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SECURITY FROM THE INSIDE

MagTek Demo Applications

Web HID-MQTT-WSS

MMS DEVICE USER GUIDE

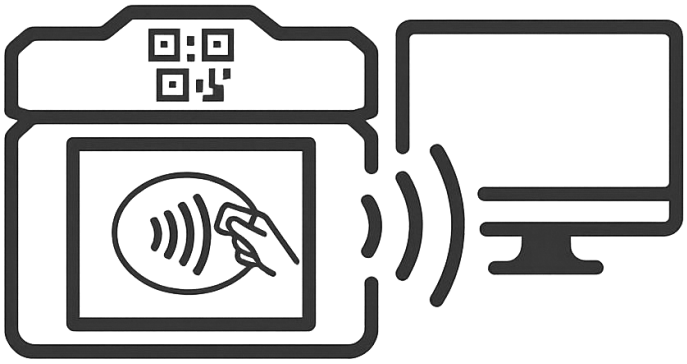

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Table 0-1 - Revisions

Rev Number	Date	Notes
100	09/03/2025	Initial Release
110	3/16/2025	Added WebSocket information

Table of Contents

Table of Contents 4
1 Introduction 5
1.1 Demo Application Home Page 5
1.2 MMS Devices 6
1.3 Quick-Start Setup Guide 6
2 Essential Configuration: Connecting Your Device 8
2.1 Phase 1: Configure Host Application Settings 8
2.2 Phase 2: Provision Device for MQTT 8
3 Using the Demo Pages 9
3.1 HID MMS Demo (Direct USB HID) 9
3.2 MQTT 11
3.3 HID MQTT Device Client 13
4 Configuring the Demo Application 13
4.1 MQTT Configuration Page 14
4.2 WSS Certificate and Trust 15

1.1 Introduction

This document provides instructions for using the browser-based **MagTek Demo Applications** to configure and test MagTek devices, including **MMS devices**, specifically the **DynaFlex family** (including DynaFlex, DynaFlex Pro, DynaFlex II, DynaFlex II PED, DynaFlex II Go and DynaProx, models).

The Demo Applications enable comprehensive testing of a wide array of capabilities, including core payment functions like EMV chip and NFC transactions, MSR reading, barcode scanning, and PIN entry. Note that **feature support is dependent on your specific device model**. For instance, the **DynaFlex II PED** model supports PIN entry, manual card entry, and signature capture functionalities.

- CRITICAL REQUIREMENT: For USB connected devices, these demos require a Desktop, Chromium Browser Only!

The MagTek Demo Applications rely on Web HID functionality for USB connected devices, which is not supported by mobile browsers (iOS/Android). You must use a desktop-based Chromium browser (like Google Chrome, Microsoft Edge, or Opera) for the demos to function correctly when using a USB connected device.

1.2 Demo Application Home Page

Upon opening the Web HID Demo home page, the Main Page is displayed. This page serves as the central menu and is organized into the following categories:

- **MMS Devices** – DynaFlex I/II device types and DynaProx (EMV, NFC, Barcode, PIN and MSR)
- **V5 Devices** – iDynamo, eDynamo, mDynamo, tDynamo (EMV, NFC and MSR)
- **V5 MSR/Manual Entry** – MSR swipe devices such as Dynamag and DynaPAD
- **V5 (SRED) Devices** – iDynamo 5 Gen III (MSR)
- **Magensa Services** – secure services for transaction testing
- **Miscellaneous** – configuration and GitHub source access

Each section provides a corresponding demo page with user interface elements for connecting a device, issuing commands, and reviewing results see **Figure 1.**

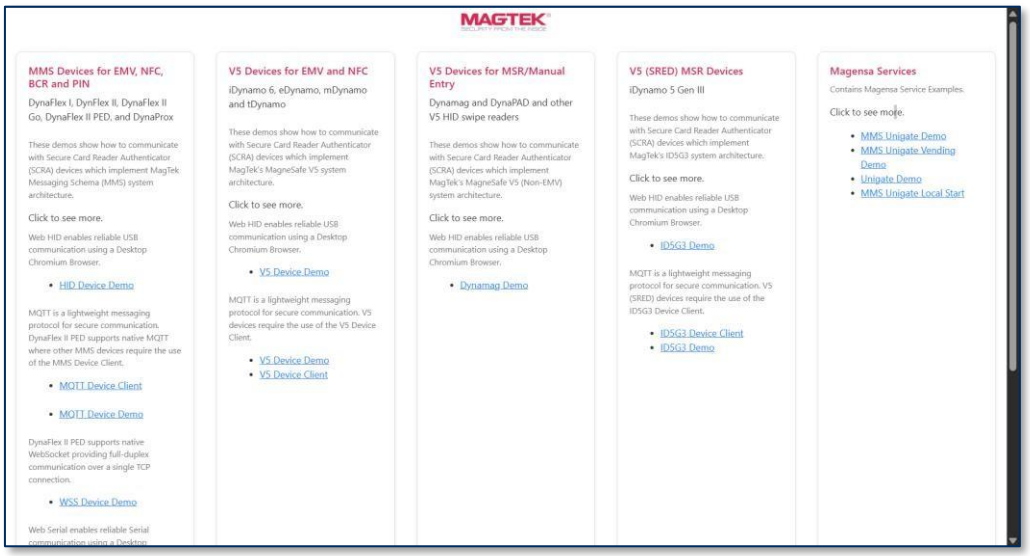


Figure 1 - Demo Application Home Page

1.3 MMS Devices

The MMS product family includes the following devices:

- DynaFlex/DynaFlex Pro
- DynaFlex II/DynaFlex II PED
- DynaFlex II GO
- DynaProx

Devices in this family generally support **EMV, NFC, barcode, MSR, and PIN functionality**, though specific features vary by model. The Demo Application connects through methods including **USB HID**, **WebSocket (WSS)**, **MQTT**, or **Bluetooth Low Energy (BLE)**, depending on the connection method enabled on your device.

1.4 Quick-Start Setup Guide

This checklist provides a summary of the steps required for configuring and running a demo with your device.

1. **Prepare Device:** Power on the device (if there is a power button) and connect it via USB, Wi-Fi, MQTT, or BLE.
2. **Open Demo Application:** Launch the Web HID Demo in a desktop Chromium browser.
3. **Configure Host App:** Be sure to enter **RMS, WebSocket, MQTT, and Contactless parameters** prior to using the various demos.
4. **Device Provisioning:** If using WSS or MQTT, provision the device's network and security settings (as outlined in Section 3)
    - **Note: For WSS connections, ensure the device's hostname (e.g., df-[SerialNumber]) is resolvable in your network. Also plan for periodic certificate renewal.**

5. **Open Session:** Select **Open** and confirm a successful connection.

