



LEADTEK GPS CF Card

User's Manual

GPS 9534



Leadtek®
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Version 1.0
31 October 2002
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1. Introduction

1.1. Overview

The Leadtek 9534 GPS CF Card receiver is a Global Position System Receiver with a type I compact flash interface. It has a standard NMEA output and compatible with all devices accepting a Type I and Type II compact flash slot. The Leadtek 9534 GPS CF Card which include a build in antenna and compatible to laptop, PDA and tablet PC will allow you to find with help of electronic map application to find your way on the streets easier.

The Leadtek 9534 GPS CF Card is in Compact Flash form-factor which is a popular form factor for both new and old generation of Windows Pocket or Handheld PCs. It is designed for easy integration with a wide range of navigation software applications. Featuring all view tracking capability, GPS CF Card provides robust performance in applications that require high vehicle dynamics and high signal blockage operations. In other words, the totally wireless Compact Flash GPS system is for the Windows Pocket PC. The customers can combine with all kinds of electronic map software and allow user to navigate worldwide, while walking, on a boat, or even in-vehicle; using a completely integrated device, eliminating cumbersome wires. Therefore, Pocket PC involving map software and GPS Compact Flash Card will have become a portable navigation device and replaced traditional GPS handheld products.

1.2. Main Features

- ◆ World's smallest GPS receiver in Compact Flash (CF) Type I form factor
- ◆ 12 Channels "All-In-View" Tracking
- ◆ Cold/Warm/Hot Start Time: 45/38/8 Seconds
- ◆ Reacquisition Time: 0.1 seconds
- ◆ RF connector for external GPS antenna
- ◆ Support Standard NMEA-0183 and SiRF Binary protocols
- ◆ Support Trickle Power mode Power Saving
- ◆ Multi-path Mitigation Hardware
- ◆ Onboard rechargeable backup battery
- ◆ Superior Sensitivity for Urban Canyon and Foliage Environment
- ◆ WAAS capable for improved accuracy where applicable
- ◆ Driver supported by Pocket PC 2002 and Windows to work with popular navigation software
- ◆ Dimension: 81.5 mm (including the connector) x 43.36 mm x 15 mm
- ◆ Power Consumption: Tracking mode 150 mA, CPU mode 35 mA, Trickle Mode 3 mA



2. Technical Specifications

2.1. Electrical Characteristics

2.1.1 General

Frequency	L1, 1575.42 MHz
C/A code	1.023 MHz chip rate
Channels	12 channel parallel tracking

2.1.2 Accuracy

Position	15 meters, 2D RMS
	7 meters 2D RMS, WAAS corrected
	1-5 meters, DGPS corrected
Velocity	0.1 meters/second
Time	1 microsecond synchronized to GPS time

2.1.3 Datum

Default	WGS-84
Other	selectable for other Datum, please refer to Appendix B

2.1.4 Acquisition Rate

Reacquisition	0.1 sec., average
Snap start	2 sec., average
Hot start	8 sec., average
Warm start	38 sec., average
Cold start	45 sec., average

2.1.5 Dynamic Conditions

Altitude	18,000 meters (60,000 feet) max.
Velocity	515 meters/second (1000 knots) max.
Acceleration	4g, max.
Jerk	20 meters/second ³ , max.

2.1.6 Power

Main Power	3.3VDC±10%
Supply Current	170mA Typical (Without active antenna at 3.3V)
Backup Power	+2.2V to 3.1V



2.1.7 Main Interface

Hardware	Compact Flash – CF type I
Software	Emulated COM-port (Auto Select)
Protocol messages	NMEA output protocol Baud rate: 4800bps Data bit: 8 Parity: N Stop bit: 1 Output format: GGA(1sec), GSA(5sec), GSV(5sec), RMC(1sec), VTG(1sec) Optional: SirF binary

2.2. Environmental Characteristics

Operating temperature range	-40 deg. C to +70 deg. C
Storage temperature range	-55 deg. C to +85 deg. C
Operation Humidity range	5% to 95% No condensing

2.3. Physical Characteristics

Length	3.21" (81.50 mm)
Width	1.71" (43.36mm)
Height	0.59" (15 mm)
Weight	34g
Antenna connector	MC PLUG type <Note>: The device disable internal antenna when connected with external antenna.

3. Applications

Leadtek GPS 9534 CF Card receiver is a high performance, low power consumption product. The product applications are as follow.

- ◆ Hand-Held Device for Personal and Portable Positioning and Navigation-- Handheld PC , Pocket PC, Tablet PC.
- ◆ Automotive applications
- ◆ Marine Navigation
- ◆ Aviation applications
- ◆ Location-Based Services

4. Operation and Test

4.1. Hardware Installation

1. If your PDA or laptop have Compact Flash slot just plug your Compact Flash card into the slot.



2. If you don't have the Compact Flash slot but you got a PCMCIA slot, then you can apply an adapter to connect your Compact Flash card to PCMCIA slot. In addition, you have to install the driver of socket serious I/O card and it makes the notebook or tablet computer regard the CF card as PCMCIA card.



4.2. How to test your GPS Compact Flash Card

1. First, you have to install WinFast Navigator for PDA with WinCE. It allows you to control the function of the CF card using an easy-to-use application. How to install WinFast Navigator, you can refer to **Appendix A**.
2. After you have finished installing WinFast Navigator, you can begin testing your GPS CF card. The following content is the operational note.



