



PlugIn for DpuScan

IrisIcr

Intelligent Character Recognition

Supplement to the DpuScan Reference Manual

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It may happen that a more recent version of this manual for DpuScan is available for download from the Internet. Therefore, it is recommended that you should compare the version by means of the date printed on this page with the version on the Internet. You should use the most up-to-date version of the manual.

The Internet version of this annex to the DpuScan Reference Manual is found on the Web at the following address:

<http://www.jkimaging.com/pdf/PlugIns/ICR-English.pdf>

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October 9, 2006

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PlugIns for DpuScan are expansions for its functional scope and must be licensed separately.

This documentation describes one such additional module for already existing licenses of DpuScan. The use of this PlugIn is possible only in combination with DpuScan. Therefore, this documentation can also be used only together with the documentation for DpuScan.

1 Overview

The actual PlugIn serves for recognition of printed writing and of handwritten entries on scanned originals. OCR (Optical Character Recognition) is the recognition of printed writing on the images that are supplied by the scanner. ICR (Intelligent Character Recognition) denominates the method to recognize handwritten remarks or entries on scanned documents. These handwritten entries must be made in block letters so that they can be read by the PlugIn.

1.1 Demands to Handwriting

IrisIcr can be used to recognize capital letters (A-Z), numbers (0-9), the comma (","), dot ("."), plus ("+") and minus ("-").

In order to be able to read handwriting with a sufficient recognition rate, the following demands must be made for such writing:

All letters must be written in capital block letters.

- The letter must be written clearly and legibly. They should resemble printed letters as far as possible. Special attention must be paid to the letters A, G and Q.

A B C D E F G H I
J K L M N O P Q R
S T U V W X Y Z
1 2 3 4 5 6 7 8 9 0 + , - .

- If bows are closed that should have been open,
or if bows are open that should be closed,
the read results will be worse.
- The letters should not be interrupted and should have about the distance from each other that matches such distances at printed writing.
- The letters may not touch each other.

Q
Q

THE SECOND

- Also lines that were drawn several times, like in a U, will decrease the quality of the letter and therefore have bad influence to the reading results.

2 The Plugin in the Task Definition

In the Task definition, you can add the Task step "Call plugin for every image" after getting the image by the Task step "Load from scanner" or "Load from directory".

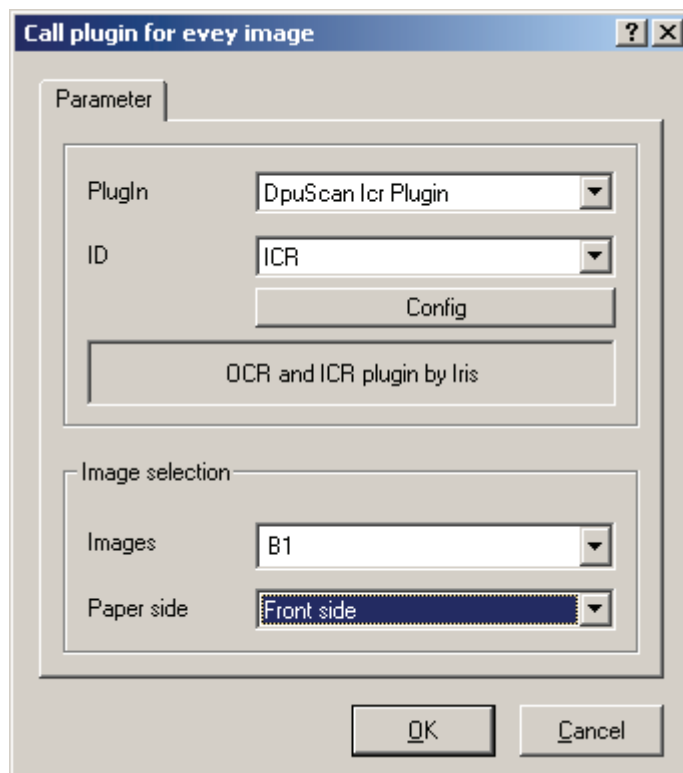


Illustration 1 – Calling the Plugin in the Task

This Task step is available only if the ICR Plugin was loaded for the actual Class.

You can configure the Task step: Select the **ICR** Plugin from the dropdown list, then the prior set configuration and the color format and image to be processed, and the page/s (front page, rear side, both sides) to be processed.

A bitonal image is required as base for the evaluation. If a color image or a grayscale image is selected, it will be transformed to a bitonal image with the internal settings.

If the documents to be read are in good enough condition, they can directly be scanned as bitonal images.

If a color image is available, you can make use of the specific image processing methods of the scan application, like Color Noise Reduction, Color Filters, or Enhanced Image Processing, in order to gain an optimal image for the ICR.

3 The PlugIn in the Class Definition

The PlugIn must be loaded and configured within the Class. Open the **Class configuration**, there you select the **Process** property page and click the **PlugIns** button.

Via the **Add** button, you reach the selection dialog for available PlugIns.

