VDS120 Vibration Data Source

Setup Instructions and Manual

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Revision History

Version	Date	Comments
1.0	17 Apr 2026	First version
1.1	07 Jul 2026	Add dual IP connection statements
A	09 Sept 2026	Initial document release

1. Getting Started

1.1 Device Connection

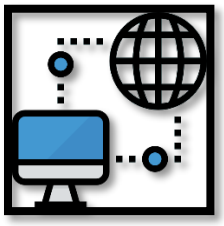
Prepare the following:

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

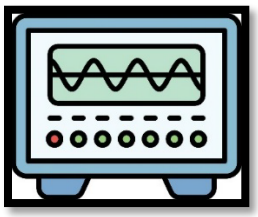
You can either:

- 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.

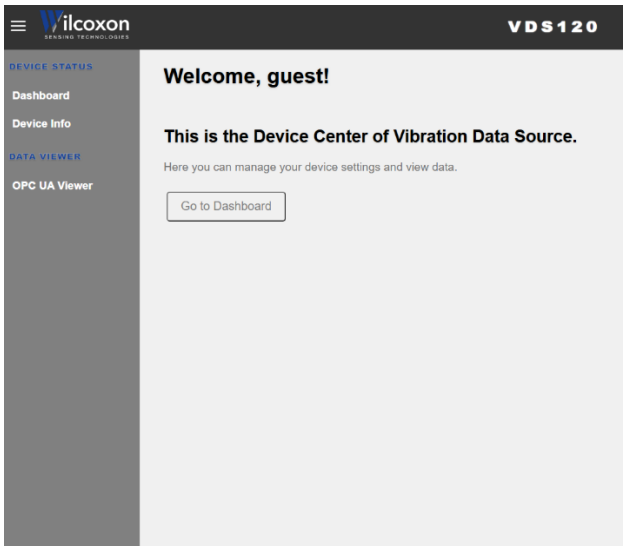


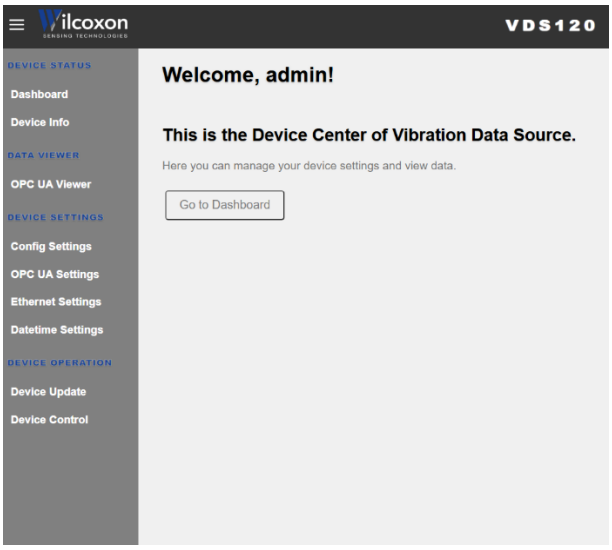
The VDS functions even without a signal input. However, if you have a signal source (a function generator or sensor), connect it to the VDS.



1.2 VDS Device Center

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





1.3 OPC UA Server

When the device is powered, the OPC UA server of VDS will be ready for the clients to connect via OPC UA protocol according to the OPC UA Settings of the VDS.

The OPC UA Viewer in the VDS Device Center makes it possible to view the OPC UA data easily, as detailed later in this document.

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/**

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

1.4.3 OPC UA Settings:

- Server Address: [IP] **opc.tcp://192.168.1.127**
- Port: **4840**
- Username / Password : *[user defined]*
- Certificate: *[No certificate, self-signed certificate available]*

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 (for each channel)**
- 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]**

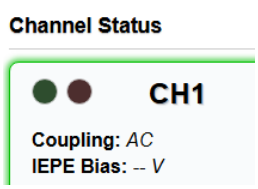
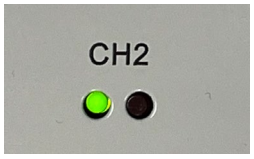
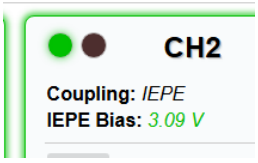
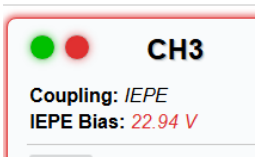
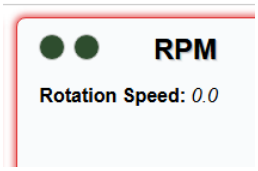
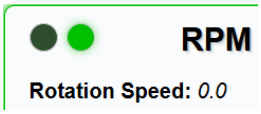
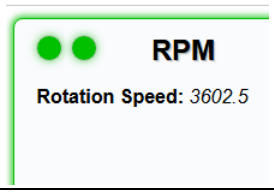
- **Velocity (scalar data)**
- Display Unit: *[selectable]* **[mm/s] [in/s] [cm/s]**
- Filter: *[selectable]* **[2Hz – 1kHz] [10Hz – 1kHz] [10Hz - 5kHz]**
- Detection: *[selectable]* **[RMS] [PEAK]**

- **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. Structure of Address Space in OPC UA

- Root
  - Device
    - serial_number (string): "ns=2;s=serial_number"
    - model_name (string): "ns=2;s=model_name"
    - RPM (float): "ns=2;s=RPM "
    - Channel1
      - enable (string): "ns=2;s=ch1_enable"
      - status (string): "ns=2;s=ch1_status"
      - input_range (string): "ns=2;s=ch1_input_range"
      - coupling (string): "ns=2;s=ch1_coupling"
      - sensor_type (string): "ns=2;s=ch1_sensor_type"
      - sensitivity (float): "ns=2;s=ch1_sensitivity"
      - Acceleration
        - value (float): "ns=2;s=Channel1_acc_value" // Calculated measurement value.
        - filter (string): "ns=2;s=Channel1_acc_filter" // Frequency filter applied.
        - unit (string): "ns=2;s=Channel1_acc_unit" // Unit of measurement.
        - detection (string): "ns=2;s=Channel1_acc_detection" // Detection method.
      - Velocity
        - value (float): "ns=2;s=Channel1_vel_value" // Calculated measurement value.
        - filter (string): "ns=2;s=Channel1_vel_filter" // Frequency filter applied.
        - unit (string): "ns=2;s=Channel1_vel_unit" // Unit of measurement.
        - detection (string): "ns=2;s=Channel1_vel_detection" // Detection method.
      - Displacement
        - value (float): "ns=2;s=Channel1_disp_value" // Calculated measurement value.
        - filter (string): "ns=2;s=Channel1_disp_filter" // Frequency filter applied.
        - unit (string): "ns=2;s=Channel1_disp_unit" // Unit of measurement.
        - detection (string): "ns=2;s=Channel1_disp_detection" // Detection method.
      - CrestFactor
        - value (float): "ns=2;s=Channel1_cf_value" // Calculated measurement value.
      - TruePeak
        - value (float): "ns=2;s=Channel1_tp_value" // Calculated measurement value.
        - unit (string): "ns=2;s=Channel1_tp_unit" // Unit of measurement.
      - StandardDeviation
        - value (float): "ns=2;s=Channel1_sd_value" // Calculated measurement value.

