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INTRODUCTION

Preliminary talks

Caution: This manual is a tutorial. We advise you to refer to the online help when you are using WinDev Mobile.

The aim of the tutorial is to help you discover WinDev Mobile, become familiar with the editors and teach you the concepts of WinDev Mobile. This manual does not cover all the features of WinDev Mobile.

This manual is intended for the developers who are already familiar with WinDev. This manual presents the main concepts required to develop an application for a mobile device (operating in Windows Mobile, Windows Phone, Android, ...).

If you are not familiar with our standard WinDev product, we recommend that you to read the WinDev tutorial beforehand.

Note: To receive the standard WinDev tutorial, get in touch with the sales department of PC SOFT. You should plan on spending a few hours to follow this course and to learn WinDev Mobile: you'll find it well worth it!

If you try to develop an application before practicing, you will lose time, and a lot more than a couple of days.

This course was designed so you can approach it in two different ways :

- either you follow all the detailed exercises in each lesson (recommended method).
- or, if you are in a hurry and already experienced, you can read through it without doing the exercises, as all the exercises have screen shots. However, in order to quickly assimilate the main concepts, we recommend that you follow the course step by step.

WinDev Mobile evolves all the time, so the screen shots found in this course may differ from the screen shots found in your product.

The language aspect is only one of the many aspects of development. programming is a lot easier if all the aspects of development are taken into account.

Overview of the tutorial

The tutorial has been designed to progressively teach you how to use WinDev Mobile. By following this course :

- you will discover the main concepts explained here informally ; these are the concepts you need to learn and understand.
- you will also be asked to perform tasks that demonstrate the concepts just explained.

A glossary that summarizes the terms used is available in "Appendices", page 146.

As you progress through the tutorial, if you want to take a closer look at a concept or if you want to get more details about a programming function, see the online help (directly accessible from the editors or from the guide).

The size of a lesson is not necessarily proportional to its relevance ...

And don't forget to take a look at the examples supplied with WinDev Mobile: they are very instructive !



TIP

The Tutorial may have evolved since this document was published. Don't forget to consult the online version of the Tutorial (PDF file accessible from "? .. Tutorial .. Tutorial (PDF)").

How do I access the online help?

1. In the code editor, a specific help is available for each function via the [F1] key.
2. The button  accessible from each window
3. In the editors, press the [F1] key.
4. In the editors, the help menu (symbolized by "?") enables you to display the help summary or to search for specific information.

Legend of the symbols



This symbol indicates the duration of the lesson. Please note that the actual time may vary according to your level of experience.



An example is available to complement the lesson. The examples supplied with WinDev Mobile can be accessed from the "Wizards, Examples and Components" pane.



This symbol introduces a "Tip", we advise you to read the associated text.



This symbol introduces a "Warning", reading the associated text is extremely important.



This symbol introduces a "Note", we advise you to read the associated text.



This symbol gives the result of a "Test", we advise you to read the associated text.

If you are familiar with WinDev Mobile 16 ...

If you are familiar with WinDev Mobile 16, following this course will do no harm: it's a good opportunity to "revise" the features of WinDev Mobile !

What is WinDev Mobile used for?

WinDev Mobile is an IDE (Integrated Development Environment). It enables you to develop applications in many fields :

- Management of stocks
- Inventories, tracking of goods
- Adjustment and monitoring of machines on an assembly line
- Taking orders for fast processing in a temporary outlet (fairs, schools, booth, ...)
- Customer forms
- Help with making snap decisions on a cell phone
- Checking the identity of visitors at an event: trade fair, presentation of products, ...
- On-call doctors or vets
- Taking information in a temporary outlet: trade fair, street poll, stadium, ...
- Returning leased heavy equipment (tools, vehicles, ...) to a parking lot
- ...

WinDev Mobile is a development environment that includes all the tools required for developing an application.

Unlike some other programming languages, you don't need to find and add modules to be able to design, test and install an application.

The 5GL (5th Generation Language) of WinDev Mobile, the WLanguage, will surprise you by its simplicity: a few hours are all you need to get the hang of it, a week is usually all it takes to fully master its potential !

The WLanguage, available in English and in French, allows you so save a lot of time !

Note: In this book, "Pocket PC" represents all the possible runtime platforms (Pocket PC, Smartphone, Psion, ...). For special cases, the name of the relevant platform is specifically mentioned.

PART 1

**Discovering
WinDev Mobile**



BEFORE WE START ...

This lesson will teach you the following concepts ...

- WinDev Mobile: what is it used for?
- Overview of the features of WinDev Mobile.



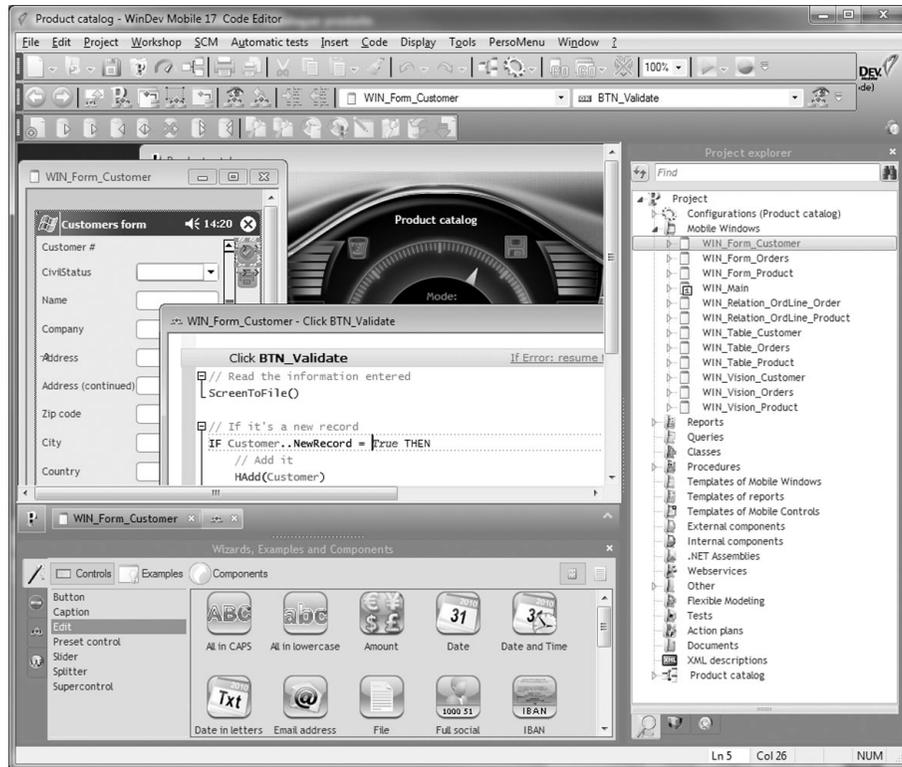
Estimated time: 1h

WinDev Mobile: what is it used for?

WinDev Mobile 17 is used to manage the development cycle of an application for Pocket PC.

WinDev Mobile enables you to develop all the applications you've been dreaming of.

The WinDev Mobile environment is as follows:



WinDev Mobile 17 is used to create applications that manage data. The WinDev Mobile applications access most of the available databases. WinDev Mobile 17 is supplied with HyperFileSQL Mobile, a powerful database already used in thousands of sites!

WebDev Mobile 17 proposes one of the most powerful work environment! Your teams will easily create outstanding applications.

The window editor of WinDev Mobile 17 is 100% WYSIWYG ("What You See Is What You Get"). It enables you to easily create outstanding windows linked to data.

Starting WinDev Mobile

In this lesson, you are going to perform your first operations in the environment of WinDev Mobile 17.

- ▶ Start WinDev Mobile 17:
 - click the desktop icon:



- select "Start .. Programs .. WinDev Mobile 17 .. WinDev Mobile 17".

WinDev Mobile starts.

The following wizard is displayed when WinDev Mobile is started for the first time:



This wizard helps you to configure the environment of WinDev Mobile.

All the wizards of WinDev Mobile can be customized. Your favorite image can be displayed in the wizard windows: fixed image, animated image, image chosen in the catalog or image imported by yourself (snapshot of your children for example).

To customize the wizards, right-click the image of a wizard and select the image to use.

For example:



Tip



See the online help (keyword: "Wizard") for more details.

Environment of the Tutorial

WinDev Mobile allows you to configure the environment. Several modes are available:

- **Simplified environment:** This mode enables you to discover the main features of WinDev Mobile.
- **Full environment:** This mode proposes all the features of WinDev Mobile, including the most recent ones.
- **Retrieve the configuration of your xx environment:** This mode restores the features available in version xx (if version xx is installed on your computer).

At any time, regardless of the type of environment used, you have the ability to add or delete the access to some unused features.

To follow this Tutorial, we advise you to work with a simplified environment. The advanced features will be added as this Tutorial goes along.

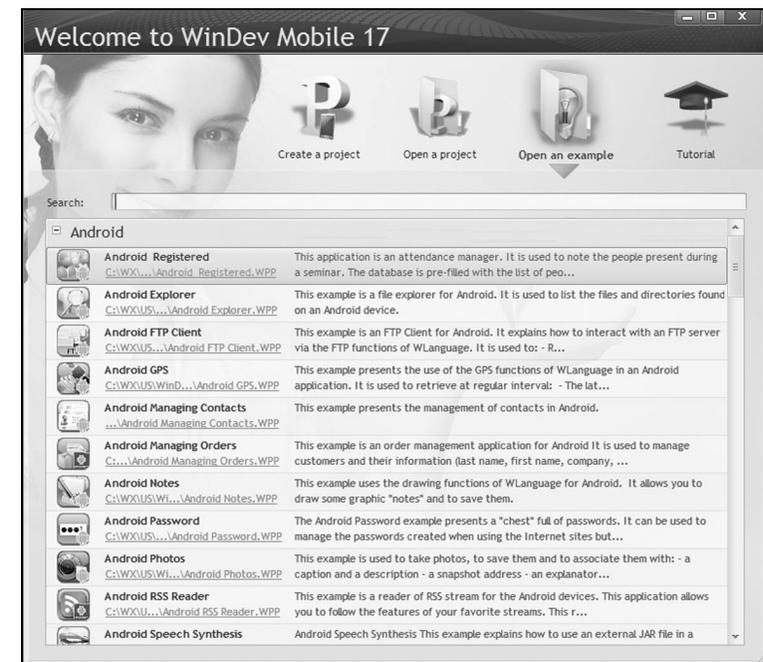
- ▶ To use the simplified environment of WinDev Mobile:
 1. Start WinDev Mobile 17.
 2. A wizard starts if WebDev Mobile 17 was never started before. This wizard enables you to choose your work environment.
 3. Select "Simplified environment" and validate.
- ▶ This welcome wizard is not displayed if WinDev Mobile was already started on your computer. To check and modify (if necessary) the configuration of your environment, perform the following operations:
 1. Select "Tools .. Options .. Options of the environment".

2. Click "Restart the wizard for configuring the environment".
3. Select "Simplified environment".
4. Validate your choice.
5. Validate the options of the environment.

That's it, WinDev Mobile is configured to follow the Tutorial.

Overview of WinDev Mobile

During the first startup of WinDev Mobile, once the environment was configured, the following window is displayed:



- ▶ Select "Open an example".
 1. Enter "Pocket Beach" in the search control.
 2. Then, click the link corresponding to the example.

Note: If WinDev Mobile is directly opened on an existing project, select "File .. Open a project" from the popup menu of WinDev Mobile and select the Pocket Beach.WPP project found in the "Examples\Mobile Windows\Beach Booking\Pocket Beach" sub-directory of the setup directory of WinDev Mobile.

3. The "Pocket Beach" project is opened.



The environment of WinDev Mobile

The WYSIWYG ("What You See Is What You Get") environment of WinDev Mobile 17 is conducive to productivity.

- ① The project dashboard gives an overall view of the progress of a project. It can also be used to start the different project elements.
- ② The document bar gives you the ability to redisplay the elements that were previously opened.
- ③ The "Wizards, Examples and Components" pane proposes a set of elements: components (elements that can be easily reused in all your projects), preset controls, examples, ... An invaluable time saver!
- ④ The "Project Explorer" pane returns the list of project elements: a double click performed on an element opens this element in the relevant editor. This pane is used to perform searches in the project.

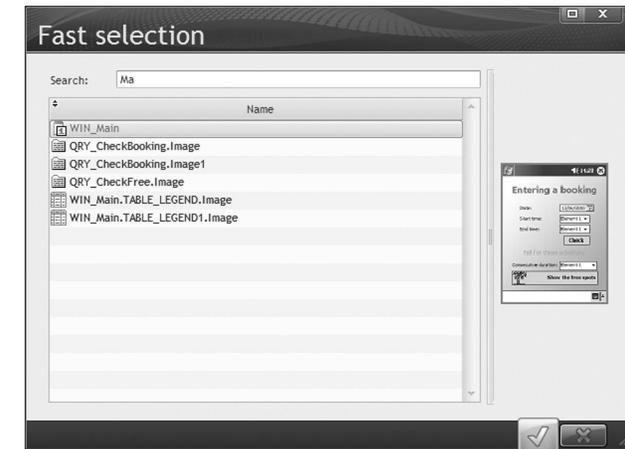
The environment of WinDev Mobile 17 is very intuitive. The different panes can be displayed at any time via "Display .. Toolbars .. Panes".

- ▶ The dashboard enables you to easily find out whether bugs have occurred in the project, whether automatic tests have been created and whether the project can be optimized. It also gives you the ability to find project elements.
- ▶ You are now going to display the graph of the "Pocket Beach" project: click the "Graph" button in the dashboard or select "Project .. Project graph". The project graph is used to view the sequences between the different project elements.

Note

FishEye
To enlarge the section of the project graph hovered by the mouse cursor, use the FishEye effect ().

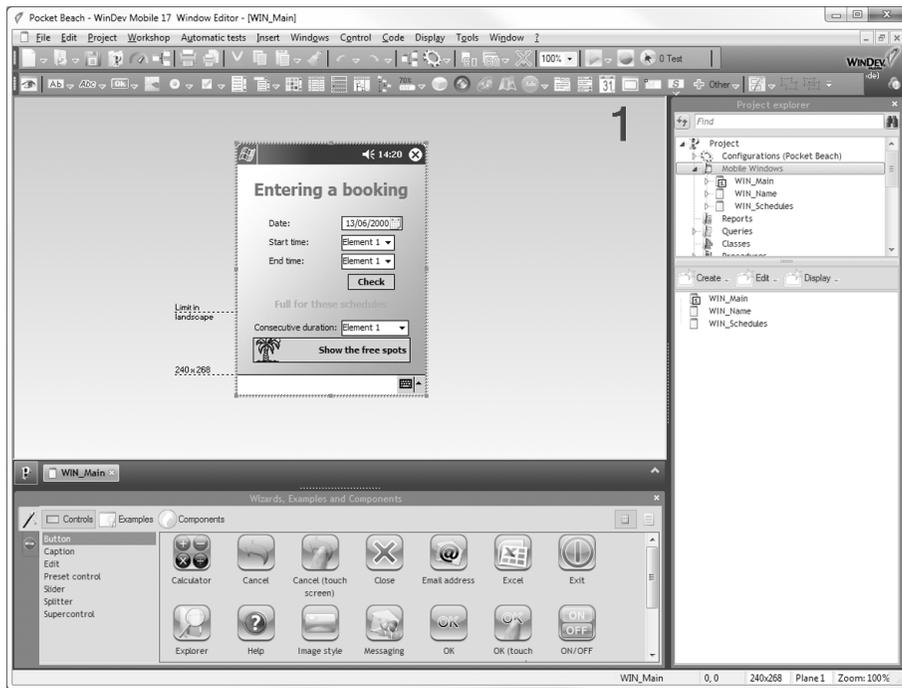
- ▶ You are now going to open a window found in the "Pocket Beach" example: "WIN_Main". This window is the first window of the project: it is the first window that will be displayed when the application is started. This window is displayed with an orange background in the project diagram.
- ▶ Use [CTRL]+[E]. Enter the letters found in the sought element and the list of corresponding elements is displayed:



- ▶ Double-click the selected window to open it.

The window editor

The window editor of WinDev Mobile enables you to easily create some outstanding windows linked to data. The window that was just opened is displayed in the window editor of WinDev Mobile. Several controls are found in this window.

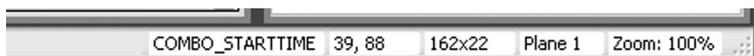


► The digit displayed at the top represents the number of the plane currently displayed. This window contains several planes: the [Pg Up] [Pg Dn] keys of your keyboard allow you to position on the first plane ("1" is displayed in the top right corner).

Note: A plane is used to display a set of controls found in a window.

► Move your mouse in the window, above a text or an image. Click with the left mouse button. The control is selected.

You will notice that some information regarding the control is displayed in the status bar.



This information corresponds to the name of the selected control, its position, its size as well as the current display zoom in the window editor.

A double click performed on the control gives access to all the characteristics of the control: name, caption, link to data file, ...



To close the description window, click the green button to validate.

- Select the "Check" control in order to view the code associated with it. To do so:
 1. Click the "Check" control. This control is named "BTN_Check".
 2. Press [F2] on your keyboard. The code associated with this control is displayed in the code editor.

The code editor

The WLanguage (the language of WinDev Mobile) enables you to describe all the requested processes. The WLanguage is a 5GL (5th generation language) that greatly simplifies the programming of your applications.

The code editor is a major component of the power and efficiency of WinDev Mobile. The coding is intuitive, fast and directly performed in the relevant control or window.

All the events are supported: click, double click, key down, mouse rollover, ...

To make coding easier and more readable, each word is colored according to its type.

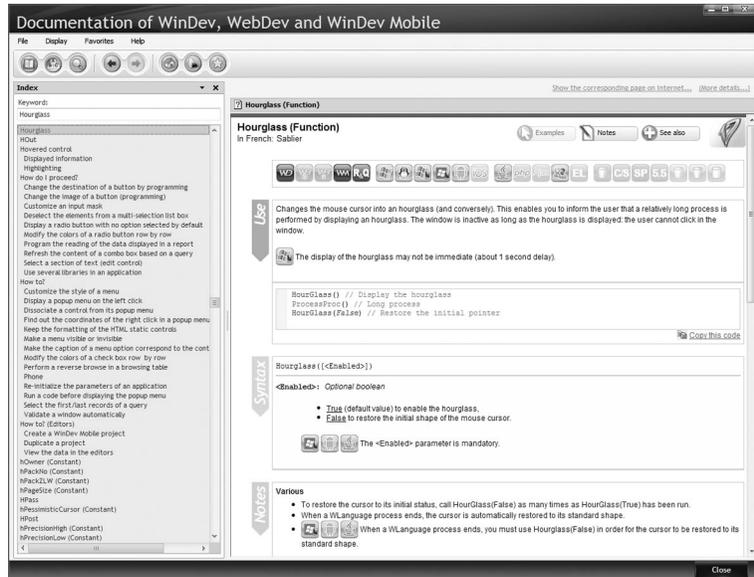
For example, in the code window that was just opened:

- The "Hourglass" word is colored in blue: it is a WLanguage function.
- The "STARTTIME" word is colored in cyan: it is a project element.
- The "hHour" word is colored in green: it is a local variable.

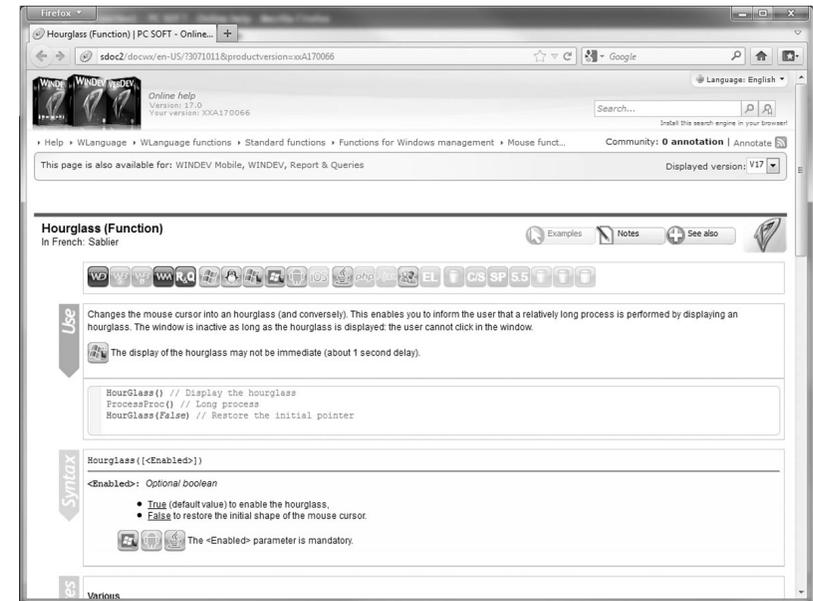
An assisted mode is also available for entering the source code: when typing the name of a function, the type of parameter expected by this function is displayed in a tooltip and in the status bar of WinDev Mobile. The completion is also available for the names of the variables or functions.

An online help is available for each control, for each editor and for each WLanguage function or property.

- ▶ You are now going to display the help about the **Hourglass** function. To do so:
 1. Position the mouse cursor on the name of the function ("Hourglass").
 2. Press [F1] on your keyboard. The help of the function is displayed in a specific "help browser".



If your computer is equipped with an Internet access, the help page currently found in the "help browser" can be displayed in its Internet version ("Show the corresponding page on Internet" link).



