⟦·⟧ IT-SOLUTIONS **MÖSER**

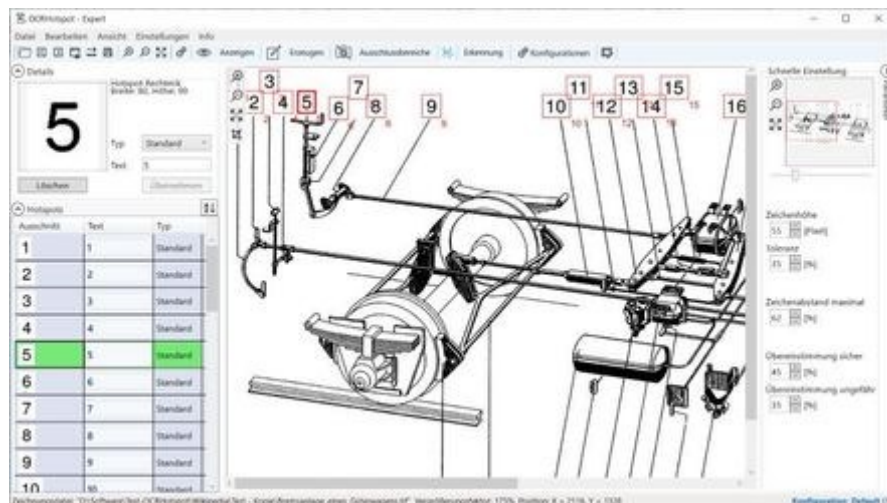# OCRHotspot

User Documentation

This documentation is valid for OCRHotspot, version 1.2.

Version 1.2

Date 2/20/2024

For reasons of better readability, the masculine form is used for personal names in the text, but nevertheless the information refers to members of all genders.

Content

Short Description - Overall Concept

Example
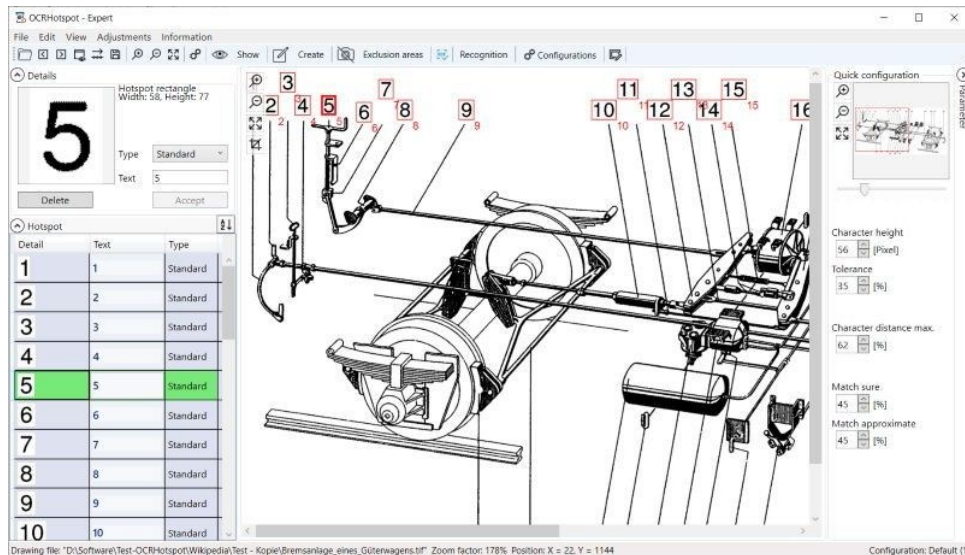
What is OCRHotspot?

OCRHotspot is a software for generating hotspot files, such as those needed for the creation of electronic spare parts catalogs.

For drawing files in pixel format (TIFF, PNG, JPEG), you can use OCRHotspot to create attribute files in which the information is stored about where position numbers are displayed in the drawing files. In the spare parts catalog, these serve as a "hotspot" for linking to the corresponding part in the parts list.

How does OCRHotspot work?

OCRHotspot assists you in the creation of hotspot files through an integrated OCR ("Optical Character Recognition") component, which specializes in the recognition of position numbers in drawings. In addition, the software offers you the possibility to define or correct hotspots interactively.

What can I do with the hotspot files?

You can use the hotspot files created with OCRHotspot immediately if you use the **SpareParts365** software. OCRHotspot creates hotspot files in the appropriate format ".hspx".

If you use other tools for the creation of electronic spare parts catalogs, the XML and CSV formats, which are also possible, can be used to transfer the hotspot data directly or by simple reformatting into your creation process.

How good is OCRHotspot?

Any tool can only be as good as the data you process with it. With OCRHotspot, however, you have a tool at hand that is specialized in the processing of drawings of different quality, thus enabling maximum automation in the recognition of item numbers or the creation of hotspot files.

What are the limitations of OCRHotspot?

The limitations of OCRHotspot lie in the quality of the drawing files; if the position numbers are too imprecise for automatic character recognition, you will have to rework them manually.

However, a wide range of configuration and training options can significantly improve the result of automatic hotspot generation.

Requirements

Environment

- Work PC or notebook with a sufficiently large display (at least 1280 x 1024)
- 64-bit operating system, x64-based processor
- Memory (RAM) 16 GB or more; 8 GB sufficient for smaller drawings
- Windows 10, 11

Permissions

You may need local administrator permission to install OCRHotspot.

Drawing Types

With OCRHotspot you can process the following file types:

- Pixel files in TIFF, PNG, or JPEG format
- Multipage TIFF files → ⚠️ depending on license type

Hotspot Files

OCRHotspot reads and writes hotspot files in the following formats:

- .hspx: Application-neutral XML file
- .csv: Separator-separated text file, configurable → ⚠️ depending on license type

For a description of the possible hotspot format, see *Hotspot Files*.

Other output formats for hotspot files on request.

Usage

OCRHotspot is compatible with the spare parts catalog and service information system **SpareParts365** of SpareParts365 GmbH (***www.spareparts365.com***).

The application-neutral XML files (".hspx") can be easily converted into hotspot files of other systems for electronic spare parts catalogs or similar applications.

Support for other target systems on request.

License

The use of OCRHotspot requires the purchase of a temporary or permanent license.

The functionality available depends on the type of license purchased.

Important note: Various features described in this document are only available as part of certain license options – see the overview under "Overview of License Variants".

Restrictions

OCRHotspot is not suitable for use on mobile devices (smartphone or tablet) and does not support touch operation.

Hotspot Files

Description of hotspot formats

OCRHotspot currently supports the following hotspot formats:

".hspx" format: application-neutral XML file

Structure of a .hspx file

Meaning of the elements:

Name	Meaning
Hotspot	Description of a hotspot with the coordinates "Top", "Bottom", "Left" and "Right"
Text	Text of the hotspot, e.g. the detected position number
Type	"Normal" (reference to part) or "Modules" (reference to assembly)
Unsure	Specifies whether the text of the hotspot was recognized as "approximate" by automatic character recognition
Form	"Rectangle" or "Ellipse" - representation of the hotspot
Top, Bottom, Left, Right	Coordinates of the hotspot as a fraction of the drawing - between "0.000000000" and "0.999999999", relative to the upper left corner of the drawing file
RelativeTop, RelativeBottom, RelativeLeft, RelativeRight	Coordinates of the hotspot in pixels, relative to the upper left corner of the drawing file
HotspotPolygon	Description of a polygon hotspot as a sequence of single points
HotspotPolygonPoint	Single point of a polygon hotspot
X, Y	Coordinates of a point of a polygon hotspot in pixels, relative to the upper left corner of the drawing file

Name	Meaning
RelativeX, RelativeY	Coordinates of a point of a polygon hotspot as a fraction of the drawing - between "0.000000000" and "0.9999999999", referring to the upper left corner of the drawing file

Example of a .hspx file

```xml
<?xml version="1.0" encoding="utf-8"?>
<Hotspots Version="2.0">
    < Hotspot Text="8" Type="Normal" Unsure="false" Form="Ellipse" Top="2464" Bottom="2509" Left="380" Right="426" RelativeTop="0.64519508" RelativeBottom="0.65697827" RelativeLeft="0.14785992" RelativeRight="0.16575875" />
    < Hotspot Text="7" Type="Normal" Unsure="false" Form="Ellipse" Top="2509" Bottom="2554" Left="500" Right="545" RelativeTop="0.65697827" RelativeBottom="0.66876146" RelativeLeft="0.19455253" RelativeRight="0.21206226" />
    < Hotspot Text="5" Type="Normal" Unsure="false" Form="Ellipse" Top="2790" Bottom="2835" Left="1175" Right="1220" RelativeTop="0.73055774" RelativeBottom="0.74234093" RelativeLeft="0.45719844" RelativeRight="0.47470817" />
    < Hotspot Text="6" Type="Normal" Unsure="false" Form="Ellipse" Top="2680" Bottom="2725" Left="1233" Right="1278" RelativeTop="0.70175439" RelativeBottom="0.71353758" RelativeLeft="0.47976654" RelativeRight="0.49727626" />
    < Hotspot Text="2" Type="Normal" Unsure="false" Form="Ellipse" Top="3546" Bottom="3591" Left="1491" Right="1536" RelativeTop="0.92851532" RelativeBottom="0.94029851" RelativeLeft="0.58015564" RelativeRight="0.59766537" />
    < Hotspot Text="1" Type="Normal" Unsure="false" Form="Ellipse" Top="3235" Bottom="3280" Left="1491" Right="1536" RelativeTop="0.84708039" RelativeBottom="0.85886358" RelativeLeft="0.58015564" RelativeRight="0.59766537" />
    < Hotspot Text="1" Type="Normal" Unsure="false" Form="Ellipse" Top="2277" Bottom="2321" Left="1634" Right="1679" RelativeTop="0.59622938" RelativeBottom="0.60775072" RelativeLeft="0.63579767" RelativeRight="0.65330739" />
    < Hotspot Text="3" Type="Normal" Unsure="false" Form="Ellipse" Top="1834" Bottom="1879" Left="1772" Right="1817" RelativeTop="0.48023043" RelativeBottom="0.49201362" RelativeLeft="0.68949416" RelativeRight="0.70700389" />
    < Hotspot Text="4" Type="Normal" Unsure="false" Form="Ellipse" Top="1905" Bottom="1950" Left="1800" Right="1845" RelativeTop="0.49882168" RelativeBottom="0.51060487" RelativeLeft="0.70038911" RelativeRight="0.71789883" />
    < Hotspot Text="2" Type="Normal" Unsure="false" Form="Ellipse" Top="2188" Bottom="2233" Left="1981" Right="2026" RelativeTop="0.57292485" RelativeBottom="0.58470804" RelativeLeft="0.77081712" RelativeRight="0.78832685" />
</hotspots>
```

".csv" format: comma-separated text file, configurable

⚠ The use of this file format depends on the license type.

Structure of a .csv file

The structure of the .csv file is configurable, adjustable parameters are:

Parameter	Possible values	in the example
Header line	yes / no	yes
Unit of coordinates	Pixels / Percent	Percent
Separator		;
Naming and order of fields		"Left"; "Top"; "Width"; "Height"; "Type"; "Text"
Quoting of field contents	any suitable character	"..."
Filename extension		.csv
Naming of the hotspot types		`"Part"`, `"Assembly"`

Configuration

The default configuration of the structure of the CSV file is done by means of an XML file "OCRHotspotCSV.config" in the program directory of OCRHotspot.

You can create your own configuration by copying and pasting this file into the directory "...\Documents\OCRHotspot".

Example of a .csv file

```
"Left";"Top";"Width";"Height";"Type";"Text"
"13.966";"49.931";"3.476";"2.138";"Part";"10"
"14.148";"59.273";"3.461";"2.117";"Part";"15"
"27.721";"23.196";"3.461";"2.138";"Part";"10"
"28.461";"14.655";"3.461";"2.117";"Part";"15"
"30.849";"67.130";"3.476";"2.117";"Part";"12"
"53.900";"35.104";"2.388";"2.138";"Part";"9"
"59.749";"38.600";"2.328";"2.138";"Part";"3"
"78.658";"69.417";"2.131";"2.095";"Part";"1"
"90.100";"51.587";"2.343";"2.117";"Part";"2"
"90.402";"58.525";"2.131";"2.095";"Part";"1"
"88.271";"96.269";"3.900";"2.213";"Assembly";"951"
```

Licenses

OCRHotspot is available in several license variants. These differ in the range of functions they can use.

Please note that some of the features described in this guide are only available from a certain license variant.

