

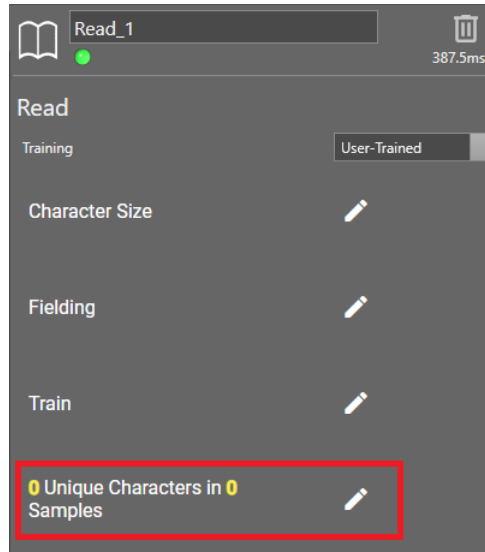
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1. ELRead Overview

The *ViDiELRead* tool enables automatic recognition of text, including letters, numbers, and symbols, from images or live camera feeds.

As a new feature included in the ISVS v25.3, the option of Unique Character in Sample shows the number of trained characters and source images, and the confidence level of the tool, in a given character. The lower the percentage is, the less likely that a result is correct.

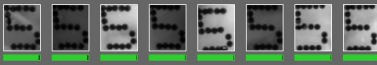
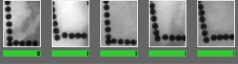


With this new characteristic you can see the percentage by hovering over the colored line under the character. The color also shows the confidence level:

- **Green:** high certainty
- **Yellow:** medium certainty
- **Red:** low certainty

You can sort the trained data either by character or image:

A screenshot of the ViDi ELRead software interface showing the 'By Character' view. The header indicates '5 Samples - 18 Character Classes - 146 Characters'. There are two tabs: 'By Character' (selected) and 'By Image'. Below the tabs is a search bar. The main area is a table with three columns: 'Class Name', 'Labeled Characters', and 'Count'. The table contains three rows of data.

Class Name	Labeled Characters	Count
6		10
5		8
L		5

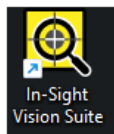
You can jump to retraining a certain character by left-clicking its image under **By Character** view, or you can retrain all characters on one image by clicking the edit icon next to the appropriate row in **By Image** view.

You can also search for a specific character by typing it in the search bar under both views. The tool differentiates between upper-case and lower-case letters.

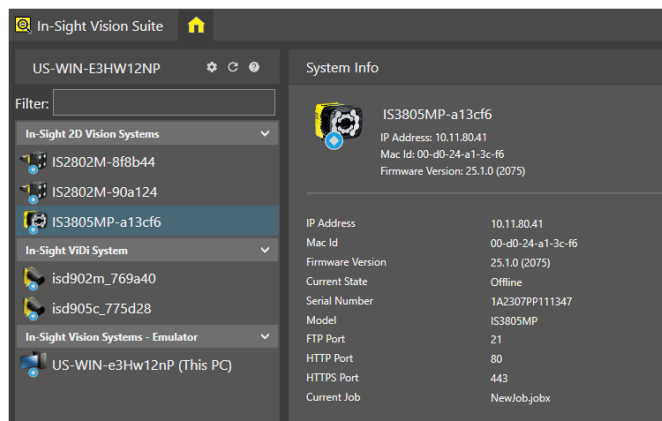
You can also delete samples by checking the box next to the appropriate row and clicking **Delete Samples**.

2. Programming Mode Selection

1. Open the ISVS software.



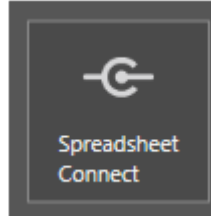
2. From the list of devices, you must select the equipment you want to access and program.



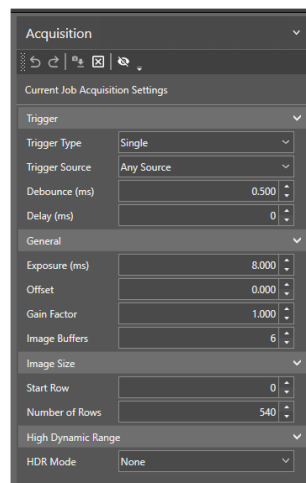
3. Choose the programming mode, Easy Builder or Spreadsheet.

3. Spreadsheet

1. Click the **Spreadsheet Connect** button that appears below the name and properties of the selected camera.



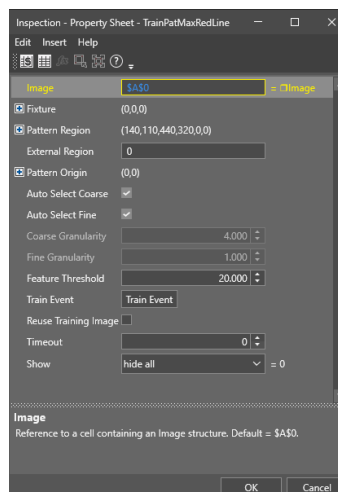
2. Adjust the focus and brightness of the image using the properties on the **Acquisition Tab**.



