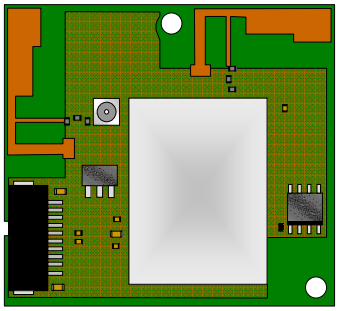
WIRELESS MODULE

BOISB-0803-00

802.11 b/g WLAN

User's Manual



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Marvell Document: MB-073155

DATE	REV	DESCRIPTION	AUTHOR
01-10-09	V 0.5	Initial	Weiser
02-13-09	V0.6	Update Regulatory Section	Weiser
02-17-09	V0.7	Corrected FCC and IC ID numbers, Remove CE "560"	Weiser
02-20-09	V0.8	Updated Regulatory section per Steven's notes	Weiser
02-25-09	V1.0	As Issued	Weiser
02-26-09	V1.1	Changed 'market in IC" to "to be marketed in Canada"	Weiser
03-12-09	V1.2	Add RMI BOISB-0803-00 number as primary identification	Weiser

Table of Contents

1. Introduction

1.1 Overview

This document describes the functions of the Marvell Wireless 802.11 b/g WLAN Client Module: BOISB-0803-00.

While this module is intended to be embedded into a host product, this manual describes how to boot and operate this module with a Linux O/S PC to exercise the WiFi communication functions.

1.2 Wireless Networks

In the Linux PC, the Marvell Client WiFi Module interface operates in similar fashion to a 10BaseT Ethernet card, except that a radio replaces the wires between communicating devices. All existing applications that operate on the host product over an Ethernet connection will operate over the Marvell wireless module without any modification to the wireless networking software.

The Marvell WiFi Module the following WiFi connection modes:

- Access Point (AP) Infrastructure mode
- Ad-Hoc (peer-to-peer) mode

1.2.1 Infrastructure Mode

In infrastructure mode, each wireless device communicates to a WiFi Access Point (AP). The AP also bridges the WiFi devices to other wired LAN devices. APs are typically strategically located within an area to provide optimal coverage for wireless clients. A large WLAN typically uses multiple APs to provide coverage over a wide area. Each AP is connected to a wired LAN through a 10BaseT Ethernet connection. APs send and receive information from the LAN through this wired connection. Most corporate WLANs operate in Infrastructure mode to allow access to wired LAN resources such as file servers and printers.

1.2.2 Ad Hoc Mode

In Ad-Hoc mode (also referred to as peer-to-peer mode), wireless clients send and receive information directly to other wireless clients without using an AP. In comparison to Infrastructure mode, this type of WLAN connection only contains wireless clients. Ad-Hoc mode is useful for establishing a network where wireless infrastructure does not exist or where services are not required. Two or more computers can establish an Ad-Hoc network when within range of one another. Ad-Hoc mode is used to connect network computers at home or in small offices. It can also be used to set up a temporary wireless network for meetings.

2. PC HOST Linux Fedora Core Kernel Requirement

The Marvell Client WiFi Module requires Fedora Kernel version:
2.6.24.4-64.fc8 for proper operation.

Follow the steps below to upgrade the Fedora Core from (2.6.23.1-42.fc8 Version) to Kernel Version: 2.6.24.4-64.fc8

- Install Fedora Core 8, which has kernel version: 2.6.23.1-42.fc8
- Login to Fedora as root (super user)
- Download : ftp://rpmfind.net/linux/fedora/updates/8/i386/kernel-2.6.24.4-64.fc8.i686.rpm
- Copy kernel-2.6.24.4-64.fc8.i686.rpm and kernel-devel-2.6.24.4-64.fc8.i686.rpm to your working directory, say, /(work). # cd /(work)
- # rpm --force –ivh kernel-2.6. 24.4-64.fc8.i686.rpm (or double click this rpm icon)
    - this rpm is binary release for i686 (bootable kernel/modules)
- Reboot the system.

3. Hardware Installation

The Marvell Client WiFi Module connects to the PC by the Marvell PCMCIA SDIO adapter card [MSK-1520] and a custom SD_Card adapter cable (See APPENDIX A).

NOTE: This module includes two PCB pattern antenna which must not be altered in any way. When mounting the module, do not place the antenna pattern with in 3mm of any material nor within 6mm of any metal material.

4. Marvell Module WLAN Setup

3. 1 For Driver Build

The latest 8686 Linux S/W can be downloaded from Marvell ExtraNet : Myproducts>wireless>88W8686>software>sdio>linux>

Within Linux O/S, go to the source code directory wlan_src/, and make a clean build, The driver and utility binaries can be found in ../bin_xxxx directory.