Overview of License Variants

Area	Function	Demo	Stand-ard	Profes-sional	Ex-pert
Drawing files	Import and display TIFF, PNG and JPEG files	✓	✓	✓	✓
	Convert to TIFF (Group 4), Rotate +/- 90°			✓	✓
	Splitting Multipage TIFF and Creating Hotspots				✓
	Split PDF files and convert them to pixel for-mat				✓
Hotspot files	Import and display XML format (".hspx")	✓	✓	✓	✓
	Import and display CSV format			✓	✓
	Import and display other formats[1]				✓ [1]
	Write XML format (".hspx")	ⓘ [2]	✓	✓	✓
	Configuring and writing CSV format			✓	✓
	Writing other formats[1]				✓ [1]
Show	Show drawing with hotspots, zoom	✓	✓	✓	✓
	Displaying and analyzing individual drawing elements			✓	✓
	Hide drawing elements				✓

Area	Function	Demo	Stand-ard	Profes-sional	Ex-pert
Hotspots	Manually create and edit hotspots as a rec-tangle	✔	✔	✔	✔
	Manually create and edit hotspots as ellipses		✔	✔	✔
	Creating and editing hotspots from individual objects			✔	✔
	Manually creating and editing of polygon hotspots				✔
	Accept "approximately" detected hotspots as valid			✔	✔
Exclusion areas	Creating and considering exclusion area		✔	✔	✔
	Create and account for multiple exclusion ar-eas – relative or absolute size, effect exclu-sive or inclusive			✔	✔
	Creating of exclusion areas as a polygon				✔
Automatic char-acter recognition	Character recognition in individual drawings using OCR ("optical character recognition")	✔	✔	✔	✔
	Numeric character recognition (0..9)	✔	✔	✔	✔
	Automatic size recognition of item numbers		✔	✔	✔
	Definition of reference characters – "training" of character recognition		✔	✔	✔
	Recognition of additional characters, also "- _ . / \ # +"			✔	✔
	Character recognition in several drawings ("batch operation") using OCR			✔	✔
	Regular expressions to define valid strings			✔	✔

Area	Function	Demo	Stand-ard	Profes-sional	Ex-pert
	Use only position numbers in frames (circle or rectangle)			✅	✅
Configurations	Creating and editing a configuration		ℹ️ 3)	✅	✅
	Multiple configurations, copy, import and export			ℹ️ 4)	✅
	"Approximate" match selectable, quick setting			✅	✅
Automation	Call OCRHotspot without user interface, automatic hotspot detection of individual drawings or entire directories			✅	✅
Languages	User interface in German and English	✅	✅	✅	✅
	User interface in other languages				✅ 1)
Drawing editing	Replace position numbers in the drawing with text in any font and color				✅
License Binding	To Windows System UUID	✅ 5)	✅	✅	✅
	Optionally to Windows System UUID, computer name or MAC address				✅

Notes:

1): On request, may incur additional costs

2): In the demo version, a maximum of 5 hotspots are stored per drawing

3): A maximum of 5 sample copies per reference character possible

4): A maximum of 5 different configurations possible

5): Time-limited trial license

Getting Started

Installation

Check the installation requirements at *Requirements*.

Download the installation package: *Download*.

Install the software on your local workstation. You will need local administrator permissions to do this.

Request and activate your license

Start the program in the Start menu under "OCRHotspot".

Invoke the dialog *View License* with "Info→License" and switch to the license request via *Request License*.

In the dialog that opens, enter the required data. A license is bound to one workstation at a time and is linked to the Windows system UUID.

Send the license request to **info@wm-itsolutions.com**. We will send you a license file by e-mail.

To apply the license, call the dialog *View License* with "Info→License" and switch to "Import License File".

Enter the received license file via file selector or by dragging and dropping. You will also need local administrator permissions to do this.

If you now open the license dialog, you will be shown the license purchased for your workstation.

Select Configuration

To create hotspot files, a configuration with different setting values must be activated.

OCRHotspot provides a sample configuration that is already sufficient for many applications. However, you can later create and customize several different configurations, e.g. to support different types of drawings. → ⚠ depending on the license type.

Open the *Configuration dialog* via the ⚙ in the toolbar, or via the "Settings" menu→Configuration".

You will now see a first, preset configuration called "Default", which can be used for the first steps.

Load Drawing File

Use the "Open File" dialog to select→ a drawing file in a suitable format (TIFF, PNG).

The drawing file is displayed and can be zoomed and moved using an overview window or the corresponding buttons.

Automatically detect hotspots

Start automatic hotspot detection via "Recognition→Character recognition with automatic size determination".

In the left pane of OCRHotspot, the detected position numbers are now displayed in a table.

In each case, you can see the corresponding drawing section and the recognized item number. If characters are not clearly recognized, the item number is preceded by a question mark (e.g. "?17"); the corresponding table row is highlighted in color. In addition, information about a single selected hotspot is displayed in a detail window above the table and can also be changed there.

If you have a good quality drawing that matches the preset parameters of the sample configuration, the job is already done. You can skip the following step.

Edit hotspots

If one or more of the hotspots are incorrect, because not all position numbers have been correctly recognized, you can edit the hotspots interactively.

You can do this in several ways:

- In the table:
  - Click in the text area of a hotspot, you can then correct the text.
  - Select one or more hotspots (use the Shift or Ctrl keys) and delete hotspots that are mistakenly identified as location numbers.
  - If there are hotspots that have been marked as "uncertainly" but have been detected correctly, you can select them and mark them as valid using the context menu "Accept hotspot texts". The question marks disappear after that.
- In the detail view:
  - Correct the text of an incorrectly recognized item number and confirm with "Apply".
- In the drawing area:
  - Select one or more hotspots (using the Shift or Ctrl keys or using a lasso function with the right mouse button).
  - Delete unnecessary hotspots using the "Remove" button or the context menu.
  - Edit the text or type of similar hotspots using the context menu.

In the case of unrecognized location numbers, you can create hotspots manually:

- Activate manual hotspot creation via "Create→New hotspot".
- Use the left mouse button to drag a rectangle over the position number, which can later be used as a hotspot.
- The hotspot first has the text content "???", you can then change it as described above.
- In this way, set all the missing hotspots on the drawing and finally finish the process with "Cancel" in the toolbar.

Save hotspots

Once all the hotspots are set correctly, you can place a hotspot file with this information in the same directory as the drawing file. To do this, use the command "File→Save hotspot file" or the icon 💾 in the toolbar.

Alternatively, you can switch to another drawing via the file selection dialog or to the next or previous drawing using the corresponding buttons in the toolbar ▷ ◁ . In this case, a query is made as to whether the hotspot file should be saved to the drawing file you just edited.

Done!

You have created your first hotspot file, which you can now use in an electronic spare parts catalog, for example.

Please note that some of the features described here are only available from a certain license variant. See the overview under *Licenses*.

Working with OCRHotspot - Use Cases

In this section, the most important real-world use cases are described.

The detailed description of the features mentioned here can be found in the rest of the documentation.

Use Case – Create Configuration
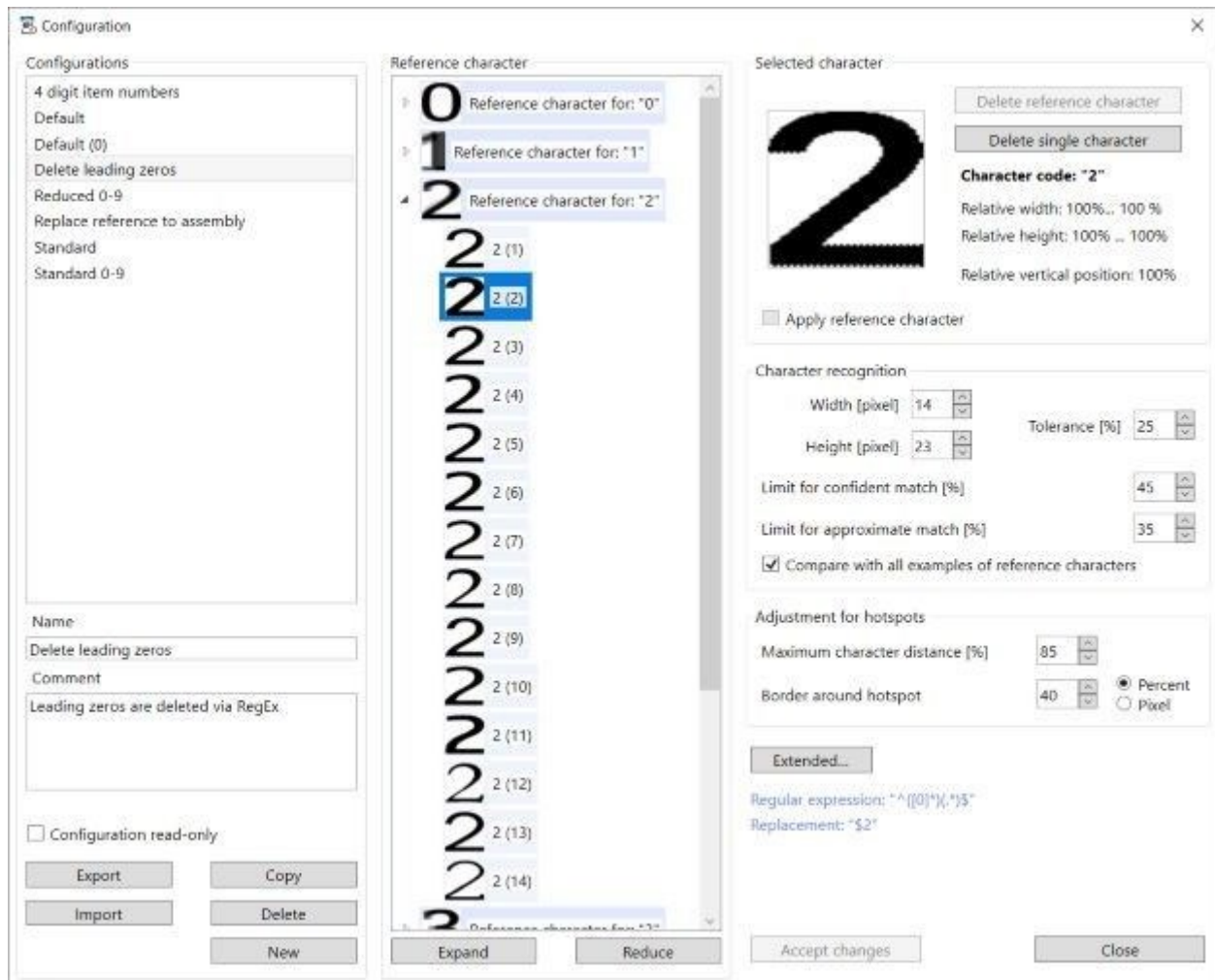
Create a suitable configuration

By creating or customizing configurations, you can optimize the results of automatic hotspot generation.

To do this, open the *Configuration dialog* via the ⚙ in the toolbar, or via the menu "Adjustments→Configuration...".

Create your own configuration

In the left area of the configuration dialog, you can see the configurations that already exist.

Select an existing configuration and copy it or create a new configuration.

Assign an appropriate name and use the description field to indicate what this configuration is intended for.

Once you've finished adjusting this configuration, you can make it read-only to prevent accidental changes.

Reference characters

If a special character set was used in your drawings, you can adapt the configuration to it to minimize the number of error detections:

- Delete any existing reference characters in the configuration dialog.
- Close the configuration dialog and save the changes.
- Load a drawing with the character set in question, in which as many digits or special characters as possible are used.
- Select an instance of each character - right-click on it - and open "Define reference character" dialog *Define reference character*.
- In the dialog that opens, enter the displayed character with the keyboard and confirm the entry.
- If a small character size has been used, or if the representation of the same characters is too different, you should mark several copies of each character as reference characters in the manner described (usually a maximum of 3 copies should be sufficient).
- Now check the result in the configuration dialog: are all the required characters available? Have all reference characters been mapped correctly?

Parameter

By setting the parameters in the right area of the configuration dialog, you can influence character recognition or hotspot generation:

- Character size and tolerance: specifies the size range in which recognized characters must be in order to be interpreted as valid.
- Limit for reliable and approximate recognition: controls how close the match of a found element in the drawing must be with one of the reference characters in order to be interpreted as "valid" or "presumably valid".
- Use all copies of a reference character: this setting allows for higher detection reliability but requires higher computing power (or leads to longer runtime).

- Maximum distance between characters: specifies how far apart two adjacent characters can be from each other in order to be recognized as a related hotspot.
- Border around hotspot: expands the sensitive area with the recognized position numbers, so that the hotspots are easier for the user to click on later.

You can also adjust the most important of these parameters without opening the configuration dialog by displaying the "Parameters" area to the right of the displayed drawing and see the effect on the results of the hotspot generation immediately.

