

Experience the power of one
Ubigate iBG1003™



System Description



www.samsungnetwork.com

The purposes of Safety Concerns are to ensure user's safety and to prevent property losses.
Please read this document carefully for proper use.

COPYRIGHT

This manual is proprietary to SAMSUNG Electronics Co., Ltd. and is protected by copyright. No information contained herein may be copied, translated, transcribed or duplicated for any commercial purposes or disclosed to the third party in any form without the prior written consent of SAMSUNG Electronics Co., Ltd.

TRADEMARKS

Ubigate iBG1003 is a registered trademark of SAMSUNG Electronics.
All other company and product names may be trademarks of the respective companies with which they are associated.

This manual should be read before the installation and operation, and the operator should correctly install and operate the product by using this manual.

This manual may be changed due to the system improvement, standardization and other technical reasons without prior notice.

If you have a question for the content of this manual or want to obtain further information on the updated manual, please contact the homepage below.

Homepage: <http://www.samsungdocs.com>



GENERAL USER INFORMATION

Radio Frequency Interference

The Ubigate iBG1003 equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to FCC Part 15 Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own risk.

FCC Requirements

The Ubigate iBG1003 equipment complies with FCC Part 68 Rules and requirements adopted by Administrative Council for Terminal Attachment (ACTA).

FCC Part 68

The FCC Part 68 label is located on the bottom of the chassis.

The label contains:

- Product Identifier Number
- FCC Registration Number
- Ringer Equivalence Number (REN)



NOTE

If requested, this information must be provided to your telephone company.

Unauthorized Modifications

Any change or modifications performed on this equipment that are not expressly approved in writing by SAMSUNG ELECTRONICS, CO., LTD. could cause non-compliance with the FCC rules and void the user's authority to operate the equipment.

Incidence of Harm

The telephone company will notify you in advance about the temporary discontinuation of service, if the Ubigate iBG1003 equipment is causing harm to the telephone network.

In case advance notification is not feasible, the telephone company will notify the customer as soon as possible and you will also be advised about your right to file a complaint with the FCC, if it is necessary.

Service Center

If you need assistance during troubleshooting, please contact out local office SAMSUNG ELECTRONICS, CO., LTD. for repair or warranty information. If the trouble is causing harm to the telephone network, the telephone company may request you to remove the equipment from the network until the problem is resolved.

Field Repairs

Only technicians certified on the Ubigate iBG1003 are authorized by SAMSUNG ELECTRONICS, CO., LTD. to perform system repairs. Certified technicians may replace modular parts of a system to repair or diagnose trouble. Defective modular parts can be returned to SAMSUNG ELECTRONICS, CO., LTD. for repair.

General

Connection to party line service is subject to state tariffs. Contact the State Public Utility Commission, Public Service Commission or Corporation Commission for information.

Electrical Safety Advisory

Parties responsible for equipment requiring AC power should consider including an advisory notice in their customer information suggesting them to use a surge arrestor. Telephone companies report that electrical surges, typically lightning transients, are very destructive to customer terminal equipment connected to AC power sources. This has been identified as a major nationwide problem.

Safety Warnings



High touch current earth connection is essential before making telecommunication network connection.



Energy Hazard-careful treatment is needed.



Every wire for communication should be larger than 26 AWG.



Double pole/neutral fusing.

Underwriters Laboratories

The Ubigate iBG1003 system has been tested to comply with Safety Standards in the United States and Canada. This system is listed with Underwriters Laboratories. The cUL Mark is separately shown on the label.

Installation Safety Guidelines and Warnings

Safety Recommendations

The Safety Warnings that appear in this document (such as the one below) indicate a procedure that can harm you if not done correctly.



Electric hazard exists. Verify the power is turned off. Do not work on energized equipment. Working on energized equipment can result in serious electrical shock.



To avoid electric shock, do not connect Safety Extra-Low Voltage (SELV) circuits (found in LAN ports) to Telephone-Network Voltage (TNV) circuits (found in WAN ports).



This equipment must be installed and maintained by properly trained service personnel. Make sure the proper electrical service is available before plugging the unit and turning it on. Disconnect the telecommunication lines before unplugging the main power connector.

Cover Panels

Do not operate the Ubigate iBG1003 with missing blank faceplates and cover panels. These covers prevent exposure to hazardous voltages and currents inside the chassis. They are important to maintaining proper air flow through the chassis. They also prevent electromagnetic interference (EMI) that might disrupt other equipment.



Laser radiation and EMI are present when the router cover panel is open.

Electrostatic Discharge (ESD) Warning

Observe the following guidelines to minimize the potential for Electrostatic Discharge (ESD) damage, which can cause intermittent or complete component failures.



When handling, Ubigate iBG1003 components, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.

1. Always use an ESD wrist strap or ankle strap, and verify that it is in direct contact with your skin. Avoid contact between the component and your clothing as it causes ESD damage.
2. When handling any component that is removed from the chassis, verify that the equipment end of your ESD strap is attached to one of the ESD points on the chassis.
3. Use care when installing or uninstalling modules or interface cards. Tighten the captive installation screws to ensure a proper connection when inserting modules or interface cards.
4. When removing or installing a component, always place it component-side up on an antistatic surface, in an antistatic card rack. If you are returning a component, place it in an electrostatic bag before packing it.



INTRODUCTION

Purpose

Ubigate iBG1003™ System Description describes general information for Ubigate iBG1003.

Document Content and Organization

This description is composed of two Chapters, two Annex, the Abbreviation, and the Index.

CHAPTER 1. Introducing Ubigate iBG1003

Describes Ubigate iBG1003 overview and specifications.

CHAPTER 2. Hardware Overview

Describes the hardware overview.

ANNEX A. Cable Specifications

Describes cable specifications.

ANNEX B. Open Source Announcement

Open source announcements for this product.

ABBREVIATION

Describes the acronyms used in this description.

INDEX

Index provides main searching keywords to be found.

Conventions

The following types of paragraphs contain special information that must be carefully read and thoroughly understood. Such information may or may not be enclosed in a rectangular box, separating it from the main text, but is always preceded by an icon and/or a bold title.



NOTE

NOTE

Indicates additional information as a reference.

Information for Product and Technical Support

For questions regarding the product and technical supports:

<http://www.samsungnetwork.com>

Revision History

EDITION	DATE OF ISSUE	REMARKS
00	04. 2009.	First edition
01	06. 2009.	Modified voice connector description
02	08. 2010.	Added DSP channel capacities and LMF-4M Modified Open Source Announcement



TABLE OF CONTENTS

GENERAL USER INFORMATION	I
Radio Frequency Interference	I
FCC Requirements	II
Unauthorized Modifications	II
Incidence of Harm	II
Service Center	III
Field Repairs	III
General	III
Electrical Safety Advisory	III
Safety Warnings	IV
Underwriters Laboratories	IV
Installation Safety Guidelines and Warnings.....	V
INTRODUCTION	VII
Purpose	VII
Document Content and Organization.....	VII
Conventions.....	VIII
Information for Product and Technical Support.....	VIII
Revision History.....	VIII
CHAPTER 1. Introducing Ubigate iBG1003	1-1
Ubigate iBG1003 Overview.....	1-1
Main Features, Functions and Benefits	1-1
Product Specifications	1-3
Ubigate iBG1003 Specifications	1-3
Interfaces	1-4
Memory.....	1-5
Power Supply	1-6
Ventilation	1-7

TABLE OF CONTENTS

Real-Time Clock.....	1-7
Ubigate iBG1003 Software Features and Licenses	1-8
Switch/Router Features	1-8
Security Features.....	1-9
Voice Features.....	1-10

CHAPTER 2. Hardware Overview **2-1**

Ubigate iBG1003 Routing Engine.....	2-1
Ubigate iBG1003 Chassis	2-2
Ubigate iBG1003 Boot Sequence	2-3
Ubigate iBG1003 Front Side	2-4
Ubigate iBG1003 Rear Side	2-6
Console Port.....	2-7
USB Port.....	2-7
Mini-Modules.....	2-7
Internal Option Module (IOM).....	2-10
DSP	2-10
Port Numbering	2-12
iBG1003 Port Numbering.....	2-13

ANNEX A. Cable Specifications **A-1**

Console Port Cable	A-1
Ethernet Cable	A-2
T1/E1 Cable	A-3
LMF-4M Port Cable	A-4
ATOP-1, ATOI-1 Port Cable	A-5
RJ-21 Champ Connector Cable	A-6
FXO, FXS Port Cable	A-8