Notes

The online help for WinDev, WebDev and WinDev Mobile is available on Internet. Therefore, the online help can be accessed from any computer equipped with Internet access, without having to install the product. This help is updated on a regular basis. Each Web user can add comments about the documentation pages: personal notes, examples, links, ...

The online help of WebDev enables you to get information about the 2000 WLanguage functions. The online help also contains the help about the editors, controls, tips, ...

The online help is common to WinDev, WebDev and WinDev Mobile. The pages displayed correspond to the product currently used.

To start the Internet online help from the product:

1. Select "Tools .. Options .. General options of WinDev Mobile".
2. In the "Help" tab, select the access mode to the help database.

The data model editor

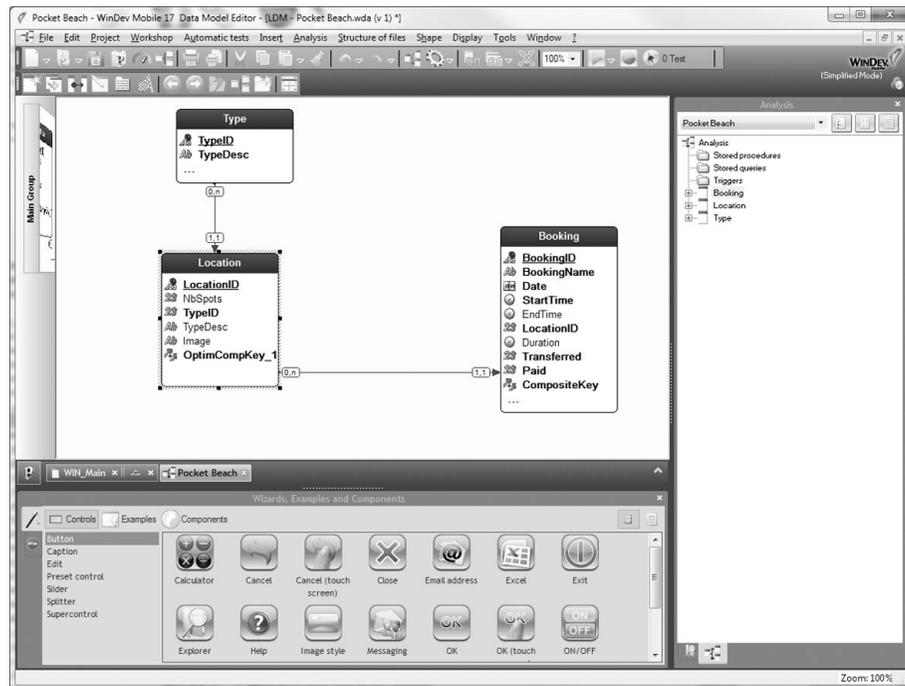
The analysis is an important phase when describing an application. The analysis is used to describe the structure of the data used by the application.

WinDev Mobile enables you to easily define the analyses, based on new or existing data. It is all done very intuitively.

The data model editor enables you to create your database, the data files and the links between these data files.

- ▶ You are now going to open the analysis found in the "Pocket Beach" example. To do so, select "Project .. Load the analysis".

The data model editor is opened.



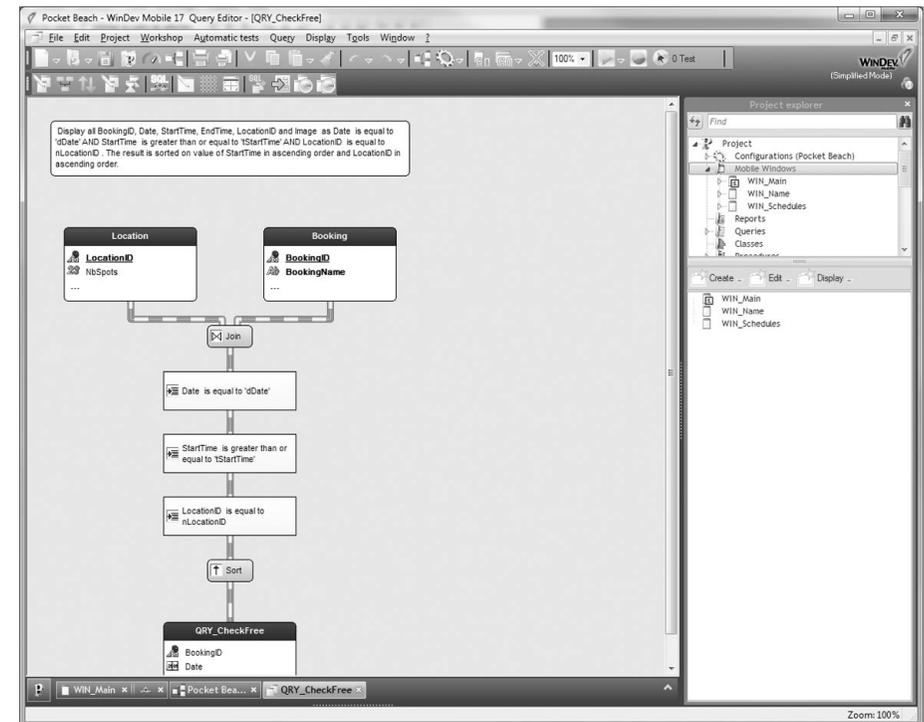
Several data files linked together are found in the analysis.

WinDev Mobile 17 allows you to create applications linked to the data via RAD (Rapid Application Development, "Workshop .. Full application RAD").

The query editor

The query editor enables you to automatically create queries based on data files. The programming is simplified: windows, tables, combo boxes, reports ... can be based on queries.

- ▶ You are now going to open a query found in the "Pocket Beach" example. To do so:
 1. Display the dashboard ().
 2. In the "Fast selection" tab (middle right), type "Check".
 3. The query named "QRY_CheckFree" is found. Double-click its name to open it.
 The query editor is displayed:



This query is used to display the free spots.

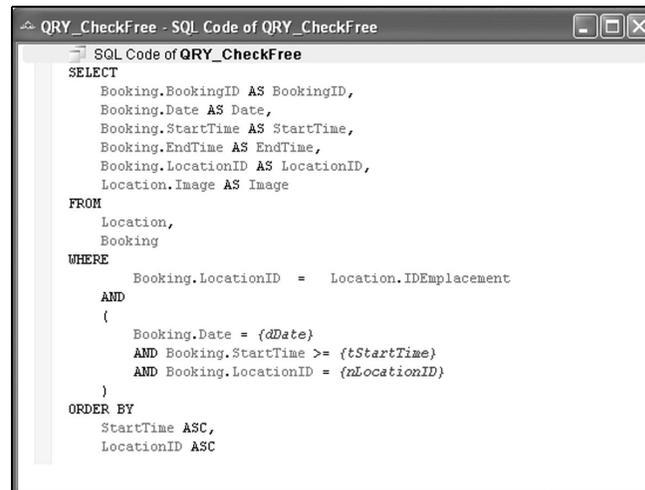
The data source of a query can be a HyperFileSQL Mobile database or an external database (AS/400 for instance).

Choose the items to include, enter the selection conditions via the query creation wizard, ... and the query is automatically created.

The queries are generated in everyday language, which makes future modifications a lot easier! No need to know the SQL language to create powerful queries: the SQL code is automatically generated by WinDev Mobile.

- ▶ Select "Query .. SQL code".

The SQL code generated by WinDev Mobile is displayed in the query editor:



```

SQL Code of QRY_CheckFree
SELECT
  Booking.BookingID AS BookingID,
  Booking.Date AS Date,
  Booking.StartTime AS StartTime,
  Booking.EndTime AS EndTime,
  Booking.LocationID AS LocationID,
  Location.Image AS Image
FROM
  Location,
  Booking
WHERE
  Booking.LocationID = Location.IDEmplacement
  AND
  (
    Booking.Date = {dDate}
    AND Booking.StartTime >= {tStartTime}
    AND Booking.LocationID = {nLocationID}
  )
ORDER BY
  StartTime ASC,
  LocationID ASC

```

The report editor

The report editor enables you to create reports that can be directly printed from your applications. A wizard is automatically proposed to create the reports: it asks several questions so you won't forget anything!

The method for creating a report is the same as then method for creating a window!

The principle for printing a report in Pocket PC is straightforward: a PCL file is created when the report is printed and this file is sent to the destination printer. The content of the PCL file is specific to the printer used.

Some WLanguage code can be entered in all the report elements: the most specific processes can be performed without hassle.

The setup editor

WinDev Mobile enables you to create the programs required to easily install your applications on the Pocket PCs of the end users.

Several methods can be used to install a WinDev Mobile application on a Pocket PC:

- setup in CAB format. This setup program is run on a Pocket PC.
- setup by direct copy of the executable from a PC to a connected Pocket PC.
- setup performed via a setup program. This setup program is run on a PC under Windows connected to a Pocket PC.

To conclude

You now had a quick look at parts of the environment of WinDev Mobile 17.

You will be able to explore the main features of WinDev Mobile in details by following this tutorial.

The online help is available at any time via the [F1] key.

You also have the ability to contact our free Technical Support or our "Assistance Directe©" service from our Web site (<http://www.windev.com>).

Don't forget to visit our Web site (<http://www.windev.com>) on a regular basis to get updates of the examples supplied with WinDev Mobile.

PART 2

First applications



LESSON 2.1. YOUR 1ST APPLICATION

This lesson will teach you the following concepts ...

- Creating your first window that can be used on Pocket PC.
- Running the test of this window.
- Creating the executable and the setup program for this application.
- Installing this window on a Pocket PC.



Estimated time: 1h



EXAMPLE

The "Discovery.WPP" project corresponds to the full project with the answers to this lesson. To open this project, select "? .. Tutorial .. Discovery".

You can follow this lesson without opening the project.

Now let's go down to work!

Starting WinDev Mobile

The following window is displayed when WinDev Mobile is started:



This window gives access to the most common features when starting WinDev Mobile.



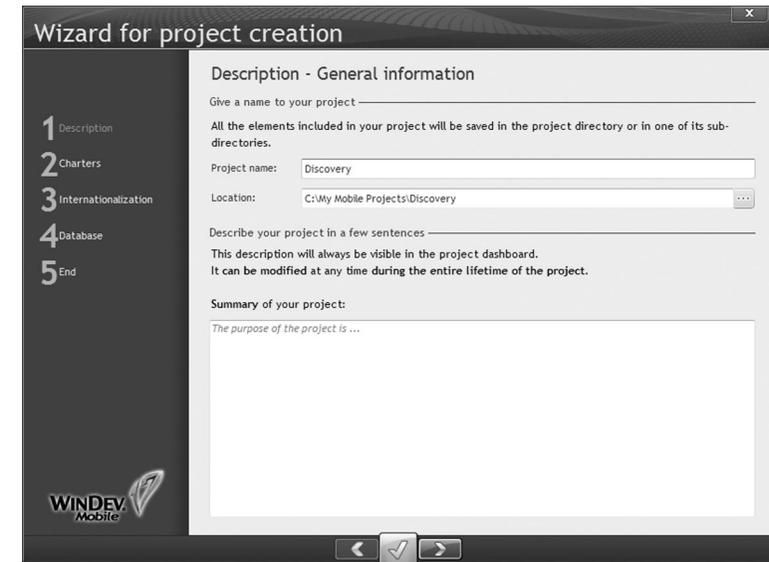
Note Tip: If this home window is not displayed, close the current project.

Our first application will be a Windows Mobile application. For our first application, we are now going to create a new project.

How do I create a project?

To create our first project:

- ▶ Click "Create a project" and select the type of application: "Windows Mobile application". The wizard for project creation starts.
 - Note:** To start this wizard, you can also select "File .. New .. Project".
- ▶ Enter the name of the project ("Discovery"). The name of the project is the name that will be used to save the project file, with the "WPP" extension.
 - The project directory is initialized by default ("My Mobile Projects\Discovery").



- ▶ Go to the next wizard screen.
 - Note:** The browse buttons in the wizards are used to go to the previous plane, to go to the next plane or to validate the entire wizard with the default options.
- ▶ Validate the wizard screens until you reach the plane named "Description - Detecting the characteristics of the device".
- ▶ If a device (Pocket PC, Smartphone, ...) is currently connected to the PC, its characteristics can be automatically detected ("Click here to start the detection" button). Otherwise, go to the next plane to choose the device to use.

- ▶ Select (if necessary) the type of device on which your project will be run ("Windows Mobile 5/6" for example).



WinDev Mobile allows you to develop applications for different families of products: Pocket PC, Smartphone, ...

The following elements can be configured for each family:

- the dimensions of windows.
- the position of menus.
- the size of the title bar.
- the image used in test mode (simulator image). This image enables you to run the test of your application in an environment corresponding to the environment of the users.

All these characteristics define the runtime platform.

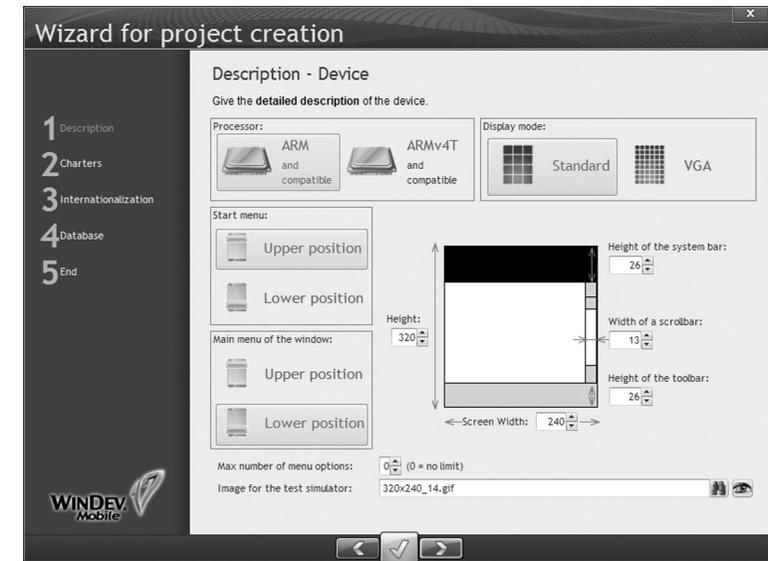


Note

The same application can be run on different platforms (Pocket PC and Smartphone for example).

However, we advise you to create a project configuration for each runtime platform. Therefore, each configuration will group all the elements specific to a runtime platform. Indeed, some characteristics can differ according to the platform used (size of the screens, management of menus, management of keyboard keys, ...).

- ▶ Go to the next plane: you have the ability to create a detailed description of the platform used:



Note: These characteristics can be modified later ("Platform description" button in the description window of the project, "Project .. Project description").

- ▶ Display the next screens until you reach the "Charters - Style book" screen.
- ▶ You have the ability to choose the style of your application by selecting a style book. Select the "ActivUbuntu" skin template for example.

WinDev Mobile proposes several style books (or skin templates). The skin templates are used to give a specific "style" to the interface of an application.

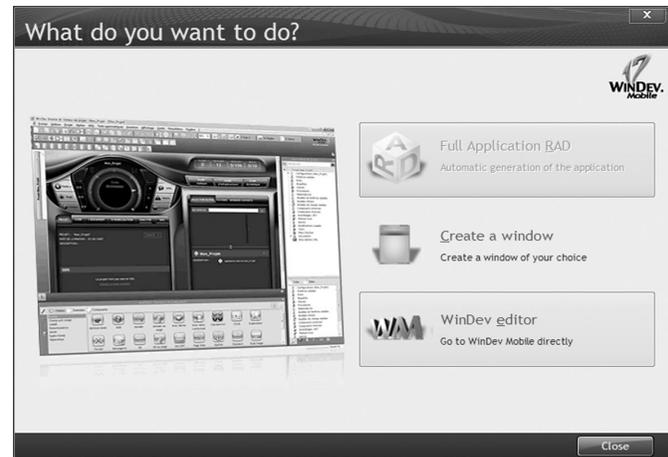
Too often, the applications built for Pocket PC all look alike: a square window, a white background, a blue title bar, gray buttons, no image, ... a little dull, which is a pity because this is your 1st contact with the user!

WinDev Mobile enables you to select the skin template of your choice from dozens of templates. Your windows, your buttons, ... are all "dressed up" in a few seconds!

You also have the ability to create your own skin templates. This is an advanced feature of WinDev Mobile. See the online help (keyword: "Skin template") for more details.

- ▶ Click the "Database" link in the left section of the wizard. Our project will be linked to no analysis. Select "No, do not use a database".
- ▶ Click the validation button to validate (green button).

► The following window is displayed:



Select "WinDev editor".

Create your first window

You are now going to create the following window:



This window is a stopwatch.

You may think this window is too simple, too basic, ... but we recommend that you create this window. You may well be surprised by how intuitive and easy it is to use the editor of WinDev Mobile. Furthermore, this window will teach you some principles that are fundamental for the rest of this tutorial.

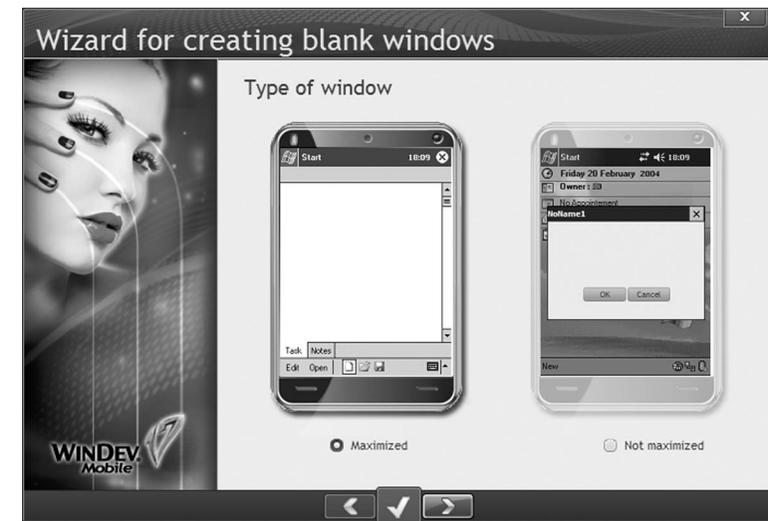
► To create the window:

1. Click  in the toolbar of WinDev Mobile. A wheel proposes the different elements that can be created.
2. Click "Window" to create a new window. A wizard is displayed.
3. Select "Wizard for blank window".

By default, this window will use the skin template selected during the project creation.

4. Validate. The wizard for creating a blank window starts. We are now going to enter information about the window (type, name, title, ...).

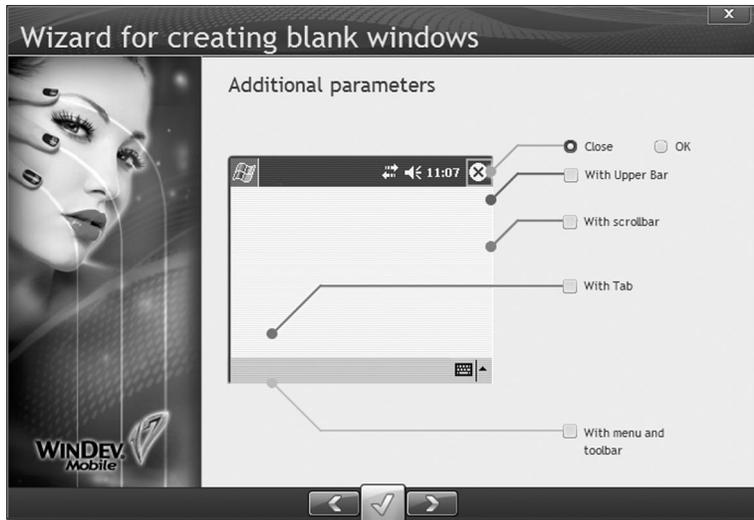
► Select the type of the window.



Two types of windows can be created in WinDev Mobile:

- Maximized window: Window that occupies the entire screen of the Pocket PC.
- Non-maximized window: Window that can be resized by the user and that occupies part of the screen only.

- Select "Maximized". Go to the next screen.
- Select the elements found in your window.



Different elements can be found in a maximized window:

- **Close/OK button:** used to close or to validate the window. This button is associated with a process used to customize the closing of the window.
- **Upper bar:** used to display information, buttons, ...
- **Vertical scrollbar:** automatically displayed if the size of a window is greater than the resolution of the screen on the Pocket PC used.
- **Tab:** used to organize the information on different panes. The user only has to choose the requested tab.
- **Menu and toolbar:** allows the user to easily access a feature of the application. In an application for Pocket PC, this menu is located at the bottom of the windows.

- ▶ Keep the options selected by default ("Close" button) and go to the next screen.

Non-maximized window

The following elements can be displayed in a non-maximized window:

- **Title bar:** used to display the title of the window as well as the Close and OK buttons.
- **Close/OK button:** used to close or validate the window. This button is associated with a process used to customize the closing of the window.
- **Border of window.**

A non-maximized window can be moved by the background and resized. See the online help (keyword: "Window") for more details.

- ▶ Enter the name of the window: "WIN_Stopwatch". The name of the window is used to handle the window in programming. This name also corresponds to the name used to save the window on disk (with the "WPW" extension). Enter the title of the window: "Stopwatch".

- ▶ Validate the creation wizard. The created window is displayed in the window editor. Note: All the window characteristics specified in this wizard can be modified later in the description window ("Description" from the popup menu).
- ▶ Save the window ("File .. Save" or). A window is displayed, indicating the name of the element and its location. Validate.



Note

Automatic prefixing

WinDev Mobile enables you to automatically prefix all the elements that can be handled in the code editor (windows, controls, variables, ...).