💡 **The easiest way to set the desired character size is to right-click a digit between 2 and 9 in the drawing and open the "*Define character size*" dialog.**

Exclusion Areas

If there are regular areas in your drawings where there may be characters that are not item numbers, you can mark the areas as exclusion areas.

Typical use cases for this are drawing heads or drawing frames.

Procedure:

- Check whether it makes more sense to use "exclusion areas" (detection only outside) or "inclusion areas" in your type of drawing and select the appropriate option in the toolbar of the main window under " 🔍 Exclusion areas→Exclude area".
- Select " 🔍 Exclusion areas→Define area" and drag a matching rectangle in the drawing area with the left mouse button.
- Create multiple exclusion areas if necessary.

Select Configuration

If you regularly have different types of drawings to work on, you can switch between the different configurations:

- In the configuration dialog by selecting the appropriate configuration
- From the Configurations drop-down menu ⚙ in the toolbar

Use Case – Creating Hotspots

OCRHotspot offers you different options for creating and editing hotspots.

Automatic hotspot generation with size detection

The easiest way to create hotspots is to start with the "Recognition → 🔲 Character Recognition with automatic size evaluation" menu in the toolbar.

In a first step, the software tries to determine what the most likely size of item numbers in the current drawing is.

The automatic hotspot generation is then performed with this size setting.

💡 **If the drawing contains only a few item numbers, this can lead to incorrect size recognition. In this case, set the character size manually (see next section).**

Automatic hotspot generation without size detection

If the item numbers in your drawings are of the same size, it is sufficient to set the size once.

To do this, select a digit between 2 and 9 in a drawing with the right mouse button and call up the dialog "*Define character size*".

You can now start automatic hotspot generation on each drawing using the 🔲 ("Character recognition") button in the toolbar.

If necessary, use the quick setting of parameters (which can be displayed on the right side of the main window) to improve the results of automatic hotspot generation.

Visual inspection

Variant 1: Using the table

- The table with detected hotspots on the left allows you to quickly check the automatically generated hotspots.
- For each element found in the drawing, the automatically recognized text is displayed. This makes it easy for you to detect faulty hotspots and delete or correct them.

Variant 2: Using the drawing, hide hotspots

- Use the " 👁 Show→Hide hotspot" menu in the toolbar.
- Any position numbers that may not be recognized are therefore easily eye-catching and can be manually provided with hotspots.

Variant 3: Using the drawing, hide drawing elements

- Use the " 👁 Show→Mask drawing" menu in the toolbar.
- Only the recognized item numbers together with the recognized texts remain visible, making it easier to detect any existing errors.

Add a hotspot manually

For item numbers that have not been recognized, you can add hotspots manually:

- Start manually entering hotspots with "🖉 Create→Hotspot new" in the toolbar.
- Over each unrecognized position number, drag a rectangle with the desired size of the sensitive area.
- Finish the manual entry with "Cancel".
- Enter the texts for the hotspots created in this way.

💡 **If you want the hotspots to all be the same size, it is sufficient to click in the middle of an item number from the second hotspot onwards. The generated hotspot will then be the same size as the last hotspot created manually.**

Fix hotspots

There are several ways to correct values of hotspots:

- You can move or resize a hotspot selected in the drawing.
- The text associated with one or more selected hotspots can be changed.
- You can change the type ("standard" or "assembly") or shape ("rectangle" or "ellipse") of one or more selected hotspots.

Automatic hotspot generation for multiple drawings

If there are several similar drawings in a directory or directory tree, you can run the hotspot generation for all drawings in one step:

- If the character size is the same, call "Recognition→ 🔲 Batch recognition" and select the desired directory (optionally with subdirectories).
- If the character size is different, call "Recognition → Batch recognition with automatic size evalutaion" and select the desired directory (optionally with subdirectories).

Use Cases – Advanced Features

Polygon Hotspots

OCRHotspot allows you to create polygon hotspots. Unlike traditional hotspots (usually rectangles or ellipses), polygon hotspots consist of three or more points that together form a polygon of any shape.

Polygon hotspots can be particularly useful for defining hotspots on overview drawings or photos, especially if there are no item numbers. However, polygon hotspots cannot be generated automatically, but must be created manually.

Preconditions:

- Only the application-neutral XML file data format ".hspx" offers the possibility to save polygon hotspots.

- The spare parts catalog creation software must be able to handle polygon hotspots (SpareParts365 does not currently support polygon hotspots).

Procedure:

- Start the creation of a polygon hotspot via " ⬜Create→⬡ Polygon new" in the toolbar.

- In turn, click on all the positions in the drawing that you want to be vertices of the polygon.

- For corrections, you can delete the last set item with the Remove key.

- Finish the creation by clicking "✓Accept" in the toolbar or by pressing Enter.

Regular Expressions

In certain cases, automatic hotspot generation can be simplified by using regular expressions.

There are two ways to do this:

Validation

You define a regular expression that describes the structure of valid item numbers (for example, 1 - 3 digits). In this case, only hotspots are created whose text is recognized as matching via the regular expression.

This allows you to prevent elements of the drawing from being recognized as hotspots that have a different structure.

Substitution

In addition to the regular expression to check the match, you enter a replacement expression. This will replace all texts from hotspots that match the regular expression with texts that result from the replacement expression.

All non-congruent texts remain unchanged.

This function can be used, for example, to delete or add leading zeros in position numbers.

Procedure

In the configuration dialog, use the dialog "*Extended Configuration*" via "Extended...".

In the input fields of the dialog that appears, you can enter a regular expression and a replacement expression.

You can also use a test string to determine whether a regular expression or replacement expression will produce the result you want.

For details on regular expressions, see *Using Regular Expressions*.

Viewing additional information

If there are unexpected effects when editing drawings, it can be helpful to display additional information.

File Properties

By calling "File→ 🖼 Properties" you will see information about file type, sizes, etc.

Displaying Object Types

Use the selection fields under " 👁 Show→..." in the toolbar, you can display different types of objects (see *Glossary*) or disable it:

- Hotspots: Rectangles or polygons that are stored along with the texts in the hotspot files. Hotspots can be created automatically or manually.
- Characters: Elements of the drawing that, due to their size, could be valid components of hotspots.
- Elements: Sections of the drawing that contain contiguous black areas up to a maximum size (128 x 128 pixels).

When you click on a displayed object, you will see information about it in the details window above the table on the left, e.g. the size and security of the detection.

Use Cases – Special Cases

When creating hotspot files for spare parts catalogs, special cases occasionally arise that require separate treatment.

Rotated Position Numbers

In older drawings, position numbers were sometimes drawn in different orientations, i.e. rotated by + or - 90°. When generating hotspots with OCRHotspot, proceed as follows:

Procedure:

- If each drawing contains location numbers in different orientations, select "Recognition→Retain hotspots". As a result, existing hotspots will not be deleted during a new detection run.
- Perform automatic character recognition. All "normal" item numbers are processed in this way.
- Rotate the drawing via "Edit→Rotate..." in such a way that the remaining position numbers are visible normally, i.e. not rotated.
- Run Character Recognition again. The original rotated position numbers are now also edited and added as additional hotspots.

Conversion to black and white TIFF files

For simple line drawings, which are very often used in spare parts catalogs, the TIFF/G4 data format is suitable. This data format only knows the colors black and white, but produces very well compressed files.

OCRHotspot offers the possibility to convert line drawings that are available in other data formats or compression types to TIFF/G4 in order to obtain the smallest possible file sizes.

To do this, use the call "Edit→ Save as TIFF/G4". The original file will be preserved and renamed.

Multipage TIFF files

If there are several drawings or drawing sheets for an assembly, they are sometimes combined into multipage TIFF files.

OCRHotspot allows you to split such files into individual files per drawing sheet and to generate individual, associated hotspot files.

To do this, use the "Edit→MultiPage TIFF" call.

PDF files

If the drawings are in PDF format, a conversion from this format to a pixel format is required before hotspots can be generated.

You can use "Edit→Convert PDF files" to select a directory of PDF files. In addition, you can set the resolution in DPI as well as the desired pixel format (usually PNG) and specify whether only the first or all pages of the PDF files should be converted.

A subdirectory "PNG" is created, in which individual pixel files are created for the pages of the PDF files.

Saving Debug Information

If you receive unexpected and inexplicable error messages while working with OCRHotspot, you can activate a debug mode under "Adjustments→Logging".

In this mode, all error messages from the program are recorded in a log file and stored in your "Documents" directory under "OCRHotspot".

You can send us this log file for problem analysis.

Invoking from the command line or from other programs

As an alternative to interactive use, you can also use OCRHotspot without a user interface.

This mode is suitable, for example, for the regular automated generation of hotspot files for newly created drawing files.

OCRHotspot can be started from the command line or from another program. If one or more parameters are entered when called, OCRHotspot is started in batch mode without a user interface.

You can get an overview of the possible parameters and result values when calling OCRHotspot in a console window, e.g. as "OCRHotspot.exe -help"

```
OCRHotspot 1.2
==============
Purpose:
- Does automatic hotspot generation for single drawing or complete directory
- Creates hotspot files accompanying the drawing files

Please use valid command line parameters.
Valid command line parameter:
 -license:<license file>              License file (default: program data directory
 -configfile:<configuration file>     Configuration file (default: executable direc-
tory
 -config:<configuration>              Configuration to be used (default: last used
configuration
 -file:<drawing file>                 Drawing file to be processed
 -directory:<directory with drawings> Directory with drawings to be processed
 -subdirs                             Process also sub directories
 -keep                                Keep hotspots already existing
```

```
 -ellipse                                    Create hotspots as ellipses instead of rectan-
gles
 -autosize                                   Use automatic character size evaluation instead
of value from configuration
 -lang:<language>                            Language to be used for log files ('EN' or
'DE')
 -debug                                      Show debug information
 -help, -?                                   Show this help text

Result values:
 0: OK
 1: no valid license
 2: configuration not found
 3: file not found
 4: directory not found
 5: error processing file
 7: invalid command line parameters
 8: no file or directory given
```

The results of the call to OCRHotspot in batch mode are recorded in a log file and stored in your "Documents" directory under "OCRHotspot".

Use Case – Edit Drawing
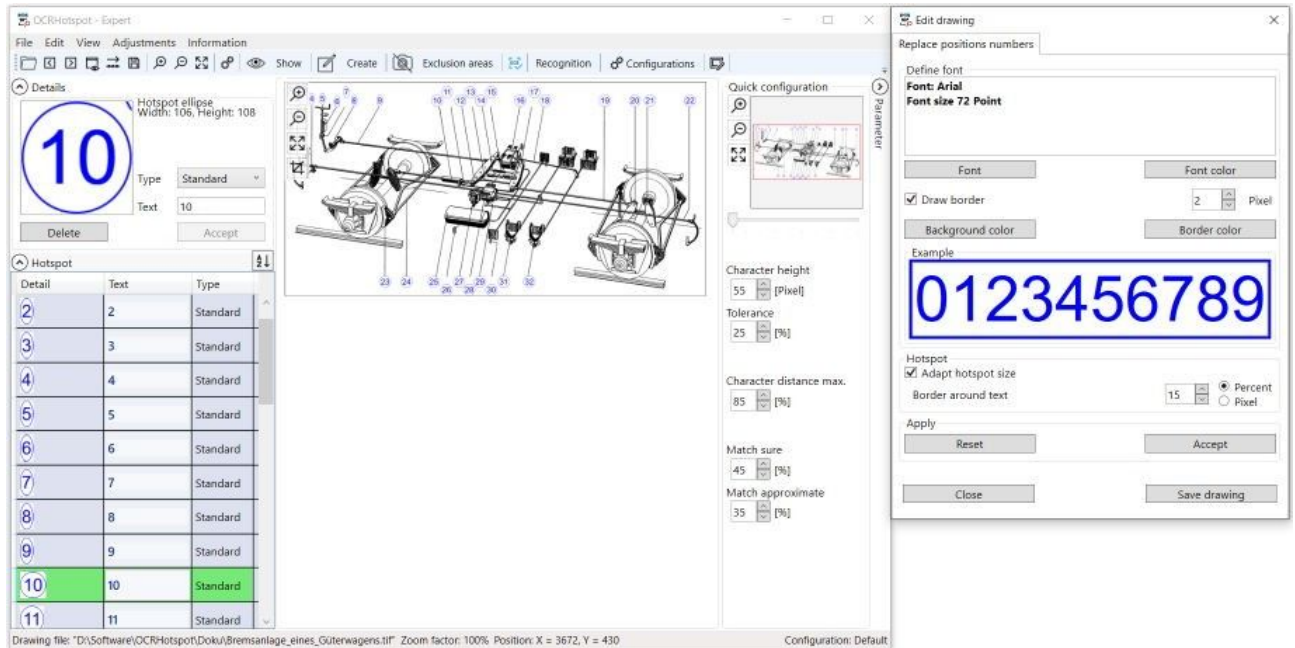
Rework an existing drawing

Especially when using old data inventories, it may be necessary to correct or revise drawings before using them in an electronic spare parts catalog.