ANNEX B. Open Source Announcement **B-1**

ABBREVIATION

I

A ~ H..... I
I ~ S..... II
T ~ W..... III

INDEX

I

C ~ V I

LIST OF FIGURES

Figure 1.1 Power Supply 1-6

Figure 1.2 Ventilation..... 1-7

Figure 2.1 Isometric View 2-2

Figure 2.2 Ubigate iBG1003 Front View 2-4

Figure 2.3 Ubigate iBG1003 Rear View 2-6

Figure 2.4 ATOP-1 Mini-Module 2-7

Figure 2.5 ATOI-1 Mini-Module..... 2-8

Figure 2.6 LMF-4M Mini-Module 2-9

Figure 2.7 iBG1003 Port Numbering 2-13

Figure A.1 Console Port Cable A-1

Figure A.2 Ethernet LAN Interface Cable A-2

Figure A.3 T1/E1 WAN Interface Cable A-3

Figure A.4 LMF-4M Port Cable..... A-4

Figure A.5 ATOP-1, ATOI-1 Port Cable..... A-5

Figure A.6 RJ-21 Champ Connector Cable A-6

Figure A.7 FXO, FXS Port Cable..... A-8



CHAPTER 1. Introducing Ubigate iBG1003

Chapter 1 describes Ubigate iBG1003 overview and specifications

Ubigate iBG1003 Overview

Main Features, Functions and Benefits

Ubigate iBG1003 is a Multi-Service Business Gateway which provides routing, security, and voice gateway features.

Here are highlights of Ubigate iBG1003's features.

Performance and Scalability

- 130 Kpps Routing Capacity
- 4 T1/E1 and 2 FE UTP ports

Versatility

- WAN: HDLC, Frame Relay, Multi-link Frame Relay (MFR), Point to Point Protocol (PPP), Multi-Link PPP (MLPPP), and PPP over Frame
- LAN: 100 Mbps Metro Ethernet, Virtual Local Area Network (VLAN), and 802.1q
- QoS: DiffServ, Auto QoS, Link Fragmentation and Interleaving (LFI), Priority Queuing, Class-Based Weighted Fair Queuing (CBWFQ), and Frame Relay PVC Queuing

Rock-Solid but Flexible Security

IPSec, Generic Routing Encapsulation (GRE), Layer 2 Tunneling Protocol (L2TP), Triple Data Encryption Standard (3DES)/Advanced Encryption Standard (AES), and Firewall.

Product Specifications

Ubigate iBG1003 Specifications

The following table lists specifications for Ubigate iBG1003.

Item	Specification
System Memory	- Typical: 512 MB - Maximum: 1 GB
u-SD Flash Memory	- Typical: 1 GB - Maximum: 2 GB * For normal operation, only Samsung certified u-SD should be used.
Boot Flash	2 MB
AC Power Supply	- Input Voltage: 100~240 V - Frequency: 50~60 Hz - Power Consumption: 72 W
High Temperature (Operating)	113°F (+45°C)
Low Temperature (Operating)	32°F (0°C)
High Temperature (Non-Operating)	158°F (+70°C)
Low Temperature (Non-Operating)	-13°F (-25°C)
Humidity (Operating)	5 to 90%, non-condensing
Dimension	- Height: 2.56-inch (65 mm) - Width: 14.17-inch (360 mm) - Depth: 11.81-inch (300 mm)
Weight	3 kg
Altitude	0 to 13,123 ft (0 to 4, 018 m)
Regulatory & Safety Compliance	- MIC Type Approval/EMC Registration - IEC 60950-1/EN 60950-1/UL 60950-1 - EN 55022/EN 55024/EN 61003-3-2/ EN 61003-3-3 - FCC Part 15 Class A - FCC Part 68

Interfaces

iBG1003 has four T1/E1 interfaces and two Fast Ethernet ports.

E1 WAN Interface

Specifications	Descriptions
Receive line rate	2.048 Mbps \pm 50 ppm (payload = 1.984 Mbps)
Line code	HDB3
Framing CRC	non-CRC (ITU G.704), and unframed
Input signal	DSX-1, 0 to -24 dB
Output signal build out	long-haul or short-haul
Impedance	75 or 120 ohm
Connectors	RJ-48C
Timing	Internal or network
Pulse density	ITU G.703

T1 WAN Interface

Specifications	Descriptions
Receive line rate	1.544 Mbps \pm 32 ppm
Line code	B8ZS or AMI
Framing	D4 or ESF
Interface ESF FDL	- AT & T TR-54016-1986 - AT & T TR-54016-1989 - ANSI T1.403-1989
Input signal	DSX-1, 0 to -24 dB
Output signal build out	0, -7.5 dB, -5 dB
Equalization	0 to 655 ft. (DSX-1)
Impedance	100 Ω
Connectors	RJ-48C
Timing	Internal or network
Pulse density	AT & T TR-62411: HDLC Inversion, forced

Ethernet LAN Interface

Specifications	Descriptions
Data flow	Full-duplex or half-duplex
Connectors	RJ-45
Data speed	10/100 Mbps, auto negotiating

Memory

Ubigate iBG1003 supports the following types of memory:

- **Double-Data-Rate II Synchronous Dynamic Random Access Memory (DDR II SDRAM):** This type of memory stores the running configuration and routing tables. It also buffers packets at the network interfaces. The base configuration shipped from the factory has 512 MB of main memory. The Small Outline Dual In-line Memory Module (SODIMM) slot can be used to upgrade the main memory to a maximum of 1 GB.
- **Internal Flash Memory:** Ubigate iBG1003 includes 2 MB of internal flash memory which is used to boot the router. Ubigate iBG1003 also has 1 GB of internal flash memory to store application software and user configuration information.

Power Supply

Ubigate iBG1003's Power Supply Module provides +12 VDC with an AC input between 100 and 240 VAC.

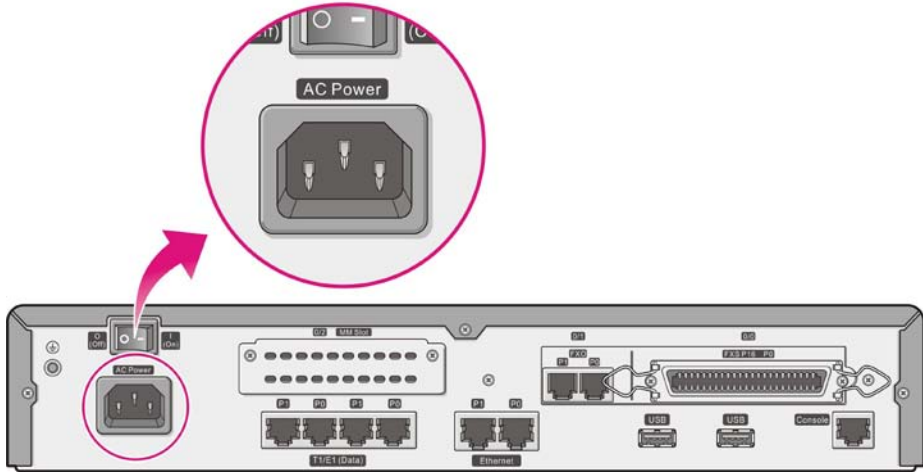


Figure 1.1 Power Supply

Ventilation

There is a cooling fan on the right side of the system which pushes internal air out, so that the air goes through the system out to the right side.

On both sides, there is a grid of holes where air comes in and goes out.

When installing Ubigate iBG1003, ensure to make room around the system in order not to block air flow.



Figure 1.2 Ventilation

Real-Time Clock

Ubigate iBG1003 provides a real-time clock so that Ubigate iBG1003 can maintain the correct date and time.

Ubigate iBG1003 Software Features and Licenses

Switch/Router Features

The following table lists the switch/router features supported by iBG1003.

