TABLET*media*

iFon™

User Guide and Technical Specifications

CONFIDENTIAL

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TABLE OF CONTENTS

1. Introduction

TABLETmedia's iFon™ is a SIP-based software client application for VoIP, video and messaging communications for Microsoft Windows Mobile and other WindowsCE-based devices.

It is capable of simultaneously sending and receiving audio, video and text messages over any suitable TCP/IP network and is tightly integrated with the capabilities of the device.

NOTE: The features and capabilities below are comprehensive of what is supported to date, but may not be available on all available distribution releases. Text messaging, dual-mode devices, video and support of specific codecs are typical examples of release-specific features.

2. Main Features

iFon™ supports the following capabilities:

- Voice and 2-way video calls
- IETF RFC3261 SIP communication client
- SIP text messaging
- SIP intercom and paging (1-way voice)
- Support for remote picture-ID and distinctive ringing
- Several advanced telephony features
- Nortel MCS compliant
- Rich set of audio and video codecs supported
- High quality audio with AEC, NR, AGC, PLC and jitter buffer
- Support for dual-mode devices with WLAN and WAN radios
- Pocket Outlook integration (Contacts)
- Speed dial numbers
- Calls log with easyEdit™
- TFTP Cisco-compatible remote programming
- Updates and licensing over the internet (OTA)
- High level of device integration
- Background operation
- Programmable skins
- On-device help file
- Microsoft Windows Mobile 2003, 2003SE, 5.0 and 6.0 compliant (hi-dpi and orientation-aware) with support for QVGA, (240x320), VGA (480x640) and square (240x240) screens
- Microsoft WindowsCE.NET 4.x and WindowsCE Embedded 5.0 support with dynamic screen sizing
- International languages ready

3. Installation and Service Configuration

iFon™ can be installed in different ways:

- Though Microsoft ActiveSync using the PC installer (.exe) application.
- Manually copying the archive file (.cab) to the device via ActiveSync or SD card and installing it directly from the device.
- Downloading the archive file (.cab) directly from the internet.
- Though a remote device management system.

The first time it is run, it will prompt the user with a window asking for a code to activate the license.

- If you have a license code you must be connected to the public internet before clicking on "Apply".

  NOTE: each license is device specific based on the unique serial number of the device. This window and the need to be connected to the internet will only occur once.

- If you do not have the code, click on "Cancel". iFon™ will operate in trial mode.

  NOTE: activation is done over the Internet and only requires a standard http/web access only (TCP port 80). If public internet access is not available on the WLAN, licenses can also be activated through a PC via ActiveSync over the USB port. Note however that ActiveSync however cannot support any type of standards-based VoIP.

At this point, unless it has been pre-programmed through a remote management tool, iFon™ needs to be programmed to work with the VoIP infrastructure (SIP servers). This is done in one of the two following ways:

- Manually: enter the following information in Menu | Settings | Application:
  - Name: the name of the user (typically the extension number)
  - ID and PWD: the user name and password required to authenticate with the SIP service
  - Registrar and outbound proxy address and port
- Via TFTP server: enter the following information in Menu | Settings | Configuration:
  - Select the "Always Check" option
  - Enter the address of the TFTP server.
  - Enter the user name and password (service-dependent)

4. Operation

4.1. Main Window Description

The window with the numeric keypad is the primary window of iFon™: it provides status/operation indication and it is the starting point for additional functions:

Main window

4.2. Telephony

4.2.1. Dialing and answering

Enter the number via the popup keypad or keyboard and press on TALK to place the call and END to hang up. Similarly, press TALK to answer calls.

Idle

Connected

Picture ID (when supported)

4.2.2. Call hold

When connected, press "H" to place the call on hold (or Call | Hold on the menu) and press it again to un-hold it.

Placing call on hold

Call on hold

4.2.3. Call transfer

When connected, press "T" (or Call | Blind transfer on the menu). At the dialtone, enter the number to transfer the call to and then "T" again (or Call on the menu) to transfer it. Press END to hang up the call (this is also done automatically after a few seconds).

Please refer to the "Placing call on hold" image above.

4.2.4. Special keypad buttons:

- While not in a call:
  - ">" deletes the last digit entered.
  - "C" clears the whole number.
  - "S" opens the speed dial window
  - "L" opens the calls log
- During a call:
  - "H" places the call on hold.
  - "F" sends a "flash/hook" notification to the gateway.
  - "T" used to transfer a call. When in a call with user A, pressing the "T" generates a dialtone to notify the user to dial the number of user B. "T" is then pressed a second time to blindly transfer the call from user A to B and hang up the call.

- "V" switches to the video window. This option is only enabled if the call negotiates a video session at the beginning of the call. During a video call it is possible to switch back to the keypad by clicking on the "KPD" button on the video layout, and switch back to video by clicking on the "V" button on the keypad layout.

4.2.5. One-handed operation

iFon™ has been designed to be used with only one had to operate the device (answer/make phone calls, using speed dial, calls and contacts lists, changing volume, etc.) without using the stylus or touching on the screen.

- On devices with the green SEND and the red END buttons, pressing them provides functionality equivalent to a traditional cellular phone. SEND places the call and END disconnects or rejects (ignore) it.
- On some devices (e.g. Motorola/Symbol MCxxxx) pressing the SEND button during a call toggles the speakerphone mode.
- Typically pressing the "Record" button (or Button 5) answers, dials or hangs up the call. It is also recommended that the Record (Button 5) button is manually assigned to iFon™ (Start | Settings | Buttons).
- iFon™ also supports the two softkeys of Windows Mobile devices to drive the application, and the positioning of commands has been optimized to reduce the number of keys pressed.

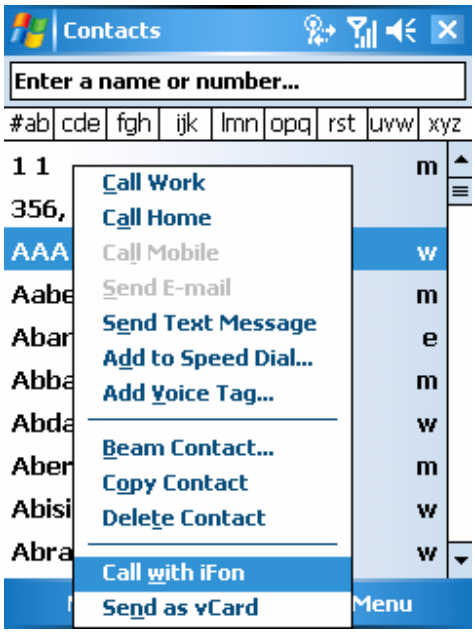
4.3. Standard Features

iFon™ is tightly integrated into the Windows Mobile OS and the device hardware with several features listed below.