OCRHotspot provides functions for this.

Replace Item Numbers

There can be different reasons for replacing or redrawing the item numbers on a drawing:

- The quality of older, possibly scanned drawings is unsatisfactory, the item numbers are not easy to recognize.
- The item numbers on the drawings should be highlighted, e.g. by a different color.
- The display of the item numbers on the drawings is to be standardized subsequently.

Call

You can access the "Edit Drawing" mode from the "Edit →Edit drawing" menu or the icon ⬚ in the toolbar.

Font and font color

You can specify which font and size, as well as in which color the item numbers should be rewritten.

Background and border

You can also choose what color you want the background to be, as well as whether you want to surround the line number with a border.

Customize Hotspot

Because a different font or size can change the amount of space required for the item number, the hotspot can be automatically adjusted to the size of the item number in the new font.

Result

You can save the modified drawing as a PNG (for colored content) or TIFF/G4 (for black and white content) and use it in your electronic spare parts catalogue.

Main
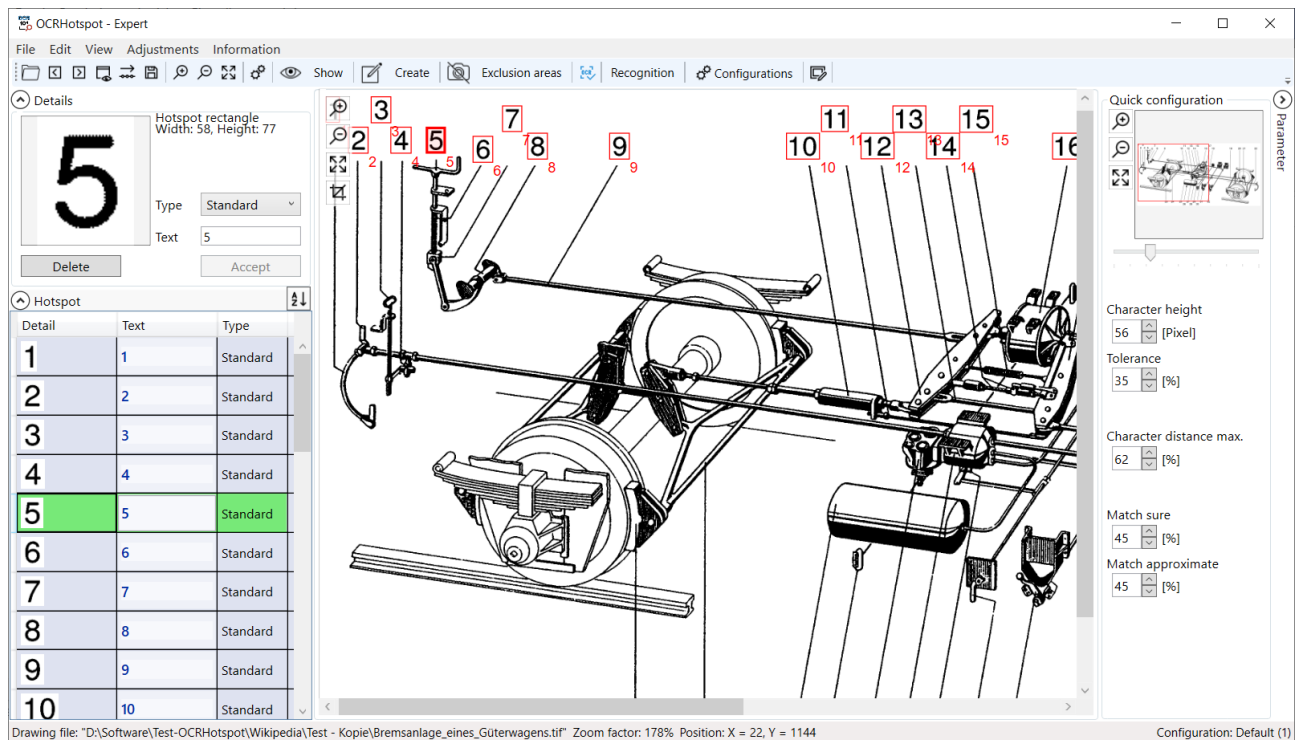
Menu Items

File Menu

Menu	Function	Note
File open	Displays an "Open File" dialog where a drawing file can be selected. The selected file will be loaded and displayed. If a corresponding hotspot file exists in one of the supported formats (".hspx", ".sen", "csv"), it will also be loaded and the hotspots defined in it will be displayed.	Supported file types: ".tif", ".png", ".jpg" and ".gif"
Next file	Loads the next drawing file from the same directory as the one currently displayed.	
Previous file	Loads the previous drawing file from the same directory as the one currently displayed.	

Menu	Function	Note
Properties	Displays the properties of the currently loaded drawing file, including size, resolution, color depth, and compression.	
Save hotspot file	Saves the currently defined hotspots of the displayed drawing in one of the defined hotspot formats as an attribute file for that drawing.	When switching to another drawing, the corresponding hotspot file is automatically saved (on demand).
Close	Quit OCRHotspot.	In the case of unsaved changes, a notification and the possibility to save them will be made.

Edit Menu

Menu	Function	Note
Save as TIFF / G4	Converts the currently loaded drawing into a black and white image (if necessary) and saves it in TIFF / Group 4 format (CCITT Group 4).	This format has a very good ratio of data volume and quality in black and white drawings and is suitable for the creation of spare parts catalogs. The original file will be preserved and renamed.
Rotate by +90°	Rotates the currently displayed drawing 90° clockwise. Any existing hotspots will also be rotated.	Useful for the presence of rotated position numbers on drawings. The original file will be preserved and renamed.
Rotate by -90°	Rotates the currently displayed drawing 90° counterclockwise. Any existing hotspots will also be rotated.	Useful for the presence of rotated position numbers on drawings. The original file will be preserved and renamed.

Menu	Function	Note
Convert hotspot files	Opens a directory selection dialog. For all hotspot files in this directory (if desired also in all subdirectories), hotspot files are created in the formats defined under "Adjustments→Settings".	Attention: Hotspot files that may already exist in the target format will be overwritten.
Convert PDF files	Opens a dialog with the possibility to select the resolution and pixel format in which PDF files are to be converted. A checkbox allows you to specify whether all pages of the PDF files should be converted. You will then see the selection of a directory in which the PDF files are contained.	
Multi-Page TIFF	Opens a directory selection dialog. For all multi-page TIFF files found in this directory, individual files with the individual drawing sheets are generated. One hotspot file is generated for each drawing sheet.	
Edit Drawing	Opens a dialog that can be used to control the functions for editing the currently displayed drawing.	The dialog is displayed to the right of the main window.

View Menu

Menu	Function	Note
Zoom +	The currently displayed drawing is enlarged by approx. 10%.	
Zoom -	The currently displayed drawing is reduced by about 10%.	
Fit in	The currently displayed drawing is fitted into the visible window area.	

Adjustments Menu

Menu	Function	Note
Configuration...	Opens the *Configuration dialog*.	

Menu	Function	Note
Language	Switching the language of the user interface. Available languages are German and English.	To change the language, the software must be restarted.
Setting	Opens the dialog with the basic *Settings*.	Used to specify the hotspot formats to be used.
Logging	Activates logging mode. Any error messages that may occur are stored in a log file in the "Documents → OCRHotspot" directory.	Facilitates the analysis of errors that have occurred.

Info Menu

Menu	Function	Note
About OCRHotspot	Opens the dialog with information about the software version, etc.	
License	Opens the *License dialog*.	
Online help	Open this user manual.	

Toolbar

Entry	Function	Note
📁	Open file	As in File Menu
‹	Next File	As in File Menu
›	Previous file	As in File Menu
🖵	Properties	As in File Menu
→	Save as TIFF / G4	As in Edit Menu
💾	Save hotspot file	As in File Menu

Entry	Function	Note
🔍⊕	Zoom +	As in View Menu
🔍⊖	Zoom -	As in View Menu
⤢	Dovetail	As in View Menu
⚙	Configuration	Opens the *Configuration dialog*.
👁 Show	Specify which drawing elements should be displayed or highlighted.	Selection: • Elements: all recognized elements are marked and can be selected. • Characters: all elements recognized as possible characters are marked and can be selected. • Hotspots: all defined hotspots are marked and can be selected. • Texts: under each hotspot, the corresponding text (automatically detected or manually entered) is displayed. • Hide hotspots: all areas belonging to the defined hotspots are hidden (white area); this makes it easier to find unrecognized item numbers. • Mask drawing: all drawing elements except the defined hotspots are hidden (white area); This makes it easier to check the correctness of the hotspots.

Entry	Function	Note
✎ Create	Creating hotspots manually	**Selection:** • ▢ Hotspot new: Create hotspots by dragging a rectangle within the drawing area with the right mouse button. Simply clicking with the left mouse button within the drawing creates a hotspot at the mouse position of the same size as the last manually created hotspot before. • ⬡ Polygon new: Create a polygon hotspot of several points by clicking on the respective vertices in the drawing (only useful if the system for creating the spare parts catalogs supports this function). You can use the Remove key to delete the last defined points of the polygon. A polygon must consist of at least three points. • ⊞ Hotspot from objects: Allows you to create hotspots from one or more elements, characters, or hotspots; a surrounding rectangle is formed around all selected elements. • ⬙ Hotspot as rectangle or hotspot as ellipse: Specify whether new hotspots are drawn as a rectangle or as an ellipse (applies to both manually and automatically generated hotspots.

Entry	Function	Note
Exclusion areas	Specify drawing areas inside or outside of which hotspots should be automatically detected.	Selection: • Define area: Set an exclusion area by dragging a rectangle within the drawing area with the left mouse button. • Define exclude area as polygon: Set an exclusion area by creating a polygon (as with polygon hotspots). • Delete all exclusion areas: all currently defined exclusion areas will be deleted. • Exclude area: the defined areas are excluded from automatic detection, alternatively the detection is only performed within the defined ranges. • Size relative: the size of the exclusion areas is calculated relative to the drawing size; alternatively fixed pixel sizes are used.
OCR	Direct call of automatic character recognition with the currently set character size	

Entry	Function	Note
Recognition	Invoking automatic character recognition	Selection: • Character recognition: automatic character recognition is performed with the currently set configuration parameters. • Character recognition with automatic size evaluation: before character recognition, an attempt is made to determine the character size of the position numbers. • Batch recognition: automatic character recognition is performed with the currently set configuration parameters for all drawings in a directory, optionally including the subdirectories. • Batch recognition with automatic size evaluation: in addition, the character size is determined for each drawing before character recognition. • Retain hotspots: existing hotspots are retained, newly recognized hotspots are added (e.g. for drawings with position numbers in different orientations or with very different font sizes).
⚙ Configurations	Opens a list of all currently defined configurations, allows you to switch to a different configuration.	If the currently used configuration has been changed in the meantime, a query is made as to whether the changes should be saved.
🖉	Edit drawing	As in Edit Menu
✓ Accept	Completes a create or edit function and applies the changed values	Available at: • Move or resize a hotspot. • Create or move a polygon hotspot. • Creating a hotspot from objects. • Move or resize the rectangle exclusion area. • Creating or moving a polygon exclusion area.

Entry	Function	Note
✕ Cancel	Cancels a creation or editing function.	Available with all features listed under "Accept", in addition: • Creating hotspots
﹥ Parameter ﹤ Parameter	Opens or closes a display area with the most important configuration parameters and allows you to quickly set these parameters.	The values can be changed by direct input or by buttons within reasonable limits. Hotspots that have already been created are deleted and regenerated due to the changed setting.

Shortcuts

Button or keyboard shortcut	Function	Note
Ctrl-A	Selects all hotspots.	
ESC	Removes the current selection or cancels the current action.	
Return / Enter	Completes the current action or switches to the input mode of the currently selected table row.	
Home / Pos1	Selects the first hotspot in the table.	In combination with Shift key: Expansion of the selection
End	Selects the last hotspot in Table.	In combination with Shift key: Expansion of the selection
Cursor up/down (except in move mode)	Moves selection in table up / down one row.	In combination with Shift key: Expansion of the selection
Page up/down	Moves selection up/down in table page by page.	In combination with Shift key: Expansion of the selection

Button or keyboard shortcut	Function	Note
Delete / Del	Deletes all selected hotspots or exclusion areas.	
Cursor up/down/right/left (while moving an object)	Moves the object 2 pixels in the specified direction.	In combination with Shift and Ctrl keys: Shift by larger values
Ctrl-M	Launches the mode for moving or resizing a hotspot or exclusion area.	
Ctrl-N	Moves to the next drawing in the current directory.	
Ctrl-L	Switches to the previous drawing in the current directory.	
Ctrl-O	Open the file selection dialog.	
Ctrl-R	Automatic character recognition on current drawing.	
Ctrl-S	Automatic character recognition on current drawing with automatic size evaluation.	