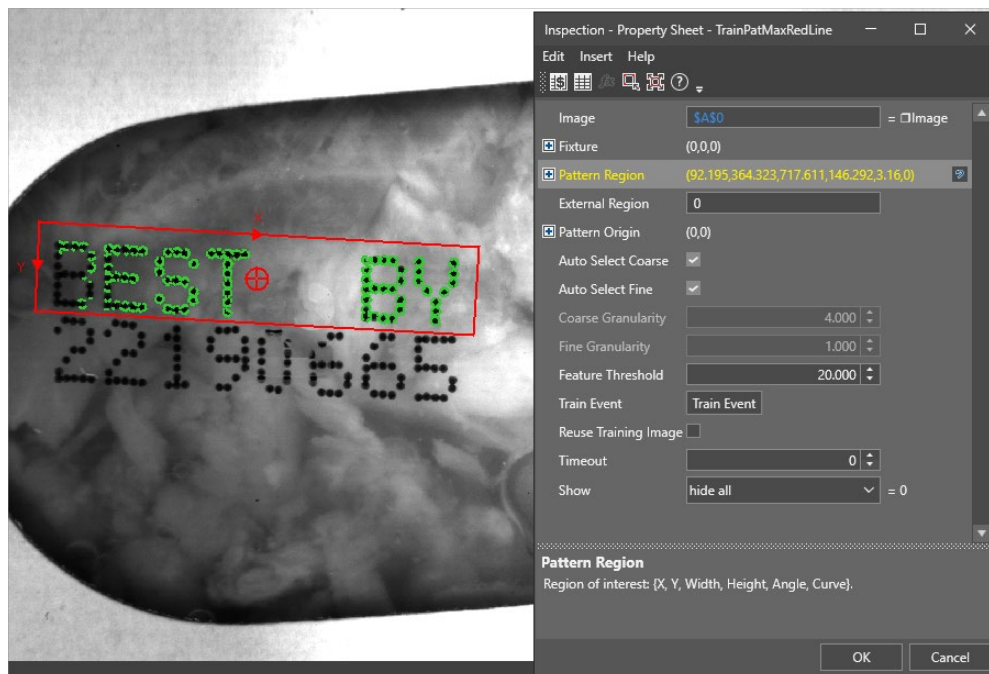
Localization

It is recommended to place a locating tool so that when the part moves, so does the ROI of the reading and/or inspection tools. Localization can be done through PatMax vision tool. It is worth mentioning that localization is not always required – it depends on the application and image of the object. Similarly, the location of the part can be by means of some other tool that allows obtaining X, Y coordinates in the image.

1. In an available cell, place the **TrainPatMaxRedLine** tool.



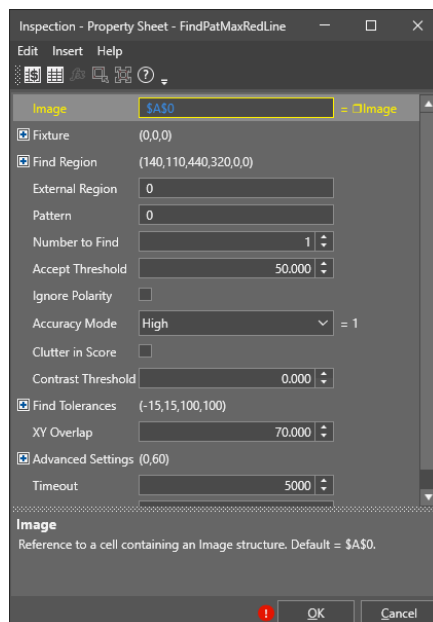
- Double-click on the word PatternRegion to be able to access the ROI edit. Select a representative object of the part in the image or you can select part of the text that does not change. Press **Enter** to perform the training.



- Click **OK** button in the tool properties window. You must return to the spreadsheet view and observe the tool in the cell.



- In another cell, place the **FindPatMaxRedLine** tool.



5. In the Pattern property, enter the cell that was previously placed by the **TrainPatMaxRedLine** tool.



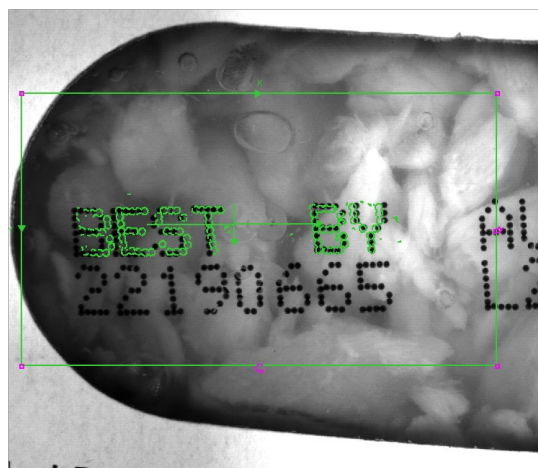
6. Double click on the **FindRegion** property to be able to access edit the ROI where you should look for the trained pattern. The size will depend on the movement of the part.