6. To test your setup and connection, choose a command (e.g., **Start EMV ALL**), paste command data if necessary, and select **Send Command**.
7. **View Results:** Swipe, insert, or tap a card, and observe the **transaction log** for the response and confirmation.

2 Essential Configuration: Connecting Your Device

For devices using **MQTT** or **WebSocket (WSS)**, configuring your host application and provisioning the device itself is mandatory to establish a successful secure connection. If connecting via USB HID, all steps listed in section 2 can be skipped.

Before using **MQTT** or **WebSocket (WSS)**, configuration is required. From the Demo Application Home Page, select **Misc. → Configuration for the Demos**.

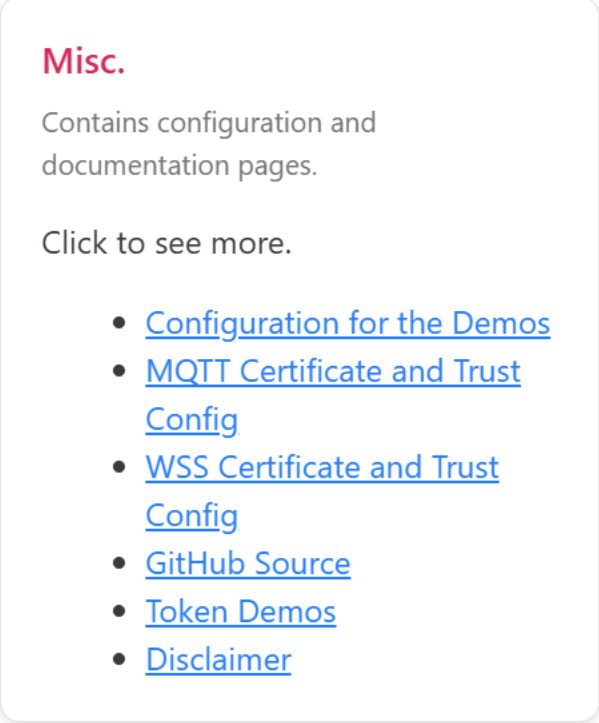


Figure 2 - Miscellaneous Configuration and Documentation Pages

2.1 Configuring the Demo and Provisioning Your Device

Step 1: Configure Host Application Settings

Configure the Demo Application by supplying the necessary API keys and server addresses.

1. From the Home Page, select **Misc. → Configuration for the Demos**.
2. **Enter and save** the required settings.
    - **RMS Options:** Enter the Magensa API key and service URL.
    - **WebSocket Options:** Provide the WebSocket server address.
    - **MQTT Options:** Specify the Org Node, broker address, client ID, and user credentials.
    - **Contactless Options:** Adjust timing parameters for NFC operations.

Note: Configuration values must be entered and saved prior to establishing a secure session. Connection attempts without proper configuration will fail.

Step 2: Provision Device for MQTT

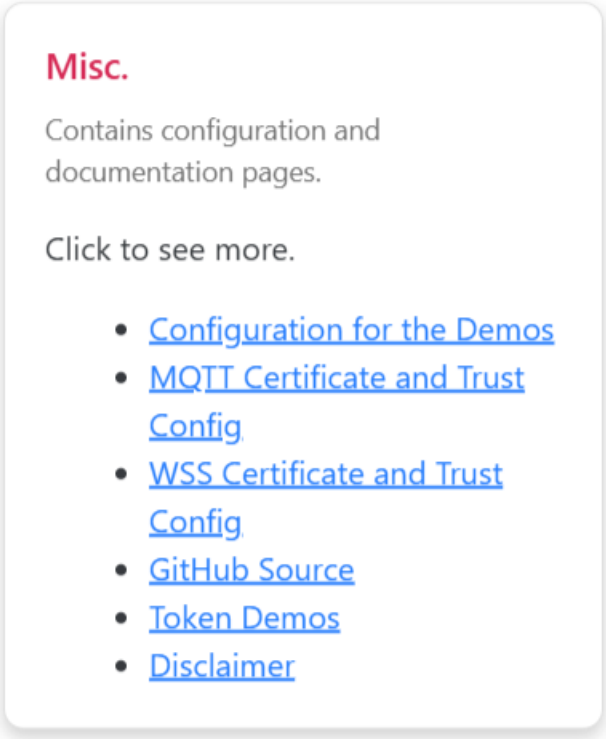
The separate **MQTT Configuration** page is used to provision your physical device with its Wi-Fi credentials and MQTT broker details.

1. Connect your device via **USB HID**.
2. Open the **MQTT Configuration** demo page.
3. Select **Open** to connect to your device.
4. Use the **Wi-Fi Settings** section to enter the device's **SSID Name** and **SSID Password**.
5. Use the **MQTT Credentials** section to enter the **MQTT User**, **Password**, and **Org Node**.
6. Select **Save Config**.
7. The device will record these settings, allowing it to connect to your broker over the network.

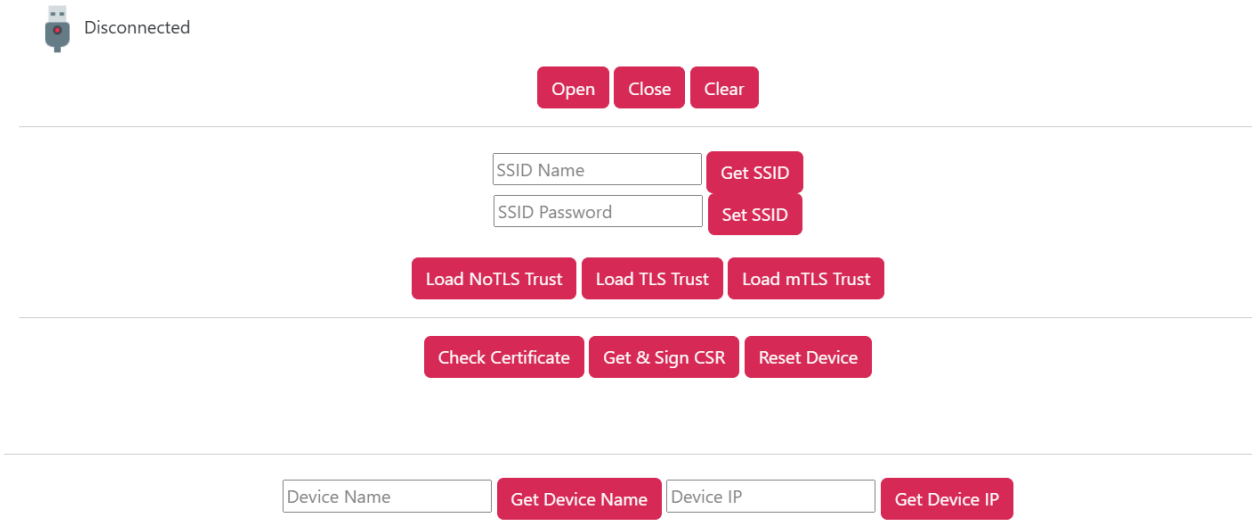
Note: Configuration values must be entered and saved prior to establishing a secure session. Connection attempts without proper configuration will fail.