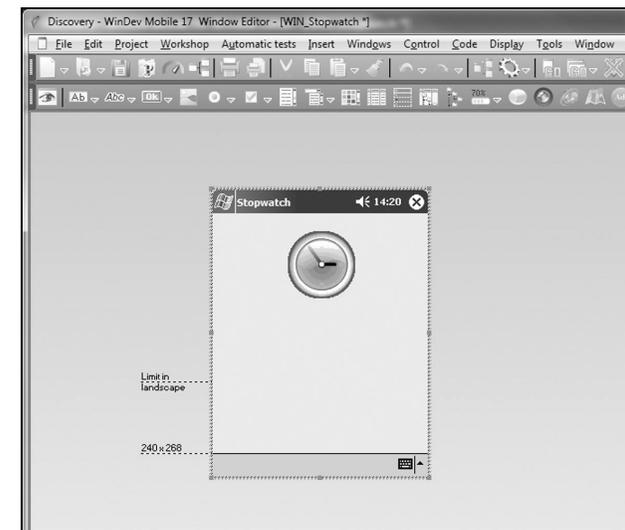
This feature enables you to easily identify the element that will be used in your programs.

See the online help (keyword: "Automatic prefixing") for more details.

Create the controls found in the window

Creating the image control

To give this window a cheerful appearance, we are going to insert an image chosen in the image catalog of WinDev Mobile. This image represents a stopwatch and it will be animated during the timing.



- ▶ To create the Image control:
 1. Click then click in the window at the requested location. The control is automatically created.
 2. Right-click the control and select "Description".
 3. Enter the name of the control: "IMG_AnimatedImage".

4. Associate an image with this control:

- click the "Catalog" button.
- uncheck "Clipart" and select "GIF animations".
- click the animation that represents a stopwatch and validate.
- validate the window asking for the name of the image to use.

This image will be automatically animated.

5. Select the display mode ("100 % Centered") in the "Display mode" combo box. Validate.

6. Click (at the bottom of the description window) and enter the following code line in the initialization code:

```
IMG_AnimatedImage..Animation = False
```

Disabling the animation of the image

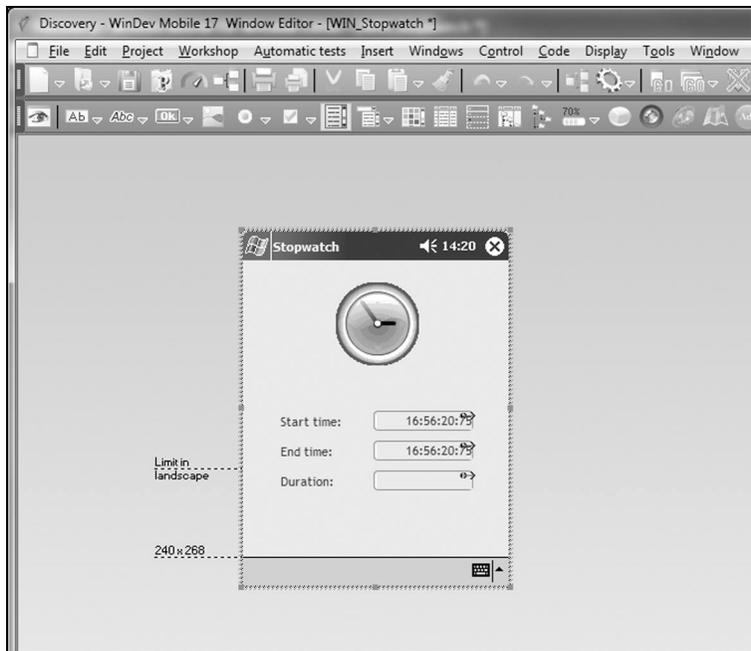


Note

In WinDev Mobile, the authorized image formats are: BMP, JPEG, GIF, PNG and ICO.

Creating the edit controls

Let's create three edit controls used to display the stopwatch information (start time, end time and duration).



► To create the first edit control:

1. Click the arrow found on the right of the icon . A window presenting the different types of edit controls is opened. Click the "Time" control and click the position where the control must be created in the window.
2. Right-click the control and select "Description".

3. Enter the name of the control: "EDT_StartTime".

4. Enter the caption: "Start time:". This control is a "Time" control. Indeed, this control will be used to display the start time of the stopwatch.

5. Select the input mask ("HH:MM:SS:CC") and the returned value ("HHMMSSCC"). This format will be used to calculate the duration by programming.



Notes

By default, the format (input mask and display mask) of a control corresponds to the mask defined by the project ("Project .. Project description", "Language" tab). Therefore, the same mask is automatically used in all the application controls. This feature is also very useful in the multilingual applications.

6. Select the "GUI" tab.

7. Select "Read-only". No data can be entered by the user in this control.

8. Validate.

► The second edit control will be created by "Copy/Paste":

1. Select the control that was just created.

2. Press [CTRL] + [C], then [CTRL] + [V]: a new control is automatically created. Modify the name and caption of this new control:

- its name: "EDT_EndTime".
- its caption: "End time:".

► To create the third edit control:

1. Click the arrow found on the right of the icon . A window presenting the different types of edit controls is opened. Click the "Duration" control and click the position where the control must be created in the window.

2. Right-click the control and select "Description".

3. Enter the name of the control: "EDT_Duration". This control will display the elapsed time.

4. Enter the caption: "Duration:".

5. Select the "GUI" tab.

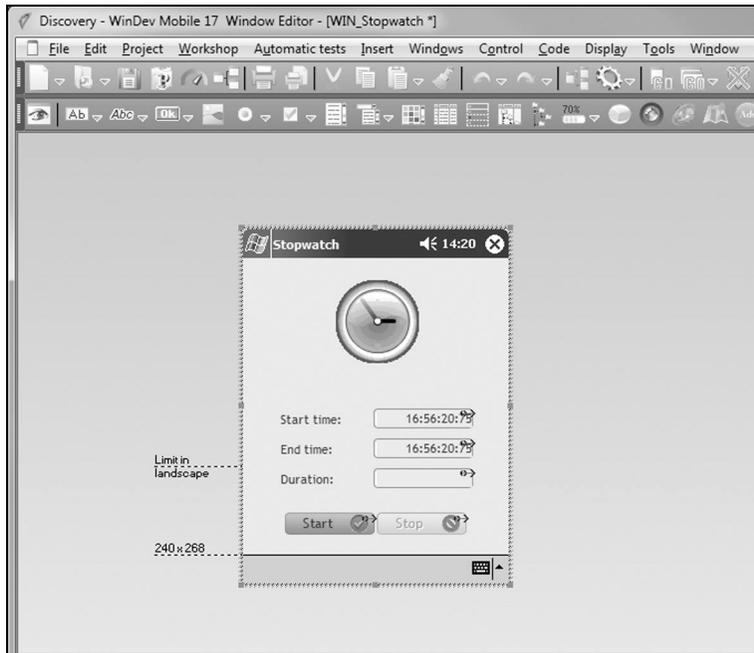
6. Select "Read-only". No data can be entered by the user in this control.

7. Validate.

► Save the window ("File .. Save" or)

Creating the buttons

We are now going to create the buttons used to start and to stop the stopwatch.



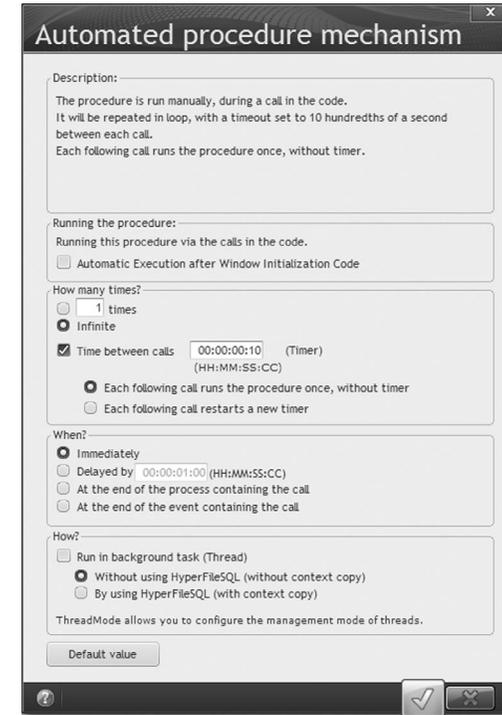
- ▶ To create the button used to start the stopwatch:
 1. Click **OK**, then click the location where the button must be created in the window.
 2. Right-click the control and select "Description".
 3. Enter the caption: "Start".
 4. Click **OK** and enter the following code lines:

<code>EDT_StartTime = Now()</code>	Display the start time
<code>IMG_AnimatedImage..Animation = True</code>	Animate the animated image
<code>ChronoStart()</code>	Start the stopwatch
<code>Stopwatch()</code>	Call to a procedure used to calculate the time passed

- ▶ To create the procedure used to calculate the elapsed time:
 1. Click the "Stopwatch" word in the code editor and select "Insert .. New local procedure" (or press [F4]).
 2. The name of the procedure ("Stopwatch") is automatically proposed. Validate this name.
 3. Enter the following code lines:

<code>PROCEDURE Stopwatch()</code>	
<code>EDT_EndTime = Now()</code>	Display the end time
<code>EDT_Duration = ChronoValue()</code>	Display the duration

- ▶ This procedure will be called every 10 hundredths of a second in order to calculate and to display the time passed:
 1. Click **OK** found on the right of the code window of the procedure. The following window is displayed:



2. Select "Infinite" and "Time between calls".
3. Specify the time between the calls to the procedure: "00:00:00:10".
4. Select "Immediately".
5. Validate.

- ▶ To create the button used to stop the stopwatch:
 1. Click **OK**, then click the location where the button must be created in the window.
 2. Right-click the control and select "Description".
 3. Enter the caption: "Stop".
 4. In the "GUI" tab, specify that the initial status of the control is grayed. Indeed, the button will be enabled only when the "Start" button is clicked.
 5. Click **OK** and enter the following code lines:

<code>EndAutomatedProcedure (Stopwatch)</code>	Stop the automatic call to the procedure
<code>ChronoEnd()</code>	Stop the stopwatch
<code>IMG_AnimatedImage..Animation = False</code>	Disable the animation of the image
<code>BTN_Stop..State = Grayed</code>	Make the "Stop" button grayed.

6. Display the code of the "Start" button: select the control and press F2. We are going to enable the "Stop" button when a click is performed on the "Start" button. Enter the following code after the existing code:

```
BTN_Stop..State = Active
```

Make the "Stop" button active.

► Save the window ("File .. Save" or )

The development of this window is now completed. We are now going to run its test.

Test of a WinDev Mobile window

WinDev Mobile proposes several types of test:

- test on the development computer (in simulation mode). This test simulates a Pocket PC on the development computer. This test is useful when no Pocket PC can be used by the developer. The debugger can be used.
- test and debug on the Pocket PC connected to the development computer. This test is directly performed on the Pocket PC but it allows the use of the debugger.
- test on the Pocket PC connected to the development computer. This test generates the executable of the application, copies it and runs it on the Pocket PC. The debugger is not available.

GO

Test

The result of some features depends on the platform used (operating system, format of character strings, ...).

Differences may occur when running the project test or the window test in simulation mode and when running the application test on a Pocket PC.

See the online help (keyword: "Test, Differences between a test on Pocket PC and a simulator test") for more details.

Test in simulation mode

Let's now run the test of the window in simulation mode.

- Click the "GO" icon  (or press the [F9] key). WinDev Mobile informs you that the test will be run in simulation mode. Validate this screen ("Yes" button). The test of the window is run. This test is performed via a simulator.



- Run the test of the different buttons and watch the changes that occur in the window.

Any developer knows that running a program test can be a long and tiresome job. WinDev Mobile enables you to run the test of your window in ONE CLICK. This is both simple and fast!

WinDev Mobile enables you to customize the simulator used for your tests in GO mode. This enables you to choose the shape of the Pocket PC for your tests. To customize the simulator, right-click the image of the simulator and select the image to use. For example:



Tip

See the online help (keyword: "Simulator") for more details.

- ▶ Close the window ("X" button in the title bar).
- ▶ The editor of WinDev Mobile is redisplayed.

The automatic tests

Once a window test has been run, WinDev Mobile allows you to save the corresponding automatic test via .

The automatic tests are a category of specific tests. The automatic tests are used to automatically perform some operations of your windows. These tests are recorded as WLanguage scenarios and they can be easily modified in the code editor.

Once recorded, the automatic test can be re-run as many times as necessary, to test for example the impact of a modification made to a window, a procedure, ...

See the online help (keyword: "Automatic test") for more details.

GO

Test

Test and debug on the Pocket PC

Let's now run the test of the window on the Pocket PC. To run this test, a Pocket PC must be currently connected to the current computer.

Before connecting a Pocket PC to a computer, we advise you to install "ActiveSync" on the PC. This software is used to synchronize data between a PC and a Pocket PC.

In most cases, ActiveSync is supplied with the Pocket PC. ActiveSync can also be downloaded from Internet.

ActiveSync automatically starts when the connection is established between the Pocket PC and the PC.

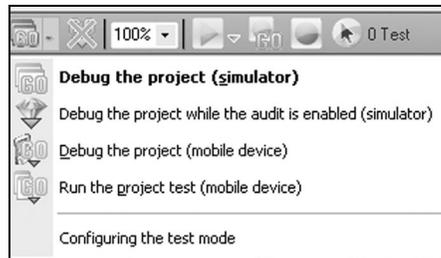


Note

From Windows Vista, the "ActiveSync" program has been replaced by the "Manager for Windows Mobile devices".



- ▶ First, we are going to debug our window on the Pocket PC. To do so, a breakpoint must be added to the code in order to start the debugger:
 1. Display the code of the "Start" button ("Code" from the popup menu).
 2. Click with the mouse in front of the first code line. A red dot is displayed: it's a breakpoint. In debug mode, the debugger will automatically start when the code line is run.
- ▶ To debug the stopwatch on the Pocket PC, click the arrow found on the right of the "GO" icon. A drop-down menu is displayed:



- ▶ Select "Debug the project (mobile device)".
- ▶ As the executable was not created, the editor informs us that its creation must be configured in order to run the test on the Pocket PC. Answer "Yes".
 1. Define (if necessary) the window that will be displayed first. There is a single one in our example. This window will be called "First project window".



Select the proposed window: "WIN_Stopwatch" and validate.

2. The wizard for executable creation is automatically started.
3. The different options for creating the executable will be presented later. For this first test, keep the options selected by default: validate the wizard directly (green button). The screen named "Copying the files to the Pocket PC" is displayed. Uncheck "Run the application on Pocket PC at the end of copy". Validate the wizard once again.

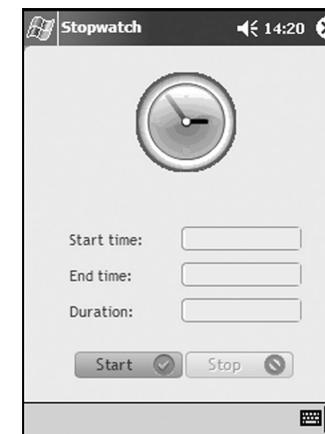


Note

Copying the executable onto the Pocket PC can take a few minutes (indeed, the PC SOFT Framework is copied when installing a WinDev Mobile application for the first time). The next copy of the executable to the Pocket PC will be faster.

If an antivirus is installed on the development computer, the real-time protection of the file system may significantly slow down the copy of the executable. To shorten this duration, disable this protection when copying the executable.

4. Select "GO .. Debug the project (mobile device)".
5. The window is automatically opened on the Pocket PC:



- ▶ Click the "Start" button. The debugger is automatically displayed on the PC. The different code lines can be run step by step.



Note

No dynamic correction is available during this test.

- ▶ Stop the debugger (). The application is automatically stopped on the Pocket PC.

Direct test on the Pocket PC

Let's now run the final test, without debugger.

- ▶ To run the test of the stopwatch on the Pocket PC, click the arrow found on the right of the "GO" icon. A drop-down menu is displayed.
- ▶ Click "Run the project test (mobile device)".
- ▶ As the executable was already created when running the test with debugger, WinDev Mobile recreates the executable with the same options. The window is automatically opened on the Pocket PC.
- ▶ Run the test of the different buttons and watch the changes that occur in the window. Although the breakpoint is still found in the code, a click performed on the "Start" button does not trigger the debugger.
- ▶ Close the window ("X" button in the title bar).



Note

When the test is run on the Pocket PC, you have the ability to disconnect the Pocket PC from the PC and to continue to use the application.

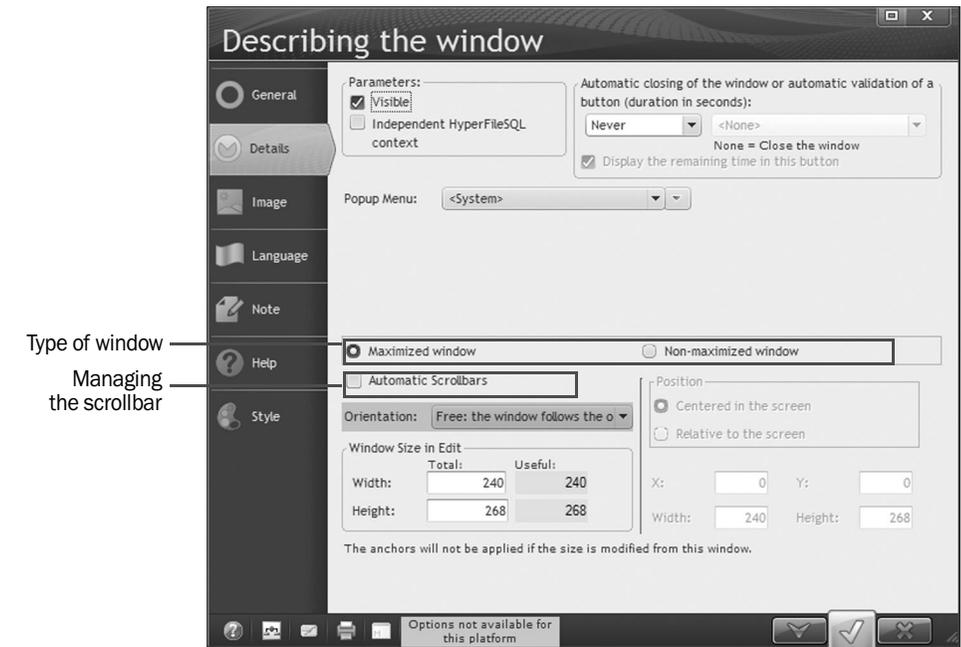
However, if you close the application (or the window), the test can be run only if the Pocket PC is reconnected to the PC.

To start the application on the Pocket PC while the Pocket PC is not connected to the PC, you must create the executable of the application (see "Creating the executable program", page 55).

Characteristics of a WinDev Mobile window

All the characteristics of a WinDev Mobile window defined during its creation can be modified in the description of this window.

For example:



Type of window
Managing
the scrollbar

Reminder: To open this window, select "Description" from the popup menu of the WinDev Mobile window (or double-click the WinDev Mobile window).

Changing the type of the window

Now let's see what happens when the window type changes.

- ▶ Select "Description" from the popup menu of the WinDev Mobile window. The description of this window is displayed.
- ▶ Display the "Details" tab and/or the "Style" tab and modify the characteristics of the window (non-maximized window, title bar, "OK" button, status bar, ...).
- ▶ Apply the modifications and view the modified window directly.



Note

The controls can be anchored in WinDev Mobile. The anchoring enables you to use the same window on different runtime platforms.

Specific process when closing the window

The "OK/Close" button found in the title bar of the window is associated with a specific process. This process is used to customize the closing or the validation of the window.

By default, this button automatically closes the window.

We are going to display a dialog box when closing the window.

► To display a dialog box when closing the window:

1. Make sure that the "Close" button is found in the title bar of the window ("Style" tab of the description window).
2. In the editor, display the popup menu of the "Close" button (right mouse click) and select "Button code". The "Before closing with OK/Close button" process is displayed.
3. Enter the following code lines:

```
SWITCH Dialog ( Display a dialog box
```

4. A "Wizard" tooltip appears: click this tooltip. The wizard for using directive questioning is displayed. Go to the next plane.
5. The wizard proposes a list of questions. Enter "close". The question "Do you want to close this window?" appears. Select this question in the table. Go to the next screen.
6. Validate the wizard to include the message in your code.
7. Complete the code as follows:

```
SWITCH Dialog("Do you want to close this window") Display a dialog box
// Close Yes (case 1): the window
CASE 1 is automatically closed.
  Close No (case 0): the window
  // Don't close remains opened. The
CASE 0 function named Return-
  ReturnToCapture() ToCapture is used to
END wait for a user action.
```

8. Run the test of the window and close it with the "X" button.



Tip

In the "Before closing with OK/Close button" process, **ReturnToCapture** is used to cancel the closing of the window.

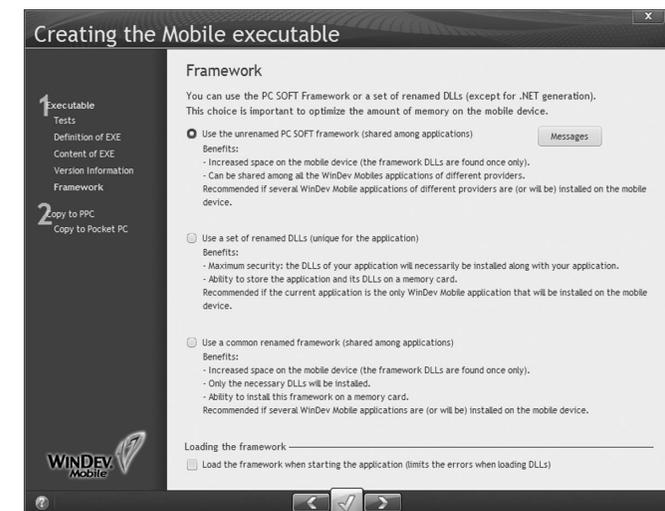
Creating the executable program

Create the executable program

Your window is now created. You had the ability to run its test while it was developed. But how do I create the executable?