- **TimeWaveform**
  - **duration (float):** "ns=2;s=Channel1_timewave_duration"
  // Duration of the data period in **seconds**.
  - **sampling_rate (float):** "ns=2;s=Channel1_timewave_sampling_rate"
  // Sampling rate in **Hz**.
  - **value (float array):** " Channel1_timewave_value"
  // Raw time-domain waveform data points.
- **PowerSpectrum**
  - **bandwidth (string):** "ns=2;s=Channel1_spectrum_bandwidth"
  // Frequency bandwidth of the analysis in **Hz**.
  - **lines (float):** "ns=2;s=Channel1_spectrum_lines"
  // Number of FFT lines used in spectrum calculation.
  - **window (string):** "ns=2;s=Channel1_spectrum_window"
  // Window applied to FFT calculation.
  - **value (float array):** "ns=2;s=Channel1_spectrum_value "
  // Frequency-domain power spectrum values.
- **Channel2** // Channel2 measurement (Same as Channel1)
- **Channel3** // Channel3 measurement (Same as Channel1)
- **Channel4** // Channel4 measurement (Same as Channel1)

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.

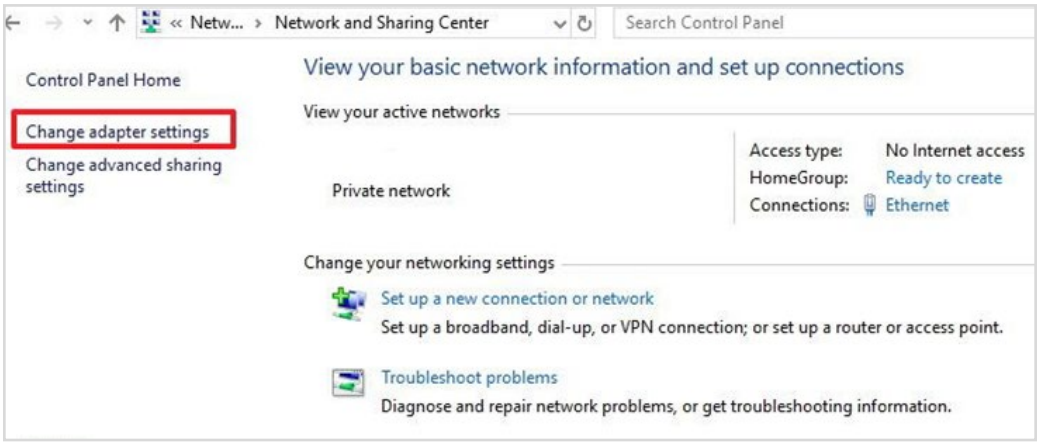
Demonstration in PC

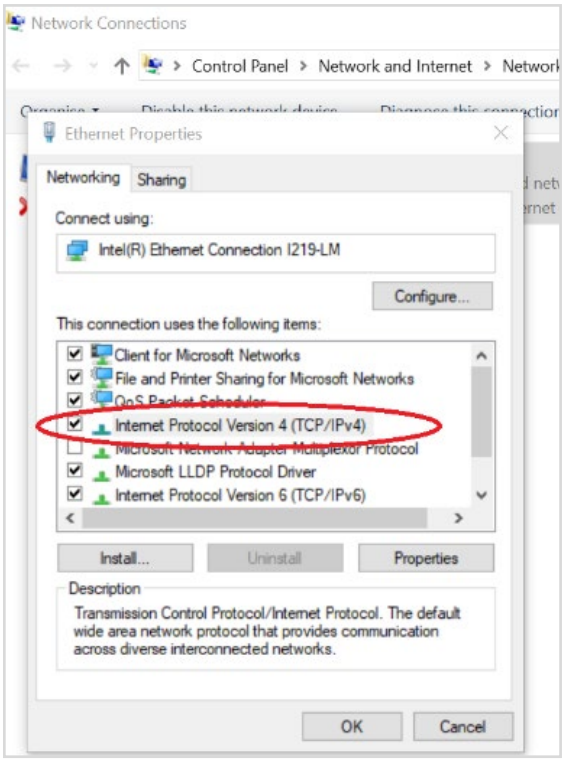
3.1.1 PC and VDS connected to a router:

- 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.

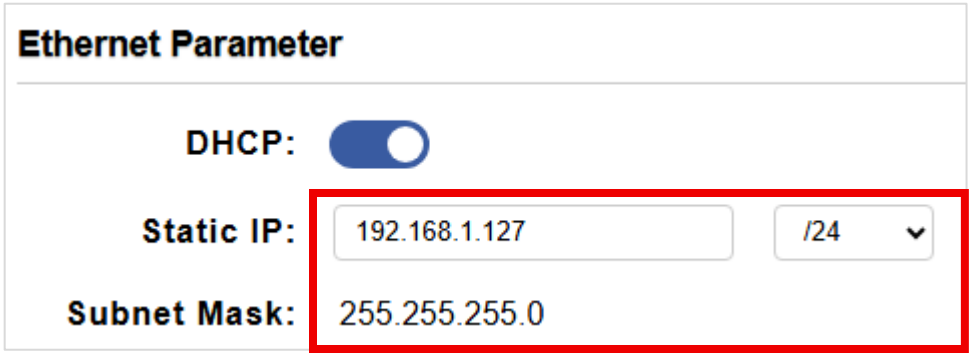
3.1.2 Direct PC Connection:

- 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




Network Connections
Control Panel › Network and Internet › Network
Ethernet Properties
Networking
Sharing
Connect using:
Intel(R) Ethernet Connection I219-LM
Configure...
This connection uses the following items:
Client for Microsoft Networks
File and Printer Sharing for Microsoft Networks
QoS Packet Scheduler
Internet Protocol Version 4 (TCP/IPv4)
Microsoft Network Adapter Multiplexor Protocol
Microsoft LLDP Protocol Driver
Internet Protocol Version 6 (TCP/IPv6)
Install...
Uninstall
Properties
Description
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.
OK
Cancel

