

Onsight Computer Vision & IoT User Guide

Copyright

Onsight Workspace User Guide

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1. OVERVIEW



Computer Vision (CV) Custom Links enable Onsight Connect to open a browser or external application based on detected objects within an image. For example, a user analyzes an image in Onsight Connect and a piece of equipment is detected and tagged in the image. The user will select the tagged equipment object in the image to open a browser with a schematic or documentation page from your website. Alternatively, you can use your custom application to be launched with the equipment part number as a parameter to start an inspection workflow.

1.1. Introduction

This guide describes **Computer Vision** services on the Onsight Platform. When a user logs into **Onsight Connect** with **Computer Vision** (CV) enabled they can capture content and tag it using **Optical Character Recognition** (OCR), **Object Classification** and **Object Detection**. OCR capabilities have been extended to recognize barcodes and QR codes and include the capability to use regular expressions using Regex to process text for pattern matching, recognition and validation. Internet of Things (IoT) services can assign IoT asset properties to images using tags and display real-time IoT aggregate data as a visualization in the viewer.

1.2. Onsight Platform Manager Setup



Onsight Platform Manager (OPM) Setup requires Artificial Intelligence (AI) Settings, Computer Vision Adaptable Programmable Interface (API) parameters and **Client Policy** settings to function. You will need:

- 1. A Computer Vision license
- 2. Al Settings for Computer Vision API that include an Endpoint and the necessary Parameters.
- 3. Client Policy must be enabled and set to include the appropriate values for :
 - CV Document Link URL
 - Document Link URL for OCR, barcodes, and QR codes



Note: The **CV Document Link URL** field is required to support all computer vision functions. The **Document Link URL for OCR, barcodes, and QR codes** field is necessary to support document linking for OCR, QR and barcode scanning.

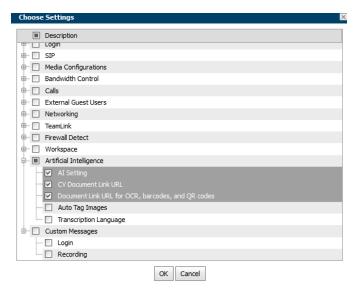
Related information

Enabling Onsight Platform Manager Settings & Client Policy (on page 6)

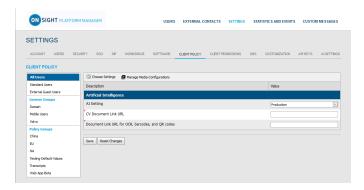
1.2.1. Enabling Onsight Platform Manager Settings & Client Policy

In this task, you enable and setup **Computer Vision** for your organization.

- 1. Login to OPM Administrator portal.
- 2. Navigate to **Settings** > **Client Policy**.
- 3. Click the **Choose Settings** icon. The **Choose Settings** window appears.



4. Locate and expand the **Artificial Intelligence** category and enable the **AI Setting**, **Document Link URL for OCR, barcodes**, and **QR codes**, and **CV Document Link URL** check boxes and click **OK**.



- 5. Select an **AI Setting** from the drop-down menu.
- 6. Locate the **CV Document Link URL** settings and enter the URL that will be used for processing document links. You can choose to add the tag { {doc} } at any point in the URL. The {{doc}} portion of the URL will be replaced with the name of the detected object. For example,
 - a. Set the CV Document Link URL to https://acme.portal.com?item= $\{\{doc\}\}$.
 - **Tip:** When Onsight Connect user performs image analysis on an image of a steam powered train, within the image a **SteamEngine** object is detected, and a titled bounding box is drawn around the SteamEngine.
 - b. When the Onsight Connect user taps the **SteamEngine** object in the image. The **CV Document Link URL {{doc}}** tag is replaced with SteamEngine and a browser is opened to https://acme.portal.com?item=SteamEngine.
 - **Note:** If the {{doc}} tag is omitted, the detected object will instead be appended to the end of the URL.