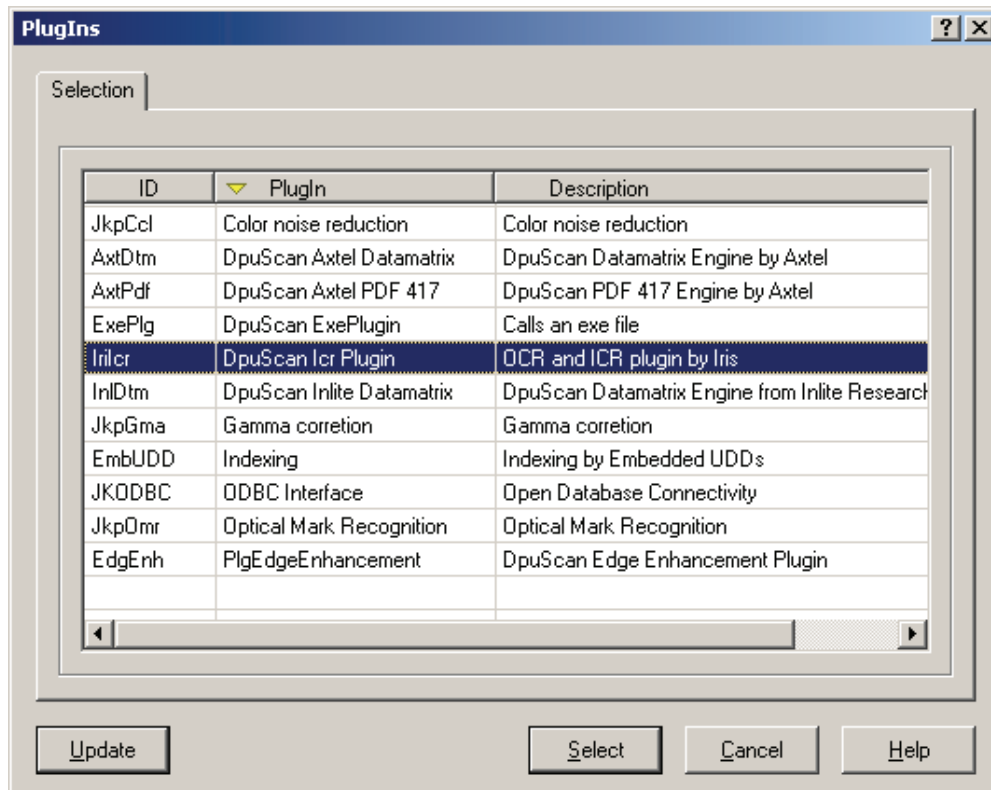


Illustration 2 – Selecting the PlugIn

Now you select the **IrisIcr** PlugIn – just select the relative line and click the **Select** button.

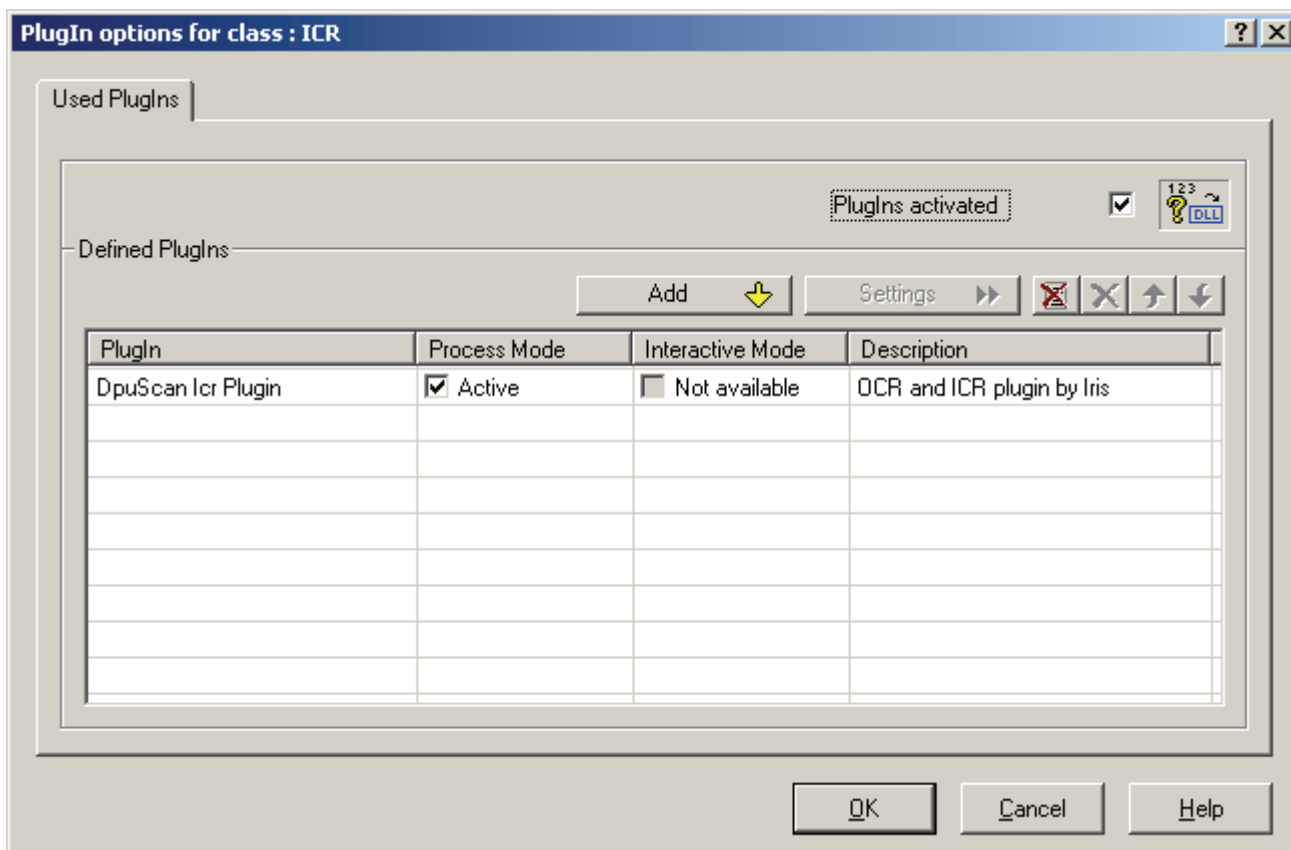


Illustration 3 – PlugIn Configuration for the Class

The OCR/ICR PlugIn is now loaded for usage in the Class.

Please keep in mind that the "Plugins activated" check box must be marked with a hook as otherwise the Plugins will not be used.

