

# Hill Sequence Labeling Tool - User Manual

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## Introduction

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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.

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# Getting Started

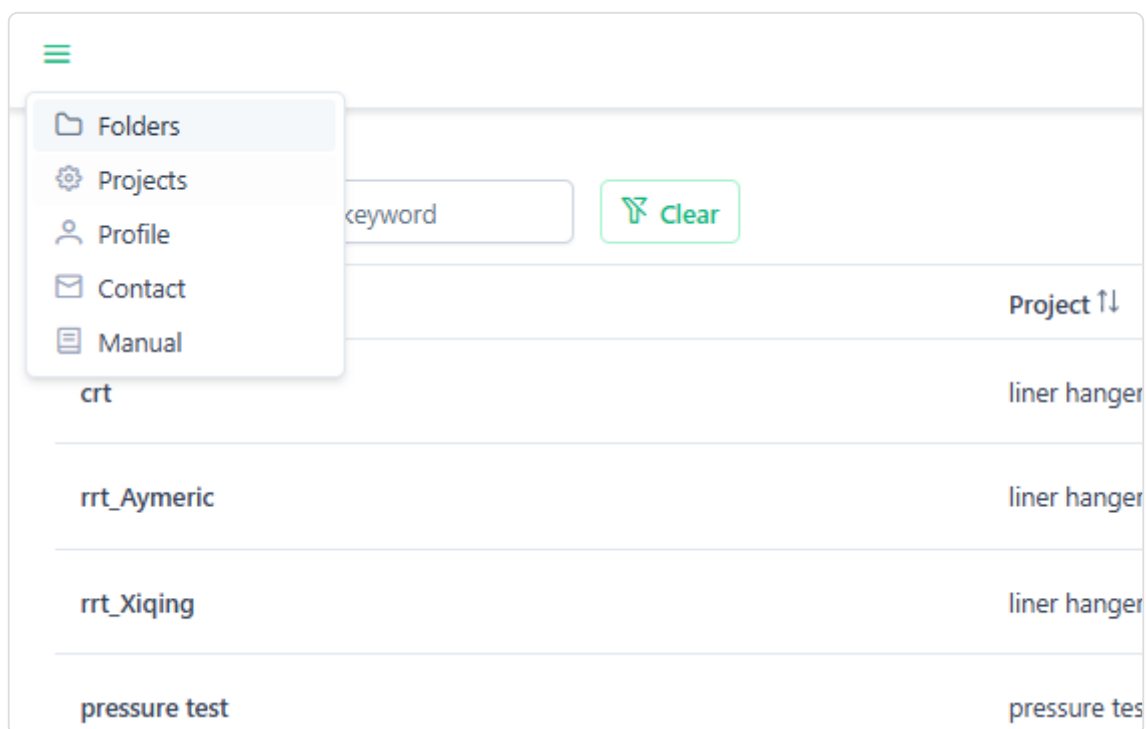
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## System Requirements

- 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



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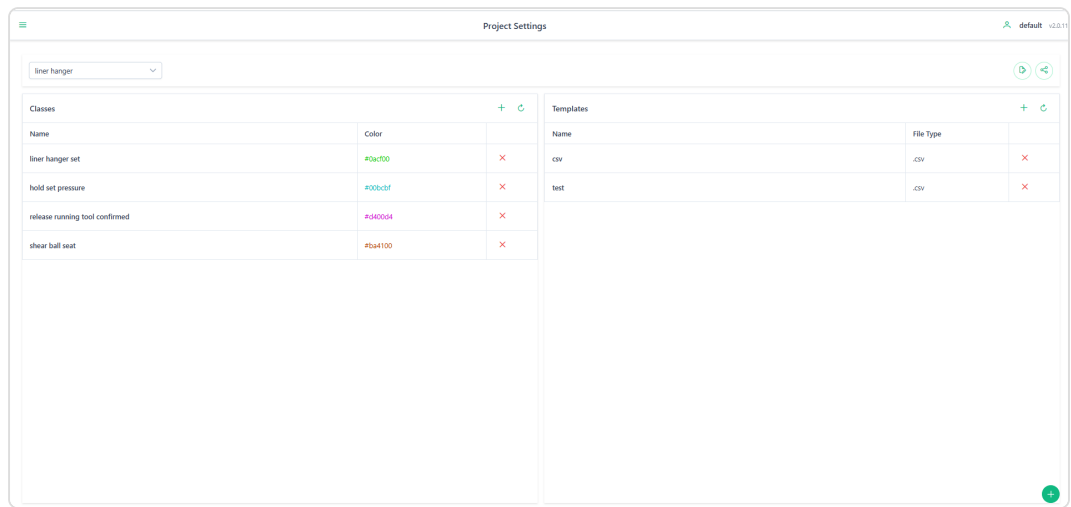
## Step 1: Create a Project