- 7. Enter information within the **Document Link URL for OCR, barcodes, and QR codes** field and include the option to use a regular expression using **Regex** language as necessary.
- 8. Click **Save** on the **Client Policy** page.



Note: Custom Links will not work if **Local Privacy Mode** is enabled for your domain, group or user account.

This completes the procedure.

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2. COMPUTER VISION TAGGING



Figure 2-1 Image Properties

Computer Vision is applied to Onsight images to generate a list of tags. The tags are saved to an image and are displayed as part of

the image properties within the Onsight application and Workspace (if enabled). Click the **Information** icon to display image properties. Tags are searchable within Workspace.

Related information

FILE PROPERTIES (on page 21)

2.1. Create the Tag List

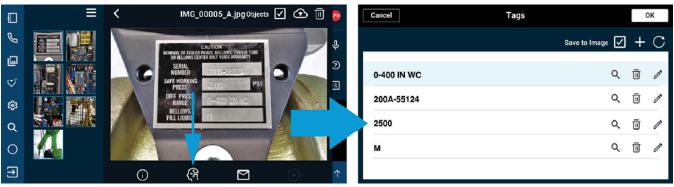


Figure 2-2 Tags List

Select an image and the click the **Computer Vision** icon to generate the tags list. The first time you display the tags list, two types of tags will be displayed:

- OCR Tags (Text that was read) or
- Object Tags (Objects that were identified in the image).



Note: The tags in the list are text that was read or objects that were detected within the image using Computer Vision (CV).

2.2. Manage the Tag List

Consider that:

- OCR Tags are text read from characters in the images. E.g., A label that reads "200A-55124" is read in the image and an OCR Tag with the text "200A-55124" is created.
- **Object Tags** identify objects that were detected in the image and are identified in the list by having a percentage of certainty below the Tag. If the object's location can be detected, then the object will be outlined by a bounding box that includes the object's title. E.g., A pump is located in the image, it is identified and its location is determined. An Object Tag: "Pump" is created in the list. When viewing the image, a bounding box will be placed around the pump with the title, "Pump".



Figure 2-3 Tags List

• Click **OK** to exit and save the tags to the image.



Note:

- 1. By default, tags that are in the list will be added to the image when you click **OK**.
- 2. Delete any tags you do not wish to save in the image prior to clicking **OK**. If you do not want to save any tags, then deselect **Save to Image** check box before clicking **OK** or click **Cancel**.
- 3. Previously edited tags will not be deleted when saving a refreshed list of tags. Please review the results to avoid duplication.

Tags that have been saved to an image will be displayed on the **Properties** page for that image. Click the **Information** icon to display the tags. Refer to FILE PROPERTIES (on page 21) for more information.

2.3. Edit the Tag List

To edit \underline{an} existing tag list, select an image and click the ${f Computer}$

Vision icon. The tags will display as one of two types:

- 1. OCR Tag (Text that was read).
- 2. **Object Tag** (an object that was identified) in the image.

The tags that display within the list were previously saved within the image and were created using **Computer Vision** (CV).



Figure 2-4 Tags List

Tag edit functions include:

- Manually **Add** , **Edit** , or **Delete** tags within the list.
- Click the **Refresh** icon to update your tag list.
- Click **OK** to exit and save the updated tags to the image.



- 1. By default, tags that are in the list will be added to the image when you click **OK**.
- 2. Delete any tags you do not wish to save in the image prior to clicking **OK**. If you do not want to save any tags, then deselect **Save to Image** check box before clicking **OK** or click **Cancel**.
- 3. Previously edited tags will not be deleted when saving a refreshed list of tags. Please review the results to avoid duplication.

2.4. Update the Tag List

If you want to update the tags list, you can apply CV to the image again by clicking the **Refresh** icon.

The list will be updated with the original list of tags. Clicking **OK** will merge your new tags with the original tags attached to the image. If the **Workspace** option is enabled for your profile, the updated tags list will be uploaded to **Workspace**.



