SPAN
Vision Melodies

Codebeat

Versatile code reader

Codebeat–Code Reader System

Software User Manual

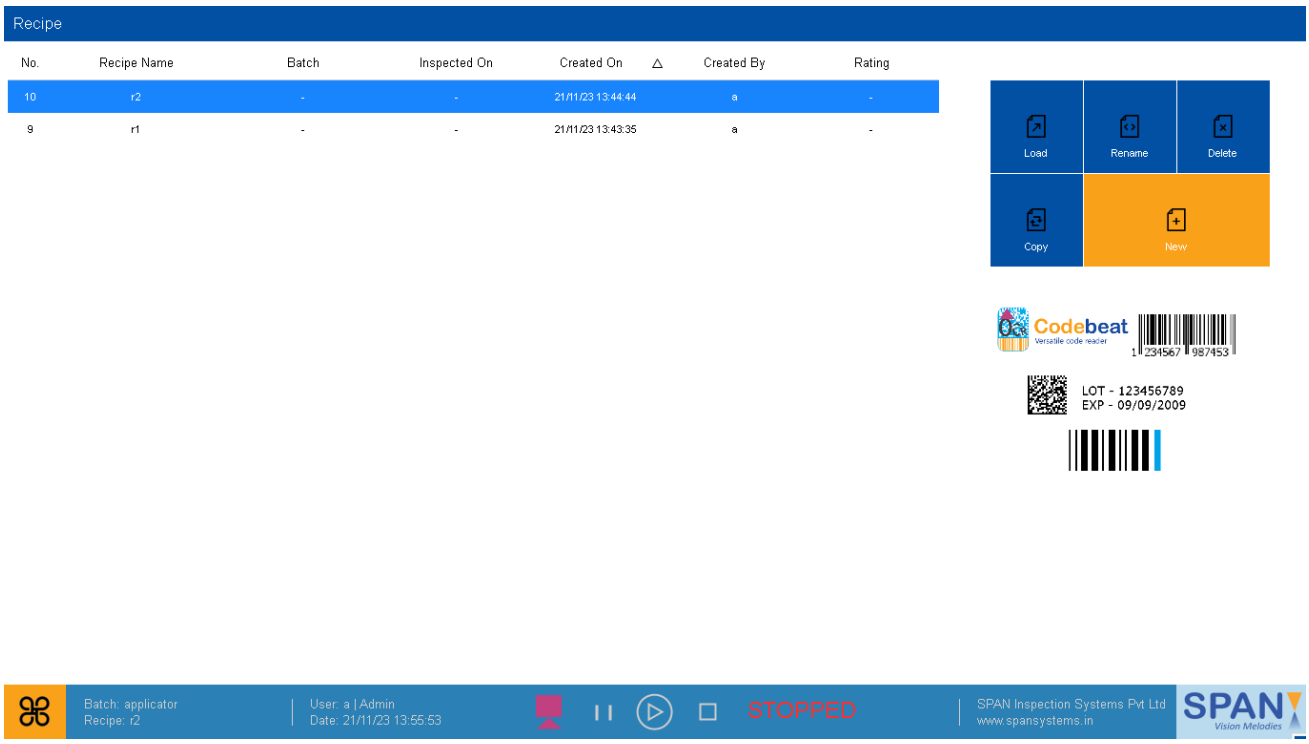
Table of Contents

INTRODUCTION TO SPAN VISION STUDIO SOFTWARE

SPAN VISION STUDIO

Vision studio is like an operating system to run all types of SPAN vision applications. It loads automatically on system logon. Vision studio will host all the cameras connected to a particular IPC, whereas connected cameras can be attached / assigned to various SPAN Vision Applications i.e. Blisbeat-A (for top inspection), Blisbeat-B (for bottom inspection in PVC clear foil), Codebeat (Code Reader Application). Vision studio can only integrate cameras installed on single machine for given IPC (e.g. Blisbeat-A + Blisbeat-B + Foil Code Reader).

VISION STUDIO SCREEN EXPLANATION

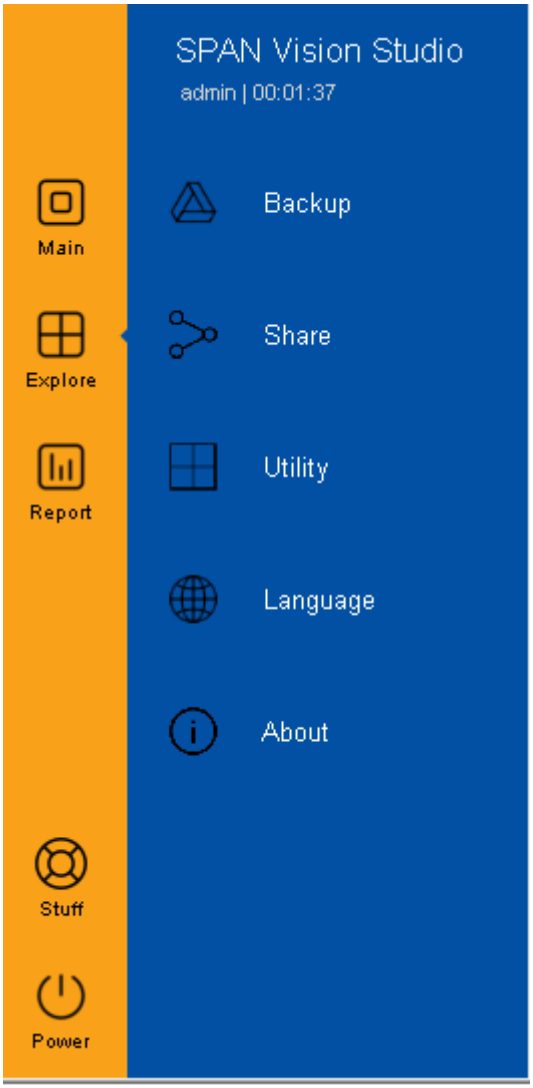


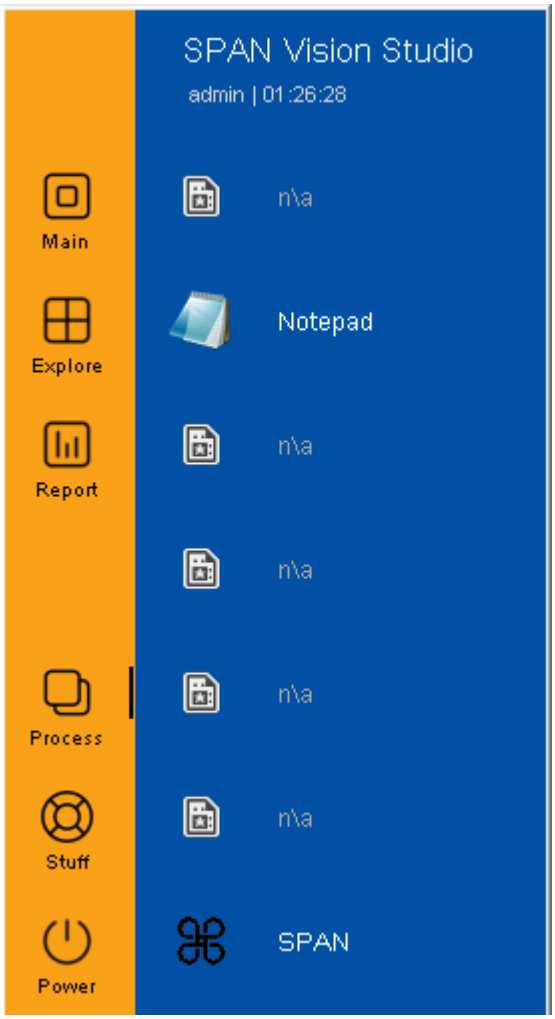
Click on Model to load the saved recipe. The recipes are application wise.

GENERAL MODULES

Some of the modules are common for vision studio application. So, any User that has appropriate rights can access following modules:

21CFR, Audit Trail, Scope View, Backup, Share, Utility, Config, Language, Video Help, About & Power.