Drawing area

Mouse Commands

Mouse command	Function	Note
Left mouse click	Hotspot, character, element, or exclusion area is selected.	In combination with Ctrl key: Extension or reversal of the selection
Double-click with the left mouse button in the area of a hotspot	Opens the *Edit Hotspot dialog*.	

Mouse command	Function	Note
Move the pressed-down left mouse button	Moves current drawing section.	
Drag rectangle with left mouse button	Depending on action: • Create hotspots: creates a new hotspot. • Define exclusion area: specifies a new exclusion area. • Select drawing section: selects drawing section to display and enlarges the drawing accordingly.	
Drag rectangle with right mouse button	Selects hotspots within the area.	Only possible if no object is currently selected.
Right-click (context menu) – At least one hotspot or exclusion area selected	Call of: • Clear hotspot(s) or exclusion area. • Edit Hotspot(s) – *Edit Hotspot dialog*. • Accept hotspot texts: hotspots marked as "approximately" are accepted as valid. • Resize, move.	
Right-click (context menu) - mouse pointer is over an element	Call of: • *Define character size* • New reference character - *Define reference character* dialog	
Rotate the scroll wheel of the mouse while holding down the Ctrl key	Changes the zoom factor of the displayed drawing.	

Table of hotspots

Buttons

Button	Function	Note
Hotspots	Hides or shows table with hotspot	For drawings with a lot of hotspots, it can be useful for performance reasons to hide the table while editing hotspots in the drawing area.
A-Z / Z-A	Reorders the hotspots in the table	

Mouse Commands

Mouse command	Function	Note
Left-click on table row	Table row with hotspot is selected.	In combination with Ctrl key: • Extension or reversal of the selection In combination with Shift key: • Selection of all hotspots between the most recently selected and clicked hotspots
Left-click in the text field of a table row	Edit the text of a hotspot.	Accept the text with the Enter key or cursor up/down
Right-click (context menu) - At least one hotspot selected	Call of: • Delete hotspot(s) • Edit Hotspot(s) - *Edit Hotspot* dialog • Accept hotspot texts: hotspots marked as "approximately" are accepted as valid	

Details view

Button

Button	Function	Note
Details	Hides or shows an area of hotspot details	Hide if you want to edit via the table

Window Elements

Window element	Function	Note
Image	Display of the drawing section of the currently selected object	Possible objects: • Hotspot • Polygon hotspot • Exclusion area • Character • Element
Information to the right of the image	Display of information about the selected object	Information: • Type • Size • Recognition quality (characters) • Shape (Hotspot)
Type	Select the type for hotspots: "Standard" or "Assembly"	Can be used to define different types of hotspots that result in different behavior in the spare parts catalog.
Text	Entering the text associated with the hotspot	
Accept	Applies the changed data of the hotspot	Alternatively: Enter
Delete	Deletes the selected hotspot or exclusion area	

Pan window and zooming

Example
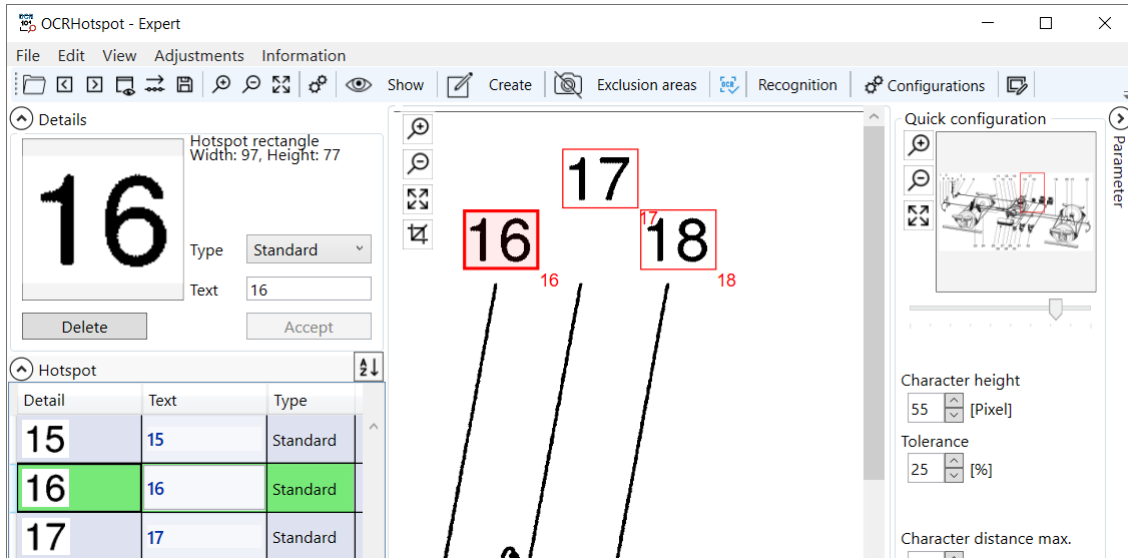
Function

Pan window

The pan window is located in the "Quick configuration" section on the right side of the program window. This area can be displayed below the toolbar via "< Parameters".

The pan window is used to navigate larger drawings.

Zoom

The buttons to enlarge the currently displayed drawing are located in the upper left area of the drawing window, as well as to the left of the pan window.

Window Elements

Pan window

Window element	Function	Note
Slider	Changes the zoom factor between 1 and 10.	

Window element	Function	Note
Drawing	The section of the drawing currently displayed in the drawing window is marked by a red rectangle. By dragging and holding down the left mouse button, you can move the section.	

Zoom

Window element	Function	Note
⊕ (zoom in)	The currently displayed drawing is enlarged by approx. 10%.	Maximum zoom: factor 10
⊖ (zoom out)	The currently displayed drawing is reduced by about 10%.	
⤢ (fit)	The currently displayed drawing is fitted into the visible window area.	
⛶ (crop)	Selection of a drawing area to be enlarged.	

More Dialogues

Define character size

Example
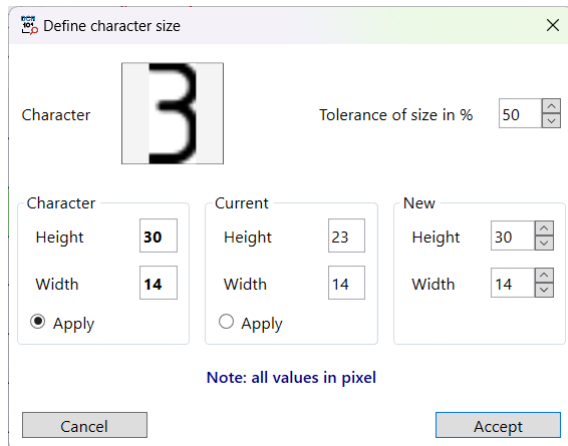
Function

In the "Define Character Size" dialog, you can specify which elements of the drawing should be recognized as possible characters. For this purpose, the values for height and width, as well as a percentage tolerance value, are used.

Once the character size has been set, only those elements whose dimensions match the specified height and width within the selected tolerance range are interpreted as "characters".

Feature

The height-to-width ratio is roughly the same for digits 2 through 9 for most fonts. Only the digit "1" usually has a smaller width than the others. When interpreting elements as characters, this is taken into account, i.e. if a character recognized as "1" is a smaller width, a smaller width is considered valid.

The same applies to special characters, such as "+", "-", ".", etc., whose widths or heights differ significantly from those of the digits.

Window Elements

Window Elements	Function	Note
Character	Detail of the drawing with the selected character	Only drawing elements with a maximum size of 128 x 128 pixels can be selected.
Character	The height and width of the selected character are applied.	
Current	Height and width settings from the currently selected configuration	
New	Depending on your selection: • Values " Character" • Values "Current" • Manually entered values in the Height and Width fields	
Accept	The values under "New" are transferred to the current configuration and used for future hotspot generation.	
Cancel	The previous values of the current configuration remain unchanged.	

Define reference character

Example
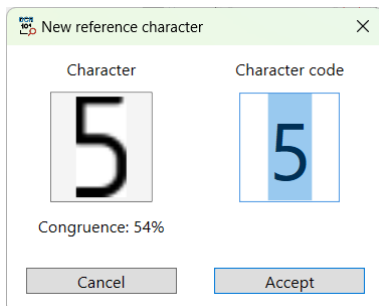
Function

In the "New reference character" dialog, you can extend the automatic character recognition by an additional character or by another example copy of an existing character.

By defining an element of a drawing that corresponds to a recognizable character as a reference character, you train character recognition to recognize that character.

You can define one or more example copies for a character code, such as "9". All reference characters of a configuration that have already been defined are displayed in the *Configuration dialog* displayed.

Window Elements

Window Elements	Function	Note
Character	Detail of the drawing with the selected character	Only drawing elements with a maximum size of 128 x 128 pixels can be selected.
Character code	If the character is recognized based on existing reference characters, the corresponding character code is entered here, otherwise a "?". If the correct character code is not entered, correct it by typing a character on the keyboard. ⚠ Depending on the license used, either only digits or arbitrary characters can be used.	
Congruence	If the character was recognized based on pre-existing reference characters, the degree of correspondence with the recognized character is indicated here.	

Window Elements	Function	Note
Accept	If no reference character has yet been defined for the entered character code, a new reference character is created for this character code. The image shown in "Characters" is stored as an example copy of the reference character for this character code. The data is transferred to the current configuration and used for future character recognition.	
Cancel	The previous values of the current configuration remain unchanged.	

Reference characters

You can use the following types of reference characters with OCRHotspot:

Type	Examples	Note
Digits	0 1 2 3 4 5 6 7 8 9	By using digits exclusively, you will get the best recognition results.
Capital letters	A B C ... X Y Z	A reliable distinction between "0" (digit) and "O" (letter) as well as "1" and "I" cannot be guaranteed.
Special character	+ - * # . , _ < > [ ] { } ( )	For these special characters, OCRHotspot considers the sometimes significantly different heights and widths compared to numbers and capital letters. Since the display of these characters differs greatly in some fonts, it is not always possible to guarantee reliable recognition.
Other characters	Lowercase letters, other special characters	Not recommended: The recognition of these characters is not guaranteed.

Edit Hotspot

Example
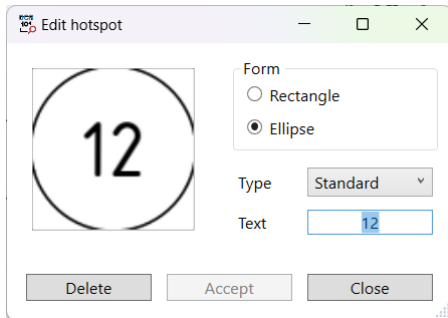
Function

In the "Edit Hotspot" dialog, you can view and change data from one or more hotspots.

If only one hotspot is selected, its current properties are displayed.

If more than one hotspot is selected, the values of the properties are not preset. The changed data will be applied to all hotspots.

Window Elements

Window Elements	Function	Note
Hotspot	Section of the drawing with the selected hotspot	Remains blank when multiple hotspots are selected.
Form	Toggle between a hotspot in the shape of a rectangle or in the shape of an ellipse	The ellipse property is only supported by the application-neutral XML file data format ".hspx".
Type	Toggle between the possible values "Standard" and "Module"	
Text	Related text, typically an item number	
Accept	The selected properties are applied to all selected hotspots.	
Cancel	The previous values of the hotspot(s) remain unchanged.	

