Hill Sequence Labeling Tool - User Manual

Table of Contents

Introduction

Hill Sequence is a time-series labeling tool designed for annotating temporal data from CSV and Excel files. It supports: - Multi-channel time-series visualization - Event labeling with customizable classes - Guideline creation for threshold marking - AI-powered auto-detection and chat assistance - Team collaboration and sharing - Large file handling (files up to several GB)

This manual will guide you through the complete workflow from project setup to data labeling.

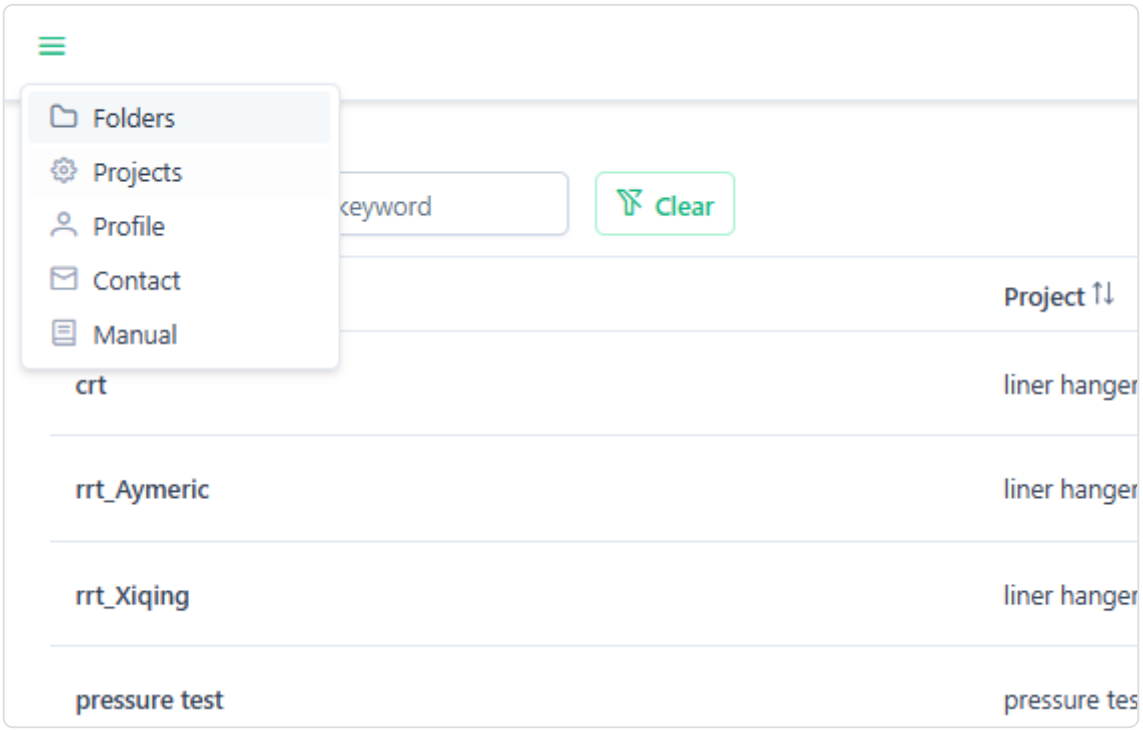
Getting Started

System Requirements

- Modern web browser (Chrome, Firefox, Edge, Safari)
- Internet connection
- User account with login credentials

Main Navigation

The application consists of the following main pages: - **Folders**: Main dashboard for managing folders and organizing files - **Files**: File list and upload interface within a folder - **Labeling**: Interactive labeling interface for annotating time-series data - **Projects**: Project and template configuration - **Profile**: User settings and preferences

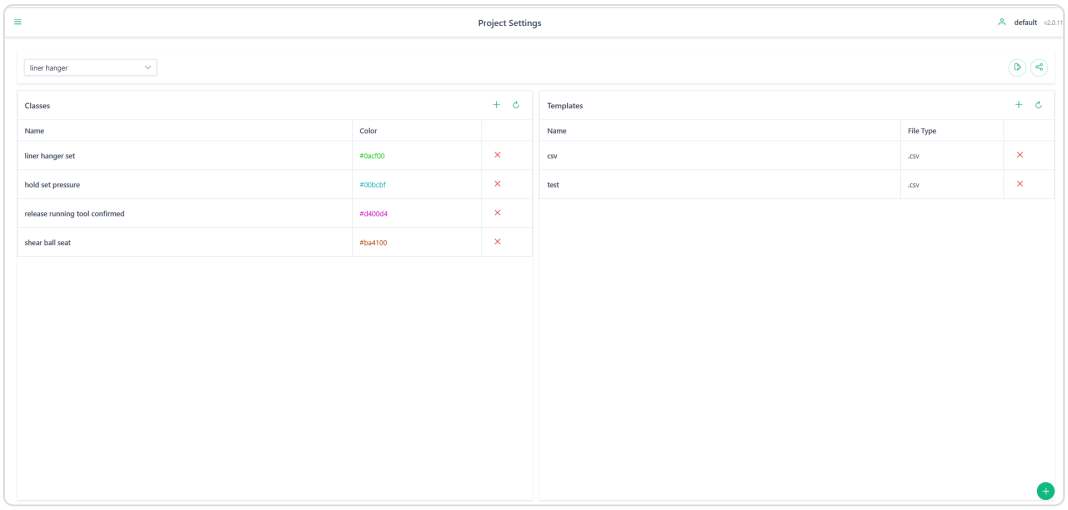


Step 1: Create a Project

Projects are the top-level organizational units that contain event classes and templates.

How to Create a Project

1. Navigate to the **Projects** page using the navigation menu



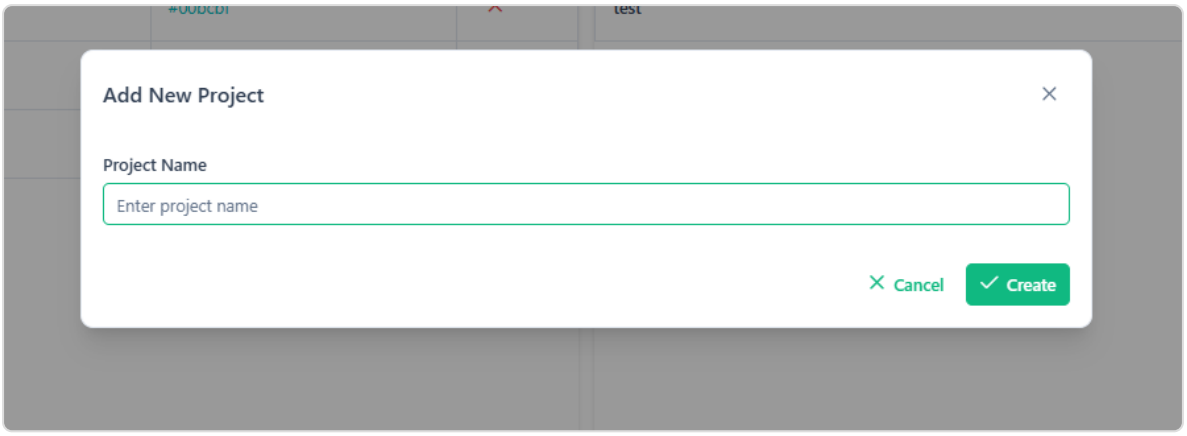
2. Click the **“Create New Project”** button (usually located at the top-right of the page)