Figure 2-5 Tags List

Tag update functions include:

- Click the **Refresh** icon to update the tag list.
- Manually **Add** , **Edit** , or **Delete** tags within the list.
- Click the Refresh icon within the list. You can also search tags for IoT assets.
- Click OK to exit and save the tags to the image. This will merge the tags with any previously saved tags.
- Click **Cancel** to exit without saving your changes.

2.5. Workspace - Refreshing the Tag List

When **Onsight Workspace** is enabled for your profile, refreshing the tags list for an image will automatically upload the changes to Workspace. These changes are saved to Workspace as a working copy of the original image. Login to Workspace and preview an image. Click or tap the **Version** drop-down menu and select **Create Version** to save the updated image with the new tags list. The original image with the original tags is preserved. E.g., The original image is **v1.0**, the updated image with the new tags will be saved as **v1.1**.

- Within Onsight Connect, you can click the Refresh licon to update the tag list.
- Now, you can further manage the list by deleting, adding or editing tags.
- Click **OK** to exit and save the tags to the image. This
 will merge the tags with any previously saved tags and
 automatically upload the changes to Workspace.

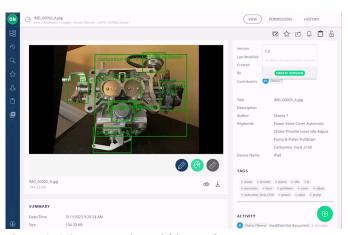


Figure 2-6 Create Version within Workspace



Note: The Workspace option **Auto-upload Media** does not need to be enabled for automatic updates of the image to occur. That feature operates independently i.e., it automatically uploads content to Workspace when a call ends. CV Tagging auto-updates Workspace regardless of how images were initially uploaded, i.e., automatically when a call ended or manually by a user.

3. OBJECTS

Objects are assets with metadata applied. Object metadata can be described as one of two types:

- Object classification
- Object detection

Related information

Object Classification (on page 13)
Object Detection (on page 13)

3.1. Object Classification

Object classification places objects into categories. Once CV has been applied to an image, any objects that were categorized are listed within the **Tags** screen as objects. Object classification enables you to search for objects within categories in your repository. Objects within the tag list will have a **Degree of certainty** listed below represented by a percentage. This indicates the system's confidence in the classification of the object.

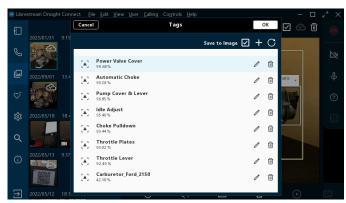


Figure 3-1 Tags List

When you exit the tag list by clicking **OK** the image's keywords will update with the object classifications. E.g., engine.

- From the **Tags** list click **OK** to exit and save the tags to the image.
- Objects that were categorized are added to the image's **Properties** as keywords.



Note: When you click **Cancel** to exit without saving your changes, the object keywords will not be added to the image properties.

3.2. Object Detection

Object detection identifies the location of objects within an image. Once CV has been applied to an image, any objects that were identified will have **Bounding Boxes** drawn around them. This enables you to identify the location of objects within the image. Objects within the **Tags** list will always have a degree of certainty listed below them as a percentage.



Note: The location of an object is not always able to be defined within an image. If there are no bounding boxes in your image, then the objects could not be located. E.g., Some objects may not be completely contained within the frame of the image therefore their location cannot be defined.

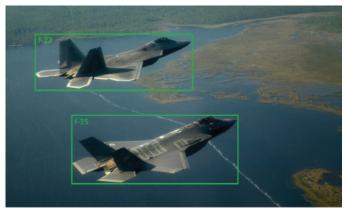


Figure 3-2 Objects with Bounding Boxes

Bounding boxes will have their **object's title** included. Once you exit the **Tags** list by clicking **OK** the image preview window will be updated with the object bounding boxes. To hide the bounding boxes, click to disable the **Objects** check box.