2.2 Use the WebHID Demo to Connect Your Device via WebSocket

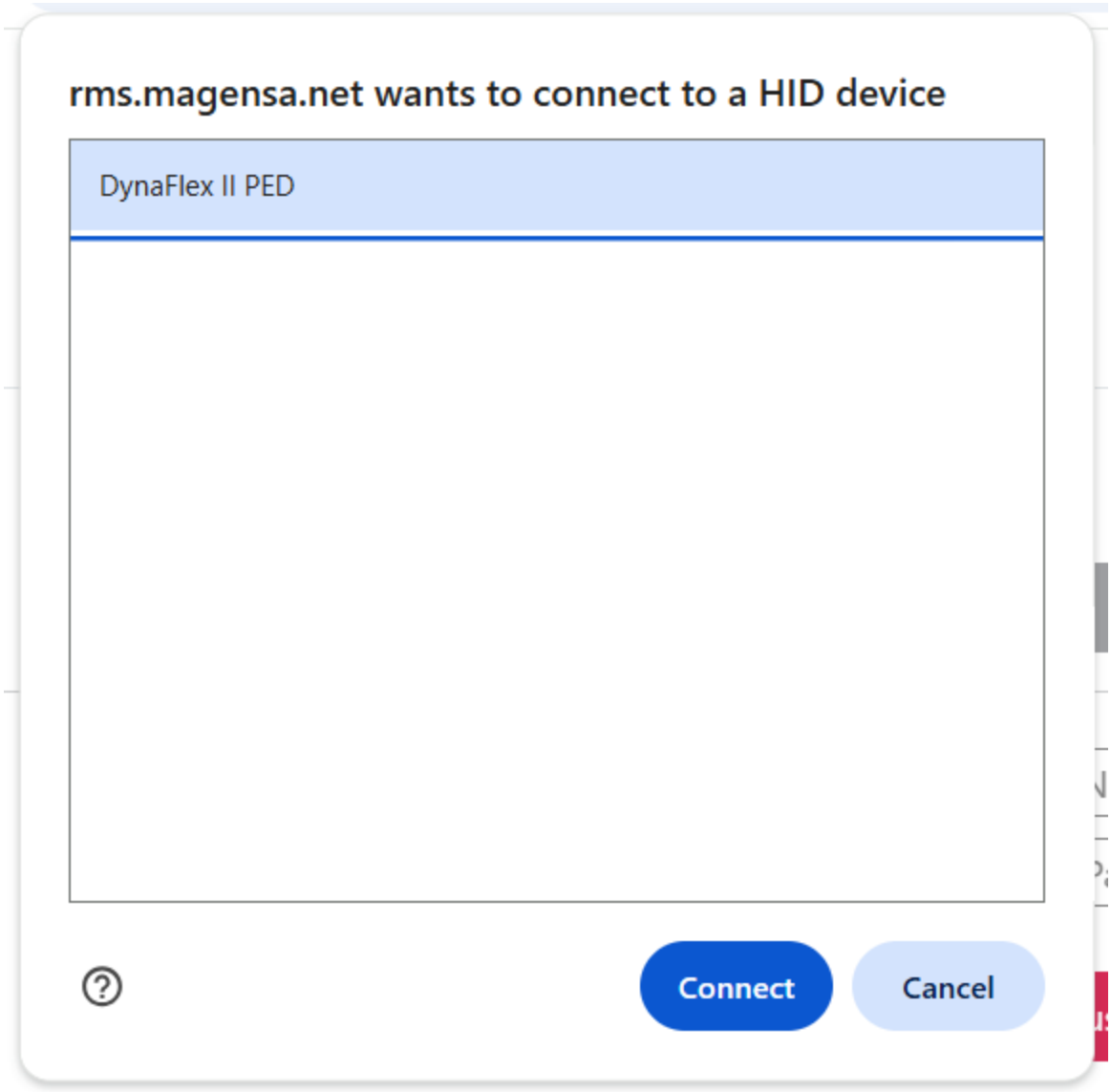
1. Connect the host PC to the same wireless network that your DynaFlex II PED device will be connected to.
2. Open this page using a Chromium Browser https://rms.magensa.net/TEST/demo/index.html
3. Plug in the device via USB cable
4. Click Misc and click WSS Certificate and Trust Config