Configuration dialog

Example
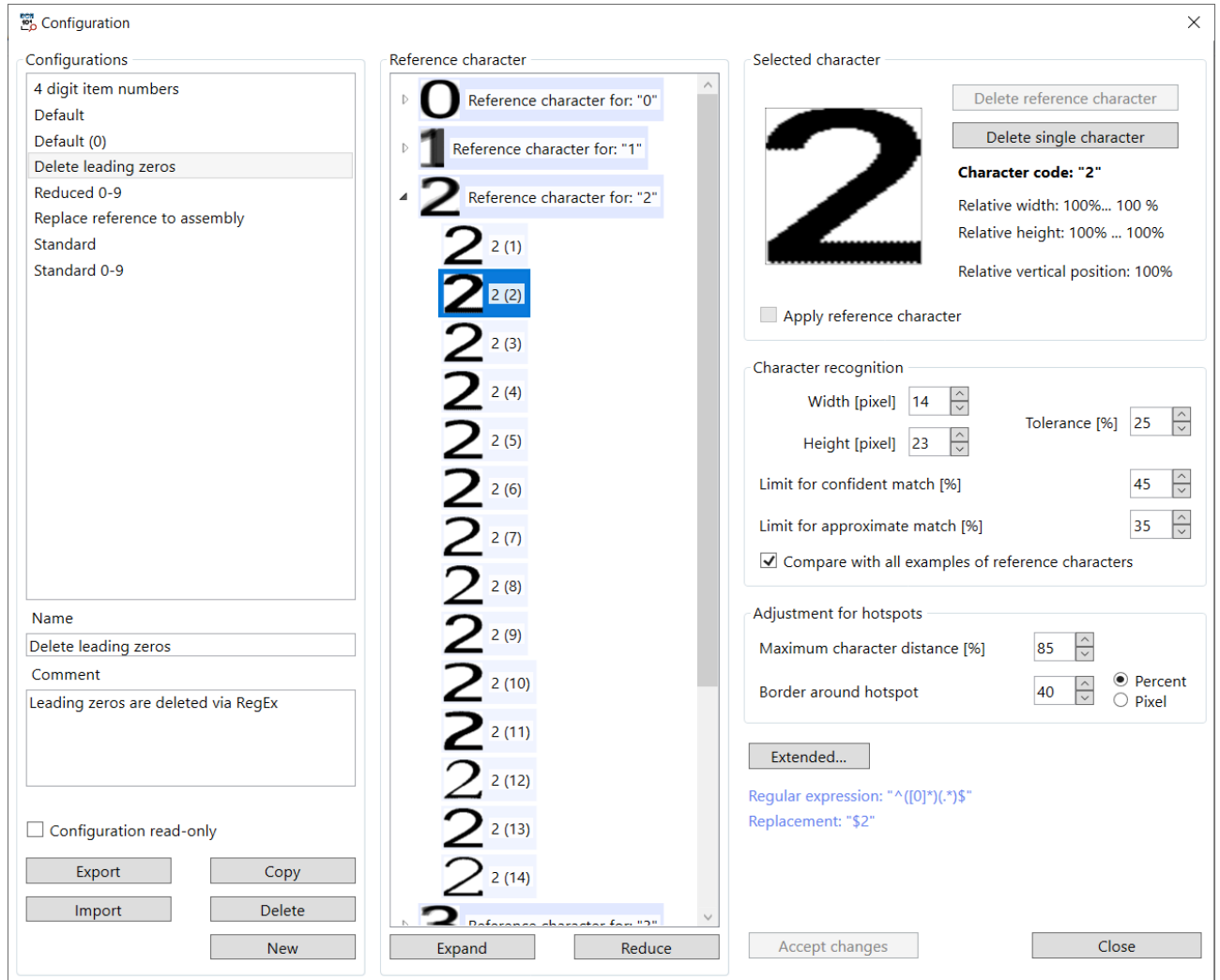
Function

In the "Configuration" dialog, you can switch between the existing configurations and create, change, or delete configurations.

The currently selected configuration controls the process of automatic hotspot generation.

By using different configurations, you can adapt the automatic hotspot generation to different types of drawings.

OCRHotspot provides a default configuration "Default", which is sufficient for several use cases.

Area "Configurations"

In this area, you can switch between existing configurations, create new configurations, or delete existing configurations.

Window Elements

Window Elements	Function	Note
List of configurations	Display of all existing configurations, select the desired configuration by clicking on them	All configurations are stored in a file "OCRHotspot.ocrx" in the directory "Documents\OCRHotspot".
Name	Configuration naming, can be changed in this field	
Comment	Additional note about a configuration, can be changed in this field	
Configuration read-only	Makes this configuration read-only. The configuration cannot be changed as long as it is read-only.	Use this option to protect completed configurations from accidental changes.
Export	The currently selected configuration will be exported and stored in a ".ocrx" file	You can use it to save completed configurations or transfer them to another workstation.
Import	A previously exported configuration is read from a ".ocrx" file and added to the existing configurations.	
Delete	Deletes the currently selected configuration.	If you have accidentally deleted a configuration, you can restore it from an automatically created backup file in the "Documents\OCRHotspot" directory.

Window Elements	Function	Note
Copy	Creates a copy of the currently selected configuration.	
New	Creates a new configuration derived from the standard configuration that came with it.	The default configuration "Default" is first searched in the file "OCRHotspot.ocrx" in the directory "Documents\OCRHotspot". You can use it to define your own default configuration. If it is not there, the search will continue in the "Default.ocrx" file in the installation directory of the software.

Area "Reference characters"

This pane displays all the reference characters defined for a configuration, as well as the sample copies of the reference characters.

Window Elements

Window Elements	Function	Note
Tree with reference characters	The tree contains one main entry for each reference character, i.e. for each different character code. In the child entries of a reference character, all example instances for that reference character (at least one) are shown. The following actions are possible: • Select a reference mark or sample copy: by mouse click or with cursor keys • Expand or collapse tree nodes: by mouse click or with cursor keys • Delete Currently Selected Reference Character or Sample Item: Remove button	Deleting the last sample instance for a reference character also deletes the associated reference character.

Window Elements	Function	Note
Expand	All entries are expanded, all sample copies are displayed.	
Reduce	All entries are collapsed, only the reference characters with the images combined from the sample copies remain visible.	

Area "Selected character"

This area displays the currently selected reference character or sample item.

Window Elements

Window Elements	Function	Note
Picture with characters	Displays the image of a sample instance or a combination of the sample instances of a reference character.	
Delete reference character	Deletes the currently selected reference character with all associated sample copies.	
Delete single character	Deletes the currently selected sample instance.	Deleting the last sample instance for a reference character also deletes the associated reference character.

Window Elements	Function	Note
Information about the character	Information about the currently displayed reference character is displayed: • Associated Character Code • Relative sizes and position in relation to "standard characters" with typical size	The digits "2" – "9" have similar width-to-height ratios in most fonts. The digit "1", on the other hand, is narrower than the other digits in most fonts. Special characters such as "+", "-", "_" or "." also have different proportions or distances from the baseline. In the case of automatic hotspot generation, these deviations are considered as far as possible. However, due to sometimes significant differences in the individual fonts, it is easier for these characters to be misrecognized.
Apply reference character	This checkbox can be used to deactivate a reference character included in the configuration. It remains in the configuration but is not used for automatic character recognition.	

Area "Character recognition"

In this area, parameters that are important for automatic character recognition can be changed.

You can also adjust most of these parameters via the "Quick configuration" in the main window in the "Parameters" section.

Window Elements

Window Elements	Function	Note
Width	Specifies the width of elements to be recognized as valid.	
Height	Specifies the height of elements to be recognized as valid.	

Window Elements	Function	Note
Tolerance	Specifies the tolerance for the height and width values in the range of which elements should be recognized as valid.	Example: • Width 20 pixels • Height 30 pixels • Tolerance 25% Gives the permissible size range: • Width 16 – 25 pixels • Height 24 – 38 pixels
Limit for confident match	The "Match" value is determined from the discrepancies between a reference character or sample instances and an element of the drawing. 100% denotes an exact match. You use this value to determine the percentage at which character recognition is to be accepted as "secure".	
Limit for approximate match	You use this value to determine the percentage at which character recognition should be assumed to be "likely". Characters whose match value is below this limit are not recognized as valid. Characters whose value of "Match" is between the two values for "confident" and "approximate" match are indicated by a prefixed question mark in the hotspot texts, e.g. "?8".	If the two values for "certain" and "approximate" match are identical, no characters are assumed to be "likely". The value for "approximately" must not be higher than the value for "certain".
Perform a comparison with all individual reference characters	Specifies whether automatic character recognition compares with each individual sample instance, or only with the image combined from the sample instances.	The comparison with each individual sample specimen allows for better recognition quality, but - depending on the number of sample instances – may require significantly more computing time.

Area "Adjustments for hotspots"

In this area, parameters that are relevant for the automatic generation of hotspots can be changed.

Window Elements

Window Elements	Function	Note
Maximum character distance	Specifies the relative distance between two characters to be interpreted as related text for a single hotspot.	Values that are too large lead to an unintentional merging of hotspots, and values that are too small lead to the creation of separate hotspots for related characters. Fine-tuning this value is necessary if position numbers are close together in the drawings and at the same time the spacing between characters within a position number is relatively large. This problem applies in particular to fonts in which the number "1" is very narrow, but the characters are displayed with uniform spacing (so-called "non-proportional font").
Border around hotspot	Typically, a hotspot should not only contain exactly the corresponding characters, but also a certain tolerance range around the characters. This makes it easier for the user of a spare parts catalog to select the hotspots.	
Percent / pixel	Specifies whether the values in "Border around hotspot" are absolute (in pixels) or relative (as a percentage of character height).	

Other elements

Window Elements

Window Elements	Function	Note
Extended...	Opens the *Extended configuration* dialog	Specific options for controlling automatic hotspot generation, e.g. via regular expressions

Window Elements	Function	Note
About regular expressions	If available, the values from the advanced configuration are displayed	
Accept changes	Saves all changes made to the current configuration	
Close	Closes the dialog without saving any changes to the configuration	

Extended Configuration

Example

The setting shown in the example removes leading zeros from position numbers, and only considers position numbers in frames.

Regular expressions – functions

In the "Extended configuration" dialog, you can use regular expressions to specify the permissible syntax of automatically generated hotspots or modify the texts of these hotspots.

Variant 1: Specifying allowed text strings

If only the "Regular expression – Source" field is populated, you use it to set the allowed strings for hotspots.

Only hotspots whose detected text matches this expression will be applied.

Variant 2: Substitution of strings

If the "Regular expression – replacement" field is also populated, you use it to specify how strings that are recognized as valid are to be modified.

Texts from hotspots that are recognized as valid by "Regular expression – source" are automatically changed via the replacement expression.

The texts of other hotspots remain unchanged.

Learn more

For details on regular expressions, see *Using Regular Expressions* as well as *Regular Expressions*.

Window Elements

Window Elements	Function	Note
Regular expression – source	Regular expression to check validity	
Regular expression - Replacement	Replacement expression for modifying a text	
Test character string	Enter any text here to check the effects of validation and replacement.	
Result of evaluation	Test string or replacement result detected as valid	
Accept	The entered values for regular expressions are copied to the current configuration.	
Cancel	The previous values for regular expressions remain unchanged.	

Special treatment – functions

For certain cases, additional parameters can be used to optimize hotspot detection.

Window Elements

Window Elements	Function	Note
Split wider elements	Can be used to separate elements that are close to each other.	Especially with blurred characters or low resolution.

Window Elements	Function	Note
Consider lower case letters	Lowercase letters can be entered as reference characters, considering different size ratios.	The recognition of lower-case letters is subject to a relatively high error rate.
Greater distance at '1'	Since the '1' is usually narrower than other digits, the distance to other characters in so-called "non-proportional fonts" can be significantly larger – and thus lead to confusion with neighboring position numbers.	
Use only positions numbers in frames	Only position numbers that are within closed areas (circles, rectangles) are considered.	Very helpful if drawings are created accordingly.
Limit for distinction black and white	Used to distinguish pixels in drawings that contain grayscale. In this context, • '0': black • '255': white	Typical Value: 192
Special codes for configuration	Possibility to influence the predefined behavior of OCRHotspot by means of XML-encoded parameters.	Possible parameters are displayed as help text.

Using Regular Expressions

Regular Expression to check validity

Only hotspots whose text matches the configured regular expression will be applied.

Important elements:

Element	Meaning
^	Start of text
$	End of text
( )	Group, used in substitutions
|	Or, several alternatives are valid
?	Quantity: zero or once
+	Quantity: at least once
*	Quantity: any number of times
{<n>}	Allowed number: exactly n times
{<n,m>}	Allowed number: at least n times, at most m times
\d	Digit
[^\d]	No digit
[<Characters>]	Description for a character
[<Characters from>-<Characters to>]	Description for a character from the "Characters from" to "Characters to" range Examples [0-9] exactly one digit [a-zA-Z] Lowercase or uppercase letter
.	Any character

Substitution of regular expressions

If the regular expression for validation is correct, the text of the hotspot is replaced by the replacement expression.

Otherwise, the hotspot text will be copied as is.

