![Zebra logo] **ZEBRA** CAPTURE YOUR EDGE

OCR and OCV

Key Points

- Deploy Zebra's deep-learning OCR solutions in minutes

- Adjust parameters with Zebra's drag-and-drop interface

- Leverage Iris GTX or VS smart cameras for ease of deployment

- Detect unreadable labels, codes, and symbols instantly

Contrast 1   Default Setup (Bank 0)

S10

FS10,SR1.0MP,USB,RED&WH_F.1909CPU

ZEBRA

(1P) P/N: FS10-SR10F1-1C01W

1PFS10-SR10F1-1C01W
1.6 PPM

**DESIGNED IN NEW YORK
MADE IN TAIWAN**

(S) S/N: 21354520180626

MAC ID: 78B8D65C8189

Pixel Count 2

Pixel Count 1

(D) MFD: 20DEC21

Default Setup (Bank

Challenge

Product package labeling requirements are rigorous and often mandated by regulatory or government agencies. As part of packaging operations, manufacturers must ensure that labels are correctly applied in the right location, and that the labels are legible by industrial automation machinery, as well as consumers and end-users. Inaccurate, unreadable, or damaged labels risk confusing the user, may expose them to health and safety risks, or could result in improper use of the product. This poses liability risks for the manufacturer as well as damage to their reputation and brand as a quality supplier.

Solution

Zebra Technologies' range of smart cameras, fixed scanners, machine vision and deep learning software empowers manufacturers with a powerful suite of tools that facilitates optical character recognition (OCR) and optical character verification (OCV). These techniques enable manufacturers to use automation to verify the integrity, readability, and accuracy of product packaging labels. Being able to rapidly identify labels or printing that is incorrect, damaged, or out-of-spec minimizes manufacturing waste, reduces risk to consumers, and averts potential product recalls.
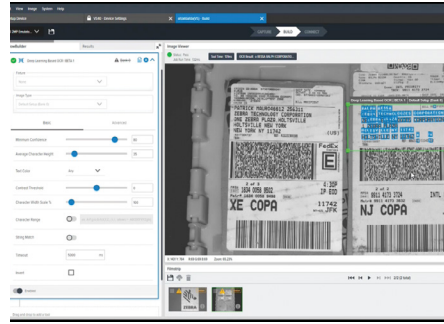
Pre-Defined OCR

When labels use consistent packaging, printing, and characters, pre-built OCR is a common solution. It relies on pre-built models or templates to recognize expected characters. These templates contain information about expected layout, font, and text patterns, enabling fast and accurate OCR processes. If a new label is introduced or if a parameter such as font type changes, the OCR model must be updated to reflect this. General-purpose OCR provides greater flexibility by not using pre-defined models but is often slower and can be less accurate because of the wider range of layouts and fonts that it must analyze.

Deep Learning OCR

In applications where fonts change, when difficult-to-read or low-contract characters are present, or where font training is excessively time consuming, deep learning OCR may be a superior option. Zebra's deep learning OCR tool—which can be set up in less than five minutes—leverages powerful convolutional neural networks (CNNs) and takes advantage of pre-training that includes thousands of characters, fonts, and styles. This results in an off-the-shelf solution that does not require constant retraining. Its flexibility makes it ideal for applications with frequent product line changes or with variable package labels. The deep-learning model can be deployed on Zebra's smart cameras and is user-adjustable via an intuitive, drag-and-drop interface.

Date- and Lot-Code Inspection

Across a range of industries including consumer packaged goods (CPG) or food and beverage production, date and lot codes help track manufacturing lots and locations. If problems arise with products, manufacturers can quickly identify when and where affected product was made and where it was shipped. Along with expiration date codes, date and lot codes are a critical part of the quality control process. The codes—which may feature barcodes, symbols, or text—must be accurate and legible. In some industries, codes are even regulated. Zebra's OCR tools enable high-speed verification of date and lot codes, ensuring that characters are readable and meet specifications and regulatory requirements.

Track-and-Trace Operations

While 1D and 2D scanners are often sufficient for reading barcodes, in shipping and logistics and other track-and-trace applications it is increasingly common to find alphanumeric characters. Boxes being loaded onto trucks will carry numerical identifiers (usually 10 digits) and in large operations where the trucks themselves are being tracked, Department of Transportation (DOT) and other regulatory numbers will be present on trucks and trailers. These must be readable, and Zebra's OCR technology introduces an effective means to automate track-and-trace operations of any scale.

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