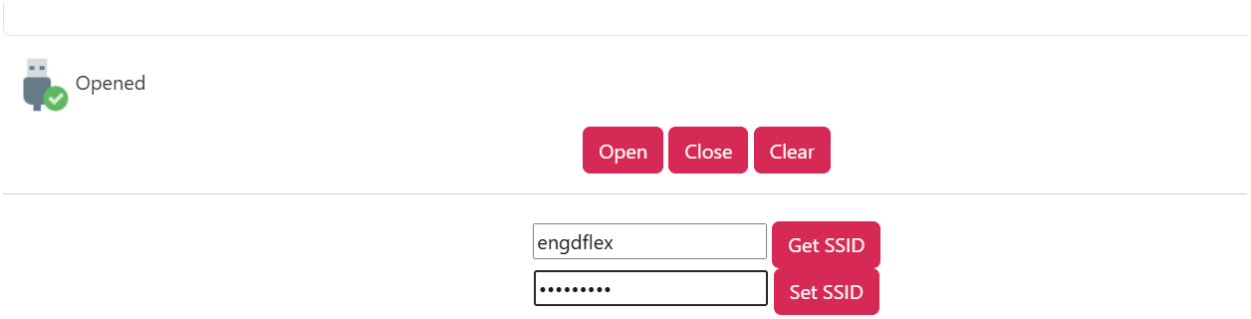
5.
6. Click Open button



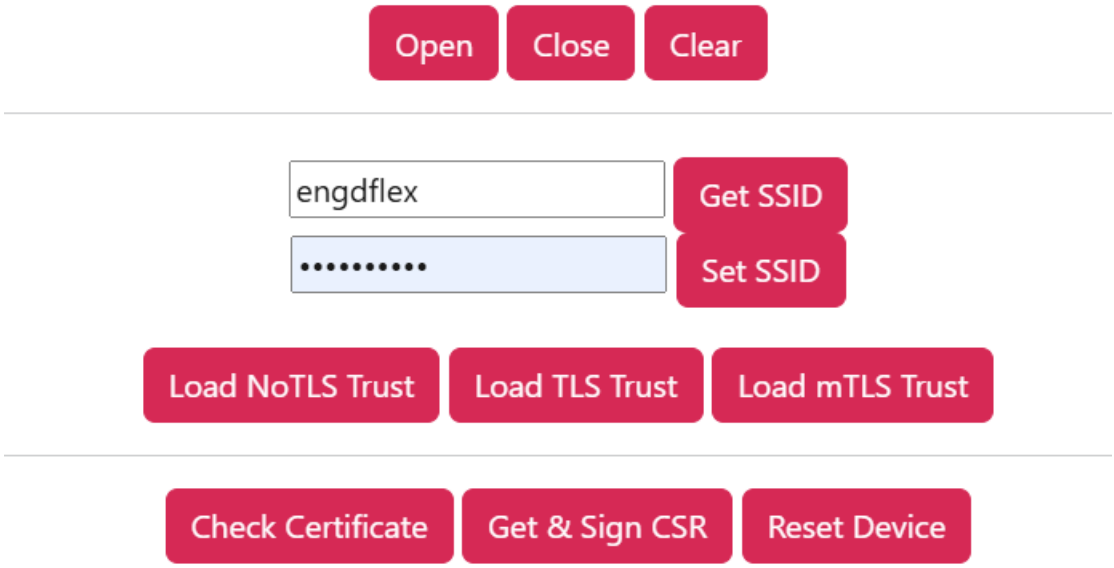
7. Select DynaFlex II PED and Click Connect



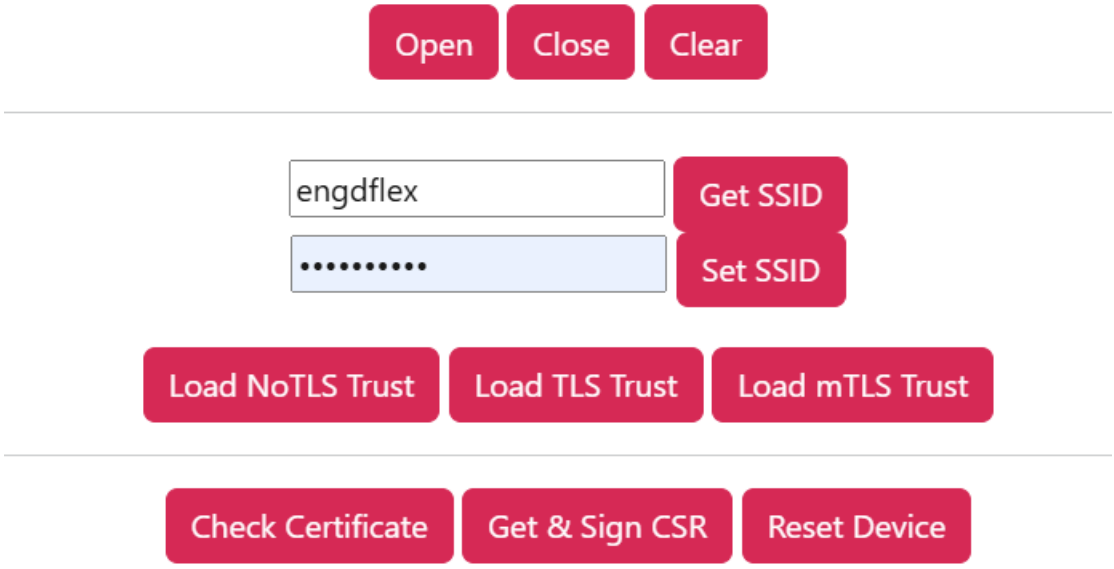
8. Enter Wireless Network SSID and password, then click Set SSID



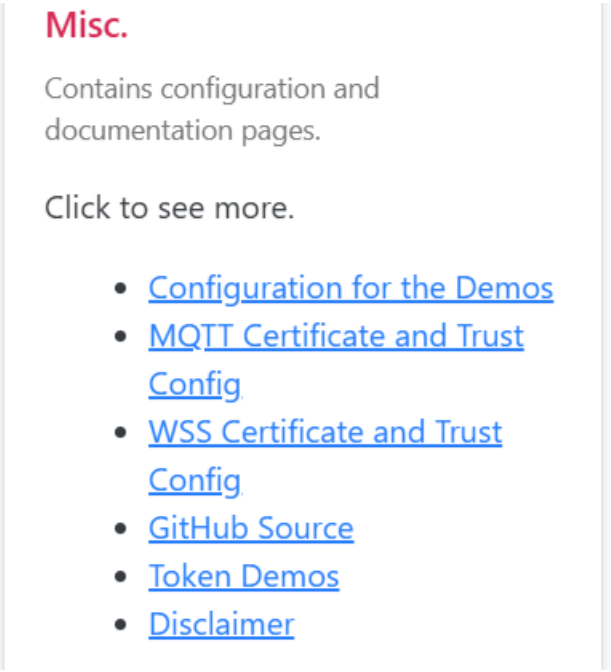
9. If you want to connect via non-secure TLS connection, press **Load NoTLS Trust**, and press Reset Device



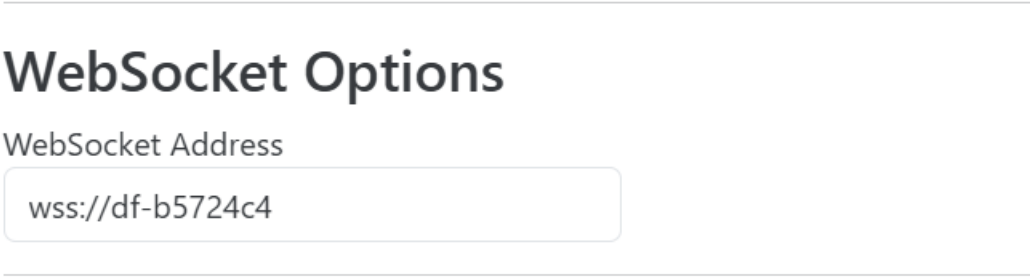
10. If you want to configure via secure TLS, press **Load TLS Trust**, then press **Get & Sign CSR**, then Press **Reset Device**



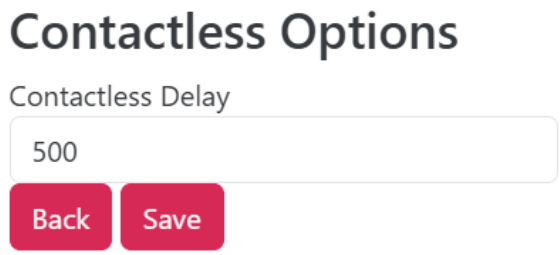
11. By clicking on the MAGTEK Logo on the top of the page, go back to the Miscm Menu and press Configuration for the Demos option



