User Guide for: Historical Frequency Tool

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1 Introduction

The Historical Frequency Tool is a web-based, modular, real-time consultation tool that provides insight into the Mexican grid's dynamic behavior. The platform facilitates the visualization of data recorded by PMUs and FDRs installed in the WAMS. The user can select the PMU measurement, date and time to visualize the frequency data.

2 Prerequisites

To access the platform, open a web browser and navigate to:

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1 http://148.216.38.78/cict/app/historicos/
```

3 Graphical User Interface Overview

3.1 Main Interface and Parameters

Once the platform is loaded, the main interface will display the input controls as shown in Fig. 1. Users must specify key analysis data before visualizing the data recorded.

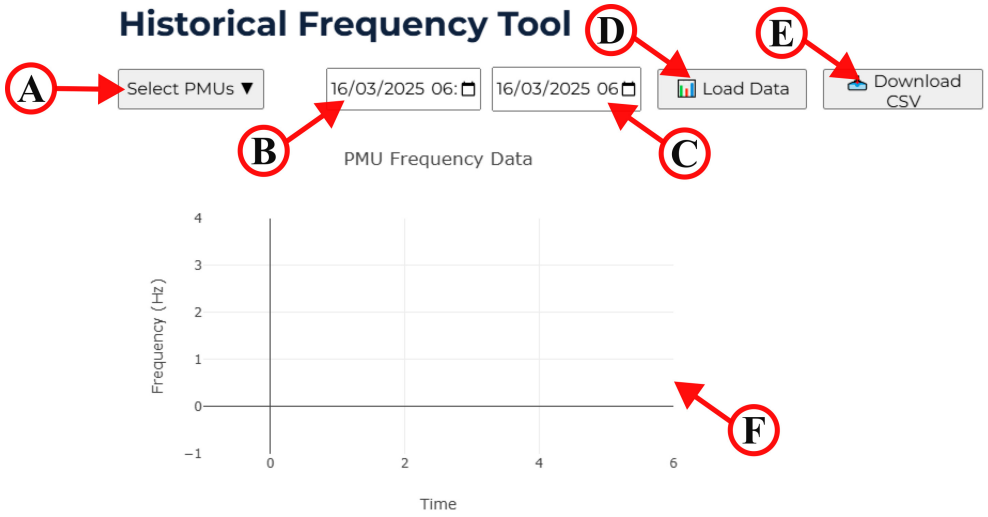

Figure 1: Main Historical Frequency interface with control buttons.

The interface includes the following configurable fields:

- A) **Select PMUs:** This menu allows selecting the PMU measurements to show in the plot.
- B) **Date and time of the start of the analysis:** Specifies the initial date and time in the database.
- C) **Date and time of the end of the analysis:** Specifies the final date and time in the database.
- D) **Load Data:** Once the date range was selected, this button loads the data in the platform and shows the signals in the PMU Frequency Data plot.
- E) **Download CSV:** The selected frequency data can be downloaded through this button, in CSV format.
- F) **PMU Frequency Data:** This area of the platform shows the frequency plot in the time selected for user visualization.

3.2 Workflow

upload your dataset using the **Select File** and **Upload** buttons. Define the sampling frequency and window parameters based on your dataset characteristics. Next, choose the desired detection algorithm and specify the algorithm-specific parameters required. Once configured, click **Load Data** to visualize the data in the **PMU Frequency Data plot**. Finally, you can download data via the **Download CSV** button.

4 Interpreting the Results

Upon completion of the analysis, Historical Tool displays a frequency vs. time plot where each signal is a PMU recording in the Mexican Interconnected System. Users can interactively explore the signals, visualize feature values, and download the data for future analysis. The next example is shown to demonstrate de performance of this tool. First select the UNAM, Ciudad de México PMU to display this recorded frequency. Then select the date, in this case 27 March 2025. After pressing the Load Data button, the graph in Fig. 2 is shown.

To complete the historical view process, press the **Download CSV** button to obtain the data for this case. This file could be downloaded in [1].

References

[1] Mexican data recorded, available at: `https://www.dropbox.com/scl/fi/bvw0isj9htdqz5jo4ji6l/historical_data.xlsx?rlkey=vcbwvk19jzumzgw9wb5ia3pw8&st=yny54v7g&dl=0` (2025).

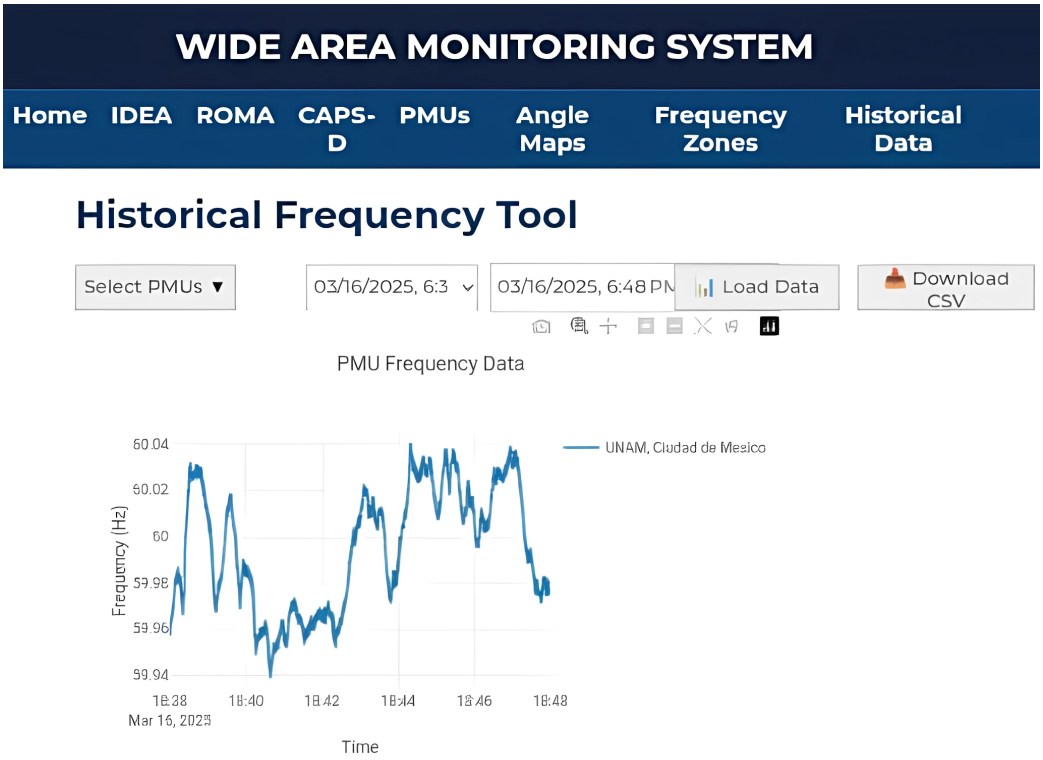

Figure 2: Data recording of Mexico City PMU at 03/16/2025 in a 10 minutes period .