3. In the dialog that appears, enter: - **Project Name**: A unique, descriptive name for your project - **Description** (optional): General information about the project

4. Click **“Create”** or **“Save”** to confirm

Main Buttons on Projects Page

- **Create New Project**: Opens dialog to create a new project
- **Edit Project** (pencil icon): Modify project name and description
- **Delete Project** (trash icon): Remove project (with confirmation)
- **View/Manage Classes**: Navigate to event class management
- **View/Manage Templates**: Navigate to template management
- **Share Project**: Share with team members



After Creation

Once created, you can: - Add event classes to the project - Associate parsing templates - Create folders that belong to this project

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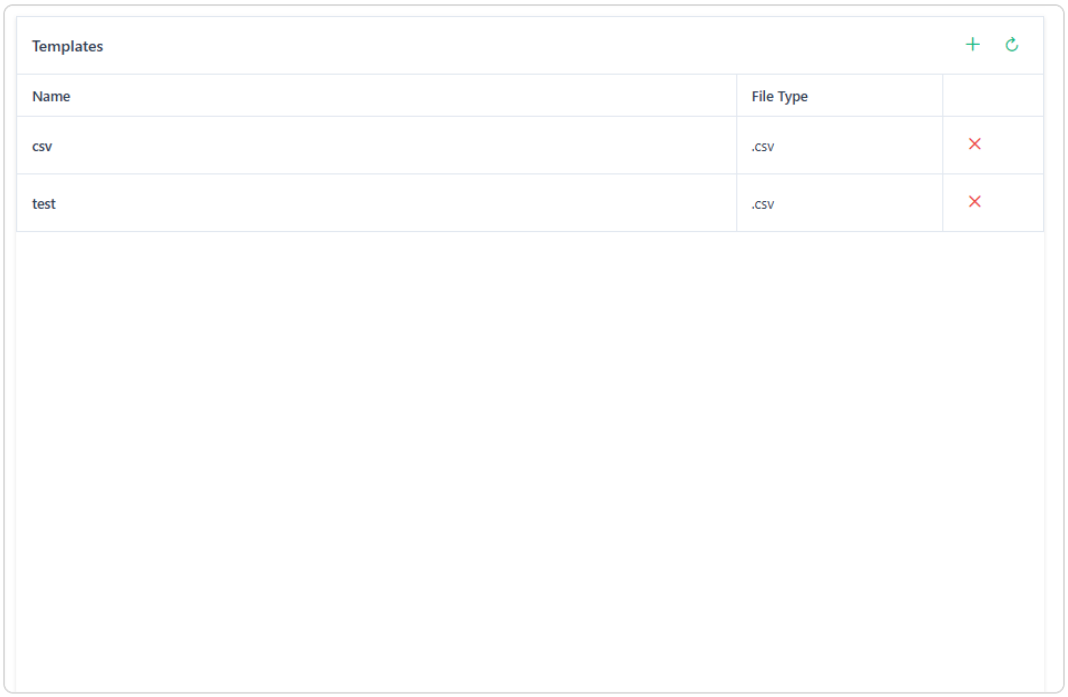
Step 2: Create a Template for Parsing

Templates define how to parse CSV/Excel files into structured time-series data. Each template specifies: - File type (CSV, Excel) - X-axis configuration (time or numeric) - Channel definitions (data columns to extract)

How to Create a Template

1. From the **Projects** page, click **“Templates”** or navigate to the template management section
2. Click **“Create New Template”** button



3. In the Template Editor dialog, configure the following:

Basic Settings

- **Template Name**: Unique identifier for this template
- **File Type**: Select from `.xlsx`, `.xls`, or `.csv`
- **Sheet Name** (for Excel files): The name of the worksheet to parse
- **Header Row**: Row number where column names are located
- **Skip Rows**: Number of rows to skip before data starts

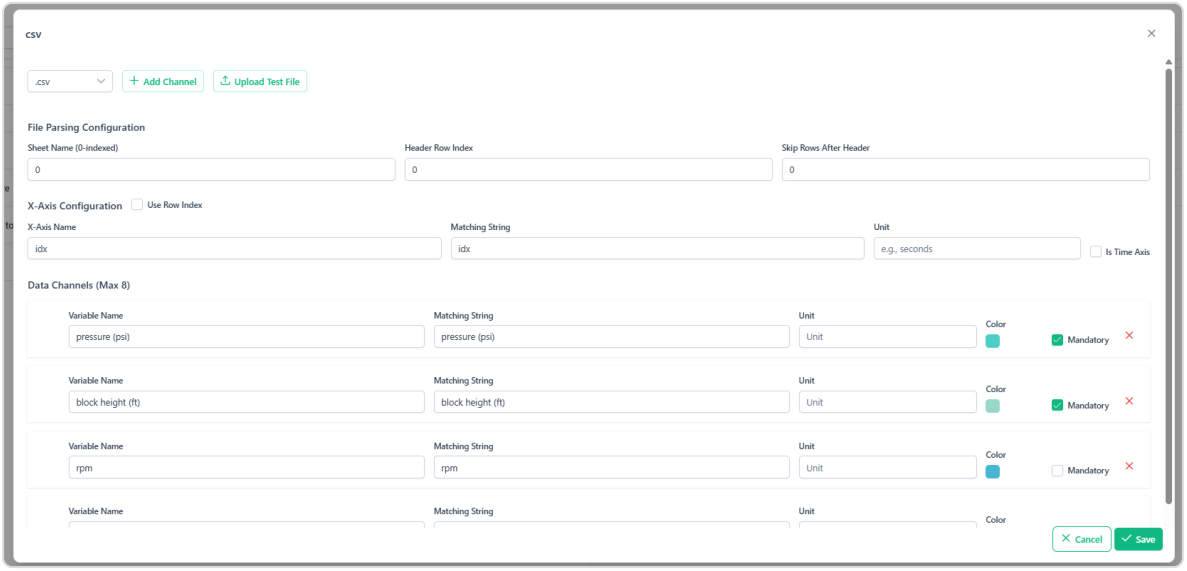
X-Axis Configuration

- **X-Axis Name**: Column name for the time/index axis
- **Use Row Index**: Toggle this if you want to use row numbers instead of a column
- **Regex Pattern** (optional): Pattern to match the X-axis column name
- **Is Time**: Check if X-axis contains timestamps
- **Unit**: Specify the time unit (seconds, milliseconds, etc.) or numeric unit