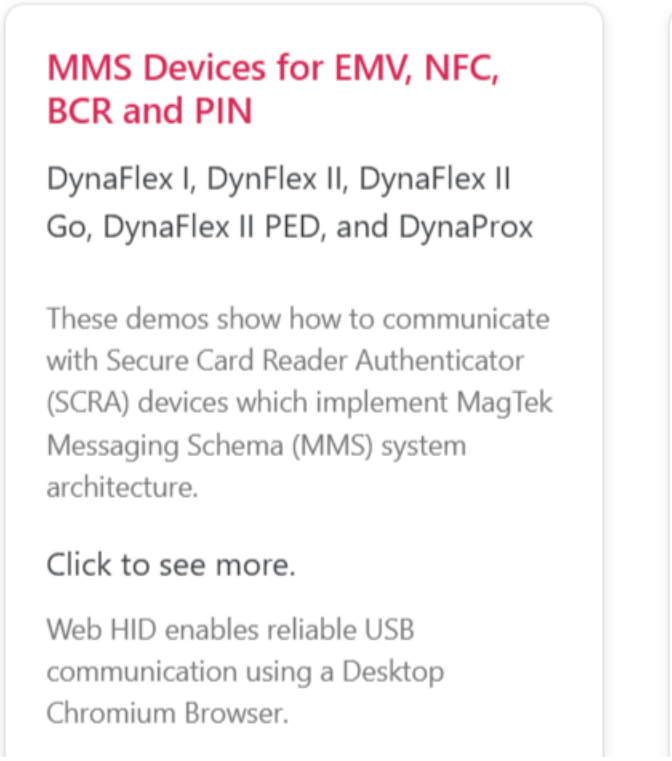
12. Enter device host name under WebSocket Options, for Non-secure TLS, just put ws://device-hostname, for TLS secure connections, enter wss://device-hostname (example wss://df-1234567)
13. **NOTE:** The device hostname must be resolvable to an address using either DNS name resolution or creating a host file entry. See section below providing some options on resolvable DNS name.



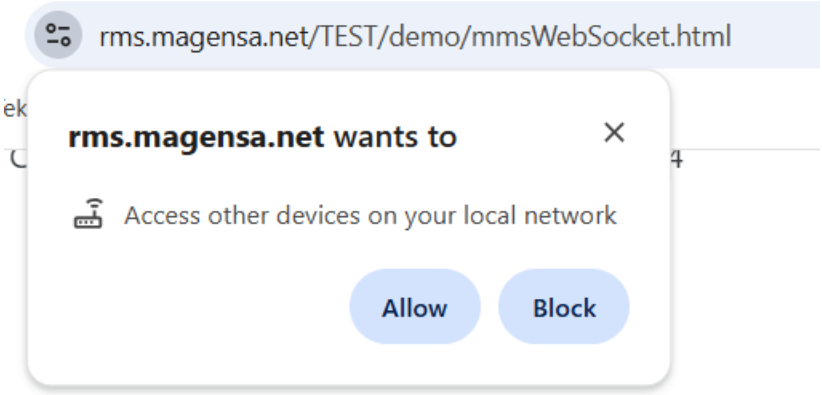
14. Click Save



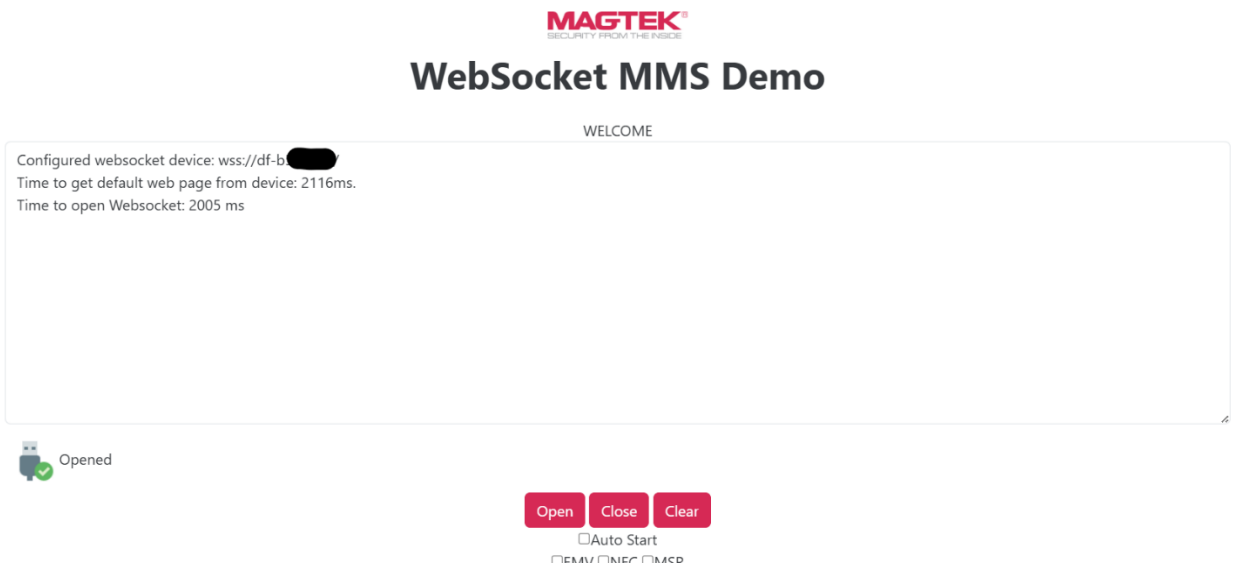
15. Go back to home page and press MMS Devices for EMV, NFC, BCR and PIN, then press WSS Device Demo



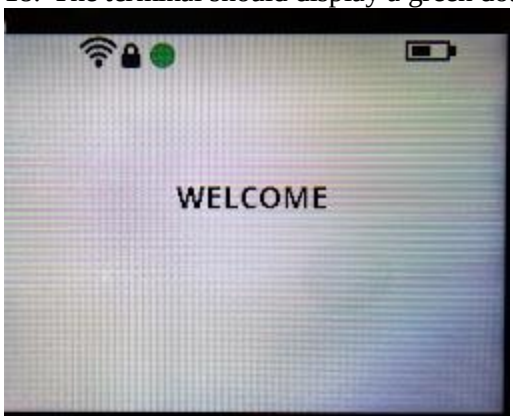
16. Allow other devices on your local network



17. Click on Open which will all open the connection to the device:



18. The terminal should display a green dot indicating successful connection:



3 Using the Demo Pages

These instructions detail the operational steps once all necessary configurations (Section 2) are complete. If connecting via USB HID, the steps listed in section 2 can be skipped.

3.1 HID MMS Demo (Direct USB HID)

The **Human Interface Device (HID)** protocol enables **driverless plug-and-play** connectivity for your device via USB.

1. Ensure the device is powered on and connected via **USB**.
2. If this is the first time, you may have to **pair the device** in the Chromium browser, which involves granting the website permission via a pop-up prompt.
3. From the Demo Application, select **Open**, and choose the appropriate device. A **green check mark** confirms the device is successfully opened.
4. From the command dropdown menu, select a command such as **DynaFlex: START EMV ALL**.
5. Select **Send Command** to execute the action.

