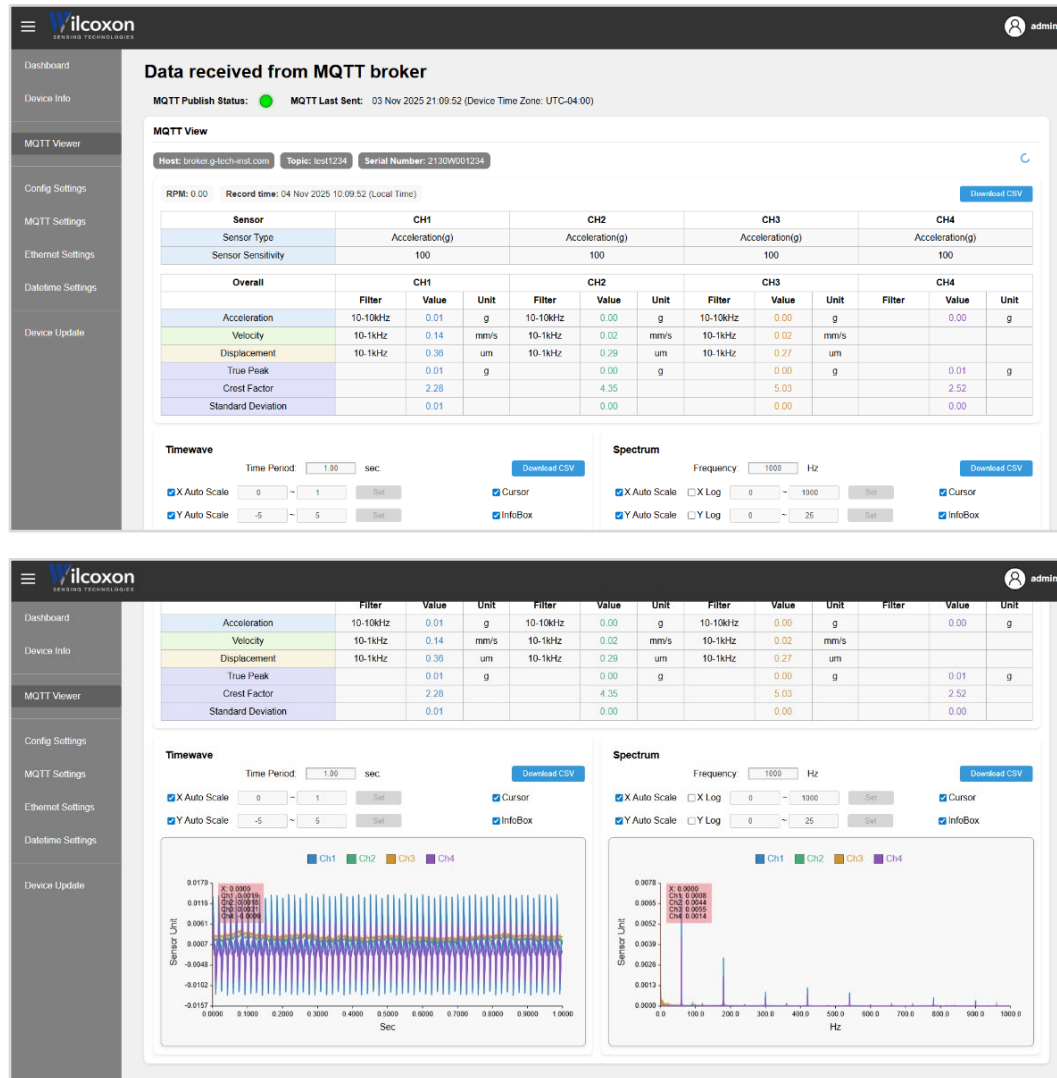
3.6 MQTT Viewer

- Access via **MQTT Viewer** on sidebar.
- Connect to the MQTT broker according to parameters in the **MQTT Settings**.



- If the connection fails after timeout, you can use the **Retry** button or reload this page to reconnect.
- This will not function if the parameters in the **MQTT Settings** are incomplete.