The entry in the list in the above illustration shows an active check box in the **Process Mode** column, whilst the check box in the **Interactive Mode** column is not activated. This means that this PlugIn can be used exclusively in the process mode , during the scan process. It can however not be used in the scan pause or in the Edit window.

3.1 Configuration of the PlugIn

With a double click on the list entry, you open the PlugIn configuration – see [Illustration 7 – PlugIn Configuration](#) on Page 9. It shows in its top area the control elements for administering different PlugIn configurations.



Selects an existing configuration and assigns it to this Class.



Creates a new configuration. The settings of the actual configuration are copied.

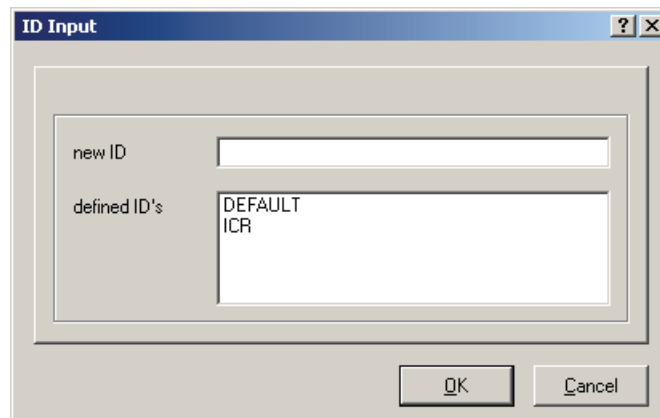


Illustration 4 – Creating a New ID



Deletes the actual configuration. Eventually, the following warning will display:

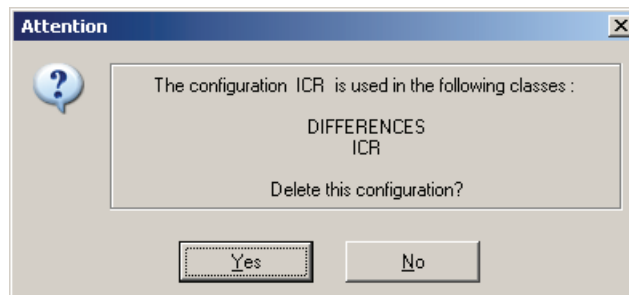


Illustration 5 – Warning Before Deletion



Assigns the modifications to the actual configuration.



Opens a dialog that displays in which Classes the actual configuration is also used.

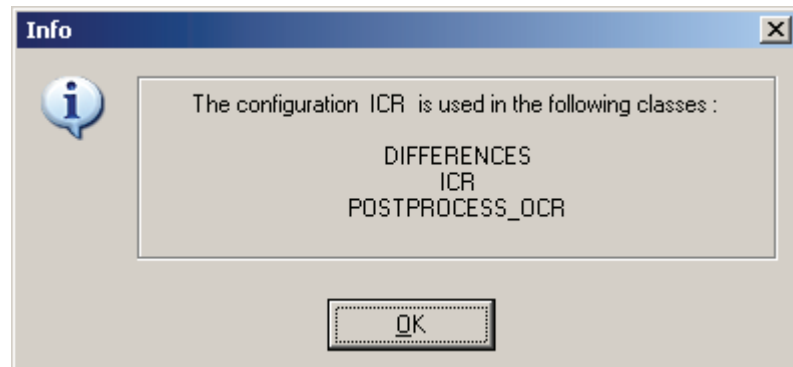


Illustration 6 – Information About Usage of the ID

The area below shows the three Property Pages **General**, **Percent Code** and **Information**.

3.1.1 Property Page: General

The **General** page shows detailed information about the PlugIn, in this case about its version and its producer.

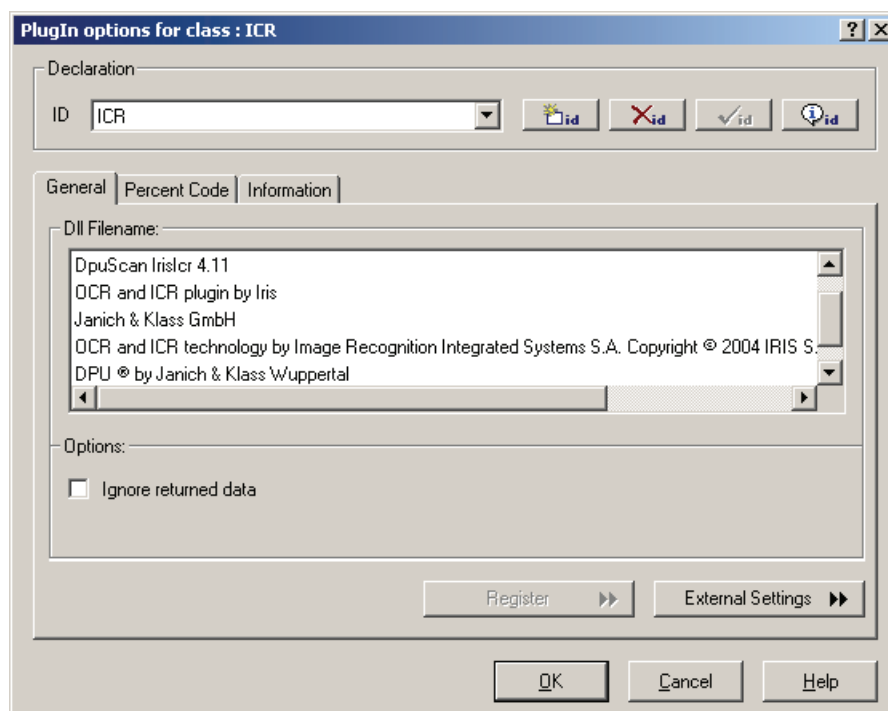
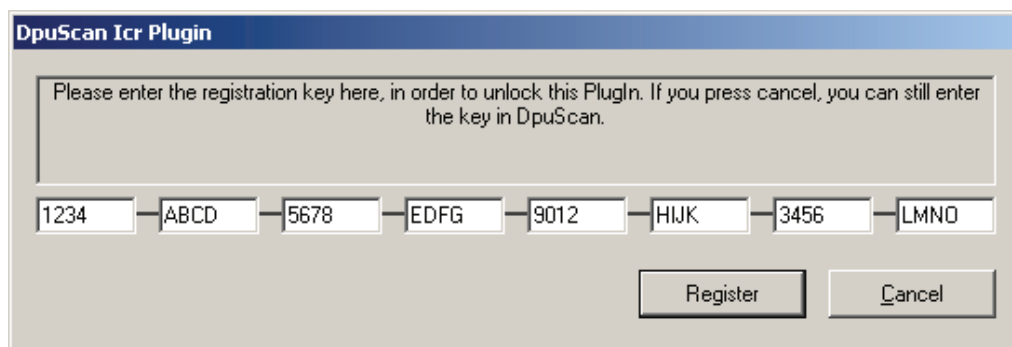