6. Insert or tap a test card and monitor the transaction log for the response.

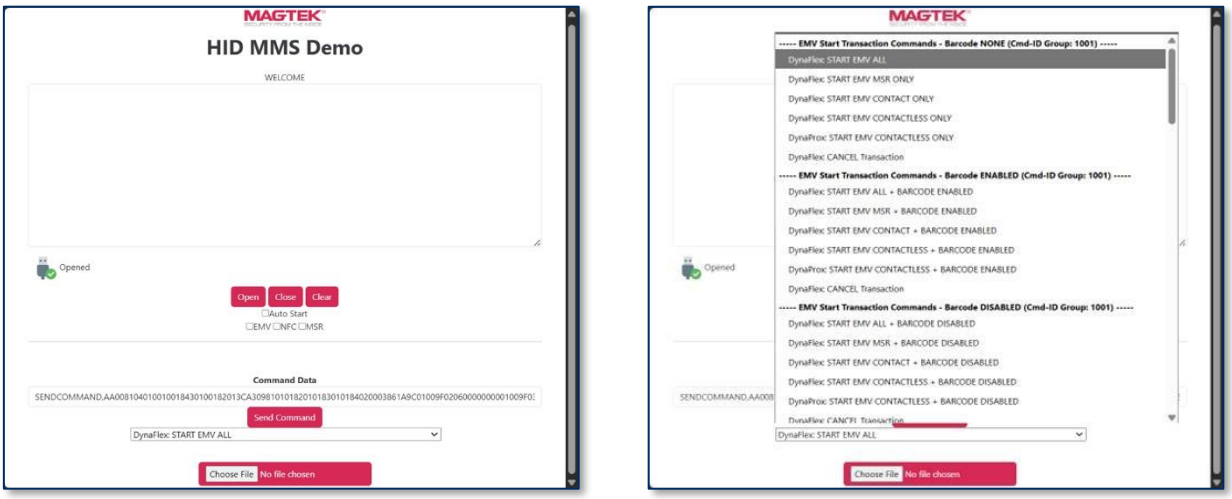


Figure 3 - HID MMS Demo

3.2 MQTT

Message Queuing Telemetry Transport (MQTT) is a lightweight messaging protocol commonly used for Internet of Things (IoT) applications. It provides efficient, reliable communication between devices and applications, even in environments with limited connectivity. **IMPORTANT: DynaFlex II PED is the only device that supports native MQTT**. All other Dyna Devices must use the HID MQTT Device Client.

Key characteristics include:

- **Publish/Subscribe model** – Devices publish data to a central broker; applications subscribe to receive data.
- **Low overhead** – Messages are compact and efficient, suitable for embedded systems.
- **Real-time updates** – Events such as card insertions are transmitted immediately to the Demo Application.
- **Cross operating system and cross browser connectivity:** MQTT ensures seamless interaction because it is platform-agnostic, meaning devices running Windows, Linux, macOS, or embedded OS, and applications running in different browsers, can all connect and exchange messages reliably.

Within the **HID MQTT Device Client** and **MQTT MMS Demo**, this protocol enables MagTek MMS devices (e.g., Dyna Family Devices) to securely communicate via MQTT across operating systems.

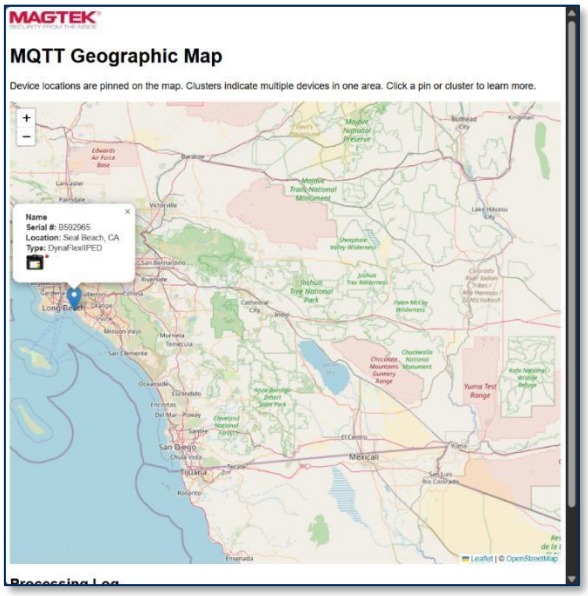


Figure 4 - MQTT Geographic Map

The MQTT MMS Demo serves as the control panel for MQTT-based device testing.

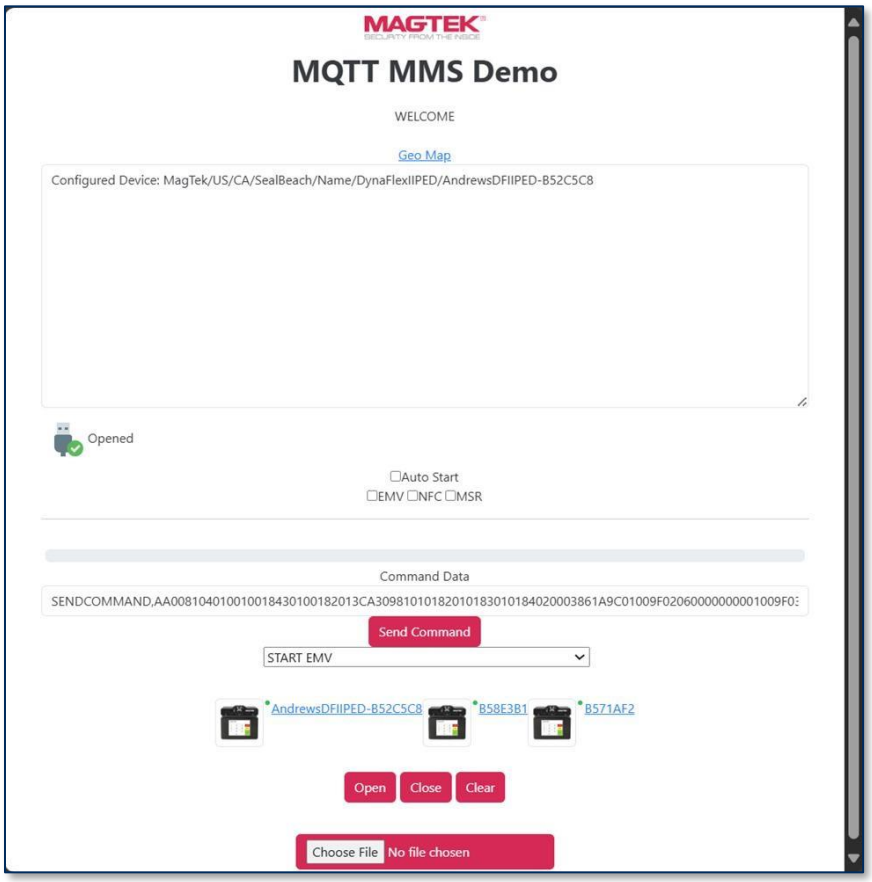


Figure 5 - MQTT MMS Demo

Components:

- **Configured Device** – Identifies the active device.
- **Status Indicator** – A green check mark indicates a successful connection.
- **Options** – Auto Start, EMV, NFC, and MSR session checkboxes.
- **Command Data** – Field for entering or pasting hexadecimal command data.
- **Controls** – Dropdown for pre-defined commands (e.g., **START EMV**) and **Send Command** button.
- **Device Instances** – Displays connected devices with selectable IDs.
- **File Upload** – Allows uploading of command scripts or batch test files.