Application Main Screen

When you run the application, the main screen appears as shown in the figure below:

The main screen include three major parts:

1. Menu bar

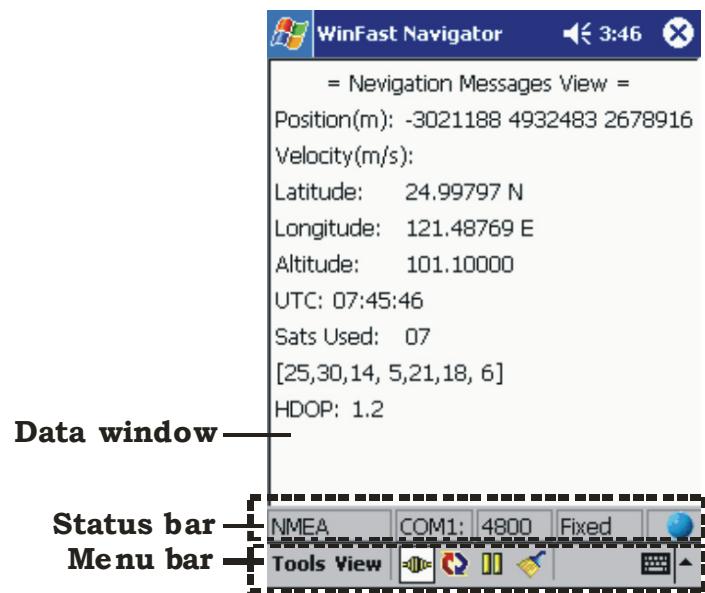
Provides accesses to all information and setting options.

2. Status bar

Shows the current status, including the connection with the GPS, and the satellite data being received.

3. Data window

Show the contents of each screen.



Reading Status Bar

NMEA	Box1	COM1:	Box2	4800	Box3	Fixed	Box4	Box5	
------	------	-------	------	------	------	-------	------	------	--

Box 1

Shows the current status of connection with the GPS in one of four possible messages:

◆Disconnect:

The GPS is not connected.

◆Connect...:

Displayed when Protocol Parser fails. The reason may be that the COM port has not been correctly set up.

◆NMEA:

The data being received is in NMEA protocol.

◆SiRF:

The data being received is in SiRF Protocol.

Box 2

Indicates the COM port currently used.

Box 3

Shows the Baud Rate of the current COM port.

Box 4

Indicates whether the satellites are in their positions by showing **Fixed** or **Unfixed**.

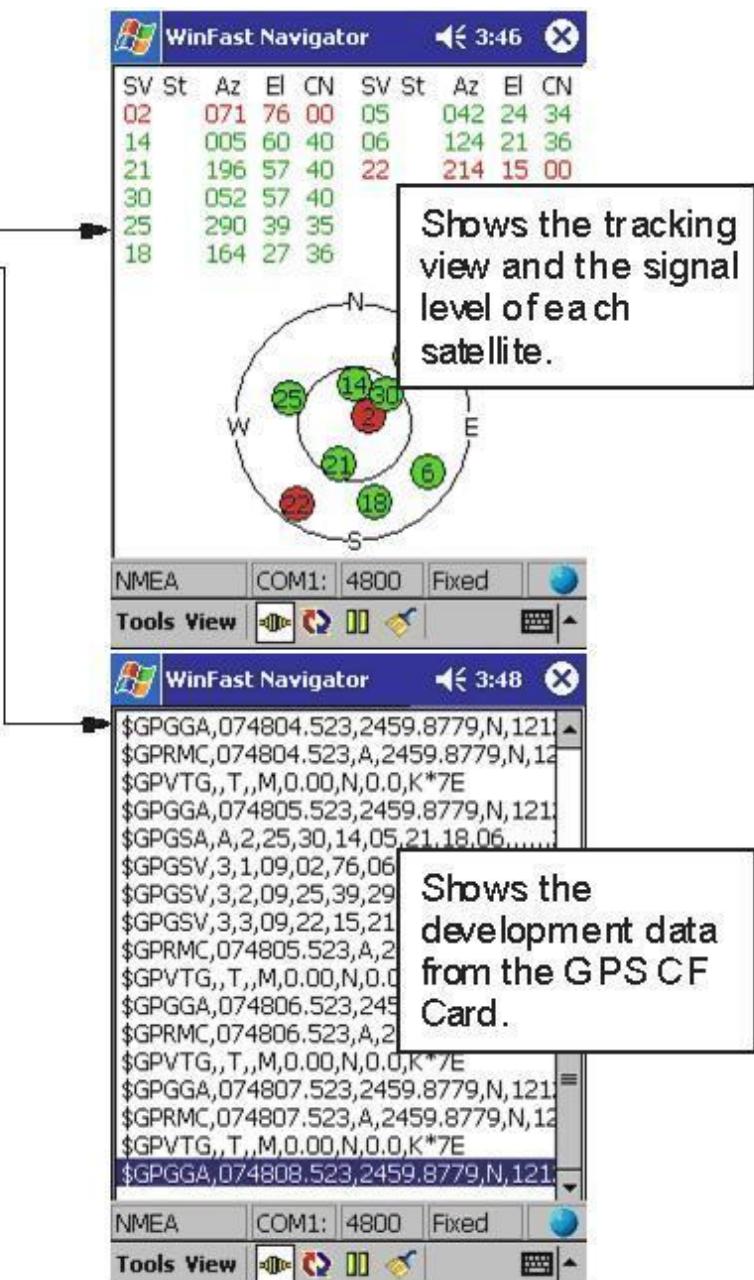
Box 5

The ball-shaped icon is the data receiving indicator.