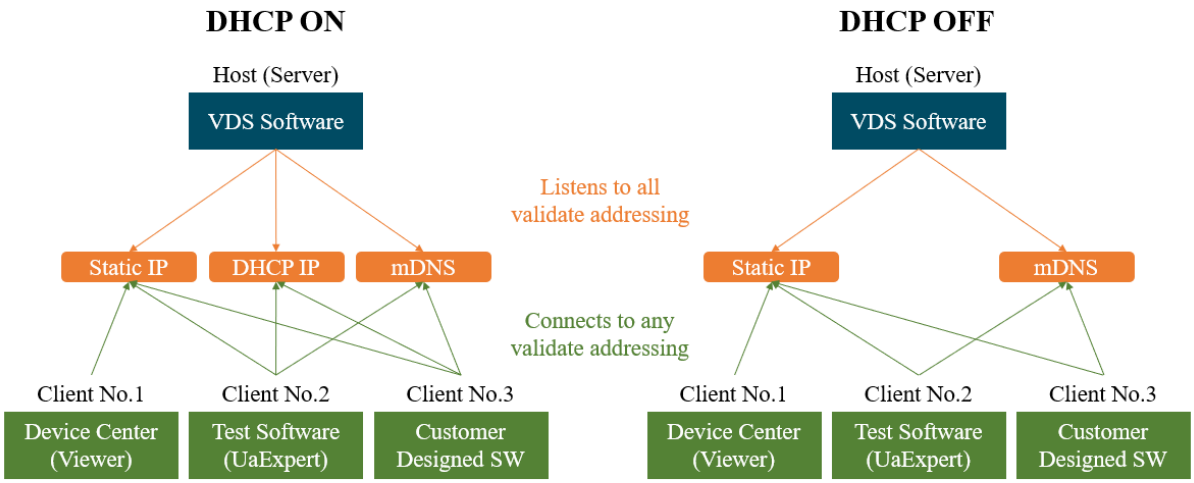

Internet Protocol Version 4 (TCP/IPv4) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 192 . 168 . 1 . 2
Subnet mask: 255 . 255 . 255 . 0
Default gateway: 192 . 168 . 1 . 1
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server: 8 . 8 . 8 . 8
Alternate DNS server: 9 . 9 . 9 . 9
Validate settings upon exit
Advanced...
OK
Cancel


Ethernet Parameter
DHCP:
Static IP:
192.168.1.127
/24
Subnet Mask:
255.255.255.0

3.1.3 Managing Static and DHCP IP Connections

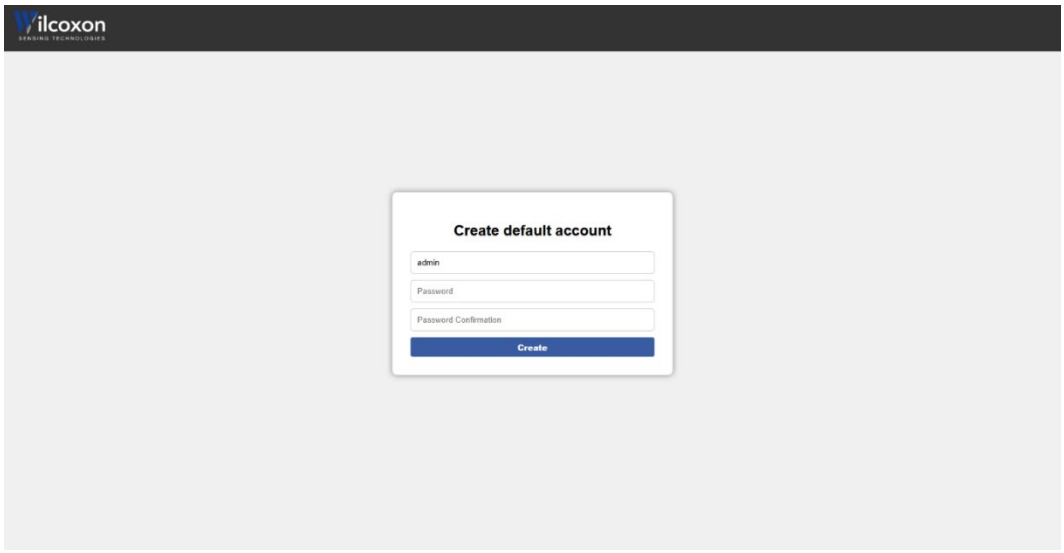
To support the direct PC connection feature, the VDS device is configured to retain its Static IP connection regardless of whether the DHCP is enabled or disabled. When the DHCP is enabled, the VDS device allows dual IP addressing connectivity.

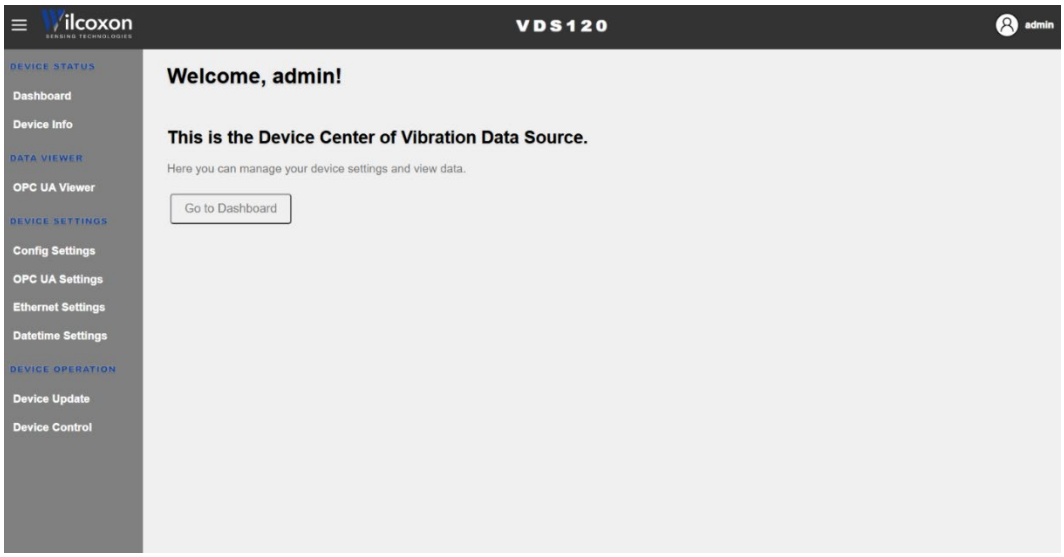
- A maximum of 3 concurrent sessions for the VDS Device Center is recommended for optimal performance.
- The number of OPC UA clients is limited to a maximum of 8 simultaneous connections.