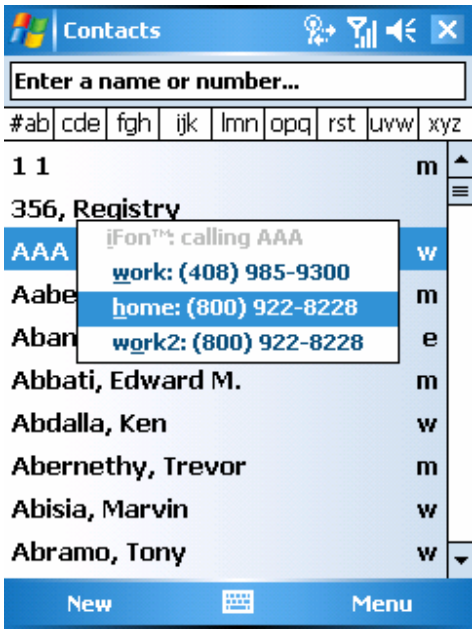
4.3.1. Contact list integration

Users can access the address book of the device (Pocket Outlook) by selecting Menu | Contacts:

- Once a name is selected, it can be called directly from iFon™ by using "Dial with iFon" (tap-and-hold on the contact name or press Menu | "Dial with iFon"). iFon™ translates the number and dials it.
- Phone number translation: iFon™ automatically translates the phone number according to the dialing rules of the user-selected location (e.g. "home" or "work").
- For translation to work, the number must either be in canonical format (e.g. "+44 (222) 5551212") or in the Windows Mobile format (e.g. "(425) 555-1212"). In the latter case, the Contact country code and area code are assumed when translating the number.
- Characters are handled as follows: "p" pauses dialing for 3 seconds, "x" pauses for 6 seconds, numbers "0" to "9" and digits "*" and "#" are dialed as regular tomes, while all other characters are ignored. This is helpful when dialing a voicemail or when reaching a contact at work. For instance: "+1(415) 555-1212p510p1234#" will dial the voicemail number "+14155551212", then enter the mail box 510 and then the password 1234 or also, "+44 (345) 777-1212 x2345" will dial the main number +44345777-1212 and then the extension 2345.
- On dual-mode devices, iFon™ automatically selects the "Mobile" dialing rules when placing a cellular call. If VoIP services are available, it uses the selected location (Default, Home or Work).



Tap'n'hold to display list

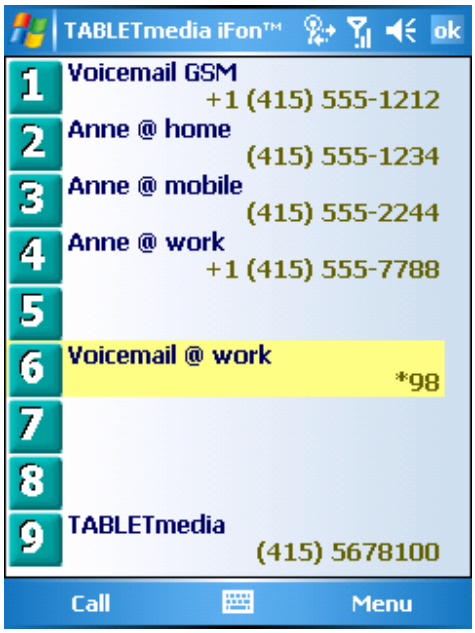


Number selection

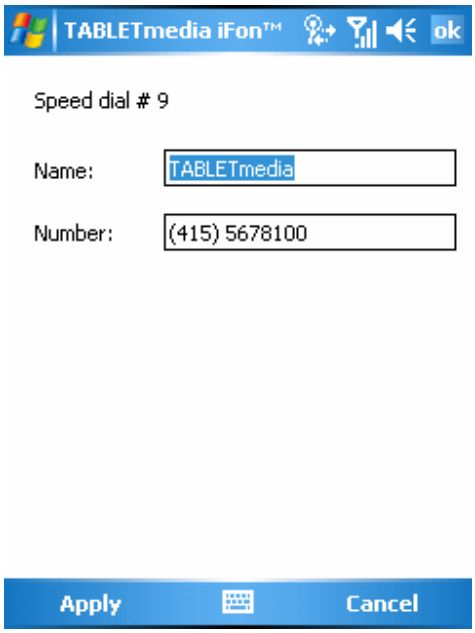
4.3.2. Speed Dial

The list displays the preprogrammed numbers for fast dialing. Click on Menu | Speed dial or the "S" button, to display the list.

- On the list, tap on the icon for immediate dialing. Double clicking on the number displays the edit window. You can also dial by pressing the action/OK button, or click "Call" on the menu.
- Edit window: enter the name and phone number and click on "Apply" to save it or "OK" or "Cancel" to discard any changes.
- Characters are handled as follows: "p" pauses dialing for 3 seconds, "x" pauses for 6 seconds, numbers "0" to "9" and digits "*" and "#" are dialed as regular tomes, while all other characters are ignored. This is helpful when dialing a voicemail or when reaching a contact at work. For instance: "+1(415) 555-1212p510p1234#" will dial the voicemail number "+14155551212", then enter the mail box 510 and then the password 1234 or also, "+44 (345) 777-1212 x2345" will dial the main number +44345777-1212 and then the extension 2345.



Speed dial list



Speed dial editor

4.3.3. Calls log

Click on Menu | Calls log or the "L" button, to display a list of all the calls dialed, received and missed.

- On the list, tap on the icon for immediate dialing. You can also dial by pressing the action/OK button, or clicking on "Call" on the menu.
- Selecting Menu | Clear log deletes all entries in the list.
- easyEdit™: often numbers require editing before dialing. With TABLETmedia's easyEdit™ you can easily edit a number with only one finger! Just double click on the number to start. If the number starts with a "+" it will be automatically translated according to the

dialing rules profile. Otherwise the call log window closes and the number in main window will be cleared and a "?" will appear. At this point:

- You can enter any digit and press "<" to delete the last digit entered.
- If you press "C" the next digit from the number double clicked in the calls log is added. Of course you can delete it ("<") or add after it any new digit.
- If you press "TALK" all the digits from the calls log that have not already been added are added to the number and the easyEdit™ process is completed.

Call log

4.3.4. *Today screen notification*

iFon™ displays a green phone handset icon in the today screen.

- The icon flashes between yellow and red for incoming calls, and is red during the call. This indication allows a user to know if iFon™ is running on the device even if in the background, and b) if during a call a user opens other windows, to know that the call is still active.
- In addition, the icon is green if the WLAN network is available and iFon™ is correctly registered with a server, yellow if network is available but iFon™ is not registered and red if the network is unavailable.
- Tapping on the icon maximizes iFon™ if running in the background.
- Lastly, iFon™ also modifies the colors of the 'tap & hold' circle of dots to provide additional user notification when running in the background. If green iFon™ is not in a call, if yellow it is placing, answering or clearing a call and if red it is in a call. Note that if it is blue, iFon™ is not running.

