ADVANCED CONFIGURATION

A1560 SONIC

OEM ULTRASONIC PULSER/ RECEIVER FRONT-END UNIT

APPLICABLE FOR A1560 SONIC-LF, A1560 SONIC-HF, A1560 SONIC-AIR

A1560 SONIC-HF

POWER   IN   OUT

Acoustic Control Systems – ACS Group
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CE

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INTRODUCTION

The A1560 SONIC (hereinafter "A1560") is a product line of ultrasonic flaw detectors designed for stand-alone and integrated use in laboratory and industrial measurement and testing applications, allowing the ultrasonic data acquisition of different materials.

The main purpose of this document is to provide the user with additional information regarding the advanced configuration of the instrument. Before reading, it is highly recommended that you familiarize yourself with further A1560 documents:

- **A1560 Getting Started**
- **A1560 Programming Manual**
- **A1560 User Manual**

Read this manual carefully before using the device to ensure safe and proper use.

SAFETY SYMBOLS USED IN THIS MANUAL:

Symbol	Description
⚠WARNING	Indicates a potential threat. Failure to avoid it can result in death or serious injury.
⚠CAUTION	Indicates a potential threat. Failure to avoid it may result in minor injury.
NOTICE	Indicates a potentially harmful situation. If it is not avoided, the device or something in its vicinity may be damaged.

A1560 MAIN COMPONENTS

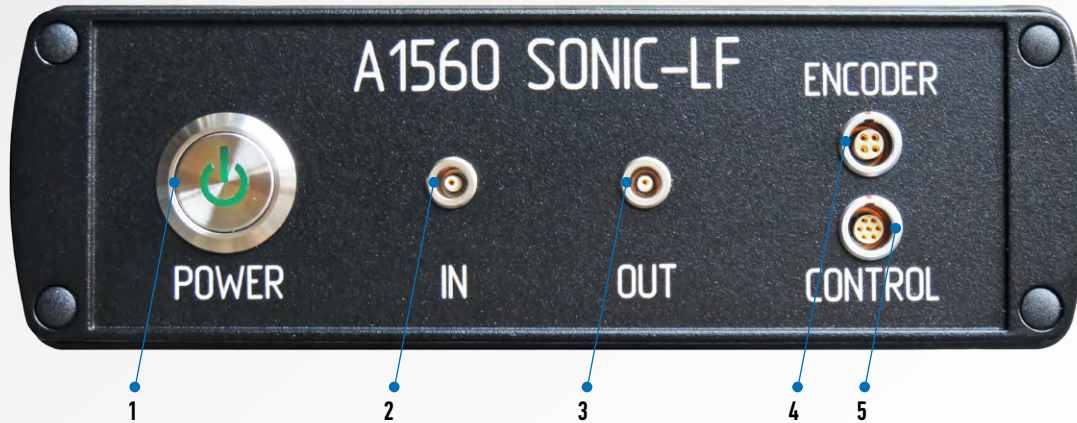The A1560 unit contains the following connectors and controls:

1. Power button with built-in state indicator, **POWER**
2. Input connector for receiving transducer or receiving element of double-crystal transducer, input-output connector of single-crystal transducer, **IN**
3. Output connector of transmitting transducer or transmitting element of double-crystal transducer, **OUT**
4. Encoder connector, **ENCODER**
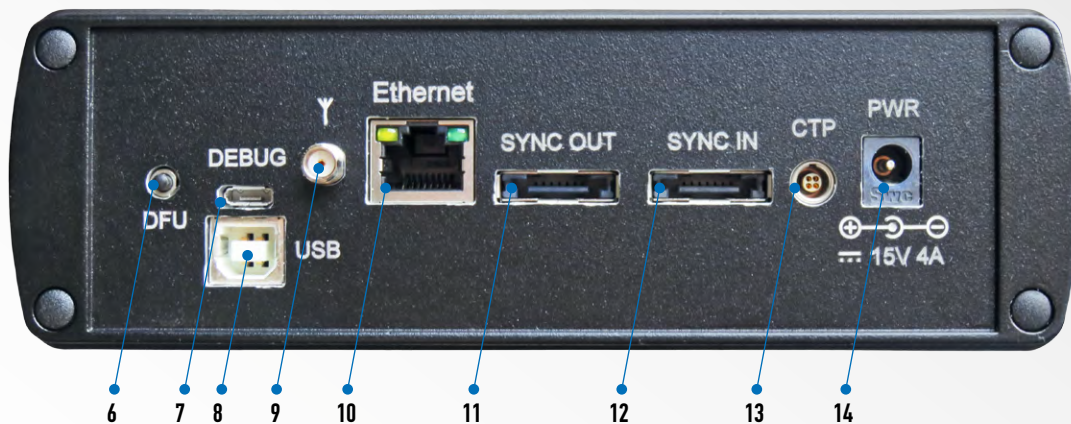5. Control connector (reserved), **CONTROL**