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

## How to Create a Project

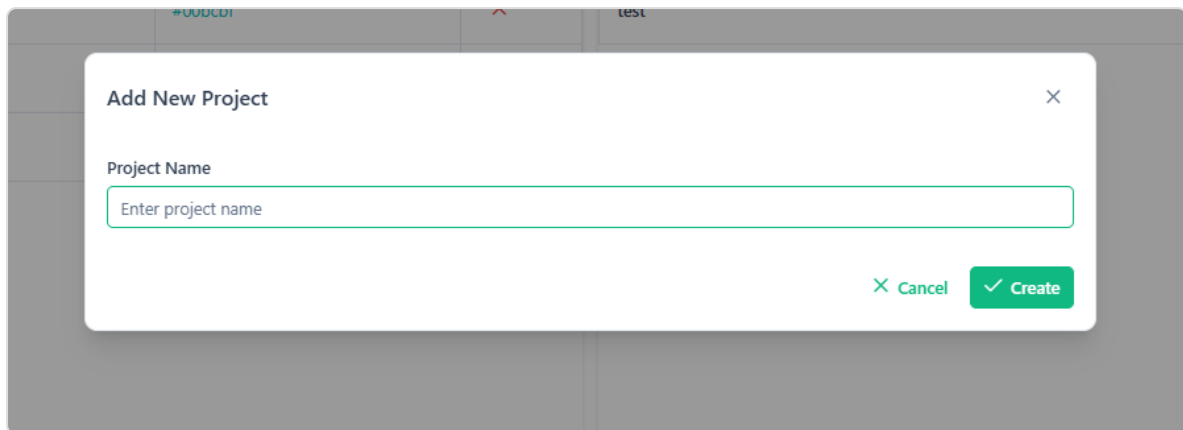
1. Navigate to the **Projects** page using the navigation menu



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

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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

Templates <span>+</span> <span>↺</span>		
Name	File Type	
csv	.csv	×
test	.csv	×

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

The screenshot shows a configuration window titled 'CSV' with a close button in the top right. At the top, there is a file format dropdown set to '.CSV', and two buttons: '+ Add Channel' and 'Upload Test File'. Below this is the 'File Parsing Configuration' section with three input fields: 'Sheet Name (0-indexed)' with value '0', 'Header Row Index' with value '0', and 'Skip Rows After Header' with value '0'. The 'X-Axis Configuration' section has a checkbox 'Use Row Index' which is unchecked. It contains three input fields: 'X-Axis Name' with value 'idx', 'Matching String' with value 'idx', and 'Unit' with value 'e.g., seconds'. There is also a checkbox 'Is Time Axis' which is unchecked. Below this is the 'Data Channels (Max 8)' section, which is a table with four rows. The first three rows are populated with data: 'pressure (psi)' with matching string 'pressure (psi)', unit 'Unit', color 'teal', and mandatory checkbox checked; 'block height (ft)' with matching string 'block height (ft)', unit 'Unit', color 'light green', and mandatory checkbox checked; and 'rpm' with matching string 'rpm', unit 'Unit', color 'blue', and mandatory checkbox unchecked. The fourth row is empty. At the bottom right of the table are 'Cancel' and 'Save' buttons.