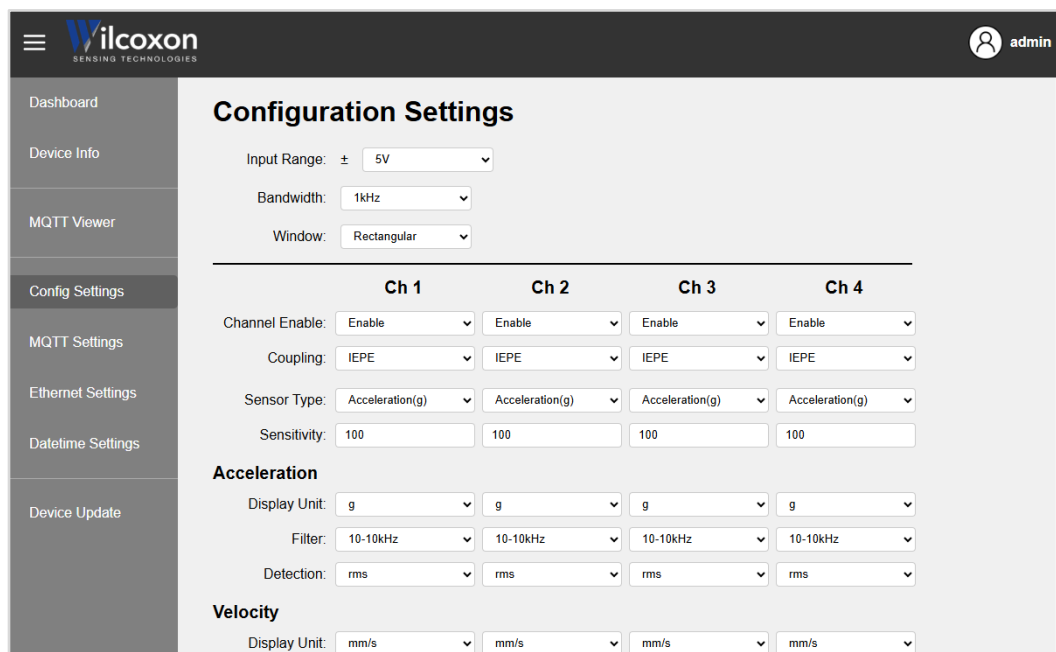
- Once the browser connects to the MQTT broker, the page redirects to the data viewer.



- There is some published information from the VDS device on top of MQTT View.
- Data received from the MQTT broker will be shown inside the MQTT View to confirm what data is being published. The MQTT View is not a monitoring software.

3.7 Configuration Settings

- Access via **Config Settings** on sidebar.
- Configure DAQ Measurement parameters, e.g. Input range, Bandwidth, Window and channel configurations.



The screenshot shows the Wilcoxon Configuration Settings web interface. The top header includes the Wilcoxon logo and a user profile icon labeled 'admin'. The left sidebar contains navigation links: Dashboard, Device Info, MQTT Viewer, Config Settings (highlighted), MQTT Settings, Ethernet Settings, Datetime Settings, and Device Update. The main content area is titled 'Configuration Settings' and contains the following controls:

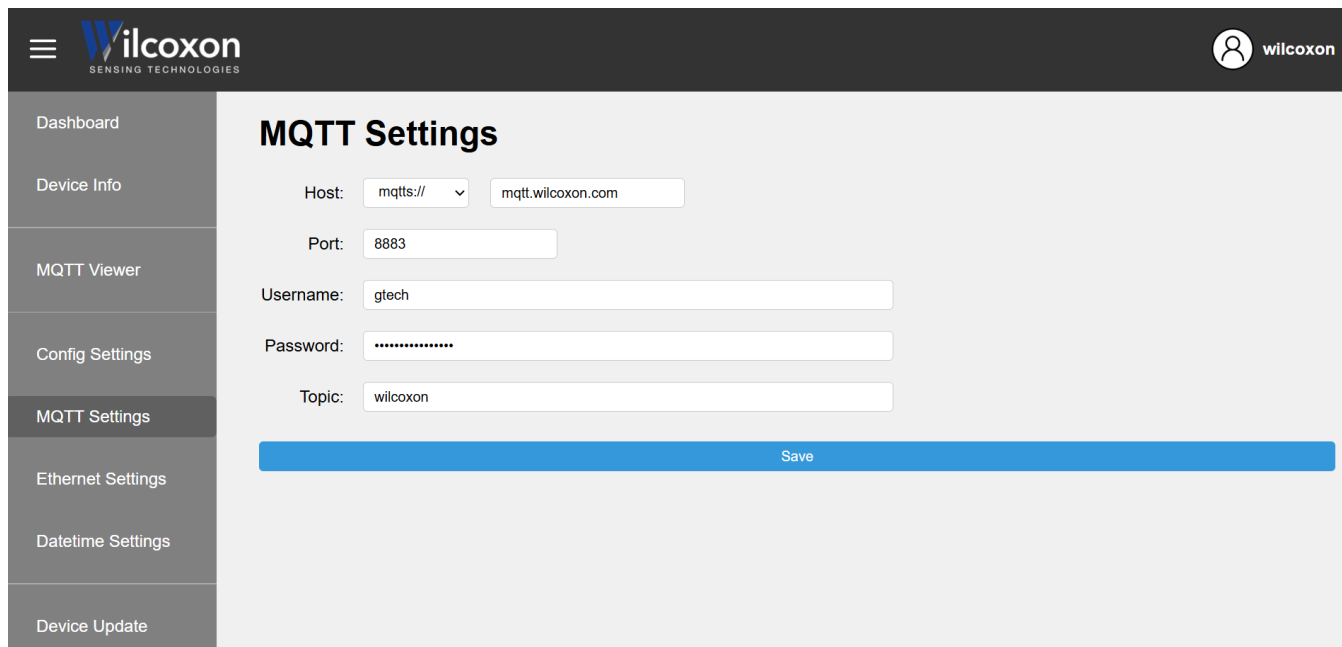
- Global Settings:**
 - Input Range: $\pm$ 5V
 - Bandwidth: 1kHz
 - Window: Rectangular
- Channel Settings (Ch 1 to Ch 4):**

	Ch 1	Ch 2	Ch 3	Ch 4
Channel Enable:	Enable	Enable	Enable	Enable
Coupling:	IEPE	IEPE	IEPE	IEPE
Sensor Type:	Acceleration(g)	Acceleration(g)	Acceleration(g)	Acceleration(g)
Sensitivity:	100	100	100	100
- Acceleration:**
 - Display Unit: g
 - Filter: 10-10kHz
 - Detection: rms
- Velocity:**
 - Display Unit: mm/s

- Changes will restart the VDS software and take effect after the restart.
- Administrator privileges are required to modify these settings.

3.8 MQTT Settings

- Access via **MQTT Settings** on sidebar.
- Configure broker address, port, username, password and topic.
The username field cannot be left blank.
- Set Host to empty to disable MQTT publish and MQTT Viewer.



The screenshot shows the Wilcoxon MQTT Settings web interface. On the left is a sidebar with navigation links: Dashboard, Device Info, MQTT Viewer, Config Settings, MQTT Settings (highlighted), Ethernet Settings, Datetime Settings, and Device Update. The main content area is titled "MQTT Settings" and contains the following fields:

- Host:** A dropdown menu showing "mqtt://", followed by a text input field containing "mqtt.wilcoxon.com".
- Port:** A text input field containing "8883".
- Username:** A text input field containing "gtech".
- Password:** A text input field with masked characters (dots).
- Topic:** A text input field containing "wilcoxon".

