

Installation and Usage Manual

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SmartGuide

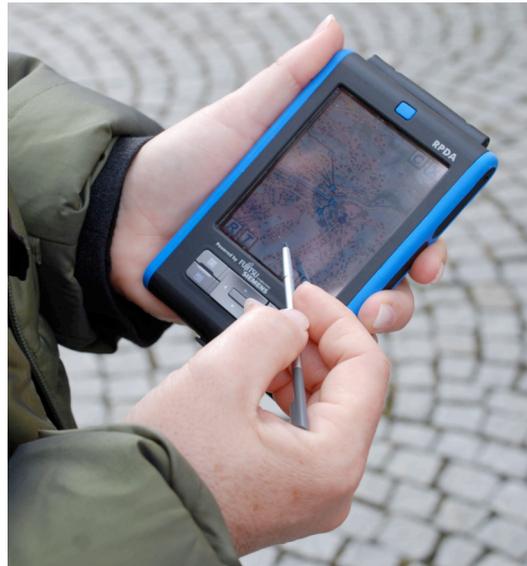


Figure 0-1 SmartGuide in the field

The SmartGuide shown in Figure 0-1 is a novel, innovative mobile application for windows mobile devices (e.g., PDAs or Smartphones) bundling the latest development from research in mobile applications and systems into the domain of tourism.

Because of the higher computing power and storage capacity of these devices compared to regular cell phones the realisation of more ambitious applications is possible. Thus the SmartGuide is able to provide a multimedia enriched hiking experience with personalized and location aware information for tourists. Due to the flexible and extensible framework on which the SmartGuide application is based it is easy for developers to extend the application and to enable GALILEO support as soon as the appropriate receivers will be available.

Requirements

The hardware of choice for the SmartGuide application is a modern PDA with a sufficiently large display and sufficient computing performance. For the demonstration and development, various HP iPAQ and Fujitsu Pocket LOOX devices were used and worked without problems. Initial issues with GPS reception are resolved by new receiver hardware as for example with a SiRF III chipset.

Hardware

The SmartGuide application works on PDAs and Smartphones with the "Windows Mobile 5" operating system, but runs also on different "PocketPC 2003 Second Edition" based PDAs which meet the required computing power. It must be noted that we experienced some differences in the behaviour of different PDAs that officially meet the requirements. Thus it can not be guaranteed that the application works on every PDA properly.

The PDA processor has to be ARM4 based and should be at least 350 MHz fast. The minimum RAM for the application is 64MB and the screen resolution should be 320x240 pixels or higher, but a resolution of 240x240 pixels works also without problems. To benefit from the positioning capabilities a GPS receiver is required. The receiver can be internal or external.

The required storage space depends strongly on the routes and maps. The application itself needs less than 400 KB, but a single route can easily have about 30 MB up to more than 100 MB. The maps will take additional space with an amount of round about 10 MB per selected region. Thus, an additional storage card is recommended (e.g., an SD card) to handle the large amount of storage data for the routes and maps.

Summarized recommendation:

- PDA or Smartphone with Windows Mobile 5
- ARM4 processor with core speed \geq 350 MHz
- RAM \geq 64 MB
- Resolution \geq 320x240 pixel
- Internal or external GPS receiver
- Storage card (optional) with memory \geq 256 MB

Software

As has been noted above, Windows Mobile 5 is the recommend operating system for the SmartGuide application, but it also works on PocketPC 2003. However, the latest version of the .NET Compact Framework 2.0 has to be installed to be able to run the application, because SmartGuide takes advantage of the .NET Compact Framework functionalities. It is available for free download on the following page:

<http://www.microsoft.com/downloads/details.aspx?displaylang=en&FamilyID=9655156b-356b-4a2c-857c-e62f50ae9a55>

Installation

This section describes the installation and directory structure of the application itself as well as the installation of routes and maps.

a.) SmartGuide

The SmartGuide application comes as a compressed archive and can be installed by simply unpacking it on the mobile device. The initial directory structure is shown in Figure 0-2.

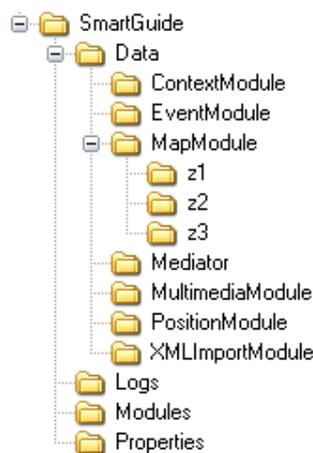


Figure 0-2 Directory structure of SmartGuide after unpacking

The location of the SmartGuide folder on the mobile device is arbitrary and it can be copied on a storage card as well as on the device storage itself. The main directory contains the directories and files shown in Figure 0-3.