SPAN Vision Studio
admin | 01:26:28
Main
Explore
Report
Process
Stuff
Power
n\a
Notepad
n\a
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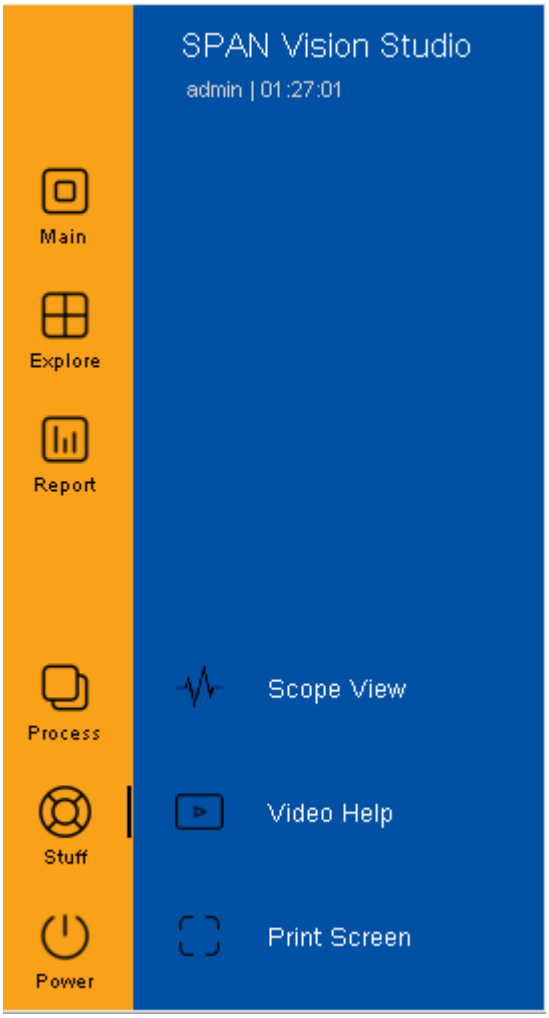
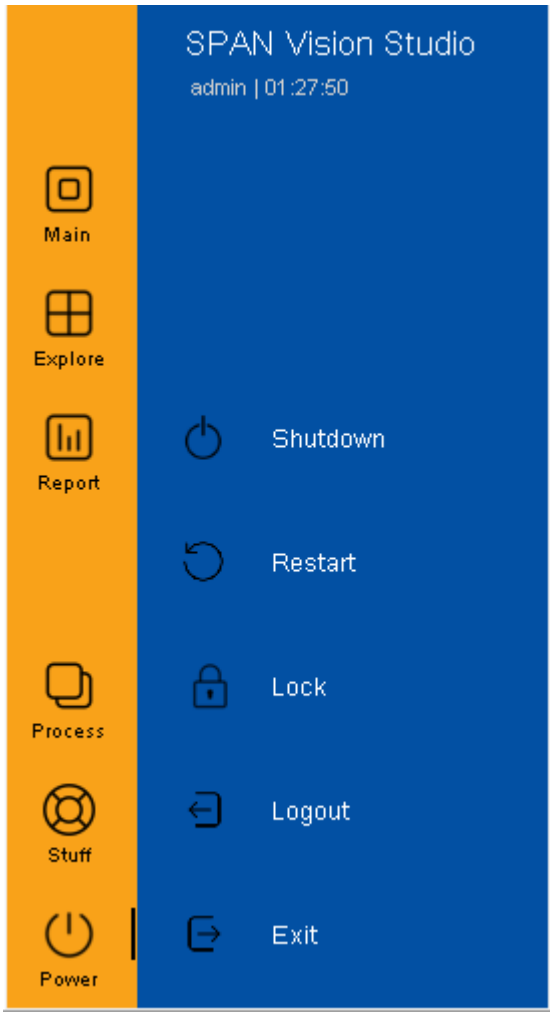
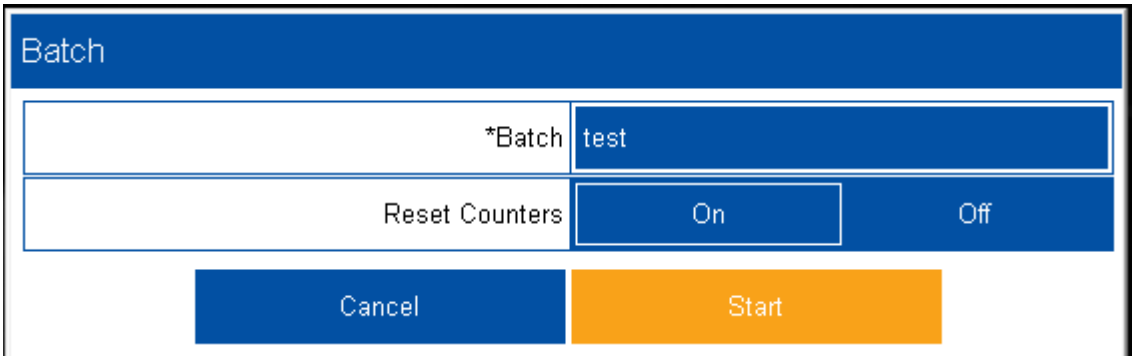
SPAN


SPAN Vision Studio
admin | 01:27:01
Main
Explore
Report
Process
Stuff
Power
Scope View
Video Help
Print Screen



This task bar is always visible to user whatever the application state is. Use can click on SPAN Logo to come to home screen form any module.

***Run* – On pressing Run button**  **software will prompt for batch number and all the applications will go to inspection mode.**



Reset Counters On **– When user select on option and click on start button counters for same recipe and batch number will be reset to zero.**

Reset Counters Off **– When user select off option and click on start button counters for same recipe and batch number increases**

On entering new batch number, if reset counters is select off that time also inspection start with counter zero.

NOTE: Reset Counters access is by default limited to Admin and Supervisor though it can be configurable.

Pause **– User can pause inspection using**  **, on inspection pause user can stop the machine and analyze the previously inspected images.**

Stop **– User can stop the inspection and end the currently running batch by pressing the inspection stop button**  **.**

Also it has a Power button; on clicking it various options are available like application Exit, Logout, Lock, System Restart & Shutdown.

This symbol states the current status of the application, namely there are 3 types of status Running, Paused, Stopped.

CODEBEAT – CODE READER SYSTEM

INTRODUCTION

Codebeat is a versatile code reader for reading codes that are printed on various types of packaging material. Codebeat is equipped with most advances optical technology which enables it to read codes on most of the printing surfaces.

SPAN Codebeat is equipped with the most advance industry-proven OCR/OCV reader for, printed and embossed codes, lot numbers, expiry date, ID number which ensures that accurate information is printed each and every time.

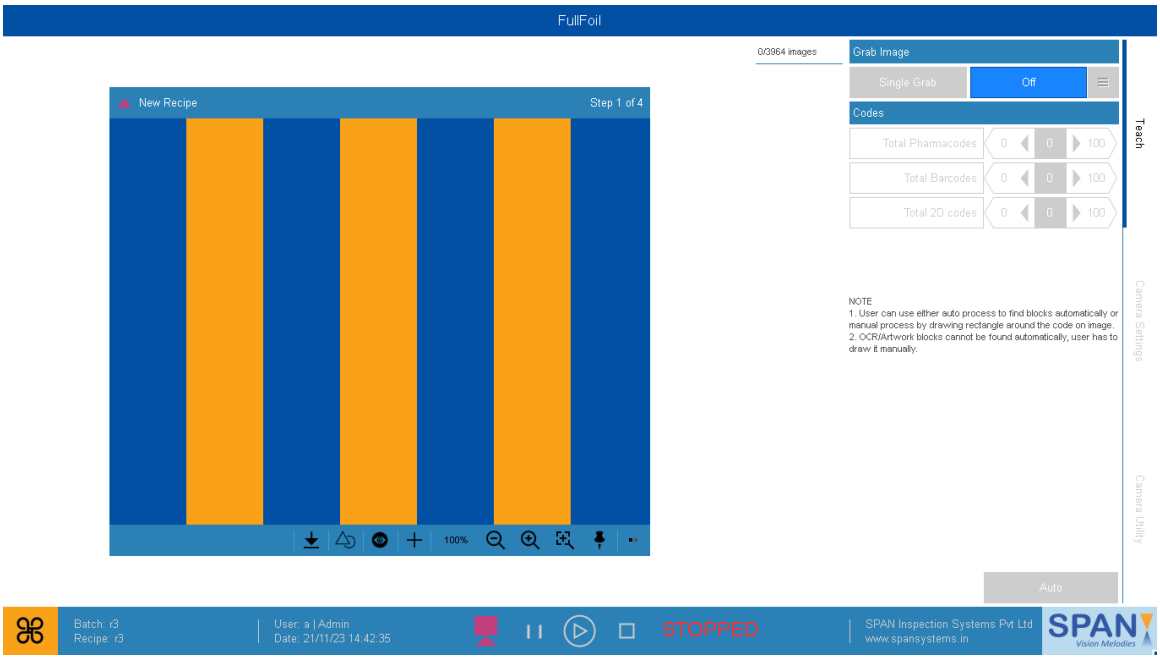
Type of Codes Supported

- **Pharmacode**
- **1D Barcode**
- **GS1 Barcodes**
- **Datamatrix Codes**
- **GS1 Datamatrix**
- **OCR / OCV**
- **Artwork / Logo**