Illustration 7 – PlugIn Configuration

- Ignore returned data** The variables are not returned to DpuScan if this chick box is activated.
- Register** Opens the dialog for entering the Registration Key.
- External Settings** Opens the dialog for the configuration of the PlugIns, see Chapter [4](#) [Configuration of the OCR/ICR](#) on Page [14](#).

Before its first usage, the PlugIn must once be registered. Please click on the Register button and enter the key in the following dialog, to decrypt the ICR-PlugIn.



The image shows a registration dialog box titled "DpuScan Icr Plugin". Inside the dialog, there is a text area with the instruction: "Please enter the registration key here, in order to unlock this PlugIn. If you press cancel, you can still enter the key in DpuScan." Below the text area, there is a row of eight input fields, each containing a character: "1234", "ABCD", "5678", "EDFG", "9012", "HIJK", "3456", and "LMNO". At the bottom right of the dialog, there are two buttons: "Register" and "Cancel".

Illustration 8 – Registration Dialog

3.1.2 Property Page. Percent Code

The **Percent Code** page lists the variables that are used by the PlugIn, or that were defined within the configuration.

Additionally, the PlugIn uses another variable that is required in case of OCR-full text search for creating the output file.

%(S.OUT.PATH) Name of the output file

Please keep in mind, at a full text search, that it can be used – in the actual version – only in the DirectMode. In addition, when the full text search is used, the call must be positioned after the action "Save image". The area searches of ICR and OCR are not subject to this restriction.

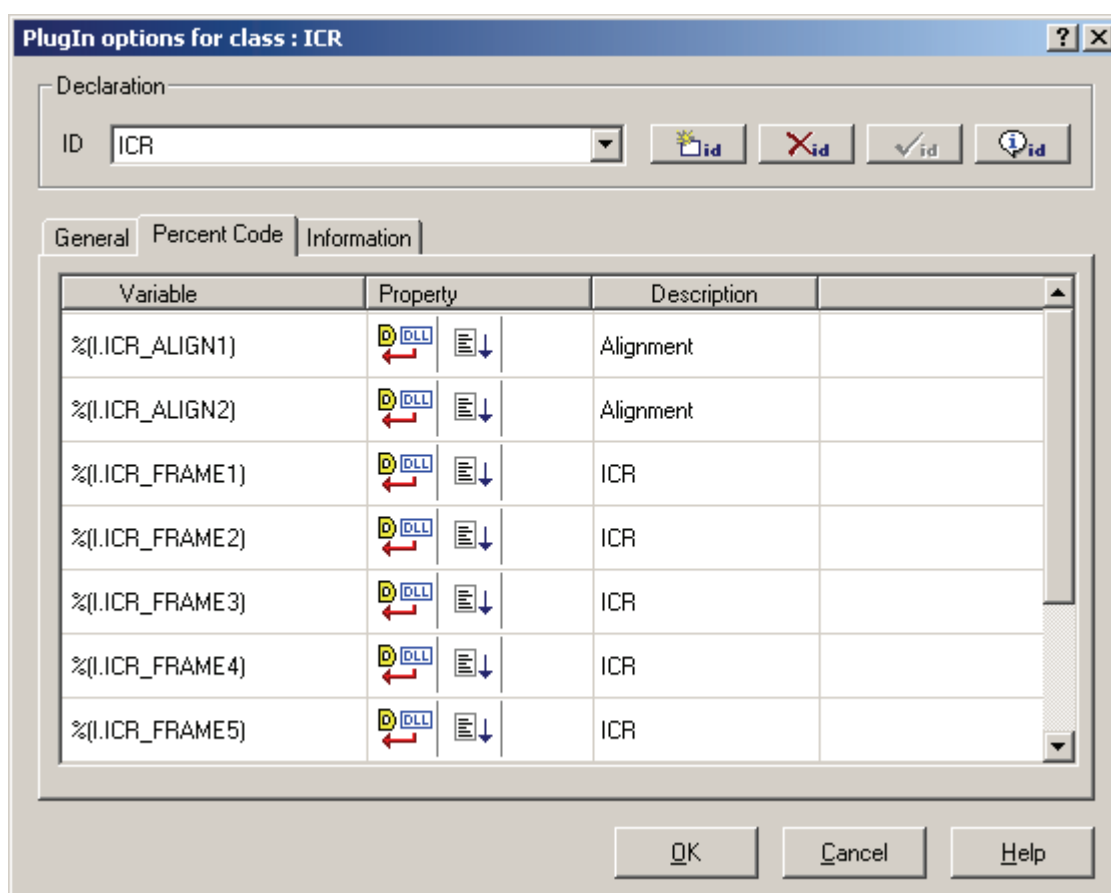


Illustration 9 – List of Variables

In the listing table, you find next to the name of the Variable the **Property** column that signs with symbols how the variables are processed by the system. In case of ICR, the following symbols are displayed:



The variable is set by the Plugin and returned to the scan application.