Channel Configuration

- **Add Channel**: Click to add each data channel (up to 8 channels)

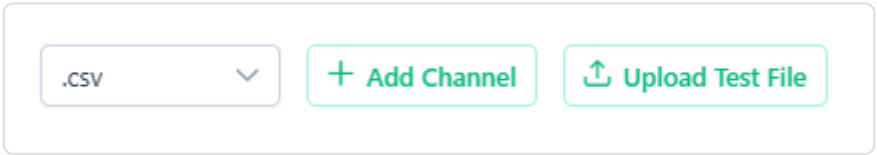
- For each channel, specify:
    - **Channel Name**: Identifier for this data series
    - **Regex Pattern**: Regular expression to match the column name in files
    - **Color**: Visualization color for this channel
    - **Mandatory**: Check if this channel must exist in all files
    - **Unit**: Measurement unit for this channel



Auto-Mapping Feature

To simplify template creation:

1. Click **“Upload Sample File”** in the template editor
2. Select a representative CSV/Excel file from your dataset
3. The system will automatically: - Extract all column names - Suggest X-axis column - Map columns to channels
4. Review and adjust the auto-mapped configuration as needed
5. Click **“Save Template”** to finalize



Main Buttons in Template Editor

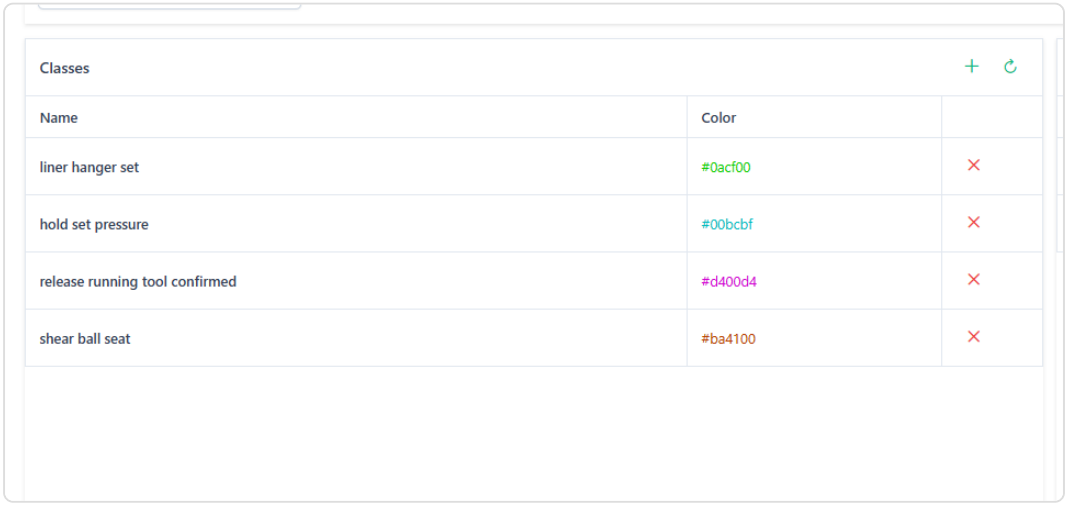
- **Upload Sample File**: Trigger auto-mapping from a sample file
- **Add Channel**: Add a new channel to the template
- **Remove Channel** (X icon): Delete a channel
- **Save Template**: Confirm and save the template
- **Cancel**: Close without saving

Step 3: Create Event Classes

Event classes are the labels you'll apply to time ranges in your data (e.g., "Running", "Idle", "Error").

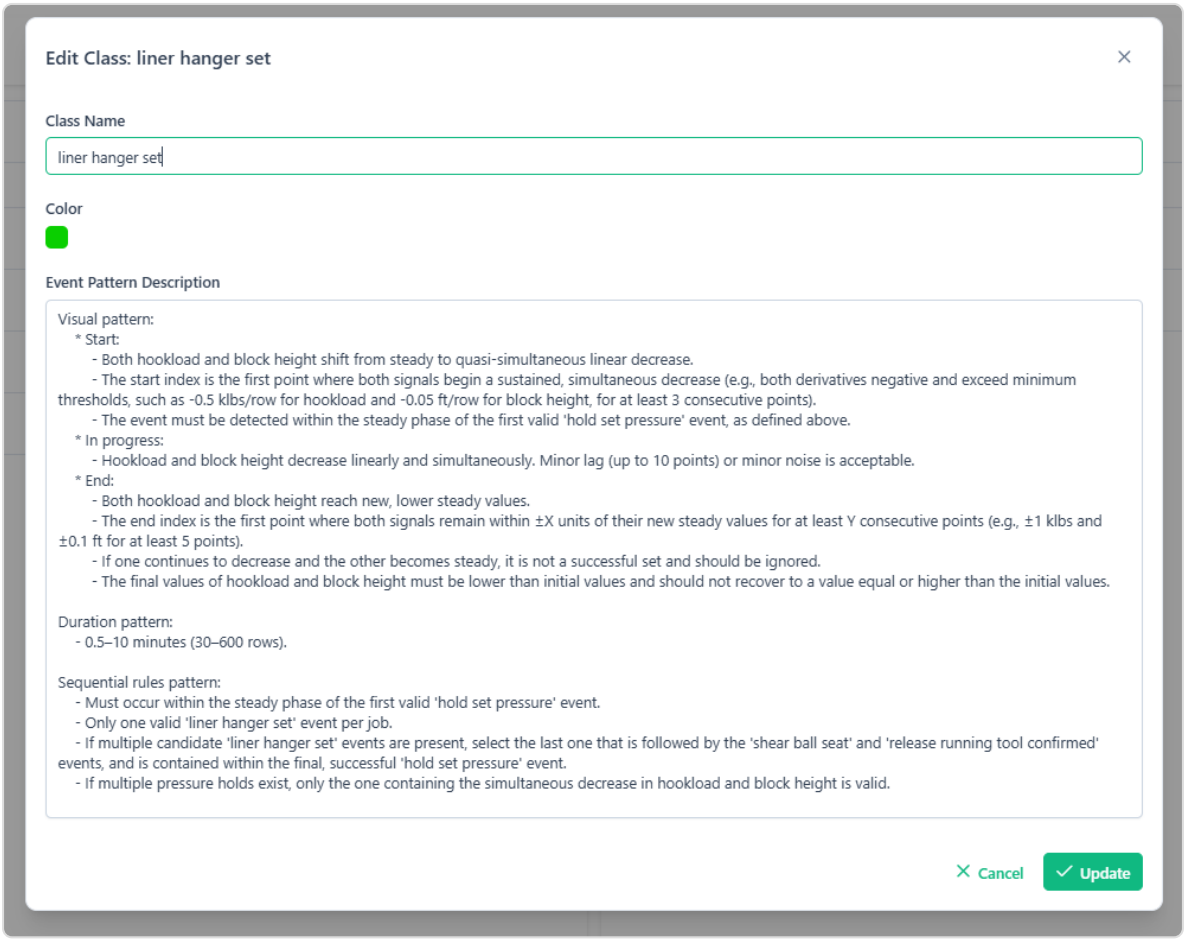
How to Create Event Classes

1. From the **Projects** page, select your project



2. Click **"Add New Class"** button
3. In the class creation dialog, enter: - **Class Name**: The label name (e.g., "Normal Operation", "Fault") - **Color**: Choose a color for visualization (color picker) - **Description**: Detailed pattern description including:
    - Visual pattern characteristics
    - Measurement value changes