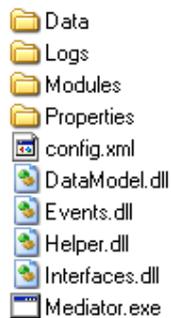


Figure 0-3 Main directory of SmartGuide

The file *mediator.exe* is the main file of the application. The SmartGuide can be started by clicking it. The directory *Data* contains the data and resources required by the application and its modules. Additional information about the folder can be found in the following sections about installing routes and maps. System messages of the modules are written in files that are located in the *Log* directory. The next folder is called *Modules* and it contains the library files (DLL files) that provide the functionality and logic of the application. As has been noted in the earlier deliverables, the functionalities are divided into modules. A property file exists for each of these modules and defines their behaviour and appearance. The property files are stored in the *Properties* directory.

b.) Routes

Routes can be downloaded via the internet from the LOCCATA content management system (L-CMS). They are distributed as tar.gz-archives. To install them for use with SmartGuide they have to be simply unpacked into the subdirectory *Data\XMLImportModule*. New subdirectories with the names of the routes should exist in this directory after unpacking as shown in Figure 0-4.

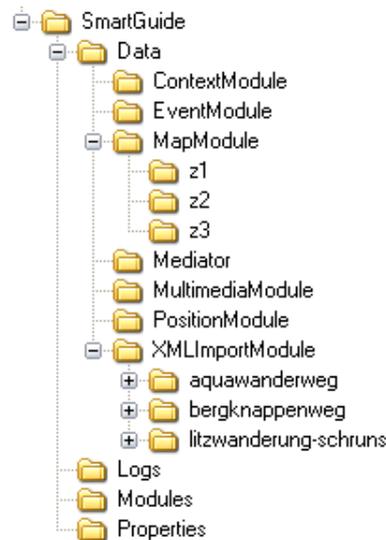


Figure 0-4 Routes in the directory structure

The three routes “aquawanderweg”, “bergknappenweg” and “litzwanderung-schruns” have been installed in the example above.

c.) Maps

As has been shown in Figure 0-2, the directory *Data\MapModule* contains three subdirectories (*z1*, *z2*, *z3*). Each of them represents a zoom level of the map. Additional SmartGuide maps which are downloaded from the internet can be simply copied in these directories. Similar to the routes the maps are also compressed to archives that include the map parts in three directories corresponding to the above noted zoom level directories. Thus the *z1* subdirectory in the archive can be easily copied into the *Data\MapModule\z1* folder and so on.

d.) Settings

One important setting for the usage of internal as well as external positioning devices is the correct COM port and the baud rate corresponding to the position receiver. These settings are required by the application to receive the position information. Currently these settings have to be written manually in the property file of the position module. This xml based file is located in the *Property* subdirectory shown in Figure 0-2 and can be opened with every text editor. The file section that has to be adopted looks like the following excerpt:

```
<gps>
...
  <port>COM8</port>
  <baudrate>4800</baudrate>
...
</gps>
```

The parameters between the tags have to be changed to the values that are valid for the used device and receiver. The COM port depends on the mobile device and the baud rate depends on the receiver. The correct values can be found in the documentation of these devices.

Instructions for use

The use of SmartGuide is pen-based such as the interaction with the PDA in general. The application can be started by clicking the file *mediator.exe* in the SmartGuide main directory (see Figure 0-3). Subsequently the start screen appears as shown on the left side of Figure 0-5. By clicking the **Exit** button the applications exits immediately. But by pressing the **Start** button the application loads the information about installed routes. This is indicated by the message on the right screen in Figure 0-5.



Figure 0-5 SmartGuide: start screen

After the loading procedure a new form is displayed as shown in Figure 0-6. The upper list shows all routes which are installed properly as has been explain in the earlier sections.