► To create the executable from the WinDev Mobile environment:

1. Select "Workshop .. Generate the Windows CE/Mobile application" or click . The wizard for creating an executable starts.
2. A screen informs you that no automatic test was created. Go to the next screen.
3. The general options of the executable are displayed. By default, the executable will be created with the same name as the project.
4. Click the "Catalog" button to select the icon associated with the executable.
5. Choose an image among the proposed ones (a stopwatch for example). Double-click the image and validate.
6. Click the "Framework" link found on the left of the wizard.



Each WLanguage function is associated with a WinDev Mobile library (".DLL" file). In order for the executable to operate properly, all the necessary libraries must be installed with the executable. The full set of the WinDev Mobile libraries is also called Framework.

To install the Framework, WinDev Mobile proposes:

- to use the **unrenamed PC SOFT framework**: the WinDev Mobile framework will be installed in the "Windows\PC SOFT\WD17.0" directory of Pocket PC. This framework is copied onto the Pocket PC during the first setup of the application or when updating the application. This option is used to limit the amount of memory occupied on the Pocket PC: all the WinDev Mobile applications use the same framework.

- **to use a set of renamed DLLs:** the renamed framework will contain the WinDev Mobile DLLs used by the application. The location of this framework is chosen by the developer. This framework is renamed in order to avoid conflicts with the other frameworks.

This framework is copied onto the Pocket PC during the first setup of the application or when updating the application.

This option is used to limit the amount of memory occupied on the Pocket PC: several WinDev Mobile applications use the same renamed framework.

- **to use a common renamed framework:** each WinDev Mobile DLL used by the application must be renamed (next plane of the wizard). These DLLs will be installed in a shared directory in order to be used by several applications.

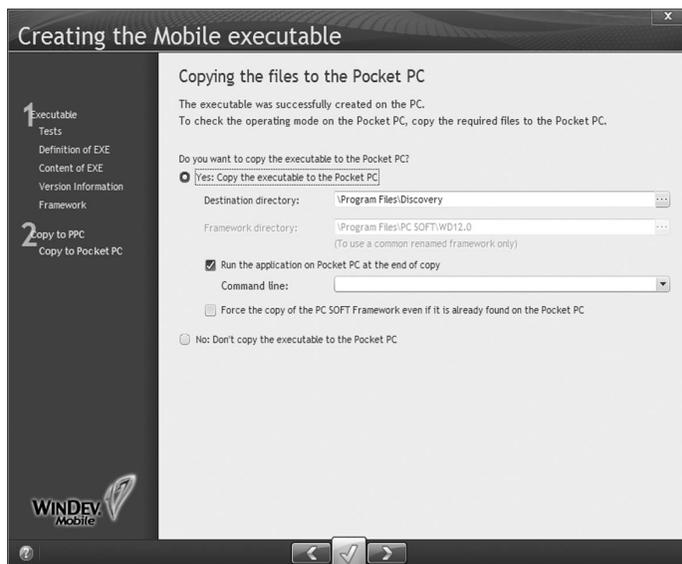
7. Validate the creation of the executable (green button). The default parameters will be automatically taken into account.

See the online help (keyword: "Executable") for more details.

Congratulations! You have created a stand-alone executable program. This program is compatible with all the versions of Windows for Pocket PC!

Run the test of the executable on the Pocket PC connected to the development computer

Once the executable is created, the wizard proposes to copy the executable onto the Pocket PC connected to the current computer.



- ▶ To copy the executable onto the connected Pocket PC:
 1. Select "Yes: Copy the executable to the Pocket PC".
 2. Specify the destination directory of the executable on the Pocket PC.
 3. Select "Run the application on Pocket PC at the end of copy".
 4. Validate (green button).

As soon as the executable is copied, the application is automatically started on the Pocket PC. The application can be started from the Pocket PC directly without having to connect the Pocket PC to the PC.

Distributing your application

WinDev Mobile simplifies the distribution of your applications.

A wizard helps you create the setup procedure ("Workshop .. Create the setup procedure").

The setup program (in CAB or MSI format) will be generated in a directory in order to be copied onto different media.

To install your application:

- in CAB format: copy the setup program (".CAB" file) onto the Pocket PC and run it.
- in MSI format: run the setup program (".MSI" file) on a PC:
 - if this PC is connected to a Pocket PC, the application will be immediately installed on the Pocket PC.
 - if no Pocket PC is connected, the setup will be performed during the next synchronization between the PC and the Pocket PC.

The files required by the application are automatically installed in the specified setup directory.



Note

When creating the setup program of an application, you have the ability to configure the automatic startup of this application.

The application can be started:

- when the Pocket PC is started (after a reinitialization for example).
- once the Pocket PC is synchronized (via ActiveSync).
- at the end of the standby mode ("On/Off" button of Pocket PC).

You can also configure the automatic startup of the application by programming with **AutoRunAdd** and **AutoRunDelete**.

LESSON 2.2. CREATING A MENU

This lesson will teach you the following concepts ...

- Creating your second window.
- Running the test of this window.
- Sequencing the windows via a menu.



Estimated time: 40 min

Overview

We are going to create two new windows in our "Discovery" project:

- a new window used to display a message from the information entered by the user.
- a menu window allowing the user to choose the window to display: the stopwatch or the display of data.

Creating a window to display a message

Creating a window to display information

You are now going to create the following window:



This window will be used to communicate with the user by allowing him to enter his name and his date of birth, and by displaying the number of days left until his birthday.

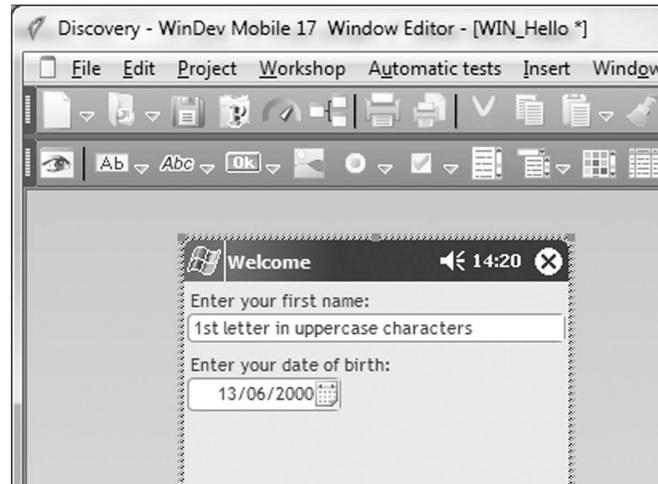
► To create this new window:

1. Click  in the toolbar of WinDev Mobile. Then, click "Window" to create a window.
2. Select "Wizard for blank window".
3. Validate. The wizard for creating a blank window starts.
4. Keep the type of window ("Maximized") and go to the next screen.
5. Check (if necessary) "With menu and toolbar" and go to the next screen.
6. Enter the name of the window: "WIN_Hello" and its title: "Welcome".
7. Validate (green button). The created window is displayed in the window editor.
8. Save the window ("File .. Save" or ). Validate the name of the window and its location.

Creating the controls found in the window

Creating the edit controls

We are going to create two edit controls allowing the user to enter his name and his date of birth.



► To create the first edit control:

1. Click , then click the location where the control must be created in the window.
2. Right-click the control and select "Description".
3. Enter the name: "EDT_FirstName".
4. Enter the caption: "Enter your first name:".
5. Select the input mask: "1st letter in uppercase characters".
6. Select the "Style" tab and select a style in which the caption of the control is "overlapping".
7. Validate.

► The second edit control is a Date edit control. To create the second edit control:

1. Click the arrow found on the right of the icon . A window presenting the different types of edit controls is opened. Click the "date" control with a calendar on the right then click the location where the control must be created in the window.
2. Right-click the control and select "Description".

3. Enter the name: "EDT_DateOfBirth".
4. Enter the caption: "Enter your date of birth:".
5. Make sure that "Display a calendar button" is checked.



Note

The "Display a calendar button" option is used to display a specific button on the right of the date edit control, allowing the user to directly enter the date in a calendar.
The "Edit the calendar" button, found in the description window of the Date control, is used to edit the options of the calendar that will be displayed (especially the style options).

6. Select the "Style" tab and select a style in which the caption of the control is "overlapping".
7. Validate.

► Save the window ("File .. Save" or ).

Creating the button

We are now going to create a button used to display the name of the user and the number of days left until his birthday.

- To create this button:
1. Click  and drag the control into the window
 2. Right-click the control and select "Description".
 3. Enter the name: "BTN_Hello".
 4. Enter the caption: "Hello".
 5. Validate.

Entering the code of the button

We are going to enter the code used to calculate the number of days left until the birthday of the user.

- To enter the code:
1. Select the "Hello" button.
 2. Select "Code" from the popup menu of the control. The code editor is displayed.
 3. Enter the following code:

```
Today is Date
Birth is Date = EDT_DateOfBirth

Birth..Year = Today..Year

Difference is Duration = Birth-Today
```

Declaring the variables and initializing the date of birth. Today is automatically initialized with today's date.

Modifying the year of birth.

Calculating the duration between the date of birth and today's date.

```

DifferenceInDays is int = Difference..InDays
IF DifferenceInDays<0 THEN ...
    DifferenceInDays = 365+DifferenceInDays
END

Message is string

SWITCH Difference..InDays
CASE 0
    Message = StringBuild("Hello %1!",...
        EDT_FirstName)+CR+"Happy birthday!"
OTHER CASE
    Message = StringBuild("Hello %1!",...
        EDT_FirstName)+CR+StringBuild(...
        "%1 days before your birthday !",...
        DifferenceInDays)
END
Info(Message)

```

Calculating the difference in days

Displaying the message

Running the test of the window

Our window is now created, we are going to run its test directly.

- ▶ Click the "GO" icon  (or press the [F9] key). WinDev Mobile informs you that the test will be run in simulation mode. Validate this screen ("Yes" button). The test of the window is run. This test is performed via a simulator.

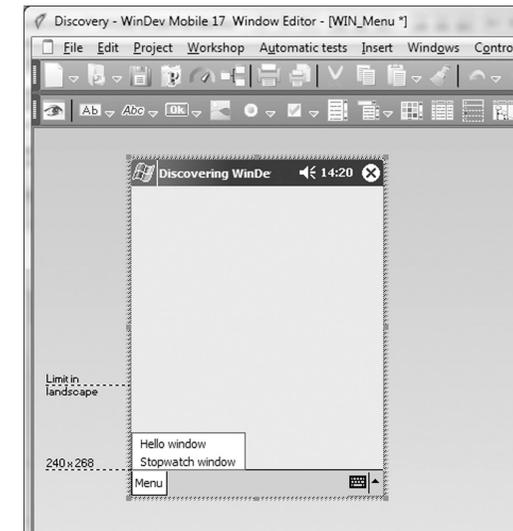
Creating the menu window

We are now going to create a welcome window used to display the two windows that were just created via a menu.

- ▶ To create this new window:
 1. Click  in the toolbar of WinDev Mobile. Then, click "Window" to create a window.
 2. Select "Wizard for blank window" and validate.
 3. Keep the type of window ("Maximized") and go to the next screen.
 4. Check (if necessary) "With menu and toolbar" and go to the next screen.
 5. Enter the name of the window: "WIN_Menu" and its title: "Discovering WinDev Mobile".
 6. Validate (green button). The created window is displayed in the window editor.
 7. Save the window ("File .. Save" or ). Validate the name of the window and its location.

Describing the menu options

The "Menu" option is automatically created at the bottom of the window. We are going to add sub-options used to display the two windows of our application.



- ▶ To add the sub-options:
 1. Click the "Menu" option and display the popup menu of this option.
 2. Select "Transform to expand a sub-menu" from the popup menu.
 3. A menu option appears in edit: enter "Stopwatch window".
 4. Click the menu option again: the option that was just added is displayed.
 5. Click the new option and display its popup menu.
 6. Select "Add before" from the popup menu.
 7. A menu option appears in edit: enter "Hello window".

The input of the menu is over. In our example, each menu option is used to open a specific window. To associate the action to perform with each option, we are going to use the preset actions of WinDev Mobile.

- ▶ To associate a preset action with each menu option:
 1. In the editor, select the "Stopwatch window" option.
 2. Select "Option description" from the popup menu.
 3. In the "Action" part, select the action named "Open the 'WIN_Stopwatch' window".
 4. Validate the description window.
- ▶ Repeat the same operations to associate the "Hello window" option with the "WIN_Hello" window.

- We are now going to define the first window of the project. This window will be the first window displayed when running the executable. In our example, the first project window will be the menu window that was just created.

To define the first window of the project:

1. In the project explorer, select the "WIN_Menu" window.
2. Display the popup menu of the "WIN_Menu" window and select "First project window".
3. The window is now the first window of the project. A small red "1" appears in the icon of the window.

- Run the test of the project via the icon .

LESSON 2.3. ANDROID DEVELOPMENT

This lesson will teach you the following concepts ...

- Configuring WinDev Mobile for the Android development
- Specific features of Android development
- Test of an application for Android
- Modifying an application for Android



Estimated time: 1h



EXAMPLE

The "Android PasswordManagement.WPP" project corresponds to the full project with the answers to this lesson. To open this project, select "? .. Tutorial .. Android (answer)".

You can follow this lesson without opening the project.

Overview

WinDev Mobile allows you to develop applications for the Android operating system of Google. The principle for developing applications for this platform is identical to the principle for developing applications intended to be run in Windows Mobile. However, developing applications for Android presents some distinctive characteristics that will be presented in this lesson.



Note WinDev Mobile generates applications compatible with all the versions of the Android operating system from version 1.5.

Configuring the Android SDK

To develop an application for the Android platform, the Android SDK must be installed on the development computer. This setup can be done before or after installing WinDev Mobile.

The WinDev Mobile projects must be configured to use the SDK. This configuration is performed:

- when creating the project.
Note: The path of the specified SDK is stored for all the forthcoming projects.
- by selecting "Project .. Project description" and by clicking the "Describing the platform" button in the "Project" tab. The path of the SDK is indicated at the bottom of the screen.
Note: The project must be an Android project or it must be in an Android configuration.

Note: See the online help for more details.

The project used in this lesson is named "Android PasswordManagement.WPP". This project is a password manager. We are going to modify it in order to discover the development for Android.

First, we are going to configure the SDK for the project found in this lesson:

- ▶ Close the current project if necessary ("File .. Close the project"). The home window is displayed.
- ▶ In the welcome window, click "Tutorial" and select the "Android" project (Exercise example). The project is automatically opened in WinDev Mobile.



Note Tip: if the home window is not displayed, you also have the ability to select "? .. Tutorial .. Android (Exercise)".

- ▶ Select "Project .. Project description". Click the "Describing the platform" button.
- ▶ Configure the location of the Android SDK.
- ▶ Start the automatic detection of your Android device. Ignore this step if you have no Android device.

Databases in Android

The Android operating system is supplied with a system for database management that can be used by any application. This database is named SQLite.

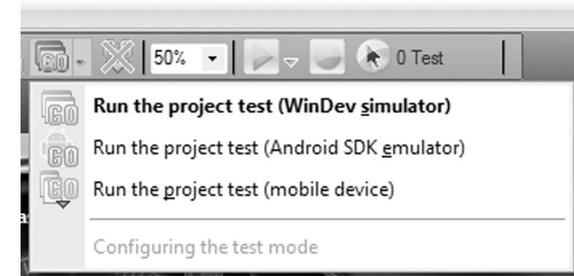
When developing a project for Android, you can:

- configure the database connection in the data model editor to use SQLite.
- declare the connection by programming as follows:

```
// In Android, the data files are in SQLite
IF InAndroidMode() THEN
  // Describes the connection that will be used
  IF HDescribeConnection(cstConnectionName, "", "", ...
    "AndroidPassword", "", hAccessSQLiteAndroid, ...
    hOReadWrite) = False THEN
    Error("Unable to describe the connection", ...
      HErrorMessage)
    EndProgram(True)
  END
  // Changes the connection of the application files
  IF HChangeConnection("*", cstConnectionName) = False THEN
    Error("Unable to change the connection", ...
      HErrorMessage)
    EndProgram(True)
  END
END
```

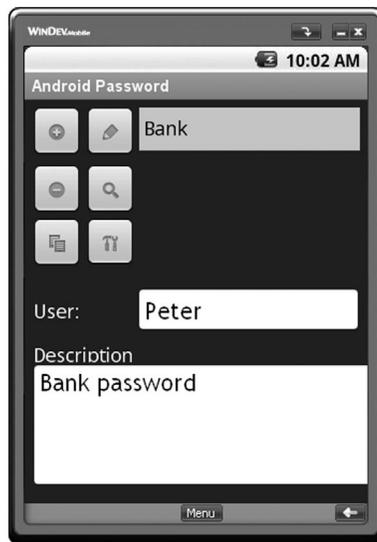
Test of the application

Three solutions are proposed to run the test of the Android application:



- **Test in the WinDev simulator:** the WinDev simulator is used to easily run the test of a code section or algorithm. It can also be used to debug the application. However, it does not entirely reproduce the behavior of a real Android device and it cannot replace the other test modes. The data files used are HyperFileSQL data files or SQLite data files (if the connection was defined in the analysis).
- **Test on an Android device:** this is the most reliable test as the application is generated and run on a real device. This test mode requires an Android device. The data files used are in SQLite format.

- **Test in the emulator of Android SDK:** this mode is a compromise between the two previous modes. Its operating mode is similar to the operating mode of a device and no Android device is required. The data files used are in SQLite format.
- ▶ Run the test of the "Android PasswordManagement" application in simulator mode ("Run the project test (WinDev simulator)") then in one of the other modes to see the differences of behavior.



- ▶ During the test, create a general password and add different passwords ("+" button). Select one of the passwords and display its characteristics (🔍). The information is displayed by a simple dialog box.
- ▶ Stop the test. Go back to the editor and display the "WIN_PassPpal" window (double-click its name in the project explorer for example).
- ▶ Display the code of the consultation button (🔍). The code used is as follows:

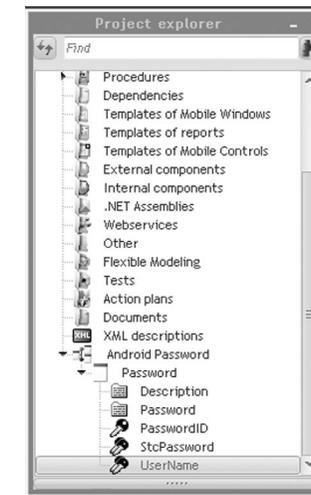
```
// Displays the user name
// and the associated password (in plain letters)
Info("User name:" + Password.UserName, ...
    "Password: " + Password.Password)
```

We are going to improve this operating mode. We are going to create a window used to display the password. This window will be automatically closed after 10 seconds in order to preserve the confidentiality of the password.

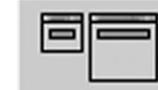
Adding a new window for displaying the passwords

Creating the window and its controls

- ▶ To add a new window:
 1. Select "File .. New" and click "Window".
 2. In the wizard, select "Blank" and validate. A blank window appears in the editor.
 3. Save the window as "WIN_ViewPassword" ("File .. Save").
- ▶ We are now going to create two controls used to display the information about the passwords.
 1. In the project explorer, expand the analysis branch then the description of the "Password" data file.



2. Select the "UserName" and "Password" items and perform a Drag and Drop into the window editor. Two edit controls linked to the items are automatically created.
- ▶ To improve the interface of the created controls:
 1. Select "Choose a style" from the popup menu of each control. Select the "EDT_Internal" style and validate.
 2. Resize the controls so that they occupy the width of the window.
 3. Select "Anchor" from the popup menu of each control to anchor the controls in width.



Therefore, if the orientation of the Android device changes, the controls will be automatically adjusted to the new window size.

4. Save the window.

Displaying the data

This window will be used to display the data coming from the Password data file. The controls are already linked to the items of the data file. All you have to do is display the data in the controls. This operation is performed in the initialization code of the window by **FileToScreen**.

► To display the data in the window:

1. Click in the window and display the popup menu of the window (right mouse click). Select "Code". The code editor is displayed.
2. Enter the following code in the "Initialization of WIN_ViewPassword" process:

```
// Displays the user name
// and the associated password (in plain letters)
FileToScreen()
```

In this code, **FileToScreen** is used to display the content of the linked items in the edit controls.

3. Close the code editor.

Adding a closing button

Our window is nearly created. However, the user must be able to easily close this window. The window will be automatically closed if it is not closed by the user.

► We are now going to add a button used to close the window.

1. Click the arrow found on the left of the icon . A window presenting the different types of buttons is displayed.
2. Click the "Close" button and click the location where the control must be created in the window.
3. Select "Control .. Alignment .. Center horizontally" to center the control in the window.
4. Select "Anchor" from the popup menu of the control to anchor the controls in width.

► A timer will be used to manage the automatic closing of the window after 10 seconds. This timer will be started when opening the window and it will trigger the closing button after 10 seconds.