Example Command Data (Hexadecimal): (Start Transaction command (arms Contact, Contactless and MSR interfaces))

```
AA00810401001001843010018201301830101840200038 61A9C0100
9F02060000000001009F03060000000000005F2A020840
```

The command above, and others can be selected from the pulldown menu. The Choose File button allows the user to upload custom commands from a file. This screen also confirms device recognition, command formatting, and connectivity prior to further testing.

3.3 HID MQTT Device Client

The **HID MQTT Device Client** acts as a communication **gateway** that transforms your locally connected MagTek device (via USB HID) into a remote asset. This allows other applications to access the device securely via the **MQTT protocol**. **IMPORTANT: DynaFlex II PED is the only device that supports native MQTT which means it does NOT need to use the HID MQTT Device Client.**

1. Power on and connect the device via **USB**.
2. Open the **HID MQTT Device Client** page.
3. Select **Open** within the client.
4. Scan the QR code or select the provided link to open the separate **MQTT Device Demo Application**.
5. From the MQTT Device Demo Application's dropdown, select the required command, or use **Choose File** to upload a custom command script.
6. Select **Send Command** to execute the command remotely.

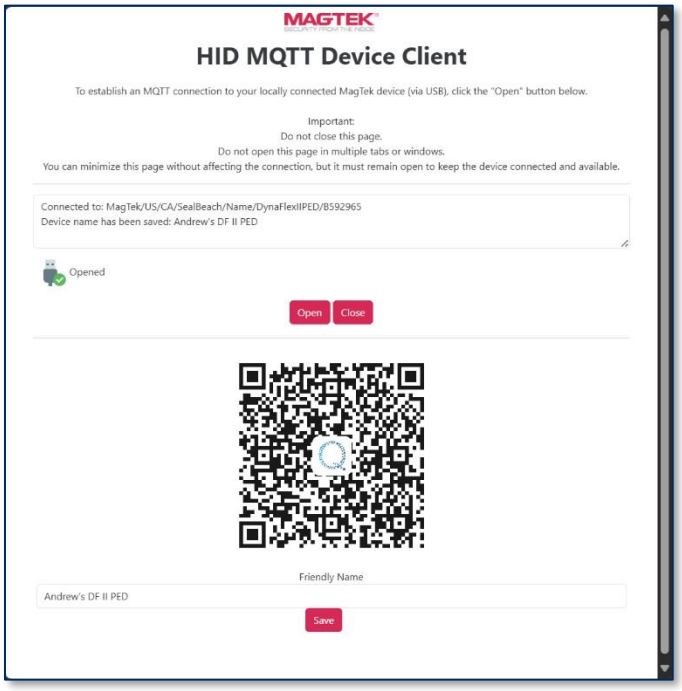


Figure 6 - HID MQTT Device Client

The **MQTT Geographic Map** displays device location and status for connected units, see **Figure** .

3.4 MQTT Configuration Page

The MQTT Configuration page provides controls and parameters necessary for device operation over MQTT.

- **Device Status Panel** – Displays device information (model, name, IP address, SSID) and records configuration progress.
- **Controls** – Includes **Open**, **Save Config**, **Reset Device**, **Close**, and **Clear**.
- **Wi-Fi Settings** – SSID and password configuration.
- **MQTT Credentials** – Org Node, username, and password for broker authentication.

Once configuration is complete and saved, the user may proceed to execute commands such as **Start EMV**. See **Figure 7 - MQTT Configuration.**

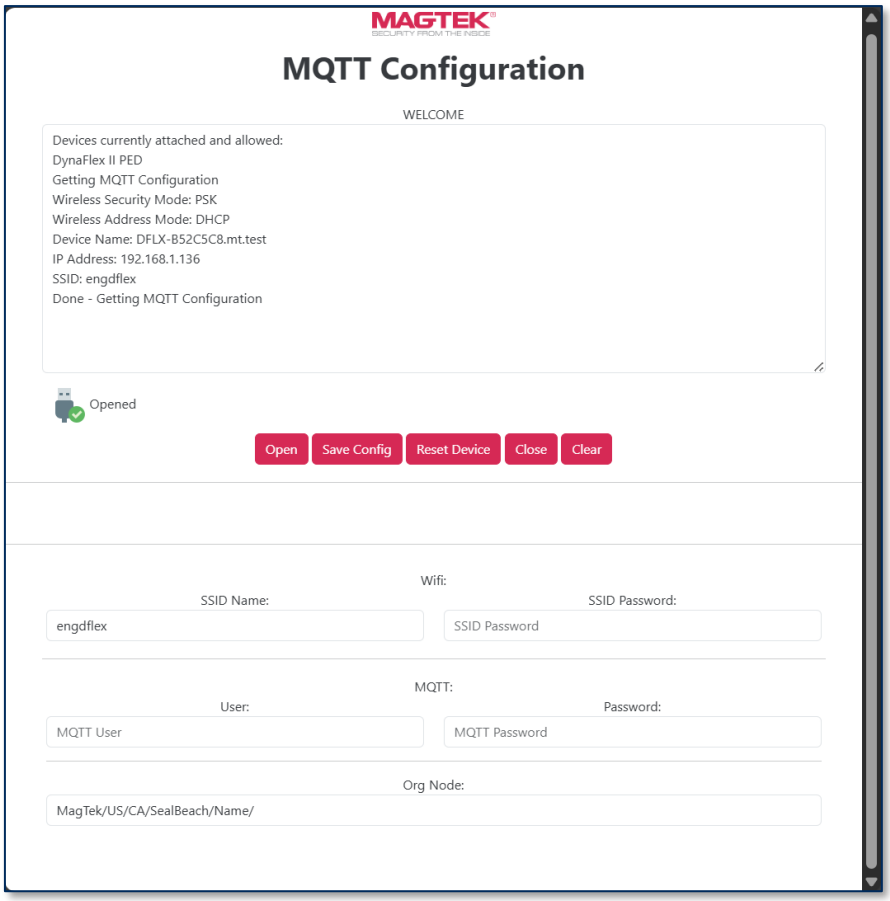


Figure 7 - MQTT Configuration

3.5 WSS Certificate and Trust

This interface is used to configure secure communication with WebSocket transport using TLS or mTLS. Functions include:

- **Network Settings** – Get DHCP and Set SSID.
- **Wi-Fi Setup** – Retrieve or assign SSID and password credentials.
- **Certificate and Trust Management** – Load TLS/mTLS certificates, verify certificates, and generate or sign Certificate Signing Requests (CSR).
    - For NonTLS connection,
        - Click

        - Next, reset the device.
    - For TLS/mTLS connections,
        - Click

 or

        - Next, click

        - Next, reset the device.
- **Controls** – **Open**, **Close**, **Clear**, and **Reset Device**.
- **Device Identity** – Display or update the registered device name and IP address.
- **Root CA Download** – Provides access to the root certificate authority file for verification.