- ◆ White: The COM port is currently not receiving data.
- ◆ Blue: The COM port is receiving data.

Navigation Messages

On the menu bar click View. A menu with 3 options appears as shown in the figure below.



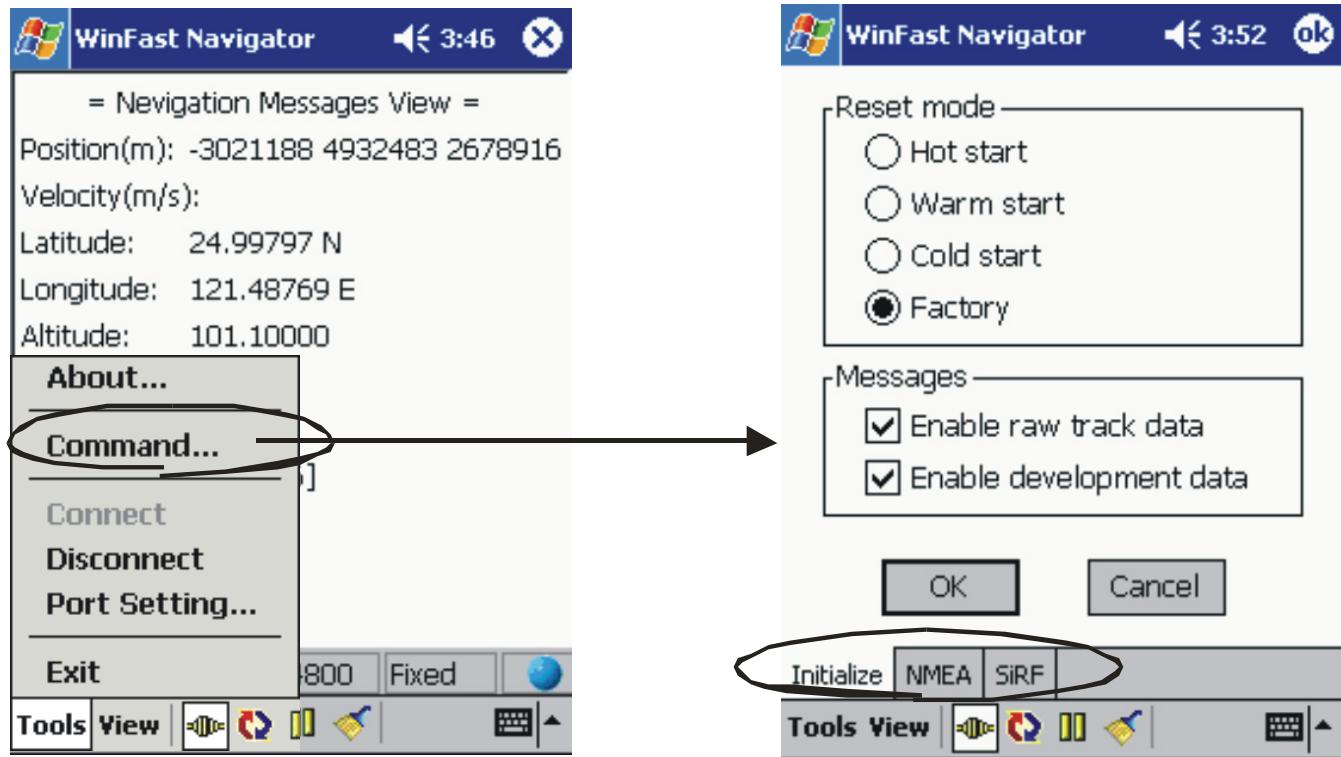
Configuration Tools

On the menu bar click **Tools**. A menu with the following options appears (see the figure on the left below):

- About
- Command
- Connect
- Disconnect
- Port Setting
- Exit

Command

Select **Command** and an additional menu bar appears on the bottom of the data window that includes 3 tabs: **Initialize**, **NMEA**, and **SiRF** (see next page)..



The Initialize, NMEA, and SiRF configuration screens under **Command** are as shown in the figures below:



<p>Reset mode —</p> <ul style="list-style-type: none"> <input type="radio"/> Hot start <input type="radio"/> Warm start <input type="radio"/> Cold start <input checked="" type="radio"/> Factory <p>Messages —</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Enable raw track data <input checked="" type="checkbox"/> Enable development data <p style="text-align: center;">OK Cancel</p>	<p>BaudRate : 4800</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>GGA</td><td>: 1</td><td>VTG</td><td>: 1</td></tr> <tr><td>GLL</td><td>: 0</td><td>MSS</td><td>: 0</td></tr> <tr><td>GSA</td><td>: 5</td><td>User</td><td>: 0</td></tr> <tr><td>GSV</td><td>: 5</td><td>User</td><td>: 0</td></tr> <tr><td>RMC</td><td>: 1</td><td>User</td><td>: 0</td></tr> </table> <p style="text-align: center;">OK Cancel Default</p>	GGA	: 1	VTG	: 1	GLL	: 0	MSS	: 0	GSA	: 5	User	: 0	GSV	: 5	User	: 0	RMC	: 1	User	: 0	<p>BaudRate : 38400</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>Data Bit</td><td>: 8</td></tr> <tr><td>Stop Bit</td><td>: 1</td></tr> <tr><td>Parity</td><td>: N</td></tr> </table> <p style="text-align: center;">OK Cancel</p>	Data Bit	: 8	Stop Bit	: 1	Parity	: N
GGA	: 1	VTG	: 1																									
GLL	: 0	MSS	: 0																									
GSA	: 5	User	: 0																									
GSV	: 5	User	: 0																									
RMC	: 1	User	: 0																									
Data Bit	: 8																											
Stop Bit	: 1																											
Parity	: N																											
<p>Initialize NMEA SiRF</p> <p>Tools View </p>																												

Initialize screen provides options for the reset mode and protocol data transmission.

The **NMEA** screen allows you to control how the NMEA messages Are being out put.

The **SiRF** screen allows you to set the data transmission

Port Setting

Select Port Setting from the Tools menu and the Port Setting screen appears. It allows you to set the GPS protocol and the connecting port.

<p>= Navigation Messages View =</p> <p>Position(m): -3021188 4932483 2678916</p> <p>Velocity(m/s):</p> <p>Latitude: 24.99797 N</p> <p>Longitude: 121.48769 E</p> <p>Altitude: 101.10000</p> <p>About...</p> <p>Command...</p> <p>Connect</p> <p>Disconnect</p> <p>Port Setting...</p> <p>Exit</p> <p>Tools View </p>	<p>GPS Protocol —</p> <ul style="list-style-type: none"> <input checked="" type="radio"/> NMEA <input type="radio"/> SIRF <p>Port : Serial COM1:</p> <p>BaudRate : 4800</p> <p style="text-align: center;">OK Cancel</p>
<p>Tools View </p>	

Connect, Disconnect & About



Select **About** on the Tools menu to view the copyright and version information.

Select **Connect** to start the connection , and **Disconnect** to terminate it.

Quick Buttons on Menu Bar



 **Connect**

Press to build connection with the GPS module.

: The GPS is not connected.

: The GPS is connected.

 **Automatically detect communication protocol**

When this button is pressed, the system will automatically detect the GPS Protocol and Baud Rate of the port currently enabled.

 **Pause**

Press to pause the data displayed in Development View.

 **Clear**

Press to clear the data in Development View.

Appendix A

Installing WinFast Navigator for Pocket PC

Note :

Microsoft ActiveSync has to be installed on your computer when you install WinFast Navigator. The application interface is shown in the figure to the right.



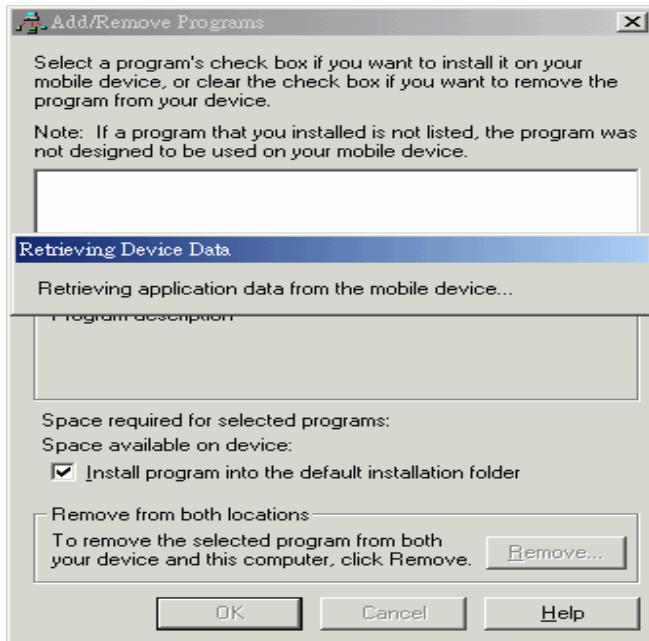
Step 1.

Insert the software CD in your CD-ROM drive. The setup screen appears as shown in the figure to the right. If the setup screen does not appear automatically, run install.exe on the CD. Click WinFast Navigator CE to initialize the installation.



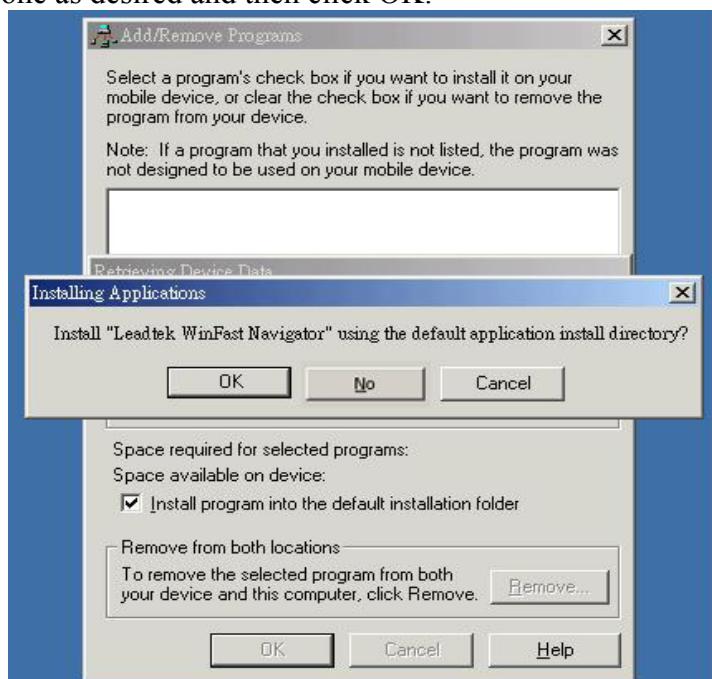
Step 2.

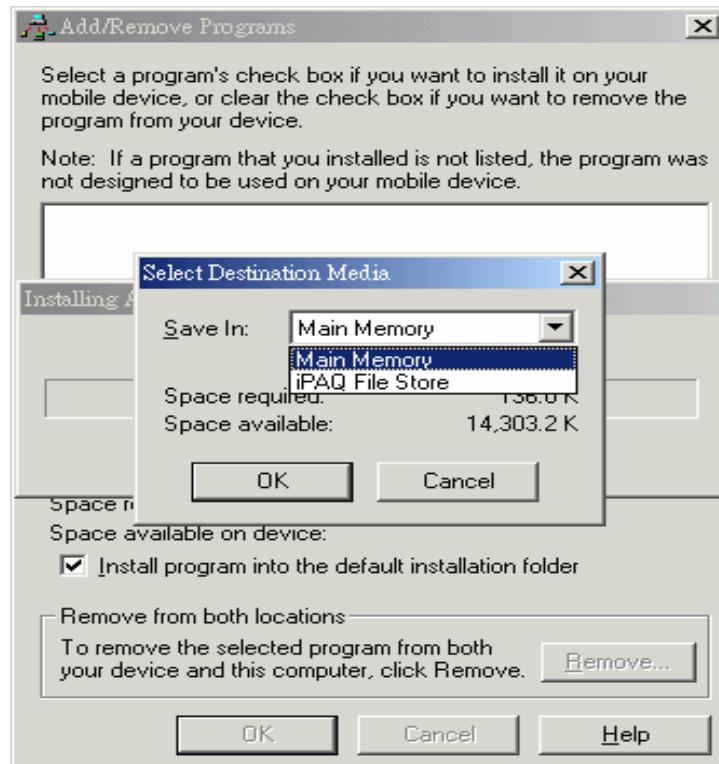
The Add/Remove Programs dialog box appears. An information box on top of it tells you the application is Retrieving application data from the mobile device.



Step 3.

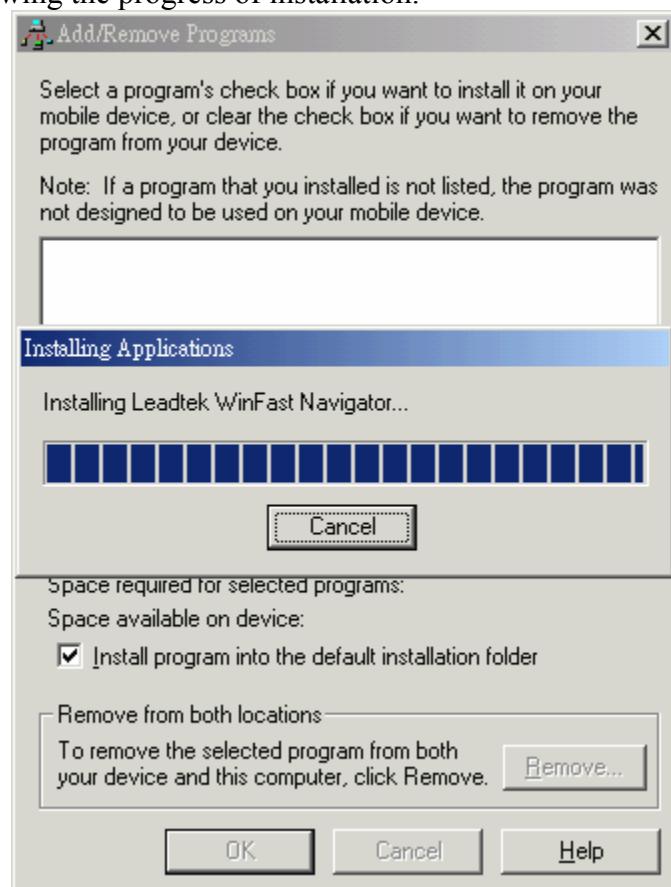
The application will next determine the destination location. A dialog box appears asking if you want to install the application at the default location, which is Main Memory on your PDA/pocket PC. Click Yes to install WinFast Navigator at that location. Click No to change the location using the next dialog box (see the second figure) which contains a selection box with 2 destination options: Main Memory and iPAQ File Store. Select one as desired and then click OK.