The variable is set in the scan application and returned to the Plugin.



The variable is set during the process of the relative Task step.

The **Description** column describes the provenience of the variables. In case of the ICR-Plugin, there are three kinds of variables:

Variables that are utilized for alignment of the image, and variables that contain the results of the ICR/OCR process.

ICR Contains the recognition result of the ICR for a defined area/frame.

OCR Contains the recognition result the OCR for a defined area/frame.

Alignment This variable mentions whether the basing search pattern was found and that it could therefore be used for correction of the image position.

0 Search pattern not found

1 Search pattern found

We recommend, mainly if you assign your own names to the variables, that you check them at this instance after their configuration is completed.

3.1.3 Property Page: Information

This page gives information, in a tree view manner, about the name of the PlugIn, its manufacturer, and its version.

The ID branch lists the windows, variables and images that are used by PlugIns. The actual ICR-PlugIn only uses Variables.

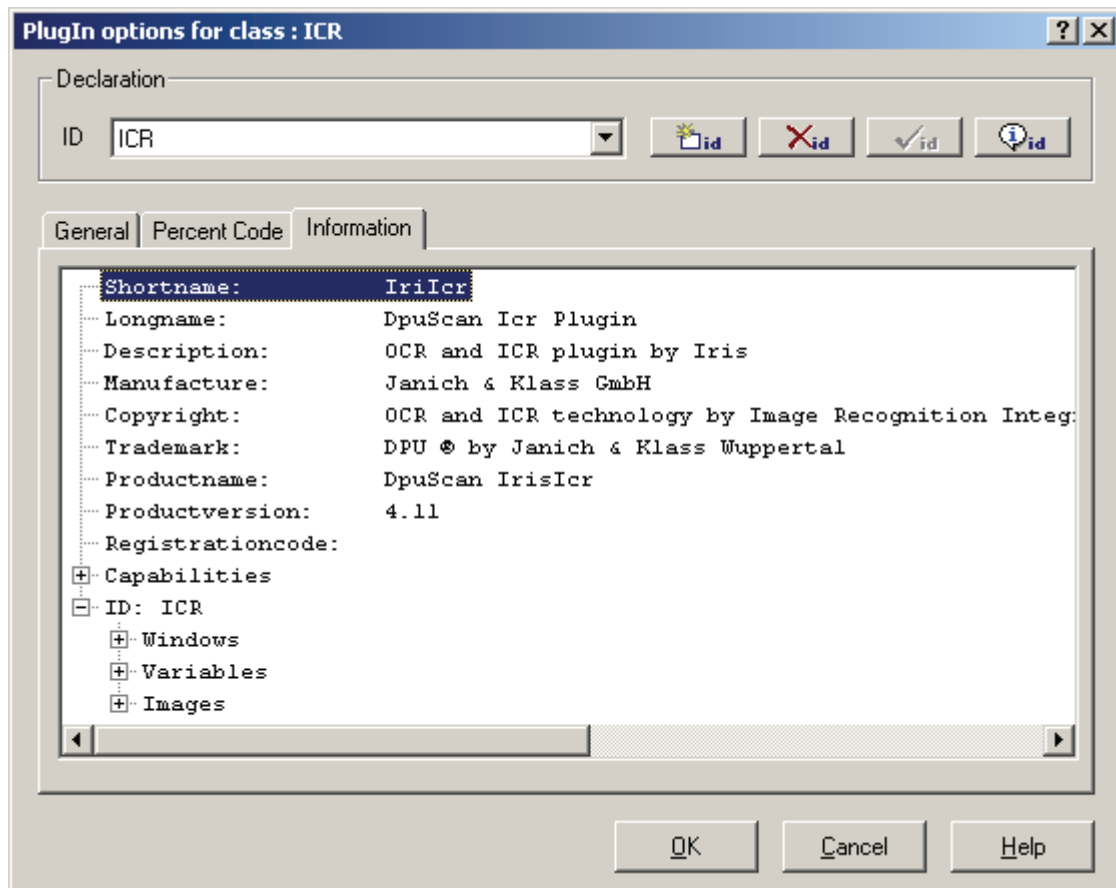


Illustration 10 –Information Tag

4 Configuration of the OCR/ICR

When you are on the **General** page and click the **External Settings** button, the dialog for the configuration of the ICR will appear.