TEACH RECIPE

STEP-1

- **Press Machine Grab button, run the machine.**

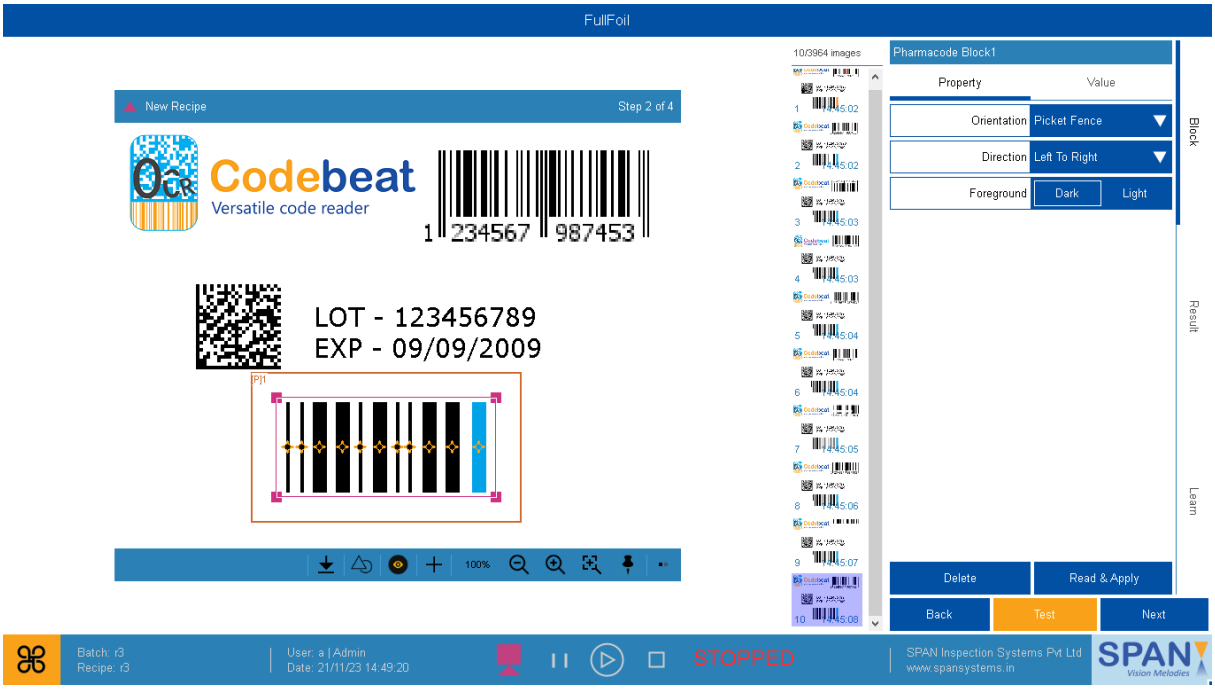


- **After running machine, all the images that are captured by camera will be displayed as thumb view with current image displayed on the main display.**

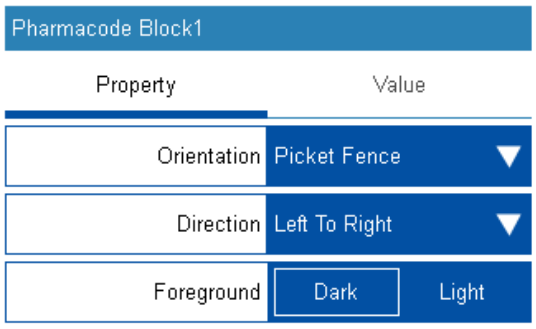
- **User can click on the thumb image to view that particular image only for this page.**

- **Enter total number of Pharmacodes that are present in the current image.**
- **Click Auto button to automatically locate the Pharmacode.**

- **Automatically located pharmacodes are highlighted with two rectangles one inner rectangle covering the code and outer rectangle indicates the shifting area of the pharmacode during inspection or machine running mode.**



- **For pharma code, first click on the pharma code image rectangle. This will prompt pharma code properties. User can change the properties of Orientation, Direction and Foreground if required.**



Orientation:

Picket Fence – It is used when the pharma code is in horizontal position.

Ladder – It is used when the pharma code is in vertical position.

Direction:

Left To Right –It is used when user wants to decode the pharma code form left to right direction.

Right to Left – It is used when user wants to decode the pharma code from right to left direction.

Foreground:

Dark - It is used when the background of pharma code is light.

Light - It is used when the background of the pharma code is dark.

- **Click on Read & Apply button.**
- **After read & apply user can change the extended search value, length value, color value and do ON/OFF the standards of the pharmacode.**

EXTENDED SEARCH:

Extended area is the area in pixels on either sides of the Pharmacode which can be used to decode Pharmacode.

STANDARDS:

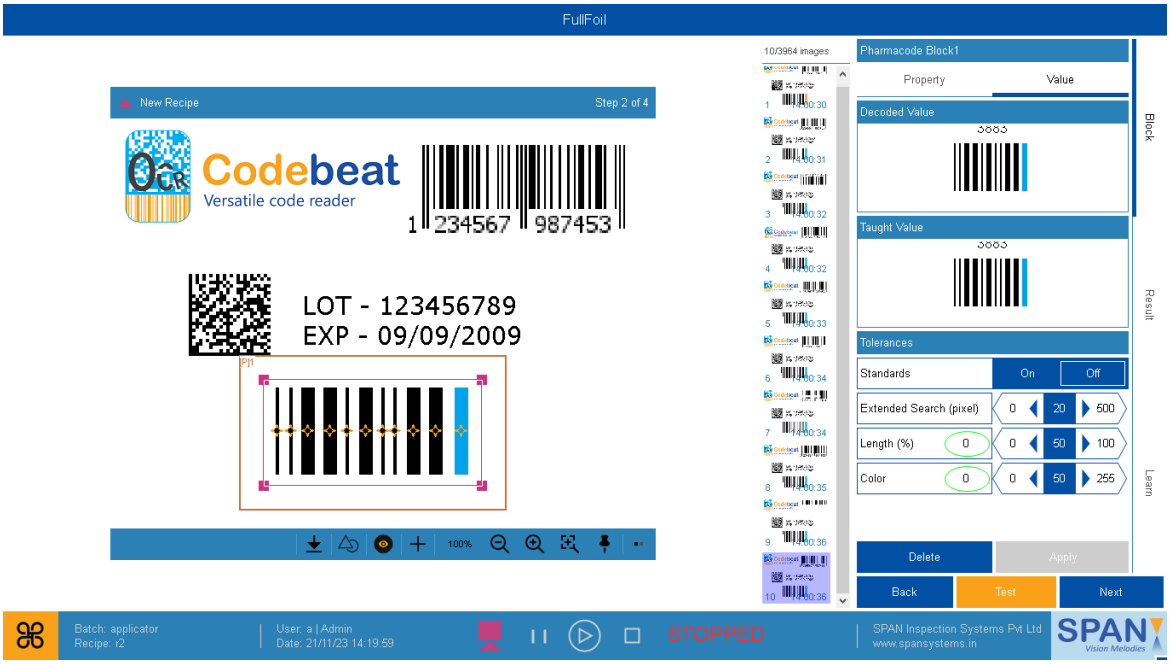
Pharmacode has its own standards of printing, which checks for space between bars, thickness of the thick bars and thinness of thin bars. So if user wants to check this printing standards it has to be kept ON.

LENGTH(%):

All the bar has certain length which is recorded during teach time and software cross checks this bar length against taught length. This can be measured in percent variation compared to the taught length of bars.

COLOR:

Color of all the bars are compared with the reference bar color. The mismatch in color variation of average color is measured on color scale of 0 to 255.



- **For OCR, user need to draw a rectangle covering the characters need to read. Then click OCR in Select Block.**

- **First user has to check if the text is segmented properly.**

Foreground:

If the text is darker than background as seen in above images, than set to Dark else Light.

Char Forming:

This option can be used for dot-matrix printing to bridge the gap between the dots.