Category	Features and Licenses	
Layer 2 Protocols	- VLAN (802.1 q, Port)	
WAN Protocols	<ul style="list-style-type: none"> - HDLC - FR/MLFR, PPP/MLPPP - PPP over FR, Multi-Link PPP over FR - FR Congestion Management and Traffic Policing 	
Routing Protocols	<ul style="list-style-type: none"> - Static Routing - OSPF v1/v2, RIP v1/v2 - IGMP v1/v2/v3 - PIM-SM/SSM, DVMRP - VRRP - Policy-Based Forwarding/Routing 	
Quality of Service	DiffServ	<ul style="list-style-type: none"> - Classification (MF, Flow Label) - Marker (SrTCM/TrTCM) - Policing/Shaping - Queuing (CBQ, PQ) - Congestion Avoidance (WRED)
	<ul style="list-style-type: none"> - Bandwidth Guarantee - LFI - Mapping of IP DSCP field to Frame Relay DE bit - QoS for FR PVC - Inter-PVC QoS - Queuing for IPSec Encryption Engine 	
Load Balancing	<ul style="list-style-type: none"> - Per Flow (ECMP) - Per Packet 	
Performance	Routing	<ul style="list-style-type: none"> - IPv4 Forwarding: 130 Kpps - Max. Route Table Size: 10 K - Max. MAC Table Size: 1 K

(Continued)

Category	Features and Licenses
Management	<ul style="list-style-type: none"> - Multilevel Administration Access (MLA) - SNMP v1/v2/v3 - CLI, Telnet, SNTP, TFTP, DHCP, SSHv2 - MIBs - Logging & Reporting, Diagnostic - System Image rollback
AAA Client	<ul style="list-style-type: none"> - RADIUS - TACACS+

Security Features

The following table lists the security features supported by iBG1003.

Category	Features and Licenses
Secure Connectivity	<ul style="list-style-type: none"> - IPSec for Site to Site - IPSec for Remote Access - hub-and-spoke support - Encryption (DES, 3DES, AES) - L2TP, GRE - Data Integrity (MD5, SHA-1) - Authentication (XAUTH) - Key Management (Manual, IKE v1 (PKI, Pre-shared)) - NAT Traversal
Internal Security	<ul style="list-style-type: none"> - AAA - ACL - MAC Address Filtering
Attack Defense	<ul style="list-style-type: none"> - Route mode - Packet Filtering - Stateful Packet Inspection - NAT (1:1, N:1, Reverse, Dynamic) - ALG (FTP, DNS, TFTP, RPC, HTTP (WEB), and SMTP) - Application Content filtering (Java, ActiveX) - Dos/DDoS Protection - IP/TCP fragment attack protection - IP Spoofing Protection - URL Filtering - DMZ

(Continued)

Category	Features and Licenses	
Management	<ul style="list-style-type: none"> - Reporting - Logging 	
Performance	Firewall	<ul style="list-style-type: none"> - Performance: 60 Kpps - Concurrent Sessions: 64 K - Sessions setup rate: 500 sessions/Sec
	VPN	<ul style="list-style-type: none"> - Performance: 80 Mbps - Maximum Tunnels: 200 - Tunnel Setup rate: 3 tunnels/sec

Voice Features

The following table lists the security features supported by iBG1003.

Category	Features and Licenses
System Interface and Signaling	<ul style="list-style-type: none"> - Analog FXS, FXO - Analog DID (Direct Inward Dial) - T1-CAS E & M, FXO, FXS - E1-CAS R2 MFC/DTMF - T1/E1 ISDN PRI Q.931, T1/E1 Q.SIG - T1 R1 - CAMA Trunk
System Features	<ul style="list-style-type: none"> - PSTN Fallback, Survivable Telephony - Call Admission Control (CAC) - FAX over IP - Distinctive dial tone, Distinctive ring - Number Analysis and Routing - Local Voice Busy Out (LVBO) - DTMF Signaling over IP - Early Media Handling - Private Line Automated Ringdown (PLAR) - Audible/Visible MWI for Analog Phone - Hunt-Group (Policy, Transfer, Forwarding) - Station Group - Time Schedule service (time-of-day, day-of-week)

(Continued)

Category	Features and Licenses
Supplementary Services	<ul style="list-style-type: none"> - Caller ID/Name - Call Forwarding always/busy/no-answer - Call Hold/Retrieve - Call Pickup Group/Direct/Universal - Call Transfer Blind/Attended - Call Transfer with 3-way consultation - Call Waiting - Incoming Call Blocking - 3-way conference - N-way conference - Call Park - Follow-Me - Last Number Redial - Do Not Disturb - Call Return - Music-On-Hold - Tone-On-Hold
Protocols	<ul style="list-style-type: none"> - SIP, H.323, RTP/RTCP, cRTP, S/MIME, TLS, sRTP - HTTP Digest Authentication
DSP Features	<ul style="list-style-type: none"> - Codec: G.711, G723.1, G.726, G.729 A - Echo Cancellation (G.168-2002) - Comfort Noise Generation (CNG) - Voice Activity Detection (VAD): G.729AB - Tone-MF/DTMF - Tone-Dial, Ringback, Busy, Congestion, Wait, Hold - Progressing, Howling, Programmable, etc.
Performance	<ul style="list-style-type: none"> - BHCA: 1,500 - CPS: 0.42 - Max Stations: 50 - AHT: 120 - Concurrent Calls: 50



This page is intentionally left blank.



CHAPTER 2. Hardware Overview

Chapter 2 describes the hardware overview.

Ubigate iBG1003 should be installed on a desktop or 19-inch rack. The front side has LED indicators. The rear side has console port, T1/E1 ports, and Fast Ethernet UTP ports. All cabling, including power cable, are installed from the rear side.

Ubigate iBG1003 Routing Engine

The Routing Engine (main board) contains a central processor of the router, core peripherals, memory, and external interfaces including serial management ports, two Fast Ethernet ports, four T1/E1 ports, two USB ports; one voice option slot, and one mini-module slot to accommodate an ADSL module. iBG1003 has an internal slot to accommodate an optional module called IOM (Internal Option Module). With IOM, iBG1003 can support additional enhanced functionality.

Ubigate iBG1003 Chassis

The following figure is an isometric view of the system, with the main chassis without the external enclosure.

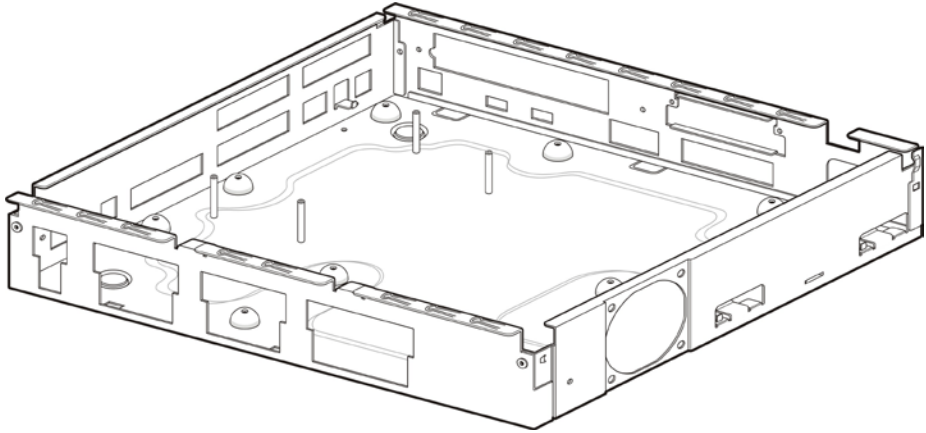


Figure 2.1 Isometric View

Ubigate iBG1003 Boot Sequence

All circuitry within Ubigate iBG1003 is reset to its initial state by the reset circuitry on the main board.

During normal operation, the reset circuitry monitors an internal power supply of the main board and, after it reaches a normal operating level, generates a reset pulse to the routing processor and all of the other circuitry on the main board.

The main board reset circuitry also includes a watchdog timer.

The watchdog timer causes Ubigate iBG1003 reset if the programmed interval elapses without the processor triggering the watchdog.

Ubigate iBG1003 boot is the sequence of software-driven events starting from the reset pulse to the loading and running of the application image.

On reset, the processor starts executing instruction from a specific location in the boot flash. This first software run is the boot loader. After CPU memory controller initialization, the boot loader locates, verifies, and runs a boot image located in the internal flash storage. The boot image then continues with the necessary initialization, decompresses, and moves itself to RAM.

Once the boot image is moved to RAM, control is given to boot software residing in RAM. At this point the additional initialization of hardware and driver software is performed before SNOS (Samsung Network Operating System) can be loaded onto RAM from flash. The SNOS software prepares Ubigate iBG1003 for forwarding packets through the interfaces at which time Ubigate iBG1003 is fully up and running.

There are various software services that support the application software.