1. In the project explorer, select the "WIN_ViewPassword" window. Display the sub-elements of the window.
2. Position on the "Local procedures" branch and select "New local procedure" from the popup menu. This new local procedure is named "AutoClosing". Validate.
3. Enter the following code in the code editor:

```
PROCEDURE AutoClosing()
Close()
```

4. Close the code editor.
5. Display the code of the window ("Code" from the popup menu of the window).
6. Add the code for triggering the trigger in the "Initialization of WIN_ViewPassword" process.

This process must now contain the following code:

```
// Displays the user name
// and the associated password (in plain letters)
FileToScreen()
// Starts the timer for automatic closing
TimerSys("AutoClosing",10*100)
```

Displaying the window for managing the passwords

Our window for managing the passwords is now created. We must now branch this window instead of the former display code by using **Info**.

► To do so:

1. Open the "WIN_PassPpal" window (double-click its name in the project explorer for example).
2. Select the "BTN_VIEW" button () and display the description of this control ("Description" from the popup menu).
3. Choose the preset action named "Open the WIN_ViewPassword window" and validate.
4. Display the code of the button ("Code" from the popup menu).
5. Put the code of the process in comment: select the code and press [CTRL]+ /.

Test of the application

The test of the application can now be run. If the different operations have not been performed, open the corrected project via "? .. Tutorial .. Android (answer)".

- Run the test of the "Android PasswordManagement" application in simulator mode for example ("Run the project test (WinDev simulator)").
 1. Select a password that was previously entered.
2. Display its characteristics (). The information is displayed in the window that was just created.

LESSON 2.4. DEVELOPMENT FOR WINDOWS PHONE 7

This lesson will teach you the following concepts ...

- Configuring WinDev Mobile for the Windows Phone development
- Specific features of the Windows Phone development
- Test of an application for Windows Phone
- Modifying an application for Windows Phone



Estimated time: 1h



The "Phone7_Notes.WPP" project corresponds to the full project of this lesson. To open this project, select "? .. Tutorial .. Windows Phone (answer)".

You can follow this lesson without opening the project.

Overview

WinDev Mobile is used to develop applications for the Windows Phone 7 operating system. The principle for developing applications for this platform is identical to the principle for developing applications intended to be run in Windows Mobile. However, developing applications for Windows Phone presents some distinctive characteristics that will be presented in this lesson.



Note

Caution: No database can be used in Windows Phone.

Required configuration

To develop an application for the Windows Phone 7 platform, the Windows Phone SDK must be installed on the development computer. This setup can be done before or after installing WinDev Mobile.



Note

Caution: The SDK of Windows Phone can only be installed on the computers running Windows Vista and later.

To run the test of an application for the Windows Phone 7 platform, you must:

- install the Zune software on the development computer. This setup can be done before or after installing WinDev Mobile.
- register the phone on which the tests will be run. Indeed, by default, only the applications coming from the "Market Place" can be installed on a phone.

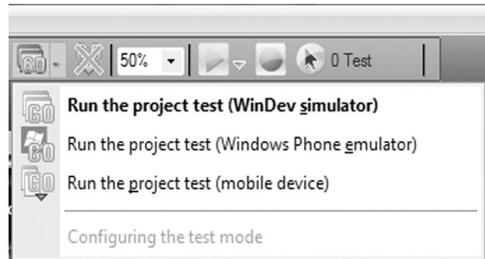
Note: See the online help for more details.

The project used in this lesson is named "Phone7_Notes.WPP". This project is a note manager. We are going to modify it in order to discover the development for Windows Phone 7.

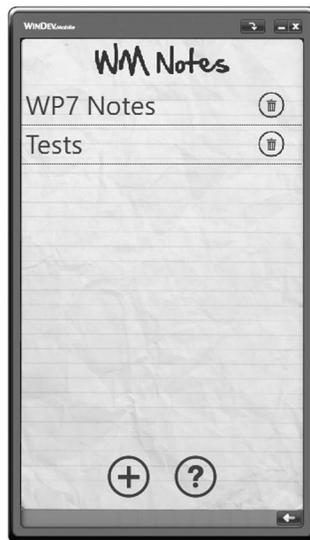
Discovering the application

- ▶ Close the current project if necessary. The home window is displayed.
- ▶ In the home window, click "Tutorial" and select the "Windows Phone" project.
Note: you also have the ability to select "? .. Tutorial .. Windows Phone (Exercise)".

Three solutions are proposed to run the test of the Windows Phone application:



- **Test in the WinDev simulator:** the WinDev simulator is used to easily run the test of a code section or algorithm. It can also be used to debug the application. However, it does not entirely reproduce the behavior of a real Windows Phone device and it cannot replace the other test modes.
 - **Test on a Windows Phone device:** this is the most reliable test as the application is generated and run on a real device. This test mode requires a Windows Phone device. This device must have been registered in order to run the test.
 - **Test in the emulator of Windows Phone SDK:** this mode is a compromise between the two previous modes. Its operating mode is similar to the operating mode of a device and no Windows Phone device is required.
- ▶ Run the test of the "Phone7_Notes" application in simulator mode ("Run the project test (WinDev simulator)") then in one of the other modes to see the differences of behavior.



- ▶ Add different notes during the test ("+" button). The notes appear in the main screen. They are displayed in a loop.
- ▶ Stop the test. Go back to the editor and display the "WIN_Home" window (double-click its name in the project explorer for example).

- ▶ Display the code of the button for adding a note. The code used is as follows:

```
OpenChild(WIN_Edit,0)
```

This very simple code uses **OpenChild** to open the window for editing the note ("WIN_Edit").

Why did we use **OpenChild** instead of **Open**? This operating mode is caused by the Windows Phone 7 operating system: the modal windows are not supported. Only the child windows can be opened.

In this code, 0 is passed in parameter by **OpenChild** to the WIN_Edit window. This parameter is used to specify that the WIN_Edit window must be opened in creation mode.

To check this:

- ▶ Open the WIN_Edit window in the editor (from the project explorer for example).
- ▶ Display the code of the window ("Code .. Window code"). The code used is as follows:

```
PROCEDURE WIN_Edit(gnID is int)
// Loads the requested note
IF gnID <> 0 THEN
    LoadNote()
END
```

In this code, if the parameter passed to the window differs from 0, the corresponding note is displayed.

Modifying the Windows Phone application

We are now going to modify this application by adding a button into the main window of the application. This button will be used to display the content of the note in an information box.

- ▶ Open the WIN_Home window in the editor (from the project explorer for example).

Let's study the different elements found in this window. This window contains:

- An Image control displaying the title of the application: "WM Notes".
- A loop used to display the different notes. The loop contains a static control used to display the title of the note as well as a clickable image used to delete the note.



Note

The Table controls cannot be used in Windows Phone 7. Indeed, this type of control is not supported by the system. Only the loopers can be used to display a list of elements.

- Two Image controls used to manage the addition of a note and the display of the help. Why did we use images instead of buttons? The Image controls are click areas and they allow you to use buttons with a specific appearance.
- ▶ We are going to add the button used to display the details of the note in the loop. To do so, we will be using an Image control.
- ▶ To create the Image control:
 1. Click  then click in the window, on the left of the image of the bin. The Image control is included in the loop (a green outline appears when positioning the control).

2. Resize the image control in order for its dimensions to be identical to the ones of the image of the bin.



Note

Don't forget to use the alignment options:

1. Select the Image control that will be used to display the bin.
2. Press the CTRL key and select the Image control that was created.
3. Expand the alignment menu () and select the following options:
 - Same width.
 - Same height.
 - Top border.

4. Display the description window of the Image control. This control is named "IMG_View" and it displays the "Validate.png" image. This image can be selected via the [...] button. This image is found in the "Images\Blue" sub-directory of the example.

5. Validate the description window of the image.

- We are now going to enter the code associated with the Image control.

1. Select the Image control.
2. Select "Code" from the popup menu of the control. The code editor appears. Enter the following code in the click process of the control.

Info (Content)

This code is used to display the content of the current note in an information box.

- Run the test of the application in the simulator.

Generating the Windows Phone application

We are now going to generate the Windows Phone 7 application. To do so:

1. Select "Workshop .. Generate the Windows Phone application". The generation wizard starts.
2. Specify the name of the application and select the associated icon. This screen can also be used to enter the information displayed on the tile of the device.
3. Validate the different wizard screens. The Windows Phone 7 application is automatically generated.

The generated application can be:

- Copied onto a Windows Phone 7 device. This copy is performed during the test on the device ("Run the project test (mobile device)" below the GO icon). The application is copied onto the mobile device and started.
- Deployed on the Market Place.

See the online help for more details.

PART 3

Databases



LESSON 3.1. INTRODUCTION

This lesson will teach you the following concepts ...

- The formats of the databases supported by WinDev Mobile.



Estimated time: 10 min

Format of the databases

A WinDev Mobile application can be used to handle the data. The format of these databases can be:

- **HyperFileSQL** (Classic or Client/Server), database system supplied with WinDev Mobile. This database system can be used with the applications for Windows Mobile, iPhone or iPad.
- **CEDB**, database system that can be used in Pocket PC.
- **AS/400**, AS/400 database that can be used in Pocket PC.
- **SQLite**, database that can be used with the Android applications.
- ...

HyperFileSQL

The HyperFileSQL format is the database format supplied with WinDev Mobile. This database format is compatible with WinDev, WinDev Mobile and WebDev.

It is a freely distributable Relational DBMS.

This format is identical to the HyperFileSQL format of WinDev and WebDev (".WDD" file, data files, ...).

This format can be used by the applications developed for Windows Mobile and by the applications developed for iPhone/iPad.

However, the available size being limited on the mobile devices and the operating system being also limited, the following features are not supported by HyperFileSQL in Classic mode, especially:

- the transactions.
- the log process.
- the management of locks for the data files and records.
- the management of data files in Hyper File 5.5 format.

Note: Only the data files in Hyper File 5.5 format are not supported in HyperFileSQL Client/Server.



Note

You still have the ability to open and to use an analysis that uses one of these features (replication, log operations, ...). The same analysis can be used in a WinDev Mobile application and in a standard WinDev application.

Using the HyperFileSQL format allows you to:

- quickly access the records,
- optimize the search time,
- handle the large databases,
- synchronize the HyperFileSQL Mobile data files found on a Pocket PC with the HyperFileSQL data files found on a PC,
- ...

In summary, most of the features of HyperFileSQL are available for the Windows Mobile applications and for the iPhone/iPad applications (file link, queries, filters, views, ...).



Example

The "Pocket Notes", "Pocket Attendance" and "Pocket Telephony" examples (supplied with WinDev Mobile) handle HyperFileSQL Mobile data files. These examples are accessible from the "Wizards, Examples and Components" pane.



Test

When running the test (in simulation mode) of a WinDev Mobile application that handles HyperFileSQL Mobile data files, the data files used are the ones found on the PC.

See "Interactions between applications", page 99 for more details.

CEDB

The CEDB format is a database format for Pocket PC.

A CEDB database corresponds to a ".CDB" file. A CEDB database can contain several data files (also called "tables").

Two types of CEDB databases are available:

- **the standard CEDB databases**, that correspond to the databases found by default on the Pocket PC. These databases contain the following data files: "Tasks", "Contacts" and "Appointment", ...
- **the other CEDB databases** (called customizable databases), that correspond to the Access databases (".MDB" file) previously exported from a PC.

Note: When an Access database (".MDB" file) is copied onto a Pocket PC (via the file explorer), this database is automatically transformed into a CEDB database (".CDB" file).

A CEDB database can be handled:

- from a WinDev Mobile application.
- from a standard WinDev application.

These operations are performed via the **cdbXXX** functions of WLanguage.



Note

Caution: From Windows Mobile 5, the access to a standard database (tasks, contacts, appointments, ...) is no longer possible from a Windows application (and therefore from a standard WinDev application).

The CDB databases are accessible from the PC, from the simulator, from the Pocket PC.

The standard database can only be accessed from the Pocket PC.



Note

Caution: The structure of the CEDB databases is not intended to process a large amount of data. Therefore, we recommend that you use HyperFileSQL databases. Furthermore, HyperFileSQL enables you to benefit from all the features available in WinDev Mobile (RAD, file link, ...).



Test

When running the test (in simulation mode) of a WinDev Mobile application that handles a CEDB database, the database used is found on the **Pocket PC**.

AS/400

This database format is accessible via a Native Access by the Windows Mobile applications. To use this Native Access, an additional module is required in addition to WinDev Mobile.

Contact PC SOFT Sales Department for more details.

SQLite

The "SQLite" database is the default database found on the Android operating system. The native access to this database is included in WinDev Mobile (for the Android projects only).

LESSON 3.2. HYPERFILESQL DATA FILES

This lesson will teach you the following concepts ...

- Generating a Full Application RAD.
- Managing the data files.



Estimated time: 20 min



EXAMPLE

The "Product Catalog.WPP" project corresponds to the full project with the answers to this lesson. To open this project, select "? .. Tutorial .. HyperFileSQL (answer)".

You can follow this lesson without opening the project.

Overview

The format of the HyperFileSQL database was presented in the previous lesson. Furthermore, you are already familiar with the main characteristics of this format. This lesson explains how to generate a full application for Windows Mobile via RAD for Pocket PC from a HyperFileSQL analysis.

Generating a full application

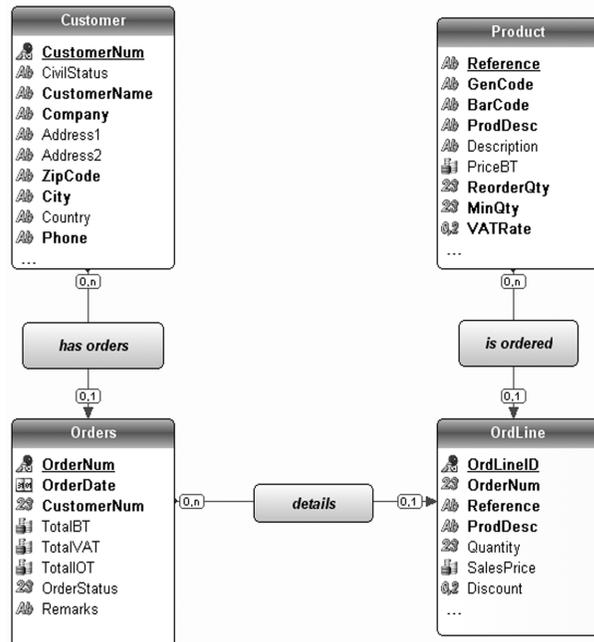
An existing project will be used to generate this application.

- ▶ Close the current project if necessary ("File .. Close the project"). The home window is displayed.
- ▶ In the home window, click "Tutorial" and select the project named "HyperFileSQL (exercise)". The project is automatically opened in WinDev Mobile.



Note Tip: if the home window is not displayed, you also have the ability to select "? .. Tutorial .. HyperFileSQL (exercise)".

This project is associated with the following analysis:



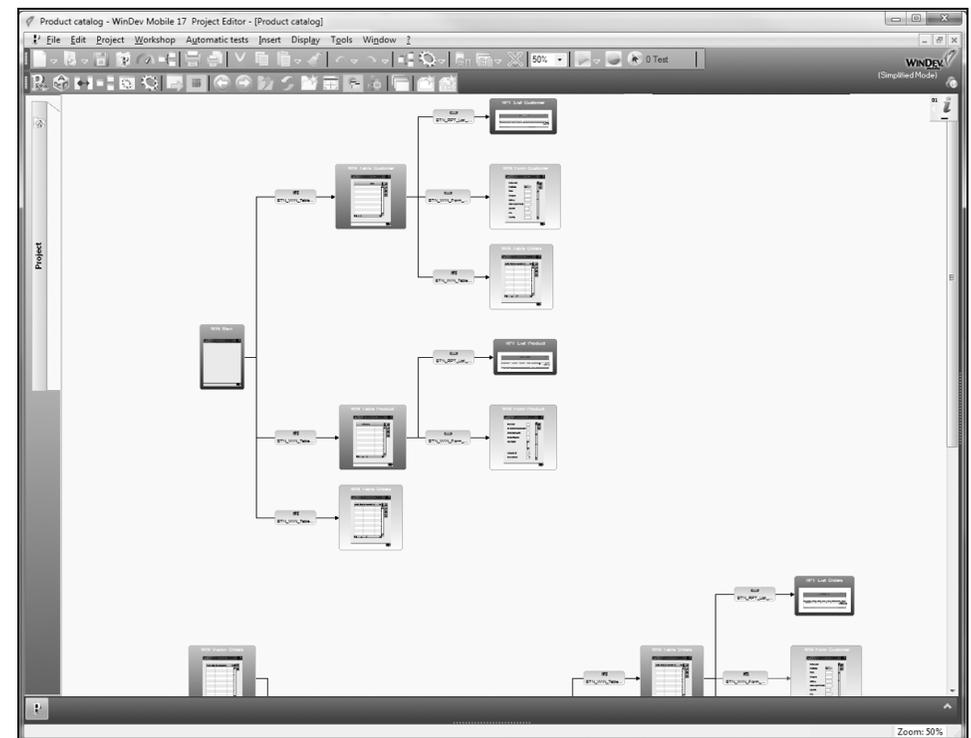
Simple data files have been deliberately chosen for this lesson:

- a Customer file
- an Orders file
- an OrdLine file
- a Product file

We are now going to create the windows and the reports of this project.

- ▶ To generate the full application:
 1. Select "Workshop .. Full Application RAD". The wizard of the RAD module starts.
 2. All the data files found in the analysis will be used for the generation. Select all the proposed data files and go to the next screen.
 3. The entry points for the application (proposed by the menus) will be:
 - Customer
 - Orders
 - Product
 4. Go to the next screen.
 5. Validate. The RAD generation starts.

The project graph is automatically drawn once the application is generated. To display it, select "Project .. Project graph". This full application is ready to be used.



The method for creating a full application by RAD is identical in WinDev Mobile and in WinDev. Another example of the legendary simplicity of WinDev.



Note

GUI errors affecting the reports

Some GUI errors affecting the reports may occur during the RAD generation. These errors are used to draw the attention of the developer to the tables that must be modified in order to get a legible report.

Indeed, the RAD automatically generates optimized reports. However, if the number of items is quite important, the captions may have to be modified.

You will find, in the answers of the example, modified reports that no longer trigger any GUI errors.

The test of this application can be run:

- in simulation mode on the development computer: select "Project .. Test mode .. Debug the project (simulator)".
- on the Pocket PC connected to the current computer: select "Project .. Test mode .. Run the project test (mobile device)".



Note

RID (Rapid Interface Design)

WinDev Mobile gives you the ability to generate windows containing the controls linked to the analysis items. The code required for these windows to operate must be written by the developer.

See the online help (keyword: "RID") for more details.

Managing the data files

Generated data files

During the call to the WLanguage function named *HCreation* or *HCreationIfNotFound*, the data files (".FIC" extension) as well as the index files (".NDX" extension) and the memo files (".MMO" extension) are automatically created.

In **test mode** ("GO" icon), these files are created on the development **PC** (in the directory of the executable).

At **run time** on the Pocket PC, these files are created on the **Pocket PC** (in the directory of the executable).

This directory can be modified before the data file is created by *HChangeDir* and *HSubstDir*.

Note: On a Pocket PC, a specific format must be used for the paths of the files. See "Managing the directories in Windows for Pocket PC" page 93 for more details.

Copying the data files

The HyperFileSQL data files can be copied from a PC to a Pocket PC and conversely (via the file explorer for example).

Synchronizing the data files

WinDev Mobile allows you to:

- synchronize data files found on the PC with the data files found on the Pocket PC.
- synchronize data files found on the Pocket PC with the data files found on the PC.

This synchronization is automatically performed via ActiveSync when the Pocket PC is connected to the PC.

This synchronization is configured when creating the setup program of the application. See the online help (keyword: "WDSynchro") for more details.

WDMAP and Pocket Map

WDMAP is used to view and handle a HyperFileSQL data file found on the PC when developing an application.

Pocket Map is used to view and handle a HyperFileSQL data file found on the Pocket PC when running the test of an application or when using an application. Pocket Map is an example supplied with WinDev Mobile.

PART 4

**Specific
features of
Pocket PC**



LESSON 4.1. SPECIFIC FORMATS

This lesson will teach you the following concepts ...

- Managing the character strings (UNICODE or ANSI).
- Managing the directories in Windows for Pocket PC.
- Specific features in Windows for Pocket PC.



Estimated time: 20 min

Managing the character strings

The default format of character strings on PC differs from the default format of character strings on Pocket PC.

On the **PCs**, the Windows applications handle character strings in **ANSI** format. On the **Pocket PCs**, the Windows applications for Pocket PC handle character strings in **UNICODE** format.

What is the UNICODE format?

The UNICODE format is used to represent a very large set of characters by representing each letter on 2 bytes. This format can encode 65,536 characters. All the characters found in the 24 most common character sets can be represented in a single set. Each character has a unique identifier. Therefore, some characters coming from different character sets can be handled at the same time.

What is the ANSI format?

The ANSI format represents each character on one byte. This format can encode 256 characters in the Indo-European character sets. This format can represent all the character sets. However, a single character set can be used at a time.

Using some character strings in UNICODE format in Pocket PC

In most cases, the character strings are handled the same way by the WLanguage functions in WinDev Mobile and in standard WinDev. WinDev Mobile automatically supports the different formats of character strings in a way that is completely transparent for the developer and for the user.

GO

Test

When running the test of a WinDev Mobile application that performs simple operations on character strings, WinDev Mobile automatically supports the ANSI or UNICODE format.