## 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

This image is a close-up of the top part of the configuration window, showing the file format dropdown set to '.CSV', the '+ Add Channel' button, and the 'Upload Test File' button.

## 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

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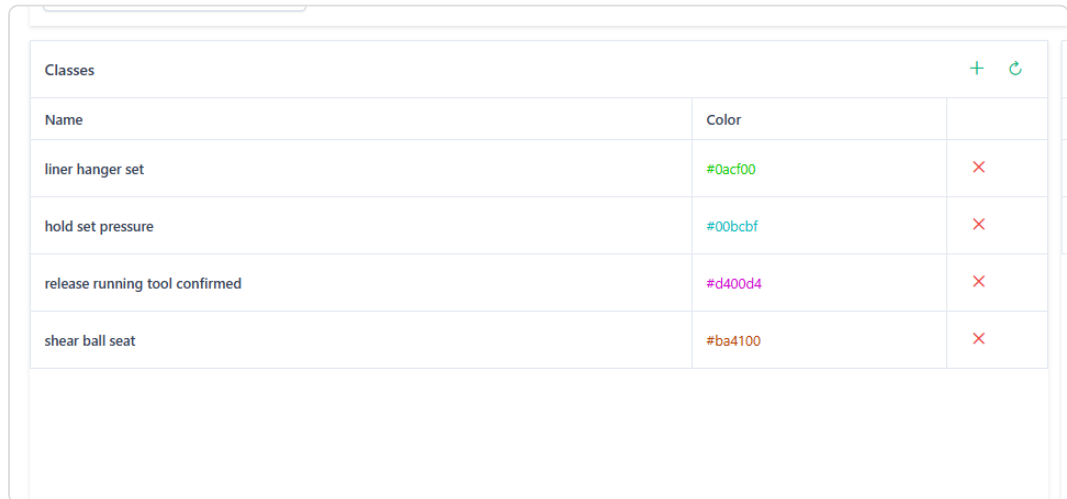
## Step 3: Create Event Classes

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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



Classes			+	↺
Name	Color			
liner hanger set	#0acf00		X	
hold set pressure	#00bcbf		X	
release running tool confirmed	#d400d4		X	
shear ball seat	#ba4100		X	

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

Edit Class: liner hanger set

Class Name

liner hanger set

Color

Event Pattern Description

Visual pattern:

- \* Start:
  - Both hookload and block height shift from steady to quasi-simultaneous linear decrease.
  - The start index is the first point where both signals begin a sustained, simultaneous decrease (e.g., both derivatives negative and exceed minimum thresholds, such as -0.5 klbs/row for hookload and -0.05 ft/row for block height, for at least 3 consecutive points).
  - The event must be detected within the steady phase of the first valid 'hold set pressure' event, as defined above.
- \* In progress:
  - Hookload and block height decrease linearly and simultaneously. Minor lag (up to 10 points) or minor noise is acceptable.
- \* End:
  - Both hookload and block height reach new, lower steady values.
  - The end index is the first point where both signals remain within  $\pm X$  units of their new steady values for at least Y consecutive points (e.g.,  $\pm 1$  klbs and  $\pm 0.1$  ft for at least 5 points).
  - If one continues to decrease and the other becomes steady, it is not a successful set and should be ignored.
  - The final values of hookload and block height must be lower than initial values and should not recover to a value equal or higher than the initial values.

Duration pattern:

- 0.5–10 minutes (30–600 rows).

Sequential rules pattern:

- Must occur within the steady phase of the first valid 'hold set pressure' event.
- Only one valid 'liner hanger set' event per job.
- If multiple candidate 'liner hanger set' events are present, select the last one that is followed by the 'shear ball seat' and 'release running tool confirmed' events, and is contained within the final, successful 'hold set pressure' event.
- If multiple pressure holds exist, only the one containing the simultaneous decrease in hookload and block height is valid.