7. To accept the ROI, press **Enter**. You must return to the tool properties of **FindPatMaxRedLine**.
8. Click **OK** in the **FindPatMaxRedLine** properties window. You must be able to display cells with pattern location values.

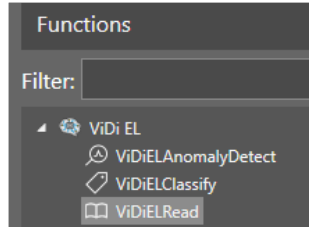
☐ Patterns	1.000							
	Index	X	Y	Angle	Scale	Score		
☐ Patterns	0.000	446.420	457.127	-0.002	100.000	96.070		

9. Check that the location tool performs the task properly. When moving the piece in front of the camera and taking different photos, you should see how the tool locates a cross on the found object.

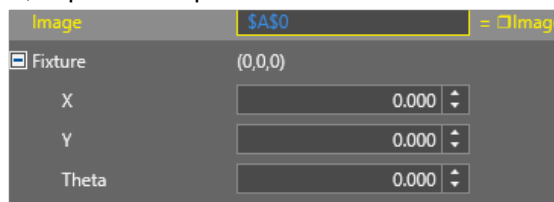


Add ViDiEL Read Tool

1. In an available cell, place the **ViDiELRead** tool.



2. In the window properties, expand the options of **Fixture**.



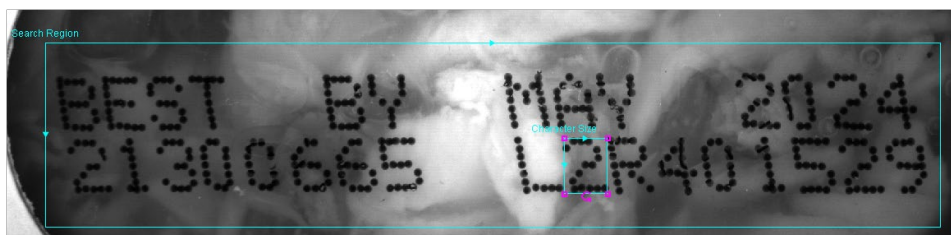
3. Double-click the X property to access the spreadsheet.
4. Select the numeric values of X, Y, and Angle provided by the **FindPatMaxRedLine** tool.

		Index	X	Y	Angle	Scale	Score	
	Patterns	0.000	446.420	457.127	-0.002	100.000	96.070	

5. Press Enter to return to the **ViDiELRead** properties. You should note that the values of X, Y, and Angle are related to the cells with the numeric values of the pattern.



6. Double click on the Region property to select the ROI.
7. Click on the **Read** tool. Two rectangles should appear on the screen: one for **Search Region** and one for **Character Size**.
8. Resize them and reposition them on the area of the image where there is the text you want to Read and the region where said text should be displayed and click **OK**.



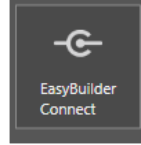
9. Because the tool naturally uses the **Pre-Trained** mode, as soon as the tool is placed, it will try to read the text in the **Search** region. If there is any element that does not correspond, then it's necessary to perform manual training of the tool.
10. To perform manual training, the Training Mode must be changed to **User-Trained**.



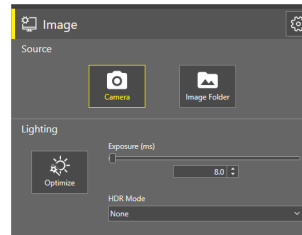
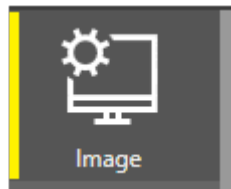
11. Go to the Training section ViDiELRead Tool (Section 4 of this guide).

4. EasyBuilder

1. Click on the **EasyBuilder** button that appears below the name and properties of the selected camera.



2. Adjust the focus and brightness of the image of the part to be inspected.



3. Switch to the inspection step.



Localization

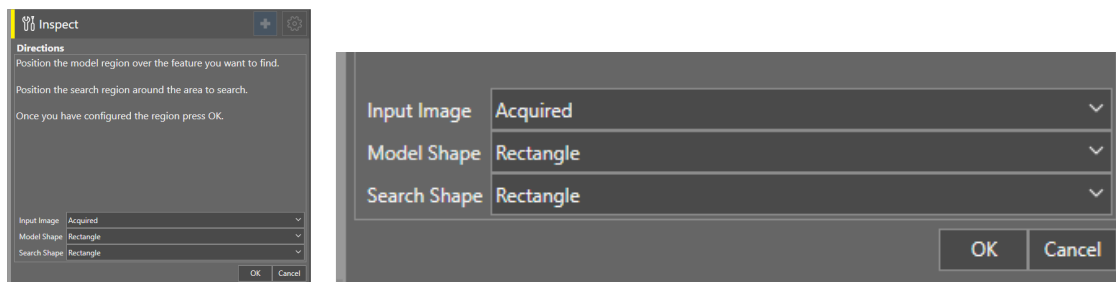
1. It is recommended to place a locating tool so that when the part moves, so does the ROI of the reading and/or inspection tools. Localization can be done through FindPattern. It is worth mentioning that localization is not always required. It depends on the application and image of the object. In the same way, the location of the part can be by means of some other tool that allows obtaining X, Y coordinates in the image.