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FIGURE 2. A1560 REAR PANEL

6. Device firmware upgrade button, **DFU**
7. Service debug connector, **DEBUG**
8. Firmware upgrade USB connector, **USB**
9. Wi-Fi antenna connector
10. Ethernet network connector, **ETHERNET**
11. Connector for the next A1560 unit in synchronized unit chain, **SYNC OUT**
12. Connector for the previous A1560 unit in synchronized unit chain, **SYNC IN**
13. Connector for an external triggering device, **CTP**
14. Connector for power supply, **PWR**

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FIRMWARE UPDATE

The A1560's firmware can be updated with a newer version or with a special firmware developed at the user's request. A standard USB 2.0 A-to-B "printer" cable (not included) is required for the update.

3.1 PUTTING THE A1560 INTO FIRMWARE UPDATE MODE

To put the unit into DFU (device firmware update) mode:

1. Connect the A1560 to AC power via the included power supply unit
2. Power the A1560 OFF with the **POWER** button on its front panel (Fig.1 Pos.1). Wait for the built-in indicator to turn off.
3. Press and hold the **DFU** button on the rear panel of the A1560 (Fig.2 Pos.6).
4. While holding the **DFU** button pressed, switch on the A1560. The built-in state indicator should start blinking, indicating that the A1560 is in DFU mode.

TABLE 1 POWER LED INDICATION IN DFU MODE

Symbol	Description
Slow blinking (once per second)	DFU idle: waiting for a firmware/configuration file
Fast blinking (twice per second)	Firmware update is in progress.

To put the A1560 back into normal mode, switch off the A1560 while in DFU idle state (slow indicator blinking) and then switch it back on again.

NOTICE DO NOT switch the A1560 off while the firmware update is in progress (fast blinking). Otherwise, the unit may be damaged.

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3.2 UPLOADING A NEW FIRMWARE FILE TO THE A1560

NOTICE Only firmware update files obtained from ACS should be uploaded to the A1560.

To upload the firmware update file obtained from ACS to the A1560:

1. Connect the **USB** connector located on the rear panel of the A1560 (Fig.2 Pos.8) to a PC with a standard USB 2.0 A-B cable.

2. Start the A1560 in DFU mode. The state indicator should start blinking slowly and a new USB drive should be detected by the PC's operating system.

3. Copy the device firmware update file to the USB drive that appeared when the A1560 was switched to DFU mode. The state indicator should start blinking rapidly, indicating that the firmware update is in progress.

4. Wait about a minute until the state indicator switches to slow blinking again, indicating that the firmware update is finished.

5. Reboot the A1560 in normal mode.

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NETWORK CONFIGURATION

Wi-Fi and Ethernet interfaces of the A1560 can be configured to make it compatible with other devices in the same network segment or according to a specific user task. An internal networking subsystem of the A1560 runs on the OpenWrt system, allowing network set-up operations in a user-friendly environment that many IT specialists are familiar with. For that reason, only the most essential tasks are described in this document. The following description of configuration steps assumes that readers are knowledgeable about basic networking concepts.

NOTICE It is advised that network configuration is performed by an IT specialist.