- Duration ranges
- Noise characteristics
- Any distinguishing features



1. Click **“Save”** to add the class

Editing Class Descriptions

You can edit class descriptions at any time: - From the Projects page: Click edit icon next to a class - From the Labeling page: Click **“Edit Class Descriptions”** in the toolbar

Main Buttons on Event Classes Page

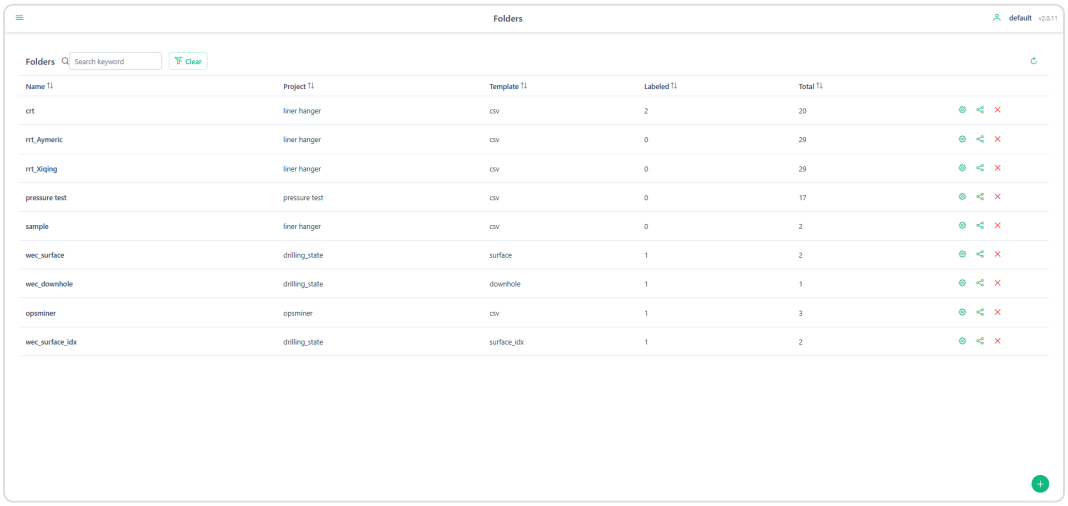
- **Add New Class**: Create a new event class
- **Edit Class** (pencil icon): Modify class name, color, or description
- **Delete Class** (trash icon): Remove a class
- **Reorder Classes**: Drag to change class order in lists

Step 4: Create a Folder

Folders organize files within a project and link them to a specific template for parsing.

How to Create a Folder

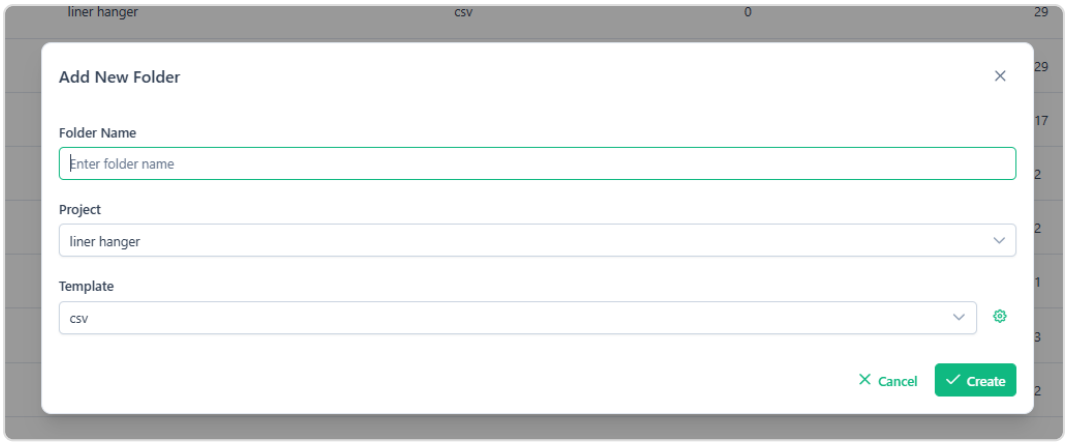
1. Navigate to the **Folders** page (main dashboard)



2. Click **“Create New Folder”** button

3. In the folder creation dialog, enter: - **Folder Name**: Descriptive name for this collection of files - **Project**: Select the project this folder belongs to (dropdown) - **Template**: Select the parsing template to use for files in this folder (dropdown)

4. Click **“Create”** to save



Main Buttons on Folders Page

- **Create New Folder**: Create a new folder
- **Open Folder**: Click on a folder row to view its files
- **Edit Folder** (pencil icon): Modify folder name, project, or template
- **Delete Folder** (trash icon): Remove folder and its file references
- **Share Folder**: Share with team members
- **Filter by Project**: Dropdown to filter folders by project

Folder Information Display

Each folder row shows: - Folder name - Associated project name - Associated template name - Progress: Number of labeled files / Total files - Last update timestamp

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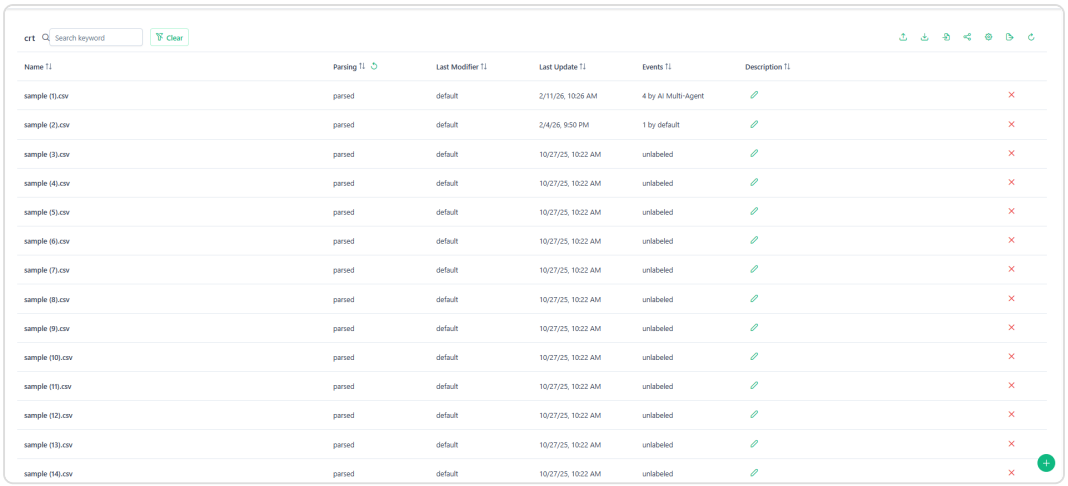
Step 5: Upload Files

After creating a folder, you can upload CSV or Excel files for labeling.