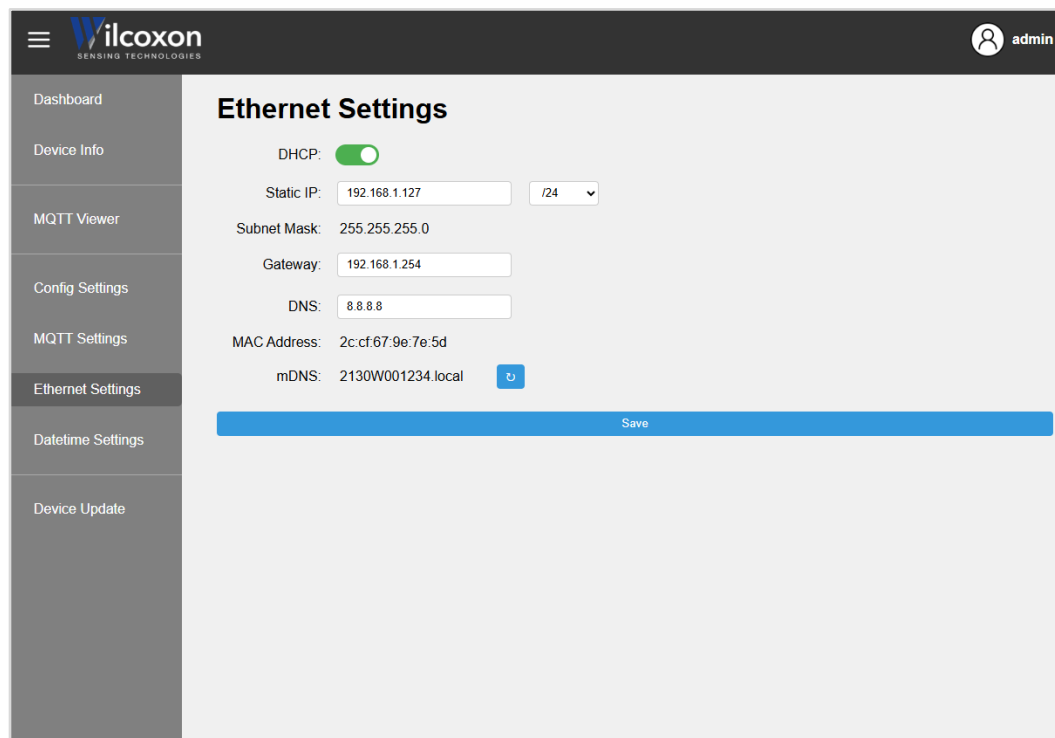
At the bottom of the form is a blue "Save" button.

- Changes will restart the software and take effect after the restart.
- Administrator privileges are required to modify these settings.

3.9 Ethernet Settings

- Access via **Ethernet Settings** on sidebar.
- Configure DHCP, Static IP, Subnet mask (CIDR), gateway, and DNS.

Note: The mDNS address cannot be changed anymore.



The screenshot shows the 'Ethernet Settings' page in the Wilcoxon web interface. The left sidebar contains a menu with options: Dashboard, Device Info, MQTT Viewer, Config Settings, MQTT Settings, Ethernet Settings (highlighted), Datetime Settings, and Device Update. The main content area is titled 'Ethernet Settings' and contains the following fields:

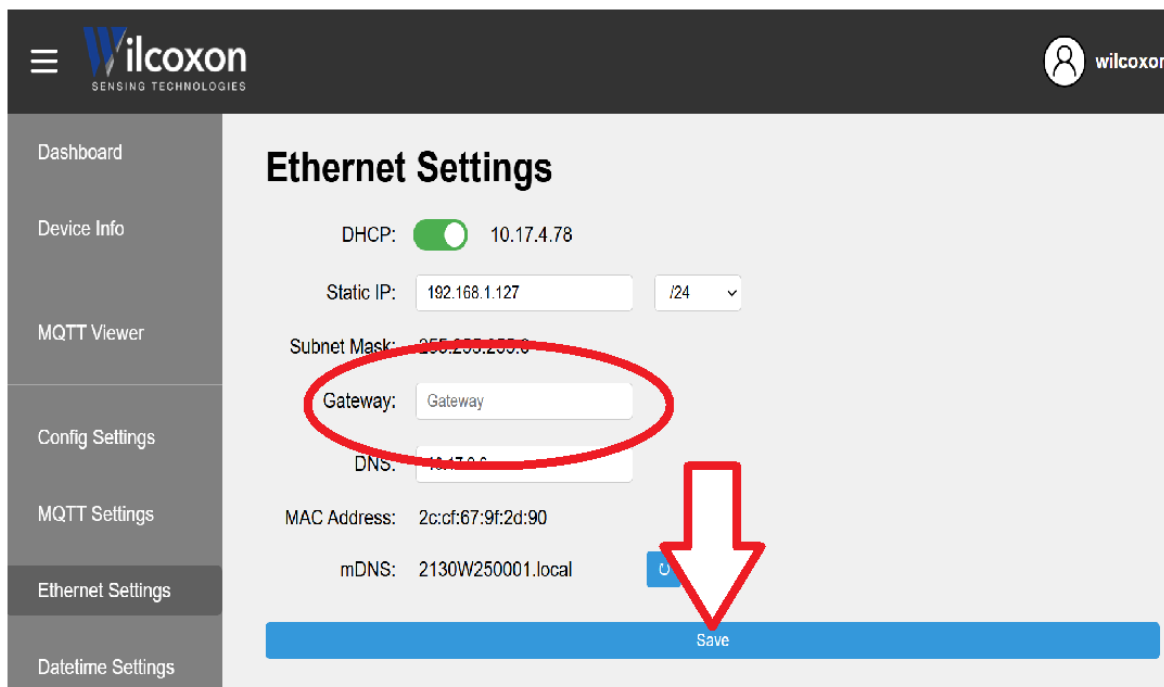
- DHCP: A green toggle switch is turned on.
- Static IP: A text input field containing '192.168.1.127' and a dropdown menu showing '/24'.
- Subnet Mask: A text input field containing '255.255.255.0'.
- Gateway: A text input field containing '192.168.1.254'.
- DNS: A text input field containing '8.8.8.8'.
- MAC Address: A text input field containing '2c:cf:67:9e:7e:5d'.
- mDNS: A text input field containing '2130W001234.local' and a blue button with a refresh icon.

At the bottom of the form is a blue 'Save' button.

- Changes will restart the VDS network service and take effect after the restart.
- Administrator privileges are required to modify these settings.

3.9.1 Enable MQTT Internet Connection:

- Within the Ethernet Settings, find the Gateway box and delete the number inside.
- Leave the textbox blank and press “Save”.