- From the **Tags** list, you can click **OK** to save the tags to the image and exit.
- Objects that were detected will be added to the image's properties as **Keywords** and have bounding boxes.
- The image preview will now include **Bounding Boxes** around the objects.



Note: When you click **Cancel** to exit without making changes, object bounding boxes do not display.

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4. WORKSPACE — AUTO-TAGGING IMAGES

When uploading images to Workspace, if auto-tagging is enabled for your profile, your captured images are tagged without having

to click the **Computer Vision** icon. This enables the user to edit tags in Workspace rather than immediately after a remote expert session has ended. This feature can be controlled by your OPM administrator using **Client Policy**. Within OPM, click **Settings > Client Policy** > **Artificial Intelligence** > **Auto Tag Images**.

If Workspace and auto-tagging are enabled, images are automatically tagged when a call has ended (Auto-upload) or when images are manually uploaded.

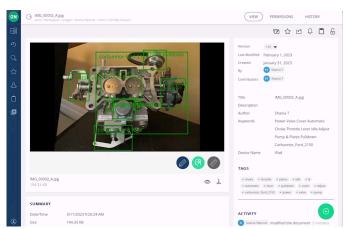


Figure 4-1 Keywords

5. IoT VISUALIZATION

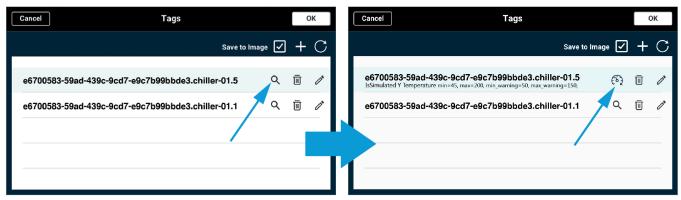


Figure 5-1 Searching Tags & Search Results

When IoT Visualization is enabled, tags may be searched as **IoT Assets**. A **Search** icon. displays beside tags that can be searched as IoT assets. When performing searches, consider that:

- To query an OCR Tag as an IoT asset, click the **Search** icon beside the OCR Tag. If the Tag has an **IoT Asset Identifier**(ID), the properties of the IoT Asset Tag are returned and placed at the top of the list as an **IoT Asset Tag**. Refer to IoT Search Results (on page 17).
- **IoT Visualization** for the IoT Asset TAG is enabled by default. This will display the **IoT Asset Properties** on the main viewer as an overlay. You can disable it by clicking the **Visualization** icon.
- Click the **Add** (Plus) icon to manually add a tag. You can query it as an **IoT Asset ID** (if IoT Visualization is enabled) by clicking the **Search** icon. Manually added tags are displayed within the **OCR** section of the **Properties** panel. An **IoT Asset Tag** contains IoT properties that were previously returned from an IoT Hub.



Note: IoT Asset tags are read-only. They may only be deleted from the Tags list. They are not editable.

5.1. IoT Search

Each Tag has a Search icon beside it in the list. Clicking the search icon beside a Tag will check whether it's recognized as an IoT Asset ID in the IoT Hub.

When the results are returned from the IoT Hub the list will be updated. If the Asset ID is not found it will be labeled as 'Not Available'. Refer to IoT Search Results (on page 17) for more details.

5.2. IoT Search Results

When a tag has been searched and identified as an IoT Asset, its properties are tagged to the image and are displayed as a visualization on the viewer. The **Visualization** icon indicates it is selected for display in the main viewer.

Toggle IoT Visualization by clicking the **Visualization** icon beside the IoT Asset Tag in the tag list. The currently selected IoT Asset visualization will be placed at the top of the list.

Once Visualization is enabled you can change the display mode by clicking the **Visualization** icon. Refer to VISUALIZATION MODES (on page 19) for more details.

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6. VISUALIZATION MODES



Figure 6-1 Visualization Modes: Graph, Gauge & Table

An IoT asset's properties can be displayed using three visualization modes:

- 1. Graph
- 2. Gauge
- 3. Table

Each mode can be used to display a property e.g., pressure, temperature or humidity. The visualizations are updated periodically and display real-time data from the last reported update from the IoT hub.

