

SWH Product description

The SWH is a board Cellular Terminal
For UMTS GSM GPS

Rev.3 – 09/08/2015



1. Overview

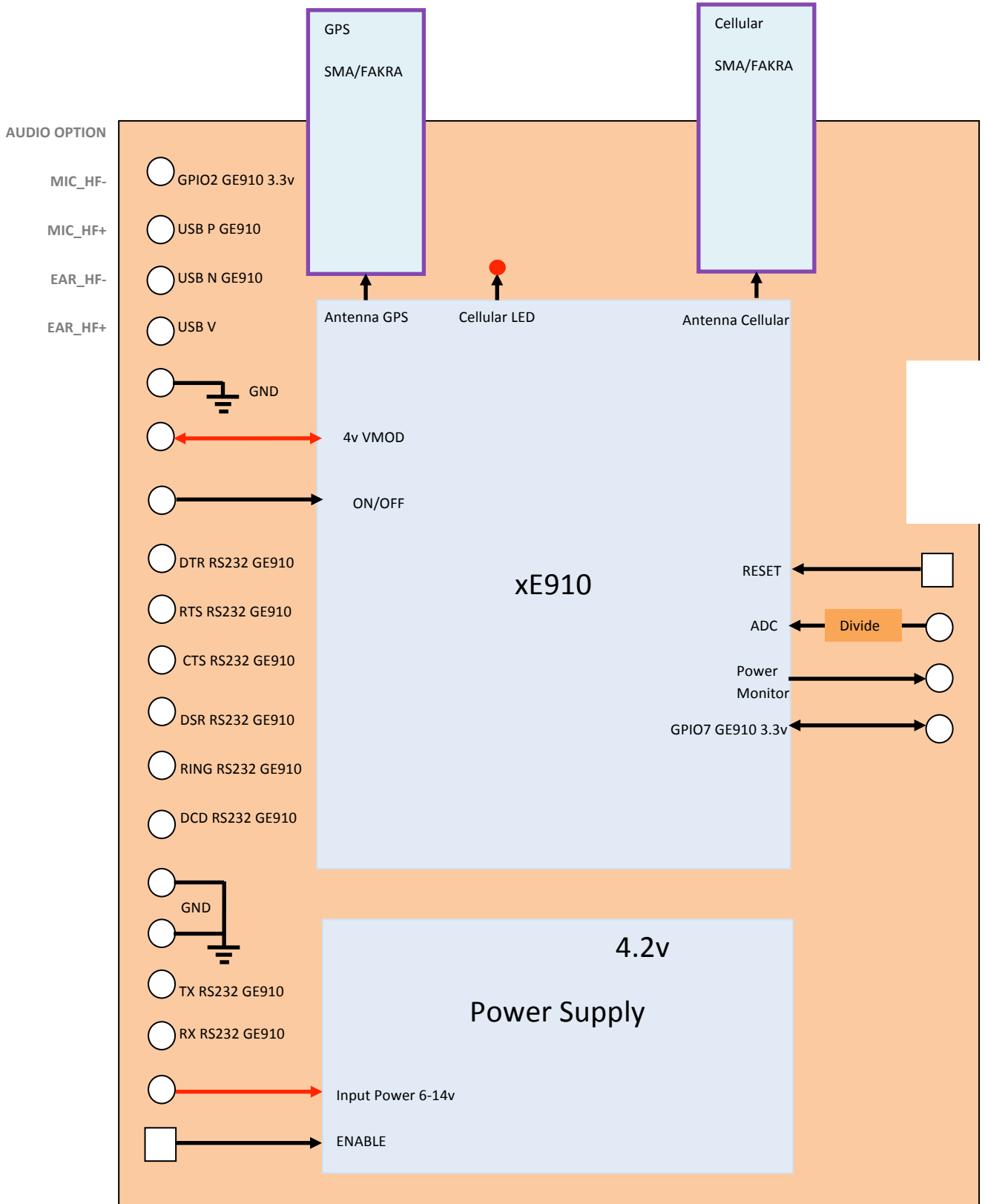
The SWH is a complete board Cellular Terminal solution for UMTS GSM GPS applications. Based on Telit xE910 module.

2. Hardware Interface Description

2.1 Main features of the SWH

Feature	Implementation
Incorporates Telit xE910 module	The Telit module handles all GSM GPS processing with PYTHON script
Frequency bands	UMTS: Global, Europe, North America GSM: 850/900/1800/1900MHz
Power supply	Single supply voltage 6V DC to 14V DC
Communication	Modem Full RS232, connector 8pin Modem USB
Antennas	UMTS GSM GPS/GLONASS via SMA connectors or MMCX

2.2 Hardware block diagram



2.3 Pin Assignment

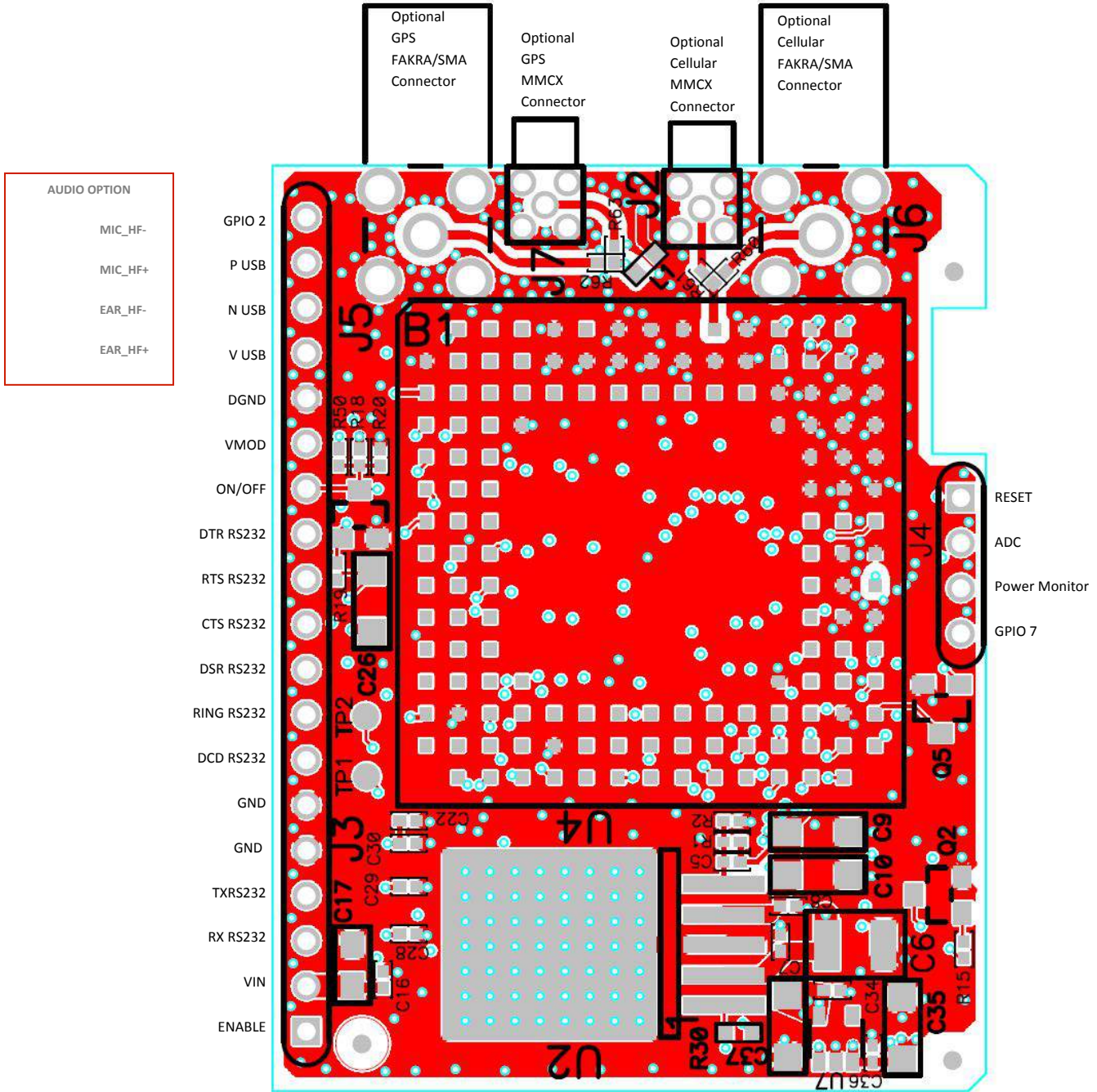
2.3.1 Connector 19 pins

Pin	Signal name	Description
1	Enable/Disable	
2	Input Power 5-12V	
3	RX RS-232 - RX on the PC end	
4	TX RS-232- TX on the PC end	
5	GND	
6	GND	
7	DCD	
8	Ring	
9	DSR	
10	CTS	
11	RTS	
12	DTR	
13	On/Off	
14	VMOD	
15	GND	
16	USB V	
17	USB N	
18	USB P	
19	GPIO 2	

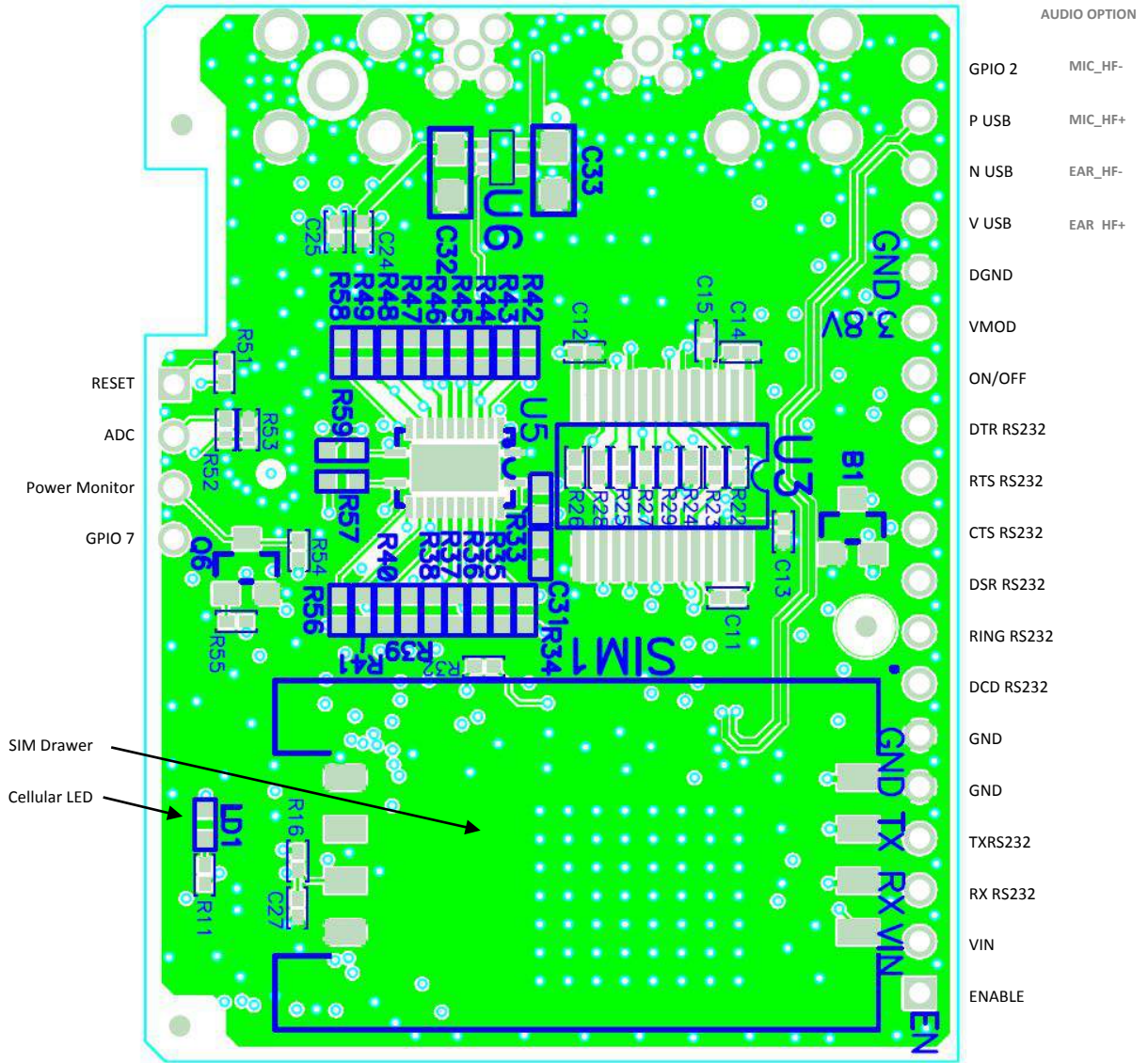
2.3.2 Connector 4 pins

Pin	Signal name	Description
1	Reset (Active High)	
2	ADC	
3	PWR Mon	
4	GPIO 7	

2.4 Top View Lay Out



2.5 Bottom View Lay Out



3.1 Power

3.1.1 Power Supply

The power supply of the SWH Board requires a single voltage source of POWER 6V-14V capable of providing a peak during an active transmission. No internal fuse. Add external fuse 1.1A 16V ensures an electrical safety according to EN60950-1.

The power supply recommended being any safety approved power supply certified IEC 60950-1 or EN 60950-1 or UL 60950-1 with limited output current up to 2A.

Pin	Signal name	Use
J3 -- 1	Power Enable	Control pin to turn ON/OFF SWH power. When this pin is HIGH (6V-14V) the unit will be turn ON. When this pin OPEN or GROUND the unit will be turn OFF.
J3 -- 2	POWER	Input Power supply range 6-14V
J3 -- 5	GND	Ground
J3 -- 6	GND	Ground
J3 -- 14	VMOD	3.8v output from power supply on board When no Vin apply to the board This pin can be use as 3.7v LI battery operated connected directly to the modem
J3 -- 15	GND	Ground

3.1.2 Supply voltage requirements

The DC power supply must be connected to the POWER input:

- Input voltage range 6 - 14V DC
- Nominal Voltage 9V DC
- Power Supply current rating: max. 2A @9V
- Power Supply ripple: max. 120mV
- Input current in idle mode: 20mA @ 12V
- Input average current in communication mode: 100mA @ 12V

3.2 RF CONNECTOR

