Introduction to VCU Data Logging in Railways

The Vehicle Control Unit (VCU) plays a crucial role in railway systems by managing and monitoring various operational parameters. Data logging in the VCU is essential for tracking real-time performance, diagnosing faults, and ensuring the safety and efficiency of railway operations.

VCU data logging involves the continuous recording of key system parameters such as speed, braking, traction status, fault events, and sensor readings. This data helps in analyzing train performance, troubleshooting issues, and maintaining historical records for compliance and safety audits.

The data logging system captures events and periodic data at predefined intervals (e.g., 1-second logs) and stores them for retrieval. Operators can access, review, and analyze this data using specialized software, enabling proactive maintenance and improved operational decision-making.

This document provides an overview of how to access, retrieve, and manage VCU data logs efficiently, ensuring smooth and reliable railway operations.

Operating Procedure:

1. **Check IP Address of PC/ Laptop**
- Steps to Check the IP Address of Your PC:
- Click on the **Windows** icon (Start menu) or press the **Windows key** on your keyboard.
- Type **cmd** into the search bar and click on **Command Prompt** to open it.
- In the Command Prompt window, type **ipconfig** and press **Enter**.
- Look for the section labeled **IPv4 Address** under your Ethernet adapter as shown in figure.

- If the **IPv4 Address** falls within the range **192.168.1.x** (e.g., 192.168.1.10, 192.168.1.100), the system is ready to connect to the GUI.
- If not, you will need to configure the IP address to match the required range.
- Click on the **Windows icon** (Start menu) or press the **Windows key** on your keyboard.
- Type **Control Panel** into the search bar and press **Enter** or click on the **Control Panel** option in the search results.
- Click on **Network and Sharing Center.**
- In the left-hand menu, click on Change adapter settings.
- Right-click on **Ethernet**, and a dropdown menu will appear.
- Click on **Properties** from the dropdown menu.
- In the **Ethernet Properties** window, scroll down and select **Internet Protocol Version 4 (TCP/IPv4)**.
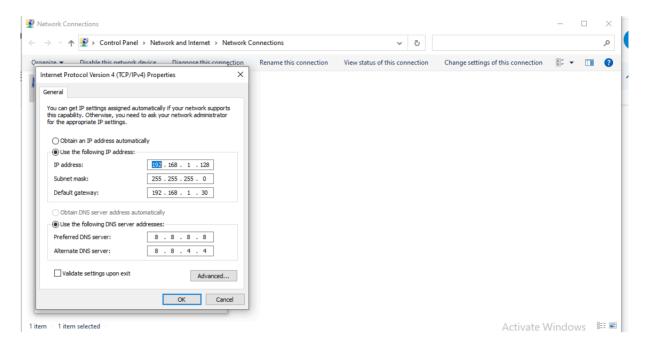- Click the **Properties** button to configure the IPv4 settings.

- In the **Internet Protocol Version 4 (TCP/IPv4) Properties** window, ensure the **Subnet Mask** and **Default Gateway** fields remain the same.
- Update only the **IP Address** field to the required address within the correct range (e.g., **192.168.1.x**).
- Click **OK** to save the changes and close the properties window.

2. **Data Logger Software**:
   - Locate and click the icon or shortcut for the Data Logger software on your system to open it.
   - **Check System Configuration**:
   - Once the software is open, verify if the system configuration is available.
   - If the configuration is not available, proceed to import it.
   - **Import Configuration**:
   - Locate the **File** menu on the top-left side of the software window.
   - Click on **File**, then select **Import Configuration** from the dropdown menu.
   - A file browser will appear. Navigate to the location of the .bin file on your system.
   - Select the appropriate .bin file and click **Open** to load the configuration.
   - Now connect the Ethernet cable to Laptop and AUX Ethernet connector.
   - In the Data Logger software, locate the **Connection Status** indicator
   - Wait for the status to change from **"Disconnected"** to **"Connected"**. This may take a few seconds as the system establishes communication.
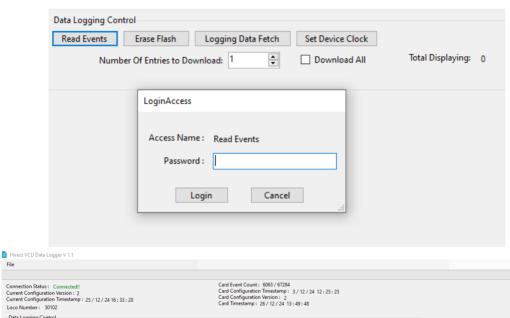
3. GUI Tab Overview