Auto Threshold:

If the image is uniformly illuminated and character are also printed properly than it can be used.

Local Threshold:

If the image is not uniformly illuminated or if it is dot-matrix print or if characters are small than it should be used. Using this option will be a bit time expensive compared to other options.

Manual Threshold:

If user wants to segment a particular color / gray value characters in image than it can be used. This is used very rarely.

- **Next click Property tab, set appropriate value in all the properties:**

ORIENTATION:

0 Degree – If the orientation of the text is horizontal.

Clock Wise – 90 Degree – If the orientation of text is made horizontal on rotating 90 degrees clock wise.

Clock Wise – 180 Degree – If the orientation of the text is inverted and has to be rotated 180 degrees.

Anti-Clock Wise – 90 Degree – If the orientation of text is made horizontal on rotating 90-degree anti clock wise.

TILT CORRECTION:

This is by default ON and should be kept on because it corrects +/- 10 degrees of orientation in text.

CHAR TYPE:

It indicated what character set should be used for reading a particular text. (ALL, Alphabets + Number, Alpha, Numbers, Custom).

BLOB SIZE:

This will remove small noises like dots sounding the printing, which can be actually present on the material surface or could be a result of the segmentation process.

CHARACTER PRESENCE:

This option can only be used if user wants to just check presence/absence of the characters with the mentioned tolerance.

(NOTE: On using this option OCR will be bypassed.)

- **Click on press Read & Apply button to read the text. The system will automatically read the characters. The result of the reading will be displayed on the top right side of the screen under the Value Tab.**

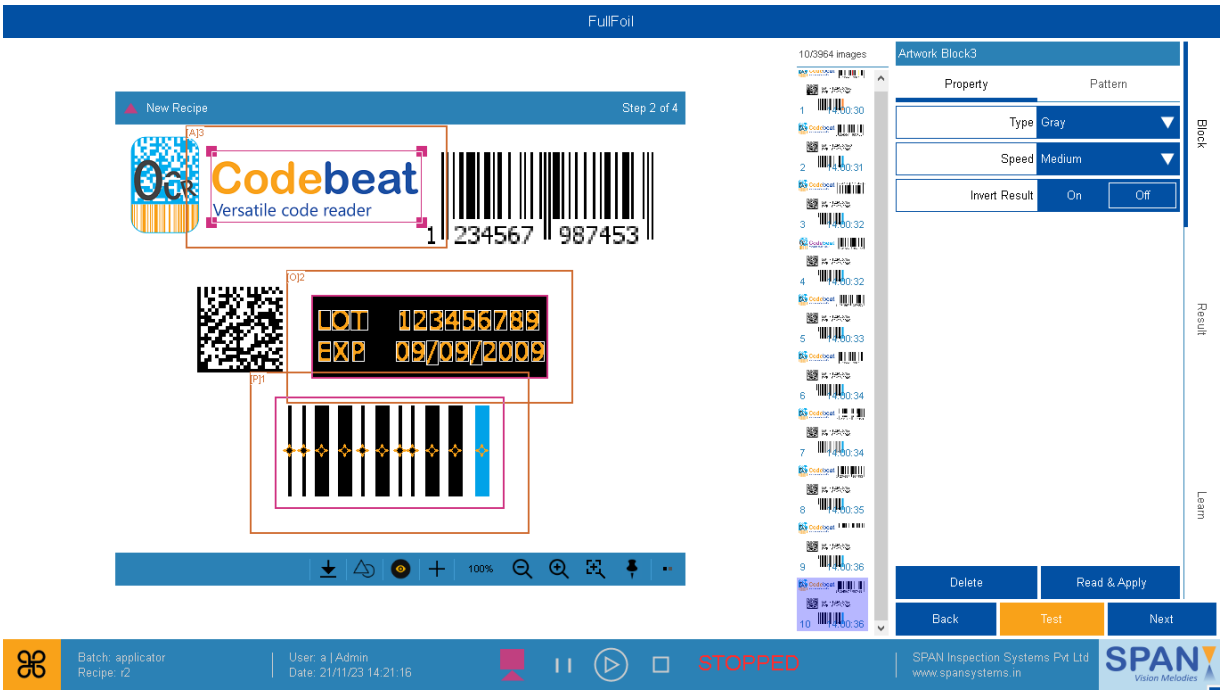
- **User can use zoom functionality from the status bar below the image to see the segmented / threshold text properly.**

- **If the characters that are printed do not appear to be in the reading string, then user can either adjust the Threshold in the Segment Tab OR set appropriate properties as explained above.**

- **Now if any of the characters in the read string does not match the character that is printed. Then user can click on that particular character under Taught Value. This will allow the user to change the taught character which the OCR engine displays as similar looking characters.**

- **For Artwork, user needs to draw a rectangle covering the artwork to identify. Then click Artwork in Select Block.**

- **For Artwork, first click on the artwork image rectangle. This will prompt artwork properties. Users can change the properties of artwork Type, Speed and Invert Results if required.**



- **User can select following property as required:**

TYPE:

Gray - This can be selected for black & white artwork. It can used to just check presence/absence of artwork.

Color - This can be selected for colored artwork. Major variation in color can only be checked consistently.

Edge - This can be selected for checking outlines of artwork on various materials(I.e. artwork printed on Metal, Glass, Rubber, etc.).

Gray-Any -

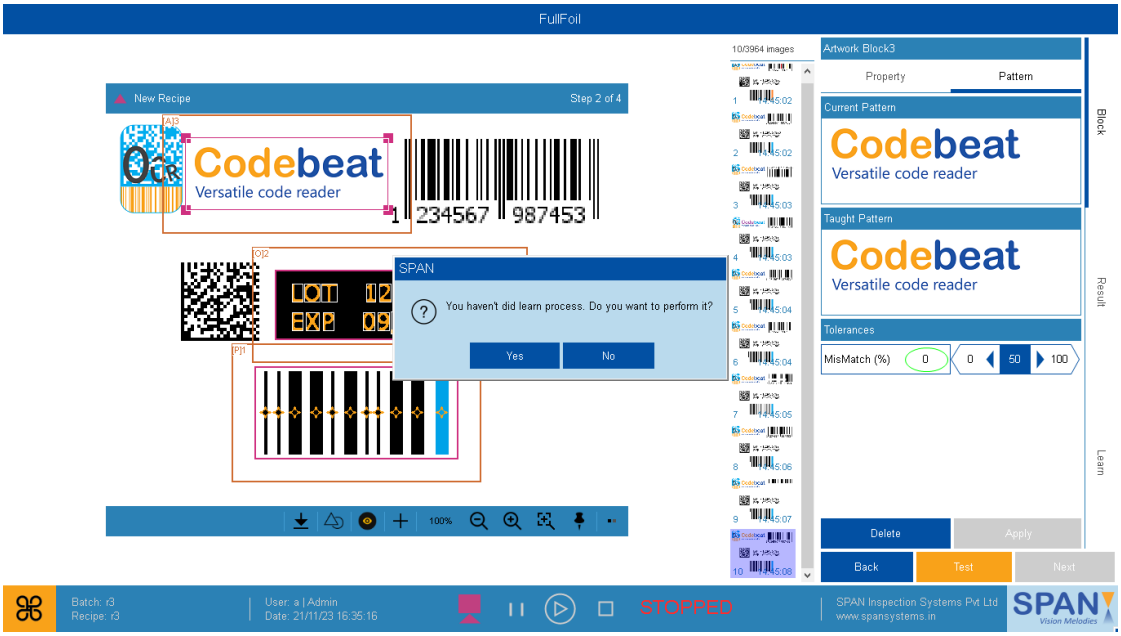
Speed:

Medium - This is a default value and works in most of the machine speed.

High - This option can be used for high-speed machines, but this will also accuracy of verification.