3.2 Entering the VDS Device Center

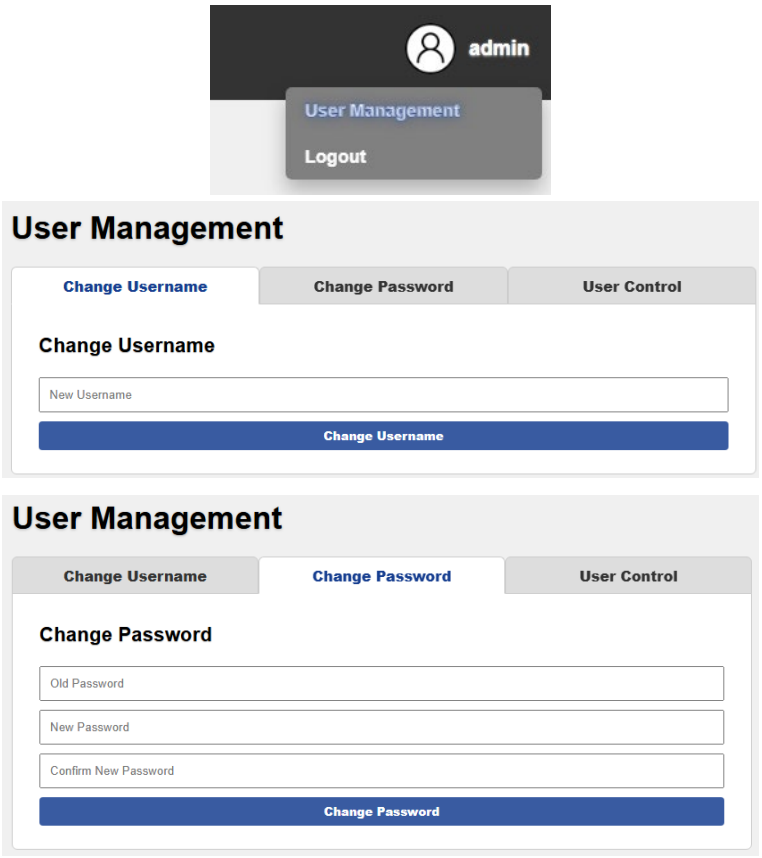
- Use the device's IP (Dynamic/Static) or mDNS address to open the VDS Device Center.
  - Device IP: **192.168.1.127**
  - mDNS: **2120w000005.local**
- On device initial setup, **Create Default Account** to establish an administrative user account.





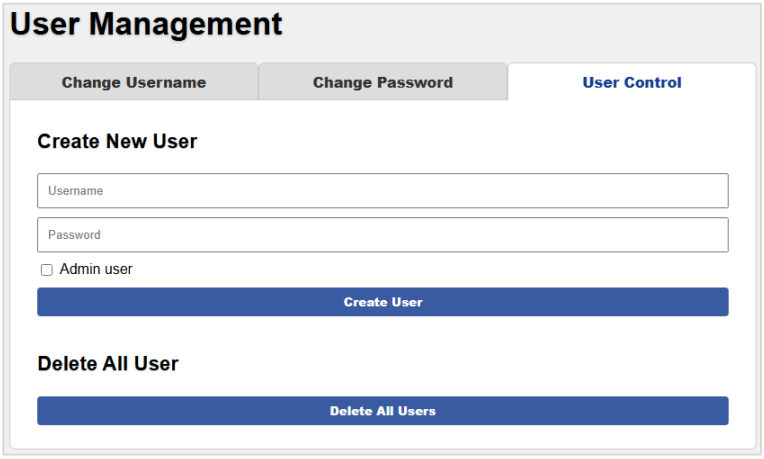
3.3 Device User Management

- After device initial setup, change your username or password under the User Management section.
- Additional administrator or standard user accounts can be created.



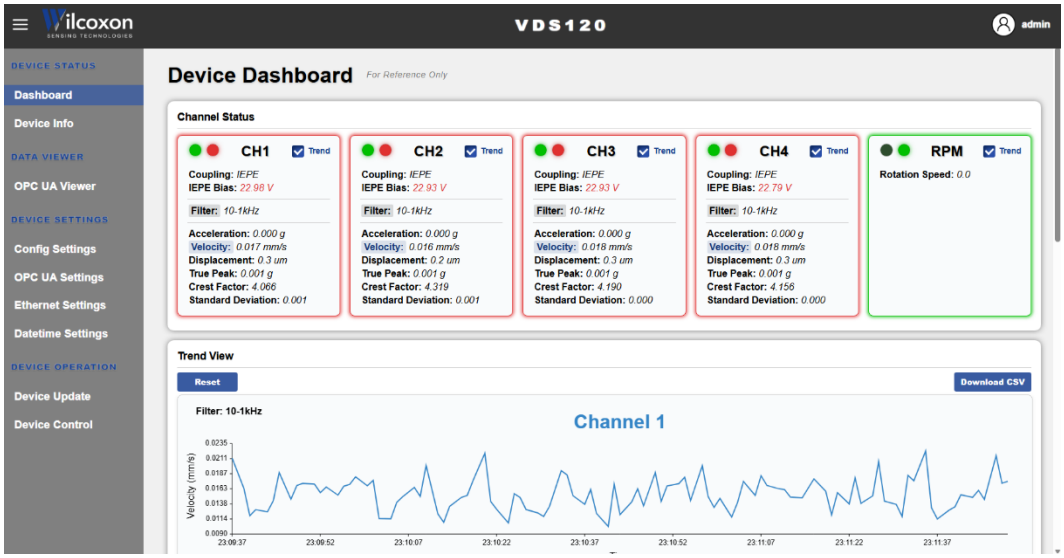
Administrators can:

- **Create User** accounts.
- **Delete All Users** to reset the device to the Create Default Account step.



3.4 Device Dashboard

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



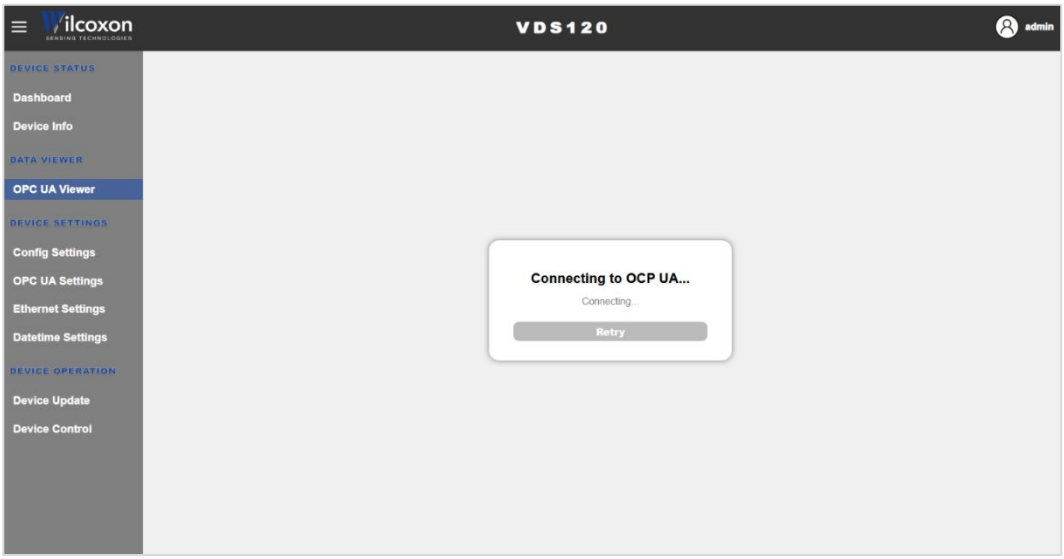
- Each channel card shows two indicators synced with hardware LEDs.
- Use the checkbox to toggle the display of channel trend charts.
- The **Reset** button clears all historical trend data (administrators only).
- The **Download CSV** button downloads the historical trend data of the selected channel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