Important elements:

Element	Meaning
$0	Entire Expression
$<n>	nth group of regular expression, denoted by "(..)"; e.g., "$1"

Examples

Regular Expressions for validation check

Regular expression	Meaning	Examples valid	Invalid Examples
^[\d]{1,3}$	The text may consist of 1 to 3 digits.	123, 999, 000	0123, 99, 12A, 123A
^[\d]{1,2}[A-Z]?$	The text may consist of 1 to 2 digits, optionally followed by one capital letter.	99, 12A	123, A9, 77BT

Substitutions

Regular expression	Substitution	Meaning	Examples of substitution	No substitution
^([0]*)(.*)$	$2	Leading zeros are deleted.	001 → 1 Phone 0999 → 999 0A1 A1 →	1, 10, A00A
^(\d{2})(\d{2})$	$1-$2	Four-digit numbers are split into two blocks separated by a hyphen.	Item 1234 → 12-34	123, 12345, 123A

Further information

Further information on the use of regular expressions can be found on the Internet, e.g. at
https://en.wikipedia.org/wiki/Regular_expression

Edit Drawing - Replace Position Numbers

Example
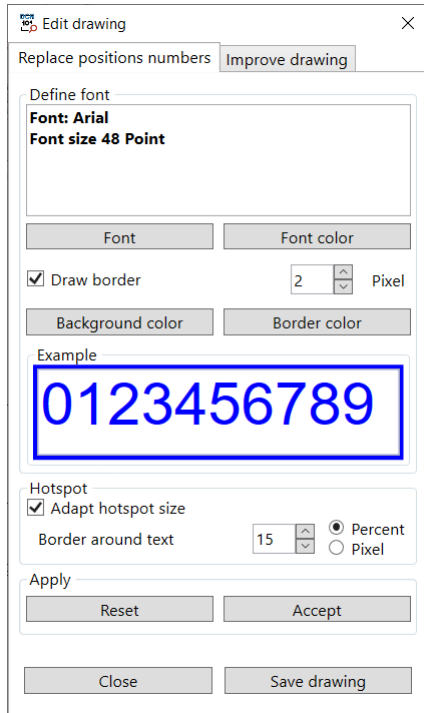
Function

You can use the "Replace position numbers" dialog to overwrite the existing position numbers at the locations on the drawing defined as hotspots.

Window Elements

Window Elements	Function	Note
Font	Selects the font family, font size, and font attributes "bold" and "italic".	
Font color	Specifies the color of the characters.	
Draw border	Specifies whether a border should be drawn around the item numbers.	The numeric value for "Pixel" indicates the line width of the border.

Window Elements	Function	Note
Border color	Specifies the color of the border.	
Background color	Specifies the color of the background of the rewritten position numbers.	
Adapt hotspot size	Specifies whether to maintain the original size of the hotspots or to adjust them to the dimensions of the rewritten position numbers in the selected font.	Usually useful
Border around text	Specifies how far the hotspot should extend beyond the text area.	
Percent/pixel	Specifies whether the numeric value is to be interpreted relative to the size of the font area or absolute in pixels.	A low value or "0" makes sense here
Accept	Applies the set values to the currently displayed drawing and replaces the position numbers at the hotspots with new position numbers in the specified font and with the set colors.	
Reset	Discards the changes made and restores the original drawing.	
Save drawing	Saves the drawing to a new file. The original file will be renamed and will remain as a backup file. Possible file formats: • TIFF: for black and white drawings • PNG: for drawings with colored elements	
Close	Closes the dialog	If changes are not saved, a request will be made

Settings

Example
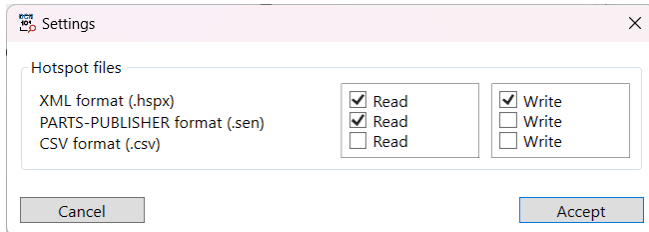
Function

In the "Settings" dialog, you can specify which of the possible hotspot formats you want to use.

For each of the three supported hotspot file formats, you can specify whether you want that format to be read or written.

For a description of the possible hotspot formats, see *Hotspot Files*.

Window Elements

Window Elements	Function	Note
XML format (.hspx)	Selects the application-neutral XML format.	
PARTS-PUBLISHER Format (.sen)	Selects the format of the hotspot files for PARTS-PUBLISHER (Quanos).	
CSV format (.csv)	Selects a format for "comma-separated" text files; commonly referred to as a "CSV file".	Depending on the settings in the configuration, the file name extension may differ.
Read	When a drawing file is opened, an attempt is made to read an associated hotspot file in the specified format.	The first hotspot file found from the series of formats marked "Read" is used.

Window Elements	Function	Note
Write	When the hotspot data is written, hotspot files are saved in all selected formats.	A format that is selected for "Write" must also be selected for "Read".
Accept	The set values are stored in the registry area of the logged in user.	
Cancel	The previous values remain unchanged.	

License management

View License

Example

Function

In the "License" dialog, the values of your currently existing license are displayed.

Window Elements

Window Elements	Function	Note
Status / License file	Displays the currently used license file. If the license is not recognized as valid, the reason will be displayed.	

Window Elements	Function	Note
License type	Currently activated license type	Possible values: • Demo • Standard • Professional • Expert
Version	Validity of the license for software and version	
Serial number	Serial number of your license	
Valid until	Expiration date for a time-limited license	
Customer	Specifies the customer to whom this license was issued.	
Binding	Type of binding of the license to properties of your workstation	Possible values: • Windows System UUID • Host name • MAC ID of the network port
Value	Value of the property used	
Request new license	Opens the dialog for requesting a new license.	See *Request License*
Read license File	Opens a dialog that can be used to apply a new license file.	The license file is stored in the "ProgramData" directory under "OCRHotspot"
Close	Closes the dialog.	

Request License

Example

Function

In the "Request License" dialog, you can request a new license for OCRHotspot.

The values of the currently used license file are copied and displayed.

Window Elements

Window Elements	Function	Note
License type	Desired license type	Possible values: • Demo • Standard • Professional • Expert
New validity period	Expiration date for a time-limited or perpetual license	
Customer	Please enter your contact details here and any other comments you may have.	
Binding	Select which type of binding of the license to properties of your workstation you prefer. Depending on your computer constellation and the selected license type, not all properties may be selectable.	Possible values: • Windows System UUID • Host name • MAC address (of the network port)
Cause	Reason for License Request	Possible values: • Request a quote • Additional license • Modification of computer data • Change license type • Extension of validity
Via email	Your default mail program is called up (via "mailto:") and an e-mail is created to "info@wm-itsolutions.com". In the body area of the email, a text block with the data from the dialog is inserted.	
Copy to clipboard	A block of text with the data from the dialog is copied to the clipboard. Include this block of text in an email requesting a new license.	

Window Elements	Function	Note
Creating file	Creates a text file with the data from the dialog. Attach this text file to an email requesting a new license.	
Close	Closes the dialog	

Other features

OCRHotspot can also make your job easier with a few more features.

Drag & Drop

As an alternative to selecting a drawing file via the "Open File" dialog, you can also copy and open a drawing file from Windows Explorer via "Drag & Drop" in OCRHotspot.

Status bar

The status bar displays some helpful information.

Field	Meaning	Note
Drawing	Name of the currently displayed drawing file	Double-click on this field to open the "Open File" dialog
Zoom	Displays the currently set zoom factor (100% corresponds to the display of the entire drawing)	Double-clicking on this field causes the "Fit drawing" function to be called, the magnification factor is set to 100%
Position	Indicates where the mouse pointer is currently located in the drawing. The value is given in drawing coordinates and refers to the upper-left corner of the drawing.	
Save changes without prompt	When changing a drawing, the currently generated hotspots are saved without a security query.	
Configuration	Displays the currently selected configuration. If changes have been made to the configuration that have not yet been saved, this field is highlighted	Double-click on this field to open the *Configuration dialog*

Possibilities and limitations

General

As already mentioned in *Getting Started* , the principle of "garbage in, garbage out" also applies to OCRHotspot. The better you pay attention to compliance with certain rules when creating drawings (or have done so in the past), the better the detection rates for automatic hotspot generation and the lower the post-processing effort will be.

Drawing quality

When creating drawings, there are several criteria that affect the quality of automatic hotspot detection.

File format

In principle, OCRHotspot processes different pixel formats. However, certain data formats are more suitable than others.

The best results can be achieved with black-and-white drawings that have been saved losslessly.

File format	Colours	Suitability	Note
TIFF Group 4	2	good	Best lossless compression for black and white drawings; must be converted before being displayed in the browser – usually to PNG.
TIFF LZW	any	good	Compression less good, not processable by a number of programs
PNG	any	very good	Generally useful, especially when colored drawings are needed.
JPEG	any	less	Detection errors due to lossy compression; is suitable, for example, for overview drawings with manual hotspot definition
GIF	256	less	Outdated, not useful for technical drawings

Resolution, character size

The maximum character size that OCRHotspot supports is 128 pixels.

Character sizes of less than about 20 pixels are harder to recognize and therefore not recommended.

A range between 40 and 60 pixels is optimal, both for the quality of character recognition and for the ratio of data volume to display quality.

If possible, the resolution of the drawings during their creation should be controlled in such a way that character sizes of the specified order of magnitude are generated.

Character set used

The selection of the character set for position numbers is also relevant for the quality of character recognition.

Keep the following points in mind:

- If possible, use the same character set for item numbers on all drawings.
- Don't use exotic character sets.
- Don't use fonts with very narrow lines, but rather "wider" characters.

For best results, use purely numeric item numbers. The use of letters and special characters is possible, but this increases the risk of errors in automatic recognition. Similar characters such as "0" (zero) and "O" (capital letter O) or "1" and "I" may not be reliably distinguished. Compound characters such as "=" or ":" are not supported.

Consistency in drawing creation

As mentioned earlier, you should use the same character set for item numbers if possible. However, it is not a problem if different – and distinguishable – character sets are used for different types of drawings. This handles well with multiple configurations.

On the other hand, it is very helpful to choose a uniform font size for item numbers, which differs significantly from other characters (dimensions, drawing header, etc.). In this way, the unwanted recognition of texts other than item numbers can be prevented.

Item numbers should also have a uniform orientation.

If the drawings contain frames and/or drawing header areas, they should be of uniform size and position to hide these areas from detection.

Position numbers in circles

Currently, position numbers are often displayed within circles (sometimes rectangles) in exploded views. In these cases, the option "Only position numbers in frames" from the extended configuration area can ensure a very secure hotspot generation.

Creation of the drawings

Naturally, drawings generated directly electronically from a creation system will be best suited for further processing.

With older, scanned drawings, the risk of erroneous recognition increases significantly.

The recognition of handwritten item numbers is not supported by OCRHotspot.

Exemption and spacing of item numbers

To ensure that there are as few false detections as possible, the following important notes should also be observed when creating the drawings:

- The characters of the item numbers must be "cut out", i.e. no drawing elements may touch the characters. Occasionally, it can be observed that the connecting lines between an item number and the marked drawing element touch the item numbers. In this case, automatic detection is not possible.
- Item numbers usually consist of one or more characters. It is important to note that the minimum spacing between adjacent item numbers is significantly greater than the maximum spacing between the individual characters of a position number. Difficulties can arise in particular with the usually narrower digit "1" and the use of fixed-width fonts.

Configuration

Default

The default configuration includes a set of common fonts, which in many cases is sufficient for high-quality recognition.

The values for safe and approximate match, as well as for tolerance and maximum character spacing, are preset to match typical drawings.

The character size must be set either once using a typical character or via "automatic character size evaluation".

Options for customization of the configuration

You can influence the quality of automatic character recognition via various settings in the configuration:

Parameter	Effect	Note
Reference character	The more closely the configured reference characters match the fonts used in the drawings, the greater the quality of character recognition.	
Multiple reference characters	If several examples are defined for each reference character, different fonts can be recognized.	However, if you use too many examples per reference character, the recognition quality can suffer, or the processing time can increase significantly.
Character size and tolerance	The individual characters of the item numbers usually have a uniform font size. The more precisely the font size is narrowed down, the easier it is to distinguish item numbers from other text or drawing elements.	If the drawings are not created consistently, the character sizes may differ between the different drawings. This can be compensated for by specifying a larger tolerance value. However, the detection quality may be impaired as a result.
Limit for sure and approximate match	The higher the sure match value, the fewer items are incorrectly recognized as valid characters. However, valid characters may not be interpreted as valid either. A lower approximate match value will also accept characters whose validity is uncertain. These characters can then be manually deleted, accepted as valid or corrected.	
Comparison with all examples of reference characters	This determines whether the detection checks each individual example of the reference characters for consistency (more reliable but slower) or only the averages composed of the individual examples (faster but less certain)	

Parameter	Effect	Note
Maximum character distance	This defines how far apart individual characters can be from each other in order to be recognized as a related item number.	If the value is too large, several adjacent item numbers may be combined into a single one, and if the value is too small, multi-digit item numbers containing "1" may be interpreted as separate item numbers.
Regular expression	In the extended configuration, a regular expression can be used to define which syntax should be allowed for item numbers.	This prevents the unwanted interpretation of other text elements in a drawing as hotspots.
Special treatment	More precise control of hotspot detection via special parameters.	e.g.: use of item numbers surrounded by frames.
Exclusion areas	You can define one or more exclusion areas within or outside of which you want to ignore the characters you want.	This allows you to hide texts from uniformly created drawing headers, for example.