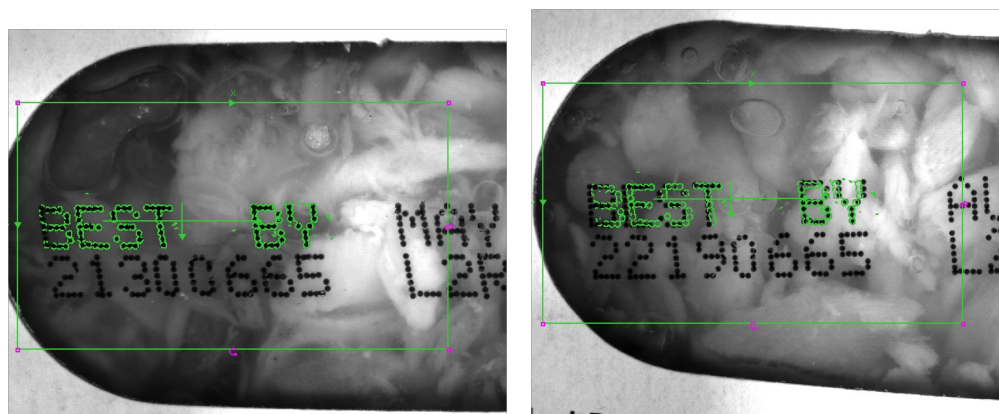
2. Place the **Model Region** on the figure that will serve as a reference for the position of the part. With **Search Region**, indicate the ROI of where the trained model in the photo can be searched. The object to be trained can be part of the text (something that does not change between pieces) or it can be some other distinctive element in the part.



3. If necessary, you can change the shapes of the Model and Search region as appropriate. Click **OK** when you are finished making adjustments in the Find Pattern tool.

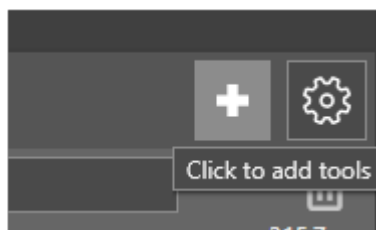


4. Check that the location tool performs the task properly, when moving the piece in front of the camera and taking different photos you should see how the tool locates a cross on the found object.



Add ViDiEL Read Tool

1. Click to add Tools.



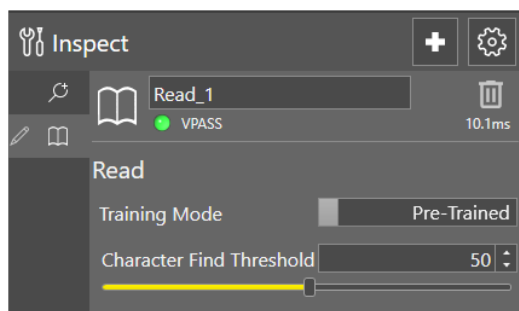
2. Find the ViDi EL tools group and open the group to view the available tools.



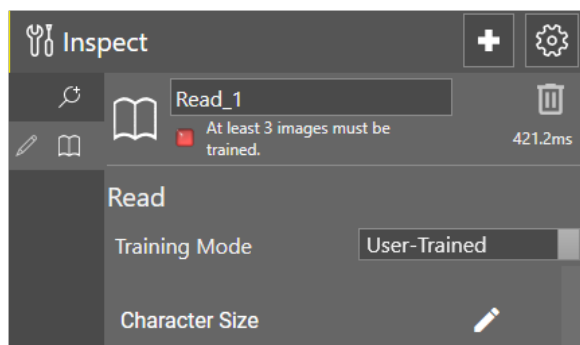
3. Press on the **Read** tool. Two rectangles should appear on the screen: one for **Search Region** and one for **Character Size**.
4. Resize them and reposition them on the area of the image where there is the text you want to Read and the region where the text should appear.
5. Click **OK**.



6. Because the tool naturally uses the **Pre-Trained** mode, as soon as the tool is placed, it will try to read the text in the **Search** region. If there is any element that does not correspond, then you must manually train the tool.