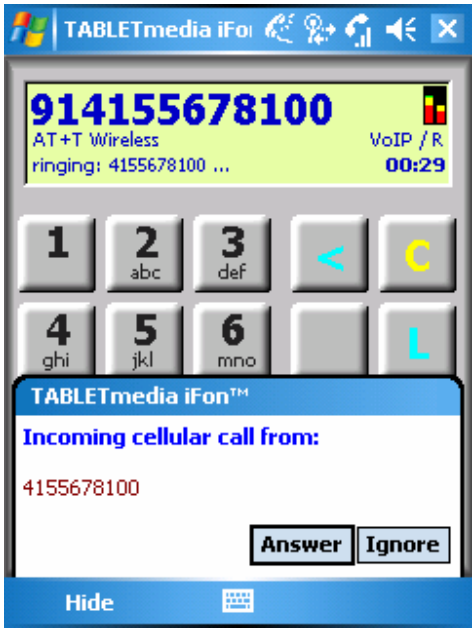
Today screen icon

4.3.5. *Incoming call "bubble" notification*

When receiving a call it displays a "bubble" type of notification, indicating the call type (VoIP or cellular) caller's information (caller-ID, user name, etc.). The user can either accept or ignore (reject) the call.

NOTE: due to the slow responsiveness this option is not enabled by default.

Incoming VoIP call



Incoming cellular (WAN) call

4.3.6. *Missed call(s) notification*

This "bubble" message notifies the user that incoming calls were not answered. Clicking on the "View" button on the notification displays the call log and disables the notification.

Missed calls notification

Standby

4.3.7. *Standby*

This menu selection places the device on standby. To enable it, set the "DC stby" option in the Menu | Settings | Application | General page.

4.3.8. *Internet updater*

The updater checks and automatically downloads over the internet (OTA) and installs iFon™'s most recent version.


TABLETmedia Update
914155678100
AT+T Wireless
VoIP / R
no voicemail messages
00:00
TABLETmedia Updater
Reading update data ...
Check
*
0
#
TALK
Call
Menu

Web updater

4.4. Communication Capabilities

iFon™ supports the following capabilities:

- Voice communication:
  - Voice is always enabled in both directions. The terminals negotiate the capabilities at the beginning of the connection.
  - When voice is not deceived for a period of time (the default of 60 seconds can be changed in the registry) iFon™ assumes there is a problem with the wireless network and the call is dropped.

    NOTE: iFon™ has an internal mechanism to detect if a remote terminal is not responding and will timeout dropping the call if audio is not received after a period of time (default is 60 seconds). The timeout period can be changed by setting the value (in seconds) of dwRTPtimeout in the registry. A value of 0 disables this feature. (See 32 Registry Settings).
- Audio capture and playback:
  - Volume: can be changed during a call by pressing the up/down jog-dial.

Volume setting during a call

  - Microphone input is automatically adjusted when the connection is established. The gain settings are device specific (auto-detected).
- Intercom/Paging:
  - iFon™ automatically answers calls when the appropriate SIP Alert-Info and/or Call-Info tags are detected. (See 10.2 Advanced SIP Features)
- Video communication:
  - Video send/receive can be enabled/disabled as a user option.

  - Incoming QCIF/CIF detection: the image size is automatically detected on an individual frame base. CIF can be enabled via signaling as a user option.

- Video Display:
  - Full screen mode: by pressing on the "Zoom" button, video can be displayed in full screen by pixel doubling. Since the LCD is normally only 320x240 in size, the zoomed 352x288 image is cropped in the center 320x240 size. Tapping on the screen resumes the original QCIF (176x144) screen image.
  - When receiving CIF video, the image can only be displayed at full screen. Tap on the LCD to display the keypad from where the user can either "END" the call or return to the video display ("V" button).
  - When displaying video, other windows can be overlaid over the video window. There are however certain cases when the "Start" or other menus are clipped by the video window (OS limitation).

Video QCIF size

Zoomed QCIF or CIF size video

- Video Capture:
  - iFon™ automatically detects a number of cameras. If the supported camera is built into the device or inserted in the device and it is properly functioning, the "Preview" menu and the "Tx" option in the video settings are enabled.
  - In addition, certain cameras support features such as brightness, contrast, exposure and zoom. It is possible to adjust such features while in preview mode, while idle or connected, by moving the jog-dial button up/down or left/right.
  - It is possible to insert and remove certain 3rd party CF cameras, while iFon™ is open and even previewing window, but not while connected.
- Text messaging:
  - A sound notifies the user of both incoming and outgoing messages. On equipped devices a vibration also notifies incoming messages.

- Pressing the "TEXT" button once the number of the calling user is entered opens the text window. Text messages can be entered and sent by pressing the "SEND" button".
- The ">" button returns the user to the main keypad window.
- Clicking on the tab displays an option menu. The primary entry is "Delete tab" to close the currently selected messages tab
- Incoming text messages automatically open the text message window while on- or off-hook.
- While receiving video, only the second incoming message opens the text window. When the user hears the incoming message sound, it can be viewed by pressing the "KPD" button and then the "TEXT" button (if in CIF fullscreen mode, by tapping on the LCD and then the "TEXT" button.
- On dual-mode devices (i.e. with GSM/CDMA radios) iFon™ also supports SMS messages. These messages are use same tabbed chat-like interface as normal SIP messages.

SIP Text Messages

SMS Messages

- WLAN network detection:
  - Out-of-range/network not available detection: once iFon™ has successfully initialized if the network is not available (e.g. "out of range") displays a notification and gracefully hangs up any ongoing calls after a period of time (to allow the user to re-enter in range).
  - Automatic re-registration: when the network is available again, iFon™ automatically re-registers with the proxy.
  - Devices with 2.5/3G support: iFon™automatically connects to a WAN data network if the WLAN is not available (user option). Voice/video calls can be made only if such network allows reasonable QoS (e.g. HSDPA).

    NOTE: iFon™ does not initialize until the network is available.

4.5. Dual-mode Devices Support

4.5.1. Multi-mode operation

iFon™ supports devices with both WLAN (WiFi) and WAN (GSM/CDMA) radios in two different ways:

- Dual-path communication: in this mode iFon™ registers with the VoIP service (SIP proxy servers) over WiFi networks and over a 2.5/3G WAN data connection. If the 3G data connection has suitable bandwidth and quality of service characteristics, voice and even video calls can be placed of such network. A user option automatically starts the WAN data connection when the WLAN is not available. When iFon™ transitions from one to the other data network, it re-registers with the VoIP service with the new address information.
- Dual-network calls: in this mode iFon™ automatically selects whether VoIP calls should be placed through the VoIP service or using the WAN voice (cellular) radio of the device. Calls are placed through the VoIP service first of the WLAN is on; otherwise they are placed over the cellular network. A user options enables dialing using the cellular phone.