Cancel

Update

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

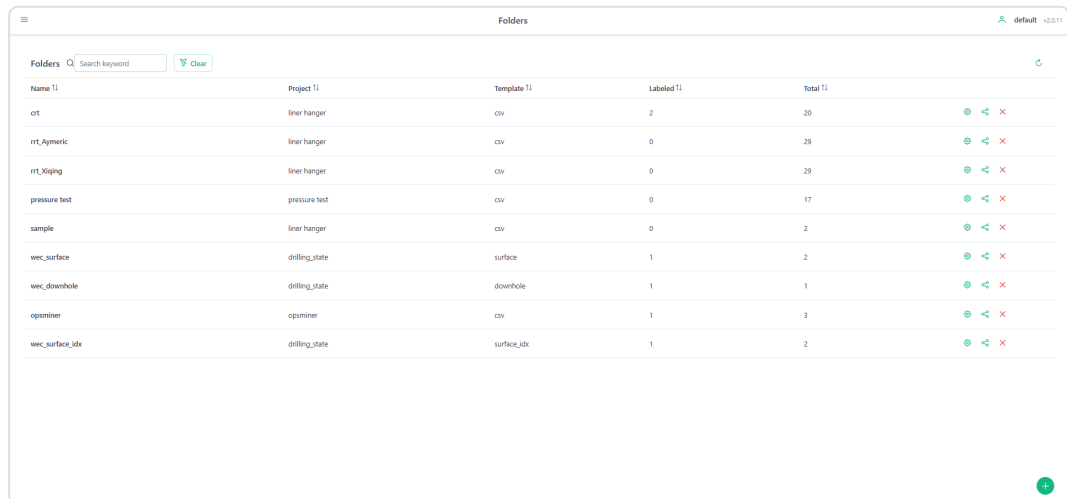


## Step 4: Create a Folder

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

### How to Create a Folder

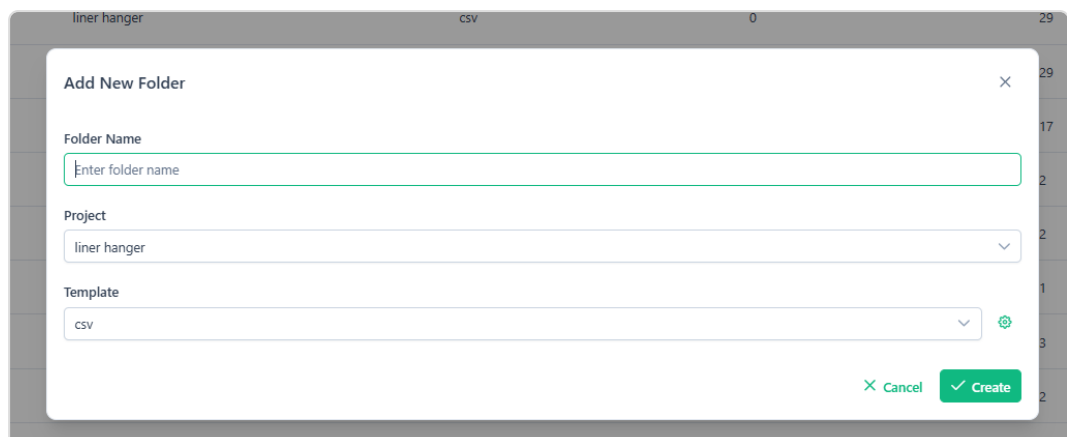
1. Navigate to the **Folders** page (main dashboard)



The screenshot shows the 'Folders' page with a table listing existing folders. The table has columns for Name, Project, Template, Labeled, and Total. Each row represents a folder with its associated details and action icons.