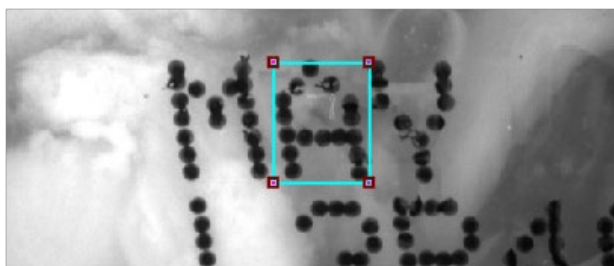


7. To perform manual training, the Training Mode mode must be changed to **User-Trained**.



5. Train ViDi ELRead Tool

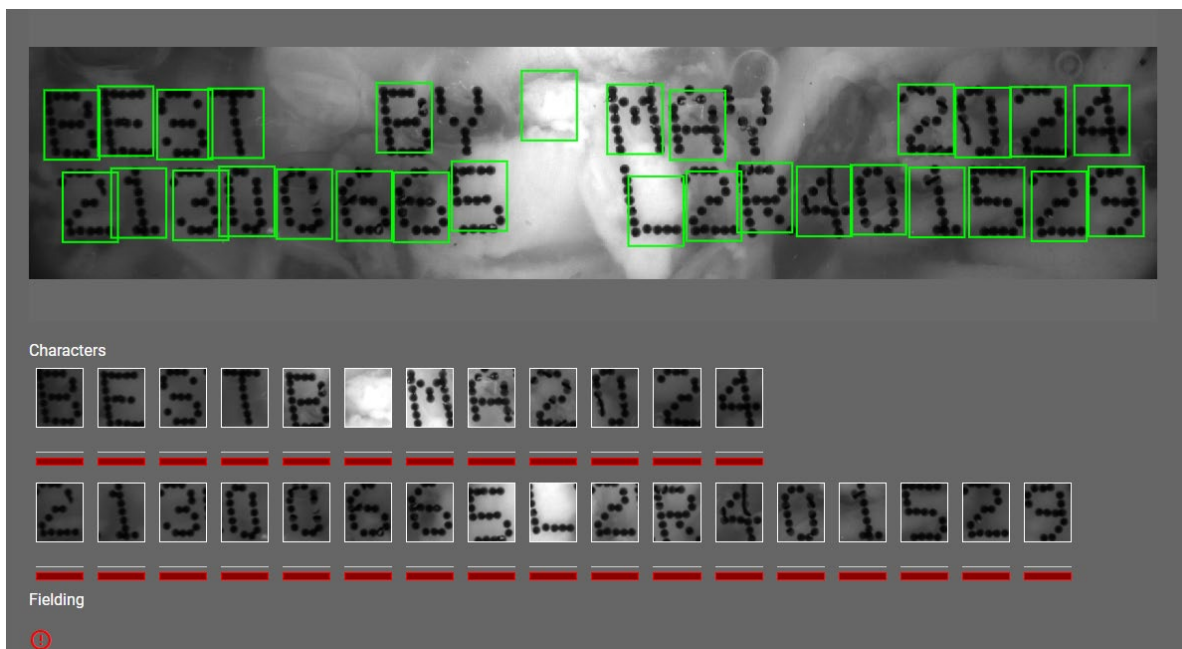
1. Click the pencil icon in front of **Character Size** to display a rectangle in the image and adjust it to the size of a character in the text.



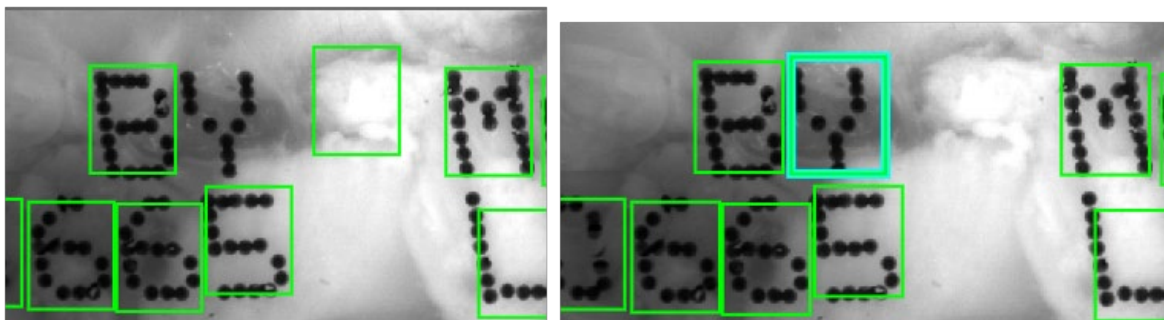
2. Click the check icon to accept the size parameter.



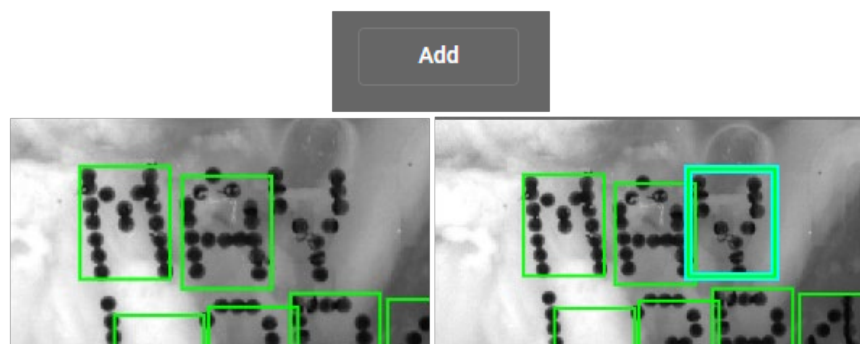
3. Click the pencil icon in front of the **TRAIN** option. If no box is shown in the image, click the **Label** button and make a left mouse click on a letter to be able to add a rectangle where each letter to be trained exists.