3.5 Device Information

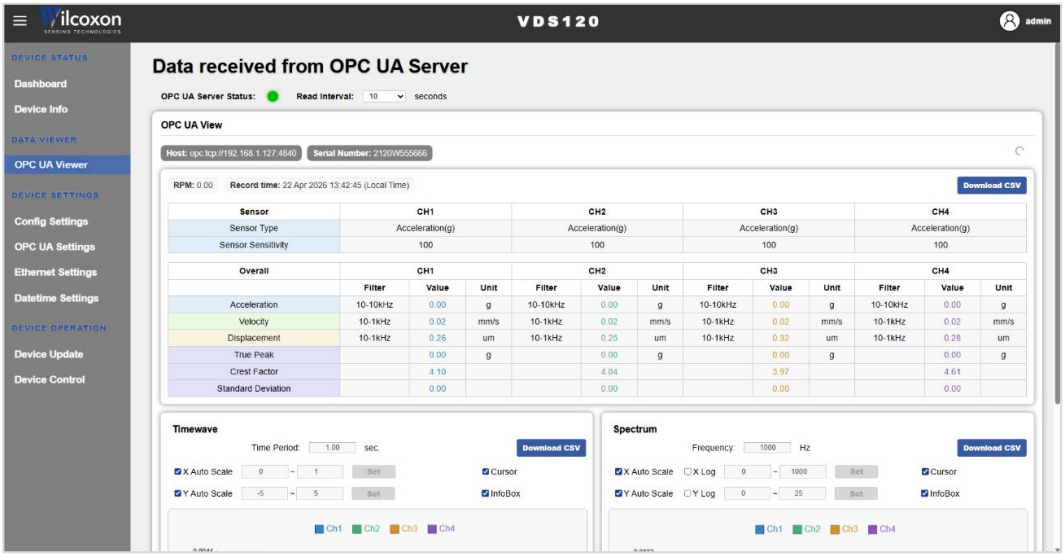
- Access via **Device Info** on the sidebar.
- Data refreshes only when the page is opened or when **Refresh** is clicked.

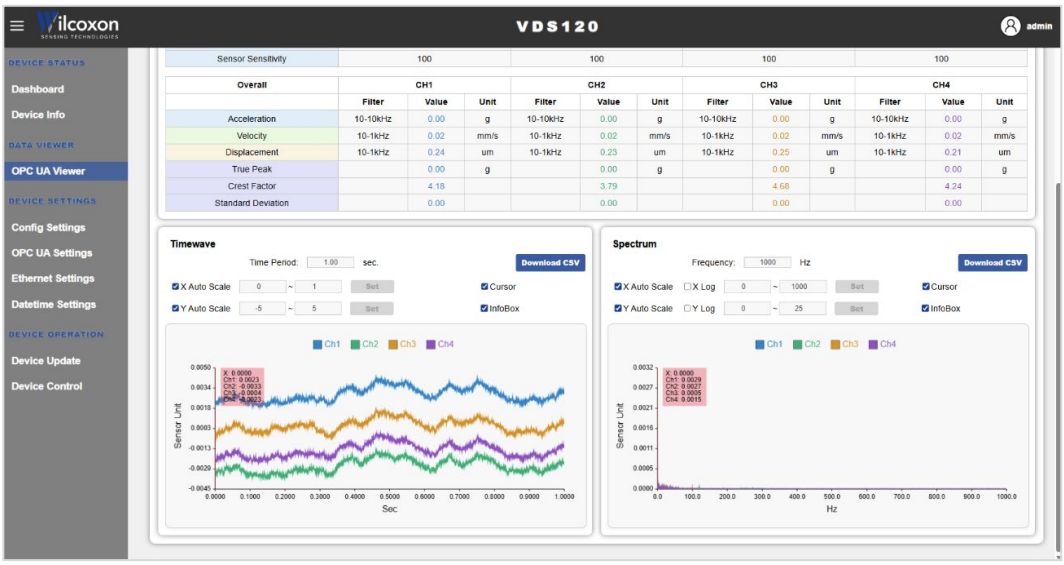
3.6 OPC UA Viewer

- Access via **OPC UA Viewer** on sidebar.
- Connect to the local host OPC UA server according to parameters in the OPC UA Settings.
- If the connection fails, use the **Retry** button or reload this page to reconnect.



- Once the browser connects to the OPC UA server, the page redirects to the data viewer.
- There is some information from the VDS device via OPC UA on top of OPC UA View.
- Data received from the OPC UA server will be shown inside the OPC UA View to confirm what data is being transmitted.

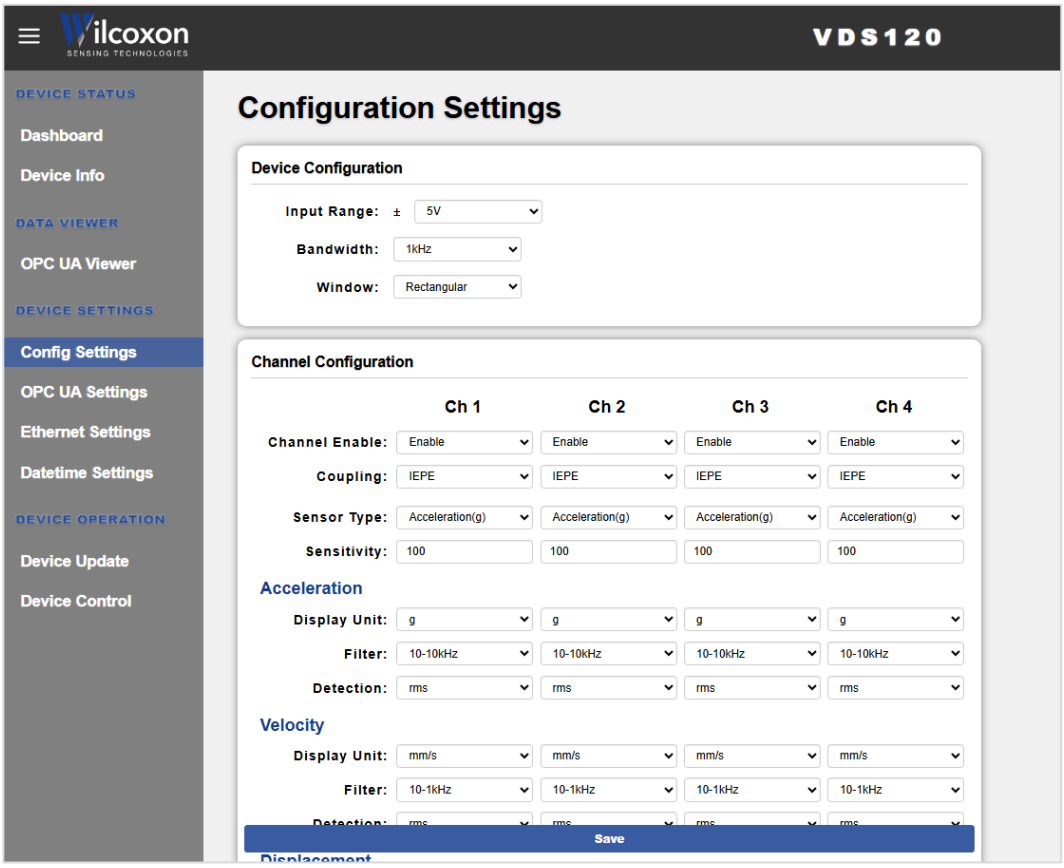




- The OPC UA Viewer is not a monitoring software. It is intended to verify operation only.