NOTICE By default, the A1560 network subsystem is left unprotected to simplify getting it into operation. The A1560 connected to an organization's local area network without adequate security measures CAN and WILL be used as an entry point for a network intrusion. Use the A1560 in an isolated network segment; otherwise, consider at the very least setting Wi-Fi and configuration passwords.
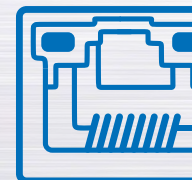
4.1 ACCESSING A NETWORK CONFIGURATION WEB INTERFACE.

1. Connect the A1560 to a PC via Wi-Fi or Ethernet

2. Open the PC's web browser and enter the IP address of the A1560 internal router into the browser's address line.

Default IP is 192.168.1.1

A welcome page like the one shown in Fig. 3 should appear.

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3. By default, no password is set for the device, so you can proceed by clicking the Login button.
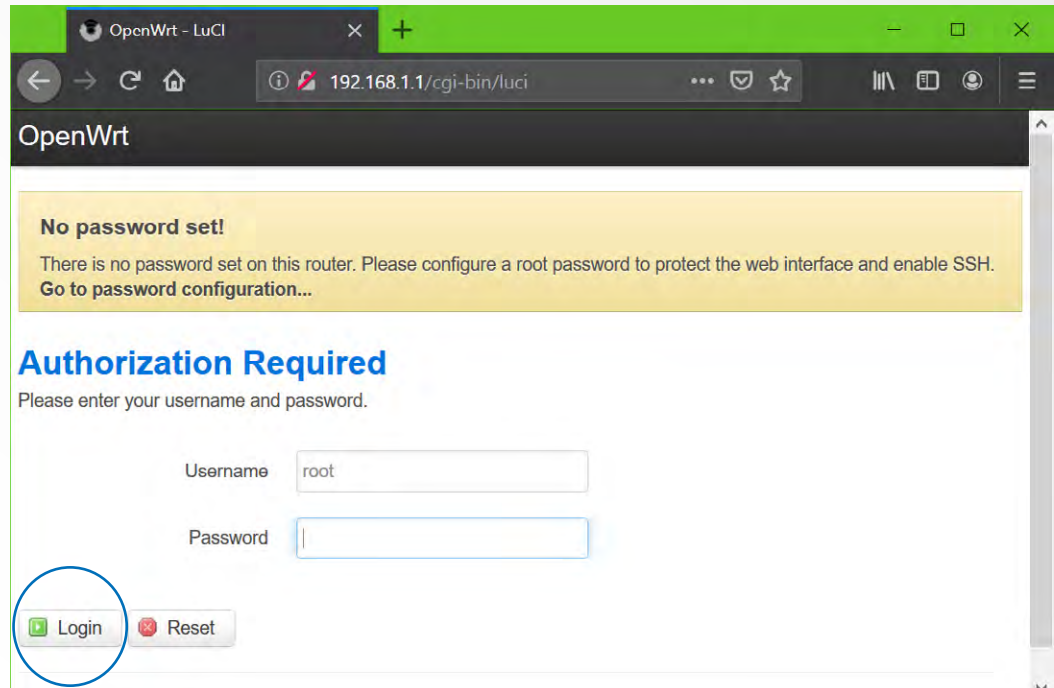

FIGURE 3 NETWORK CONFIGURATION INTERFACE LOGIN SCREEN

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4.2 SETTING A NETWORK CONFIGURATION PASSWORD

To protect the A1560 network configuration with a password:

1. Access the A1560 network configuration web interface
2. Click on the **Go to password configuration...** phrase on the welcome screen's warning header
3. Click the **Login** button
4. On the page that appears, enter your new password into the Password field, as well as into the **Confirmation** field
5. Scroll the page down to the bottom, then find and click the **Save & Apply** button

NOTICE Write down and store your configuration password in a safe place. Resetting a lost configuration password is possible only by contacting an ACS serviceperson.

4.3 SWITCHING OFF DHCP SERVICE

The A1560 is delivered with the DHCP server enabled at the Ethernet port. It is generally advised to disable the DHCP before connecting the A1560 to an organization's local area network (LAN) to avoid disrupting it. Otherwise, connect the A1560 directly to a PC Ethernet port or to an isolated network.