Name	Project	Template	Labeled	Total	
ort	liner hanger	csv	2	20	
rtt_symetric	liner hanger	csv	0	29	
rtt_xiqing	liner hanger	csv	0	29	
pressure test	pressure test	csv	0	17	
sample	liner hanger	csv	0	2	
wec_surface	drilling_state	surface	1	2	
wec_downhole	drilling_state	downhole	1	1	
opminner	opminner	csv	1	3	
wec_surface_idx	drilling_state	surface_idx	1	2	

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



The screenshot shows the 'Add New Folder' dialog box. It contains three input fields: 'Folder Name' (text input), 'Project' (dropdown menu), and 'Template' (dropdown menu). The 'Project' dropdown is set to 'liner hanger' and the 'Template' dropdown is set to 'csv'. At the bottom right, there are 'Cancel' and 'Create' buttons.

linér hanger      csv      0      29

29

17

2

2

1

3

2

Add New Folder

Folder Name

Enter folder name

Project

linér hanger

Template

csv

Cancel Create

## 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

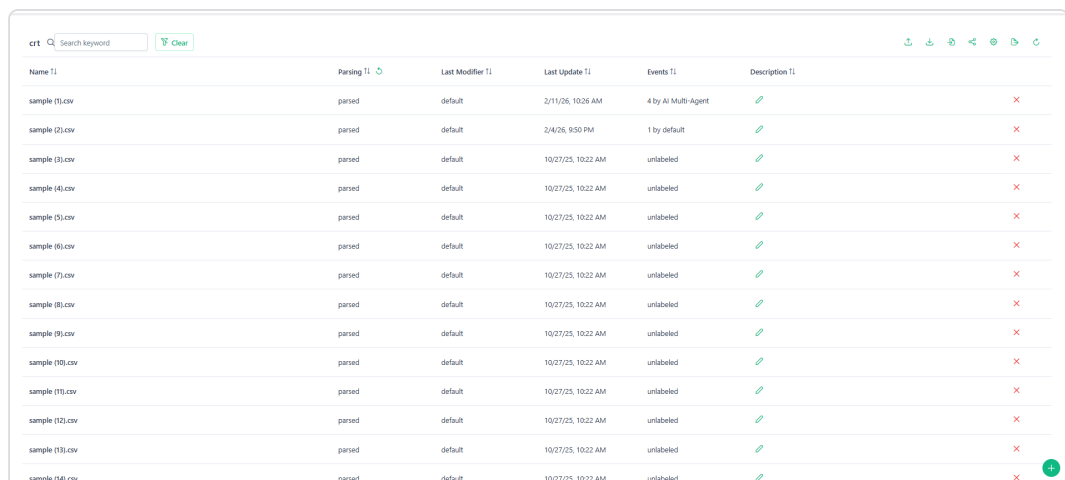
Each folder row shows: - Folder name - Associated project name - Associated template name - Progress: Number of labeled files / Total files - Last update timestamp

## Step 5: Upload Files

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

### How to Upload Files

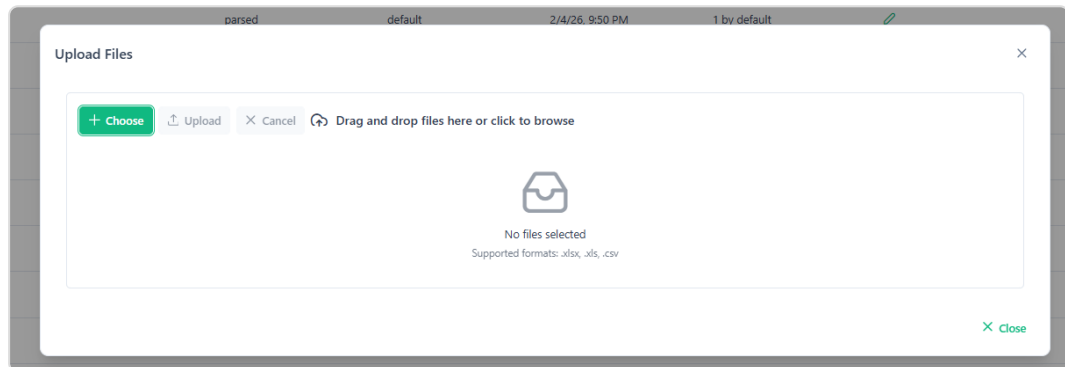
1. From the **Folders** page, click on a folder to open it
2. You'll be taken to the **Files** page for that folder