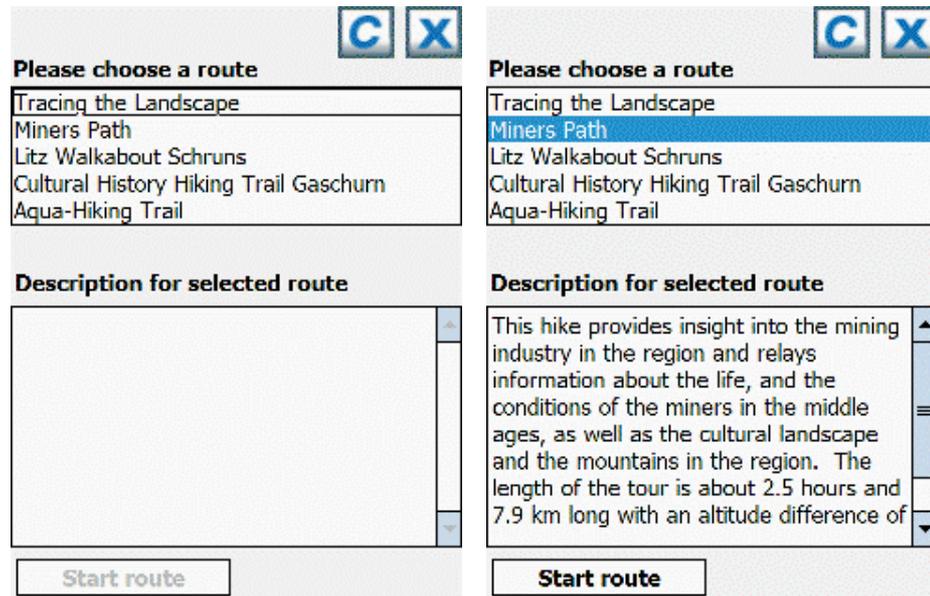


Figure 0-6 SmartGuide: route choice

With a click on the name of a route the bottom area presents general information about the currently selected route. Via the **X** button in the upper right corner one comes back to the start screen. This **X** button has the same meaning in every view and allows for switching back to the prior screens. If the user decides to start the walk on the highlighted route a click on **Start route** loads the corresponding information and the screen looks as in Figure 0-7. This can take some time depending on the amount of data belonging to the selected route.

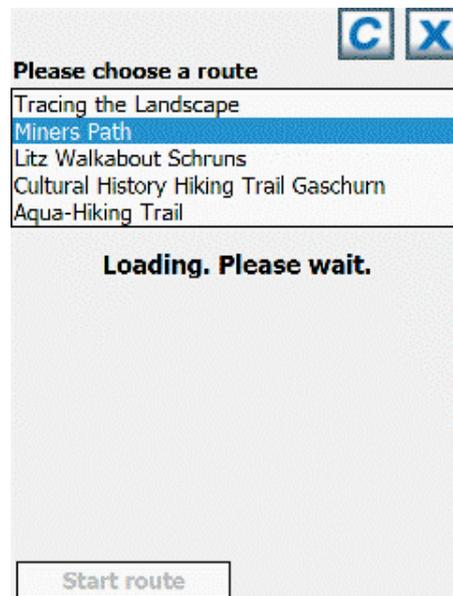


Figure 0-7 SmartGuide: loading of a route

Once the necessary information is loaded by the system the map view which is presented by Figure 0-8 appears. Since there is no position signal received, an appropriate message is shown. As soon as the signal is coming in and is valid the map is drawn and it shows the user's position. The **+** and **-** buttons allow for zooming in and out and the **o** toggles between keeping the user's position in the middle of the view (user tracking) and free movement. The map

can be focussed on a certain position by clicking on it. The point of click becomes the new centre of the map view. If user tracking was on it will be deactivated until the **O** button will be pressed again. The map can also be moved by dragging it. Therefore the user can press down the pen on the screen and drag it to another position. As soon as the pen is lifted the map will be moved for the drawn distance.