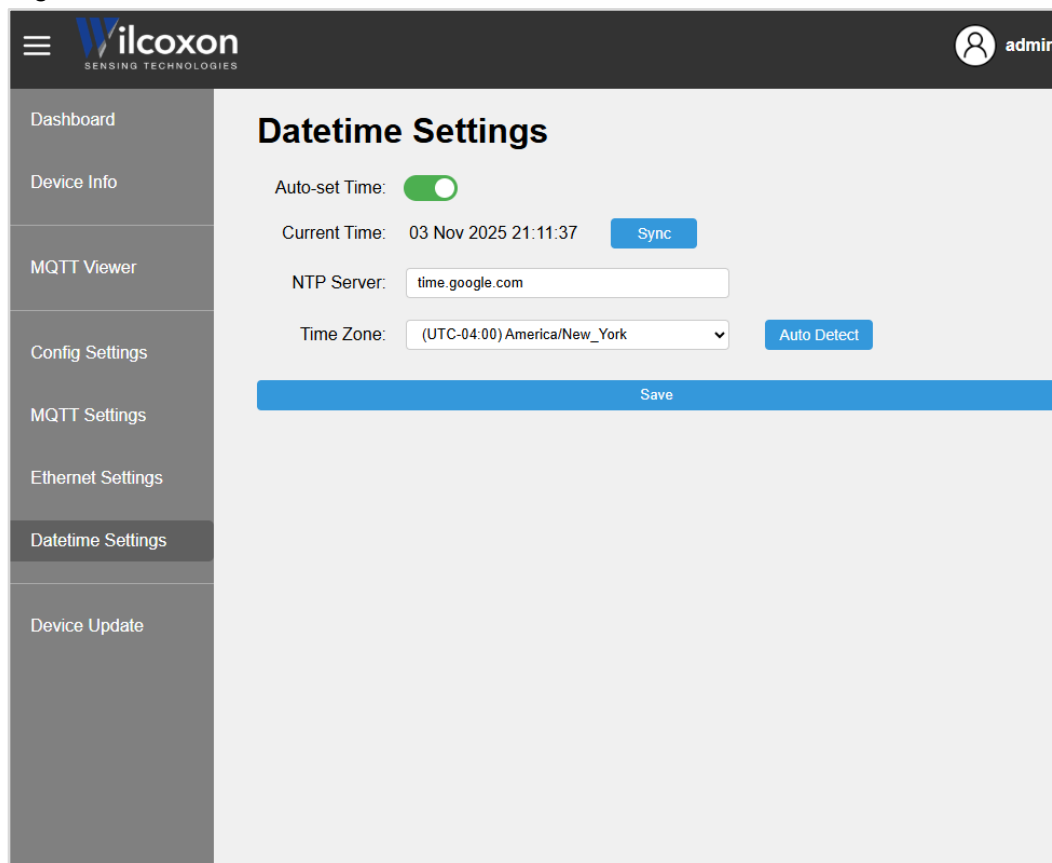


The screenshot shows the 'Ethernet Settings' page in the Wilcoxon web interface. The left sidebar contains navigation links: Dashboard, Device Info, MQTT Viewer, Config Settings, MQTT Settings, Ethernet Settings (highlighted), and Datetime Settings. The main content area displays various network settings: DHCP is enabled with IP 10.17.4.78; Static IP is 192.168.1.127 with a /24 subnet; Subnet Mask is 255.255.255.0; Gateway is a text box containing 'Gateway' (circled in red); DNS is 10.17.0.1; MAC Address is 2c:cf:67:9f:2d:90; and mDNS is 2130W250001.local. A blue 'Save' button is at the bottom right, with a red arrow pointing to it.

- A new Gateway value will be assigned, and internet connection will be enabled

3.10 Datetime Settings

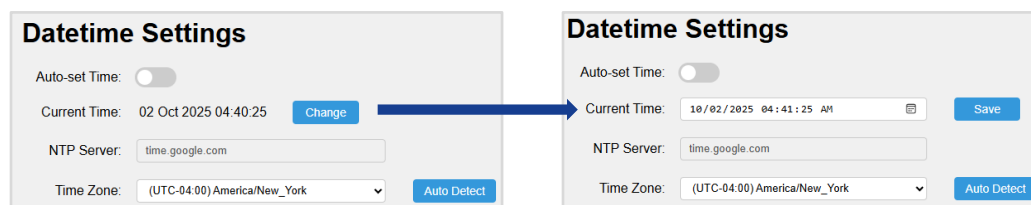
- Access via **Datetime Settings** on sidebar.
- Configure Auto-set Time, Current RTC time, NTP server and Time Zone.



If **Auto-set Time** is enabled:

- Time sync occurs at startup and every 8 hours.
- Use **Sync** button to trigger immediately.