Name	Parsing	Last Modifier	Last Update	Events	Description
sample (1).csv	parsed	default	2/11/26, 10:26 AM	4 by AI Multi-Agent	
sample (2).csv	parsed	default	2/4/26, 9:50 PM	1 by default	
sample (3).csv	parsed	default	10/27/25, 10:22 AM	unlabeled	
sample (4).csv	parsed	default	10/27/25, 10:22 AM	unlabeled	
sample (5).csv	parsed	default	10/27/25, 10:22 AM	unlabeled	
sample (6).csv	parsed	default	10/27/25, 10:22 AM	unlabeled	
sample (7).csv	parsed	default	10/27/25, 10:22 AM	unlabeled	
sample (8).csv	parsed	default	10/27/25, 10:22 AM	unlabeled	
sample (9).csv	parsed	default	10/27/25, 10:22 AM	unlabeled	
sample (10).csv	parsed	default	10/27/25, 10:22 AM	unlabeled	
sample (11).csv	parsed	default	10/27/25, 10:22 AM	unlabeled	
sample (12).csv	parsed	default	10/27/25, 10:22 AM	unlabeled	
sample (13).csv	parsed	default	10/27/25, 10:22 AM	unlabeled	
sample (14).csv	parsed	default	10/27/25, 10:22 AM	unlabeled	

3. Click the **“Upload Files”** button

- 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
- 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

	Parsing ↑↓ ↻
	parsed
	parsed
	parsed
	parsed

## 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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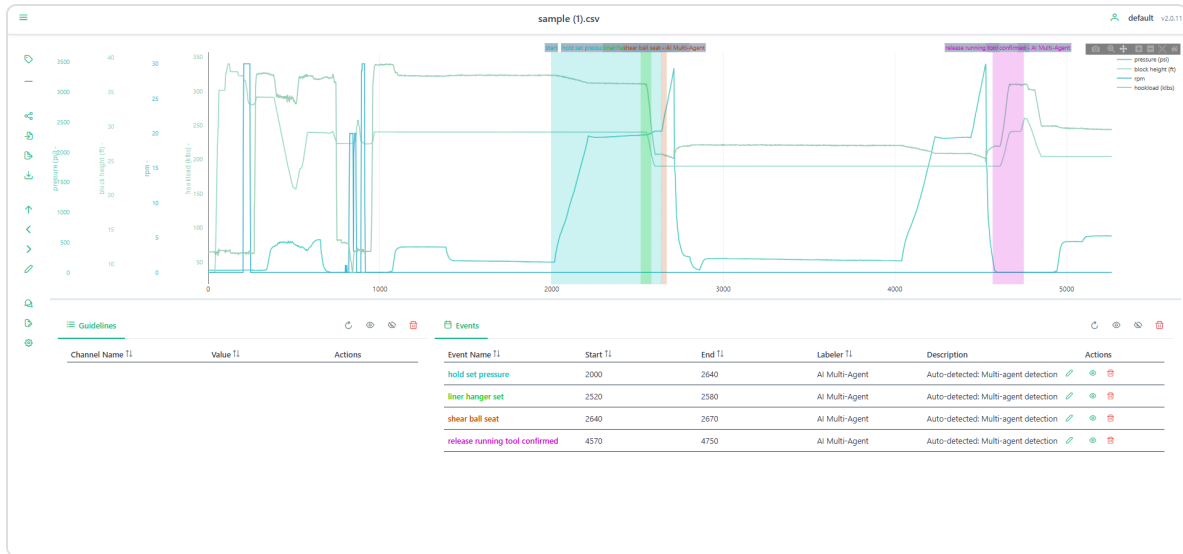
## Step 6: Open a File

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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)