- **Current Configuration version** & **Current Configuration Timestamp**: If we import a .bin file, it will indicate the file configuration version and file generation date time.
- **Loco Number**: Current Loco Number
- **Card Event Count**: Shows Number of faults and number of 1 seconds data stored in the system.
- **Card Configuration Timestamp & Card Configuration version**: Current card installed configuration version number and configuration data time.
- **Read Events**: A clickable button allows you to read the events from the card.
- **Erase Flash:** A clickable button to erase all stored fault events and 1 Seconds logged Data.
- **Logging Data Fetch:** A clickable button to read all stored 1 seconds data from Card.
- **Set Device Clock:** This tab is used to update the card's current date and time if they are mismatched.
- **Number of faults to Download:** To download the first few faults, enter the desired number of faults.
- **Download All:** The 'Download All' checkbox allows you to download all faults from the card.
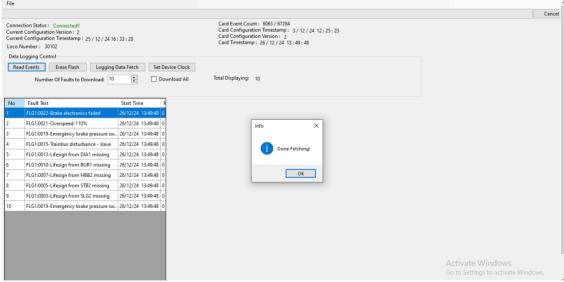- **Total Displaying:** Total number of displayed Events/1 Seconds Data from system(card).

4. **Read Events**
   - After the GUI opens, you need to enter the password once to read the events from the card
   - Enter your password to proceed.
   - Click **Enter** or **OK** to confirm the password.
   - The system will begin reading the event data from the data logging board.
   - Wait for the process to complete. A progress indicator, message display the operation's status.
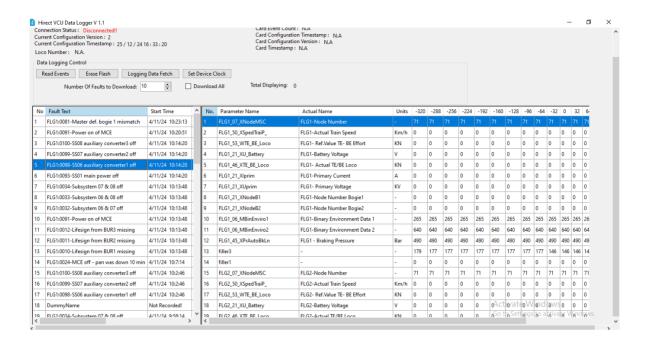

   - Click on Ok
   - Click on any fault to check all fault related background data as shown in figure.

Save Events:

- To store the last read events from the card, click on 'File,' and a dropdown menu will appear.
- Click on 'Save Events,' and a file path prompt will appear to store the fault events on your system. also provide an appropriate name for the file (.vcue).
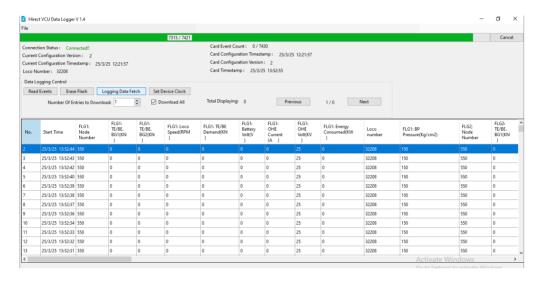-

Load Events:

- To load the last events from the system, click on 'File,' and a dropdown menu will appear.
- Click on 'Load Events,' browse to the (.vcue) file, and click 'Open' to display the last read events.
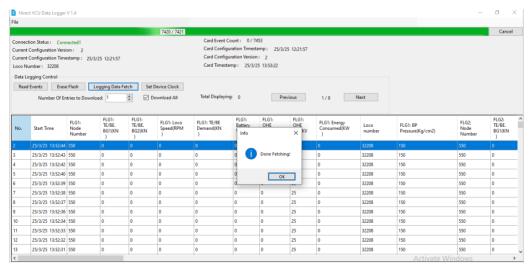
5. **1 Seconds Data:**
   - To fetch the 1 seconds data from the system, click on 'Logging Data Fetch' to read the all 1 seconds data.
   - The system will begin reading the 1 seconds data from the data logging board.

   - Wait for the process to complete. A progress indicator, message display the operation's status.

   - Previous and Next tabs are used to view the 1 Seconds data Page vise.
   - Each page 1000 seconds of data display to view next or previous data just click on Previous or NEx

Save 1 Seconds Data:
- To store the last read events from the card, click on 'File,' and a dropdown menu will appear.
- Click on 'Save Events,' and a file path prompt will appear to store the fault events on your system. also provide an appropriate name for the file (.vcul).

Load 1 Seconds Data:
- To load the last events from the system, click on 'File,' and a dropdown menu will appear.
- Click on 'Load Events,' browse to the (.vcul) file, and click 'Open' to display the last read events.