How to Upload Files

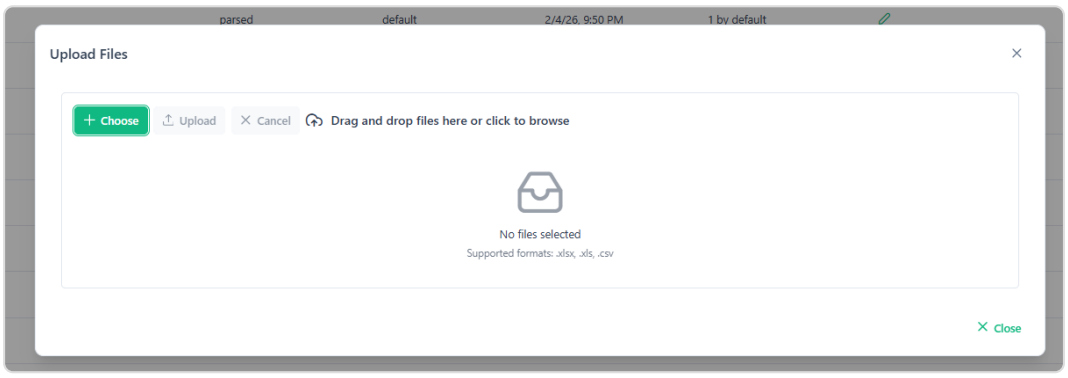
1. From the **Folders** page, click on a folder to open it
2. You'll be taken to the **Files** page for that folder



3. Click the **"Upload Files"** button

4. In the upload dialog: - **Drag and drop** files into the upload area, OR - Click **“Browse”** to select files from your computer - You can upload multiple files at once

5. Click **“Upload”** to start the process



Upload Process

- Files are uploaded with a progress indicator
- After upload, files are automatically parsed in the background using the folder’s template
- Parsing status is displayed for each file:
- **“Processing”**: File is being parsed
- **“Parsed”**: File is ready for labeling
- **“Failed”**: Parsing error occurred

Main Buttons on Files Page

- **Upload Files**: Open file upload dialog
- **Open File**: Click on a file row to open in labeling interface
- **Delete File** (trash icon): Remove file from folder
- **Search/Filter**: Search box to filter files by name
- **Edit Description**: Add or modify file description
- **Back to Folders**: Return to folders list

File Information Display

Each file row shows: - File name - Parsing status - Number of events labeled - File description - Last update timestamp - Last modifier username

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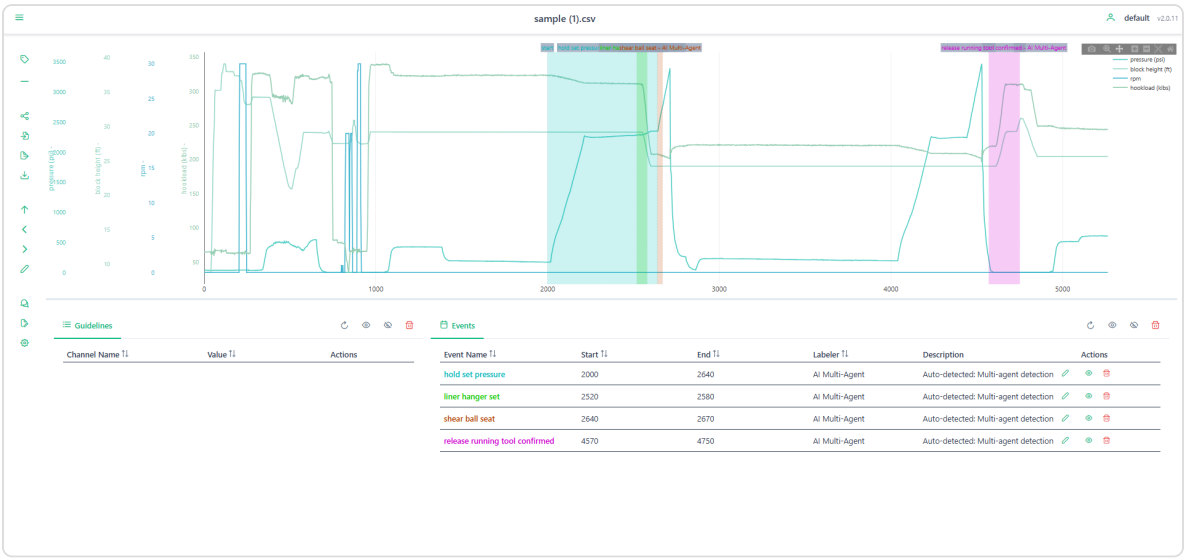
Step 6: Open a File

Once a file is parsed, you can open it for labeling.

How to Open a File

1. From the **Files** page, locate the file you want to label
2. Ensure the file status shows **"Parsed"** (not "Processing" or "Failed")
3. Click on the file row to open it
4. The **Labeling** page will load with: - Interactive time-series chart at the top - Events panel and Guidelines panel below (or in tabs) - Toolbar with labeling actions - Optional AI chat panel



Main Components of the Labeling Page

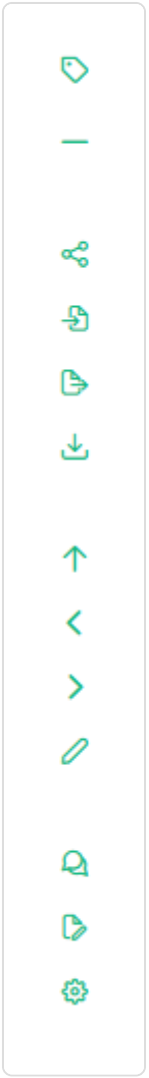
Chart Area

- Displays all channels as line plots
- X-axis shows time or numeric index
- Y-axis shows measurement values
- Labeled events appear as colored rectangles
- Guidelines appear as horizontal lines

Toolbar (Top)