3.2 For Driver Install

Copy firmware image 8686.bin to ... to /lib/firmware/mrvl/ directory (create the directory if it doesn't exist).

For example, to install 8686 driver,

```
insmod mlan.ko
insmod sd8xxx.ko [fw_name=mrvl/sd8686.bin]
```

To install sd8xxx driver with MFG firmware file /lib/firmware/mrvl/sd8xxxmfg.bin, using the following command:

```
insmod sd8xxx.ko mfgmode=1 fw_name=mrvl/sd8686mfg.bin
```

To remove the driver,

```
rmmod sd8xxx
rmmod mlan
```

3.3 Set up a simple Network Connection

To set up a simple network connection, follow the installation steps:

a. Copy the file, sd8686.bin, from 'FwImage' folder of current release to '/lib/firmware/mrvl/' directory (create the directory 'mrvl' in '/lib/firmware' if it doesn't exist).

b. Go to 'bin_sd8686' folder of current release and install firmware/driver using command:

```
# insmod sd8xxx.ko
```

c. G Run command:

```
Ifconfig ethx up
```

d. To associate with an Access Point by using the command

```
# iwconfig  mlan0 essid "ESSID_OF_ROUTER"
```

d. Then assign an IP address to 'mlan0' interface by using command below. Please note that configure the desired IP to be the same subnet as the AP. For example,

#ifconfig mlan0 192.168.1.101 up

e. Now the user should be able to ping the AP or other clients that are connected to the AP.

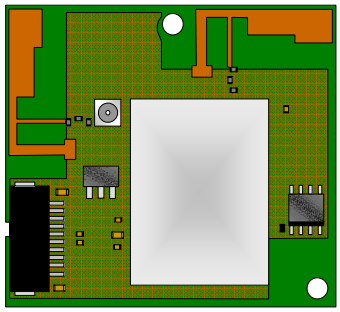
To un-install the driver, enter the command at the prompt,