The following table indicates the call priority order:

Mode	Cellular Dialer	Auto 3G data	Priority
Single-path	Disabled	Disabled	WiFi
Dual-path	Disabled	Enabled	WiFi, 3G data
Dual-network	Enabled	Disabled	Cellular, WiFi
	Enabled	Enabled	Cellular, WiFi

4.5.2. Dual-path communications:

This mode, most suitable for 3G users (e.g. HSPDA or EVDO Rev. A) ensures that calls can be seamlessly placed and answered within and outside WLAN coverage.

If 3G data services are not available, iFon™ is still capable of registering with the VoIP service and receiving SIP messages.

4.5.3. Dual-network calls:

iFon™ can be used as an unified dialer for devices with both WLAN (e.g. WiFi) and WAN (e.g. GSM/CDMA) radios. In this mode:

- Incoming calls: they are automatically detected whether VoIP or WAN and can be answered as normal. If iFon™ is already in a call, incoming calls are rejected. In other words, if the user is on a VoIP calls and a cellular call comes in, the cellular call is rejected. Similarly, if the user is on a cellular call and a VoIP call comes in, the VoIP call is rejected.
- Outbound calls: iFon™ automatically detects whether to place calls as VoIP or as WAN. The priority is VoIP calls and if services are not available, calls are placed as WAN. If the 3G data network is available and the cellular phone option is enabled, calls are placed through the cellular network first.

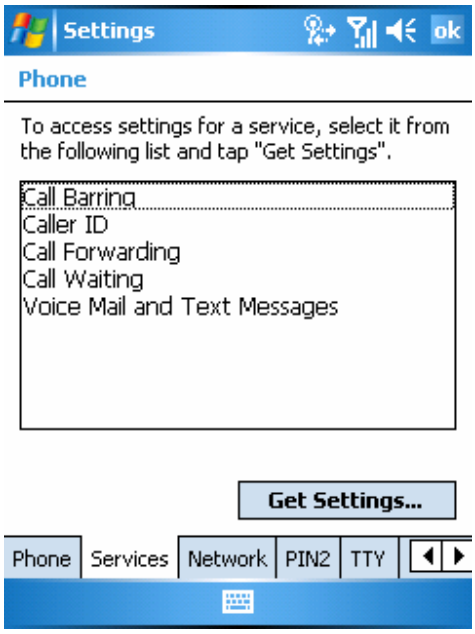
- Once the call is established, iFon™ supports call hold, inband tones (digits) and volume controls.
- Voicemail notifications (new messages) are also displayed.

NOTE: due to the design of the OS, there are some limitations to the cellular features supported and proper device integration. Certain features, such as mute, swap, conference and 3-way calling, while already implemented, are not available through the user interface.

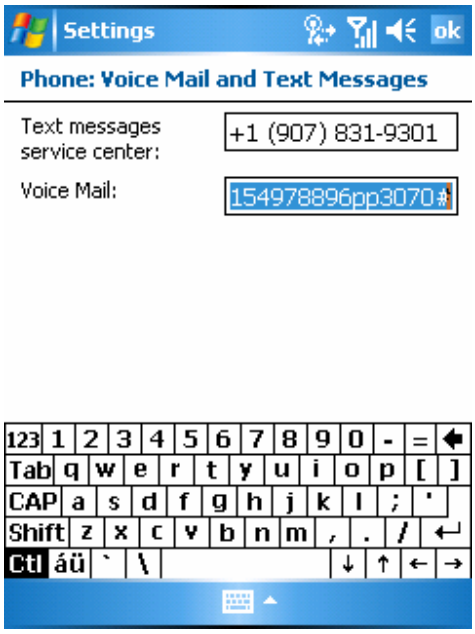
4.5.4. Cellular settings:

iFon™ uses the device settings to change the cellular options, by clicking on Menu | Settings | Cellular phone. To set the option, select the option and click on "Get Settings…".

SHORCUT HINT: using the popup keyboard you can cut (ctl + x) the cellular voicemail number in the "Voice Mail:" | "Voice Mail and Text Messages" setting and paste it (ctl + v) into iFon™'s speed dial list.



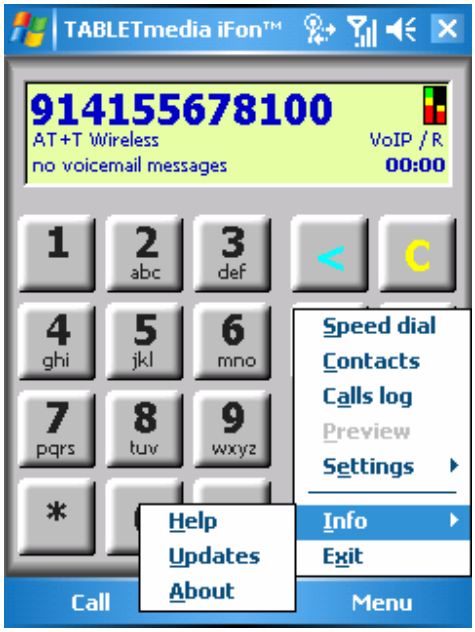
Cellular phone settings



Voicemail settings

4.6. Information Options

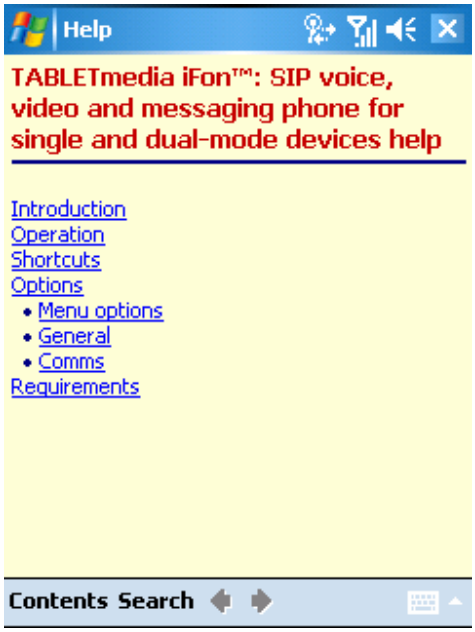
Additional information about iFon™ is provided through the Menu | Info:



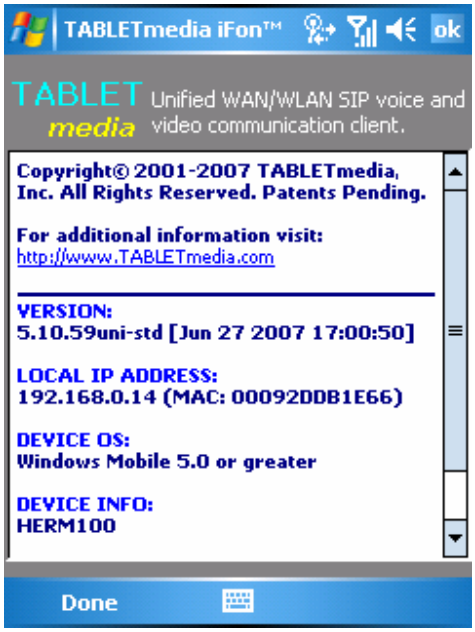
Information menu

4.6.1. Help file

Provides users immediate assistance and tips on the operation of iFon™.