- **Back**: Return to files list
- **Previous File**: Navigate to previous file in folder
- **Next File**: Navigate to next file in folder
- **Label Mode** (button): Enable event labeling mode
- **Guideline Mode** (button): Enable guideline creation mode
- **Share Folder**: Share current folder with others
- **Import Labels**: Upload existing labels from JSON file
- **Export Labels**: Download current labels as JSON
- **Export Data**: Download parsed chart data
- **Edit Classes**: Modify event class descriptions
- **Auto-Detection**: Start AI-powered event detection

- **AI Chat**: Toggle AI chat assistant panel
- **File Description**: Edit description for current file

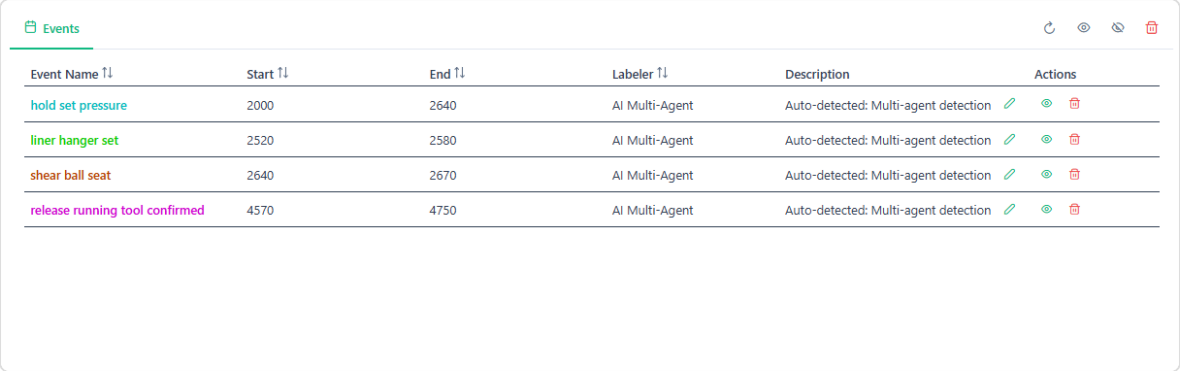


Events Panel

- **Table** showing all labeled events with:
- Class name and color
- Start and end times
- Description
- Labeler username
- Visibility toggle (eye icon)
- Delete button (trash icon)
- Edit description button (pencil icon)

- **Bulk Actions**:

- **Show All**: Make all events visible
- **Hide All**: Hide all events from chart
- **Remove All**: Delete all events (with confirmation)



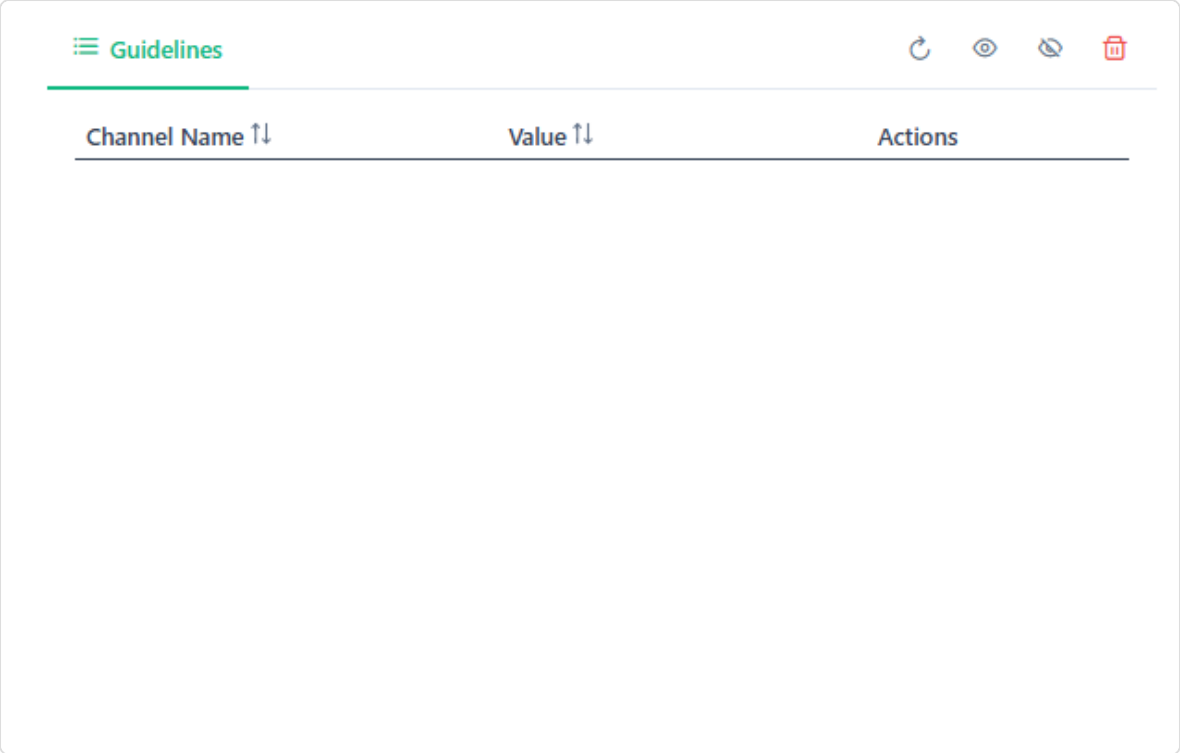
Guidelines Panel

- **Table** showing all guidelines with:
- Channel name
- Y-value
- Color
- Visibility toggle

- Delete button

- **Bulk Actions**:

- **Show All**: Make all guidelines visible
- **Hide All**: Hide all guidelines
- **Remove All**: Delete all guidelines



Step 7: Create Events (Labeling)

This is the core labeling workflow where you annotate time ranges with event classes.

Label Mode: Creating Events

1. Click the **“Label Mode”** button in the toolbar (or press `E` key) - The button should highlight to indicate label mode is active
2. Click on the chart at the **start time** of the event - A vertical line may appear to show your selection
3. Click on the chart at the **end time** of the event - This defines the time range for the event
4. The **Event Creation Dialog** will appear with: - **Class Selector**: Dropdown or list of available event classes - **Create New Class**: Button to create a class on-the-fly - **Description** (optional): Text area for event-specific notes - **Color Preview**: Shows the selected class color

1. Select an event class from the list, OR create a new class if needed
2. Optionally add a description for this specific event instance
3. Click **“Save”** or **“Add Event”** to create the labeled event
4. The event will appear as a colored rectangle on the chart
5. The event will also appear in the Events panel below