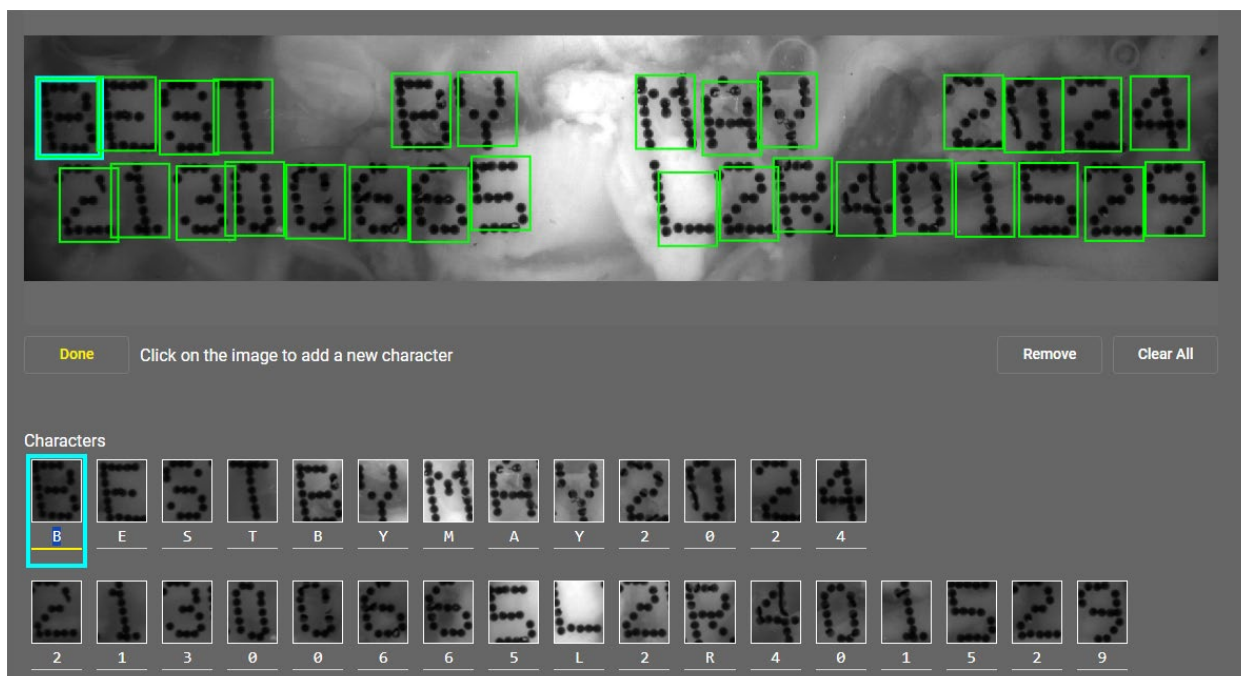
- For each box placed, it is necessary to place the letter or number to which each region corresponds. If necessary, a box can be repositioned in case you have not properly located a particular letter.



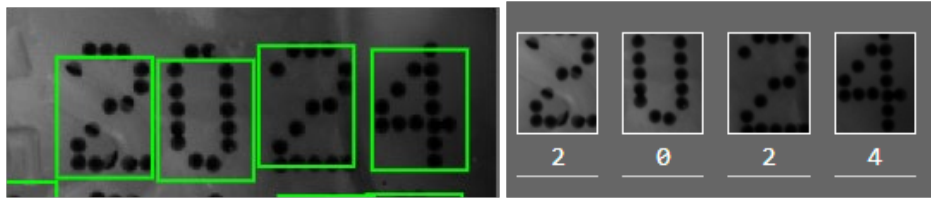
- If a letter has not been identified automatically, it can be added using the **Add** button and click on the center of the missing letter with a box.



- Click **Done** when you finish adding the missing letter boxes.



Note: The system is case sensitive. Sometimes the ROI that defines the character must also be repositioned.

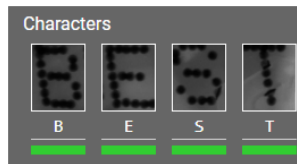


7. Click **Accept All** to add the prompts to the tool's training.

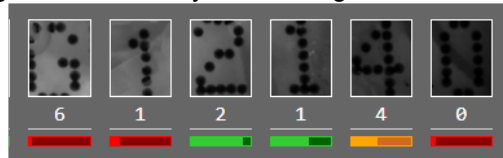


It is important to consider that it is required to train at least three images of each letter or number. It is feasible to perform manual triggers and/or load some other image that is in the filmstrip.

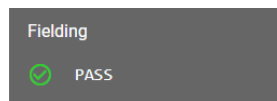
8. When changing the image, boxes will be displayed in the letters/numbers that the system can recognize. Otherwise, the manual labeling procedure must be done again. For each trained image, it is required to place the labels of each of the letters and/or numbers and click **Accept All**.
9. The tool provides visual feedback of the training process for each character via a bar at the bottom of each of the letters.