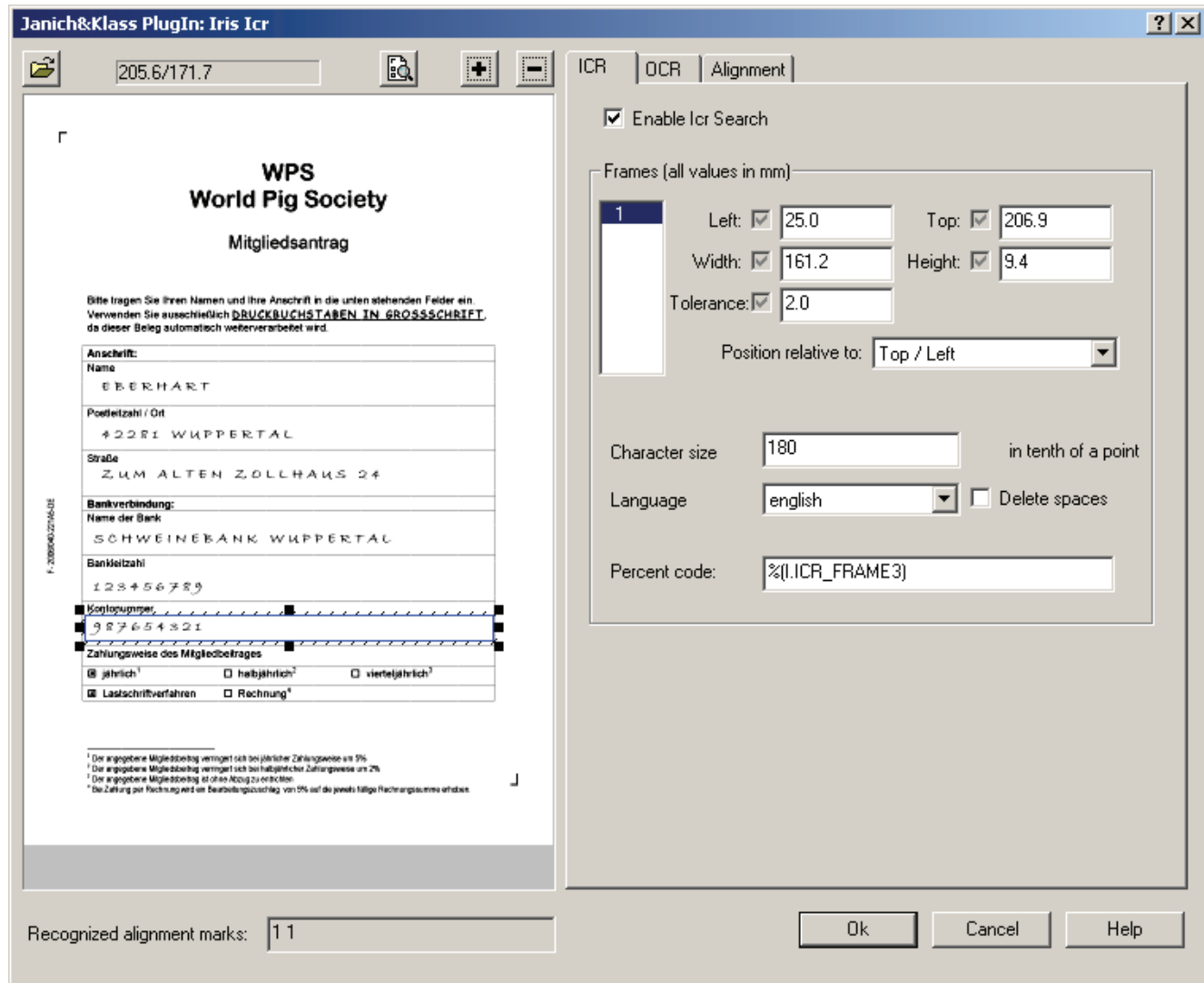
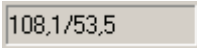


Illustration 11 – Setting Dialog for the ICR

It shows, on its left-hand side, a preview window and control elements for loading an image and for setting and removing the frames. Beside it, you find the three Property Pages **ICR**, **OCR** and **Alignment**. Beneath the preview window is a text field that displays, after a test, which alignment marks were found. The order matches the order of the definitions on the **Alignment** Property Page.



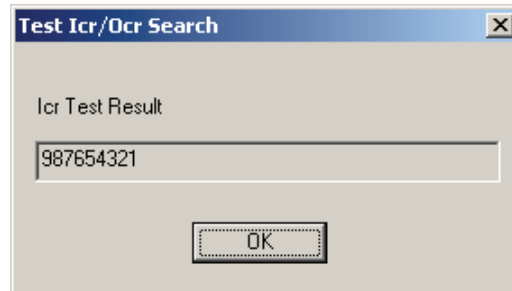
Opens the dialog for loading an image.



Shows the actual position of the mouse pointer in the preview window.



Executes an ICR / OCR search, depending on the selected ICR / OCR property page. If a frame is active, the ICR / OCR search result for this image area is reported in a message box.



If the OCR page OCR is selected and no frame is defined, a full text search is executed for the entire sheet. The formatted search results are saved in a file whose name can still be determined.

For the ICR search, formatted output in a file is not possible.



Adds a new frame.



Removes a frame.

Preview window

In the preview window, several functions are assigned to the mouse buttons:

Click left Enlarge the image

Click right Reduce the image

Pan a frame with the left mouse button pressed down:
Selects all elements inside this opened frames

Keep the right mouse button pressed down
to move the image section

Keep the Shift key pressed down
to directly pan a frame with the left mouse button pressed down.

Keep the Control button pressed down and click on individual frames
to include them in the existing selection.

4.1 Property Page: ICR

Here you define the search areas where the ICR shall execute the recognition of written information. A frame must be defined for every search area. For each of these frames, their automatically pre-assigned topics can be altered. The ICR search is enabled or disabled with the **Enable Icr search** check box, so that for example only the OCR search is executed, while the ICR search is disabled.

4.1.1 Frames



Allows to select already defined search fields. You may select them individually, but also multi-selection is possible. The multi-selection is done Windows-conform with pressed Shift key or Control key.

Left

Indicates the position of the left edge of the frame. The representation relates to the selection in the drop down list **Position relative to:**.

Top

Indicates the position of the top edge of the frame. The representation relates to the selection in the drop down list **Position relative to:**.

Width

Indicates the width of the frame.

Height

Indicates the height of the frame.

Tolerance

Indicates an area around the frame position that will be considered in the recognition process. Depending on the quality of the feeder, the position of the frame to be evaluated will be more or less shifted on the following images. The set tolerance area is graphically shown as hatched.

Position relative to

Indicates the point of reference for defining the frame position.

Character size

Determines the maximum size for recognized characters. This value relates to the width as also to the height of characters to be searched, in tenths of a point.

Language

This combination field serves to set the language for the characters to be recognized. Some languages have special characters that will not occur in other languages, like Ä, Ö, Ü, ä, ö, ü and ß in German.

Delete spaces

Deletes all blank spaces from the recognized string. This option can be enabled or disabled with this check box.