Help file



About iFon™

4.6.2. Updater

See "Web updater" above

4.6.3. About window

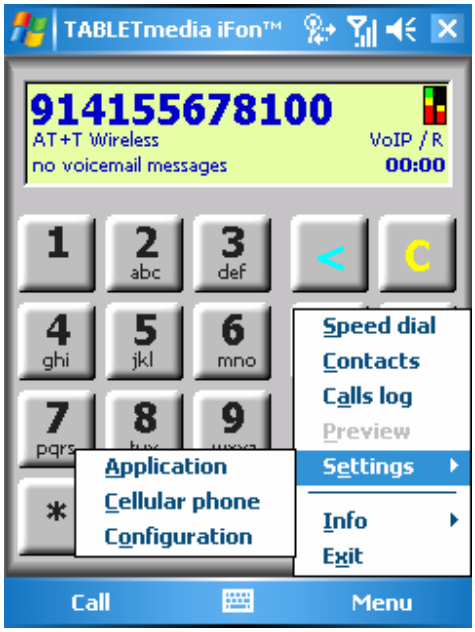
This window (see image above) provides information on the status of the devices as reported to iFon™:

- Version: current version of iFon™
- Local IP and MAC addresses: reports the current network interface bindings
- Device OS: reports the version of the operating system
- Device Info: reports the internal device codename
- Device ID: reports the serial number of the device

5. User Settings

iFon™ is highly configurable. However, most of its configuration parameters are in the registry. The settings in the pages below are intended to simplify the user interaction with the program.

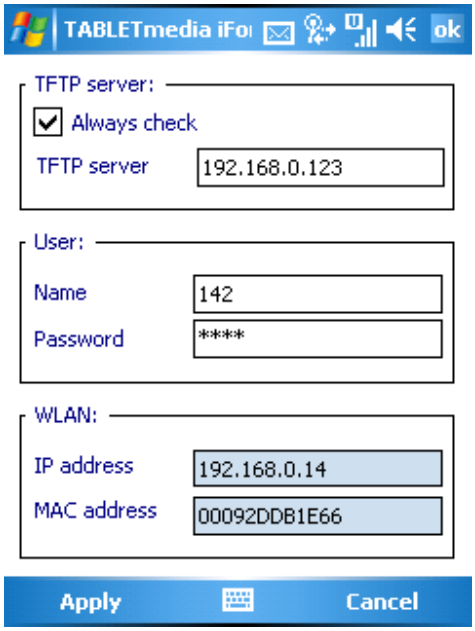
Please also note that closing the settings window re-initializes (forces) SIP proxy registration.



Settings menu

5.1. Remote Configuration

The settings on this page allows iFon™ users to retrieve the configuration information from a remote server and optionally set the SIP authentication name and password.



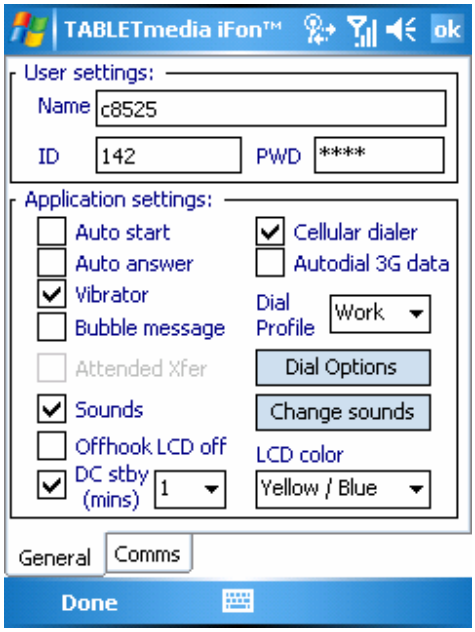
VoIP remote configuration

- TFTP server:
  - Always check: checks the configuration every time iFon™ is started. Note that enabling this option disables the "Comms" settings page!
  - TFTP server address: this can be in dotted or URI format.
- User:
  - Name: used to authenticate with the SIP server.
  - Password: used to authenticate with the SIP server.
- WLAN:
  - IP address: address of the WLAN (WiFi) adapter
  - MAC address: address of the WLAN (WiFi) adapter

    NOTE: if the remote server is setup to provide both common and device specific (MAC-dependent) files as per Cisco's mechanism, the user information will be overridden by the settings in the device-specific file. (see Administration Notes | Remote Configuration).

5.2. General Page

These setting enable the user to change the behavior of the application.



Application settings

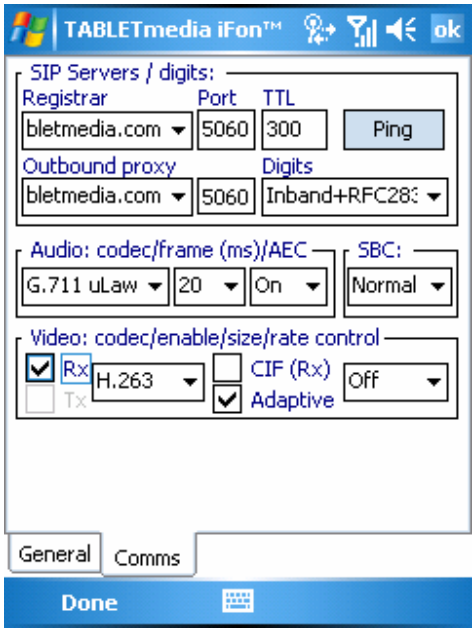
- User name, ID and password authentication fields:
  - The user "Name" field is the name/extension of the terminal used when registering with the proxy.
  - "ID" field is the name appearing in the <name> part of the URI, and must be entered even if authentication is not enabled.
  - "PWD": password used to authenticate. This field is ignored if the proxy does not require authentication.
- Auto start: automatically starts iFon™ when the device is reset or, if the application was closed, when power is turned on again. Having iFon™ always open and silently monitoring the network connection in the background, ensures that users do not miss incoming phone calls.
- Auto answer: automatically answers incoming calls.
- Vibrator: when available, it enables the vibrator on incoming calls.
- Bubble Message: displays bubble-type messages.
- Cellular dialer: enables seamless WAN/WLAN call handling.
- Autodial 3G data: automatically dials a WAN data (GPRS / 1xRTT / EVDO / HSDPA / etc.) connection when the WLAN network is not available.
- Dial Options: see "Phone number translation" in the "Contact List Integration" part of the "Application" section.