For example, the following code returns the same result in test mode and at run time.

```
MyString is string = "WinDev is fantastic"
Info(Length(MyString)) // Returns 19
```

AnsiToUnicode and UnicodeToAnsi

The functions named *AnsiToUnicode* and *UnicodeToAnsi* are used to convert the ANSI strings into UNICODE strings (and conversely).

These functions are useful when handling character strings between two computers that use different formats of character strings or when handling external files.

The "Buffer" type

To handle binary data, we recommend that you use a buffer variable.

Furthermore, the buffer type allows you to use the same source code in a WinDev Mobile application and in a standard WinDev application.

No String type must be used to handle the binary data.

Managing the directories in Windows for Pocket PC

The management of directories differs on a PC and on a Pocket PC.

On a **PC**, the paths have the following format: "C:\MyDocuments\MyFile.txt". On a **Pocket PC**, the paths have the following format: "\MyDocuments\MyFile.txt". There is a single tree structure and the notion of drive does not exist.

Handling a file by programming

When a file is handled by programming (*TreeAdd*, *fCreate*, *dSaveImageBMP*, *HSubstDir*, ...), one of the following formats must be used:

- "\<FileName>.<Extension>" (if the file is found at the root of the Pocket PC)
- "\<DirectoryName>\<FileName>.<Extension>"

For example:

```
fOpen("\Poll.txt")
// the file is found at the root of the Pocket PC

TreeInsert(TVRecipe, "Recipes" + TAB + "Desserts", ...
    "Cakes", "\MyImages\CollapsedImg.BMP", ...
    "\MyImages\ExpandedImg.BMP")
// the files are found in the "MyImages" directory

dSaveImageGIF(DrawingImage, fExeDir()+"\Image.GIF")
// file in the runtime directory of the application
```

GO

Test

When running the test (in simulation mode) of a WinDev Mobile application that handles files by programming, the files and the directories used are those found on the development computer (and not the ones found on the Pocket PC).

To use the same code in test mode and at run time, you can group all the relevant files in the directory of the application and use *fExeDir* to build the path of the files to handle.

Current directory

The notion of current directory does not exist in Windows for Pocket PC (limit of the operating system). This is the reason why the functions that handle the current directory (*fCurrentDir* for example) are not available in WinDev Mobile.

File picker

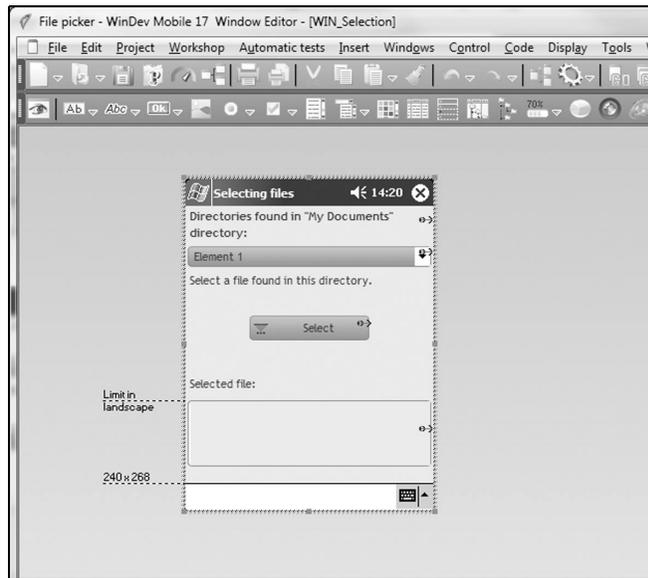
In Pocket PC, the file picker is used to select the files found:

- in the "\\My Documents" directory or in one of its immediate sub-directories.
- in a directory found at the root of a storage card.

Therefore, **fSelect** can only be used to select a file found in one of these directories.

We are now going to use the file picker:

- ▶ Open the "File Picker.WPP" project ("? .. Tutorial .. File picker").
- ▶ Open the "WIN_Selection.WPW" window (from the project explorer).
The following window is displayed:



This window is used to select a file from the "My Documents" directory or from one of its immediate directories.

Test in simulation mode



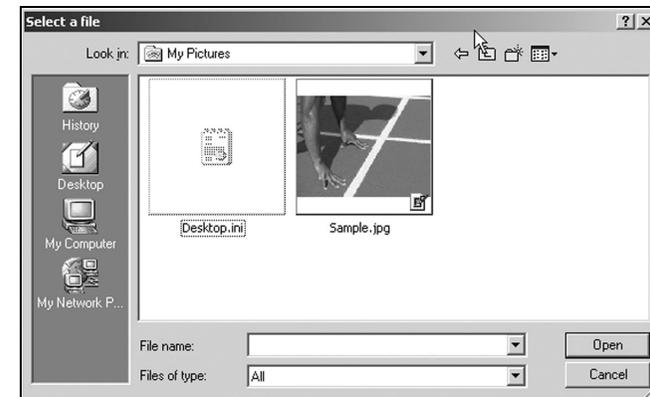
Test In test mode (simulation on the development computer), during the call to **fSelect**, the Windows file picker for PC is displayed and it returns a path in PC format.

We are going to run the test of the "WIN_Selection" window in simulation mode on the development computer:

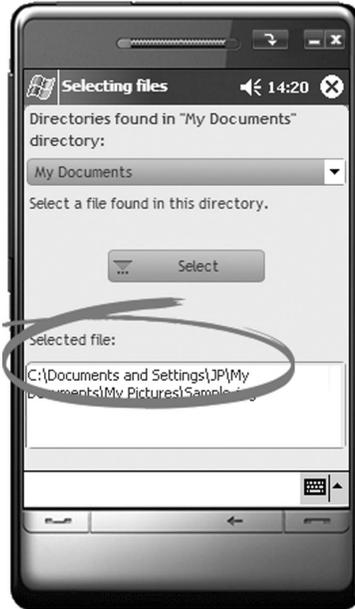
- ▶ Click the "GO" icon (or press the [F9] key). The test of the window is run. The window is displayed in a simulator. WinDev Mobile proposes to run the test in simulation mode: accept (answer "Yes").



- ▶ Select one of the directories found in the "My Documents" directory (from the combo box) and click the "Select" button.
The file picker for PC is displayed and it returns the list of files found on the current computer:



- ▶ If you select a file, the path of this file will be in PC format:



- ▶ Close this window. Let's now run the test of the window on the Pocket PC.

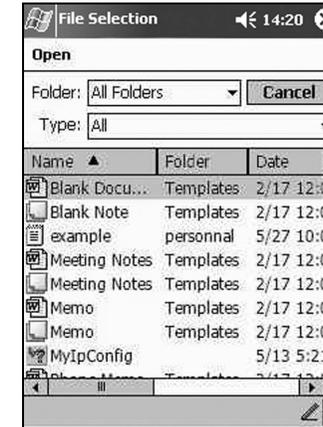
Test on the Pocket PC directly

Let's now run the test of the window on the Pocket PC. To run this test, a Pocket PC must be currently connected to the current computer.

- ▶ Click the "Run the project test (mobile device)" icon (or select "Project .. Test mode .. Run the project test (mobile device)"). The editor proposes to generate the executable. Accept and follow the different steps of the wizard. At the end of the wizard, the window is automatically started on the Pocket PC:



- ▶ Select one of the directories found in the "My Documents" directory (from the combo box) and click the "Select a file found in this directory" link. The file picker for Pocket PC is displayed and it returns the list of files found on the Pocket PC:



- ▶ If you select a file, the path of this file will be in Pocket PC format:



Note

If the "My documents" directory is directly selected from the "WIN_Selection" window, the file picker of the Pocket PC returns the list of all the files found in the "My documents" directory and in its immediate sub-directories. In this case, the "Folder" option of the picker corresponds to "All the folders".

- ▶ Close this window.

File explorer

The file explorer of Windows for Pocket PC is not as limited as the file picker. Indeed, the file explorer is used to browse all the directories found on the Pocket PC.

Storage card

Many Pocket PCs are equipped with one or more storage cards. These cards are used to increase the storage capacity of the Pocket PC.

You have the ability to install a full WinDev Mobile application on a storage card and/or to handle the files found on a storage card.

To handle by programming a file found on a storage card, all you have to do is use the following format: "`<CardName>\<DirectoryName>\<FileName>.<Extension>`".

For example:

```
fOpen ( "\MyCard\MyFiles\Advertising.txt "
```



Note

When a hard reset is performed on the Pocket PC, loss of data occurs in the main storage card.

On a Smartphone, only the data found in the "Storage" directory (and in its sub-directories) and in the storage card are kept once the phone is switched off.

Memory space and speed of Pocket PC

The available memory space as well as the runtime speed of applications on a Pocket PC are a greatly restricted compared to a standard PC.

Don't forget this fact when you create a WinDev Mobile application!

Don't overload your application with useless files, limit the number of windows, clear the data files, ...

Platform on which the project is run

To find out the platform on which the WinDev Mobile application is run, use `SysWindowsVersion` associated with the `SysVersionPlatform` constant.

LESSON 4.2. INTERACTIONS BETWEEN APPLICATIONS

This lesson will teach you the following concepts ...

- Sharing data between a WinDev Mobile application and a standard WinDev application
- Accessing the Pocket PC from a standard WinDev application.



Estimated time: 15 min

Sharing data between two applications

A WinDev Mobile application can share data with a standard WinDev application.

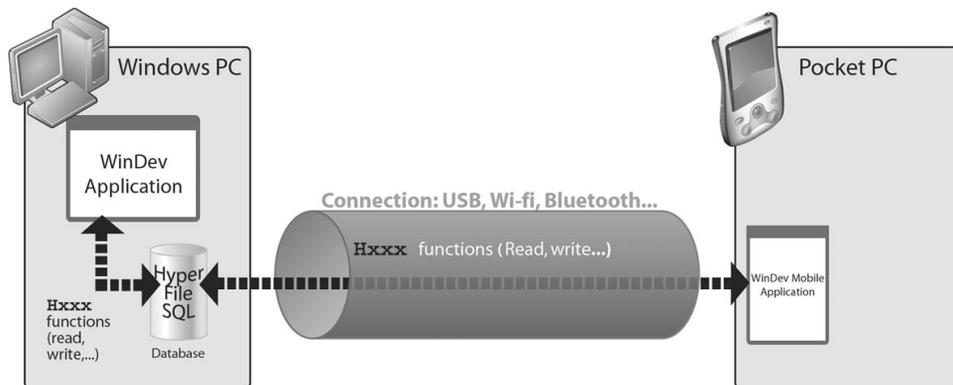
You have the ability to use:

- a standard WinDev application that handles the entire database.
- a WinDev Mobile application that handles the entire database or part of this database.

When two applications share the same data, the data files can be managed in two different ways:

• **Handling the same data files:**

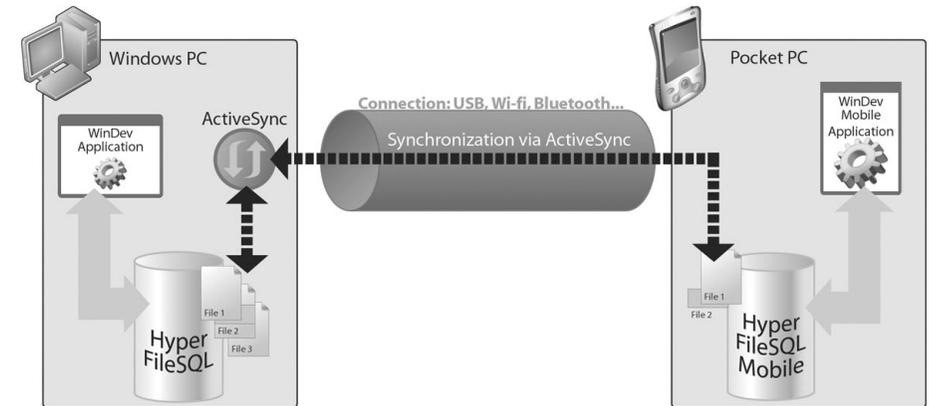
The two applications handle the same data files. These data files are found on the PC. The WinDev Mobile application accesses the data files via Wi-Fi, via infrared, via GPRS, ... **HSubstDir** is used to specify the data directory to use.



For example: application for taking orders in a restaurant. The new orders are automatically sent to the database found on the PC.

• **Copying the data files onto the Pocket PC:**

All the data files (or some of them) are previously copied onto each Pocket PC. Each application handles its own files. To take into account the modifications performed in each application, the data files must be synchronized (automatically or not).



For example: application for taking street polls. The answers will be available in the standard WinDev application once the data files have been synchronized.

Handling the same data files

To allow the WinDev Mobile application to access the data files found on the PC:

- the Pocket PCs must be equipped with a network access (Ethernet, Wi-Fi, ...).
- the data found on the PC must be accessible in read/write via a UNC path (the directory used must be a shared directory).

The data can then be handled (addition, modification and deletion) by the HyperFileSQL functions.



Example

Databases in HyperFileSQL format (on the Pocket PC and on the PC)

The "Network tasks" example (supplied with WinDev Mobile) contains a project that can be run on Pocket PC and a project that can be run on PC. These two examples use the data files found on the PC.

Copying the data files onto the Pocket PC

To update the data files found on the PC with the data entered on the Pocket PCs, all you have to do is synchronize the files.

If the data files used are in HyperFileSQL format, all the Pocket PCs must be connected one by one to the PC. The automatic HyperFileSQL synchronization via ActiveSync takes everything in charge. See "Synchronizing the data files", page 87 for more details.

If the data files used are not in HyperFileSQL format, you must program the synchronization between the WinDev Mobile application and the standard WinDev application. See the examples supplied with WinDev Mobile for more details.



EXAMPLE

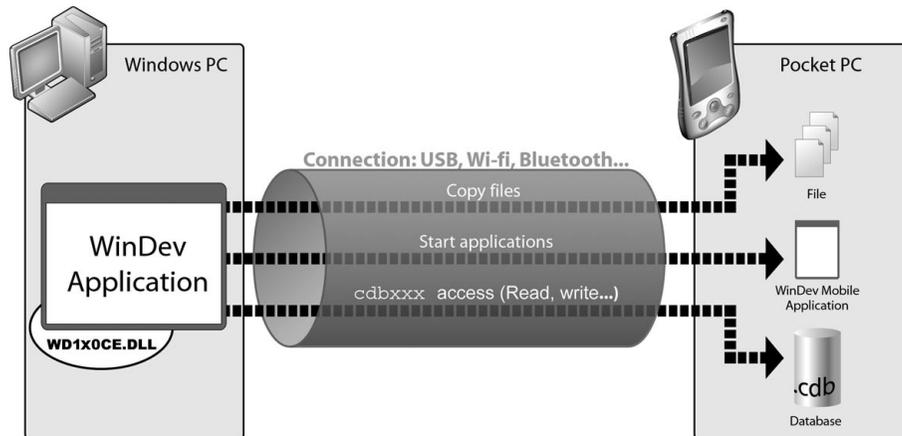
Example

Databases in HyperFileSQL format (on the Pocket PC and on the PC)

The "Sending SMSs", "Managing lists of purchases" and "Stocks" examples, supplied with WinDev Mobile, include a project that can be used on Pocket PC and a project that can be used on PC. These examples present the synchronization of the data entered in the two projects.

Accessing the Pocket PC

The functions for accessing the Pockets PCs (starting with "ce") are used to access the Pocket PCs from a standard WinDev application.



These functions can be used in a standard WinDev application when a Pocket PC is connected to the current computer.

These functions are mainly used to:

- handle the files found on the Pocket PC (copy the files, find out the size of a file, return the list of files found in a directory, ...).
- retrieve information about the Pocket PC (find out the charge level of the batteries, the type of processor, the Windows version used, ...).
- manage the registry of Pocket PC (create or delete a key, modify the value of a key, check the existence of a key, ...).

LESSON 4.3. SHARING WINDEV ELEMENTS

This lesson will teach you the following concepts ...

- Importing standard WinDev windows into a WinDev Mobile project.
- Sharing the code.



Estimated time: 10 min



EXAMPLE

The "Pocket PC Import .WPP" project corresponds to the full project with the answers to this lesson. To open this project, select "? .. Tutorial .. Pocket PC import (answer)".

You can follow this lesson without opening the project.

Importing a standard WinDev window

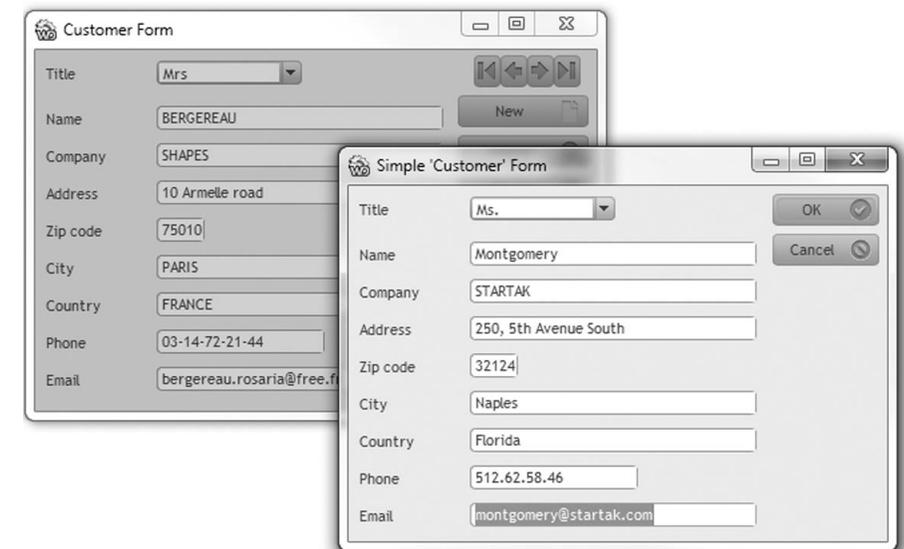
The same WinDev elements (analysis, reports, queries, ...) can be used in a WinDev application and in a WinDev Mobile application.

However, the windows do not have the same format in standard WinDev (".WDW" file) and in WinDev Mobile (".WPW" file). Indeed, the windows do not have the same size, the same characteristics, the same features, the same user approach, ...

WinDev Mobile enables you to import a standard WinDev window into a WinDev Mobile project.

How do I import a WinDev window?

We are going to import the following WinDev windows:



- To import these windows into a WinDev Mobile project:
1. Open the project named "Pocket PC Import.WPP": select "? .. Tutorial .. Pocket PC import (exercise)".
 2. Select "File .. Import .. WinDev elements". The import wizard starts.
 3. Select the windows named "WIN_Form_Customer.WDW" and "WIN_Simple_Form_Customer.WDW" (found in the "Tutorial\Exercices\PC Import" sub-directory).
 4. Validate the import wizard. The windows are automatically imported into the window editor. These windows are automatically opened in the editor. These windows correspond to the following files: "WIN_Form_Customer.WPW" and "WIN_Simple_Form_Customer.WPW"
 5. For each window, WinDev Mobile proposes to add the window to the current project. Accept this addition.

The screen of a Pocket PC being smaller than the screen of a PC, the imported windows as well as their controls must be resized.

6. Resize the window as well as their controls (modify the anchors of the controls if necessary).
7. Save the windows ("File .. Save" or [Ctrl]+[S]).



Operations performed during the import

When importing a window:

- the controls that do not exist in WinDev Mobile are automatically deleted (toolbar controls, HTML controls, ...).
- the list of errors that occurred (functions that do not exist in WinDev Mobile for example) is displayed in the "Compilation errors" pane.

Sharing the code

WinDev Mobile proposes several methods for sharing the code:

- the input of multi-product code.
- the function named *InWindowsMobileMode*.

Input of multi-product code

The code editor is used to enter the equivalent of the code that will be run in WinDev Mobile, in standard WinDev or in WebDev. Via the "Conditional Target-Code" mechanism, this code is entered at the same location in the code editor. Several tabs are used to select the platform corresponding to the current code.

The corresponding code will be automatically run according to the runtime platform.

The same feature is also available for WinDev and for WebDev. Therefore, creating multi-product components is child's play.

InWindowsMobileMode function

InWindowsMobileMode allows you to share the source code between a WinDev Mobile application and a standard WinDev application.

During the compilation, the functions that cannot be used in Pocket PC will be displayed in the "Code" pane.

At run time, *InWindowsMobileMode* will prevent these functions from running so that no error will occur.

For example, the following code is shared between a WinDev Mobile application and a standard WinDev application.

```
MyParameterFile is string
// Code run from the WinDev Mobile application ?
IF InWindowsMobileMode() = True THEN
  // WinDev Mobile application
  MyParameterFile = "\My Files\Param.INI"
ELSE
  // Standard WinDev application
  MyParameterFile = fCurrentDir() + "\Param.INI"
END
```

During the compilation, an error will be displayed in the "Code" pane to indicate that the function named *fCurrentDir* is not allowed in Pocket PC. However, no runtime error will occur when the application is used on a Pocket PC: indeed, *fCurrentDir* will never be called.



Note

The function named *InWindowsMobileMode* is used to share the sets of procedures, classes, components, ... between a WinDev Mobile application and a standard WinDev application.



Test

In test mode, *InWindowsMobileMode* always returns True. *InWindowsMobileMode* returns False only when it is called from a standard WinDev application.

LESSON 4.4. INPUT MODE

This lesson will teach you the following concepts ...

- The different input modes available for a Pocket PC and for a Smartphone.