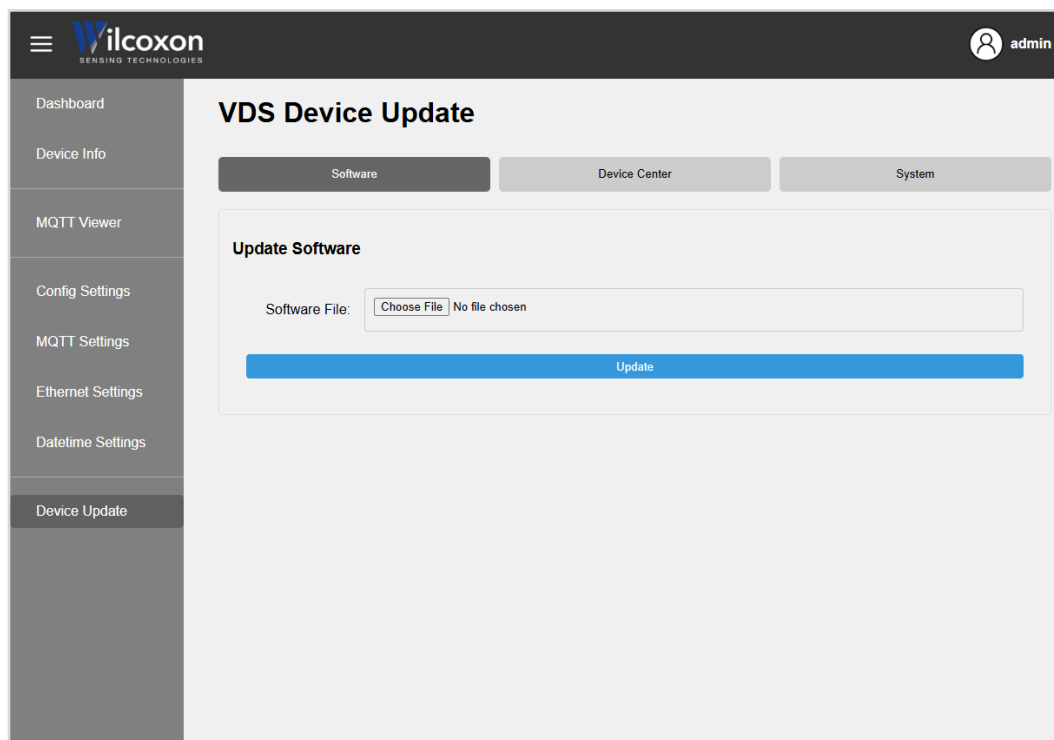
If **Auto-set Time** is disabled, the time must be set manually.



- Administrator privileges are required to modify these settings.

3.11 VDS Device Update

- Access via **Device Update** on sidebar.
- Perform software, Device Center, and system updates.
- Administrator privileges are required to perform all types of updates.



Software Update

- Upload a valid software file.
- The device restarts software after update.

 VDS_MQTT_v1.0.56

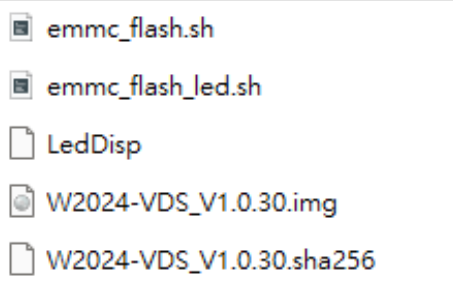
Device Center update

- Upload a valid .zip file.
- The device restarts Device Center service after update.

 VDSDeviceCenter_v1.1.46.zip

System update

Requires the following files on a USB drive:



3.11.1 Necessary Files:

- ◆ **emmc_flash.sh**: update script
- ◆ **emmc_flash_led.sh**: progress display script
- ◆ **LedDisp**: LED control file
- ◆ **W2024-VDS_Vx.x.x.img**: full system image
- ◆ **W2024-VDS_Vx.x.x.sha256**: checksum file

Do not change the filename or place them in folders.

3.11.2 Update Procedure:

1. Use a clean USB flash drive (formatted as **exFAT** or **FAT32**).
* Faster USB drives (USB 3.0) improve system update speed significantly.
2. Place files on USB root directory.
3. Insert USB into the VDS device and reboot.
4. Select the image file on the “**System Update**” page of the Device Center.
5. The Device Center starts doing file checksum.
6. The Device Center runs the update script **emmc_flash.sh**.
7. The device reboots after the update script finishes.

Important Notes:

- * A system update is a relatively risky step. Only perform it when necessary.
- * Do not unplug USB or power off during an update — the device will become unusable and must be sent back for recovery.
- * Please refer to the LED progress indicators, as earlier versions of the Device Center may contain some bugs.