Percent code

During the area search, the search results are saved in a variable and can be utilized in the further process of the scan application. The proposed name for this variable can be modified in this edit field.

In case of a multi-selection, you can set the properties **Left**, **Top**, **Width**, **Height** and **Tolerance** for all selected elements to the same values, for example for all fields in a column. For values that are already equal, the edit field is active, and the value can be altered.

The edit fields for values that are different for the selected elements do not allow modifications.

Only when you activate the check box next to the edit field, you can enter values here, and they will be assigned to all selected elements in the same way. This serves to prevent from unintentional modifications.

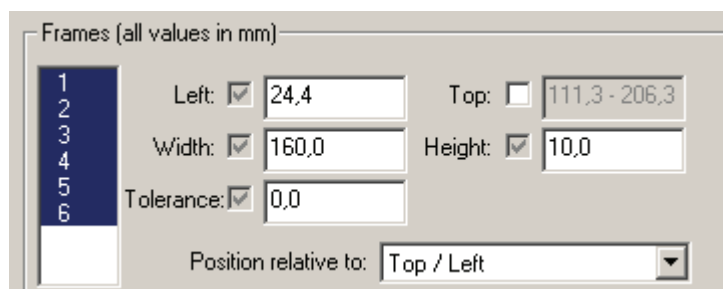


Illustration 12 – Changing Properties in a Multi-Selection

In the above illustration, the frames 1 to 6 are selected. They all lie in one column and therefore have the same values for the field **Left**. As we assume in our example that it is a group of frames, also the values for **Width**, **Height** and **Tolerance** are equal. If you enter new values in these fields, they will be taken over for all selected elements.

The locked edit field **Top** is filled with the minimum and the maximum value for the actually selected frames.

4.2 Property Page: OCR

Here you define the search areas where the OCR shall execute the character recognition. The check boxes **Enable Ocr area search** and **Enable Ocr fulltext search** are connected in a way that either only the area search, or only the full text search, or no OCR search is active. It is not possible to execute area search and fulltext search at one time.

4.2.1 Area Search

All definitions for the area search must be made analog to the definitions for the area search of the ICR. Please see Chapter [4.1 Property Page: ICR](#) on Page [16](#)

4.2.2 Full Text Search

As an alternative to the OCR area search, also a full text search can be executed. Here, the results are written in a file in formatted way. For the full text search, the following options can be configured:

Language	This combination field serves to set the language for the characters to be recognized. Some languages have special characters that will not occur in other languages, like Ä, Ö, Ü, ä, ö, ü and ß in German.
Output format	The search is executed as a formatted OCR full text search where the result matches the look of the original. The results are saved in a file. You can select the type of the output file; at choice are can create PDF, RTF, HTML or TXT files.

Please keep in mind for the full text search that this option can actually be used only in the DirectMode. In addition, when the full text search is used, the call must be positioned after the action "Save image". The area searches of ICR and OCR are not subject to this restriction.

4.3 Property Page: Alignment

Use this property page to define fields that serve the PlugIn for alignment of the image. Many printed forms already have such positioning marks. The search fields for the alignment of the image are defined analog to the fields for character recognition.

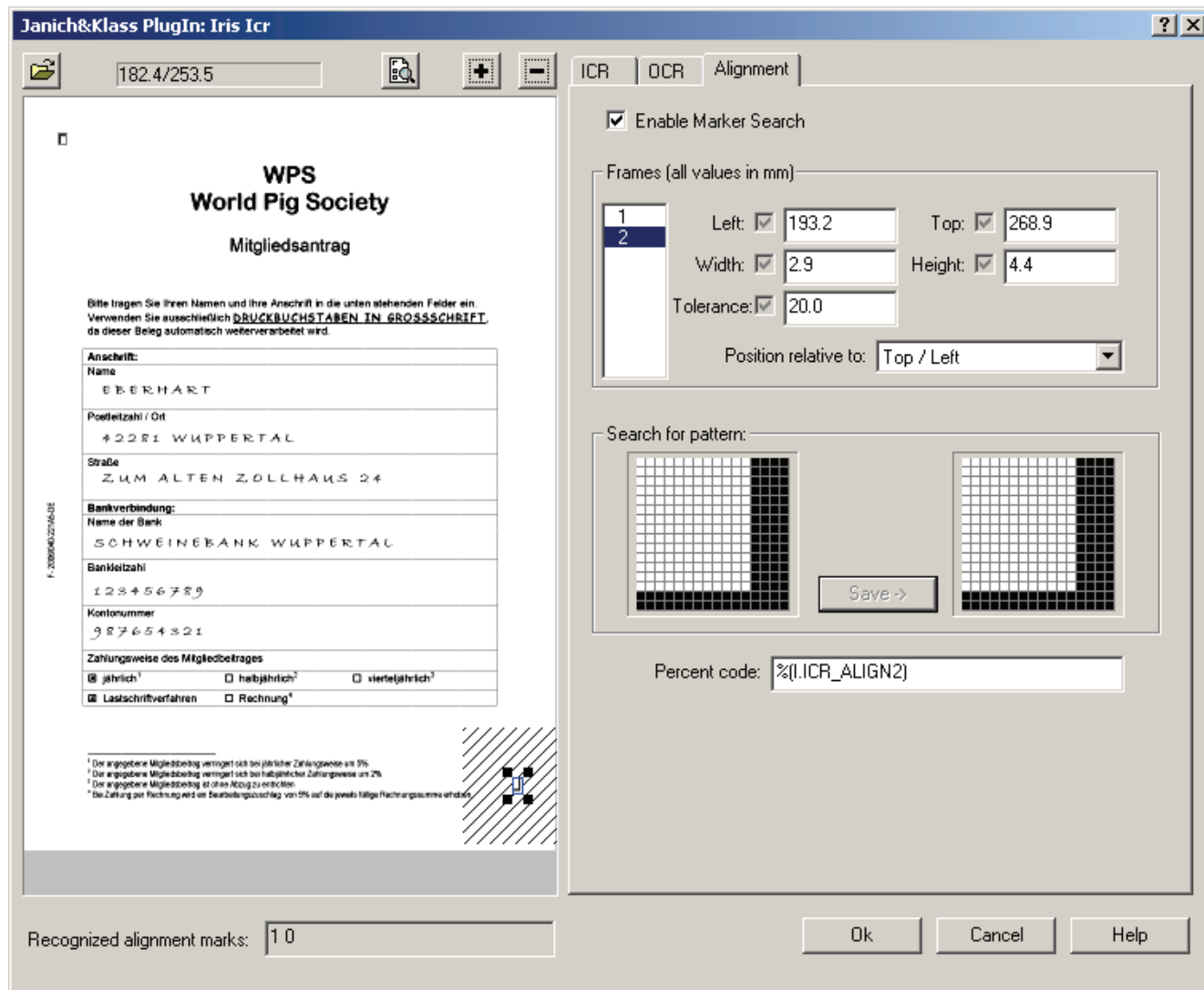


Illustration 13 – Setting Dialog for Alignment

4.3.1 Frames

Left	Indicates the position of the left edge of the frame. The representation relates to the selection in the drop down list Position relative to: .
Top	Indicates the position of the top edge of the frame. The representation relates to the selection in the drop down list Position relative to: .
Width	Indicates the width of the frame.
Height	Indicates the height of the frame.
Tolerance	Indicates an area around the frame position that will be considered in the recognition process. Depending on the quality of the feeder, the position of the frame to be evaluated will be more or less shifted on the following images. The set tolerance area is graphically shown as hatched.
Position relative to	Indicates the point of reference for defining the frame position.

4.3.2 Search for Pattern

In the left-hand view, the relatively recognized search pattern is displayed inside the actually selected frame. The right-hand view represents the saved search pattern. In order to be able to use the alignment, the frame must be positioned across an element on the image in a way that the search pattern can well be recognized in the left-hand view. Then it is necessary to save it, using the **Save** button.

4.3.3 Percent Code

Also here, analog to the definitions on the property pages for **ICR** and **OCR**, a variable is created for every frame; it can be used in the process later.

5 Usage of the ICR


In the following, we describe an example for the process of a configuration.

Scan some exemplary documents and process them (by deskewing and cropping) in a way that they are suitable for their usage in the configuration.

Open the configuration for the Class where you intend to work with the ICR/OCR. Select the **Process** tab and click on the **Plugins** button.


Activate the check box **Plugins activated**. Click on the **Add** button and then select the **Irilcr** PlugIn.

Use the **Settings** button or make a double-click on the newly added line to reach the configuration dialog for the PlugIn. Eventually you must register here.


Create a new ICR/OCR configuration, with the  button, initially enter a name for it.

Via the button for **External Settings**, you can start the definition for the search fields.

Now the **ICR** Property Page is active. Here you define the image areas that will be read during the recognition process.

First, you load a suitable image that you use as base for the positioning of the frames. Click on: 

Switch over to the **Alignment** page. There, you must add a frame for every alignment mark. Move the frame over the alignment mark and change the size so that the entire mark lies within the frame. The left-hand view area will display the pattern if the frame is suited for a search. You accept the pattern with a click on the **Save** button. The saved pattern is now displayed in the right-hand area.

Now you change to the **ICR** tab or the **OCR** tab. You add a frame using the  button. You can position the new frame with your mouse, and change its size. A new frame can also be panned directly at the desired position with the mouse and the Shift button pressed down. The PlugIn proposes a name for the selected field, in the **Percent Code** edit field. You may keep this proposed name, or find our own, meaningful name. Please obey to the name rules for Variables and Percent Codes, respectively.

For the definition of further frames, just repeat the process correspondingly.

Finally, you can check your setup by pressing the  button for a test. The recognition result for the selected frame is displayed in a dialog box.

This completes the definition phase.

5.1 Usage of the ICR/OCR Results

5.1.1 Results from the Area Search

The ICR/OCR results can be utilized in the process by having access to the defined variables. So, for example, the results can be written in a Batch file.

The Batch file is defined in the Class definition as follows:

```
[03]%F
[03]Name:      %(I.ICR_FRAME1)
[03]PLZ/Ort:   %(I.ICR_FRAME2)
[03]Straße:    %(I.ICR_FRAME3)
[03]Bank:      %(I.ICR_FRAME4)
[03]BLZ:       %(I.ICR_FRAME5)
[03]KtoNr:     %(I.ICR_FRAME6)
```

The Batch file of the example therefore contains:

```
C:\SCAN\154054.124\00000000.TIF
Name:      EBERHART
PLZ/Ort:   42281 WUPPERTAL
Straße:    ZUM ALTEN ZOLLHAUS 24
Bank:      SCHWEINEBANK WUPPERTAL
BLZ:       123456789
KtoNr:     987654321
```

5.1.2 Results From the Full Text Search

The Plugin is called for every image. In the target folder, the full text search creates exactly one file for every image.

Therefore the storage of scanned images must be done in form of single side files. No multi-page files are allowed in this connection. Please also remark that the full text search in the actual version can be used only in the DirectMode.

The file name is the same name as for the image file. The file name extension is rules by the prior selected format.

Example:

An individual file is created for every image. The file name extension is generated by an automatic counter. TIF is selected as storage format for the images, and the recognition results shall be saved as PDF files. Then, the target folder contains the following files:

```
00000001.TIF
00000001.PDF
00000002.TIF
00000002.PDF
00000003.TIF
00000003.PDF
```

...

The assignment of recognition result to the source image is found via their file names. The recognition results for the image of the file called 00000001.TIF are contained in the file 00000001.PDF.



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