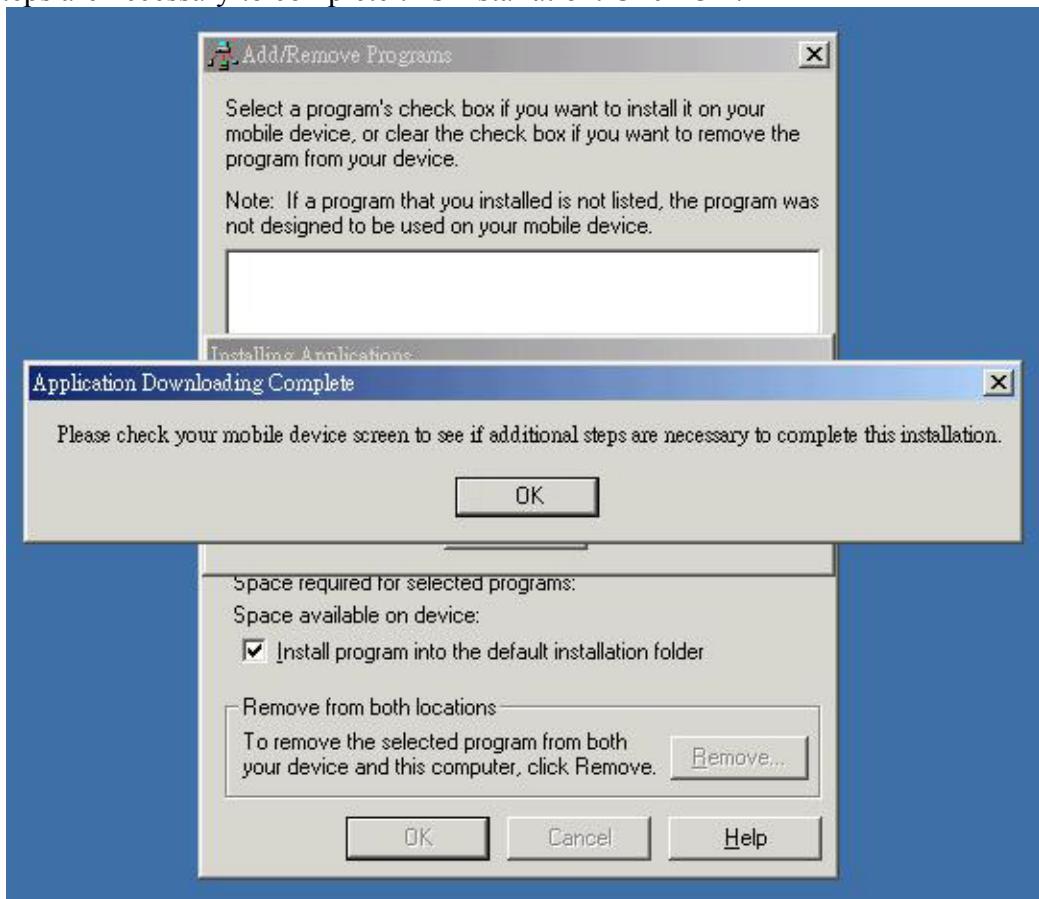
Step 4.

A dialog box appears showing the progress of installation.



Step 5.

When the installation is completed, a dialog box tells you to check your mobile device screen to see if additional steps are necessary to complete this installation. Click OK.



Appendix B : Available Datum list

Datum NO	Description
0	GPS Default
1	Adindan - Burkina Faso Clarke 1880
2	Adindan - Ethiopia Clarke 1880
3	Adindan - Ethiopia, Sudan Clarke 1880
4	Adindan - Mali Clarke 1880
5	Adindan - Regional Mean Clarke 1880
6	Adindan - Senegal Clarke 1880
7	Adindan - Sudan Clarke 1880
8	Adindan - Cameroon Clarke 1880
9	Afgooye - Somalia Krassovsky
10	Ain el Abd 1970 - Bahrain International
11	Ain el Abd 1970 - Saudi Arabia International
12	American Samoa 1962 - Samoa Islands Clarke 1866
13	Anna 1 Astro 1965 - Cocos Islands Australian National
14	Antigua Island Astro 1965 - Leward Islands Clarke 1880
15	Arc 1950 - Botswana Clarke 1880
16	Arc 1950 - Burundi Clarke 1880
17	Arc 1950 - Lesotho Clarke 1880
18	Arc 1950 - Malawi Clarke 1880
19	Arc 1950 - Regional Mean Clarke 1880
20	Arc 1950 - Swaziland Clarke 1880
21	WGS 1972 - Global Definition WGS 72
22	Arc 1950 - Zaire Clarke 1880
23	Arc 1950 - Zambia Clarke 1880
24	Arc 1950 - Zimbabwe Clarke 1880
25	Arc 1960 - Kenya Clarke 1880
26	Arc 1960 - Kenya, Tanzania Clarke 1880
27	Arc 1960 - Tanzania Clarke 1880
28	Ascension Island 1958 International
29	Astro Beacon E 1945 - Iwo Jima International
30	Astro DOS 71/4 - St Helena Island International
31	Astro Tern Island (FRIG) 1961 International
32	Astronomical Station 1952 - Marcus Island International

33	Australian Geodetic 1966 Australian National
34	Australian Geodetic 1984 Australian National
35	Ayabelle Lighthouse - Djibouti Clarke 1880
36	Bellevue (IGN) International
37	Bermuda 1957 - Bermuda Clarke 1866
38	Bissau - Guinea-Bissau International
39	Bogota Observatory - Colombia International
40	Bukit Rimpah - Indonesia Bessel 1841
41	Camp Area Astro - Antarctica International
42	Campo Inchauspe - Argentina International
43	Canton Astro 1966 - Phoenix Islands International
44	Cap - South Africa Clarke 1880
45	Cape Canaveral - Bahamas, Florida Clarke 1866 -2 151 181. Coordinate Systems D-9
46	Carthage - Tunisia Clarke 1880
47	Chatham Island Astro 1971 - New Zealand International
48	Chua Astro - Paraguay International
49	Corrego Alegre - Brazil International
50	Dabola - Guinea Clarke 1880
51	Deception Island - Deception Island Clarke 1880
52	Djakarta (Batavia) Bessel 1841
53	DOS 1968 - New Georgia Islands International
54	Easter Island 1967 - Easter Island International
55	Estonia Coordinate System 1937 Bessel 1841
56	European 1950 - Cyprus International
57	European 1950 - Eastern Regional Mean International
58	European 1950 - Egypt International
59	European 1950 - Finland, Norway International
60	European 1950 - Greece International
61	European 1950 - Iran International
62	European 1950 - Italy (Sardinia) International
63	European 1950 - Italy (Sicily) International
64	European 1950 - Malta International
65	European 1950 - Northern Regional Mean International
66	European 1950 - Portugal, Spain International

67	European 1950 - Southern Regional Mean International
68	European 1950 - Tunisia International
69	European 1950 - Western Regional Mean International
70	European 1979 - Central Regional Mean International
71	Fort Thomas 1955 - Nevis, St Kitts Clarke 1880
72	Gan 1970 - Republic of Maldives International
73	Geodetic Datum 1949 - New Zealand International
74	Graciosa Base SW 1948 - Azores International
75	Guam 1963 - Guam Clarke 1866
76	Gunung Segara - Indonesia Bessel 1841
77	GUX 1 Astro - Guadalcanal Island International
78	Herat North - Afganistan International
79	Hermannskogel Datum - Croatia, Serbia Bessel 1841
80	Hjorsey 1955 - Iceland International
81	Hong Kong 1963 - Hong Kong International
82	Hu-Tsu-Shan - Taiwan International
83	Indian - Bangladesh Everest 1830
84	Indian - India, Nepal Everest 1956
85	Indian - Pakistan Everest (Pakistan)
86	Indian 1954 - Thailand, Vietnam Everest 1830
87	Indian 1960 - Everest 1830
88	Indian 1960 - Vietnam (Con Son Islands) Everest 1830
89	Indian 1975 - Thailand Everest 1830
90	Indonesian 1974 - Indonesia Indonesian 1974
91	Ireland 1965 - Ireland Modified Airy
92	ISTS 061 Astro 1968 - South Georgia Islands International
93	ISTS 073 Astro 1969 - Diego Garcia International
94	Johnston Island 1961 - Johnston Island International
95	Kandawala - Sri Lanka Everest 1830
96	Kerguelen Island 1949 International
97	Kertau 1948 - West Malaysia & Singapore Everest 1948
98	Korean Geodetic System - South Korea GRS 1980
99	Kusaie Astro 1951 - Caroline Islands International
100	L. C. 5 Astro 1961 - Cayman Brac Islands Clarke 1866
101	Legion - Ghana Clarke 1880

102	Liberia 1964 - Liberia Clarke 1880
103	Luzon - Philippines Clarke 1866
104	Luzon - Philippines (Mindanao) Clarke 1866
105	Mahe 1971 - Mahe Island Clarke 1880
106	Massawa - Ethiopia (Eritrea) Bessel 1841
107	Merchich - Morocco Clarke 1880
108	Midway Astro 1961 - Midway Islands International
109	Minna - Cameroon Clarke 1880
110	Minna - Nigeria Clarke 1880
111	Montserrat Island Astro 1958 Clarke 1880
112	M'Poraloko - Gabon Clarke 1880
113	Nahrwan - Oman (Masirah Island) Clarke 1880
114	Nahrwan - Saudi Arabia Clarke 1880
115	Nahrwan - United Arab Emirates Clarke 1880
116	Naparima BWI - Trinidad & Tobago International
117	North American 1927 - Alaska Clarke 1866
118	North American 1927 - Alaska (Aleutian Islands E) Clarke 1866
119	North American 1927 - Alaska (Aleutian Islands W) Clarke 1866
120	North American 1927 - Bahamas Clarke 1866
121	North American 1927 - Bahamas (San Salvador) Clarke 1866
122	North American 1927 - Canada (Yukon) Clarke 1866
123	North American 1927 - Canal Zone Clarke 1866
124	North American 1927 - Central America Clarke 1866
125	North American 1927 - Central Canada Clarke 1866
126	North American 1927 - Cuba Clarke 1866
127	North American 1927 - East Canada Clarke 1866
128	North American 1927 - East of Mississippi Clarke 1866
129	North American 1927 - Greenland Clarke 1866
130	North American 1927 - Gulf of Mexico Clarke 1866
131	North American 1927 - Mean for Canada Clarke 1866
132	North American 1927 - Mean for Conus Clarke 1866
133	North American 1927 - Mexico Clarke 1866
134	North American 1927 - Northwest Canada Clarke 1866
135	North American 1927 - West Canada Clarke 1866
136	North American 1927 - West of Mississippi Clarke 1866

137	North American 1983 - Alaska, Canada, Conus GRS 1980
138	North American 1983 - Aleutian Islands GRS 1980
139	North American 1983 - Central America, Mexico GRS 1980
140	North American 1983 - Hawaii GRS 1980
141	North Sahara - Algeria Clarke 1880
142	Observatorio Metereo 1939 - Azores International
143	Old Egyptian 1907 - Egypt Helmert 1906
144	Old Hawaiian - Hawaii Clarke 1866
145	Old Hawaiian - Kauai Clarke 1866
146	Old Hawaiian - Maui Clarke 1866
147	Old Hawaiian - Oahu Clarke 1866
148	Old Hawaiian - Regional Mean Clarke 1866
149	Oman - Oman Clarke 1880
150	Ord. Survey G. Britain 1936 - England Airy
151	Ord. Survey G. Britain 1936 - Isle of Man Airy
152	Ord. Survey G. Britain 1936 - Regional Mean Airy
153	Ord. Survey G. Britain 1936 - Scotland, Shetland Airy
154	Ord. Survey G. Britain 1936 - Wales Airy
155	Pico de las Nieves - Canary Islands International
156	Pitcairn Astro 1967 - Pitcairn Island International
157	Point 58 - Mean for Burkina Faso & Niger Clarke 1880
158	Pointe Noire 1948 - Congo Clarke 1880
159	Porto Santo 1936 - Maderia Islands International
160	Provisional S. American 1956 - Bolivia International
161	Provisional S. American 1956 - Chile (Northern) International
162	Provisional S. American 1956 - Chile (Southern) International
163	Provisional S. American 1956 - Colombia International
164	Provisional S. American 1956 - Ecuador International
165	Provisional S. American 1956 - Guyana International
166	Provisional S. American 1956 - Peru International
167	Provisional S. American 1956 - Regional Mean International
168	Provisional S. American 1956 - Venezuela International
169	Provisional S. Chilean 1963 - Chile International
170	Puerto Rico - Virgin Islands Clarke 1866
171	Pulkovo 1942 - Russia Krassovsky 1940

172	Qatar National - Qatar International
173	Qornoq - Greenland (South) International
174	Reunion - Mascarene Islands International
175	Rome 1940 - Italy (Sardinia) International
176	S-42 (Pulkovo 1942) - Albania Krassovsky 1940
177	S-42 (Pulkovo 1942) - Czechoslovakia Krassovsky 1940
178	Timbalai 1948 - Brunei, East Malaysia Everest (Sabah, Sarawak)
179	S-42 (Pulkovo 1942) - Hungary Krassovsky 1940
180	S-42 (Pulkovo 1942) - Kazakhstan Krassovsky 1940
181	S-42 (Pulkovo 1942) - Latvia Krassovsky 1940
182	S-42 (Pulkovo 1942) - Poland Krassovsky 1940
183	S-42 (Pulkovo 1942) - Romania Krassovsky 1940
184	Santo (DOS) 1965 - Espirito Santo Island International
185	Sao Braz - Azores International
186	Sapper Hill 1943 - East Falkland Island International
187	Schwarzeck - Namibia Bessel 1841 (Namibia)
188	Selvagem Grande - Salvage Islands International
189	SGS 85 - Soviet Geodetic system 1985 SGS 85
190	Sierra Leone 1960 - Sierra Leone Clarke 1880
191	S-JTSK - Czechoslovakia (prior to Jan 1993) Bessel 1841
192	South American 1969 - Argentina South American 1969
193	South American 1969 - Bolivia South American 1969
194	South American 1969 - Brazil South American 1969
195	South American 1969 - Chile South American 1969
196	South American 1969 - Colombia South American 1969
197	South American 1969 - Ecuador South American 1969
198	South American 1969 - Ecuador (Baltra, Galapagos) South American 1969
199	South American 1969 - Guyana South American 1969
200	South American 1969 - Paraguay South American 1969
201	South American 1969 - Peru South American 1969
202	South American 1969 - Regional Mean South American 1969
203	South American 1969 - Trinidad & Tobago South American 1969
204	South American 1969 - Venezuela South American 1969
205	South Asia - Singapore Modified Fischer 1960



206	Tananarive Observatory 1925 - Madagascar International
207	Tokyo - Regional Mean Bessel 1841
208	Tokyo - South Korea Bessel 1841
209	Tristan Astro 1968 - Tristan da Cunha International
210	Viti Levu - Fiji Clarke 1880
211	Voirol 1960 - Algeria Clarke 1880
212	Wake Island Astro 1952 - Wake Atoll International
213	Wake-Eniwetok 1960 - Marshall Islands Hough
214	WGS 1984 - Global Definition WGS 84
215	Yacare - Uruguay International
216	Zanderij - Suriname International
217	Tokyo - Japan Bessel 1841
218	Tokyo - Korea Bessel 1841
219	Tokyo - Okinawa Bessel 1841



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