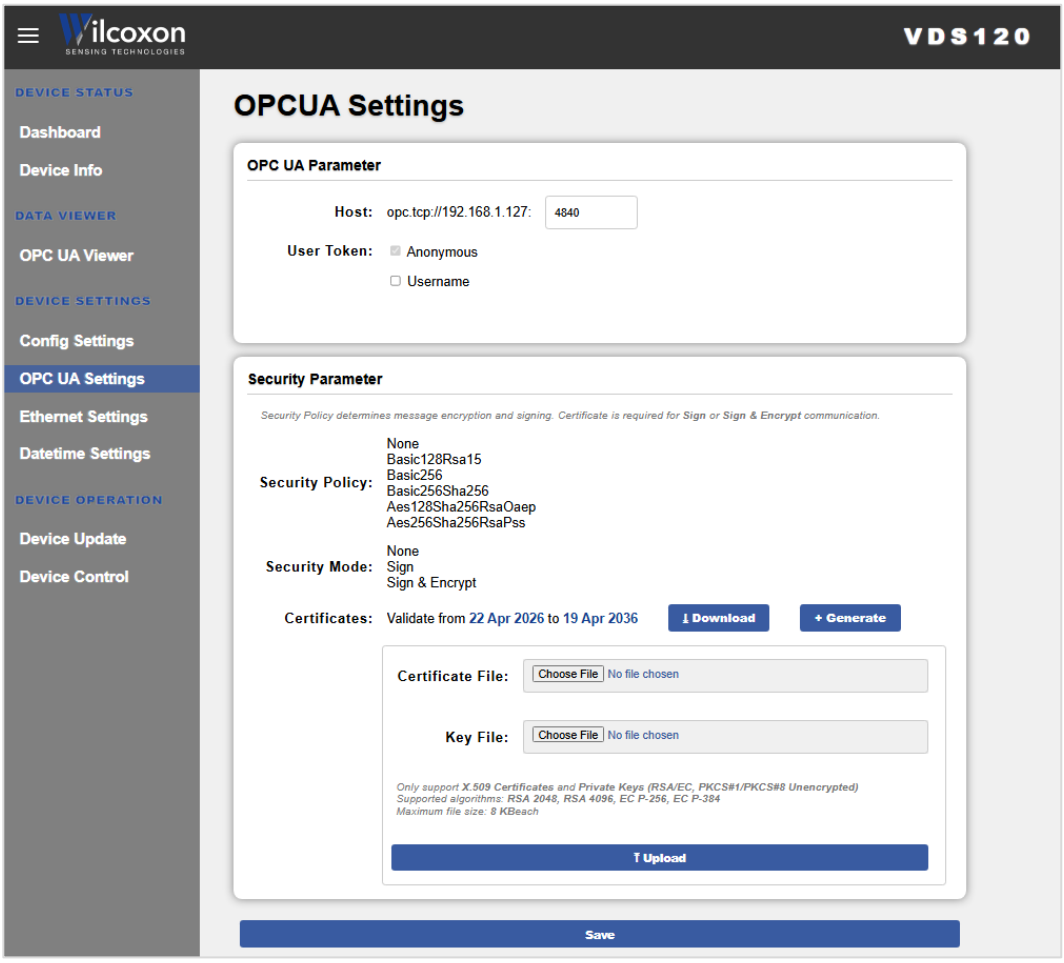
3.7 Configuration Settings

- Access via **Config Settings** on sidebar.
- Only administrators can modify these settings.
- Configure DAQ Measurement parameters, e.g. Input Range, Bandwidth, Window and Channel Configurations.
- Changes will restart the VDS software and take effect after the restart.



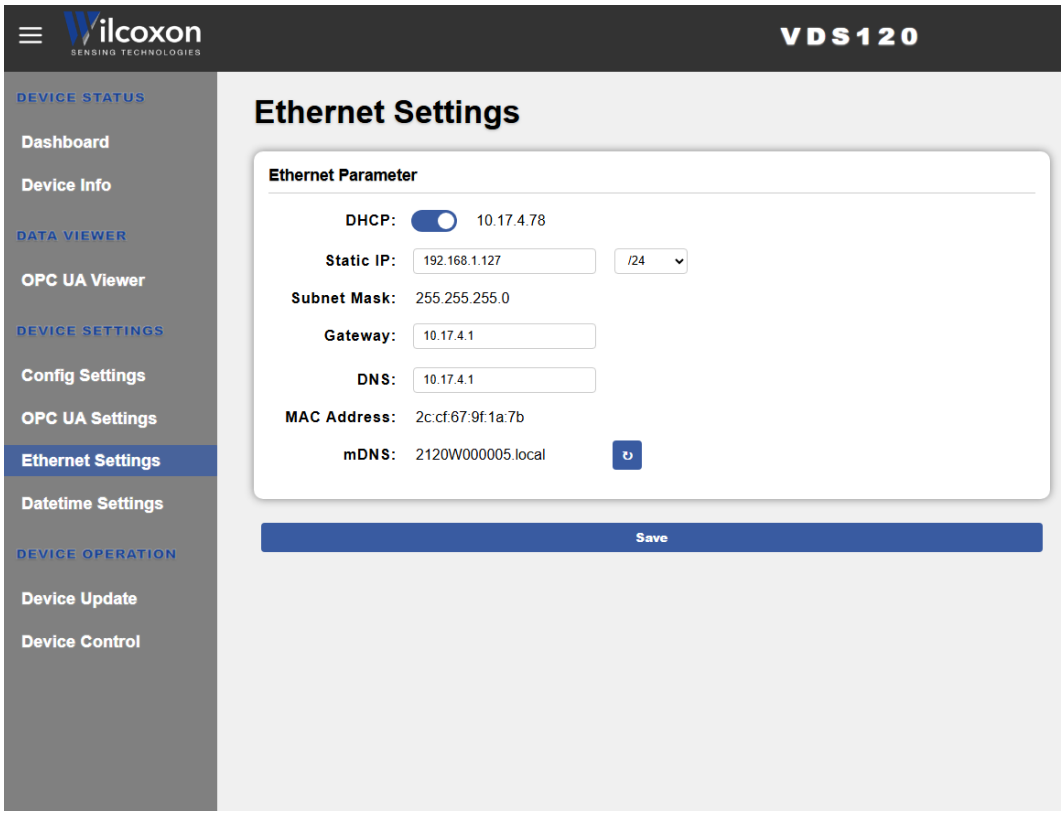
3.8 OPC UA Settings

- Access via **OPC UA Settings** on the sidebar.
- Only administrators can modify these settings.
- Configure the Host / port.
- A Certificate is optional and not required for standard OPC UA communication. For signed or encrypted communication, Generate a self-signed certificate or upload a Certificate File and corresponding Key File.
- The User Token is disabled (Anonymous) by default. It can be enabled to configure the Username and Password.
- Changes will restart the VDS software and take effect after the restart.