Events					
Event Name ↑↓	Start ↑↓	End ↑↓	Labeler ↑↓	Description	Actions
hold set pressure	2000	2640	AI Multi-Agent	Auto-detected: Multi-agent detection	  
liner hanger set	2520	2580	AI Multi-Agent	Auto-detected: Multi-agent detection	  
shear ball seat	2640	2670	AI Multi-Agent	Auto-detected: Multi-agent detection	  
release running tool confirmed	4570	4750	AI Multi-Agent	Auto-detected: Multi-agent detection	  

## 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

<div> <span>☰ Guidelines</span> <span>↺</span> <span>👁</span> <span>🔗</span> <span>🗑</span> </div>		
Channel Name ↑↓	Value ↑↓	Actions

## 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

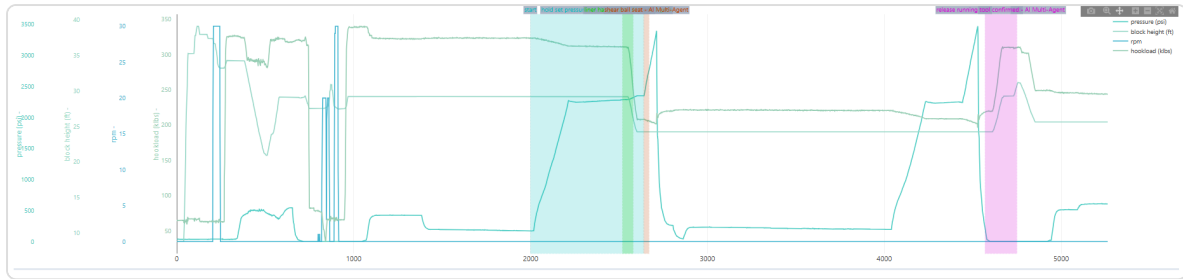
If you discover a new event type while labeling:

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

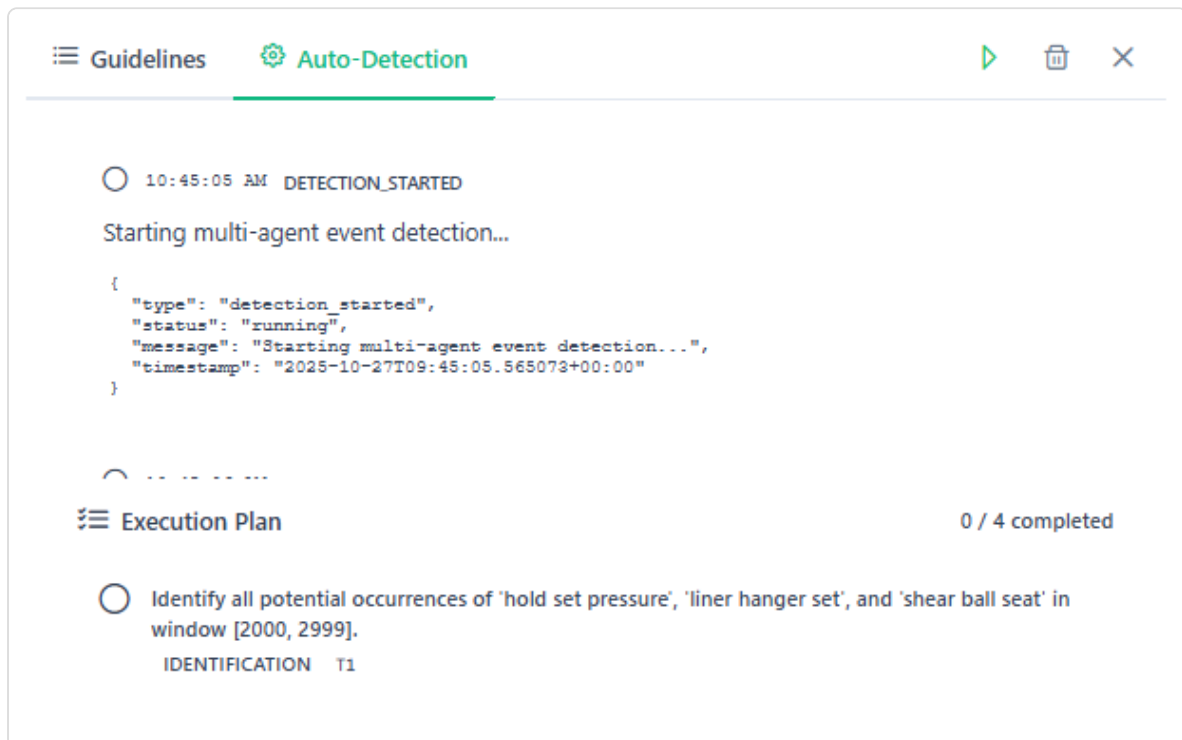
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### AI-Powered Auto-Detection