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To switch off the DHCP service on Ethernet **and Wi-Fi** interfaces:
1. Access the A1560 network configuration web interface
2. Select **Network ->Interfaces** from the top menu (Fig.4 Pos.2)
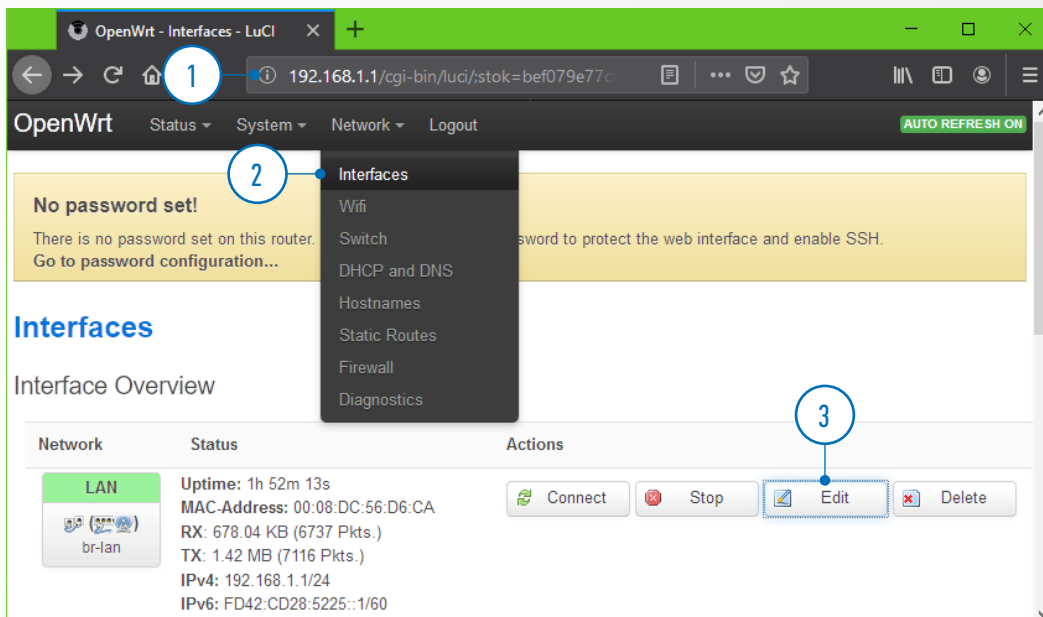3. Click the **Edit** button belonging to **LAN** Network (Fig.4 Pos.3)

FIGURE 4 EDITING THE LAN CONFIGURATION OF THE A1560

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4. Scroll the page to the bottom, check the **Disable DHCP for this interface** flag (Fig.5 Pos.4)
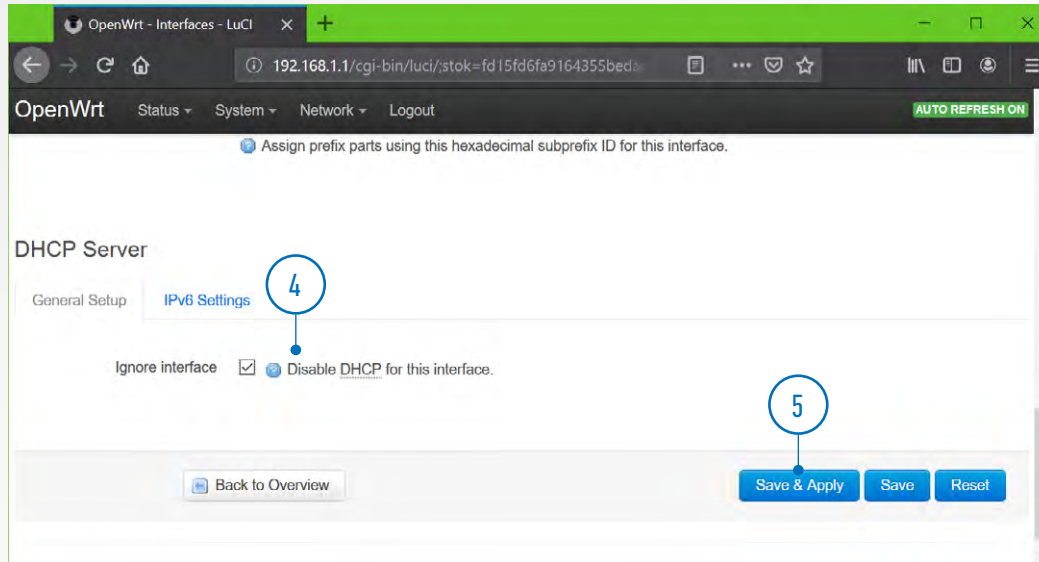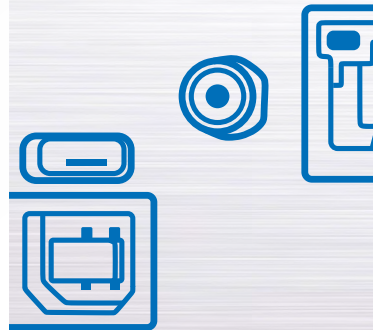5. Click the **Save & Apply** button (Fig.5 Pos.5)