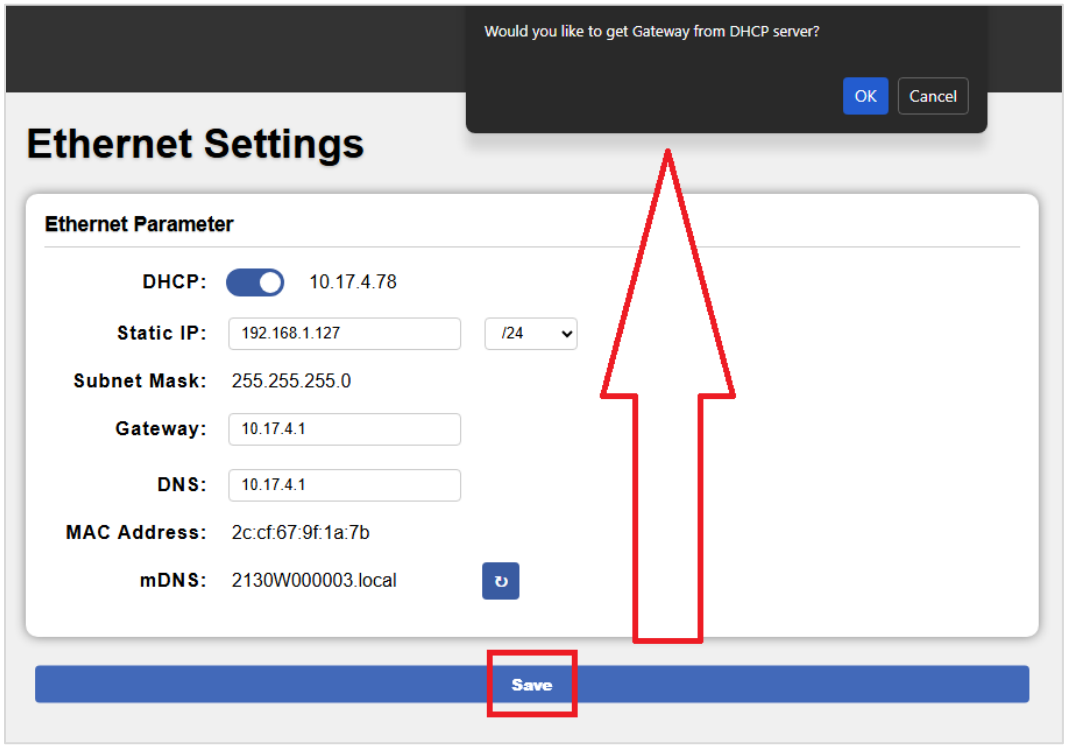
3.9 Ethernet Settings

- Access via **Ethernet Settings** on sidebar.
- Only administrators can modify these settings.
- Configure DHCP, Static IP, Subnet Mask (CIDR), Gateway, and DNS.
- Note: The mDNS address cannot be changed.
- Changes will restart the VDS network service and take effect after the restart.



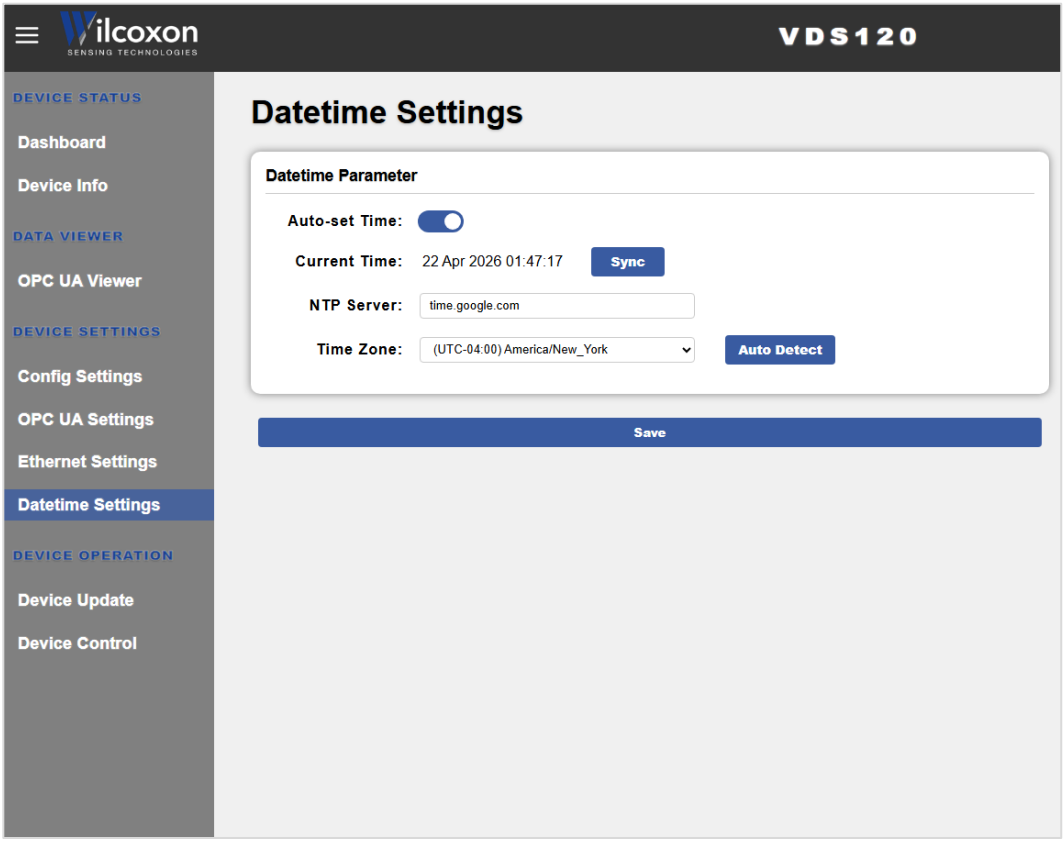
3.9.1 Enable Internet Connection:

- A new Gateway value will be assigned, and internet connection will be enabled.
- The default Gateway is automatically assigned. (A properly set router/DHCP server is necessary.)
- If DHCP is enabled and Gateway/DNS is not empty, a dialog will show to ask if you want to get the Gateway/DNS from DHCP server or keeping the manual settings.



3.10 Datetime Settings

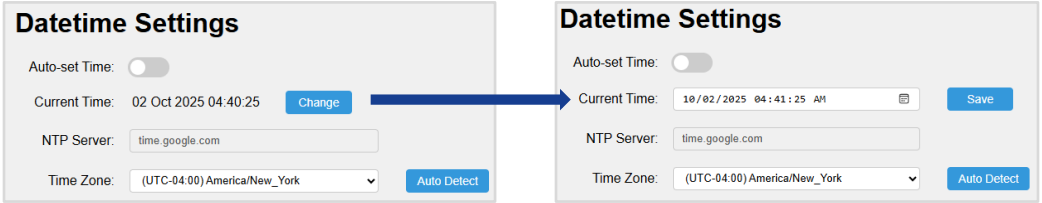
- Access via **Datetime Settings** on sidebar.
- Only administrators can modify these settings.
- Configure Auto-set Time, Current Time, NTP Server and Time Zone.