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

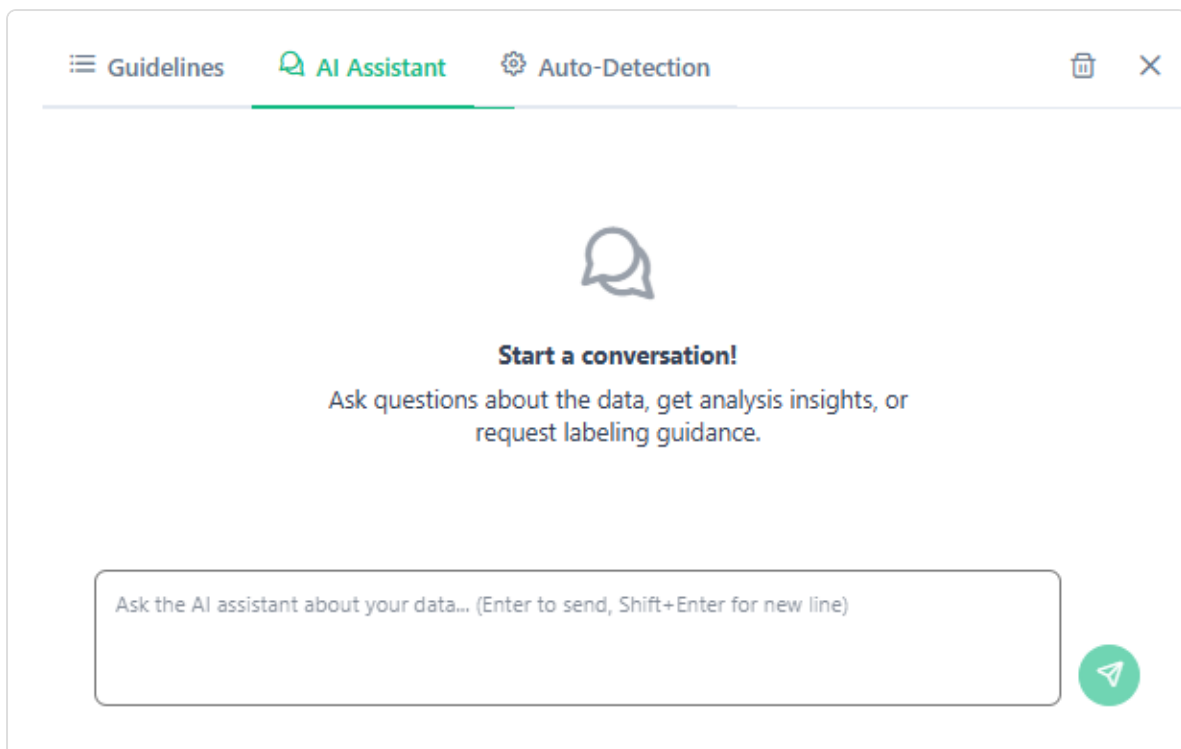
- **Validating:** AI verifies and refines detections
- **Complete:** Detected events added to labels

## 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
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## Keyboard Shortcuts

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- **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

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### 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

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### 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

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## Support and Feedback

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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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