Creating a New Class On-the-Fly

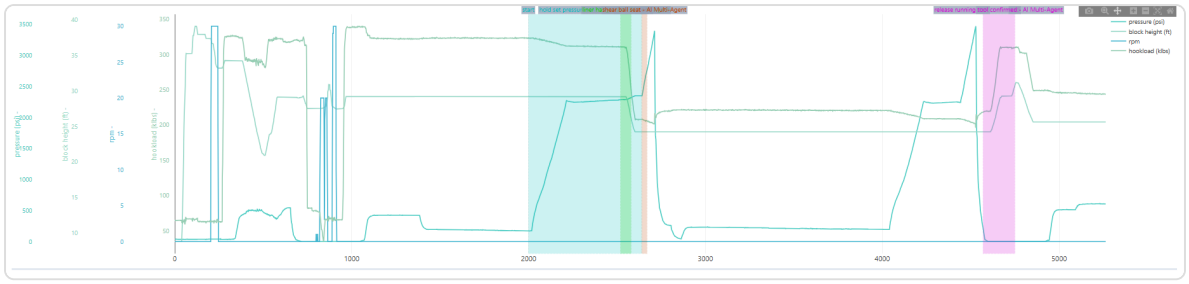
If you discover a new event type while labeling:

1. In the Event Creation Dialog, click **“Create New Class”**
2. Enter: - Class name - Description (optional) - Color (auto-generated or custom)
3. The new class is added to your project and immediately available

Guideline Mode: Creating Reference Lines

Guidelines are horizontal reference lines that mark thresholds or important values.

1. Click the **“Guideline Mode”** button in the toolbar (or press `G` key)
2. Select the **channel** from the dropdown (which data series to add the guideline to)
3. Click on the chart at the desired **Y-value** - The click location determines the guideline’s value
4. A horizontal line will appear on the selected channel
5. The guideline will appear in the Guidelines panel



Editing Events

To modify an existing event:

1. In the Events panel, click the **Edit** (pencil icon) next to the event
2. Update the description in the dialog
3. Click **“Save”**

To delete an event: - Click the **Delete** (trash icon) next to the event in the Events panel - Confirm deletion if prompted

Chart Interactions

- **Zoom**: Click and drag on the chart to zoom into a region
- **Pan**: Click and drag while zoomed in to move the viewport
- **Reset View**: Double-click the chart to reset zoom
- **Click Event**: Click on an event in the Events panel to zoom the chart to that event’s time range

Auto-Save

All labels and guidelines are automatically saved to the database as you create them. No manual save action is required.

Step 8: Navigate Between Files

After labeling a file, you can efficiently move to the next file without returning to the files list.

Navigation Options

Using Toolbar Buttons

1. **Next File** button: Click to move to the next file in the folder - If you're on the last file, this button will be disabled
2. **Previous File** button: Click to return to the previous file - If you're on the first file, this button will be disabled
3. **Back** button: Return to the files list page

Sequential Workflow

The typical workflow is: 1. Open first file 2. Label events and create guidelines 3. Click **"Next File"** 4. Repeat for all files in folder 5. Click **"Back"** when done

File Navigation Behavior

When navigating between files: - Current labels are auto-saved - Chart resets to full view - New file data loads - Events and guidelines for the new file are displayed - File description updates in toolbar

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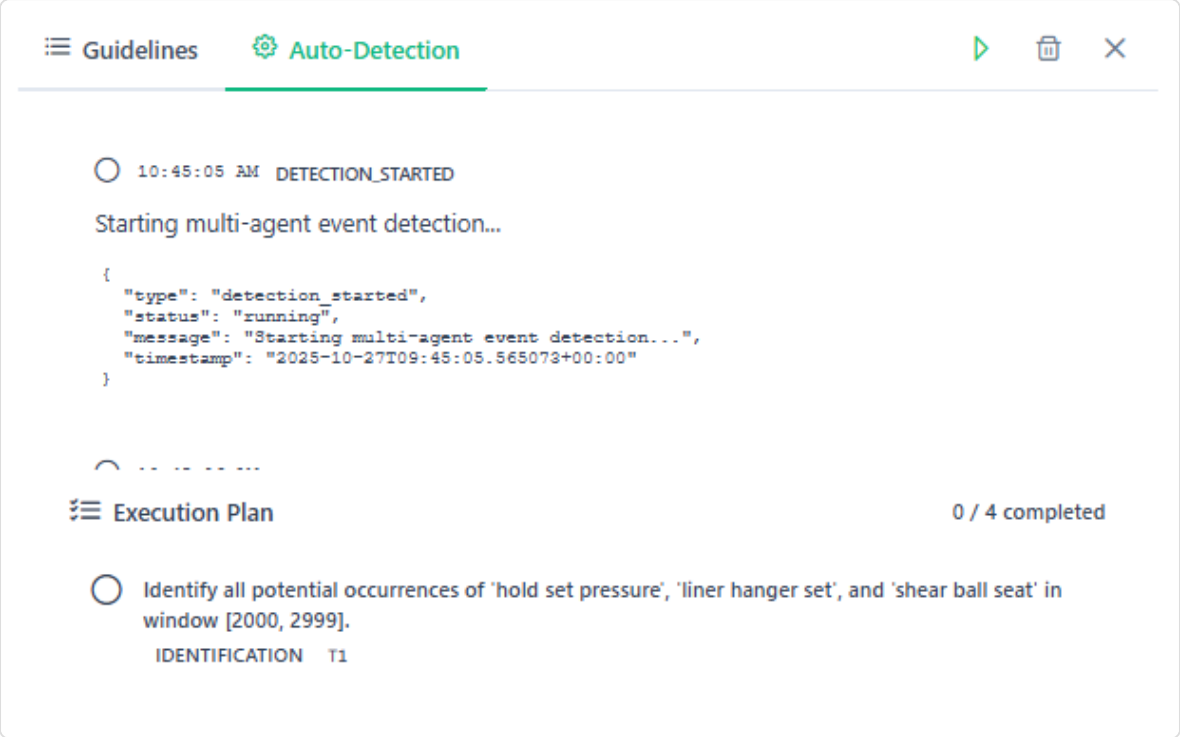
Advanced Features

AI-Powered Auto-Detection

The auto-detection feature uses AI to automatically identify and suggest event labels.