If for some reason the training has not been completed properly or there is confusion, the displayed bars change between red, yellow, and green.



10. Click **Done** and **Accept All**.
11. Repeat the manual labeling procedure until the acceptance icon appears under Fielding.



12. Click the check icon on **Train**.



6. Train Unique Character in ViDi ELRead Tool

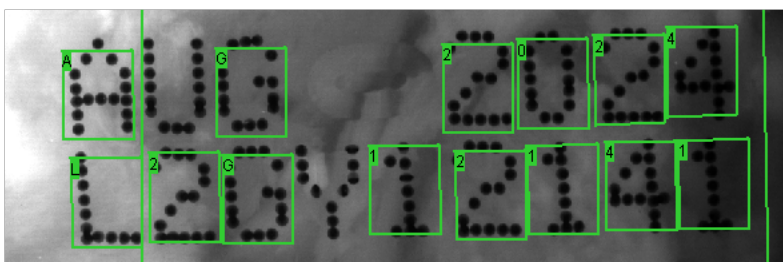
During the training process, information is displayed on the number of characters trained and the number of images used.

18 Unique Characters in 5
Samples



Sometimes omissions can be made or it is necessary to make changes to a character and you must perform the following procedure.

1. Click the pencil icon on the Unique Character option. For example, in our case, it was omitted to add a "Y" and "U".



When accessing the single training, you can view the table of each of the trained characters and their result through the colored bar below each letter or number.

2. There are two ways to perform the training.

By Character

By Image

- **By Character:** Double-clicking on any of the images of a character.
- **By Image:** You can see the image used and each of the trained characters.

By Character

5 Samples - 18 Character Classes - 146 Characters

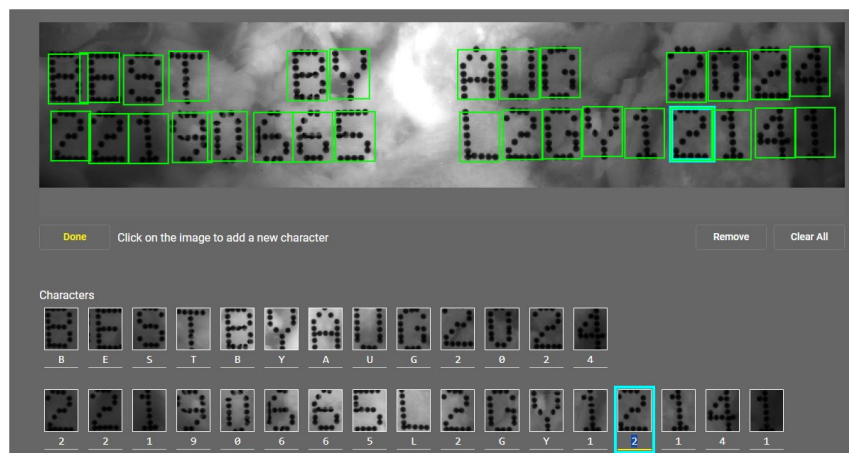
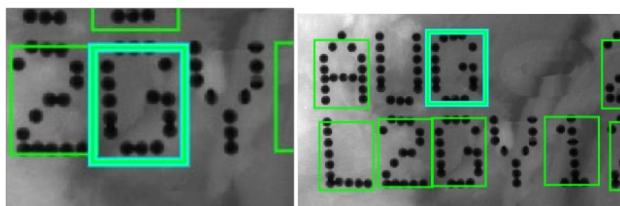
By Character By Image

Search

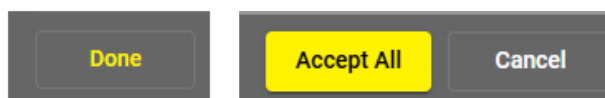
Class Name	Labeled Characters	Count
6		10
5		8
L		5
R		3
9		3
G		4

- When you click on an image of the letter, it is directed to the image that was used as a reference for the training.