These include a file system, logging, monitoring, validation of downloaded image and flash update.

Ubigate iBG1003 Front Side


The front side of the Ubigate iBG1003 has LEDs in order to indicate the system's performance and operation status as shown in figure below.



Figure 2.2 Ubigate iBG1003 Front View

Proper LED status is shown in the following table.

LED Description

LED	Indication & Color	Description
 (Power)	Solid blue	Power supply installed and operating normally.
	Amber	Power supply installed but power fault condition detected.
	Off	Power supply not present or Power supply malfunctioning.
SYS	Solid green	System is operating normally.
	Solid red	System is not operating normally.
	Amber	System diagnostic mode.
	Off	Router is not receiving power.
IOM	Solid green	IOM (Internal Option Module) card present and operational.
	Solid red	IOM card present but not operational.
	Off	IOM card not present.
FAN	Solid green	Fan is operating properly.
	Solid red	Fan present but malfunctioning.
	Off	Fan has been stopped by user configuration.

(Continued)

LED	Indication & Color	Description
P0~P3 (T1/E1)	Solid green	T1/E1 port is operating normally.
	Solid red	T1/E1 port cable is not connected properly or a critical alarm has been detected.
	Amber	User alarm detected.
	Off	System is not operating normally or port is disabled.
Link0, 1 (Ethernet)	Solid green	Ethernet port link is detected.
	Off	Ethernet port link is not detected.
Act0, 1 (Ethernet)	Blinking Amber	Blinking Amber indicates transmit/receive activity with speed 10/100 Mbps.
	Off	No activity.

Ubigate iBG1003 Rear Side

Ubigate iBG1003 rear side has four T1/E1 ports, two Fast Ethernet UTP ports, two FXO ports, two USB ports, and one console port.

Depending on sub-models, iBG1003 has different voice connectors such as four RJ-11 ports for accommodating four FXS ports, one 50-pin champ connector for accommodating 8 or 16 FXS ports, or two RJ-45 ports for accommodating two T1/E1 PRI ports. A model shown in figure below has a 50-pin champ connector for accommodating 8 or 16 FXS ports.

In addition, the rear side has one mini-module slot to accommodate an ADSL module optionally. And two USB ports and one console port are provided in the rear side. Power connector, power switch, and ground stud are also located in the rear side.

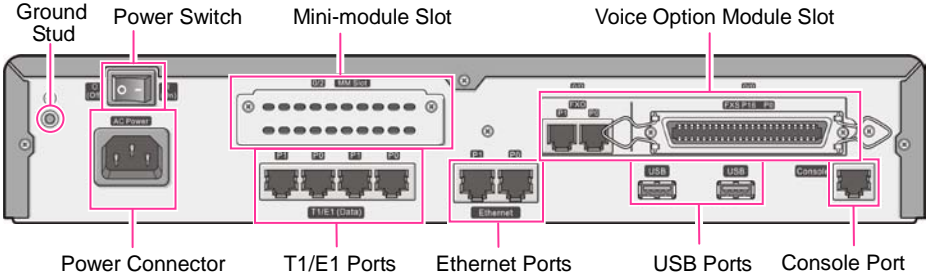


Figure 2.3 Ubigate iBG1003 Rear View

Connector	Description
Ground stud	A screw hole for grounding lug
Power switch	Switch to turn on or off the power supply
Power connector	AC power connector
Mini-module slot	An optional ADSL module can be plugged into this slot.
Voice option module slot	A voice option module can be plugged into this slot. One is pre-assembled in the factory in order to meet different deployment needs. The following voice option modules are present: <ul style="list-style-type: none"> - 2 FXO + 4 FXS - 2 FXO + 8 FXS - 2 FXO + 16 FXS - 2 FXO + 2 T1/E1 - 2 T1/E1 + 4 FXS

(Continued)

Connector	Description
T1/E1 ports	T1/E1 WAN connection
Ethernet ports	Fast Ethernet LAN connection
USB ports	Supports USB 2.0 interface
Console port	Serial port for local monitoring and configuring

Console Port

The console port is an RS-232 asynchronous serial port that operates at up to 9,600 bps. The console port is activated immediately after system resets and allows the system operator to directly control the system using the Command Line Interface (CLI).

USB Port

The Universal Serial Bus (USB) port is USB 2.0 compliant. USB interface (Type A) is configured as a host. This port can accommodate a USB flash memory module which can be used to store a system software or configuration file. It is strongly recommended to use Samsung-certified USB flash memory module on iBG1003. Contact your local Ubigate dealer in order to get a Samsung-certified USB flash memory.

Mini-Modules

ATOP-1 (1-Port ADSL Over POTS Mini-Module)

This mini-module provides ADSL high-speed digital data transfer between a single CPE subscriber and the central office over POTS.

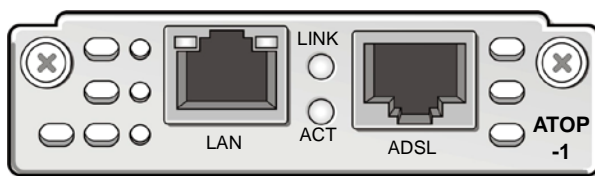


Figure 2.4 ATOP-1 Mini-Module

The following table explains the LEDs states in detail.

ADSL Port LEDs

LED	Indication & Color	Description
LINK	Solid Green	Indicates that the Link is established
	Blinking Green	Indicates that the Link is being established
	Off	Indicates that the port is not enabled
ACT	Solid Green	Indicates that the transmit/receive is not active
	Blinking Green	Indicates that the transmit/receive is active
	Off	Indicates that the port is not enabled

ATOI-1 (1-Port ADSL Over ISDN Mini-Module)

This mini-module provides ADSL high-speed digital data transfer between a single CPE subscriber and the central office over ISDN.

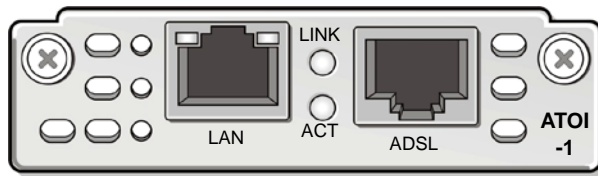


Figure 2.5 ATOI-1 Mini-Module

The following table explains the LEDs states in detail.

ADSL Port LEDs

LED	Indication & Color	Description
LINK	Solid Green	Indicates that the Link is established
	Blinking Green	Indicates that the Link is being established
	Off	Indicates that the port is not enabled
ACT	Solid Green	Indicates that the transmit/receive is not active
	Blinking Green	Indicates that the transmit/receive is active
	Off	Indicates that the port is not enabled

LMF-4M (4-Port Fast Ethernet Mini-Module)

This module provides four 10/100 Base-T Ethernet ports.

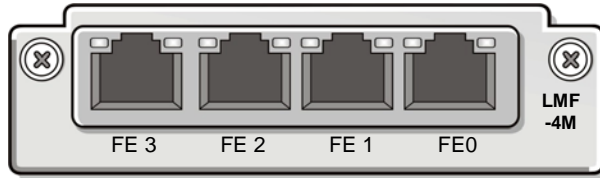


Figure 2.6 LMF-4M Mini-Module

The following table explains the LEDs states in detail.

LED	Indication & Color	Description
Link	Solid Green	Link is established with speed 10/100 Mbps.
	Off	Link failure or no connection.
Activity	Blinking Orange	Blinking orange indicates transmit/receive activity with speed 10/100 Mbps.
	Off	No activities.

Internal Option Module (IOM)

An IOM can be plugged into the IOM slot. An IOM can be used to support additional enhanced applications. (Currently, no IOM is supported. IOMs will be released in the future.)

DSP

iBG1003 has an on-board DSP which is used to process VoIP packets and analog/digital voice signal. Depending on sub-models, iBG1003 supports different DSP channel capacities.

The following table lists the number of channels supported by each sub-model for different CODECs.

CODEC	Number of channels
G.711 10 ms	64
G.711 20 ms	64
G.711 30 ms	64
G.711 40 ms	64
G.711 50 ms	64
G.711 60 ms	64
G.729a 10 ms	16
G.729a 20 ms	16
G.729a 30 ms	16
G.729a 40 ms	16
G.729a 50 ms	16
G.729a 60 ms	16
G.726 10 ms	16
G.726 20 ms	16
G.726 30 ms	16
G.726 40 ms	16
G.726 50 ms	16
G.726 60 ms	16
G.723 30 ms	16
G.723 60 ms	16

The following table shows the information on VoIP data packets generated by each CODEC.