6.1. Graphs

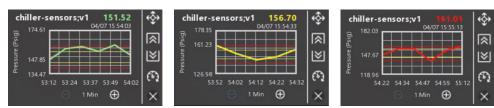


Figure 6-2 Graph Visualizations

A **Graph** displays time series data for an IoT asset. The values displayed are over the time period shown on the X-axis of the graph. The X-axis can be adjusted to display time in increments of 1, 10, 30 or 60 minutes. The warning and critical ranges are color coded on the graph. Yellow horizontal lines indicate the Warning range. Red horizontal lines indicate the Critical range. For example, a sensor's pressure property is displayed over a period of time indicating the current value as well as the trend over time. The current value is displayed in the upper right-hand corner of the graph. It is color-coded to match its position in the range of values, normal (green), warning (yellow) and critical (red).

6.2. Gauges



Figure 6-3 Gauge Visualizations

A **Gauge** displays real-time data for an IoT asset. Gauges are updated periodically displaying the value of the property at the time of the update. For example, a sensor's pressure value is displayed on a gauge. Each gauge is color-coded to match the Normal (green), Warning (yellow) and Critical (red) ranges for the IoT asset. In these examples, the pressure value displays and is color-coded to match its current position in the range of values.

6.3. Tables

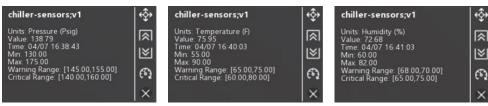


Figure 6-4 Table Visualizations

A **Table** displays real-time data for an IoT asset that is updated periodically. The table displays the reported value at the time of the update as well as other related properties such as: The unit of measure, e.g., pressure, temperature, or humidity, the last reported value, the time of the update, the Min value, the Max value and the Warning and Critical Range values.

6.4. Displaying Visualizations on the Viewer

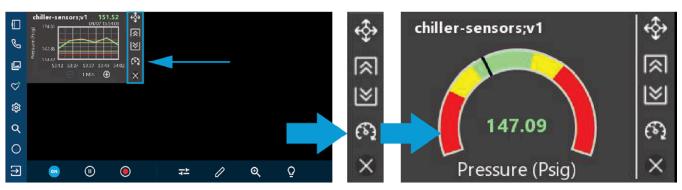


Figure 6-5 Displaying Visualizations within the Viewer

When an IoT asset is selected in the Tags list for Visualization, there are three display modes: **Graph**, **Gauge** and **Table**. Each mode can display the IoT Asset's properties, e.g., A pump may have **Temperature**, **Humidity** and **Pressure** as properties. Click the **Visualization** icon to change the mode.

6.5. Visualization Toolbar

The **Visualization Toolbar** options includes the following functions:

- Move Change the location of the visualization on the viewer.
- Next Navigate to the next IoT Property e.g., temperature, pressure or humidity.
- Previous Navigate to the previous IoT Property.
- Visualization Navigate to the next view e.g., graph, gauge or table.
- **Exit** Close the visualization.



Figure 6-6 Visualization Toolbar

7. FILE PROPERTIES

Once tags have been added to an image they can be viewed by clicking the **Information** icon to reveal the **Properties** panel.

The **Properties** panel contains standard information that is applied to all images:

- Summary
 - File Name
 - Date/Time
 - Size
 - Resolution
- Properties
 - Author
 - Title
 - Description
 - Keywords Can be manually added to any image.
- Imported Metadata Can be displayed if imported by Call APIs.



Figure 7-1 Properties Panel



Note: Computer Vision tags will be displayed within the Properties Panel in separate sections: **Keywords**, **OCR** or **IoT** .

7.1. Keywords

Tags that are generated through **Computer Vision** object detection display within the **Keywords** field within the **Properties** section.



Tip: You can manually edit the keywords. When looking at the **Tags** list, Objects will have their degree of certainty listed below them. For example, object1, object2 and object3.