If Auto-set Time is enabled:

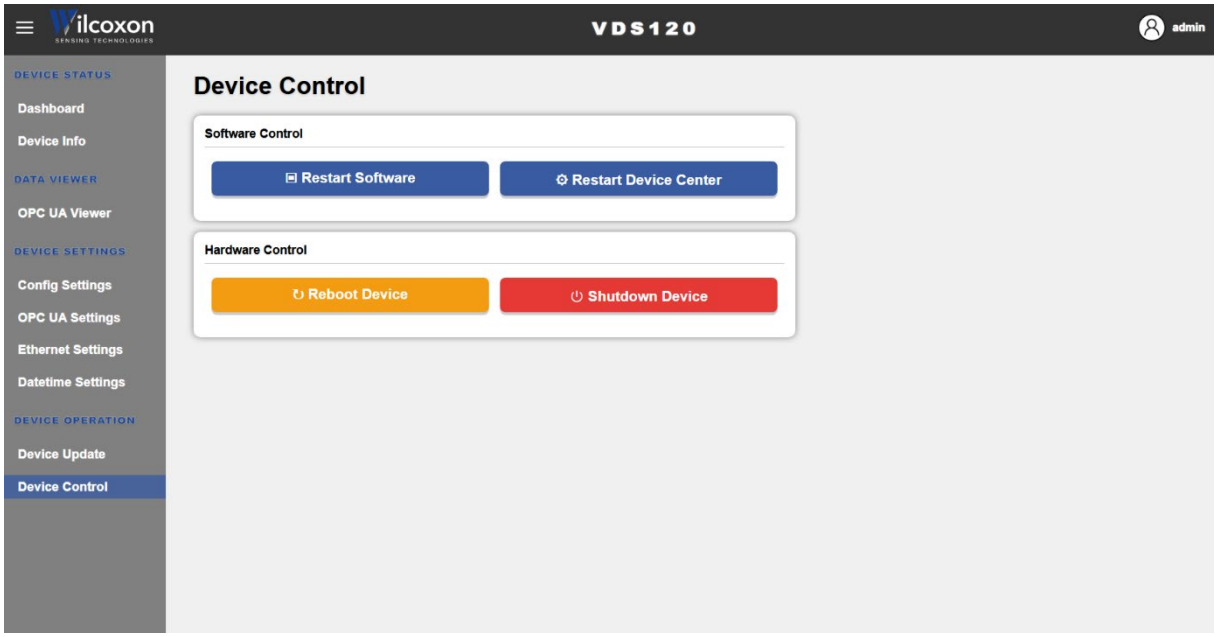
- Time sync occurs automatically on startup and every 8 hours.
- The **Sync** button triggers a time sync immediately.

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



3.11 VDS Device Control

- Access via **Device Control** on sidebar.
- Only administrators can perform controls.
- Perform software or hardware control.



3.11.1 Software Control

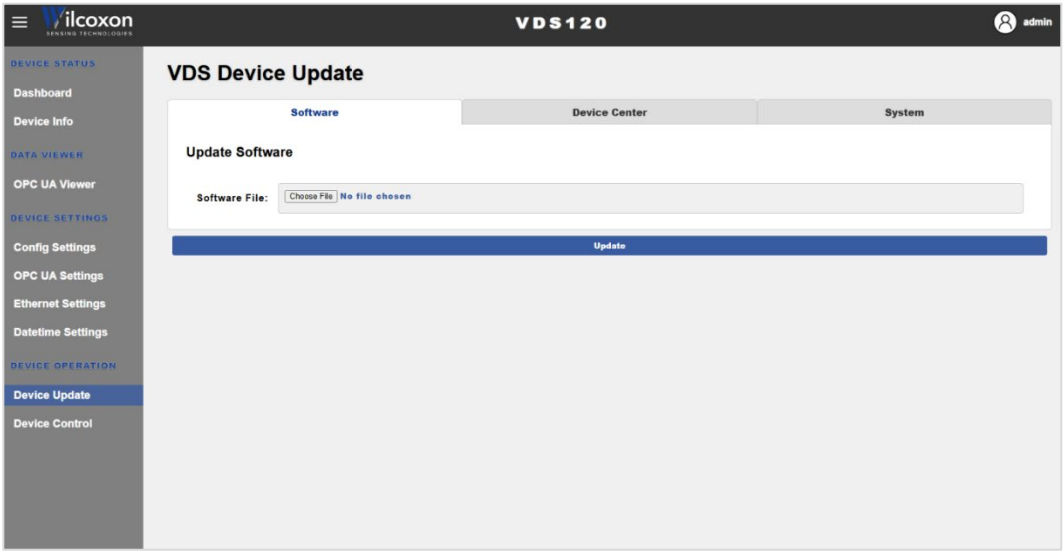
- **Restart Software** will restart the software data measuring and publishing procedure. It usually takes around 15 seconds to restart and return to operation.
- **Restart Device Center** will restart the service of Device Center. It usually takes around 10 seconds to restart and return to operation.

3.11.2 Hardware Control

- **Reboot Device** will reboot the OS to clear all temporary files and remount USB device. It usually takes around 1 minute to reboot and return to operation.
- **Shutdown Device** will shut down the VDS device. Once shutdown, the device becomes unreachable via the Device Center. The “Reboot” button or “Power” button on the physical device must be pressed to restart and reconnect to the Device Center.

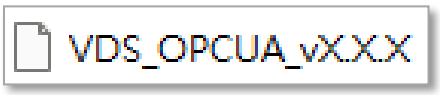
3.12 VDS Device Update

- Access via **Device Update** on sidebar.
- Only administrators can update the device.
- Perform software, Device Center, and system updates.



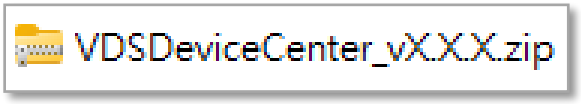
Software Update

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



Device Center Update

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

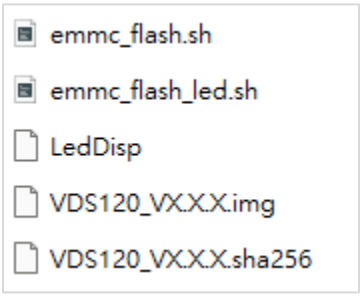


System Update

- A System Update requires the following files on a USB drive.
- Do not change the filename or place them in folders.

3.12.1 Necessary Files:

- emmc_flash.sh (update script)
- emmc_flash_led.sh (progress display script)
- LedDisp (LED control file)
- VDS120_Vx.x.x.img (full system image)
- VDS120_Vx.x.x.sha256 (checksum file)



3.12.2 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 the USB root directory.
3. Insert the 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 the 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.