  NOTE: the country and area codes are set in the Contacts (Pocket Outlook) options.

- Sounds and Change Sounds: ring, call progress and other sounds can be enabled and user selected. In the "Sounds and Notifications" list, change the sounds associated with "iFon: Ring" and "iFon: Dial".
- Power Management: iFon™ contains several power management features. The following are user selectable:
  - Offhook LCD off: If selected, the LCD is turned off as soon as the call is established, thus saving about 40% of the power of the device. The LCD can be turned on again by pressing one of the 4 user buttons or the jog dial. The LCD automatically turns back on when if video is received during the call, or when the call is terminated.
  - DC stby: sends the device to standby mode (LCD off, total power consumption reduced by over 60%, while the radio is kept on for incoming calls). Once in standby mode, the device it waken up by either pressing a hardware button or when receiving a call.
- User programmable LCD color: choose the favorite LCD color scheme.

5.3. Comms Page

This page is only visible if the "Always check" option in the Remote Configuration page is not selected.



Communications settings

- SIP servers / digits:
  - Registrar: enter the registrar proxy server address, port and TTL.
  - Outbound proxy: enter the outbound proxy address and port.

    NOTE: the outbound proxy must always be entered, even if the same as the registrar proxy. Press on "Ping" to test connectivity.
  - Digits: select the most appropriate combination of in-band (tones) and out-of-band (RFC2833 or SIP INFO) digits.
- Audio codec / packet size / AEC: Selects the preferred codec used to transmit voice, its frame size in ms or to enable echo canceling.
- SBC (session border control): selects the method used:
  - Normal: for regular operation and outbound proxy
  - Nortel MCS: for operation with Nortel MCS servers
  - VPN: for operation with Nortel MCS (and others) servers over VPN
- Video codecs / enable / size / rate control: Selects the preferred codec used for video.
  - Rx: enables receiving video.
  - Tx: (only available when camera is detected): select to send video.
  - CIF: select to indicate the remote user that support of CIF size video is available.

    NOTE: while iFon™ automatically detects incoming video irrespective of this option, it is recommended unchecking it unless necessary and only video receive is required.

- Adaptive: and target bit rate (only available when camera is detected): check to select adaptive rate control, uncheck to select dynamic. When adaptive is enabled, the video quality is constant, but the frame varies according to the amount of motion. When dynamic is selected, the quality varies while the codec attempts to maintain a constant frame rate.

6. Requirements and Distributable

6.1. Minimum Requirements:

- Microsoft Windows Mobile 2003, 2003SE, 5.0, 6.0 and 6.1 operating systems. Other versions (PocketPC 2002, WindowsCE.NET 4.2, WindowsCE Embedded 5.0 and 6.0, Windows 2000/XP, etc.) are also available upon request.
- Generic ARM, Intel/Marvel StrongArm, Xscale or Xscale with WMMX technology processors.
- A TCP/IP connection with all UDP and TCP ports open and suitable symmetrical bandwidth and service level (e.g. analog modem, wired Ethernet, 802.11b/g/a, Bluetooth, EDGE, CDMA, UMTS, etc.).
- Device storage: approx. 500KB MB.
- Device memory: approx. 1.5 MB.

6.2. Distributable

The iFon™ PC installation program (.exe) installs:

- The main .cab file (below) on the device
- A readme.txt file and un-installation link.

  NOTE: this un-installation option only removes the PC files. To remove iFon™ both from the PC and the device, you must use the ActiveSync Add/Remove Programs option or un-install the application directly on the device.

The iFon™ installation program (.CAB) includes the following files:

- iFon5.exe: main application
- tmUpdater.exe: iFon™ web updater program
- Various built-dependent and device-specific libraries placed in "\Windows".
- iFon.htm: help file in HTML format and placed in "\Windows".
- iFon.lnk: shortcut to the help file and placed in "\Windows\help".
- NOTE-1: The .CAB native device installable size is less than 3MB and the .EXE PC-side installation is about 1MB in size. The iFon5.exe executable is less than 1MB.
- NOTE-2: Microsoft ActiveSync 3.8 or greater must be installed and properly functioning (connected) to install iFon™ from the PC.

7. FAQ

[This section is intentionally left empty for now]

8. Administrators Notes

8.1. Registry Settings

iFon™'s settings are located in the registry under HKEY_CURRENT_USER\SOFTWARE\TABLETmedia\iFon.

[This section is intentionally left empty for now]

8.2. Remote Configuration

iFon™ supports a Cisco-compatible endpoint management system, by retrieving configuration files from a TFTP server. This mechanism is supported by Cisco CallManager as well as Asterisk-based Trixbox (ex Asterisk@Home) and other servers.

8.2.1. Configuration Files

Two files are processed:

- SIPDefault.cnf: this file includes values common to all endpoints. iFon™ only uses the following values:
  - proxy1_address: IP address or URI of the registrar server
  - proxy1_port: port of the registrar server
  - outbound_proxy: IP address or URI of the registrar server
  - outbound_proxy_port: port of the outbound server
  - timer_register_expires: TTL expiration time for registration

    NOTE: when empty, the outbound values are filled with the values of proxy1 (if these are non-empty)!
- SIP<MAC address>.cnf (e.g. SIP000B6C18D07E.cnf): this is the endpoint-specific configuration file.
  - proxy1_address: IP address or URI of the registrar server
  - proxy1_port: port of the registrar server
  - outbound_proxy: IP address or URI of the outbound server
  - outbound_proxy_port: port of the outbound server
  - line1_shortname: name of the endpoint (caller-id)
  - line1_name: name used for user authentication
  - line1_password: password used for user authentication

    NOTE-1: The filename differs per each endpoint and is based its MAC address, which in iFon™ is the one of the WiFi/Ethernet adapter (not the WAN data adapter, if available).

    NOTE-2: Since this file is read after the common one, the new values replace the previous ones.

The files are downloaded in the application directory and deleted after being read.

8.2.2. Operation:

Upon init (if the "Always check" user option is enabled), the application values are read from the registry. iFon™ then retrieves the configuration files from the TFTP server and overwrites the new values before initializing communications (SIP stack).

In addition, if the "Always check" option is disabled when opening the Remote Configuration window, by enabling it and closing the window, iFon™ retrieves the configuration files and reprogram the communications accordingly.