CODEC	Voice payload size		Ethernet packet size (bytes)	Data rate per call	
	Packet interval (ms)	Size (bytes)		Packet/s (Simplex)	Kbps
G.711 (64)	5	40	118	200	188.8
G.711 (64)	20	160	238	50	95.2
G.729a (8)	20	20	98	50	39.2
G.723.1 (6.3)	30	24	102	33.3	27.2
G.723.1 (5.3)	30	20	98	33.3	26.1
G.726 (32)	20	80	158	50	63.2
G.726 (24)	20	60	138	50	55.2

Port Numbering

This section describes the port number conventions used by Ubigate iBG routers.

Ports on a network module are numbered in a format: *network module slot-number/port-number*, and ports on a mini-module are numbered in a format: *network module slot-number/mini-module slot number/port-number*.

Network modules are numbered from right to left, starting with slot number one. If there is more than one row, the bottom row is numbered first, from right to left, starting at slot one, then the next row up is numbered, from right to left, starting with the next slot number based on the lower rows last (left most) numbered slot. The main board is considered as network module slot 0.

Mini-modules are numbered from right to left, starting with slot number zero. If there is more than one row, the bottom row is numbered first, from right to left, starting at slot zero, then the next row up is numbered, from right to left, starting with the next slot number based on the lower rows last (left most) numbered slot.

Ports on any mini-module or network module are numbered from right to left, starting with port number zero. If there is more than one row of ports on a given module, the bottom row is numbered first, from right to left, starting at port zero, then the next row up is numbered, from right to left, starting with the next port number based on the lower rows last (left most) numbered port.

iBG1003 Port Numbering

The main system of an iBG1003 is considered as network module slot 0. Thus, built-in ports on the system such as 4 T1/E1 ports and Ethernet ports are numbered in $0/x$ format. Specifically, the Fast Ethernet ports are numbered 0/0 and 0/1, starting from right to left. Likewise, the T1/E1 ports are numbered 0/0, 0/1, 0/2, and 0/3, starting from right to left.

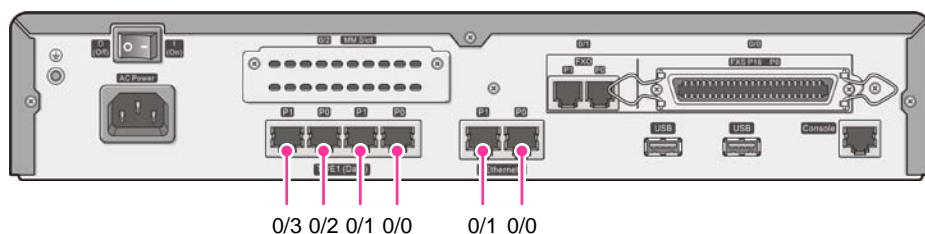


Figure 2.7 iBG1003 Port Numbering

iBG1003's voice option modules are considered to consist of two mini-modules according to the iBG1003 design concept. For instance, in Figure 2.6, a 50-pin champ connector for FXS and two FXO ports are considered two mini-modules. Therefore, iBG1003 has three mini-module slots for the purpose of port numbering. Thus, FXS or voice T1/E1 ports are numbered in $0/0/x$ format. FXO ports are numbered in $0/1/x$ format. The ADSL port in the ADSL module is numbered $0/2/0$.





This page is intentionally left blank.



ANNEX A. Cable Specifications

Console Port Cable

Cable Shape

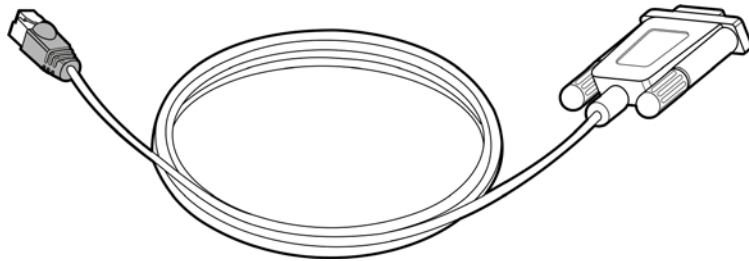


Figure A.1 Console Port Cable

Cable Signaling and Pinout

Console Port (DTE)	RJ-45 to RJ-45 Rollover Cable	RJ-45 to DB-9 Terminal Adapter (connected to Rollover Cable)	Console Device
Signal	RJ-45 Pin	DB-9 Pin	Signal
RTS	1	8	CTS
DTR	2	6	DSR
TxD	3	2	RxD
GND	4	5	GND
GND	5	5	GND
RxD	6	3	TxD
DSR	7	4	DTR
CTS	8	7	RTS

Ethernet Cable

Cable Shape

- Cable Length: 6/10 feet
- Standard, Straight-Through Wiring (both ends are the same)
- 10/100/1000 Base-T interfaces

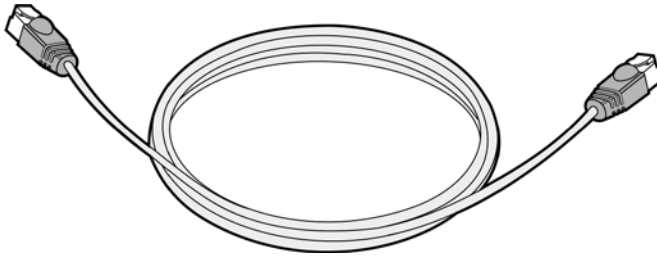


Figure A.2 Ethernet LAN Interface Cable

Cable Signaling and Pinout

RJ45 Pin #	Wire Color (T568A)	1000 Base-T Signal
1	White/Green	BI_DA+
2	Green	BI_DA-
3	White/Orange	BI_DB+
4	Blue	BI_DC+
5	White/Blue	BI_DC-
6	Orange	BI_DB-
7	White/Brown	BI_DD+
8	Brown	BI_DD-

T1/E1 Cable

Cable Shape

- RJ-48C to RJ-48C Cable

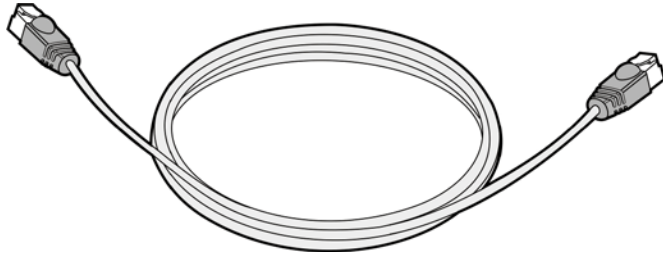


Figure A.3 T1/E1 WAN Interface Cable

Cable Signaling and Pinout

Pin	Signal
1	RXRING
2	RXTIP
4	TXRING
5	TXTIP



Pin	Signal
4	TXRING
5	TXTIP
1	RXRING
2	RXTIP

LMF-4M Port Cable

Cable Shape

- Cable Length: 6/10 feet
- Standard, Straight-Through Wiring (both ends are the same)
- 10/100 Base-T interfaces

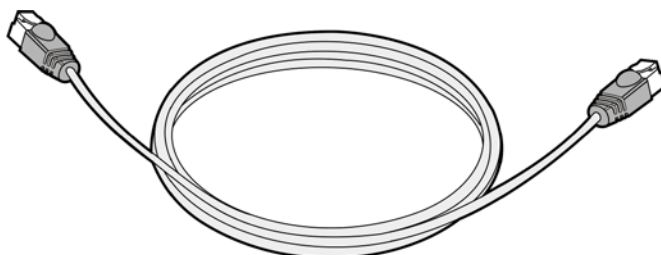


Figure A.4 LMF-4M Port Cable

Cable Signaling and Pinout

RJ45 Pin #	Wire Color (T568A)	1000 Base-T Signal
1	White/Green	BI_DA+
2	Green	BI_DA-
3	White/Orange	BI_DB+
4	Blue	BI_DC+
5	White/Blue	BI_DC-
6	Orange	BI_DB-
7	White/Brown	BI_DD+
8	Brown	BI_DD-