Invert Result:

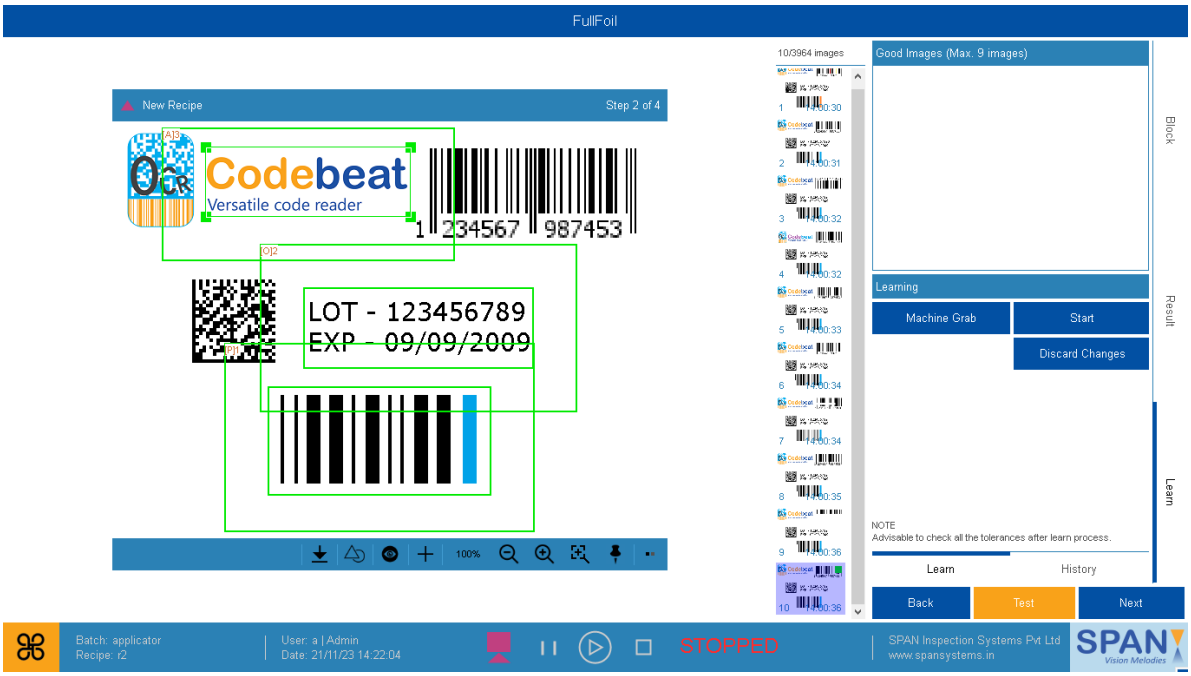
It is used to invert the result.



- **Drag all good product image (i.e. images at are good but rejected by camera) into Good Image bin, maximum 9 images can be dragged.**

- **After dragging good images in good image bin click on start to proceed learning.**

- **Now click on the thumb image and check the result once again, good images should be accepted whereas bad images should be rejected.**

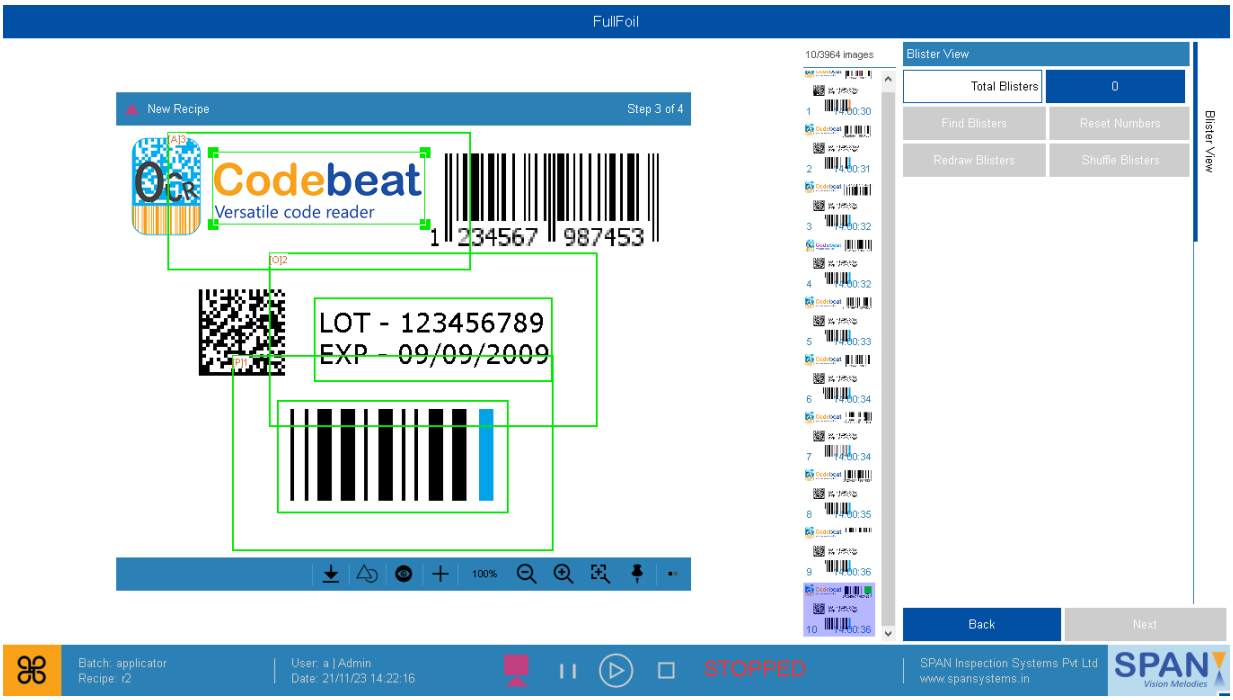


- **If the results of the Learn are worse (can be due to wrong images provided) than before proceeding user can also discard changes by click on Discard Changes button.**
- **After completion of learning some of the tolerances of particular category will be changed automatically, as given below:**

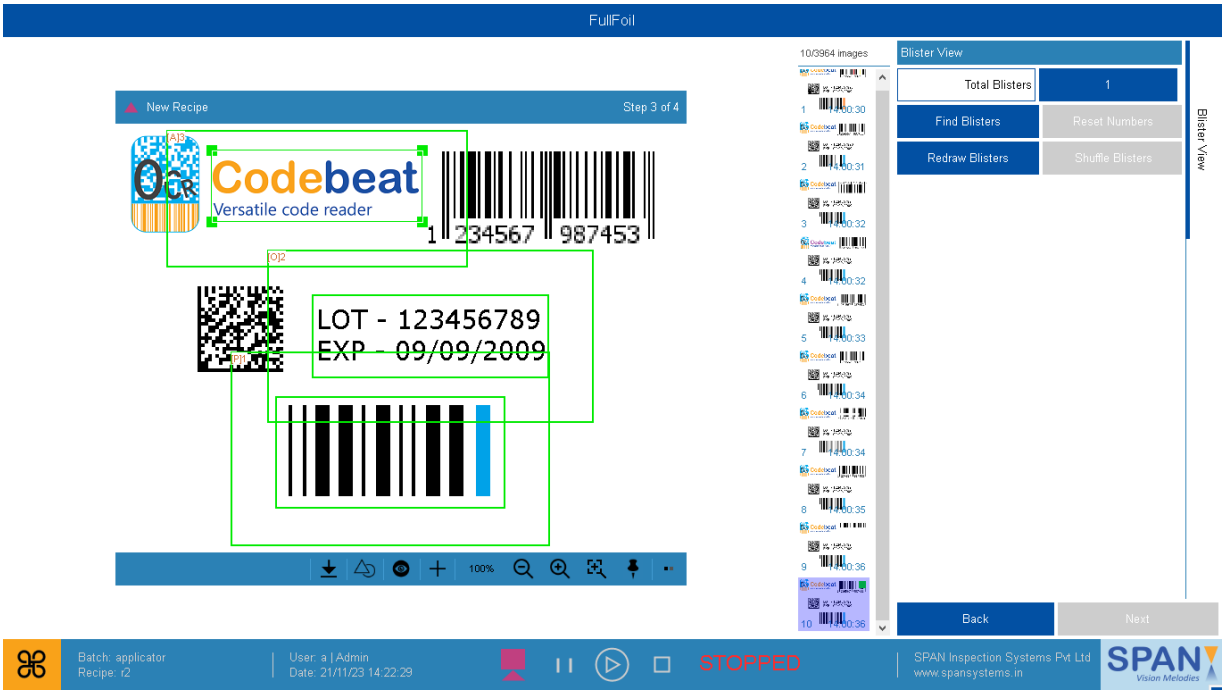
  Artwork: Mismatch (%) tolerance is changed automatically.

  OCR: The character matching (%) tolerance is changed automatically.