8.3. Programmable skins

This is a special features supported on a "per-customer" basis. Refer to the separate documentation for more information

8.4. Diagnostics

- Statistics: to enable audio and video statistics, enter "*#statson#" (disable with "*#statsoff#") and click on TALK. This displays audio jitter (ms) and total packets lost as well a video display and capture rates (fps).
- Debug logging: to enable logging, enter "*#debugon#" (disable with "*#debugoff"), click on TALK and restart the application. iFon™ writes all SIP stack information to the file "\iFonUA.log".

  NOTE: this feature is only available through specific versions of iFon™. Also, due to the amount of data written to the file and the relatively slow speed of disk storage this may create some instability in iFon™.

9. Command Line Operation

iFon™ can be called by other applications and options can be accessed through command line switches:

- "-a" or "-A": auto-answer call. If there is an incoming call, it is answered when iFon™ is started. Otherwise, any call is automatically answered.
- "-h" or "-H": to hang up a call.
- "-i < number>" or "-I <number>": place a call using the specified number. The number is also automatically translated using the appropriate dialing rules.
- "-m" or "-M": minimize iFon™ (e.g. open iFon™ and leave it minimized).
- "-u username" or "-U username": sets the name of the user.

10. Communication Framework

10.1. Supported Capabilities

The following is a partial list of the capabilities supported by iFon™ communication frameworks and media engines:

- SIP Stack:
  - IETF SIP (RFC3261)
  - SIP proxy support with MD5/Digest authentication
  - Registrar and outbound proxy selection of address, port and TTL
  - Digits: in-band, RFC2833 and SIP INFO (0-9, *, # and flash/hook)
  - Call progress
  - Call hold
  - Call transfer: blind and attended (consultative)
  - Simultaneous audio, video and text message channels
  - Multi-part MIME messages
  - UDP signaling
  - Dynamic codec re-negotiation (mid-session INVITEs)
  - Session Timer
  - Audio and video early Media
  - Supports Call-Info and Alert-Info remote notifications (file formats are: WAV, WMV, BMP, GIF and JPG)
  - NAT traversal support (outbound proxy, Nortel MCS, Jasomi, etc.)
- Media Framework
  - RTP/RTCP transport
  - Low-latency audio with adaptive jitter management
  - Packet Loss Concealment (PLC)
  - Acoustic Echo canceling (AEC) and/or echo suppression (ES) (device dependent)
  - Noise Reduction
  - Automatic Gain Control (AGC)
  - Silence management supported internally but not recommended for wireless communications
  - Load balancing
  - Adaptive and dynamic video rate control
  - Video: encode at QCIF (176x144) resolution, decode at QCIF or CIF (352x288) resolution. Encoding at CIF resolution is optional.
- Audio Codecs:
  - ITU-T G.711 A-law and mu-law at 64,000 bps (10/20/30 ms/frame).
  - ITU-T G.722 at 64,000 bps (10/20/30 ms/frame).

- MS-GSM at 13,200bps (40/80/120 ms/frame)
- (*) ITU-T G.729 Annex A at 8,000 bps (10/20/30 ms/frame).
- (*) ITU-T G.723.1 at 6,400/5,333 bps (30/60/90 ms/frame)
- (*) ETSI GSM 6.10 at 13,200bps (20/40/60 ms/frame)
- (*) ETSI GSM/AMR from 4,750 to 12,200 bps (20/40/60 ms/frame)
- (*) Others (e.g. AMR wideband/G.722.2, iLBC, Speex, etc.)

- Video Codecs:
  - ITU-T H.263 (1996, simple profile with RFC2190 Mode A packetization)
  - (*) ITU-T H.261
  - (*) H.264 (platform dependent)
  - (*) MPEG-4 (platform dependent)
- Dual Mode (radio) support:
  - Supports placing VoIP calls over 3G
  - Supports placing, answering and teardown WAN (GSM/CDMA) calls
  - Supports call hold and outbound inband digits
  - Supports mute, volume and microphone gain control
  - Automatic detection of incoming VoIP and WAN calls
  - Automatic WAN/WLAN network detection for outbound calls
  - WAN signal strength indication
  - SMS messages

NOTE: (*) = upon request

10.2. Advanced SIP Features

iFon™ contains several SIP-specific features that can be activated by SIP servers.

- Call-Info: INVITE or 180 messages can include this tag for caller information. The supported format is a URL to a file, e.g.:

  ```
  Call-Info: <http://wwww.example.com/alice/photo.jpg>;purpose=icon
  ```

  The supported formats as of this date are:

  - .jpg: JPEG images can be no larger than 176 x 144 pixels.
  - .bmp: BMP images can be no larger than 176 x 144 pixels.
  - .gif: GIF images can be no larger than 176 x 144 pixels.
  - .png: PNG files are recognized but not decoded: a default image is displayed instead.
  - .wav: file must be 8,000, 11,025 and 22,050 Hz 8 or 16 bit mono PCM.
  - .wmv: Windows Media Video file (PocketPC format) are played with the MS Media Player overlaid on top of iFon™ until the call is either connected or rejected.
  - .avi: AVI files are detected but not processed

- Alert-Info: 180 messages can include this tag for distinctive ringing. The supported format is a URL to a file, e.g.:

  ```
  Alert-Info: <http://www.example.com/sounds/moo.wav>
  ```

  The supported formats are as in the above Call-Info.

- Intercom/paging: as a special case to the handling of the Alert-Info/Call-Info tags, iFon™ allows for incoming intercom pages by automatically answering an incoming call when either the Alert-Info tag is set to "Ring Answer", or the Call-Info tag is set to "answer-after=<number>" where <number> is the number of rings after which iFon™ answers the call. E.g.:

  ```
  Alert-Info: <Ring Answer>
  ```

  ```
  Call-Info: ;answer-after=0
  ```

- Early media / Session Progress: upon receiving a 183 message, iFon™ starts receiving audio and video streams.

- Message Waiting Indication (WMI): iFon™ displays MWI indication in the INFO field indicating "Messages-Waiting" and then "yes" or "no". Both "Voicemail:" and "Voice-Message:" tags can be followed by either one or two digits indicating either the total number of messages or both the unheard and the total number of messages.

  ```
  Messages-Waiting: yes\nVoicemail: 14/20\n
  ```

  ```
  Messages-Waiting: no\nVoicemail: 0/0\n
  ```

  This follows the standard RFC 3842 format.

- Session timer: the UAC-side of draft-ietf-sip-session-timer-xx is supported. The registry entry dwSIPsessiontimer=0 disables it, otherwise a value greater than zero is used as the timeout value. [default dwSIPsessiontimer=0]

- Rport: this tag in the REGISTRY can be disabled through the registry entry bSIPrportEnable=0. [default bSIPrportEnable=1]

- Dual-mode handset support (Nortel only): the ";dmh" tag is supported.