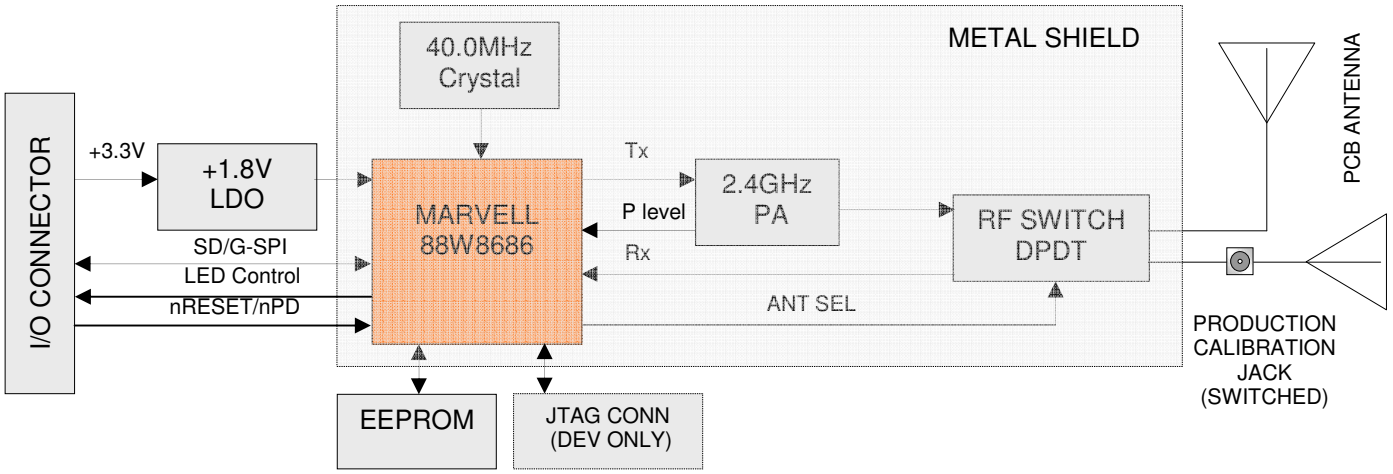
#rmmod sd8xxx.ko

Note: Please Refer to README file in bin_sd8686 folder for other commands

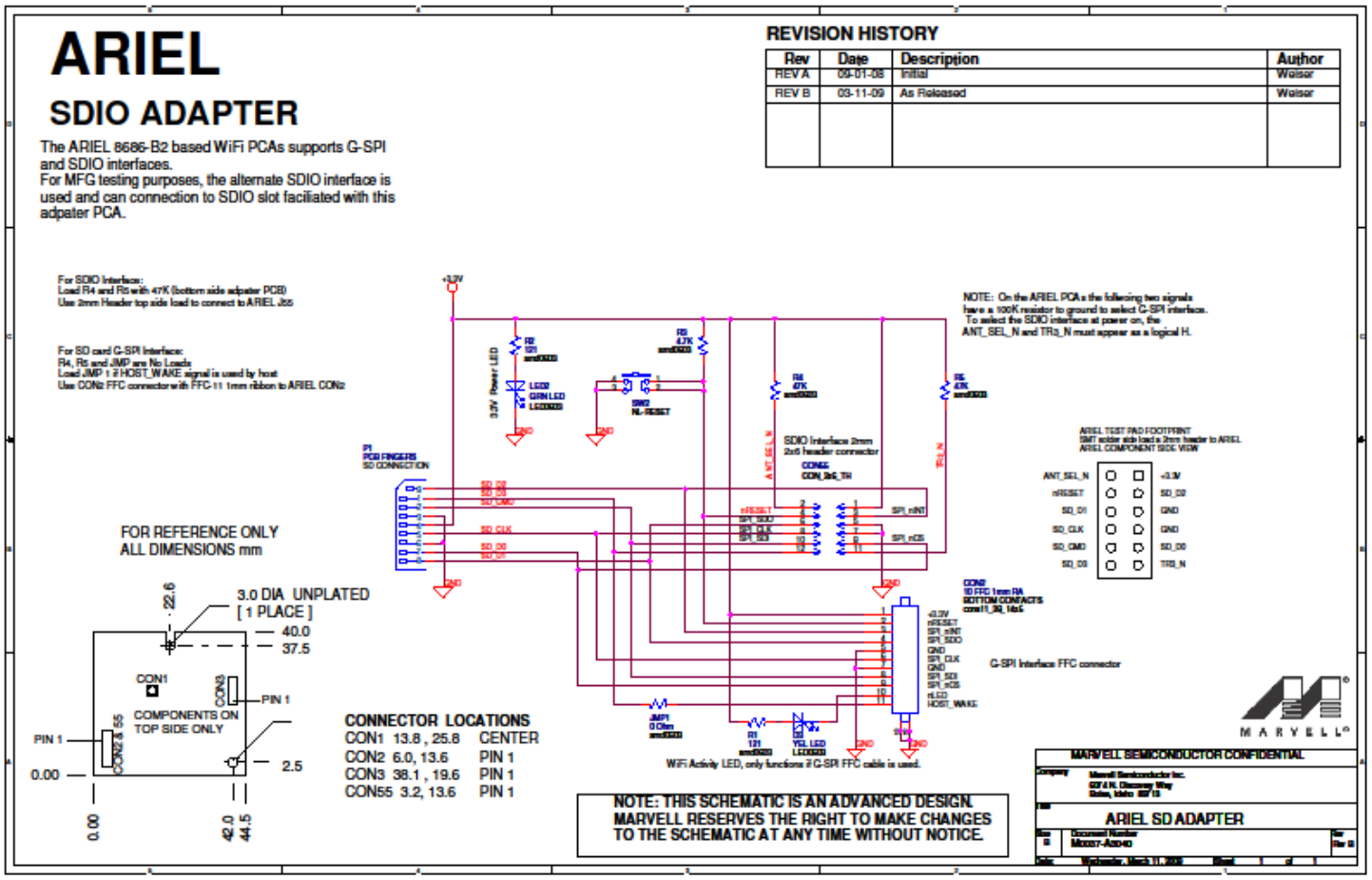
A. Appendix: BLOCK DIAGRAM

BOISB-0803-00
BLOCK DIAGRAM





B. Appendix: SD CABLE SCHEMATIC



C. Appendix: Compliance Statements

i. Federal Communication Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE:
FCC Radiation Exposure Statement:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device is intended only for OEM integrators under the following conditions:

1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
2) The transmitter module may not be co-located with any other transmitter or antenna,
3) For all products market in US, OEM has to limit the operation channels in CH1 to CH11 for 2.4G band by supplied firmware programming tool. OEM shall not supply any tool or info to the end-user regarding to Regulatory Domain change.

As long as 3 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example: printer…etc.).

IMPORTANT NOTE:
In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID: B94BOISB0803".

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.
The end user manual shall include all required regulatory information/warning as show in this manual.

ii. Canadian Regulatory Wireless Notice

This device complies with RSS-210 of the Industry Canada Rules. Operation is subject to the following two conditions:

1) This device may not cause interference and
2) This device must accept any interference, including interference that may cause undesired operation of the device

IMPORTANT NOTE:

IC Radiation Exposure Statement:

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

This device is intended only for OEM integrators under the following conditions:

1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
2) The transmitter module may not be co-located with any other transmitter or antenna,
3) For all products to be marketed in Canada, OEM has to limit the operation channels in CH1 to CH11 for 2.4G band by supplied firmware programming tool. OEM shall not supply any tool or info to the end-user regarding to Regulatory Domain change.