FIGURE 5 DISABLING THE DHCP

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4.4 SETTING A NEW WI-FI PASSWORD AND CHANGING THE NETWORK NAME.

Securing the A1560 Wi-Fi access point with a password is highly recommended. Changing the access point name might be convenient in some cases. To change the password:
1. Access the A1560 network configuration web interface
2. Select **Network ->Wi-Fi** from the top menu (Fig.6 Pos.2)
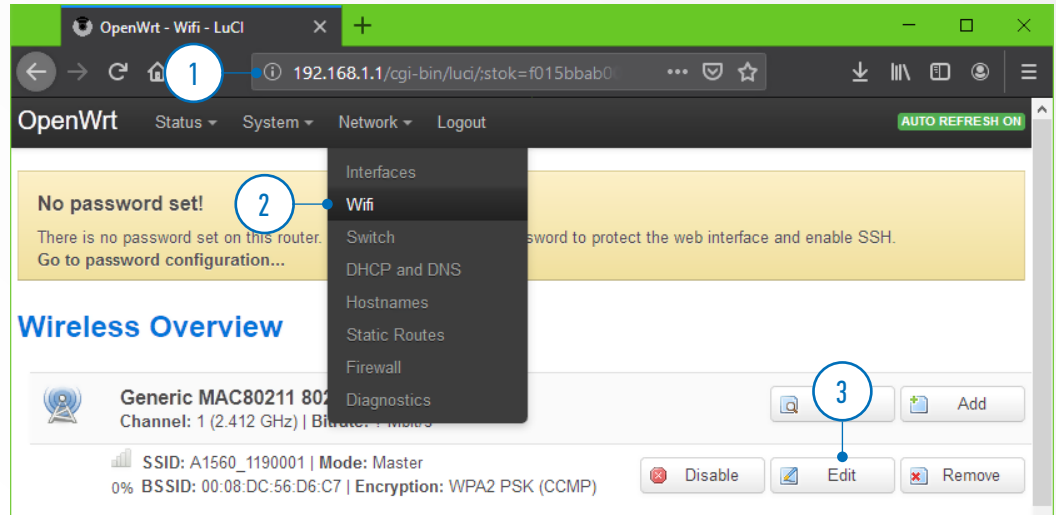3. Click the **Edit** button (Fig.6 Pos.3)