How to Use Auto-Detection

1. Open a file in the labeling interface
2. Click the **“Auto-Detection”** button in the toolbar
3. The **Auto-Detection Panel** will open, showing: - **Start Detection** button - **Stop Detection** button - **Progress indicator** - **Reasoning logs** (live updates) - **Detected events count**



1. Click **“Start Detection”**
2. The AI will: - Analyze the time-series data - Generate a detection plan - Identify potential events - Validate findings - Add suggested events to your labels
3. Review the detected events in the Events panel
4. Edit or delete any incorrect suggestions
5. Click **“Stop Detection”** to cancel if needed

Auto-Detection Process Stages

- **Planning**: AI analyzes data patterns and creates detection strategy
- **Identifying**: AI finds potential event candidates

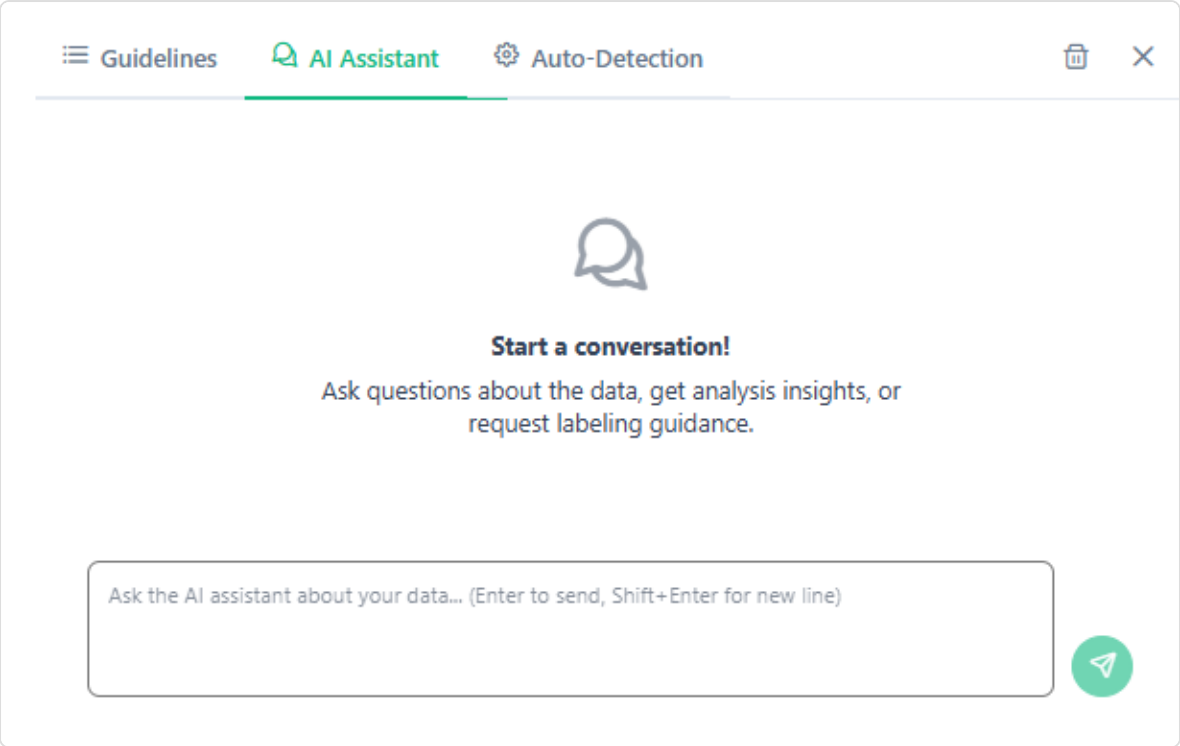
- **Validating**: AI verifies and refines detections
- **Complete**: Detected events added to labels

AI Chat Assistant

The AI Chat provides natural language interaction for data analysis.

How to Use AI Chat

1. Click the **“AI Chat”** button in the toolbar to open the chat panel
2. The chat interface includes: - **Conversation history** (scrollable) - **Message input box** - **Send button** - **Clear Chat** button



1. Type questions or requests, such as: - “What patterns do you see in channel 1?” - “Are there any anomalies between 10:00 and 11:00?” - “Suggest event labels for this file” - “What’s the average value of Temperature channel?”
2. Press **Enter** or click **“Send”**
3. The AI will analyze the data and respond with insights
4. Responses may include: - Pattern descriptions - Suggested labels - Statistical analysis - Recommendations for guidelines

Importing Labels

To import labels from a previously exported JSON file:

1. Click **“Import Labels”** in the toolbar
2. In the dialog: - Click **“Browse”** or drag and drop a JSON file - Preview the labels to be imported
3. Click **“Import”**
4. Confirm that existing labels will be replaced
5. Imported labels appear in the Events panel

Exporting Labels

To export labels for backup or sharing:

1. Click **“Export Labels”** in the toolbar
2. Select export format (typically JSON)
3. Click **“Download”**
4. Save the file to your computer

The exported file contains all events and guidelines for the current file.

Exporting Chart Data

To export the parsed time-series data:

1. Click **“Export Data”** in the toolbar
2. Choose format: - **JSON**: All channels with timestamps/indices - **CSV**: Tabular format
3. Click **“Download”**

Sharing Folders and Projects

To collaborate with team members:

1. Click **“Share Folder”** or **“Share Project”** button

2. In the sharing dialog: - Enter usernames or email addresses - Set permissions (view, edit, admin)
3. Click **“Share”**
4. Team members will receive notifications and access

Keyboard Shortcuts

- **E**: Toggle Label Mode
- **G**: Toggle Guideline Mode
- **Enter** (in AI Chat): Send message
- **Ctrl/Cmd + Z**: Undo (in some contexts)
- **Ctrl/Cmd + S**: Manual save (auto-save is default)

Tips and Best Practices

Template Creation

- Always test templates with sample files before uploading large batches
- Use descriptive regex patterns to ensure correct column matching
- Mark critical channels as “mandatory” to catch parsing errors early

Event Labeling

- Create detailed class descriptions to help with AI auto-detection
- Use consistent naming conventions for event classes
- Add event-specific descriptions for unusual or ambiguous cases
- Regularly export labels as backups

File Organization

- Group related files in the same folder

- Use descriptive folder names (e.g., “Machine_A_January_2024”)
- Keep folder size manageable (50-200 files per folder recommended)

AI Features

- Provide detailed class descriptions to improve auto-detection accuracy
- Review all AI-suggested labels before finalizing
- Use AI Chat to understand complex patterns before labeling

Performance

- For very large files (>100MB), the system automatically resamples data to 5,000 points per channel for visualization
- All original data is preserved; resampling only affects display
- Close unused tabs/panels to improve browser performance

Collaboration

- Add file descriptions to provide context for team members
- Use consistent event class definitions across the project
- Regularly sync with team to avoid duplicate labeling efforts

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Troubleshooting

File Won’t Parse

- Verify the template matches the file structure
- Check that column names match the regex patterns
- Ensure header row and skip row settings are correct
- Try uploading a different file to isolate the issue

Chart Not Loading

- Ensure file status is “Parsed” (not “Processing”)
- Refresh the browser page

- Check browser console for errors
- Verify file size is supported

Labels Not Saving

- Check internet connection
- Ensure you have edit permissions for the folder
- Verify you're logged in
- Try refreshing and re-creating the label

Auto-Detection Not Working

- Ensure class descriptions are detailed and accurate
- Verify file has valid data in all channels
- Check that WebSocket connection is active (status indicator)
- Try stopping and restarting the detection

Support and Feedback

For additional help or to report issues: - Navigate to the **Contact** page in the application - Email support (if provided) - Check the **Help** or **Manual** page for updates

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Version: 1.0 **Last Updated**: February 2026