As long as 3 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example: printer…etc.).

IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the IC authorization is no longer considered valid and the IC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate IC authorization.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains IC: 466I-BOISB803".

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

iii. Taiwan Regulatory Notice 警語

第十二條

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

Note:

1. 本模組於取得認證後將依規定於模組本體標示審驗合格標籤

2. 系統廠商應於平台上標示「本產品內含射頻模組:CCXXXXYYyyyZzW」字樣

iv. Europe – EU Declaration of Conformity

This device complies with the essential requirements of the R&TTE Directive 1999/5/EC. The following test methods have been applied in order to prove presumption of conformity with the essential requirements of the R&TTE Directive 1999/5/EC:

- **EN 60950-1: 2006**
- Safety of Information Technology Equipment

- **EN 62311: 2008**
- Generic standard to demonstrate the compliance of electronic and electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields (0 Hz - 300 GHz)

- **EN 300 328 V1.7.1: (2006-10)**
- Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques; Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive

- **EN 301 489-1 V1.8.1: (2008-04)**
- Electromagnetic compatibility and Radio Spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements

- **EN 301 489-17 V1.3.2 (2008-04)**
- Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for 2,4 GHz wideband transmission systems and 5 GHz high performance RLAN equipment

This device is a 2.4 GHz wideband transmission system (transceiver), intended for use in all EU member states and EFTA countries, except in France and Italy where restrictive use applies.

In Italy the end-user should apply for a license at the national spectrum authorities in order to obtain authorization to use the device for setting up outdoor radio links and/or for supplying public access to telecommunications and/or network services.

This device may not be used for setting up outdoor radio links in France and in some areas the RF output power may be limited to 10 mW EIRP in the frequency range of 2454 – 2483.5 MHz. For detailed information the end-user should contact the national spectrum authority in France.

CE !

cs Česky [Czech]	*[Jméno výrobce]* tímto prohlašuje, že tento *[typ zařízení]* je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
da Dansk [Danish]	Undertegnede *[fabrikantens navn]* erklærer herved, at følgende udstyr *[udstyrets typebetegnelse]* overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
de Deutsch [German]	Hiermit erklärt *[Name des Herstellers]*, dass sich das Gerät *[Gerätetyp]* in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
et Eesti [Estonian]	Käesolevaga kinnitab *[tootja nimi = name of manufacturer]* seadme *[seadme tüüp = type of equipment]* vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
en English	Hereby, *[name of manufacturer]*, declares that this *[type of equipment]* is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
es Español [Spanish]	Por medio de la presente *[nombre del fabricante]* declara que el *[clase de equipo]* cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
el Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ *[name of manufacturer]* ΔΗΛΩΝΕΙ ΟΤΙ *[type of equipment]* ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
fr Français [French]	Par la présente *[nom du fabricant]* déclare que l'appareil *[type d'appareil]* est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
it Italiano [Italian]	Con la presente *[nome del costruttore]* dichiara che questo *[tipo di apparecchio]* è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar šo *[name of manufacturer / izgatavotāja nosaukums]* deklarē, ka *[type of equipment / iekārtas tips]* atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]	Šiuo *[manufacturer name]* deklaruoja, kad šis *[equipment type]* atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
nl	Hierbij verklaart *[naam van de fabrikant]* dat het toestel *[type van*

Nederlands [Dutch]	*toestel]* in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
mt Malti [Maltese]	Hawnhekk, *[isem tal-manifattur]*, jiddikjara li dan *[il-mudel tal-prodott]* jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
hu Magyar [Hungarian]	Alulírott, *[gyártó neve]* nyilatkozom, hogy a *[... típus]* megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak.
pl Polski [Polish]	Niniejszym *[nazwa producenta]* oświadcza, że *[nazwa wyrobu]* jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
pt Português [Portuguese]	*[Nome do fabricante]* declara que este *[tipo de equipamento]* está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
sl Slovensko [Slovenian]	*[Ime proizvajalca]* izjavlja, da je ta *[tip opreme]* v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
Slovensky [Slovak]	*[Meno výrobcu]* týmto vyhlasuje, že *[typ zariadenia]* spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
fi Suomi [Finnish]	*[Valmistaja = manufacturer]* vakuuttaa täten että *[type of equipment = laitteen tyyppimerkintä]* tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
sv Svenska [Swedish]	Härmed intygar *[företag]* att denna *[utrustningstyp]* står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.