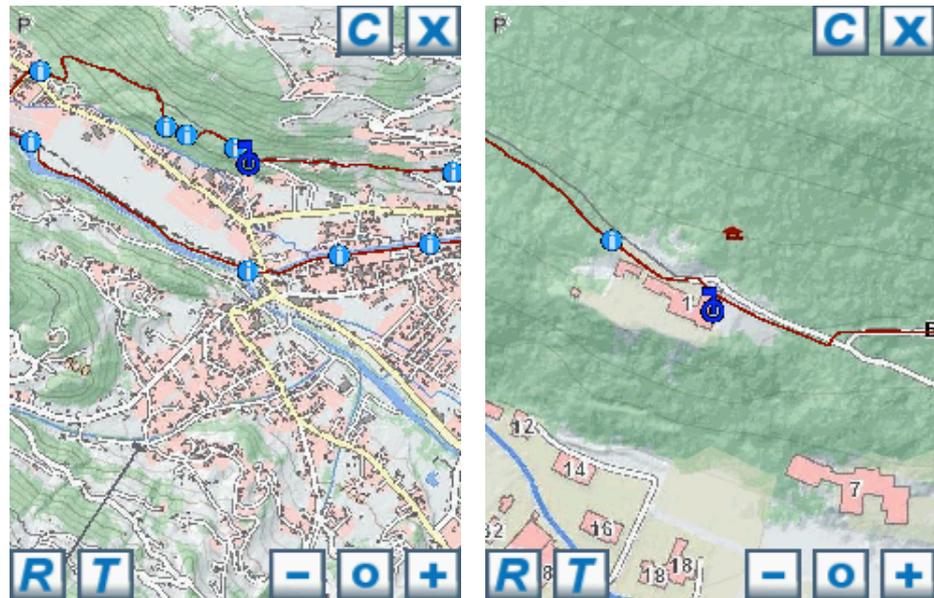


Figure 0-8 SmartGuide: map view

The map module displays the course of the route as a dark red line. This is the suggested way and sequence to go. It can be toggled on/off by pressing the **R** button. Figure 0-9 illustrates this.

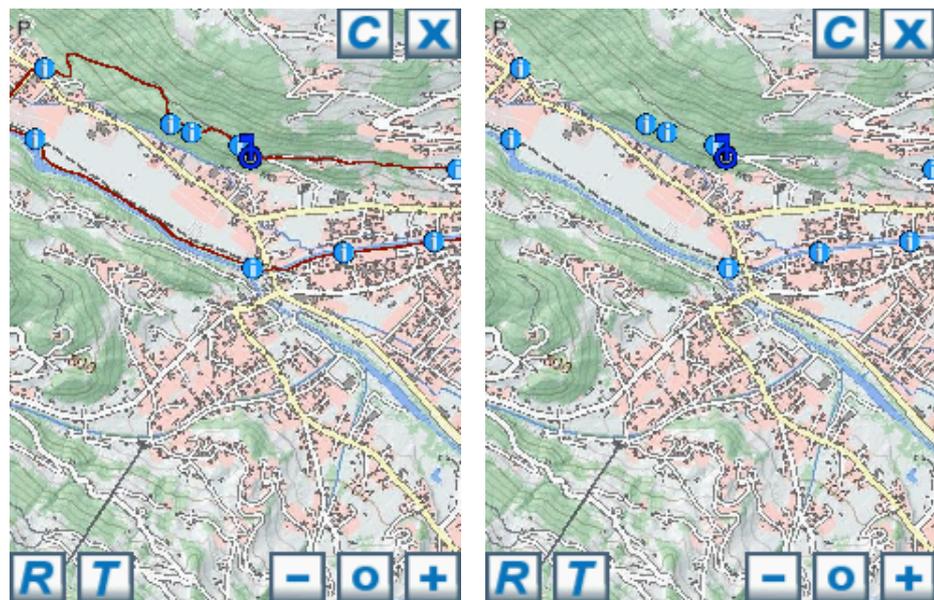


Figure 0-9 SmartGuide: route presentation on the map

The presentation of the user track which is the course the user has gone so far functions similar to that and can be seen as the blue line shown in Figure 0-10. The display in the upper left corner of the map view represents the

current signal precision in six steps from green (=very good) over red (=very bad) to no coloured bar (=no valid signal).

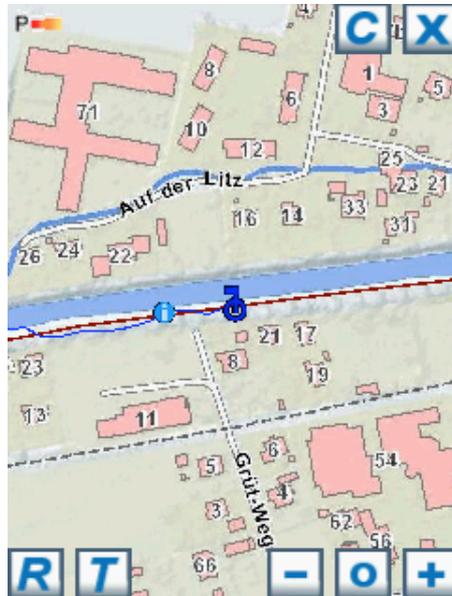


Figure 0-10 SmartGuide: user track

The information icons with an **i** on it represent the points of interest (POIs) for the selected route. The user can access detailed information about these POIs by clicking on these icons. This action brings up the multimedia module which presents an introductory information as shown in Figure 0-11.

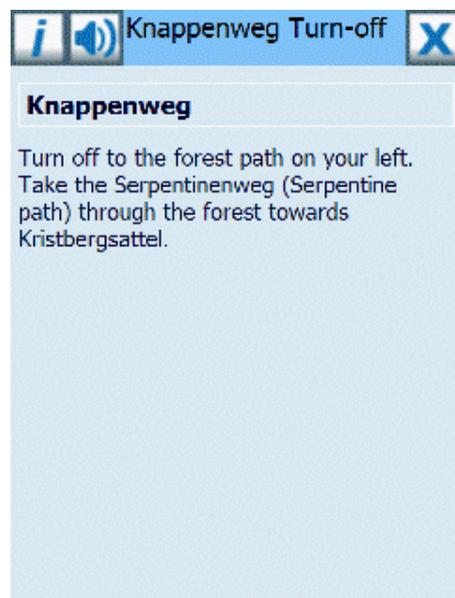


Figure 0-11 SmartGuide: information presentation

Further information is accessible by means of the buttons on the upper left side of the multimedia view. The **i** menu contains all written texts and all images for the chosen POI. A click on the **i** button opens a list box with the title of these contents. This is presented in the left half of Figure 0-12. A click on the title opens the corresponding information as for example an image (on the right side of Figure 0-12).

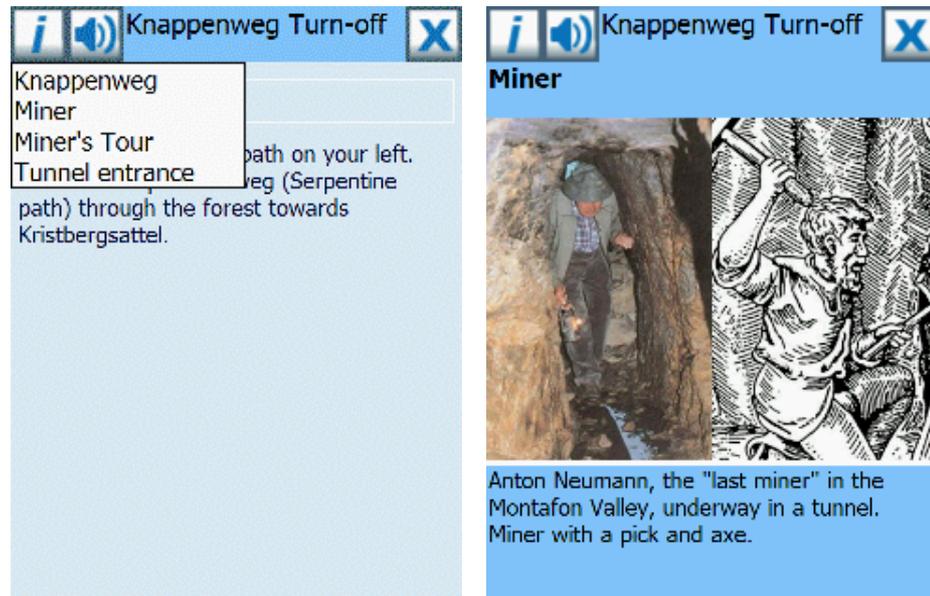


Figure 0-12 SmartGuide: choice of information

Also audio information is available beside the images and texts. The user can open the audio contents via the **Audio** button near the **i** menu. A list box similar to the other content can be opened by clicking the button as shown on the left side of Figure 0-13. A click on a title starts the media player that outputs the information. This can be seen on the right side of Figure 0-13.