Figure 7-2 Keywords

7.2. OCR Tags

Tags that are generated through Computer Vision OCR will be placed in the **OCR** section. You can click **Delete** to remove all tags in the section. When looking at the tags list OCR text will have a

Search icon beside it.

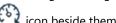


Figure 7-3 OCR Tags

7.3. IoT Assets

Tags that are identified as IoT Asset IDs will be placed in their own IoT section. The Asset ID will be in the title of each section and will list the asset's properties. You can click **Delete** to remove the IoT tags from the image properties. When looking at the Tags list IoT

Asset Ids will have a **Visualization** (icon beside them.



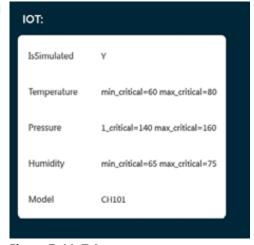


Figure 7-4 IoT Assets

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8. COMPUTER VISION & ONSIGHT CONNECT

Access Computer Vision functionality from within **Onsight**

Connect. Access Files and browse to where your images are stored.

Image Files and Location

Depending on your device, images can be located within different locations:

- My Files (PC, iOS, Android)
- File System (PC)
- Camera Roll (iOS)
- Gallery (Android)

Locate the image file and click or tap **Computer Vision** to run Al on the image.

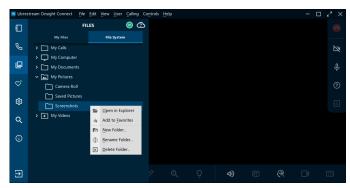


Figure 8-1 PC

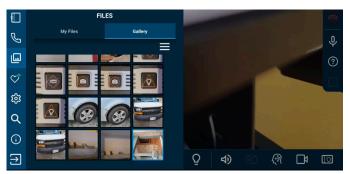


Figure 8-2 Android



Figure 8-3 iOS

8.1. Using Computer Vision Within Onsight Connect

- 1. Capture an image using your camera.
- 2. Launch **Onsight Connect** and click or tap the **Files** icon from the **Left Toolbar**. Navigate and browse to where your image is stored, as defined by your device:
 - My Files (PC, iOS, Android)
 - File System (PC)
 - ∘ Camera Roll (iOS)
 - Gallery (Android)

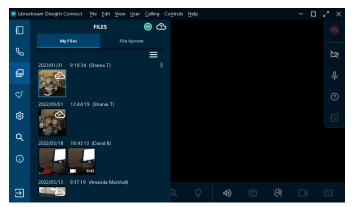


Figure 8-4 Files

3. Select an image and click or tap the **Computer Vision** icon to analyze the image.

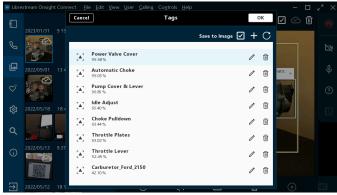


Figure 8-5 Running Computer Vision on an Image

4. Within the **Tags** window, enable the **Save to Image** check box and click **OK**. Detected objects will have a **Titled bounding box** drawn around them.



Figure 8-6 Detected Objects with Bounding Boxes

5. Click or tap within an object's bounding box to access the **CV Document Link URL** and open a browser document or external app for the object.



Figure 8-7 Document Link URL



Note: If the constructed URL is not valid, an error message will be displayed.

This completes the procedure.

Appendices

End User License Agreement

This software is licensed under the terms of an End User License Agreement (EULA). The latest EULA version can be found at:

http://librestream.com/support-archives/termsofuse/

Contact Sales

Contact your sales representative to involve our professional services team in setting-up and training your CV model to recognize objects. We can also assist you in managing your CV links from one central location on the web.

Contact Support

For support, please contact:

• Email: support@librestream.com

• Web: https://librestream.com/contact-us-support/

• **Phone:** 1.800.849.5507, or +1.204.487.0612



Figure 9-1 Contact Support QR Code

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