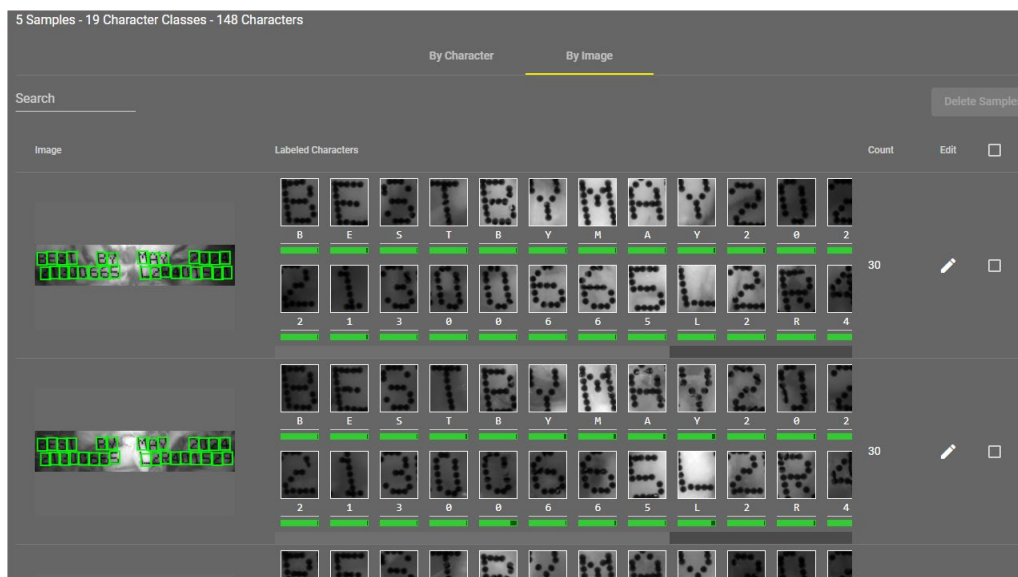
It is important to review the letters with a red and/or yellow bar to define if it is necessary to reposition the ROI. It is common that it has not been placed in the appropriate region and is cropping the image of the letter.



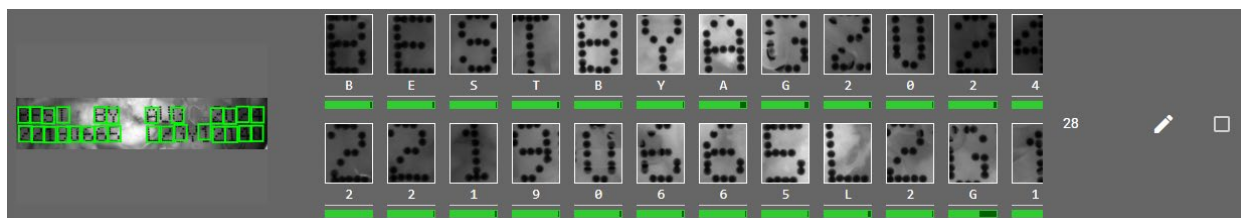
- Check that each of the characters are not cut out in the boxes where the name is placed.
- Click **Done** and **Accept All** to end training.



By Image



1. View each of the trained images and determine if you need to add and/or modify any trained character, for example, in the following image you need to add a letter "Y" and a "U".



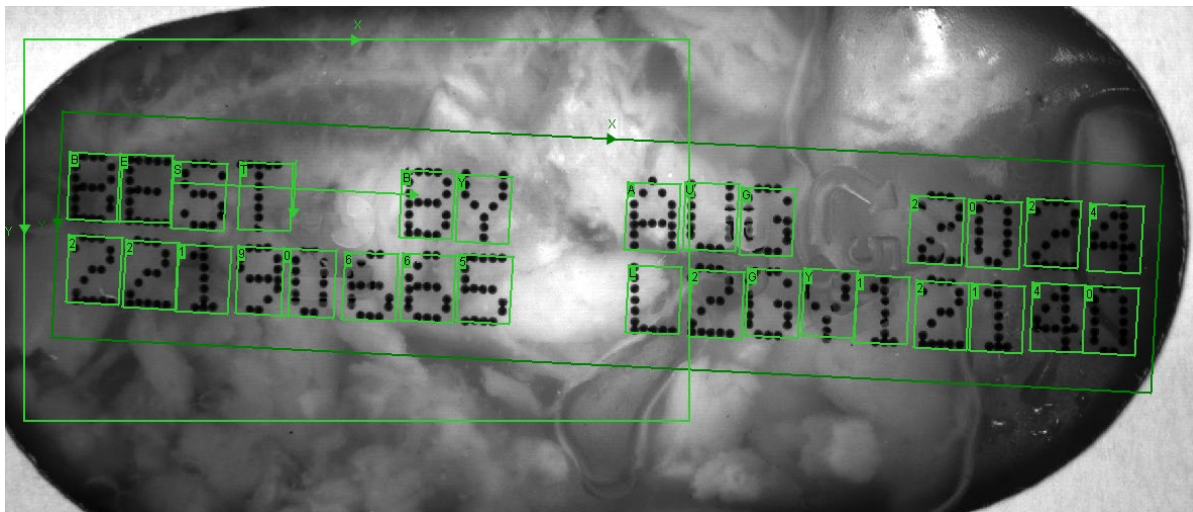
2. Click the pencil icon to access that image and make the relevant changes as if you were doing the regular workout.



3. Make the changes and click **Accept All**.

Check operation

Lastly, check the operation of the tool, change parts, send triggers, or change the photo of the filmstrip.



Example of results displayed on Spreadsheet:

☐ Patterns	1.000							
	Index	X	Y	Angle	Scale	Score		
☐ Patterns	0.000	405.998	562.037	-1.469	99.688	36.633		
	String	Passed	Index	Char	Score	2nd Char	2nd Score	
☐ ViDiELRead	BESTBYAUG2024 22190665L2GY12139	1.000	0.000	B	99.649	R	0.002	

Example of results displayed on EasyBuilder:

