

Background

package

READ IRIS OCR

yannanir

real

text

Save Time, No More Retyping!

typed

IRIS
paper

Druckqualität

trainable

učici modul

OCR

matrix

обраа

caractères accentués

omnifont

easy

recognition

fax

neue Symbole und Schriftar

IR

IMAGE RECOGNITION
INTEGRATED
SYSTEMS

JUST READ IT!



Readiris™ User's Guide

Intelligent Character Recognition Software

for IBM PCs, PS/2 and compatible computers

Image Recognition Integrated Systems

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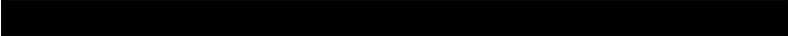
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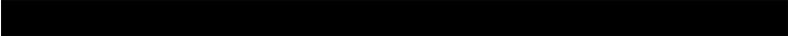


Welcome

Readiris is a powerful Intelligent Optical Character Recognition (IOCR) system which transforms your PC and scanner into an efficient page reading system.

It provides you with the best and fastest way to transform printed and typed information into editable text files that can be used by your wordprocessor, spreadsheet, desktop publishing software etc.

Readiris uses the familiar menus and style of the Windows environment. The user-friendliness is such that you can even start Readiris from within your favourite Windows applications!



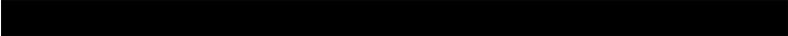
About Readiris

The Readiris software package is very easy to install and use. The installation takes two minutes, getting started five. Its operation is in most cases limited to clicking in the button bar.

Readiris, although being designed as a low-cost product, nevertheless gives you access to the most advanced techniques of artificial intelligence used in the field of IOCR (Intelligent Optical Character Recognition).

Readiris is a self-learning system. In other words, it can learn new characters by itself. Multiple linguistic databases, lexicons, are used to analyze the linguistic context and thus provide a powerful tool to find new solutions in difficult cases.

Finally, Readiris allows you to capture images from printed documents via your scanner and import them into your graphics application program.



About This Manual

This manual describes how to use Readiris. The first chapter, "Getting Started", gives you information on the system requirements and on the installation procedure.

The second chapter, "Quick Start", gives you a quick overview on how Readiris works and introduces you to the basic concepts.

After that short tutorial, you may want to get more details on the many advanced features of Readiris. This constitutes the content of the third chapter, "Learning More About Readiris".

A full reference to the Readiris menus and their commands can be found in the fourth chapter, "Commands Reference".

The last chapter, "More About OCR", gives a brief description of the OCR concepts and parameters. It deals with the impact of these different parameters on the performance of OCR systems in general and on Readiris in particular.

All complementary information not included in this manual can be found in the README.TXT file. Please read this file if you have any trouble with the Readiris installation or its operation. For information on scanners, consult the READSCAN.TXT file.

1 Getting Started

This chapter tells you how to install Readiris before using it for the first time.

It is assumed that you are familiar with your computer, the DOS operating system and the Windows environment.

System Requirements

These are the minimal system requirements for Readiris:

- 386 based IBM PC, PS/2 or compatible PC. Multitasking is supported, even on a 386 based PC!
- 4 MB RAM. You may need additional memory space to use the Connect capability.
- the MS-DOS operating system, 3.3 or later. MS-DOS 6.x is recommended.
- a Windows 3.1 licence. Do not run Windows 3.1 in the standard mode!

Installing Readiris

As a security measure, make a backup copy of your Readiris diskettes and store them in a safe place.

Execute the following steps to install Readiris:

- Be sure that you are in Windows' Program Manager. Choose "Run" from the "File" menu, enter **a:setup** in the command line box and click "OK".
- The installation program starts running. Indicate the desired operating language of Readiris and follow the on-screen instructions.

You'll be asked to insert the second diskette at some point.

The program group and application icons are created by the installation program.

Installing the Connect Capability

Readiris should be installed correctly before you install the Connect capability.

Start Readiris, select your scanner and save the default settings before installing the Connect capability. Refer to chapter 3, "Learning More about Readiris", to learn how to do so.

For WordPerfect, Word and Excel, a macro must be installed by the user if the Connect capability is to work. The on-line help system will tell you how - the appropriate help topic is displayed automatically when you run the Readiris installation program.

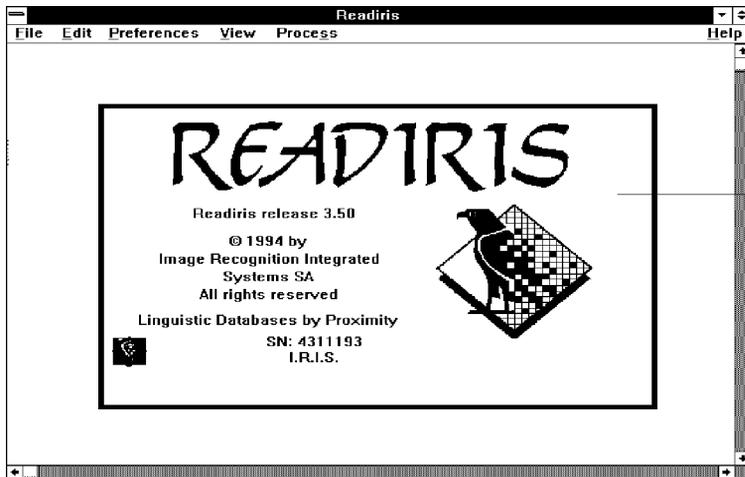
For all other Windows applications, a Connect task server has been installed by the Readiris installation program; the user isn't involved.

2 Quick Start

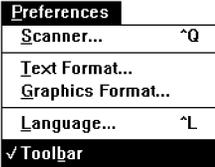
The best way to see how Readiris works is to use it. The following pages allow you to get started immediately. A pre-scanned image, ENGLISH.TIF, is provided with your licence, so it's suitable for training on the OCR program, even when your scanner isn't connected yet.

Running Readiris

Be sure that you are in Windows' Program Manager. Double-click the Readiris icon.



The startup screen is displayed.



The Readiris application window not only contains command menus but also a **button bar**: clicking these buttons will suffice to execute most actions. Click the command "Toolbar" under the "Preferences" menu to enable and disable the button bar.

Defining your Default Configuration



- 1 Select the "Preferences" menu. The following commands appear: "Scanner", "Text Format", "Graphics Format" and "Language".
- 2 Go through each command and select your standard settings.
- 3 Select the command "Set Default Settings" from the "File" menu. Click "OK" to confirm.

Your system is now ready for use. Even if you have a scanner connected, we recommend you to try the tutorial first.

Performing OCR on a Prescanned Image

This short tutorial uses a prescanned image of a text about OCR. We'll recognize the text and save the artwork in a graphic file.

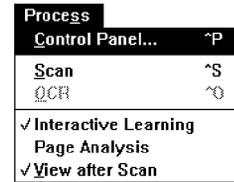
Settings

Let's set our system up first.



- 1 Be sure that English is selected in the "Language" drop-down list of the button bar.
- 2 In the "Preferences" menu, select the ASCII file format for your text file with the "Text Format" command, and the Paintbrush format for your graphics file with the command "Graphics Format".
- 3 Choose "Control Panel" from the "Process" menu.
- 4 Check if the character size and font type are set to normal and the character pitch to proportional.

- 5 Ensure that the font dictionary is READIRIS.DUS and that the dictionary is in the new mode.
- 6 Disable the "Page Analysis" in the button bar if necessary.
- 7 Close the Control Panel by clicking the "Close" button.

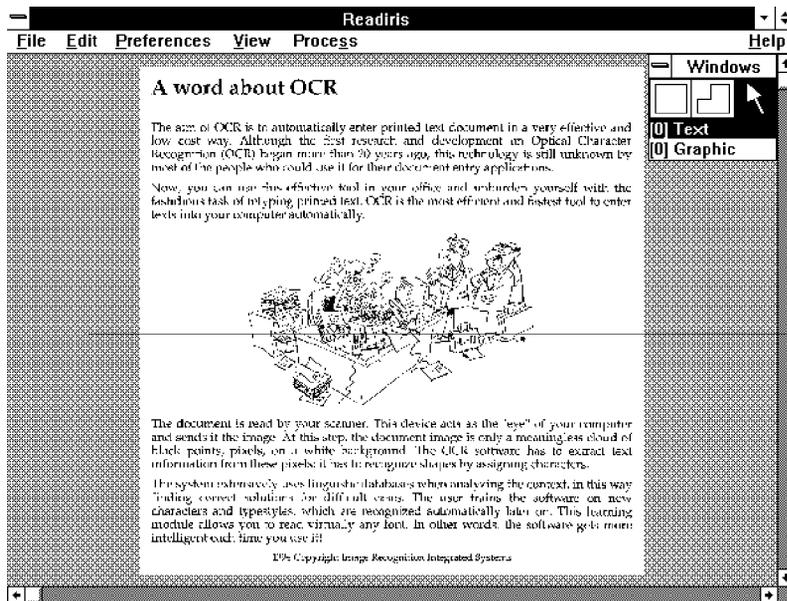


Opening the Image File

- 1 Set the "View After Scan" option in the "Process" menu.

This option is set when a check mark is present. If this is not the case, click "View After Scan".

- 2 Click the disk icon in the button bar to indicate the proper input source.
- 3 Click the "Scan" button in the button bar. You now have to select the image file. Select the prescanned image ENGLISH.TIF installed in the Readiris directory.



- 4 The image is read from the disk and displayed progressively on your screen. The windows toolbox is also displayed.

Zooming the Image

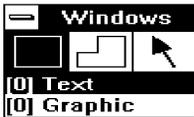
We can zoom in on parts of the image.

- 1 Put your mouse pointer over the area of the image you want to enlarge.
- 2 Click on the *right* mouse button to zoom in. Clicking this button again restores the full-size image.

You may also use the commands of the "View" menu and their associated shortcut keys. These can even be used while moving the mouse, which is especially useful when you are working on pages with a complex layout.

Defining the Text and Graphic Window

The second phase is that you indicate which text blocks are of interest to you. We will draw a text window around the text to be recognized and a graphic window around the artwork.



- 1 Select the rectangle tool by clicking on the rectangular tool in the windows toolbox. The mouse pointer becomes a crossbar.
- 2 Select the window type: text.
- 3 Move the crossbar near the upper left corner of the text and click.
- 4 Stretch the window by moving the crossbar to the right lower corner and click again.

The text window is drawn.

Drawing a graphic window is done in the same way, the only difference being that you select the graphic window type in the windows toolbox.

Modifying a Window



- 1 Select the window by clicking the arrow tool in the windows toolbox and clicking a window side.
- 2 Move the cursor to one of the markers.
- 3 Click and hold down the left mouse button.

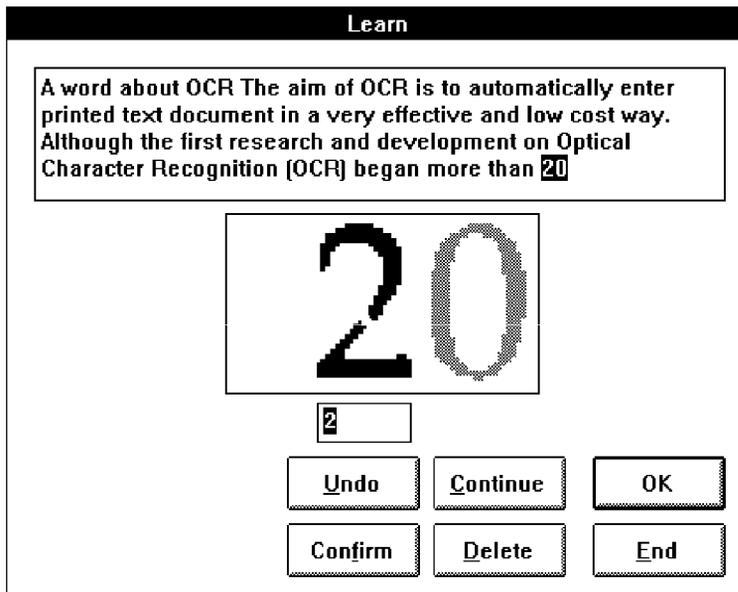
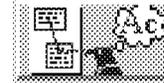
- 4 Move the mouse. The window is adjusted accordingly.
- 5 Release the button when the window size is correct.

Character Recognition

When your windows are correctly defined, you can execute the character recognition process.

- 1 Click the "OCR" button in the button bar.

At the end of the recognition phase, the program enters the interactive learning mode. The recognized text is displayed progressively and the system stops on doubtful characters. The system displays the image of each doubtful character in its context and proposes a solution.



- 2 Click "OK" or press ENTER to confirm a correct proposal; key in the right solution if the system's proposal is wrong, then click "OK" or press ENTER.

"Continue" allows correction without learning. Ignore the other buttons for the moment.

(Actually there's much more to it than that. The exact significance of these buttons will be discussed in the next chapter.)

- 3 Quit Readiris when you have finished.

Since the "OCR" button also serves to save graphics, the graphic zone has been invisibly saved.

Viewing the Results

You should now have the text file READIRIS.TXT and the graphic file READIRIS.PCX in your working directory.

- 1 Start Notepad and open READIRIS.TXT.

The recognized text is displayed on-screen. What was first a paper document has now become an editable text file!

- 2 Quit Notepad.
- 3 Start Paintbrush and open the file READIRIS.PCX.

Windows' graphic module displays the image. You can now edit this picture.

Performing OCR on a Paper Document

It is now assumed that you have installed your scanner correctly.

Setting up Your Scanner

- 1 Click the "Scanner" button in the button bar. The supported scanners are listed.



- 2 Select the installed scanner model and click "OK". The supported page formats are listed for flatbed scanners as are the various resolutions.
- 3 For OCR purposes, select a resolution of 300 dpi. You may use 400 dpi when the image quality is poor.
- 4 You may have to adjust the brightness and contrast setting with the slider bar, if available.

With handy scanners, however, brightness and resolution are set with switches on the scanner itself.

- 5 Indicate the correct input source by clicking the scanner in the button bar.

Scanning with a Flatbed Scanner

- 1 Put your document on your scanner's flatbed.
- 2 Select the correct scanning orientation in the button bar.
- 3 Click the "Scan" button.

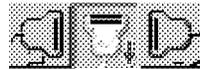


The page is scanned and displayed on your screen progressively.

If the selected scanning orientation was landscape, the image will be rotated immediately after the scanning.

Scanning with a Handy Scanner

- 1 Select the correct scanning direction in the button bar.
- 2 Click the "Scan" button. The cursor changes into a small handy scanner.
- 3 Place your scanner on the section of the document you want to capture. Your document should be on a flat surface.
- 4 Press the start button of your scanner once and move it in the selected direction.



The movement has to be slow and as steady as possible, otherwise the scanned image may be useless for the OCR. The image is displayed progressively as your scanner moves.

- 5 When you have finished scanning the image, press the space bar to pass control to Readiris.

If the selected scanning direction was left to right or right to left, pressing the space bar will automatically rotate the image.

Executing Recognition

Now you can use Readiris in the same way as you did with the prescanned image: you can zoom in to have a closer look, indicate the zones of interest by drawing windows, execute recognition etc.

3 Learning More About Readiris

This chapter provides many details on the extensive capabilities of Readiris.

You will learn how to scan an image and how to control the quality of the scanned image. When your document is correctly scanned, you may define windows to specify which parts of the text you'd like to be recognized by Readiris or have the system analyze your page layout automatically. Next, Readiris starts the character recognition and generates an output file.

We will also look into some advanced features such as automatic recognition, the Connect capability and we will learn how to OCR tables.

Defining Your Default Settings

First of all, you need to define your default settings. In other words, you should specify:

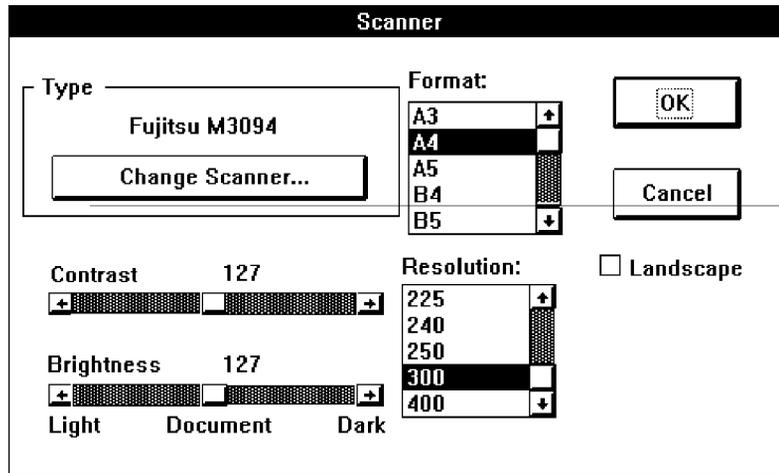
- the supported scanner and its settings
- the file format for the output text and graphics
- the language of the text to be recognized
- the parameters defined with the control panel

These settings rarely need to be changed and can be stored in a default settings file to avoid having to redefine them.

Setting up Your Flatbed Scanner



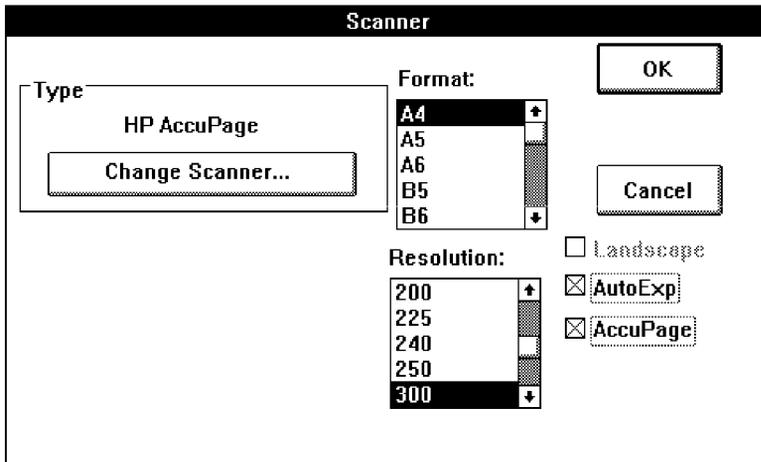
- 1 Click the “Scanner” button in the button bar. The supported scanners are listed.



- 2 Select the installed flatbed scanner and click "OK". The default resolution, page format, brightness and possibly contrast are displayed.
- 3 Click on the document format corresponding to the pages you normally read. A4 is the default page format.
- 4 Select your scanning resolution. The default resolution is 300 dpi.
- 5 Set the scanner's brightness and possibly contrast. The middle position is the default value.

The contrast option may not be available on your scanner. The brightness and contrast scrollbars allow you to adjust the scanning to light and dark documents. HP scanners allow you to enable the AutoExp option, which adjusts the scanning brightness to the document automatically.

Readiris also supports the HP **AccuPage** technology. This technology not only adjusts the scanner brightness autonomously but also uses advanced image processing techniques to optimize the scanned image for the recognition process.



This technology is only available on HP scanners. Select the AccuPage "scanner" instead of an HP scanner and click the AccuPage option.

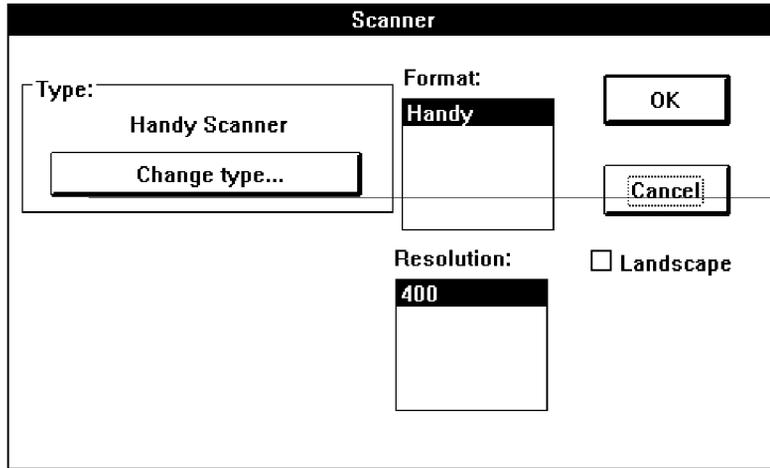
The technical documentation that came with your scanner undoubtedly gives more information on its setup and operation.

The file READSCAN.TXT in your Readiris directory also contains information on how to set up a scanner.

Setting up Your Handy Scanner

- 1 Click the "Scanner" button in the button bar. The supported scanners are listed.
- 2 Select the installed handy scanner and click "OK". The current resolution is displayed on-screen.

The resolution and brightness are set with switches on your scanner.

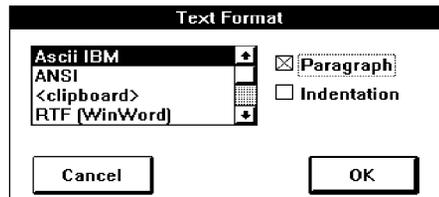
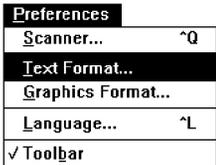


The technical documentation that came with your handy scanner undoubtedly gives more information on its setup and operation.

The file READSCAN.TXT in your Readiris directory also contains information on how to set up a scanner.

Text Format

- 1 Choose "Text format" from the "Preferences" menu.



- 2 Select the text format you intend to use.

Readiris outputs directly to a large number of **wordprocessors and text formats**. Use the ASCII or ANSI format for other wordprocessors.

Readiris also outputs tables directly to **spreadsheets** in a generic table format.

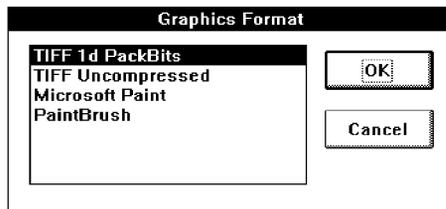
The **clipboard** "format" allows you to save the results directly to the clipboard and paste them directly in your Windows application.

Two options give you the possibility to influence the appearance of your output:

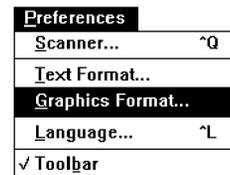
- **Paragraph**: enables the paragraph detection. When enabled, Readiris respects the wordwrap typical of wordprocessors by putting a carriage return only at the end of paragraph.
- **Indentation**: activates the text margin codes. This is useful if you want to preserve the appearance of the original text. Do not activate this feature if you intend to import your text in a desktop publishing application!

Graphics Format

- 1 Choose "Graphics Format" from the "Preferences" menu.
- 2 Select the graphics format accepted by your graphics application program.



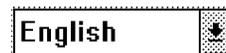
Readiris will save your graphics in that graphic format.



Language

It is important that the user indicates the language of the document to be recognized correctly if the **linguistic databases** are to play a positive role in the recognition process.

- 1 Click the dropdown list in the button bar or choose the command "Language" from the "Preferences" menu.
- 2 Select the language you want to recognize most often.



Readiris is equipped with many linguistic modules which positively influence the recognition rate!

Readiris can also be set to a **numeric mode** to recognize tables of figures with maximum accuracy and speed.

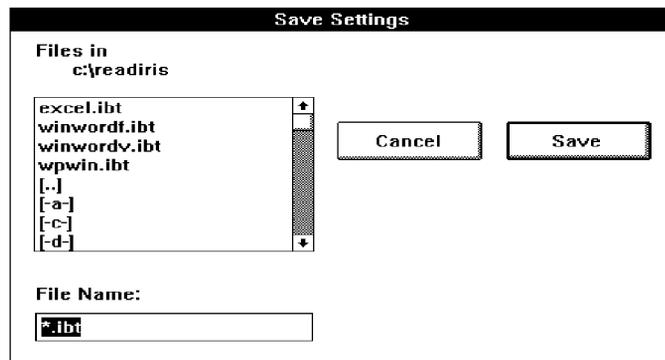
Saving Default Settings

You can now store these settings in order to avoid having to redefine them each time you run Readiris.

Choose "Save Default Settings" from the "File" menu. These settings will be loaded each time you start up Readiris. You can display these settings with the "Get Info" command of the "File" menu.

Saving and Restoring Settings

In addition, you can save particular settings for other than you basic application. These settings are saved with the "Save Settings" and activated with the "Get Settings" commands of the "File" menu.



Saving Settings

- 1 Choose “Save Settings” from the “File” menu. The settings files in your current directory are listed.
- 2 Enter a filename to save your settings to a new file or overwrite an existing file.
- 3 Click “Save”.

Doing so stores the current Readiris configuration in the specified file. These files have the default extension *.ibt.

Restoring Settings

- 1 Choose “Get Settings” from the “File” menu.
The settings files in your current directory are listed.
- 2 Select the correct file or select it in another directory.
- 3 Click “Get”.

All about the Control Panel

Before starting the OCR process on a document, you need to specify the characteristics of this document. These are:

- the document’s language
- the document quality
- the font type
- the character pitch and size

You can also specify if there is a font dictionary for the typeface of the document to be read.

The Control Panel gives you the control of every parameter needed to adjust your software to the various document types that may be recognized. It is split up in three parts:

- Document
- Process

Control Panel

Document

Pitch

Fixed

Proportional

Size

Small

Normal

Font

Normal

Dot Matrix

Files

Input Scanner

Output Text: (N) READIRIS.TXT
Graphics: READIRIS.TIF

Layout Default

Dico (N) READIRIS.DUS

Process

1 Page(s) to Read

Page Analysis

View after Scan

Interactive Learning

Strong Checking

Scan

Close

■ Files

Document

This part specifies the characteristics of the document to be recognized. These are:

- the character pitch: proportional or fixed
- the character size: normal or small
- font type: normal or dot matrix

With a **fixed pitch**, all symbols of your font have the same width, e.g. most documents produced using a typewriter.

A **proportional pitch** means that the size of a character depends on its shape. An "m" will be wider than an "i". Most books and newspapers are printed in proportional pitch.

The size is considered to be **small** when the point size is smaller than 10 and when the interline spacing is too small. In this last case, Readiris would have difficulties to correctly separate two consecutive lines.

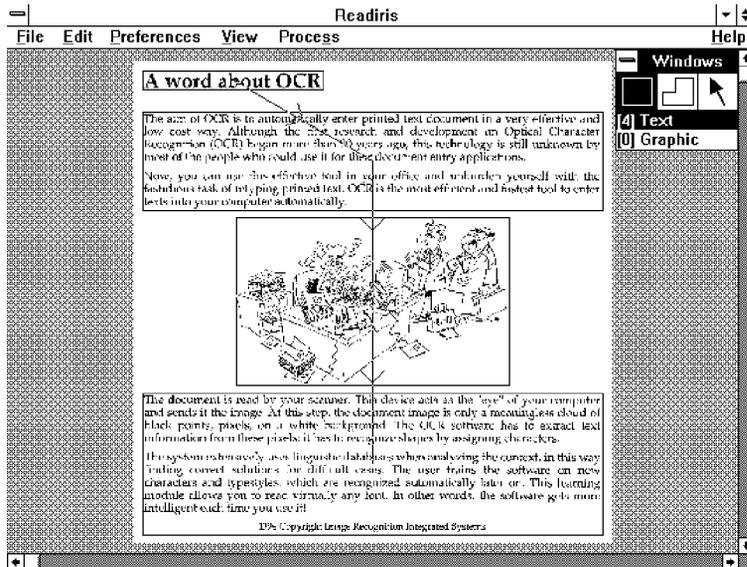
ape-descended life

The user should also indicate the font type: you cannot OCR **dot matrix** characters without enabling the correct parameter here. Dot matrix characters are very degraded and very often cut up or composed of individual dots. See the example below.

Process

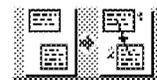
Defines the processing mode of Readiris.

When the **page analysis** is enabled, the text and graphic blocks on the page are detected and sorted automatically. The user avoids having to window the scanned image manually. This is particularly useful when columnized texts and documents with a complex page



layout are OCRed.

Page analysis initially considers every detected block to be a text block. Don't interfere when graphics occur on the document: in a second phase, the software notices by itself that no characters can be found there! (Nor will they be saved as graphics.)



The blocks are sorted from the top down and left to right by default

to cope with columnized documents but you can change the sort order. Click the "Sort" button in the button bar and click on a window marker of the various windows. The windows which you do not click on at this point will be simply ignored!

Finally, we should add that page analysis is fast, skew-tolerant and accurate.

With the "View after Scan" option, you enable and disable the **preview**. Using the preview mode means that the scanned documents are displayed on-screen before being processed. (For handy scanners, it is best to leave the preview enabled at all times.)

The third parameter is **interactive learning**. Enables the validation phase, where Readiris can acquire new font information. Disable this option to run automatic OCR on a multiple page document and when the recognition rate is excellent.

You can also influence the degree of interaction. With the option "Strong Checking" enabled, the verification level is high: Readiris will confront the user with even the smallest doubt instead of taking some decisions autonomously. When Readiris recognizes a text with great comfort, you can limit yourself to the verification of those forms that constitute a real doubt.

Files

Here you will find all files Readiris can use during its operation. There are four types.

Input: defines the input source - you scan a page or open a prescanned image.

Output: defines the filename for the output and the output mode - you replace or append a text file. Readiris can create up to two output files: a text file and a graphic file.

Layout: determines the layout file. You start with the default, empty layout or with a specific layout file. Layouts are windowing configurations, they contain the windows structure you defined during the document preview. After the manual windowing and page analysis by the system, layouts constitute the third method of indicating the zones of interest.

Dico: defines the font dictionary and mode.

These font or user dictionaries contain font information on the characters you train the system on during the validation phase.

Three dictionary modes are available:

- **New:** you create a new font dictionary, you start without any previously learnt knowledge.
- **Append:** you make use of previously built up font knowledge and complete it.
- **Read:** you make use of previously learnt knowledge but don't store new information in it.

It is imperative to use font dictionaries efficiently to obtain an accurate and fast recognition of your documents. Doing so implies that you select the correct mode for the dictionaries.

If you have only one page to be recognized, select the mode new. However, if you have many pages of the same type - meaning documents with the same typeface and printing quality - you should select the mode new for the first page, the append mode for the second and third pages, and the read mode for the rest of your pages.

Saving to the same user dictionary all the time doesn't make any sense: the size of these files is limited!

Scanning a Page with a Flatbed Scanner

- 1 Select the correct scanning orientation in the button bar. (You can also enable the "Landscape" option by clicking the "Scanner" button in the button bar.)
- 2 Click the "Scan" button.

The document is scanned immediately. When the preview is enabled, the image is displayed on-screen progressively.

If the selected scanning orientation was landscape, the image is rotated directly. You can also rotate images afterwards with the "Rotate" command under the "View" menu.

Pay some attention to **lineskew**. Although page analysis and recognition by Readiris are skew-tolerant, it may become difficult to window and OCR a scanned page correctly when the lineskew is too significant.



Click the "Scanner" button to modify the scanner's settings such as resolution, page format etc.

Scanning a Page with a Handy Scanner



When you have activated every parameter necessary, you are ready to scan your document.

- 1 Select the correct scanning direction in the button bar.
- 2 Click the "Scan" button in the button bar. The cursor changes into a small handy scanner.
- 3 Brightness and resolution are set with switches on your handy scanner. Use a resolution of 300 dpi for high-quality documents, select 400 dpi if the image quality is poor.
- 4 Place your scanner on the section of the document you want to recognize.
- 5 Press the start button of your scanner once and move it in the selected direction.

The image is displayed progressively as your scanner moves about.

The movement has to be slow and as steady as possible, otherwise the scanned image may be useless for the OCR.

The manufacturer's instructions that came with your scanner can undoubtedly give you more information on how to operate your scanner.

- 6 When you have finished scanning the image, press the space bar to pass control to Readiris.

If the selected scanning direction was left to right or vice versa, pressing the space bar will rotate the image directly. You can also rotate images afterwards with the "Rotate" command under the "View" menu.

Pay some attention to **lineskew**. Although page analysis and recognition by Readiris are skew-tolerant, it may become difficult to window and OCR a scanned page correctly when the lineskew is too significant.

Taking a Closer Look at the Scanned Image

Displaying the entire page at once is convenient for seeing the text and graphic blocks as they relate to each other. This full-page view is called “Fit in Window”.

To control the scanning quality of the document, you must take a closer look. Readiris gives you three other views:

- Actual Size: approximates the page size as it is printed
- 50% Actual Size: displays at half the actual size
- 200% Actual Size: displays at twice the actual size

You can also switch from the “Actual Size” to “Fit in Window” and vice versa by clicking the *right* mouse button.

View	
<input checked="" type="checkbox"/> Fit in Window	^W
50% Actual size	^5
Actual Size	^1
200% Actual Size	^2
<input checked="" type="checkbox"/> All Windows	
Selected Type	
Sort	^T
<input checked="" type="checkbox"/> Sort View	
Sort Reset	
Rotate...	^R
Toolbox...	
Coordinates...	^C

Controlling the Scanned Image Quality

The performance of the optical character recognition depends greatly on the quality of your document and scanning. Taking a closer look at the scanned image is useful in controlling this quality.

Readiris will produce the best results on a document of “good” quality, e.g. documents where the characters are well formed and reasonably well separated.

On a document which is too light, characters are sometimes cut into two parts: an “O” may become “()”. On the other hand, a document which is too dark will contain letters with very large shapes, and opened letters may be closed when scanned: a “c” becomes an “o”, for example. On a dark document, many characters may be glued together, preventing good recognition.

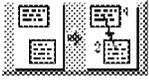
You can enhance the quality of the scanned image by adjusting the brightness and contrast of your scanner.

Once the image has been rescanned, you can verify the changes on your screen.

Windowing Tools

When the document is displayed, the next step is to indicate the zones of interest.

There are several ways of doing so: page analysis automatically detects and sorts the various blocks. You can modify the resulting layout with the "Sort" button. The other way is manually defining the windows. Thirdly, you can save specific windowing structures, so-called "layouts", in files for future use.



Drawing or detecting several windows is mandatory whenever a text is arranged in **columns**. To recognize tables correctly, draw windows around each column to neatly arrange the output in table cells.

Here's a description of the Readiris windowing tools.

Creating a Rectangular Window



- 1 Select the rectangle tool by clicking on the rectangular tool in the windows toolbox.
- 2 Select the window type: text or graphics.
- 3 Move the cursor to a corner of the window you want to create and click.
- 4 Stretch the window by moving the cursor to the opposite corner and click.

The window is drawn.

Sides smaller than 1 mm are not allowed!

Creating a Polygonal Window



- 1 Select the polygon tool by clicking on the polygonal tool in the windows toolbox.
- 2 Move the cursor to a corner of the polygonal window you want to create and click.
- 3 Move the cursor. One side of the polygon is drawn as your the mouse.
- 4 Click to fix the first side.

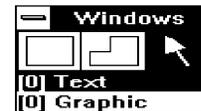
- 5 Move the cursor and click where ever you want to terminate a polygon side.
- 6 Click on the *right* mouse button to close the polygon.

You can't cross a side you've already drawn!

You can also create polygons by merging rectangles. Whenever two windows of the same type touch, they are merged to form a single window.

Selecting Windows

- 1 Select the arrow tool in the windows toolbox.
- 2 Click on a window border.



Markers appears at each corner and in the middle of the window sides.

- 3 To select a second window without unselecting the first one, hold down the Shift key while clicking on this second window.
- 4 To select one window and every window included in it, hold down the Ctrl key while clicking on the main window.
- 5 To unselect windows, click the mousebutton anywhere but the on the window sides.

You can display the type and **coordinates** of a window by pressing the Alt key while you select the window.

Modifying a Window

- 1 Select the window. See above.
- 2 Move the cursor to one of the markers.
- 3 Click and hold down the mouse button.
- 4 Move the mouse.

The window size changes accordingly to your moves.

- 5 Release the button when the window size is correct.

Moving Windows

- 1 Select the window(s). See above.
- 2 Move the cursor to a window side, midway between two markers.
- 3 Click and hold down the mouse button.
- 4 Move the mouse. The window position changes accordingly to your moves.
- 5 Release the button when the window position is correct.

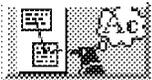
Deleting Windows

- 1 Select the window(s). See above.
- 2 Choose the "Delete" or "Clear" command from the "Edit" menu.

The "Delete" command erases the window(s) but saves an internal copy that you can paste later on. "Clear" erases your window(s) irretrievably.

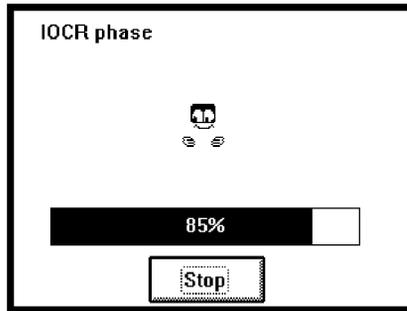
Edit	
Undo	Alt+BkSp
Delete	Sh Del
Copy	^Ins
Paste	Sh Ins
Clear	Del
Select All	^A

Character Recognition



Click the "OCR" button in the button bar to execute the character recognition on the zones you have indicated, even when you only want to save graphics.

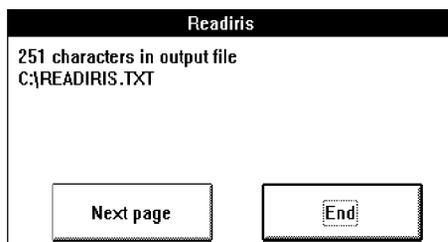
The progress is indicated; you may interrupt any time by clicking the "Stop" button.



As Readiris supports **multitasking**, you may also run the recognition in the background. Minimize the Readiris window and perform another task on your PC; the interactive learning window will pop up when the software is ready.

During that interactive phase, the recognized text is displayed progressively. When the system is unsure about a solution, the image of the word is displayed and the doubtful character is highlighted. The system stops and waits for your response. See below.

After the validation phase, the recognized text is saved in the output file or in the clipboard and you are asked if you want to read another page.



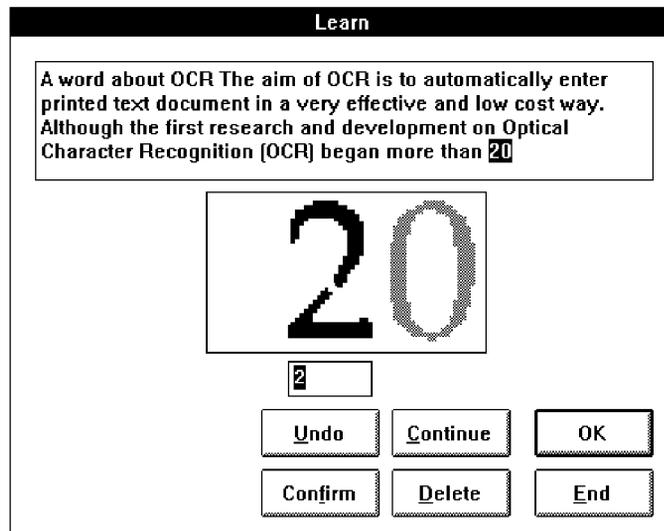
In case of multiple-page document, the "Next Page" button automatically puts the font dictionary and output file in the append mode. With a flatbed scanner, the next page is scanned, with a handy scanner, you are ready to scan again.

You will easily find that the learning phase requires much less interaction for the next pages, when the font is similar.

Learning Fonts

The last step of the recognition is the **learning phase**. (The degree of interaction is dependant on the option "Strong Checking" in the "Control Panel".)

If Readiris is unsure about a recognition result, the doubtful form is displayed with its parent word. The character - or string of characters if they aren't separated - is highlighted and the proposed solution is presented. Unrecognized characters are signalled as "~".



If necessary, key in the valid characters and select one of the following buttons.

OK

You agree with or correct the proposed solution. The result is stored in the font dictionary as certain, final: future recognition of the same form will no longer require your intervention.

Alternative: press ENTER.

Continue

You agree with or correct the proposed solution. The difference with "OK" is that Readiris stores the result as "unsure" information in the font dictionary. Future recognition of the same form will still require your intervention.

Use this command for damaged characters which could be confused with other characters if OKed.

Confirm

The number '1' and letter "l" have an identical form in many typefaces. In this case, Readiris performs a context analysis to discriminate them. Where the context does not suffice, the user has to decide.

Use this button when the shapes for the number '1' and the letter "l" are clearly different, otherwise use "Continue".

Undo

Allows to go back, correct mistakes. Readiris keeps track of the last nine operations!

Delete

Deletes characters from the output. Use this button to prevent spots on your document from being recognized as periods, comma's etc.

End

Aborts the interactive learning process. The decision phase will be completed automatically. You accept every solution of Readiris.

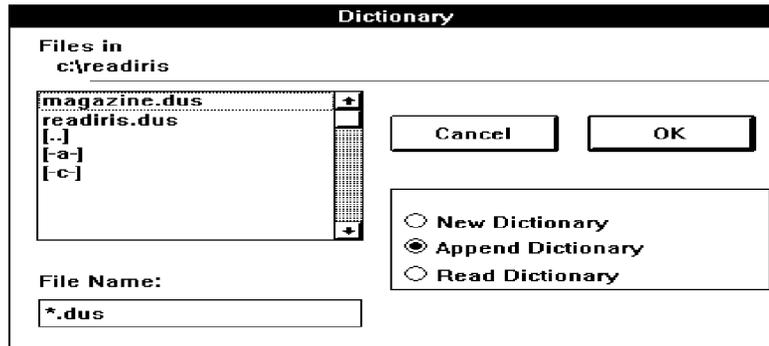
Making Good Use of Font Dictionaries

If you run Readiris on many documents of the same type, you may not want to repeat the same learning process every time. For this reason, you can store learnt characters in a font dictionary and use that acquired intelligence when you want to OCR similar documents.

To create or activate a font dictionary:

- 1 Choose "Control Panel" from the "Process" menu.
- 2 Click on "Dico".

All font dictionaries in your current directory are listed. They have the default extension *.dus.



- 3 Enter a name to create a new font dictionary or select an existing one.
- 4 Click on one of the available modes: "New" to start a new font dictionary, "Append" to complete an existing dictionary and "Read" to use a font dictionary without storing new information in it.
- 5 Click "OK".

The active dictionary file is displayed next to the "Dico" button in the "Control Panel". The selected mode is indicated between parentheses.

Getting Help

This concludes our general overview of the operation of Readiris. Readiris contains an **on-line help** system that extensively documents every aspect of the software. The on-line help may also contain some last-minute information.



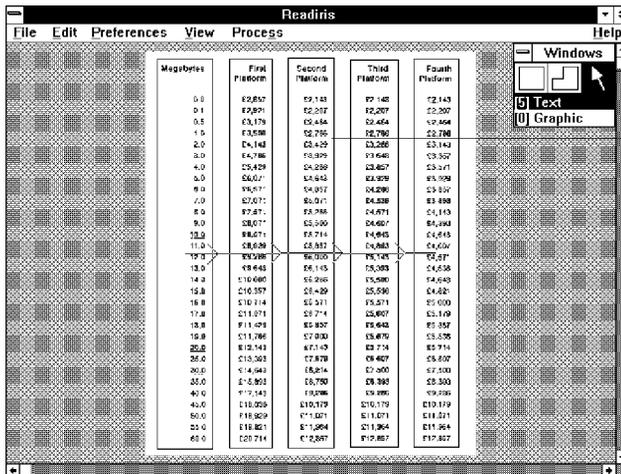
Select the command "Contents" under the "Help" menu to access that information. Shortcut: press F1. "About Readiris" displays the initial screen with your registration data.

However, Readiris contains some **advanced features** which we still should discuss in detail. We'll explain how to recognize tables, how to execute automatic OCR and how to use the Connect capability.

Recognizing Tables

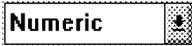
You can use Readiris to import tables of figures directly into your spreadsheet.

Drawing a window around each column is mandatory to neatly arrange the output in corresponding cells, otherwise you won't be able to import the tables correctly. The illustration below gives a good example.



Select one of the two following text formats: Excel ASCII or Excel clipboard. Although both provide a generic table filter, the Excel ASCII format creates a table file that can be imported directly in your spreadsheet while the Excel clipboard format sends the recognized table to the Windows clipboard. Use the "Paste" command of your spreadsheet to insert the table.

Detection of paragraphs and indentation is disabled whenever you select a table format.



Readiris can limit recognition to a numeric character set when tables of figures which contain no text are OCR'd. Select the **numeric mode** in the "Language" dropdown list of the button bar.

Automatic Recognition

You can make the recognition of your pages automatic. How automatic the recognition is executed depends on the scanner type.

Flatbed scanners allow fully automatic recognition of a large number of pages. Disable the options "Interactive Learning" and "View after Scan" and enable the option "Page Analysis". (You may also use a windowing layout to indicate the zones of interest.) Enter the number of pages to recognize in the "Control Panel".

Process	
Control Panel...	~P
Scan	~S
OCR	~O
Interactive Learning	
<input checked="" type="checkbox"/> Page Analysis	
<input type="checkbox"/> View after Scan	

Put a stack of pages in the scanner's document feeder, click the "Scan" button to start scanning and let your PC do the rest. The document stack is scanned, zoned and recognized without any intervention on your behalf! If the document feeder gets empty before the specified number of pages is recognized, an error message pops up.

Things are somewhat different for **handy scanners**. As the scanning always takes some physical effort on the part of the user, recognition is never fully automatic. Nevertheless, you can make automatic the windowing and recognition phases.

As automatic recognition implies that the interactive learning phase is disabled, it may be recommended to train Readiris on a few pages first; otherwise, your output may not show an optimal recognition rate.

Using the Connect Capability

The Connect capability offers a direct OCR link between your scanner and your Windows application. You are indeed able to OCR texts from within your favourite Windows application!

A new command appears in the menus of your Windows application after the installation of the Connect feature. Click on it and Readiris starts running. You scan and recognize your document and the output is inserted directly in your Windows application, at the current cursor position.

WordPerfect, Word and Excel

Make sure that Readiris does not run in the background.

Click on the new command "Scan Text" in your application menu to run Readiris from within your Windows application. For WordPerfect 5.x, this command appears in the "Macro" menu, for WordPerfect 6.0 under the command "Macro" of the "Tools" menu and for Word and Excel in the "File" menu.

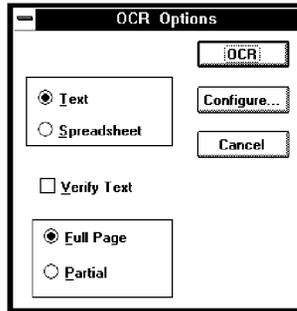
The Connect interface may ask you some questions before Readiris starts running. Proceed as usual and quit the Connect interface when you are through. The recognition results are inserted at the current cursor position.

Other Windows applications

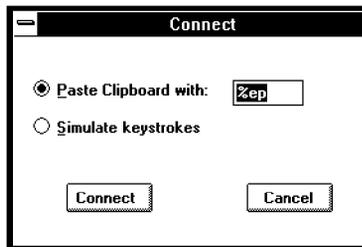
Double-click the Connect icon to run the Connect task server in the background *before* you run your Windows application. Click on the new command "OCR" in the "File" menu of your application. A dialog box appears.

Indicate if you are going to read a body text ("Text") or a table of figures ("Spreadsheet"). Select "Full Page" to enable page analysis or select "Partial" to window the scanned document manually.

Enable the option "Verify Text" to include the interactive learning phase. The user validation is by default disabled.



The "Configure" button gives access to some advanced parameters. Select "Simulate keystrokes" to insert the recognized text as if keyed in on the keyboard or select "Paste Clipboard" to paste the text invisibly from the clipboard.



Check if the correct shortcut key is specified for the paste command of your Windows application.

Some keys are represented by a special character.

KEY	REPRESENTATION
Shift	+
Ctrl	^
Alt	%
Insert	{INSERT}

Some examples: when the shortcut key for the Paste command is CTRL+V, you should enter **^V** here, when the shortcut key is SHIFT+INSERT you should enter **+{INSERT}** etc.

4 Commands Reference

This chapter is a short reference guide of all the Readiris menus. You are undoubtedly familiar with these commands if you have studied the previous chapters.

File

Gives you the possibility to save and retrieve settings and windowing files. Allows you to open a prescanned image.

Open

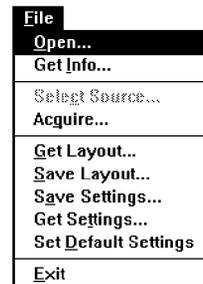
Opens a TIFF format image file. Active only in the preview mode.

Get Info

Displays the active Readiris configuration.

Select Source

Readiris being compliant with the Twain scanner standard, this command allows to select a Twain scanner and set the scanning parameters.



Acquire

Starts the scanning. Equivalent to the command "Scan" in the "Process" menu and the "Scan" button in the button bar and the "Control Panel".

Save Layout

Saves the windowing structure as defined on a document during its preview. Layouts are saved in a file with the default extension .wdw. Active only in the preview mode.

Get Layout

Recovers the windows structure previously stored in a file with the default extension .wdw. Active only in the preview mode.

Save Settings

Saves the current Readiris configuration in a file with the default extension .ibt.

Get Settings

Recovers the Readiris configuration previously stored in a configuration file.

Set Default Settings

Stores the current configuration as the default for the Readiris startup.

Exit

Quits the Readiris session.

Edit

The commands of this menu are only active during the document preview: they act on windows defined when the document is displayed on-screen.

To select a window, click on a window side. If more windows are to be selected simultaneously, hold down the Shift key while you click on the window sides.

Edit	
Undo	Alt+BkSp
Delete	Sh Del
Copy	^Ins
Paste	Sh Ins
Clear	Del
Select All	^A

Undo

Cancels the previous command.

Delete

Deletes the selected windows but saves them in an internal buffer.

Copy

Copies the selected windows to an internal buffer.

Paste

Inserts the content of the internal buffer. The inserted windows appear where they were originally copied or deleted from. To move them, click on the side of one of them and drag the mouse: the windows move with your mouse displacements.

Clear

Deletes all the selected windows irretrievably.

Select All

Selects all windows simultaneously.

Preferences	
Scanner...	^Q
Text Format...	
Graphics Format...	
Language...	^L
Toolbar	

Preferences

Specifies the basic settings of Readiris: which text and graphic format you use and which is the language of the document to be read. Enables the button bar.

Scanner

Displays the scanner type and his settings.

Text Format

Selects the file format for the recognized characters.

Enables the paragraph detection and margins coding. When you recognize tables, be sure to select the Excel format.

Graphics Format

Selects a graphic format for your graphic zones. Check which file formats your graphics application can read.

Language

Selection of the document's language. Readiris has numerous linguistic databases. You can also limit the character recognition to numeric characters, e.g. to recognize numeric tables which contain no text with maximum precision and speed.

Toolbar

Enables the button bar. The button bar is displayed on the left side of the application window. Using the button bar is recommended as buttons provide fast access to the most frequent menu functions.

View

The commands of this menu are only available during the document preview.

Fit in Window

Adjusts the zoom level so that the document image fits your screen size.

50% Actual Size

Zooms 50%.

Actual Size

Zooms at the real size of the document: a screen pixel equals an image pixel. You can switch from the “Actual Size” to the “Fit in Window” view and vice versa by clicking the *right* mouse button.

200% Actual Size

Zooms 200%.

All Windows

Displays all windows defined on your document layout.

Selected Type

Displays the windows of the selected window type only.

Sort

Sorts the text windows. The sort order determines in which order the different text windows have to appear in the output. This

View	
✓ Fit in Window	^W
50% Actual size	^5
Actual Size	^1
200% Actual Size	^2
✓ All Windows	
Selected Type	
Sort	^T
✓ Sort View	
Sort Reset	
Rotate...	^R
Toolbox...	
Coordinates...	^C

feature is very useful for multi-column documents. Click on a window border to define the sort order of the various text blocks.

Sort View

Displays the logical sequence of windows as defined in the sort command. Arrows join the different text windows.

Sort Reset

Resets the sort order of the text windows. Alternative: use the "Sort" button in the button bar.

Rotate

Rotates the scanned image. Select clockwise or counterclockwise rotation of the image. We recommend you to scan with the correct scanning direction.

Toolbox

Viewing of the windows toolbox which allows you to select the window type (text or graphics) and the window tool (rectangle, polygon or arrow).

Coordinates

Displays the coordinates window. The coordinates of the cursor are displayed in document pixels.

Process

Contains the commands related to the actual OCR process: scanning, OCRing and all parameters concerning those operations.

Control Panel

Displays the Control Panel.

Scan

Starts the scanning of a document or opens a prescanned image, dependent on the selective input source. Equivalent to the “Scan” button in the button bar.

OCR

Starts the character recognition and saves the graphics. Equivalent to the “OCR” button in the button bar.

Interactive Learning

Enables the interactive learning. Determines whether you will check the doubtful characters or accept the system’s solutions. (The option "Strong Checking" in the "Control Panel" determines the degree of verification by the user.)

The learning mode is also accessible on the button bar. Disable this option to execute automatic OCR.

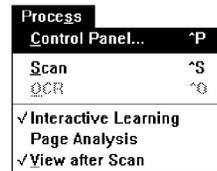
Page Analysis

Enables the page analysis. Determines whether the scanning is followed by the automatic page decomposition.

You can also enable and disable the page analysis in the button bar. Enable this option to execute automatic OCR.

View after Scan

Activates the preview mode: the scanned document is displayed on-screen. So you can define the different text parts to be recognized and the graphics to be extracted by Readiris. Disabling the preview mode doesn’t make much sense with handy scanners.



Control Panel

The Control Panel specifications are described at great length in chapter 3, "Learning More About Readiris".

Pitch

Selects the character pitch: fixed or proportional.

Size

Selects the character size: small or normal. A character is said to be "small" if its point size is smaller than 10 or if the software has difficulties to correctly separate two adjacent lines.

Font

Indicate the printing quality of your text: you read "normal" fonts or dot matrix printed texts.

Page(s) to Read

Number of pages to read automatically. This option is not available with handheld scanners.

Page Analysis

Enables the page analysis. Determines whether the scanning is followed by the automatic page decomposition.

You can also enable the page analysis in the button bar. Enable this option to execute automatic OCR.

View after Scan

Activates the preview mode. Equivalent to "View After Scan" in the "Process" menu.

Interactive Learning

Enables the interactive learning. Determines whether you will check the doubtful characters or accept the system's solutions.

The learning mode is also accessible on the button bar. Disable this option to execute automatic OCR. You can also influence the degree of interaction with the next option.

Strong Checking

When this option is enabled, the "rejection" degree is high: Readiris will confront the user with even the smallest doubt instead of taking some decisions autonomously. When Readiris recognizes a text with ease, you can limit yourself to the verification of those forms that constitute a real doubt.

Input

Selects the input source. You perform OCR either from the scanner or from a prescanned image file. Equivalent to the input source buttons in the button bar.

Output

Defines the output filename. If this file already exists, you have to select the replace or append mode. The extension of the output file is added automatically on the basis of the output format you have selected.

Layout

Selects the layout file which contains the windows structure adapted to a document type. The default extension is .wdw.

Dico

Selects the font dictionary and its mode: new to create a new font dictionary, append to complete an existing dictionary and read to

use but not write to a font dictionary. By default, the file extension is .dus.

Scan

Starts the scanning. Equivalent to the "Scan" button on the button bar.

Close

Closes the Control Panel.

Help Menu



This menu contains the on-line help system and the "About" window.

Contents

Gives access to the on-line help system that extensively documents every aspect of the software. The on-line help may also contain some last-minute information.

Shortcut: press F1.

The information can be consulted on-screen and printed out! Your Windows manual can tell you how.

About Readiris

Displays the initial screen with your registration data.

5 More About OCR

The aim of OCR is to automatically enter printed and typed documents in a very effective and low-cost way. Although the first research and development on Optical Character Recognition (OCR) began more than 20 years ago, this technology is still unknown by most of the people who could, and should, use it for their document entry applications.

You can install this useful tool in your office to unburden yourself with the fastidious task of retyping printed text.

OCR systems work well on many document types, but not all... The following pages briefly describe the different steps in the OCR process of a document. At the same time, an overview of the Readiris specifications is given.

The OCR Process

The document is read by your scanner. This electronic device acts as the “eye” of your computer and sends it the image. At this step, the document image is only a meaningless cloud of black points, so-called “pixels”, on a white background. The OCR software has to extract text information from these pixels: it has to recognize shapes and assign a symbol.

There are two types of OCR systems: “automatic” and “learning” systems. The first type can automatically recognize text from a wide range of fonts... but not all. With the second type, you must teach the system new characters every time you deal with a new document set. This method requires more user interaction, but it can treat nearly all fonts.

Both types of OCR systems use equivalent processes to recognize text. The main steps are:

- line segmentation
- words and characters segmentation
- character recognition
- text output

The **line segmentation** consists of slicing a page of text into its different lines. This step also analyses lineskew and interspacing. The most difficult documents are those which have both a small interline spacing and a significant skew.

The **words and characters segmentation** isolates one word from another and then separates the different letters present in each word. If the characters are all of the same width (fixed fonts), this step is very easy to perform. This happens e.g. on documents printed with a typewriter.

The problem is more interesting if all letters have a width which depends on their actual shape (proportional fonts). The most difficult cases are found in documents where proportional characters randomly touch. Dot matrix characters are composed of little dots and require highly specific segmentation techniques.

The **character recognition** phase extracts characteristics out of each isolated shape and gives it a name.

The **text output** is the conversion of the recognized text into a file which can be imported in your wordprocessor, spreadsheet, desktop publishing software etc.

Readiris Scope

Readiris is a high-performance but easy-to-use OCR package. Its functions have been selected from all the high-end IOCR techniques mastered by IRIS. This product has the following specifications:

- It makes use of **self-learning techniques** in order to be an open system. Readiris is a learning system which appears to be automatic: the software finds the right solution for the major part of the document by itself.
- It extensively uses the **linguistic context** to find its solutions, however it also can work without any context, like on numeric tables for example.
- It guides the user with great comfort through a single **five-step process**: scanning, preview, windowing, recognition and validation of the doubtful results.

Like any OCR product, Readiris can not deal with every document type, but what it does, it does well. This reliable and cost-effective system is intended to read original documents and/or good quality copies.

The learning capabilities are very powerful and give the best results if the following conditions are satisfied.

Amount of Characters and Linguistic Context

Readiris needs a reasonable amount of characters and linguistics context for each represented symbol in order to perform the auto-learn process in such a way that recognition is mostly automatic.

If the linguistics context is poor or doesn't exist, the system will still work but will prompt the user for more interaction.

Character Isolation

Readiris performs a limited segmentation algorithm so as to reduce the processing time and memory requirements.

The first step of character isolation can be performed on reasonably separated characters. In a second step, Readiris uses a very powerful algorithm in order to decompose groups of kerned characters and random ligatures.

Assuming this, it needs to have been able to isolate a minimum of elementary models (the isolated characters) to perform a correct segmentation of touching characters.

The immediate consequence of this technique is that recognition of any font is possible if the system manages to isolate a sufficient number of elementary characters.

Character Size Range

The size range is 8 to 20 points, which covers most of font sizes used for current text body. However, even smaller fonts may be legible too if you select a resolution of 400 dpi.

It's suggested not to mix a title of a few words in a larger typeface with the much bigger part of the current text to be recognized. In most cases, the DTP operator will key in his own titles anyway.

Excluded Documents

Readiris will not read text which is too dense, i.e. where nearly all letters in each word are touching. This is the reason for the exclusion of low quality documents of the very dark, fat photocopy type.

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