ATOP-1, ATOI-1 Port Cable

Cable Shape

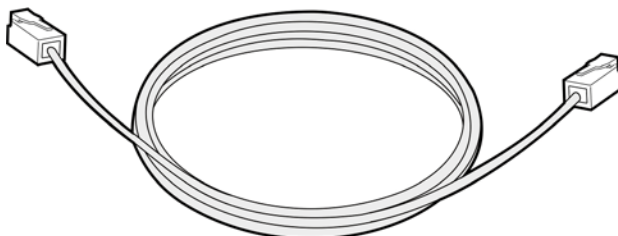


Figure A.5 ATOP-1, ATOI-1 Port Cable

Cable Signaling and Pinout

RJ-11 connector		RJ-11 connector	
Pin	Signal	Signal	Pin
1	-	-	1
2	-	-	2
3	Ring	Ring	3
4	Tip	Tip	4
5	-	-	5
6	-	-	6

RJ-21 Champ Connector Cable

Cable Shape

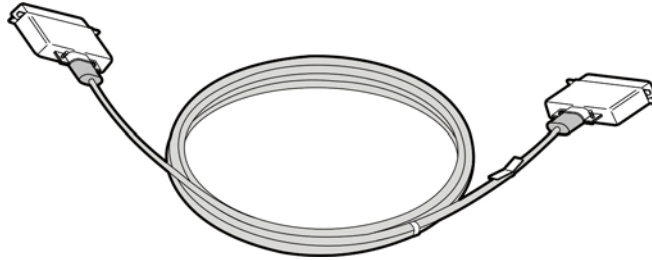


Figure A.6 RJ-21 Champ Connector Cable

Cable Signaling and Pinout

RJ-21 (Left)	RJ-21 (Right)	Signal name	RJ-21 (Left)	RJ-21 (Right)	Signal name
1	1	TIP 1	14	14	TIP 14
26	26	RING 1	39	39	RING 14
2	2	TIP 2	15	15	TIP 15
27	27	RING 2	40	40	RING 15
3	3	TIP 3	16	16	TIP 16
28	28	RING 3	41	41	RING 16
4	4	TIP 4	17	17	-
29	29	RING 4	42	42	-
5	5	TIP 5	18	18	-
30	30	RING 5	43	43	-
6	6	TIP 6	19	19	-
31	31	RING 6	44	44	-
7	7	TIP 7	20	20	-
32	32	RING 7	45	45	-
8	8	TIP 8	21	21	-
33	33	RING 8	46	46	-
9	9	TIP 9	22	22	-
34	34	RING 9	47	47	-
10	10	TIP 10	23	23	-
35	35	RING 10	48	48	-

(Continued)

RJ-21 (Left)	RJ-21 (Right)	Signal name	RJ-21 (Left)	RJ-21 (Right)	Signal name
11 36	11 36	TIP 11 RING 11	24 49	24 49	-
12 37	12 37	TIP 12 RING 12	25 50	25 50	-
13 38	13 38	TIP 13 RING 13	-	-	-

FXO, FXS Port Cable

Cable Shape

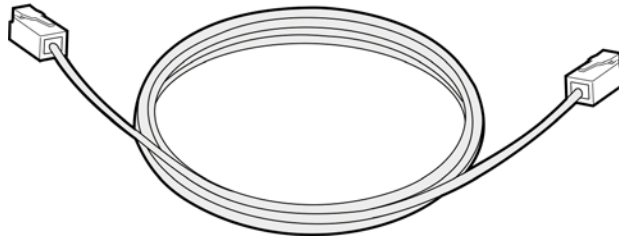


Figure A.7 FXO, FXS Port Cable

Cable Signaling and Pinout

RJ-11 connector		RJ-11 connector	
Pin	Signal	Signal	Pin
1	-	-	1
2	-	-	2
3	Ring	Ring	3
4	Tip	Tip	4
5	-	-	5
6	-	-	6



ANNEX B. Open Source Announcement

Some software components of this product incorporate source code covered under the BSD License, libxml2 License and OpenSSL License etc.

Acknowledgement:

This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (<http://www.openssl.org/>).

The software included in this product contains copyrighted software that is licensed under the GPL/LGPL. You may obtain the complete Corresponding Source code from us for a period of three years after our last shipment of this product by sending email to: nwsmanager@samsung.com

If you want to obtain the complete Corresponding Source code in the physical medium such as CD-ROM, the cost of physically performing source distribution may be charged.

This offer is valid to anyone in receipt of this information.

Below is the list of components covered under BSD License, libxml2 License and OpenSSL License, which were used to develop software running in the main system.

Component	License	Component	License
OpenSSH	BSD License	TCP Dump	BSD License
pppd	BSD License	FreeBSD	BSD License
libxml2	libxml2 License	OpenSSL	OpenSSL License

Below is the list of components covered under the GNU General Public License, the GNU Lesser General Public License, BSD License and OpenSSL License, which were used to develop software running in the ADSL module.

Component	License	Component	License
net-snmp	BSD 2.0	RP PPP OE	GPL 2.0
libupnp	BSD 2.0	ebtables	GPL 2.0
T FTP	BSD 2.0	DNRD	GPL 2.0
Rinecrypt	BSD 2.0	wireless-tools	GPL 2.0
BusyBox	GPL 2.0	ez-ipupdate	GPL 2.0
U-Boot	GPL 2.0	Bridge Utility for Linux	GPL 2.0
GNU Zebra	GPL 2.0	ntpdclient	GPL 2.0
MTD and JFFS2 improvements	GPL 2.0	uClinux(bc2684ctl)	GPL 2.0
ATM on Linux	GPL 2.0	Linux Kernel	GPL 2.0
iptables	GPL 2.0	7 Zip - LZMA SDK	LGPL 2.1
iproute2	GPL 2.0	V Config	LGPL 2.1
squashfs	GPL 2.0	OpenSSL	OpenSSL License

GNU GENERAL PUBLIC LICENSE

Version 2, June 1991

Copyright (C) 1989, 1991 Free Software Foundation, Inc.
51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software--to make sure the software is free for all its users. This General Public License applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by the GNU Lesser General Public License instead.) You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price.

Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the software, or if you modify it. For example, if you distribute copies of such a program, whether gratis or for a fee, you must give the recipients all the rights that you have. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

We protect your rights with two steps:

(1) copyright the software, and (2) offer you this license which gives you legal permission to copy, distribute and/or modify the software. Also, for each author's protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is modified by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents.

We wish to avoid the danger that redistributors of a free program will individually obtain patent licenses, in effect making the program proprietary. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

The precise terms and conditions for copying, distribution and modification follow.

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0 This License applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public License. The "Program", below, refers to any such program or work, and a "work based on the Program" means either the Program or any derivative work under copyright law; that is to say, a work containing the Program or a portion of it, either verbatim or with modifications and/or translated into another language. (Hereinafter, translation is included without limitation in the term "modification".) Each licensee is addressed as "you".

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope.

The act of running the Program is not restricted, and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program). Whether that is true depends on what the Program does.

- 1 You may copy and distribute verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and give any other recipients of the Program a copy of this License along with the Program.
You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.
- 2 You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

- a) You must cause the modified files to carry prominent notices stating that you changed the files and the date of any change.
- b) You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License.
- c) If the modified program normally reads commands interactively when run, you must cause it, when started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions, and telling the user how to view a copy of this License. (Exception: if the Program itself is interactive but does not normally print such an announcement, your work based on the Program is not required to print an announcement.)

These requirements apply to the modified work as a whole.

If identifiable sections of that work are not derived from the Program, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program.

In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

- 3 You may copy and distribute the Program (or a work based on it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the following:
 - a) Accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,
 - b) Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machine-readable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,
 - c) Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for noncommercial distribution and only if you received the program in object code or executable form with such an offer, in accord with Subsection b above.)

The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

If distribution of executable or object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

- 4 You may not copy, modify, sublicense, or distribute the Program except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense or distribute the Program is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.
- 5 You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Program or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Program (or any work based on the Program), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Program or works based on it.

- 6 Each time you redistribute the Program (or any work based on the Program), the recipient automatically receives a license from the original licensor to copy, distribute or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.
- 7 If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Program at all. For example, if a patent license would not permit royalty-free redistribution of the Program by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Program.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system, which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

- 8 If the distribution and/or use of the Program is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.
- 9 The Free Software Foundation may publish revised and/or new versions of the General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of this License, you may choose any version ever published by the Free Software Foundation.

- 10 If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

- 11 BECAUSE THE PROGRAM IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.
- 12 IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

How to Apply These Terms to Your New Programs

If you develop a new program, and you want it to be of the greatest possible use to the public, the best way to achieve this is to make it free software which everyone can redistribute and change under these terms.

To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

<one line to give the program's name and a brief idea of what it does.>
Copyright (C) <year> <name of author>

This program is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program; if not, write to the Free Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA 02110-1301 USA.

Also add information on how to contact you by electronic and paper mail.

If the program is interactive, make it output a short notice like this when it starts in an interactive mode:

Gnomovision version 69, Copyright (C) year name of author
Gnomovision comes with ABSOLUTELY NO WARRANTY; for details type 'show w'.

This is free software, and you are welcome to redistribute it under certain conditions; type 'show c' for details.
The hypothetical commands 'show w' and 'show c' should show the appropriate parts of the General Public License.
Of course, the commands you use may be called something other than 'show w' and 'show c'; they could even be mouse-clicks or menu items--whatever suits your program.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the program,
if necessary. Here is a sample; alter the names:

Yoyodyne, Inc., hereby disclaims all copyright interest in the program 'Gnomovision' (which makes passes at compilers) written by James Hacker.

<signature of Ty Coon>, 1 April 1989
Ty Coon, President of Vice

This General Public License does not permit incorporating your program into proprietary programs. If your program is a subroutine library, you may consider it more useful to permit linking proprietary applications with the library.
If this is what you want to do, use the GNU Lesser General Public License instead of this License.

GNU LESSER GENERAL PUBLIC LICENSE

Version 2.1, February 1999

Copyright (C) 1991, 1999 Free Software Foundation, Inc.
51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

[This is the first released version of the Lesser GPL. It also counts as the successor of the GNU Library Public License, version 2, hence the version number 2.1.]

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public Licenses are intended to guarantee your freedom to share and change free software--to make sure the software is free for all its users.

This license, the Lesser General Public License, applies to some specially designated software packages--typically libraries--of the Free Software Foundation and other authors who decide to use it. You can use it too, but we suggest you first think carefully about whether this license or the ordinary General Public License is the better strategy to use in any particular case, based on the explanations below.

When we speak of free software, we are referring to freedom of use, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish); that you receive source code or can get it if you want it; that you can change the software and use pieces of it in new free programs; and that you are informed that you can do these things.

To protect your rights, we need to make restrictions that forbid distributors to deny you these rights or to ask you to surrender these rights. These restrictions translate to certain responsibilities for you if you distribute copies of the library or if you modify it.

For example, if you distribute copies of the library, whether gratis or for a fee, you must give the recipients all the rights that we gave you. You must make sure that they, too, receive or can get the source code. If you link other code with the library, you must provide complete object files to the recipients, so that they can relink them with the library after making changes to the library and recompiling it. And you must show them these terms so they know their rights.

We protect your rights with a two-step method: (1) we copyright the library, and (2) we offer you this license, which gives you legal permission to copy, distribute and/or modify the library.

To protect each distributor, we want to make it very clear that there is no warranty for the free library. Also, if the library is modified by someone else and passed on, the recipients should know that what they have is not the original version, so that the original author's reputation will not be affected by problems that might be introduced by others.

Finally, software patents pose a constant threat to the existence of any free program. We wish to make sure that a company cannot effectively restrict the users of a free program by obtaining a restrictive license from a patent holder.

Therefore, we insist that any patent license obtained for a version of the library must be consistent with the full freedom of use specified in this license.

Most GNU software, including some libraries, is covered by the ordinary GNU General Public License. This license, the GNU Lesser General Public License, applies to certain designated libraries, and is quite different from the ordinary General Public License. We use this license for certain libraries in order to permit linking those libraries into non-free programs.

When a program is linked with a library, whether statically or using a shared library, the combination of the two is legally speaking a combined work, a derivative of the original library. The ordinary General Public License therefore permits such linking only if the entire combination fits its criteria of freedom. The Lesser General Public License permits more lax criteria for linking other code with the library.

We call this license the "Lesser" General Public License because it does Less to protect the user's freedom than the ordinary General Public License. It also provides other free software developers Less of an advantage over competing non-free programs. These disadvantages are the reason we use the ordinary General Public License for many libraries.

However, the Lesser license provides advantages in certain special circumstances.

For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in non-free programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.

Although the Lesser General Public License is Less protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, whereas the latter must be combined with the library in order to run.

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0 This License Agreement applies to any software library or other program which contains a notice placed by the copyright holder or other authorized party saying it may be distributed under the terms of this Lesser General Public License (also called "this License"). Each licensee is addressed as "you".

A "library" means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables. The "Library", below, refers to any such software library or work which has been distributed under these terms. A "work based on the Library" means either the Library or any derivative work under copyright law: that is to say, a work containing the Library or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language.

(Hereinafter, translation is included without limitation in the term “modification”.) “Source code” for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running a program using the Library is not restricted, and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether that is true depends on what the Library does and what the program that uses the Library does.

- 1 You may copy and distribute verbatim copies of the Library’s complete source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and distribute a copy of this License along with the Library. You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

- 2 You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:
 - a) The modified work must itself be a software library.
 - b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.
 - c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.
 - d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful. (For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.) These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works.
 But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it. Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library. In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

- 3 You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices. Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy. This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

- 4 You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.
 If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

- 5 A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a ‘work that uses the Library’. Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

ANNEX B. Open Source Announcement

However, linking a ‘work that uses the Library’ with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a ‘work that uses the library’. The executable is therefore covered by this License. Section 6 states terms for distribution of such executables. When a ‘work that uses the Library’ uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a “work that uses the Library” with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer’s own use and reverse engineering for debugging such modifications. You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:
 - a) Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable “work that uses the Library”, as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)
 - b) Use a suitable shared library mechanism for linking with the Library.
A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user’s computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.
 - c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.
 - d) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.
 - e) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.
For an executable, the required form of the “work that uses the Library” must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.
7. You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things:
 - a) Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities. This must be distributed under the terms of the Sections above.
 - b) Give prominent notice with the combined library of the fact that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.

- 8 You may not copy, modify, sublicense, link with, or distribute the Library except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense, link with, or distribute the Library is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.
- 9 You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Library or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Library (or any work based on the Library), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Library or works based on it.
- 10 Each time you redistribute the Library (or any work based on the Library), the recipient automatically receives a license from the original licensor to copy, distribute, link with or modify the Library subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties with this License.
- 11 If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Library at all. For example, if a patent license would not permit royalty-free redistribution of the Library by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Library. If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply, and the section as a whole is intended to apply in other circumstances.
- It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice. This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.
- 12 If the distribution and/or use of the Library is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Library under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.
- 13 The Free Software Foundation may publish revised and/or new versions of the Lesser General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.
- Each version is given a distinguishing version number. If the Library specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Library does not specify a license version number, you may choose any version ever published by the Free Software Foundation.
- 14 If you wish to incorporate parts of the Library into other free programs whose distribution conditions are incompatible with these, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

- 15 BECAUSE THE LIBRARY IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE LIBRARY, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE LIBRARY "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE LIBRARY IS WITH YOU. SHOULD THE LIBRARY PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE LIBRARY AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE LIBRARY (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE LIBRARY TO OPERATE WITH ANY OTHER SOFTWARE), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

How to Apply These Terms to Your New Libraries

If you develop a new library, and you want it to be of the greatest possible use to the public, we recommend making it free software that everyone can redistribute and change. You can do so by permitting redistribution under these terms (or, alternatively, under the terms of the ordinary General Public License).

To apply these terms, attach the following notices to the library. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

one line to give the library's name and an idea of what it does.

Copyright (C) year name of author

This library is free software; you can redistribute it and/or modify it under the terms of the GNU Lesser General Public License as published by the Free Software Foundation; either version 2.1 of the License, or (at your option) any later version.

This library is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.

See the GNU Lesser General Public License for more details.

You should have received a copy of the GNU Lesser General Public License along with this library; if not, write to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA. Also add information on how to contact you by electronic and paper mail.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the library, if necessary. Here is a sample; alter the names:

Yoodyne, Inc., hereby disclaims all copyright interest in the library 'Frob' (a library for tweaking knobs) written by James Random Hacker.

Signature of Ty Coon, 1 April 1990 Ty Coon, President of Vice

That's all there is to it!

libxml2 License

Except where otherwise noted in the source code (e.g., the files hash.c, list.c and the trio files, which are covered by a similar licence but with different Copyright notices) all the files are:

Copyright (C) 1998-2003 Daniel Veillard. All Rights Reserved.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE DANIEL VEILLARD BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Except as contained in this notice, the name of Daniel Veillard shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Software without prior written authorization from him.