10.3. Supported SIP Standards

The following is a partial list of SIP standards supported in iFon™:

- RFC3261: "SIP: Session Initiation Protocol"
- RFC2327: "SDP: Session Description Protocol"
- RFC3264: "An Offer/Answer Model with the Session Description Protocol (SDP)"
- RFC2976: "The SIP INFO Method"
- RFC3515: "The Session Initiation Protocol (SIP) Refer Method"
- RFC3959: "The Early Session Disposition Type for the Session Initiation Protocol (SIP)"
- draft-ietf-sipping-service-examples-05.txt: "Session Initiation Protocol Service Examples draft-ietf-sipping-service-examples-05"
- draft-ietf-sip-session-timer-xx.txt: "Session Timers in the Session Initiation Protocol (SIP) draft-ietf-sip-session-timer-13"
- RFC3842: "A Message Summary and Message Waiting Indication Event Package for the Session Initiation Protocol (SIP)"
- RFC3489: "STUN - Simple Traversal of User Datagram Protocol (UDP) Through Network Address Translators (NATs)" NOTE: this is upon request.
- RFC2617: "HTTP Authentication: Basic and Digest Access Authentication"
- RFC3550: "RTP: A Transport Protocol for Real-Time Applications"
- RFC3551: "RTP Profile for Audio and Video Conferences with Minimal Control"
- RFC3555: "MIME Type Registration of RTP Payload Formats"
- RFC2833: "RTP Payload for DTMF Digits, Telephony Tones and Telephony Signals"
- RFC2032: "RTP Payload Format for H.261 Video Streams"
- RFC2190: "RTP Payload Format for H.263 Video Streams"
- RFC3016: "RTP Payload Format for MPEG-4 Audio/Visual Streams"
- draft-ietf-avt-rtp-h264-xx.txt: "RTP Payload Format for H.264 Video" (TBD)
- RFC3267: "Real-Time Transport Protocol (RTP) Payload Format and File Storage Format for the Adaptive Multi-Rate (AMR) and Adaptive Multi-Rate Wideband (AMR-WB) Audio Codecs"

In addition iFon™ is also conformant to Nortel MCS5200 and MCS5100 systems, including:

- MCP SIP Interoperability Specification: SIP Client Call Flows Addendum, Issue 3.0, 13 March 2004
- Nortel Networks Multimedia Communications Platform (MCP): Client/Service Access through Firewall (FW) and Network Address and/or Port Translation (NAPT) Devices Version 1.0
- Other Nortel-specific specifications

11. Interoperability List

11.1. Equipment

iFon™ - SIP equipment supported (partial list)	March 2007

Pure proxy
Brekeke SIP proxy
Cisco CSPS
partysip
SER/iptel

Switches
Asterisk and derivative products
Brekeke PBX
Broadsoft
Cisco CallManager
Ericsson Webswitch
Mitel 3300
NEC Aspire
NEC Neax
Nortel CS2000
Nortel MCS 5200/5100
Sylantro
Telecom Italia StarSIP
Vertical Networks

Other (gateways, servers, endpoints, etc.)
Audiocodes audio gateway
BayPacket media servers
BEA application server
Radisys (Convedia) Media Gateway
Etel audio gateways
IP unity video voicemail and other
NMS media gateway
Openwave video ringback tones
Openwave video voicemail
Openwave video portal
Polycom video terminals
Radvision ClickToMeet
Radvision media gateway
Radvision video portal
SS8 media servers
Tandberg video terminals
Polycom video terminals

11.2. Devices

iFon™ Supported Compatibility Chart (partial list) - February 2009

Model	**Device features**						**iFon™**	
	WiFi built-in	*Camera support*	*PPC 2002*	*WM 2003*	*WM 5.0+*	*WinCE 4.x/5.x*	***SIP***	***Dual mode***
Compaq iPAQ h36xx		CF	yes				yes	
Compaq iPAQ h37xx		CF	yes				yes	
Compaq iPAQ h38xx		CF	yes	yes			yes	
Compaq iPAQ h39xx		CF	yes	yes			yes	
Compaq iPAQ h54xx	yes	CF	yes	yes			yes	
HP iPAQ h55xx	yes	CF		yes			yes	
HP iPAQ h22xx		CF		yes			yes	
HP iPAQ rx31xx	yes	2+ fps		yes			yes	
HP iPAQ rx37xx	yes	5+ fps		yes			yes	
HP iPAQ hx24xx	yes	CF		yes			yes	
HP iPAQ hx27xx	yes	CF		yes			yes	
HP iPAQ hx47xx	yes	CF		yes			yes	
HP iPAQ h63xx (*)	yes	no		yes			yes	yes
HP iPAQ hw69xx	yes	15 fps			yes		yes	yes
Toshiba e74x	yes	CF	yes				yes	
Toshiba e75x	yes	CF	yes	yes			yes	
Toshiba e40x		no		yes			yes	
Toshiba e80x (**)	yes	CF		yes			yes	
Toshiba e83x	yes	CF		yes			yes	
Dell Axim X30	yes			yes			yes	
NEC P300		CF	yes				yes	
NEC Pocket@i	yes	no				yes	yes	
AsusTek A730 (**)		16+ fps		yes			yes	
AsusTek A730W (**)	yes	16+ fps		yes			yes	
Hitachi G1000		3 fps	yes				yes	
i-mate PDA2K (aka Qtek 9090)	yes	10+ fps		yes			yes	yes
i-mate PDA2 (**)	yes	up to 30fps		yes			yes	yes
AudioVox 6600 (***)		TBD		yes			yes	yes
Audioxox 6700 (aka Sprint/Verizon 6700) (**)	yes	up to 30fps			yes		yes	yes
Cingular 8525	yes	up to 10fps			yes		yes	yes
imate JasJar (**) (aka Qtek 9000, HTC Universal, etc.)	yes	up to 30fps			yes		yes	yes
Samsung i730	yes			yes			yes	yes
BenQ P50		no		yes			yes	yes
Casio e200		no	yes				yes	
Casio e3000	yes	no	yes				yes	
Fujitsu iPAD	yes	no				yes	yes	
Fujitsu iPAD 100-20	yes	no				yes	yes	
Symbol PDT8146	yes	no	yes	yes			yes	
Symbol MC50 (**)	yes	no		yes			yes	
Symbol MC70 (**)	yes	no			yes		yes	yes
Symbol MC9090G	yes	no			yes		yes	
Symbol MC3090	yes	no				yes	yes	
Motorola MC55	yes	no			yes		yes	TBD
Motorola MC75	yes	no			yes		yes	TBD
Intermec CN3	yes	no			yes		yes	
Intermec CN2B	yes	no		yes			yes	
Intermec CK3	yes	no			yes		yes	

NOTES:
(*) video receive only, other codec limitations may apply
(**) Recommended (use A730W only with external WiFi CF card)
(***) GPRS or 1xRtt only

2468 Union Street • San Francisco CA 94123 • 415 567 8100 phone • 415 567 1362 fax