Error Condition: If the status window displays *"OpenDevice No HID device selected or found"*, ensure the reader is connected via USB HID prior to attempting certificate operations.

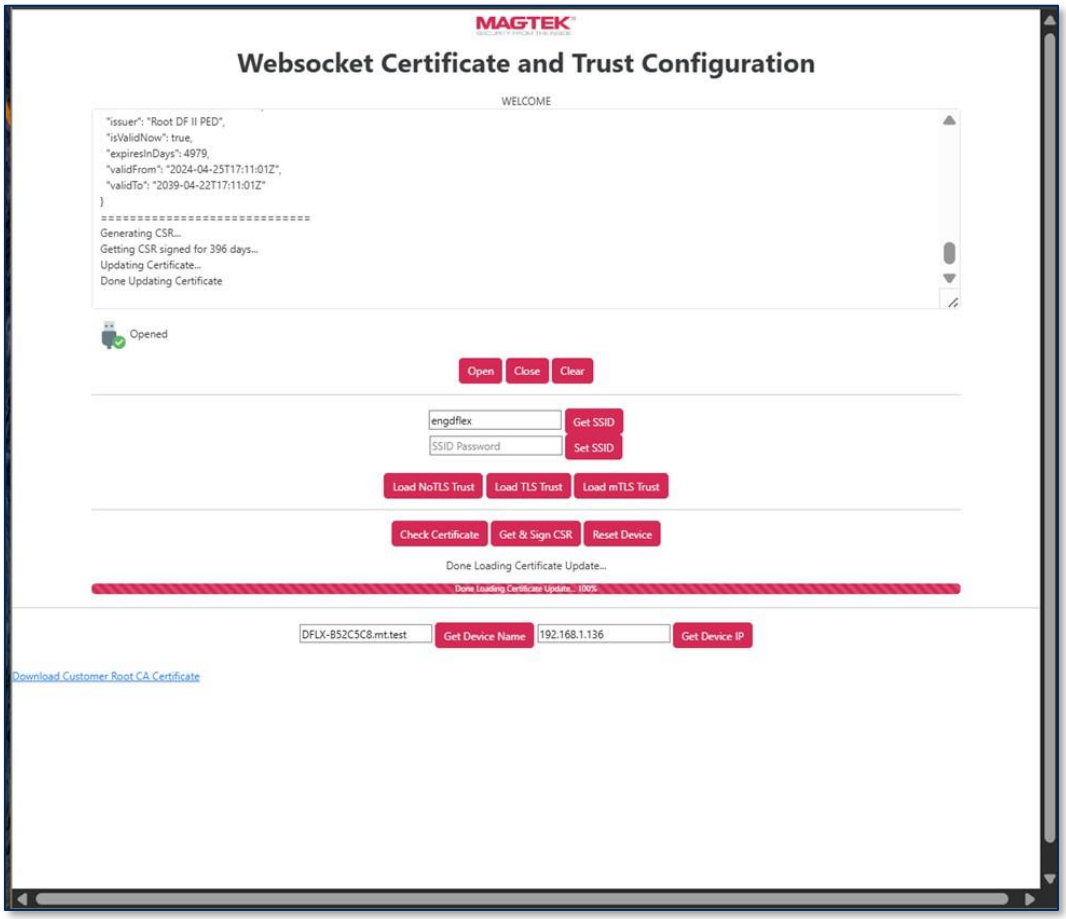


Figure 8 - WebSocket Certificate and Trust Configuration

2.1 Technical Notes on WSS Hostname Resolution and Certificate Lifecycle

When using WSS (WebSockets over SSL/TLS) with DynaFlex devices, the following technical considerations are critical for IT teams to ensure reliable and secure communication.

1. Hostname Constraint and Certificate Matching

The default SSL certificate pre-installed on DynaFlex devices is uniquely generated for each device and tied to a hostname in the format df-[SerialNumber] (e.g., df-1234567). This certificate is used to establish the WSS connection.

- **SSL/TLS certificates are literal. The browser (or any WebSocket client) validates that the hostname used in the connection URL exactly matches the certificate's Subject Name or Subject Alternative Name (SAN). If the URL uses wss://df-1234567/ but the network appends a domain suffix (e.g., df-1234567.office.lan), the browser will reject the connection as insecure because the names do not match.**
- **IP addresses cannot be used. Connecting via wss://192.168.1.50/ will trigger a SAN missing error because the certificate is issued to a name, not an IP address.**

Therefore, the network must be configured to resolve the short hostname (e.g., df-1234567) to the device's IP address. The following options are available:

- **Option A: Global Search Suffix (Recommended)**
  Configure the DHCP server to add a Connection-Specific DNS Suffix (via DHCP Option 15/119). This allows client computers to automatically map the short name to the device without manual DNS entries.
  Action: **Add your local domain to the DHCP option list so that df-[SerialNumber] resolves correctly.**
- **Option B: The "Trailing Dot" Override**
  If DNS search suffixes are misconfigured or polluted, you can force the browser to look for the bare hostname by appending a trailing dot to the URL.
  Standard URL: **wss://df-12345678/ (the OS may append the domain)**
  Forced URL: **wss://df-12345678./ (the trailing dot forces an exact hostname lookup)**
- **Option C: CNAME or A-Record in Local DNS**
  For networks with a central DNS server, create a static entry.
  Action: **Create a forward lookup zone with an A record (or CNAME) for df-[SerialNumber] pointing to the device's static IP address.**

2. Certificate Expiration and Renewal Strategy

The WSS connection relies on a server certificate installed on the device. As of this writing, the demo application signs certificates with a validity period of 13 months. After expiration, any WSS communication will fail silently due to browser security policies—no manual override is possible for WebSocket connections.

- **Best Practice: Certificates must be replaced before they expire. A certificate update strategy must be employed when deploying devices in production using WSS.**
- **Renewal Process: Use the WSS Certificate and Trust page to generate a new Certificate Signing Request (CSR) and load a renewed certificate. Refer to the steps for loading TLS trust and resetting the device.**
- **Monitoring: Implement monitoring to alert administrators when certificate expiration is approaching (e.g., 30 days prior).**

By adhering to these hostname resolution and certificate lifecycle guidelines, you ensure uninterrupted and secure WSS communication with your DynaFlex devices.