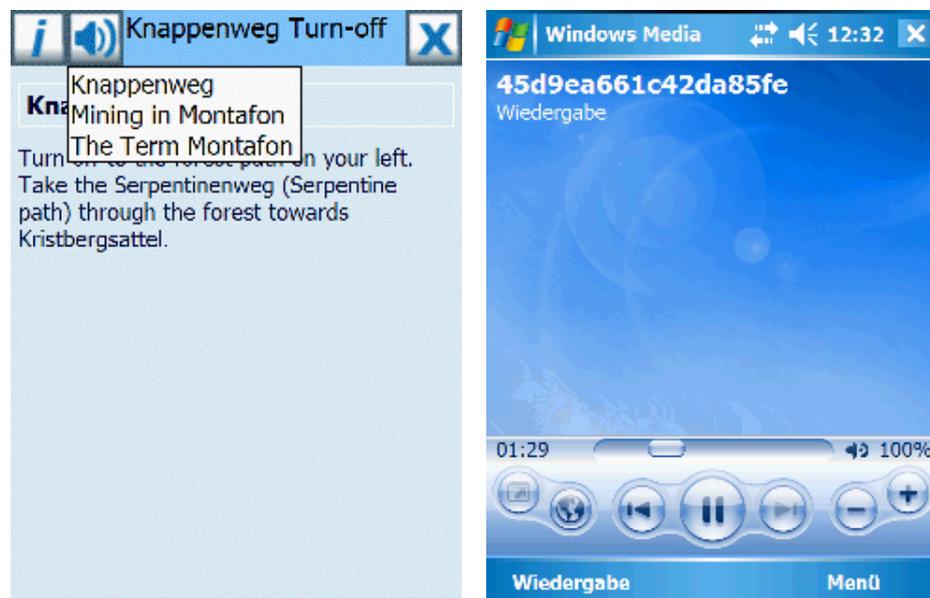


Figure 0-13 SmartGuide: audio information

The audio output can be stopped via the **Pause** button in the lower centre of the screen and continued via the **Play** button respectively. The user can switch back to the multimedia module by clicking the **x** button of the media player in the upper right corner. If the file playback was not stopped, the audio will continue even after closing the media player and will automatically stop at the end of the audio file. Thus the user has to stop the audio before closing the media player, if audio in the background is not wanted.

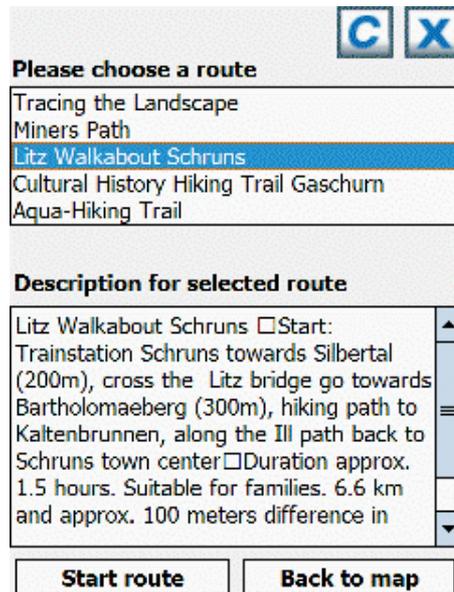


Figure 0-14 SmartGuide: change of route

While walking on a certain route the user can switch back to the route choice view by clicking on the X button in the map view shown in Figure 0-8. This leads back to the screen illustrated in Figure 0-14. During a route an additional **Back to map** button is visible. Via this button the user can open the map view for the current route again. In contrast, a click on **Start route** exits the current route and starts the new selected one. Finally the X button on this screen opens the start and exit view shown in Figure 0-15 from which the user can quit the SmartGuide by clicking **Exit** or switch back to the route choice via the **Start** button.

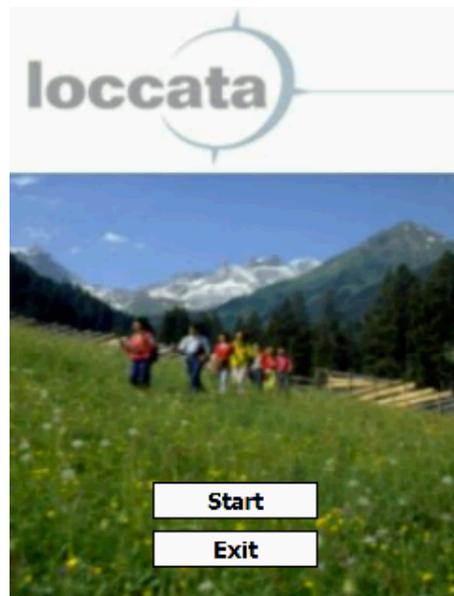


Figure 0-15 SmartGuide: exit

A running route will not be stopped until leaving the application with the **Exit** button or choosing a new route.