Recommendations – Typical Example Cases

Example 1: Large quantities of inhomogeneous legacy data, medium quality standards

Let's say you have an extensive drawing archive (a few thousand drawing files) that you want to use to create electronic spare parts catalogs. As a rule, the drawings have been generated over the course of many years, by different creators and with different creation systems.

They now face a number of challenges:

- Some of the drawings may be scanned with low quality, some item numbers may be difficult to read or smudged.
- Due to the different creation history, the item numbers are drawn in different fonts and sizes.
- Some item numbers are too close together or are touched by other drawing elements.
- In addition to the relevant item numbers, there are other numbers or characters on the drawings, e.g. in the drawing header or as dimensions.

If you were to set all hotspots manually, you would have to calculate several minutes of time per drawing, including quality control.

If your quality requirements are limited and you can accept a certain percentage of missing or faulty hotspots, there are the following options:

Variant 1: Fully automatic hotspot generation with OCRHotspot

Procedure:

- Use the included "Default" configuration, which includes reference characters from several common fonts.
- Use automatic size detection for item numbers.
- For character recognition, use the variant "Compare with all individual reference characters".

Depending on the quality of the drawings, you can expect a recognition rate of 70% - 90%.

This method requires the most computing power and may require a longer runtime, depending on the number of drawings and the size of the drawing.

Variant 2: Hotspot generation in service

Procedure:

- You provide us with your entire stock of drawings.
- We process your stock of drawings in the manner described under "Variant 1".

- We will provide you with the result in the form of hotspot files (at a pre-agreed fixed price).

Example 2: Large amounts of legacy data, higher quality standards

With a similar starting point as in example 1, you want to achieve a significantly higher quality of the hotspots.

A purely automatic hotspot generation is not sufficient here, some preparatory and follow-up work is required, the extent of which depends not only on the initial data but also on the desired quality level.

Variant 1: Pre-sorting and use of different configurations

Presort:

- Try grouping the drawing inventory so that similarly created drawings are grouped together in their own directories.
- File naming conventions, creation date or source directories may help you with grouping, it may be useful to sort the drawing files "visually".

Automatic hotspot generation:

- For each of the identified drawing groups, create an individual configuration that is as well adapted as possible (reference characters, character size, tolerance range, exclusion areas for drawing headers, etc.).
- For each drawing group, perform automatic hotspot generation with the appropriate configuration.

Rework:

- Load all automatically edited drawings in order with OCRHotspot.
- If the quality of the automatic recognition is significantly worse than expected for this type of drawing, you may be able to noticeably improve the recognition rate in the quick configuration under "Parameters" by slightly varying individual parameters.
- Check item numbers with an "approximate" match (indicated by "?.." and color highlighting) and delete, apply, or correct them.
- Perform a visual inspection of the detected hotspots. This can be made easier by the options to alternatively hide the hotspots or the rest of the drawing elements. This makes it easier for you to determine if item numbers have been missed, or if all recognized item numbers are correct.

Variant 2: Hotspot generation in service

Procedure:

- You provide us with your entire stock of drawings.

- We analyze the stock of drawings and provide you with an offer via hotspot generation with a desired quality level (e.g. a quality level of 99% means that for every 99 correctly created hotspots, there will be at most one missing or incorrect hotspot).
- We process your stock of drawings in the manner described under "Variant 1".
- We will provide you with the result in the form of hotspot files (at a pre-agreed fixed price).

Example 3: Continuous hotspot generation with a uniform method of drawing creation

In your company, there is an established procedure for the creation of drawings for spare parts catalogs, which is adhered to by all graphic designers or model designers involved.

You define a process in which each newly created or modified drawing is automatically provided with hotspots.

Definition of a suitable configuration

Procedure:

- Check the drawing quality recommendations under *Possibilities and limitations* the extent to which the drawings currently being created already meet all the criteria.
- Incorporate any necessary changes into the creation process.
- Create a custom configuration for OCRHotspot for this type of drawing with reference character set, character size, and tolerance, as well as a reasonable "safe match" boundary.
- Collect newly created or changed drawings in a special handover directory and process them cyclically, e.g. weekly.
- Automatically create hotspots based on the customized configuration.
- Check the results.
- In the event of deviations, check the configuration and, if necessary, make adjustments there or arrange for a corresponding correction when creating the drawing.

As soon as this procedure works interactively without interference, you can further automate it by using the "batch operation" of OCRHotspot, e.g. by incorporating hotspot generation as a post-processing step in the creation process of the drawings.

Glossary

List of technical terms used

Term	Explanation
Exclusion area	For each configuration, one or more exclusion areas can be defined, which can be used to exclude certain sections of the drawing from automatic character recognition. Exclusion areas can be either "inclusive" (search only within the scope) or "exclusive" (search outside the scope only). In addition, it can be specified whether the coordinates of the exclusion areas should be "absolute" (i.e. in pixel coordinates, relative to the upper left corner) or "relatively" (percentage, based on the drawing size).
Electronic Spare Parts Catalog	An electronic spare parts catalog is used for easy identification of spare parts, usually supported by graphical navigation via hotspots on the exploded views of the individual assemblies. A software compatible with OCRHotspot for the creation of electronic spare parts catalogs is **SpareParts365** from SpareParts365 GmbH.
Element	An element is a part of a drawing file that could represent a valid character. Criteria: • Freestanding, i.e. no direct connection to other drawing parts • Minimum size of 3 x 3 pixels • Maximum size of 128 x 128 pixels
Hotspot	A hotspot is the area around an item number that is supposed to be "sensitive" in an electronic catalog, i.e. to react to clicking or hovering over it with the mouse. A hotspot is typically slightly larger than the item number itself to make it easier to select with the mouse. A hotspot is usually in the shape of a rectangle. Alternatively, OCRHotspot can also be used to define elliptical or polygon hotspots.

Term	Explanation
Hotspot file	A hotspot file is an attribute file that is created as part of a drawing file. Typically, the hotspot file is located in the same directory as the drawing file and has the same filename, but a different, specific filename extension (e.g. ".hspx", ".csv"). The hotspot file contains an entry for each hotspot on the drawing, which includes the coordinates, the text of the position number, as well as the shape (rectangle, ellipse, polygon) and type (reference to item or reference to assembly).
Hotspot generation	With automatic hotspot generation, the results of automatic character recognition (OCR) are linked to the drawing coordinates of the relevant drawing section.
Configuration	A configuration consists of a set of parameters that control the detection of item numbers on a specific drawing type. A configuration includes the following information: • Set of reference characters, each with one or more examples • Character size and acceptable tolerance • Values for reliable or approximate detection • Maximum spacing of characters within a position number • Regular expression to define valid item numbers • Width of the border around the location numbers that should belong to the area of the hotspot • Exclusion areas defined, if any
OCR	OCR is the abbreviation for "optical character recognition" and refers to a method for recognizing text in pixel graphics. OCRHotspot has a built-in OCR component that specializes in recognizing item numbers in drawings.
Pixel format, pixel drawing	Drawings in pixel format consist of a sequence of individual pixels, which are provided with a color value. A drawing element such as a line is depicted as a sequence of black pixels, as are the individual characters of a position number. The information as to whether a sequence of pixels is a line, a character or another drawing element is no longer available and must be reconstructed using OCR.

Term	Explanation
Position number, item number, ("Callout")	A position number is a sequence of one or more valid characters whose spacing from each other does not exceed a configured maximum value. Typical use cases: • Purely numerical value, 1 - 3 digits; refers to a line in the corresponding BOM • Purely numerical value, 6 - 12 digits; material or order number of a part • Alphanumeric value, possibly including special characters, e.g. as location code on circuit diagrams
Reference characters	A reference character must be defined for each permissible character within position numbers (e.g. for each digit). A reference character includes one or more examples of this character, e.g. from different character sets.
Vector format, vector drawing	Drawings in vector format contain the descriptions of the individual drawing elements, such as line, ellipse, curves, text, etc. A common format for display in vector format is SVG. The use of a tool such as OCRHotspot is usually not necessary for these drawing formats, as texts or position numbers are contained as directly usable data and can thus be used directly for the definition of hotspots.
Character	A character is an element of the drawing that corresponds to one of the reference characters used with sufficient accuracy and is within the currently configured size tolerance for characters.
Character recognition	see OCR. Character recognition is the prerequisite for automatic hotspot generation.
Drawing	OCRHotspot can be used to process different types of drawings: • Exploded view of an assembly with position numbers → best suitability for automatic character recognition • Technical drawing with item numbers → usually requires manual post-processing following automatic character recognition • Photo or illustration → Manual definition of hotspots over drawing areas, independent of position numbers

Term	Explanation
Drawing file	File that contains a drawing in pixel form (as opposed to vector shape). Typical file formats are: • TIFF / Group 4 (CCITT/4) for black and white line drawings • PNG for colored line art • JPEG for photos or photorealistic illustrations
Drawing coordinates	For pixel format drawing files, each point in the drawing (pixel) has an X and a Y coordinate associated with it. The X-coordinate is usually calculated from the left edge of the drawing, the Y-coordinate from the upper edge of the drawing.

Support

If you need support for OCRHotspot, please contact the manufacturer by email at ***mailto:info@wm-itsolutions.com***

Required Information

In order for us to help you in the best possible way, we needed some information.

Topic

What is it about, e.g.:

- Installation
- License
- Configuration
- Detection quality
- Special function

Description

Please describe your request as precisely as possible. If possible, attach screenshots that show the described topic (e.g. error message).

Environment

Please specify the operating system version and any special features of your system configuration.

Drawing file(s)

If you have problems with specific drawing files, you can attach them as an attachment, preferably packed as a ZIP file.

The attachment should not exceed 2 MB, otherwise use a cloud-based file transfer.

Configuration

If there is a question related to a specific configuration, you can save it under "Configuration→Export" and attach it as an attachment (⚠️only from the "Professional" license option).

Otherwise, please use the configuration file "OCRHotspot.ocrx" in the folder "Documents\ OCRHotspot".

Logging Information

If your request refers to a reproducible error message from the program, please activate the logging mode ("Adjustments→Logging") and perform the action that led to the error again.

In the directory "Documents\OCRHotspot\Logfiles" you will now find a file "Log Debug..." which contains information about the error that occurred. Send this file in addition to the information described here.

References

Drawings Used

The drawing used in the example screenshots is from the Wikipedia article *https://de.wikipe-dia.org/wiki/Druckluftbremse_(railway)*.

Link to the drawing:
https://commons.wikimedia.org/wiki/File:Bremsanlage_eines_G%C3%BCterwagens.PNG

Icons

Most of the icons used in OCRHotspot are from *Icons8.*

Trademark

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Download

Current version of OCRHotspot

Version 1.2.24

Download the ZIP file from the provided download directory to your computer and unzip the file in a suitable folder.

Start **OCRHotspot.exe**.

Follow the instructions at *Getting Started* to request your license file.

Release Notes

Version 1.2.24

- Migrating to .NET 8
- Create hotspot only within frames (circles, rectangles)

Version 1.2.23

- Migrating to .NET 7
- Splitting and converting PDF files

Version 1.2.22

- Moving to .NET 6
- Improved handling of narrow digits and characters
- Support for small screen sizes
- "Special codes" in the advanced configuration to override the predefined behavior

Version 1.2.5

- Moving to .NET 5
- Texts with spaces possible
- Improved display of longer hotspot texts
- Improved performance
- Improved detection of related characters and separation from adjacent hotspots

- Batch operation extension to include parameters for paths to the license file and configuration file

Version 1.2.4

- Insecurely detected hotspots can be taken over as valid directly in edit mode
- For hotspot file in CSV format, additional fields configurable for: file name, directory, path name
- Better recognition of characters in very small fonts
- Expanded range of auto-detected fonts
- The size of the areas of the hotspot list (left) and drawing (right) can be changed by a splitter

Version 1.2.2

- Hotspot files in XML format (.hspx) also contain relative coordinates related to the width and height of the respective drawing
- Improved color coding and highlighting of individual elements
- Tooltip within the drawing with information about the element below the mouse pointer