Estimated time: 10 min

Entering some information on a Pocket PC

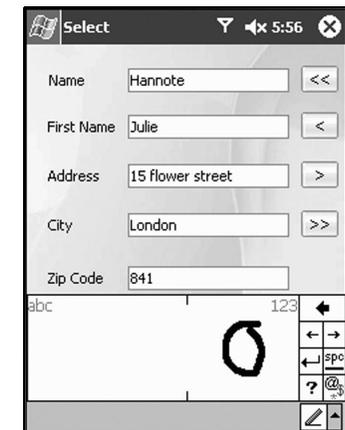
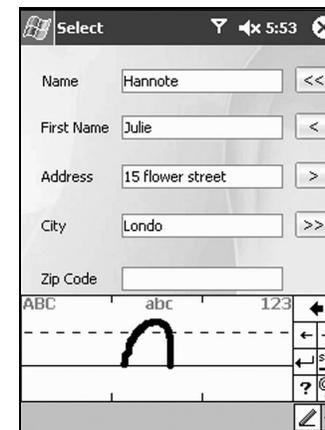
To allow the users of your applications to enter information, the keyboard of the Pocket PC must be used (also called SIP for Software Input Panel).

This keyboard allows you to:

- display a miniature keyboard at the bottom of the screen. The user clicks this keyboard with the stylus to enter information. For example:
- automatically recognize the different words written on the screen with the stylus (method called "Transcriber"). For example:



- automatically recognize the letters entered in a specific character set (method called "Letter Recognizer"). For example:
- automatically recognize the blocks of words entered in a specific character set (method called "Block Recognizer"). For example:



Note: Other types of keywords can also be available.

WinDev Mobile enables you to easily manage this keyboard by programming (**SIPList**, **SIPMode** and **SIPVisible**).



Note The icon representing the keyboard of the Pocket PC (for example) enables you to manage the use of the keyboard.



Note The "Enables the keyboard in edit" option ("Details" tab in the description window of an edit control) enables you to automatically make the current keyboard visible when the control is in edit.

Entering information on a Smartphone

Several default input modes are available for a Smartphone:

- the "abc" and "ABC" modes: to enter lowercase and uppercase characters.
For example, in this mode, "5" must be pressed twice to write the letter "k".
- the "123" mode: to enter digits.
- the "T9" mode (intuitive edit patented by AOL): this test mode is used to avoid pressing the same key several times for a letter.
For example, press "43556" to automatically write "hello".
To choose the different words corresponding to the same sequence of keys, press "0" to display the available suggestions.
For example, "2355" can be used to write "bell" and "cell".

To toggle the different input modes, press the "*" key (long pressures). Short pressures are used to toggle the uppercase/lowercase characters.

The input mode currently used is displayed in the top right corner of the Smartphone:



• icon for the "abc" mode.



• icon for the "ABC" mode.



• icon for the "123" mode.



• icon for the "T9" mode.



PART 5

Communication



LESSON 5.1. INTRODUCTION

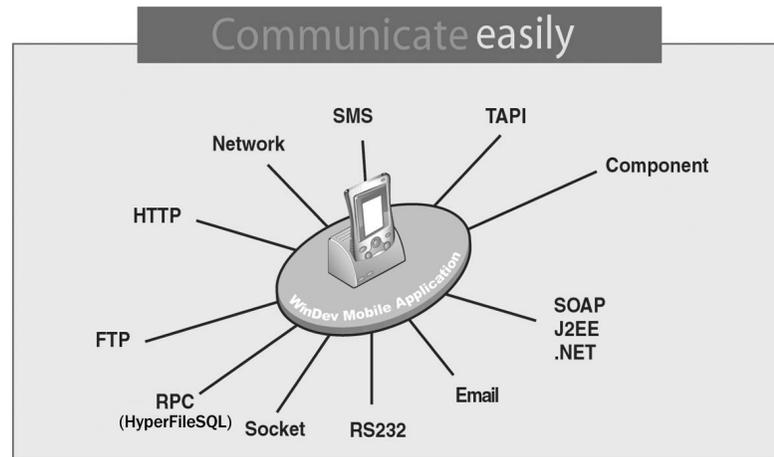
This lesson will teach you the following concepts ...

- Communication with WinDev Mobile.



Estimated time: 10 min

Communicating with WinDev Mobile



The communication tools proposed by WinDev Mobile allow for total openness!

RPC, TAPI, network, socket, FTP, Email, HTTP, SOAP, J2EE, .NET, Google, ... all these standards are supported by WinDev Mobile.

WinDev Mobile can be used to establish a communication between two Pocket PCs, a Pocket PC and a Smartphone, a Pocket PC and a PC, ...

These "dialogs" are performed via infrared, via Wi-Fi, via network card ... These "dialogs" are entirely transparent.

We shall not present all the features proposed by WinDev Mobile. We shall only take a look at the management of emails (see "Managing the emails", page 118).

For the other communication modes, we shall briefly explain the main differences compared to standard WinDev.

Transferring files by FTP

The FTP (File Transfer Protocol) is a protocol used to transfer files from a site to another remote site. This protocol is used to exchange files via TCP/IP, Internet, Wi-Fi or ActiveSync.

Several thousands of file servers can be accessed by FTP on Internet. These servers propose shareware or freeware to the public.

Several WLanguage functions allow you to manage the files found on an FTP server from your applications (**FTPxxx** functions).



EXAMPLE

The "Pocket FTPClient" example, supplied with WinDev Mobile, is used to manage an FTP server.

Remote access (RPC on HyperFileSQL)

In a Windows Mobile application, the remote access enables you to consult a HyperFileSQL database via Internet/Intranet or even via STN (Switched Telephone Network).

To reduce the number of exchanges via network, the functions that do not directly affect the database are run locally. Therefore, the HyperFileSQL library (wp170hf.dll) and the analysis description (".WDD" file) must be found on each Pocket PC.

The exchanges of data are performed according to the RPC protocol (Remote Procedure Call) by using the functions of the wd170com.dll library (found on the server) and the functions of the wp170com.dll library (found on the client computer, which means on the Pocket PC).

These exchanges of data can be performed:

- by Wi-Fi.
- by ActiveSync.
- by GPRS.
- by network card.

Managing the sockets

Several functions can be used to perform an advanced management of sockets (**SocketXXX** functions).

A socket is a communication resource used by the applications to communicate between computers regardless of the network type.

This communication mode can be used, for example, to establish a communication between computers connected by Internet.

WinDev Mobile allows to create a socket that uses the infrared port (**SocketCreateInfrared** and **SocketConnectInfrared**).

The exchange of data between two computers can be performed:

- by Wi-Fi.
- by infrared.
- by ActiveSync.
- by GPRS.
- by network card.

Exchanging messages



Caution !

When exchanging messages between a Pocket PC and a PC, don't forget to check the format of the character strings (ANSI or UNICODE). Depending on the current computer and on the format used, some conversions will be required (*AnsiToUnicode* and *UnicodeToAnsi*). See "Managing the character strings", page 92 for more details.



Example

The example for managing the sockets (supplied with WinDev Mobile) includes a project that can be used on Pocket PC ("Pocket Socket UNICODE") and a project that can be used on PC ("PC Socket Unicode"). These two examples present the use of the functions for socket management.

Web services (SOAP, J2EE, .NET)

The Microsoft .NET and Sun J2EE platforms allow you to export their components as XML Web services.

An XML Web service is defined as an application accessible via the standard Internet protocols. More specifically, the Web services allow several computers connected via Internet to interact between themselves.

The Web services allow you to run some procedures and processes on a remote Web server (.Net or J2EE) from a Pocket PC.

Passing parameters



Caution !

When passing parameters to a procedure, if the value of the parameter is a character string, don't forget to check its format (ANSI or UNICODE). Indeed, this string is automatically converted to the ANSI format when it is sent. To prevent this string from being automatically converted, use one of the following variables: *SOAP.ExtendedValue*, *J2EE.ExtendedValue* or *DotNet.ExtendedValue*.

SMS

WinDev Mobile allows you to easily send and read some SMSs (Short Message Service) via the *SMSxxx* functions of *WLanguage*.

An SMS corresponds to a text message (up to 160 characters) sent on a cell phone. See the online help for more details.

Summary

The table below presents the communication modes available for each feature proposed by WinDev Mobile.

	Remote access (RPC on HyperFileSQL)	Email	FTP	HTTP	Telephony	SOAP J2EE .NET	Socket	SMS
ActiveSync	X	X	X	X		X	X	
Network card	X	X	X	X		X	X	
GPRS	X	X	X	X		X	X	
Infrared							X	
Smartphone or access by phone (GSM type)					X			X
Wi-Fi	X	X	X	X		X	X	

LESSON 5.2. MANAGING THE EMAILS

This lesson will teach you the following concepts ...

- Sending and receiving emails.



Estimated time: 5 min

Overview

Several WLanguage functions allow you to manage the incoming and outgoing emails. Furthermore, WinDev Mobile enables you to find out all the characteristics of an email:

- sender
- recipients
- outgoing date
- subject
- message
- attachments
- ...

WinDev Mobile proposes several methods for managing the emails:

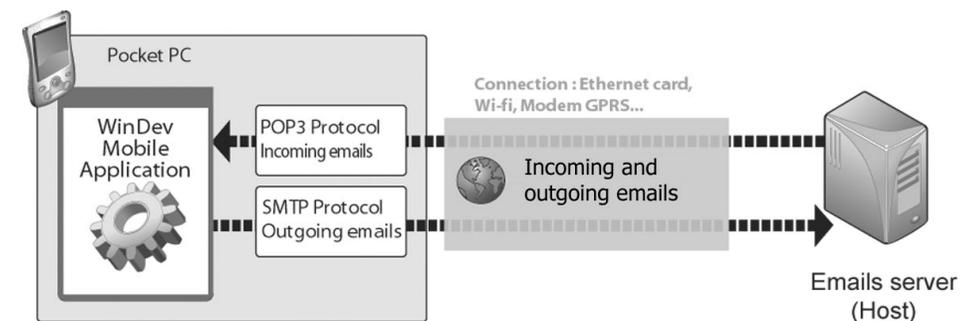
- **the POP3/SMTP protocol** (most common method): this protocol, used to manage emails, is recognized by all the service providers. This protocol enables you to directly communicate with the server, available at your ISP.
- **the IMAP protocol**: this protocol for receiving emails stores the emails on the server in order to consult them from different messaging clients or webmail.
- **the "CEMAPI" API**: this management mode of emails uses Pocket Outlook to send and receive emails.

Managing the emails via the POP3/SMTP/IMAP protocol

The POP3, IMAP and SMTP protocols are protocols for email management recognized by all the Internet Service Providers. These protocols allow you to directly communicate with the email server, available at your service provider.

The POP3 and IMAP protocols are used to receive emails.

The SMTP protocol is used to send the emails.



Note

The method for sending and receiving emails via the POP3/IMAP/SMTP protocol is identical in WinDev Mobile and in standard WinDev. A connection must be established between the Pocket PC and a PC if no Ethernet card or GPRS modem is found on the Pocket PC.

Managing the emails via "CEMAPI"

CEMAPI is an API for email management used by most of the Pocket applications to send and receive emails (Pocket Outlook in most cases).

CEMAPI simplifies the management of the emails received by the hosting company. When an email is read, it is automatically loaded in the local message box and deleted from the server (at the hosting company).

All the characteristics required to manage the emails (POP3 protocol, SMTP protocol, remote access, etc.) are grouped in the "User Account".

User account

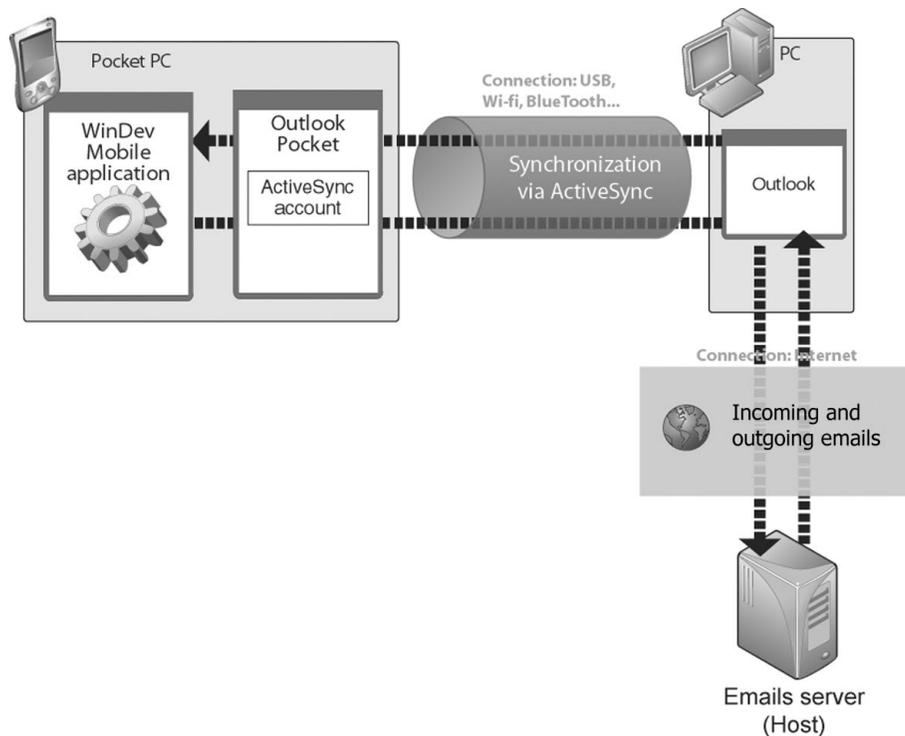
A user account defined in Pocket Outlook is required to manage the emails via CEMAPI.

By default, Pocket Outlook manages the "ActiveSync" user account.

Another user account can be used. It must be defined in this case.

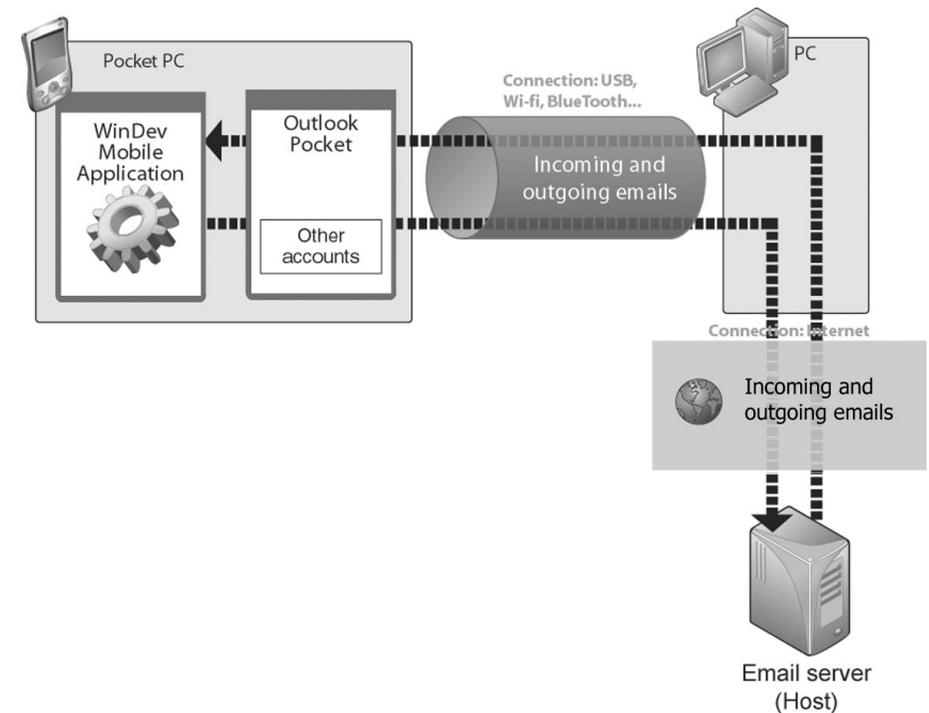
"ActiveSync" user account

The "ActiveSync" user account is used by default.



Other user account

To use a user account other than "ActiveSync", all you have to do is describe a new user account.



Note

The method for sending and receiving emails via the CEMAPI protocol in WinDev Mobile is identical to the method for sending and receiving emails via the SIMPLE MAPI protocol in standard WinDev.

Only differences:

- **"ActiveSync" user account:** in WinDev Mobile, the synchronization of emails must be configured by ActiveSync.
- **Other user account:** in WinDev Mobile, the emails must be synchronized by the email server.



PART 6

How do I proceed?



QUESTIONS/ANSWERS

This lesson will teach you the following concepts ...

- Answers to your questions.



Estimated time: 1h

Controls, windows

Question How do I change the type of a window?

Two types of windows can be created in WinDev Mobile:

- Maximized window: A maximized window occupies the entire screen of the Pocket PC.
- Non-maximized window: A non-maximized window can be resized by the user and it can occupy part of the screen only.

To change the type of a window:

1. Right-click the window and select "Description".
2. Display the "Details" tab.
3. Select the new type for the window.



Note

The "Style" tab can also be used to change the type of a window.

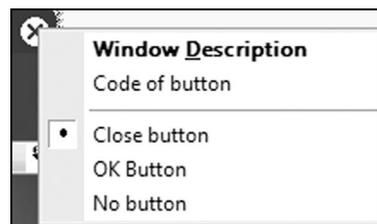
Question How do I modify the type of the "OK/Close" button displayed in the title bar?

The "OK/Close" button found in the title bar of the WinDev Mobile windows is used to close or validate the current window.

By default, this button is used to automatically close the window.

The type of this button can be modified:

- via the popup menu of the button:



- in the "Style" tab of the window description.
- by programming (**WinSystemButton**).



Note

The "OK/Close" button is not available for the windows associated with the Smartphone or Android platform.

Question How do I display the keyboard on the Pocket PC?

To allow the users of your applications to enter information, the keyboard of the Pocket PC must be used (also called SIP for Software Input Panel).

To display the keyboard on the Pocket PC:

- select "Enable the keyboard in input" ("Details" tab in the description window of an edit control). This option is used to automatically make the current keyboard visible when the control is in edit.
- by programming (**SIPVisible**).
- on the Pocket PC directly, by clicking .

Question How do I display all the drop-down menus of a window?

In edit, when the window is not wide enough to display all the drop-down menus, the icon  is displayed. This icon is used to display all the menus.

At run time, only the menus that can be contained in the width of the window are visible.

Question How do I duplicate a control found in a window by programming?

With WinDev Mobile, you already have the ability to clone the controls. The function named **ControlClone** is used to duplicate a control found in a window or in a report by programming.

The control is duplicated with the same characteristics but with a different name.

Question How do I delete a control found in a window by programming?

The function named **ControlDelete** is used to delete a control from a window or from a report by programming.

Question How do I manage the planes of a window?

The planes found in a window are used to arrange the controls in "layers" to avoid overcrowding the screens and to keep the number of project windows down.

To associate a control with a plane:

1. Right-click the control.
2. Select "Associate with a plane".
3. Choose the number of the plane to which the control must be associated.

The [Page Up] and [Page Down] keys allow you to go from one plane to another in the editor. The number of the current plane is displayed:

- in the status bar of the editor (bottom right)
- in the home window of the current window (top right).



Tip

To avoid duplicating the same control in a window, associate the control to "no plane". The control will be visible in all the planes.

Only the controls of the current plane and the controls that belong to no plane are visible in edit and at run time.

The **Plane** property can also be used to:

- find out and change the current plane in a window.
- find out and change the plane associated with a control.

The "Plane Mode" pane ("Display .. Toolbars .. Panes .. Other panes .. Plane mode") is used to edit all the captions of the controls found in all the window planes in order to view them and to modify them if necessary.

Question How do I make a button invisible?

A button can be made invisible by programming with the following syntax:

```
ButtonName.Visible = False
```

Set the value to "True" to make the control visible.

This syntax can also be applied to all types of controls and to groups of controls.

Question How do I modify the color of a static?

The color of the captions is defined in the control style ("Control .. Choose a style").

However, the color of a static can be modified by programming. The syntax is as follows:

```
// Color the static in red
StaticName.Color = PastelRed

// Color the background of the static in green
StaticName.BrushColor = LightGreen

// Restore the initial color (the one of the style)
StaticName.Color = iDefaultColor
```



Note

This syntax applies to all types of controls.

The function named **RGB** is used to define a color from the values of the Red, Green and Blue components.

```
<ColorCode> = RGB(<red>, <green>, <blue>)
```

You also have the ability to modify the colors of the rows, columns or cells in a Table control. The syntax is as follows:

```
// Modify the color of a column
ColumnName.Color = <ColorCode>

// Modify the color of a row
TableName[RowSubscript].Color = <ColorCode>

// Modify the color of a cell
ColumnName[RowSubscript].Color = <ColorCode>
// or
// TableName[RowSubscript, ColumnSubscript].Color = <ColorCode>
```

The function named **HSL** is used to create a color from its hue, saturation and lightness.

```
<ColorCode> = HSL(<Hue>, <Saturation>, <Lightness>)
```

Question How do I display the progress of a process?

The function named **Gauge** uses the status bar of your window to display the progress of a process.

A progress bar is used to display the progress of a process.

To do so, use a Progress Bar control in a window ("Insert .. Control .. Progress bar").

In the initialization code of the Progress Bar control:

1. Initialize the minimum value of the progress bar:

```
NameProgressBar.MinValue = MinimumValue
```

2. Initialize the maximum value of the progress bar:

```
NameProgressBar.MaxValue = MaximumValue
```

In the code of the requested process, increment the progress bar at each step of the process:

```
NameProgressBar ++
// or NameProgressBar = NameProgressBar + 1
```

Question How do I link a window to an option of my main menu?