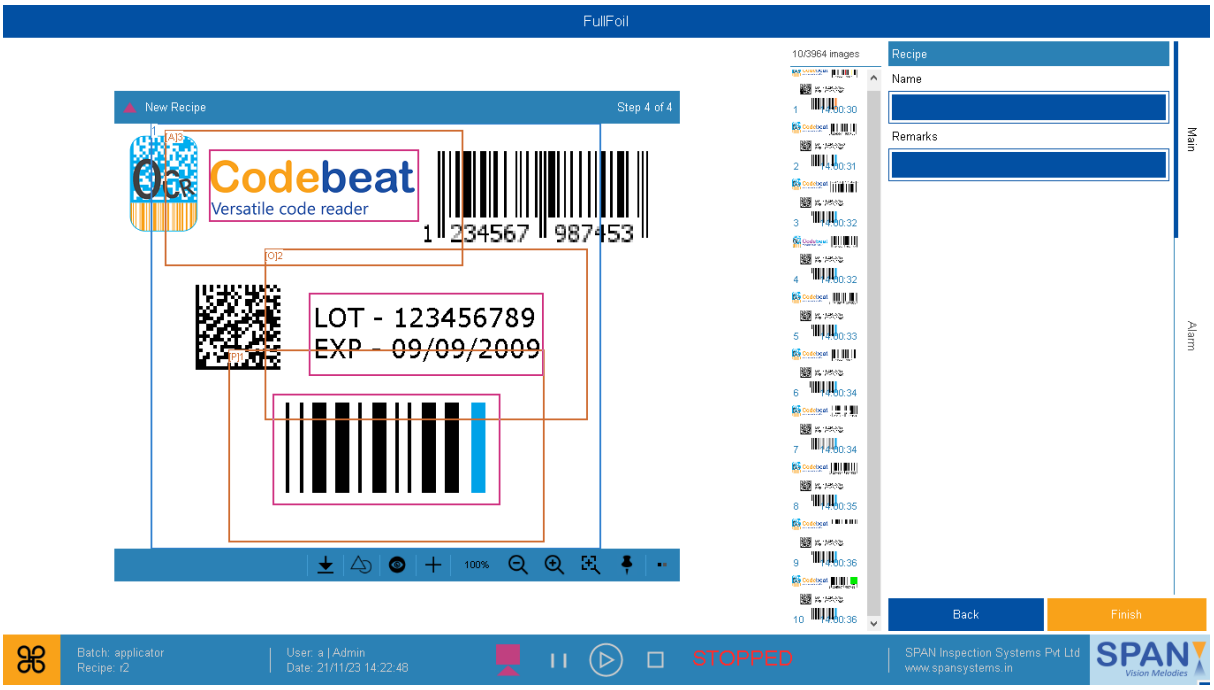
  Pharma code: Extended search(pixel), Length (%) and Color tolerances are changed automatically.
- **Press Next button for navigating to next page.**



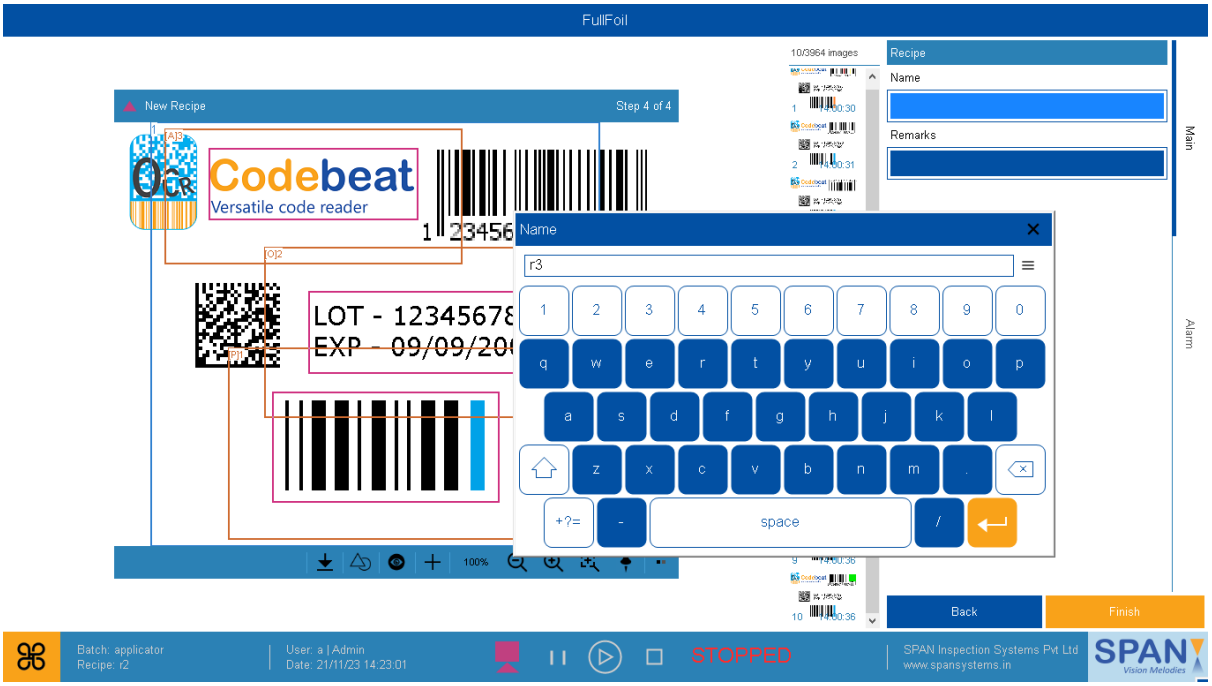
- **Enter the Total number of blisters and click on find blister.**



- **Blister will be found automatically if the number of blisters is 1, but if the number of blisters is more than 1 then user has to manually identify the blisters.**
- **Click on next button to navigate to next page.**



- **Click on name and enter the name of recipe, then click on Finish.**



SCOPEVIEW

INTRODUCTION

In order to meet the constantly increasing and different demands on data analysis and troubleshooting tools in vision inspection systems, SPAN has laid the foundations for the next development steps of its software-based digital oscilloscope - Scope View. It is seamlessly integrated as a part of SPAN vision studio.

The Scope View is responsible for the graphical display of the input and output signals captured from the SPAN PLC system. It can be used for tracking and monitoring processes over a longer period of time. After stopping the recording, it is possible to save the current data in a .svd file for later offline analysis.

Scope view can be also useful for the analysis and troubleshooting of various machine inputs particularly suitable for the commissioning of machines. User can connect their machine sensors or other inputs to SPAN PLC input module and with the analysis tools provided the user can, for example, optimize drive parameters based on a recording or get a quick overview of the current status of the machine.

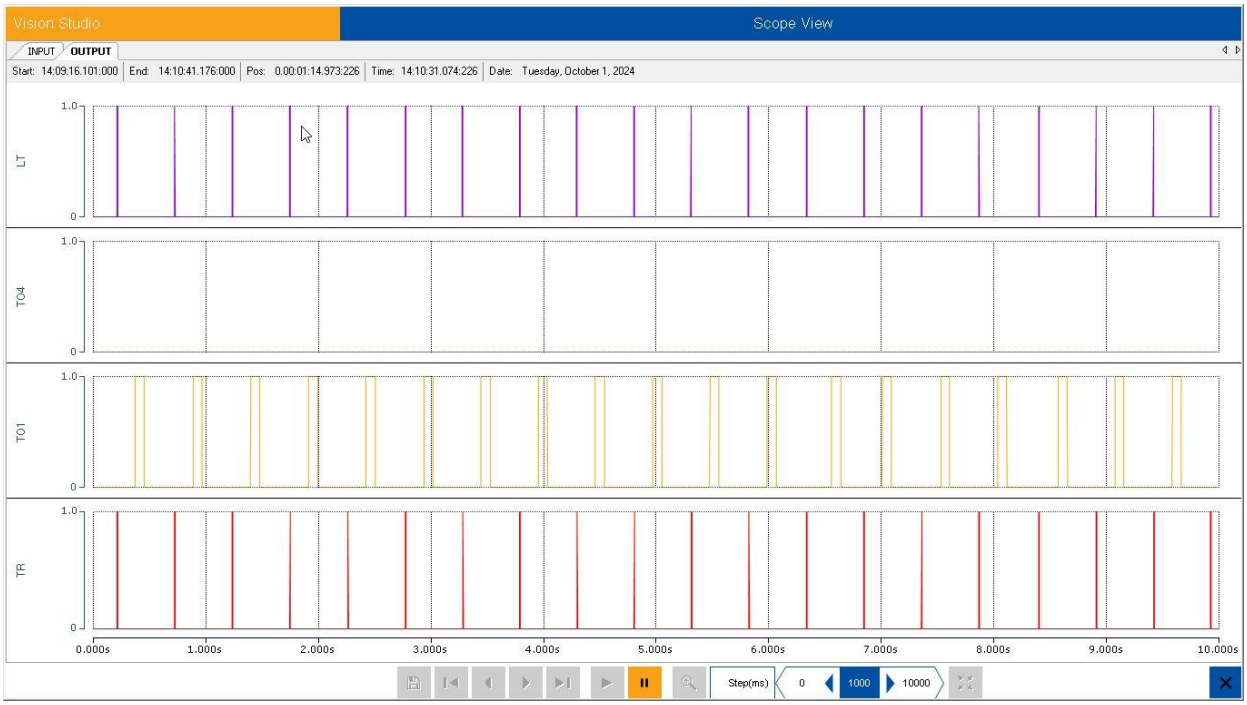
Architecture

YT Chart: They are the actual display area in the view and provide the time base. Each chart has its toolbar for changing the display.