The SWH Board uses FAKRA CONNECTORS or MMCX CONNECTORS for ANTENNAS

PERPLE FAKRA CELLULAR --- use the 5 band ANTENNA with 2.5dB gain.

BLUE FAKRA GPS/GLONASS --- use the ACTIVE GPS/GLONASS ANTENNA with 25-28dB gain.

3.3 RS-232 Interface

The serial interface of the SWH is intended for the communication between the GSM GPS/GLONASS module and the host application. This RS-232 interface is a data and control interface for transmitting data. It accepts, AT commands and provides multiplexed channels. EMC immunity complies with the vehicular environment requirements according to EN 301 489-7. The user interface of the SWH is accessible from a Data Terminal Equipment DTE connected to the RS232 interface and it is managed by AT commands according to the GSM GPS/GLONASS specification. The supported commands are listed in the AT Commands Reference Guide.

Connector type on the terminal is:

- RS-232 through 2.54mm header
- Baud rate from 300 to 230,400 bit/s
- Short circuit (to Ground) protection on all outputs.
- Input voltage range: -12V to +12V

Pin no.	Signal name	I/O	Function of application
J3 -- 7	DCD	O	Data Carrier Detected
J3 -- 2	RXD	O	Receive Data
J3 -- 3	TXD	I	Transmit Data
J3 -- 12	DTR	I	Data Terminal Ready
J3 -- 5,6	GND	-	Ground
J3 -- 9	DSR	O	Data Set Ready
J3 -- 11	RTS	I	Request To Send
J3 -- 10	CTS	O	Clear To Send
J3 -- 8	RING	O	Ring Indication

3.4 AUX Interface

The AUX interface provides the following options:

- Two digital input/output 0--3vdc.
- One ADC (10 bit) input 0--5vdc.
- Power monitor pin, this pin when HIGH the modem is ON
- RESET pin, when go to LOW will restart the modem
- ON/OFF pin, will turn modem ON/OFF
- VMOD pin, this pin provide 3.8v or when no Vin can be operated form LI battery

Pin no.	Signal name	I/O	Function
J3 -- 19	GPIO2	I/O	3.3v
J3 -- 2	RXD	O	Receive Data
J3 -- 3	TXD	I	Transmit Data
J3 -- 12	DTR	I	Data Terminal Ready
J3 -- 5,6	GND	-	Ground
J3 -- 9	DSR	O	Data Set Ready
J3 -- 11	RTS	I	Request To Send
J3 -- 10	CTS	O	Clear To Send
J3 -- 8	RING	O	Ring Indication

3.5 Status LED

3.5.1 Red LED

The Red LED is connected to GPIO1, OFF by default.

Red LED status	Device Status
Permanently on	A call is active
Fast interrupt sequence (period 0,5s, Ton 1s)	Net search / Not registered
Slow interrupt sequence (period 0,3s, Ton 3s)	Registered full service
Permanently off	Device off

The LED can use for Network status or controlled by the user.

To activate GSM status Red LED "AT#GPIO=1,0,2;#SLED=2,1,1"

Red LED ON: "AT#GPIO=1,1,1"

Red LED OFF: "AT#GPIO=1,0,1"

4.1 Environmental requirements

Operating temperature range	-20°C to +55°C -4°F to 131°F ambient temperature	The module is fully functional (*) in all the temperature range and it fully meets the ETSI specifications.
	-30°C to +70°C -22°F to 158°F	The module is fully functional (*) in all the temperature range. Temperatures outside of the range -20°C to +55°C (-4°F to 131°F) might slightly deviate from ETSI specifications.
Humidity	5% - 85%	

(*)Functional: the module is able to make and receive data calls and SMS.

4.2 Protection class

IP40 Avoid exposing the Terminal to liquid or moisture.

4.3 RoHS compliance

All hardware components are fully compliant with the EU RoHS and WEEE Directiv

5. SAFETY RECOMMENDATIONS

READ CAREFULLY

1. The unit does not provide protection from lightning and surge. For outdoor installation use outdoor nonmetallic case safety approved according UL 50. Additionally you should provide protection from lightning and over voltage according National code.

2. Be sure the use of this product is allowed in the country and in the environment required. The use of this product may be dangerous and has to be avoided in the following areas: Where it can interfere with other electronic devices in environments such as hospitals, airports, aircrafts, etc. Where there is risk of explosion such as gasoline stations, oil refineries, etc. It is responsibility of the user to enforce the country regulation and the specific environment regulation. Do not disassemble the product; any mark of tampering will compromise the warranty validity. We recommend following the instructions of the hardware user guides for a correct wiring of the product. The product has to be supplied with a stabilized voltage source and the wiring has to be conforming to the security and fire prevention regulations. The product has to be handled with care, avoiding any contact with the pins because electrostatic discharges may damage the product itself. Same cautions have to be taken for the SIM, checking carefully the instruction for its use. Do not insert or remove the SIM when the product is in power saving mode. The system integrator is responsible of the functioning of the final product; therefore, care has to be given to the external components of the unit, as well as of any project or installation issue, because the risk of disturbing the GSM network or external devices or having impact on the security. Should there be any doubt, please refer to the technical documentation and the regulations in force. Every unit has to be equipped with a proper antenna with specific characteristics. The antenna has to be installed with care in order to avoid any interference with other electronic devices and has to guarantee a minimum distance from the body (20 cm/8"). In case this requirement cannot be satisfied, the system integrator should assess the final product against the SAR regulation. The European Community provides some Directives for the electronic equipment introduced on the market. All the relevant information available on the European Community website:

<http://europa.eu.int/comm/enterprise/rtte/dir99-5.htm> The text of the Directive 99/05 regarding telecommunication equipment is available, while the applicable Directives (Low Voltage and EMC) are available at:

http://europa.eu.int/comm/enterprise/electr_equipment/index_en.htm