LICENSE ISSUES

=====

The OpenSSL toolkit stays under a dual license, i.e., both the conditions of the OpenSSL License and the original SSLeay license apply to the toolkit. See below for the actual license texts. Actually both licenses are BSD-style Open Source licenses. In case of any license issues related to OpenSSL please contact openssl-core@openssl.org.

OpenSSL License

Copyright (c) 1998-2004 The OpenSSL Project. All rights reserved.
 Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgment:
 "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (<http://www.openssl.org/>)"
4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact openssl-core@openssl.org.
5. Products derived from this software may not be called "OpenSSL" nor may "OpenSSL" appear in their names without prior written permission of the OpenSSL Project.
6. Redistributions of any form whatsoever must retain the following acknowledgment:
 "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (<http://www.openssl.org/>)"

THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

This product includes cryptographic software written by Eric Young (eay@cryptsoft.com). This product includes software written by Tim Hudson (tjh@cryptsoft.com).

Original SSLeay License

Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)
 All rights reserved.

This package is an SSL implementation written by Eric Young (eay@cryptsoft.com).
 The implementation was written so as to conform with Netscapes SSL.

This library is free for commercial and non-commercial use as long as the following conditions are adhered to. The following conditions apply to all code found in this distribution, be it the RC4, RSA, lhash, DES, etc., code; not just the SSL code. The SSL documentation included with this distribution is covered by the same copyright terms except that the holder is Tim Hudson (tjh@cryptsoft.com).

Copyright remains Eric Young's, and as such any Copyright notices in the code are not to be removed. If this package is used in a product, Eric Young should be given attribution as the author of the parts of the library used.

This can be in the form of a textual message at program startup or in documentation (online or textual) provided with the package.

ANNEX B. Open Source Announcement

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgement:
“This product includes cryptographic software written by Eric Young (eay@cryptsoft.com)”
The word ‘cryptographic’ can be left out if the routines from the library being used are not cryptographic related: -).
4. If you include any Windows specific code (or a derivative thereof) from the apps directory (application code) you must include an acknowledgement: “This product includes software written by Tim Hudson (tjh@cryptsoft.com)”

THIS SOFTWARE IS PROVIDED BY ERIC YOUNG “AS IS” AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

The license and distribution terms for any publicly available version or derivative of this code cannot be changed. i.e., this code cannot simply be copied and put under another distribution license **[including the GNU Public Licence.]**

BSD License

Copyright (c) 2000-2003 Intel Corporation
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- Neither name of Intel Corporation nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS “AS IS” AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL INTEL OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.



ABBREVIATION

A

AES Advanced Encryption Standard

C

CLI Command Line Interface
 CPE Customer Premises Equipment

D

DDR SDRAM Double Data Rate Synchronous Dynamic Random Access
 Memory
 DVMRP Distance Vector-Multicast Routing Protocol

F

FR Frame Relay
 FTP File Transfer Protocol

G

GRE Generic Routing Encapsulation
 GUI Graphic User Interface

H

HDLC High-level Data Link Control

ABBREVIATION

I

IGMP	Internet Group Management Protocol
IP	Internet Protocol
IPSec	Internet Protocol Security

L

L2TP	Layer 2 Tunneling Protocol
LAN	Local Area Network
LLQ	Low-Latency Queuing

M

MAC	Media Access Control
-----	----------------------

O

OSPF	Open Shortest Path First
------	--------------------------

P

PIM	Protocol Independent Multicast
PIM-SM	Protocol Independent Multicast-Sparse Mode
PIM-SSM	Protocol Independent Multicast-Specific Source Multicast
PPP	Point to Point Protocol

Q

QoS	Quality of Service
-----	--------------------

R

RIP	Routing Information Protocol
-----	------------------------------

S

SNMP	Simple Network Management Protocol
SODIMM	Small Outline Dual In-line Memory Module

T

TCP	Transmission Control Protocol
TFTP	Trivial File Transfer Protocol

U

UTP	Unshielded Twisted Pair
-----	-------------------------

V

VLAN	Virtual Local Area Network
VPN	Virtual Private Network

W

WAN	Wide Area Network
-----	-------------------



This page is intentionally left blank.



INDEX

C

Console Port 2-7

E

E1 WAN Interface 1-4

Ethernet LAN Interface 1-5

I

Interfaces 1-4

P

Performance and

Scalability..... 1-1

Power Supply..... 1-6

Product Specifications 1-3

S

Security 1-2

T

T1 WAN Interface1-4

U

Ubigate iBG1003 Boot

Sequence2-3

Ubigate iBG1003

Chassis.....2-2

Ubigate iBG1003

Front Side2-4

Ubigate iBG1003

Rear Side2-6

Ubigate iBG1003

Routing Engine.....2-1

USB Port2-7

V

Versatility1-1



This page is intentionally left blank.

WEEE SYMBOL INFORMATION



Correct Disposal of This Product (Waste Electrical & Electronic Equipment)

(Applicable in the European Union and other European countries with separate collection systems)

This marking on the product, accessories or literature indicates that the product and its electronic accessories (e.g. charger, headset, USB cable) should not be disposed of with other household waste at the end of their working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take these items for environmentally safe recycling.

Business users should contact their supplier and check the terms and conditions of the purchase contract. This product and its electronic accessories should not be mixed with other commercial wastes for disposal.

BATTERY SYMBOL INFORMATION



Correct disposal of batteries in this product

(Applicable in the European Union and other European countries with separate battery return systems.)

This marking on the battery, manual or packaging indicates that the batteries in this product should not be disposed of with other household waste at the end of their working life. Where marked, the chemical symbols Hg, Cd or Pb indicate that the battery contains mercury, cadmium or lead above the reference levels in EC Directive 2006/66.

If batteries are not properly disposed of, these substances can cause harm to human health or the environment.

To protect natural resources and to promote material reuse, please separate batteries from other types of waste and recycle them through your local, free battery return system.

Ubigate iBG1003™ System Description

© 2009–2010 Samsung Electronics Co., Ltd.
All rights reserved.

Information in this manual is proprietary to SAMSUNG
Electronics Co., Ltd.

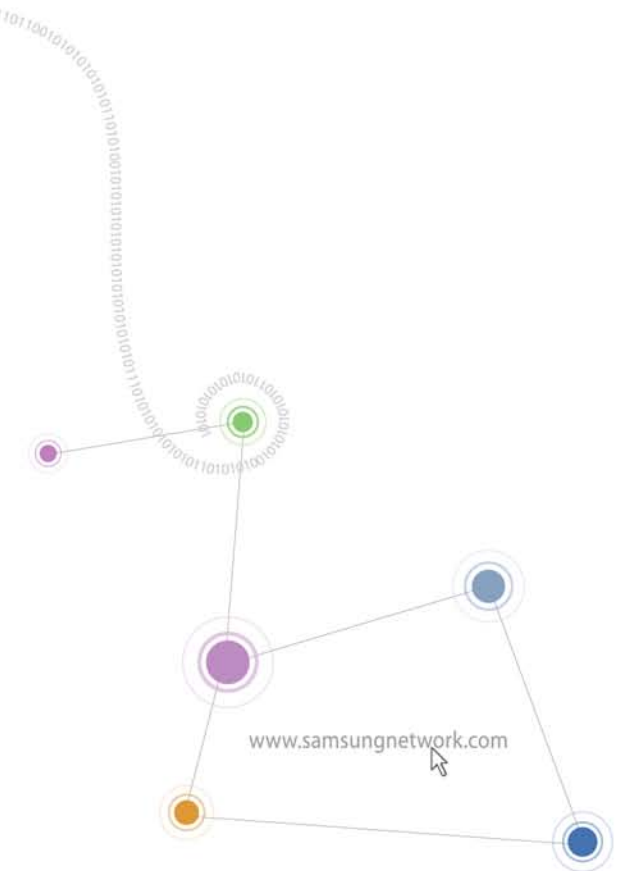
No information contained here may be copied, translated,
transcribed or duplicated by any form without the prior written
consent of SAMSUNG.

Information in this manual is subject to change without notice.



Experience the power of one
Ubiquitous iBG1003™

Installation Manual



Homepage
www.samsungnetwork.com