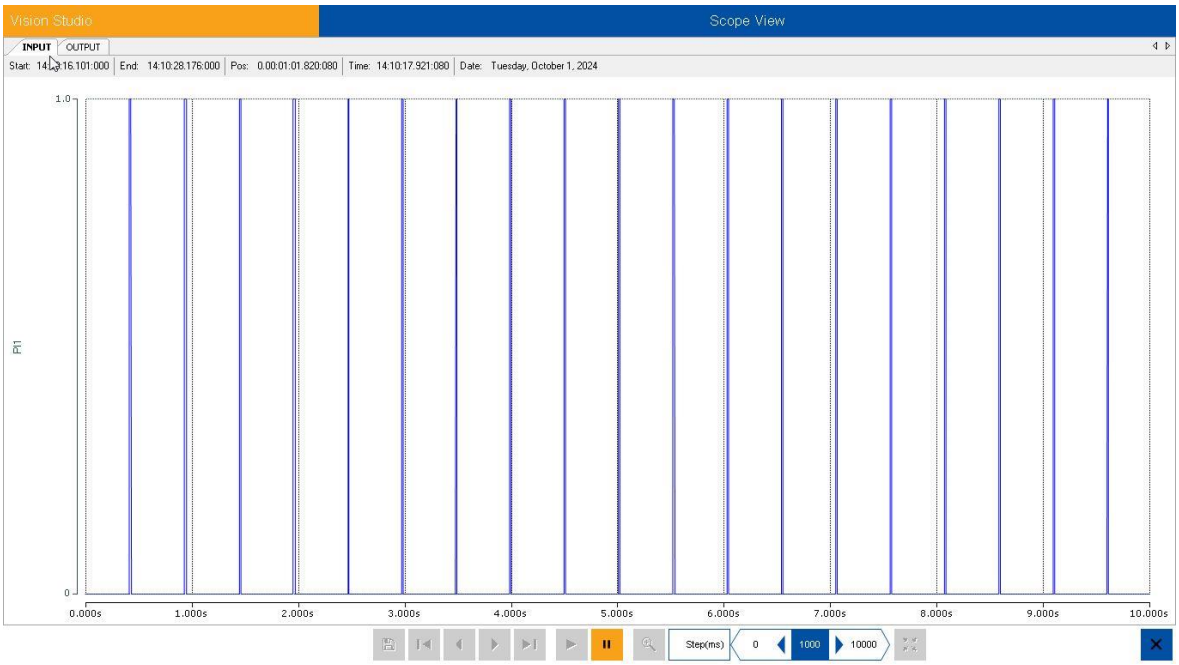
Axis: An YT chart can feature several axes. An axis provides the range of values for the connected input/output channels.

Channel: It highlights the respective signals in the chart.

Running Inspection View:

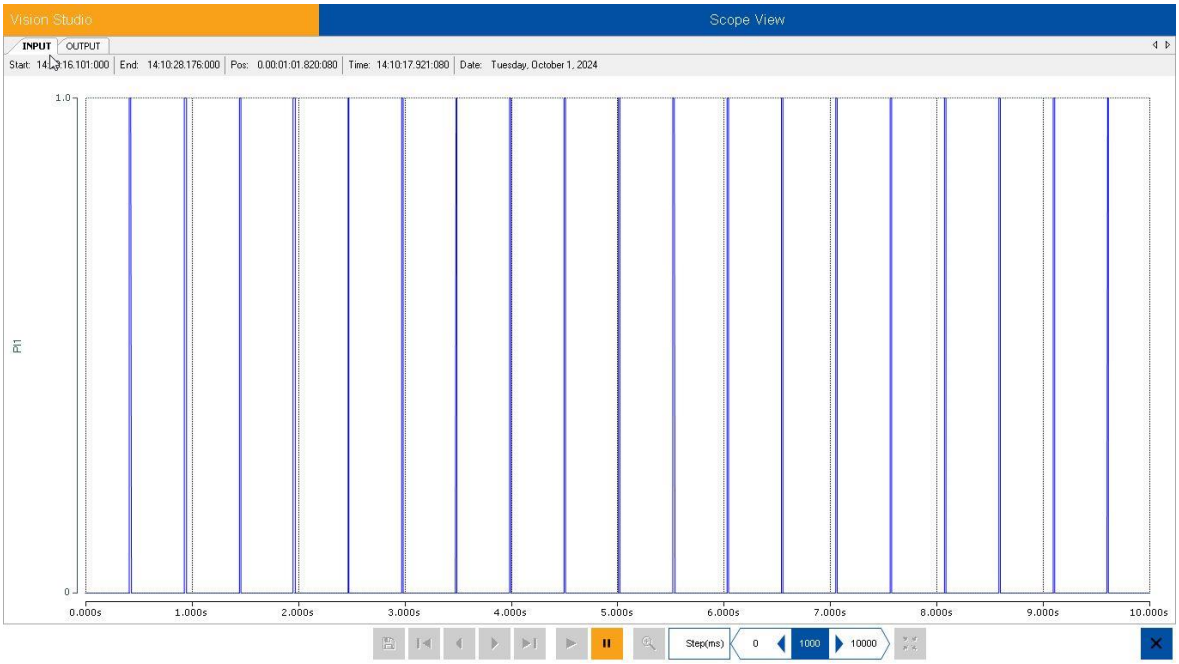


Inspection Cycle: A real-time graphical plot of inspection cycle for each connected cameras with SPAN Vision Studio during running machine. It depicts the digital trapezoidal waveform for input received for camera trigger, camera trigger and light on output and inspection processing complete output.



- **Inspection Cycle: An YT chart, displaying the real-time graphical view of the digital signals captured form the SPAN PLC system during running inspection.**
- **Input Axis: Displaying the received input signal for camera trigger.**
- **Output Axis: Displaying the camera trigger and light on output signals after receiving the input.**
- **Output Axis: Displaying the inspection process complete output for the current input and it is an end of an inspection cycle.**

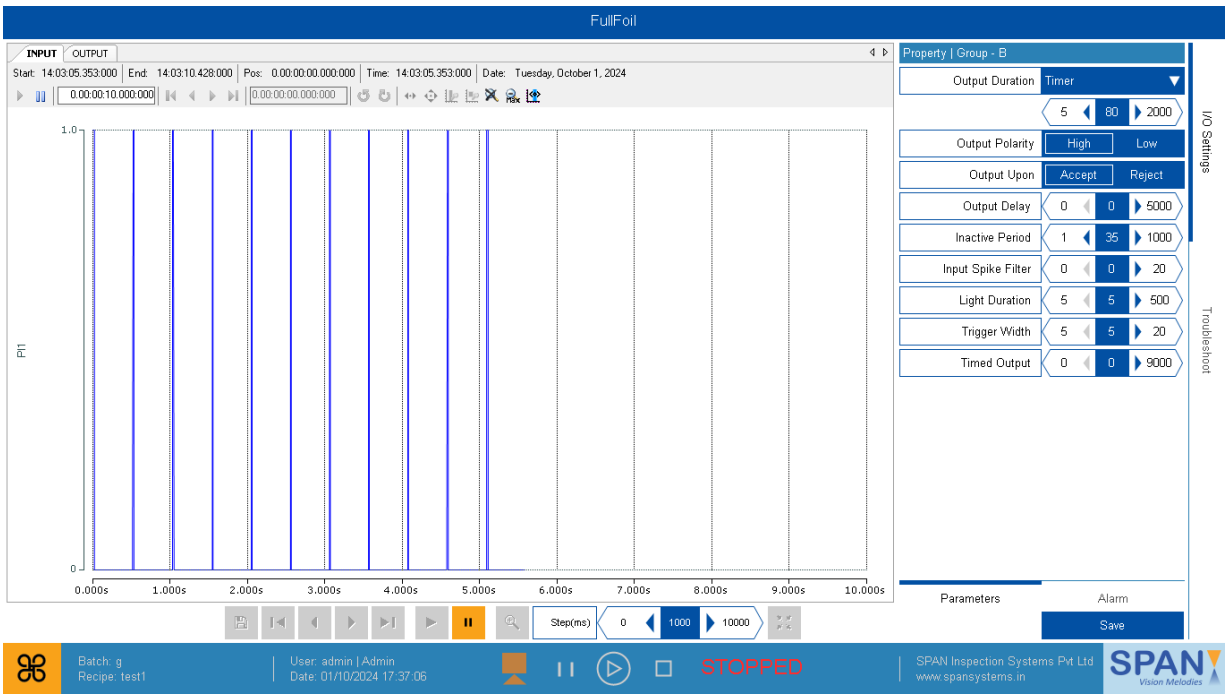
Input:



- **Input: An YT chart, displaying the real-time graphical view of the digital input signals captured form the SPAN PLC system during running inspection.**

- **Input Axes: Displaying the input signals received on input pin no 1 and 2 in SPAN PLC input module.**

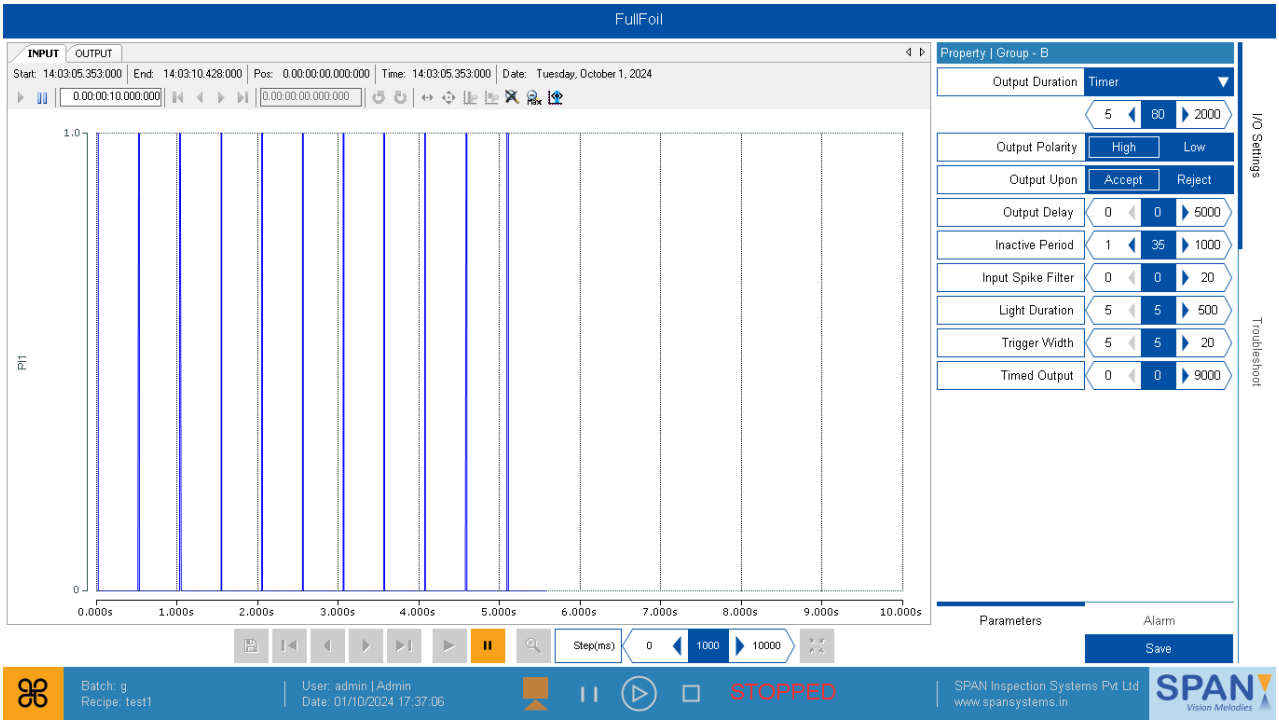
Troubleshoot View:



SPAN Vision Studio input/output troubleshoot module is also integrated with scope view. So user does not require other electronic tools like Multimeter in order to validate SPAN vision systems input and output.

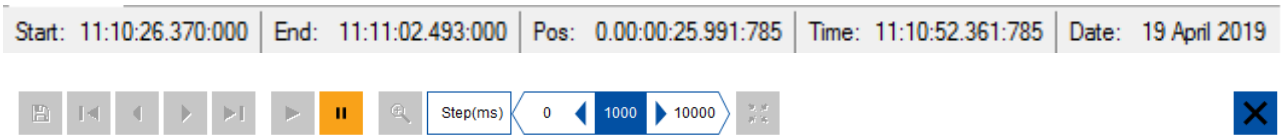
In troubleshoot mode, scope view graphically displays all the digital input and output signals as well as light, trigger, EM (machine interlock signal) and hooter signals.

Troubleshoot Input View:



Troubleshoot Output View:

Scope View Toolbar:



• Play: Starts the live display mode. The data currently being accumulated are displayed.

• Pause: The display switches to the pause mode. You can now navigate in the data already recorded without stopping the recording.

• Display-Width: The current display width is displayed here. It can be edited in the format "hh:mm:ss.fff". The zoom function works down to the µs range. Alternatively, the display width can be changed by turning the mouse wheel in the selected chart window. The changed value is adopted automatically.

• Scroll buttons: The outer scroll buttons move the current display in steps that correspond to the display width. The inner scroll keys move the display only by a tenth of the display width and can be kept pressed to view the data set.

• Position: Shows the position. It can be edited in the format "hh:mm:ss.fff". The colons are used as separators. If not, all units are edited the format is sorted in ascending order, starting with seconds.

• Undo/Redo Time/Position: This option can be used to undo step changes in the display width or the current position, irrespective of how they were made (e.g. zoom, scroll, etc.). The right mouse button is likewise assigned this function. Once undone, values can be repeated with redo.

• Panning Horizontal: In the horizontal panning mode the current display can be shifted along the x-axis by clicking and dragging with the mouse.

• Panning Free: In the free panning mode the current display can be shifted along the x and y-axis by clicking and dragging with the mouse.

• Zoom Horizontal: A new time range for the display can be selected by stretching a rectangle over the x-axis.

• Zoom Free: You can zoom into the current display by stretching a rectangle over the graphic area.

• Rescale All: Carries out an auto scale on all axes. The x-axis is/axes are set to the default display time.

• Zoom Out Max: Scales the x-axis in such a way that all current values in the recording appear in the display.

• Overview Chart: The Overview Chart option activates a chart display. The signal range currently shown in the main chart is highlighted in the Overview Chart. The Overview Chart also offers an absolute time axis for the whole recording time.

By turning the mouse wheel, you can also zoom in or out on the current display. The cursor position of the mouse determines the center.

The current recording times are displayed in the chart toolbar:

• Start-Time: The common starting point of the recordings of all connected channels. The start time defines the zero point of the recording.

• End-Time: The largest common time of all connected channels. The end time thus marks the final value of the recording. The difference between the end time and start time is maximally as large as the defined record time.

• Position time: The position time represents the zero point of the current chart, i.e. the time from the start time to the beginning of the display.

• Time: The absolute time at the origin of the chart.

• Date: The absolute date at the origin of the chart.

SPAN STANDARD ALARMS

1	SERIAL NUMBER <<>> CAMERA IS NOT DETECTED BY THE SYSTEM	Communication between camera and IPC is lost.	Machine stops normally.	Remove Communication cable between Camera & IPC and check the alarm.
2	UNABLE TO CONNECT WITH SPAN IO CONTROLLER	Communication between camera I/O controller and IPC is lost.	Machine stops normally.	Remove Communication cable between Camera I/O controller & IPC and check the alarm.
3	GOOD PRODUCTION LIMIT REACHED	Good Production limit Reached.	Machine stops normally.	Set Good Production Count limit on HMI.
4	CONSECUTIVE FAULT LIMIT REACHED	Consecutive Fault Limit Reached.	Machine stops normally.	Set Good Production Count limit on HMI.