The function named **Open** is used to associate a window with a menu option. Enter the following code in the click code of your menu option:

```
Open (MYWINDOW)
```



Note

To associate a report with a menu option, use the function named *iPrintReport*:
`iPrintReport (MYREPORT)`

Question How do I create a popup menu?

A popup menu can be added:

- at window level.
- at control level.

For a window:

1. Right-click the window and select "Description".
2. Click the "Details" tab. Click the arrow found beside "Popup Menu" and select "Create a new popup menu".

For a control:

1. Right-click the control and select "Description".
2. Click the "GUI" tab. Click the arrow found beside "Popup Menu" and select "Create a new popup menu".

PopupMenu enables you to find out and modify the popup menu of a control or window by programming.

Question How do I pass parameters to a window?

The method for passing parameters to a window is similar to the method for passing parameters to a procedure.

In the declaration code of the global variables of the window, enter the following syntax of WLanguage code:

```
PROCEDURE WindowName (pNameParam1, pNameParam2, ...)
```

When the window is opened by **Open**, pass the parameters after the name of the window, for instance:

```
Open(WindowName, ValueParam1, ValueParam2, ...)
```

If a parameter is initialized when declaring the window, this parameter becomes optional:

```
// pNameParam2 is an optional parameter
PROCEDURE WindowName (pNameParam1, pNameParam2 = "Test")
```



Note

We advise you to pass parameters to a window rather than declaring some global variables in the project.

Question How do I transform a check box into a radio button?

"Control .. Swap .. Radio Button/Check Box" is used to swap the two types of controls.



Note

This operation can also be performed between a combo box and a combo box with table, or between a table and a loopier.

Question How do I retrieve the parameters passed by command line to an executable?

To do so, use **CommandLine** in the initialization code of the project.

See the online help (keyword: "CommandLine") for more details.



Tip

Passing parameters by command line to your project can be simulated in test mode. In the editor, select "Project .. Test mode .. Configure the test mode" and enter the parameters of the command line.

Question How do I group the controls in order to modify their properties by programming?

Perform the following operation:

1. Select several controls with the mouse.
2. In the menu of the editor, select "Control .. Groups .. Associate the selection". Click "New".
3. Enter the name of the group and validate.

The groups of controls can be used in the windows and in the reports.

The controls will be associated with this group. You can then modify the properties of the controls found in this group with the following syntax:

```
GroupName.<PropertyName> = Value
```



Caution !

Only the properties common to all the controls can be modified.

Question How do I align the controls?

Several methods can be used to align the controls:

- the rulers.
- the interface checker.
- the real-time interface checker.
- the alignment options.

To enable the rulers, press [CTRL] and [R] simultaneously. "Markers" (or "tabulation marks") can be defined on the ruler and moved (by clicking the ruler at the requested location). Then, when the controls are moved in the window (or in the report), they will be "magnetized" when they come near these markers.

The real-time interface checker is automatically enabled when creating or moving a control. Temporary rulers are used to align the selected control with the other controls found in the window.

To enable the interface checker, select "Control .. Alignment .. Interface checker". This wizard proposes some tips to perform alignments in the window.

The alignment options can be accessed from the menu of the WinDev Mobile editor or from the icon bar.

From the icon bar of WinDev Mobile, click .

From the menu of WinDev Mobile, select "Control .. Alignment" and choose an action.

After practicing a few minutes, you will soon realize what a good thing proper alignment is!

Question How do I give the same size to the buttons?

- ▶ Select the button that will be used as reference for the size (height and width). Then, select the button that must be resized.
- ▶ Select "Same width", "Same height" in the alignment options ("Control .. Alignment").

Question How do I add a background image to a window?

On the window:

1. Right-click and select "Description".
2. Select the "Image" tab.

You now have the ability to choose an image and to configure the display mode.

Environment

Question How do I display or hide the panes?

Press [CTRL] and [W] simultaneously.

To display or to hide the pane anchored at the bottom of the screen, press [CTRL] and [Q] simultaneously.

Question How do I view the element to which the current process belongs?

To view the element corresponding to the current process, click . The window containing the requested element is displayed and the control is automatically selected.

Question How do I print the source code?

To print the current source code (displayed in the code editor), click  in the icon bar of the editor or select "File .. Print the code".

Question How do I print the analysis documentation?

To print the analysis documentation from the data model editor, click  in the icon bar of the editor or select "File .. Print the documentation".

Question How do I print the full documentation of my project?

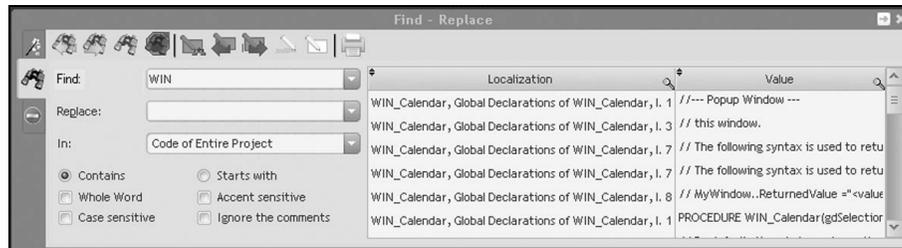
To print the full project documentation from the project graph (or from the dashboard), select "Project .. Print the project documentation".

Question How do I create a skin template?

This operation includes several steps. See the online help (keyword: "Create, Skin template") for more details. But don't forget: several skin templates are supplied with WinDev Mobile!

Question How do I find and/or replace a variable in the code?

The functions for performing searches or replacements in the code can be accessed via "Edit .. Find" and "Edit .. Replace" or in the "Find - Replace" pane ():



The search can be accessed at any time by pressing [CTRL]+[F].

Question How do I find out the list of project elements?

The elements found in a project are: windows, reports, queries, ...

- ▶ To view the project elements, select "Project .. List of project elements".

Question How do I view and change the tab order of the controls in a window?

The tab order of the controls is defined by the order in which the controls are created in the window.

The [F5] key is used to view the current order.

- ▶ To modify the tab order:
 1. Select "Windows .. Tab order .. Edit".
 2. In the window, modify the input order of the controls.

The option "Windows .. Tab order .. Define automatically" automatically defines the order of the controls according to their position and alignment in the window. The controls are browsed from the top left corner of the window.

Question How do I enable or disable the automatic data preview (Live Data)?

To enable or disable this feature, check or uncheck "Enable Live Data" in the "Live Data" tab of the project description ("Project .. Project description").

Question How do I add a language to my project?

In the menu of WinDev Mobile, select "Project .. Project description", then select the "Languages" tab. In the window, check the new languages that must be supported.

Question How do I modify the options of WinDev Mobile?

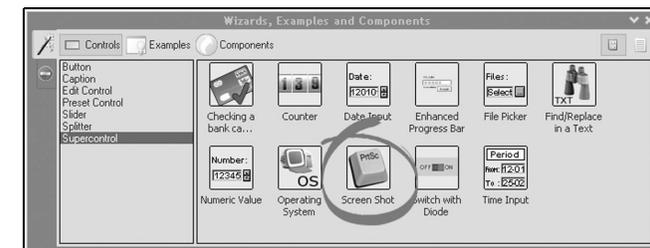
The environment parameters of the editor (directory, language, login, ...) can be modified from the options of WinDev Mobile ("Tools .. Options .. General options of WinDev Mobile").

The parameters for displaying the windows or the reports (click, magnetism, ...) can be modified from "Display .. Options .. Modify the options".

Various

Question How do I perform a "screen shot"?

Include the "Screen shot" supercontrol (available from the "Wizards, Examples and Components" pane) in your window. You don't even have to enter any code!



To perform a screen shot of the Pocket PC (or Smartphone), use "WDCapture" ("Tools .. WDCapture - Screen shot").

Question How do I read and write into an .INI file?

The functions named *IniRead* and *IniWrite* are used to read and write in a .INI file. See the online help (keywords: "IniRead" and "IniWrite") for more details.

Question What are the image formats supported by WinDev Mobile?

WinDev Mobile supports the following image formats: BMP, JPEG, GIF, PNG or ICO.

Question I want to compress data, can I do this with WinDev Mobile?

WinDev Mobile proposes several functions used to compress and to decompress the data. The name of these functions starts with "Zip".

See the "Pocket Zip" example supplied with WinDev Mobile or the online help (keyword: "Zip") for more details.

Question How do I read and write in the registry?

The functions named *RegistryQueryValue* and *RegistrySetValue* are used to read and write in the registry.

See the online help (keyword: "Registry, WLanguage functions") for more details.



Caution !

Don't forget to save the registry before you make any modification so that it can be restored if a problem occurs.



Note

The Pocket PC registry can also be handled from a standard WinDev application (*ceRegistryXXX* functions).

Question How do I uninstall an application created with WinDev Mobile?

The provider and the name of the application must necessarily be specified when creating the setup program. This information is displayed in the panel for uninstalling programs on the Pocket PC.

To uninstall an application:

1. Click the "Start" menu.
2. Select "Parameters".
3. Display the "System" tab.
4. Select "Remove programs".
5. Select the application to delete and click "Uninstall".

Question How do I create an executable for Windows CE/Mobile?

To create the executable of your project, select "Workshop .. Generate the Windows CE/mobile application".

Question How do I install an application for Windows CE/Mobile?

Once the executable is generated ("Workshop .. Generate the Windows CE/mobile application"), the EXE directory found in the directory of your project contains all the elements required for your application to operate.

To prepare a setup for your application:

1. Select "Workshop .. Create the setup procedure". The setup creation wizard starts.
2. Follow the instructions given on the screen.

Question How do I associate an icon with my executable?

The icon that is associated with your executable can be defined when creating the executable. This icon must be in ICO format.



Note

A catalog of preset icons is supplied with WinDev Mobile. This catalog is accessible when selecting the icon.

Question How do I detect the elements not used by my application?

After months or years of development and maintenance, the directory of your project often contains several files that are not used anymore but that you don't dare delete.

Test files and windows, useless images, ... It's time to clean up!

A WinDev Mobile tool is available to automatically detect the unused elements and to delete them from the project. The elements deleted from the project will be archived (in ZIP format or in a backup directory) so that they can be restored later if necessary.

- ▶ To use this wizard, select "Tools .. Clear the project directory".

Managing the files and disks

Question How do I manage the files found on the Pocket PC from a standard WinDev application?

The functions for accessing the Pocket PCs (starting with "ce") allow you to handle the files found on the Pocket PC (copy the files, find out the size of a file, return the list of files found in a directory ...).

These functions can be used in a standard WinDev application when a Pocket PC is connected to the current computer.

See the online help (keyword: "Pocket PC, Access functions") for more details.

Question How do I list all the files found in a directory?

The function named **fDir** associated with the **frFile** constant is used to list the files found in a directory.

For a more advanced use, **fListFile** is used to retrieve the list of files found in a directory or in several cascading directories.

See the online help (keyword: "fListFile") for more details.



Note The files found in a Pocket PC directory can also be listed from a standard WinDev application (**ceDir** and **ceListFile**).

Question How do I copy files?

The function named **fCopyFile** is used to copy files.

See the online help (keyword: "fCopyFile") for more details.



Note The files found on the Pocket PC can also be copied from a standard WinDev application (**ceCopyFile**).

Question How do I create a directory?

The function named **fMakeDir** is used to create a directory.

See the online help (keyword: "fMakeDir") for more details.



Note A directory can also be created on the Pocket PC from a standard WinDev application (**ceMakeDir**).

Question How do I read a text file?

Two methods are available:

1. Use **fOpen**, **fReadLine**, **fClose**. For example:

```
FileLine is string
FileNumber is int
FileNumber = fOpen("\My Documents\MYFILE.TXT", ...
                foRead)
IF FileNumber <> -1 THEN
  FileLine = fReadLine(FileNumber)
  WHILE NOT FileLine = EOT
    Info(FileLine)
    FileLine = fReadLine(FileNumber)
  END
  fClose(FileNumber)
END
```

2. Use **fLoadText**. For example:

```
FileContent is string
FileContent = fLoadText("\My Documents\MYFILE.TXT")
Info(FileContent)
```

See the online help (keyword: "Read, In an external file") for more details.

Tables

Question How do I modify the search key of a table linked to a data file?

The search key in a table control corresponds to the item used as sort criterion for the table rows.

- ▶ To modify the search key of a table linked to a data file:
 1. Right-click the browsing table and select "Description".
 2. Click the "Content" tab.
 3. In the "Search item" combo box, select the item that will be used as search key.



Note The search key defined for a table can be modified by programming with **..BrowsedItem**.

Question How do I modify the stored item of a table linked to a data file?

The stored item in a browsing table corresponds to the value retrieved in the table for the selected row.

- ▶ To modify the stored item of a table linked to a data file:
 1. Right-click the browsing table and select "Description".
 2. Click the "Content" tab.
 3. In the "Stored item" combo box, select the item that can be retrieved.



Note The stored item defined for a table can be modified by programming with `..StoreItem`.



Tip The stored item of a table can be used to link two browsing tables in cascade.

HyperFileSQL Mobile

Question Are the formats of the HyperFileSQL and HyperFileSQL Mobile data files compatible?

Yes, the HyperFileSQL format and the HyperFileSQL Mobile format are compatible. Their format is identical. The HyperFileSQL data files and the HyperFileSQL Mobile data files can be used in WinDev Mobile and in WinDev.

However, the available size on a Pocket PC being restricted and the operating system of the Pocket PC being limited, the following features are not supported by HyperFileSQL Mobile:

- the transactions.
- the log process.
- the HyperFileSQL replication.
- the management of locks for the data files and records.
- the management of data files in Hyper File 5.5 format.

Question How do I disable an integrity constraint?

The integrity constraints are defined in the analysis when creating the links between the data files. Each constraint has a name. All the constraints are enabled by default.

To disable a constraint, use `HSetIntegrity`. This function can be used before and after some specific processes or in the initialization code of your windows or projects.

See the online help (keyword: "HSetIntegrity") for more details.

Question How do I manage the NULL value?

To manage the NULL value in your data files, you can use:

- In the data model editor:
 - a "NULL supported" option available in the description of the data file. This option is used to specify whether the management of NULL is supported by this data file. In this case, you will have the ability to manage the NULL value for the different items of the data file.
 - a "Default to NULL" option available for each item of your data files. This option enables you to define the null value as default value for the item.
- In programming, two properties:

<code>..NULL</code>	Used to: <ul style="list-style-type: none"> • define the NULL value as the default value for an item of a data file during its dynamic description • associate (or not) the NULL value with an item of a data file
<code>..NullSupported</code>	Used to: <ul style="list-style-type: none"> • define the management mode of the NULL value for a data file during its dynamic description. • find out the management mode of the NULL value for a data file

See the online help (keyword: "Management, Manage the Null value") for more details.

Question How do I manage a duplicate error during a write operation in a data file?

If a duplicate error occurs during a write operation in a data file (`HAdd` and `HModify`), a window for error management is automatically displayed. This window allows the user to modify the values entered.

To find out whether a duplicate error occurred and to process it by programming, `HErrorDuplicates` must be called after `HAdd` and `HModify`.

Example of code:

```
HModify(CUSTOMER)
IF HErrorDuplicates() THEN
    Error("Unable to modify the customer", ...
        "Duplicate error")
END
```

Question How do I manage an integrity error during a write operation or during a deletion in a data file?

If an integrity error occurs during a write operation in a data file (**HAdd** and **HModify**) or during a deletion (**HDelete**), a window for error management is automatically displayed.

To find out whether an integrity error occurred and to process it by programming, **HErrorIntegrity** must be called after **HAdd**, **HModify** and **HDelete**.

Example of code:

```
HDelete (CUSTOMER)
IF HErrorIntegrity() THEN
    Error("Unable to delete the customer", ...
        "Integrity error")
END
```

Question How do I manage a composite key during a search?

Start a search with **HFilter** or **HReadSeek** by using the following notation:

```
HReadSeek (File, COMPOSITEKEY, [1, "A"])
HFilter (FILE, COMPOSITEKEY, [1, "A"], [5, "S"])
```

Queries

Question How do I optimize the speed of a query?

The optimization of a query is based on the following principle: a wizard defines the composite keys that must be modified and/or added in the analysis associated with the project.

To optimize the execution speed of the current query, select "Query .. Optimize the query". The window for query optimization is displayed and it proposes the different modifications that can be performed in the analysis.

Caution: Adding a lot of composite keys to an analysis increases the size of the index files and slows down the access to the data files.

Note: This option is available only if the following conditions are fulfilled:

- the "Live Data" is enabled ("Project .. Project description .. Live Data"). See the online help (keyword: "Live Data") for more details.
- the data files are found in the test directory of the project ("Project .. Project description .. Files"). See the online help (keyword: "Test, Project") for more details.

Question How do I add or modify a condition in a query?

- ▶ To add or modify a condition in a query:
 1. Select and open the query to modify.
 2. Right-click the query and select "Query description".
 3. Select the item for which a selection condition must be added or modified.
 4. Click the "Selection condition" button and select "New condition" or "Modify the condition".

Reminder: When defining a condition, you can refer to a value (constant in the query) or to a parameter (value passed in parameter when calling the query).

Question How do I add or modify a sort in a query?

- ▶ To add or modify a sort in a query:
 1. Select and open the query to modify.
 2. Right-click the query and select "Query description".
 3. Right-click the requested item, select "Sort..." and choose the operation to perform.

Reminder: The red arrow is used to change the sort direction.

Printout

Question How do I print from a WinDev Mobile application?

The PCL format is the format used when printing from a Pocket PC. This print can be performed in a PCL file or on a PCL printer directly.

To format the information to print:

- create a report via the report editor of WinDev Mobile.
- use the print functions of WLanguage.

See the online help (keywords: "Report (Report editor)" and "Print") for more details.

Question What is the PCL standard?

PCL (Printer Control Language) is a standard allowing the Pocket PC to send commands to a printer that supports it. This standard was developed by Hewlett Packard.

A PCL file is a binary file containing all the commands sent. This file contains the commands required to define the print areas.

Question Why does the font on the printed page differ from the font in my report?

The result of a print performed on a Pocket PC depends on the features of the printer used (management of images and lines, management of fonts, ...).

To limit the resources required for printing, WinDev Mobile uses the printer fonts. The printer automatically selects the font that best suits the specified criteria. Check the fonts available on your printer as well as their sizes and effects.

Ports

Question How do I read a bar code?

Two methods can be used to read a bar code:

1. If you are using a bar code reader that is directly interfaced with the keyboard, you won't have to write any code in WinDev Mobile. When the bar code is read, the value is returned to the keyboard as if the code was entered directly. To do so, you must be positioned in an edit control.
2. If you are using a bar code reader that is connected to the serial port, you must use the functions for managing the serial ports. The functions named *sOpen*, *sRead*, *sWrite* and *sClose* are used to manage the dialog with a serial port.

Question How do I read the data sent by a magnetic card reader?

Proceed exactly the same way as for bar code readers.

Question How do I manage a serial port?

- ▶ Use *sOpen*, *sRead*, *sWrite*, *sClose*, ...

See the online help (keyword: "Serial port") for more details.

Question How do I manage an infrared port?

The functions for managing the infrared ports are the same as the functions for managing the serial ports.

- ▶ Use *sOpen*, *sRead*, *sWrite*, *sClose*, ...

See the online help (keyword: "Infrared port") for more details.

CONCLUSION

The tutorial is over now!

This course has discussed a variety of subjects, but not all the features of WinDev Mobile, far from it!

You are now familiar with the main concepts.

We recommend that you spend another day exploring the menu options of WinDev Mobile, for each one of the modules.

You can also explore the examples supplied with WinDev Mobile: some are simple and only address one topic, while others are more complex. These examples illustrate the different aspects of WinDev Mobile. Reading the source code is also a good way to learn.

It would take too much room to discuss all the available topics (there are hundreds, even thousands!). WinDev Mobile proposes several features that were not presented in this course:

- sockets, HTTP and telephony functions,
- creation of skin templates ...
- nested reports, queries with parameters ...
- ...

See the online help for more details.

Reminder! To directly receive intermediate updates and tips, don't forget to subscribe to the **LST** (quarterly technical magazine + DVD).

We wish you great development experiences with **WinDev Mobile!**

APPENDICES

Glossary of the main words

A quick vocabulary reminder.

Window	A window is also called a " dialog box ". We will use both "dialog box" and "window"; we hope purists won't mind. A window can also be called a screen.
Button	A button (text or graphic) is an area materialized by a "rectangle" that can be clicked in order to perform an action. In the icon bars, we talk of icons rather than buttons. A button is also called a "control".
Project	A project is a set of windows, reports, A project can be based on an analysis created in the data model editor.
Analysis	An "analysis" is a set of files (or tables) created to build a database.
Application	An application is a set of programs that perform specific actions.
Control / Item	We will use " control " for the screen areas and " item " for the file areas. Therefore, we will talk about the "NAME" control (that is found in the window) and about the "NAME" item (that is found in a file); there can also be a program variable named "NAME".
Table	A table is a control used to view the content of a file or the content of a memory zone. A table is also called "browse" or "data sheet".
Combo box / Drop-down list box	A " combo " or " combo box " corresponds to a " drop-down list ".
Scrollbar	We will use scroll bar or scrollbar .
File	A file is also sometimes called a "table". We will use " table " for an object used to view the content of a file or the content of a memory zone.
Record	A record is sometimes called a row. A record groups several items found in a file.
Item	An item is a zone that belongs to a record.
SQL language	The SQL language is a language used to handle data found in files. It is both a query language and a language used to update the files (addition, modification, deletion). This language can be used in the query editor or by programming. However, no prior knowledge of the SQL language is required to use the query editor.