FIGURE 6 EDITING WI-FI NETWORK PROPERTIES

4. At the bottom of the page, find the **Wireless Securit**y tab (Fig.7 Pos.4) and switch to it

5. Set **Encryption** (Fig.7 Pos.5) to **WPA2-PSK**

6. Enter the desired Wi-Fi network **Key** (Fig.7 Pos.6)

7. Click **Save & Apply** button (Fig.7 Pos.7)

8. If you wish to change the Wi-Fi access point name, find and edit it in the **ESSID** field of the **General Setup** tab (Fig.7 Pos.8). Do not forget to click **Save & Apply** after doing so.
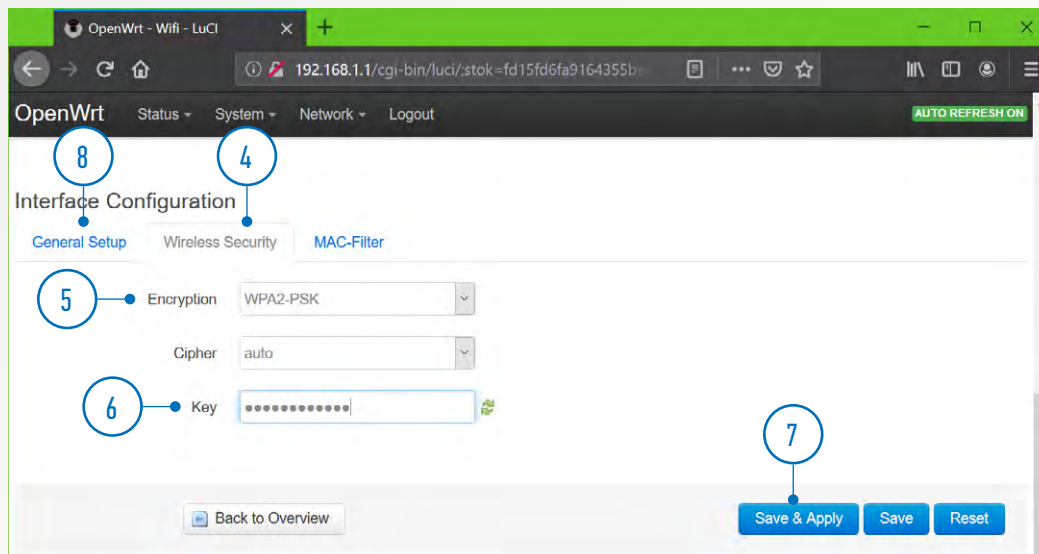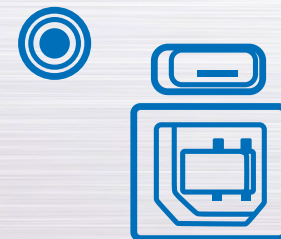

FIGURE 7 CHANGING WI-FI PASSWORD OF A1560

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4.5 SWITCHING WI-FI TO A CLIENT MODE.

Users may want to switch the A1560's Wi-Fi to a client mode, for example, to connect to several A1560 units simultaneously via Wi-Fi. To connect the A1560 as a client to an existing Wi-Fi network:
1. Access the A1560 network configuration web interface
2. Select **Network -> Wi-Fi** from the top menu (Fig.8 Pos.2)
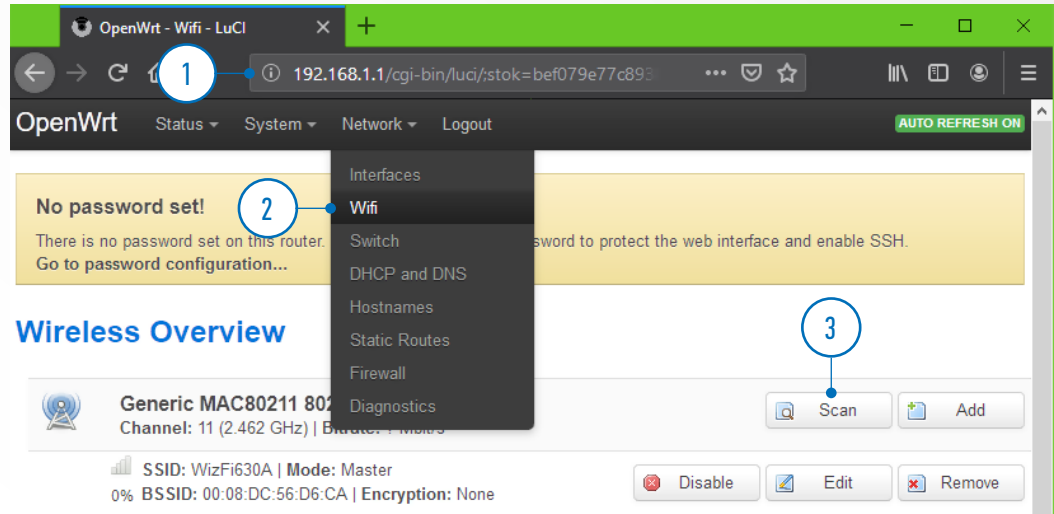3. Click the **Scan** button (Fig.8 Pos.3)

FIGURE 8 INITIATING EXISTING WI-FI NETWORKS SCAN

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4. Find your network in the list of the accessible Wi-Fi networks and click the **Join Network** button next to its name.
5. Input the network's password in the **WPA passphrase** field (Fig.9 Pos.5)
6. Check the **LAN** flag in **Create/Assign firewall-zone** selector (Fig.9 Pos.6)
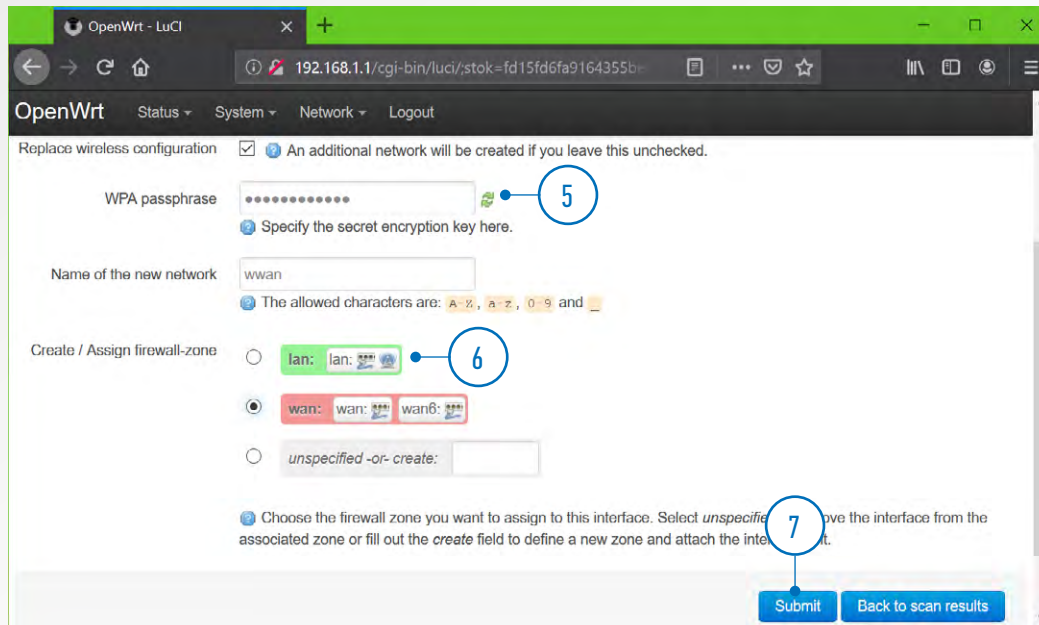7. Click the **Submit** button (Fig.9 Pos.7)

FIGURE 9 WI-FI CLIENT SETTINGS

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4.6 RESTORING DAMAGED IP OF THE ACQUISITION SUBSYSTEM

By default, the control and data ports of the pulse generation and data acquisition subsystem are available at **192.168.1.2.** This address can be changed via the A1560 API Library programmatically. In some cases, this IP address might be misconfigured, rendering the acquisition subsystem inaccessible. If this happens, the address can be set back to the default IP or some other IP in DFU mode. To restore the IP address:

1. Prepare the IP configuration text file named **address.txt** and containing the two following lines:

USER
ip address 192.168.1.2

2. Connect the **USB** connector located on the rear panel of the A1560 to a PC with a standard USB 2.0 A-B cable.

3. Start the A1560 in DFU mode. The state indicator should start blinking slowly and a new USB drive should be detected by the PC's operating system.

4. Copy the **address.txt** file from step 1 to the USB drive that appeared when the A1560 was switched in DFU mode.

5. Reboot the A1560 in normal mode.

6. The acquisition subsystem should now be accessible to the external PC software via Ethernet by the IP from the **address.txt file**.

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