

# *HIGH* *Speed* *SURFING*

## **User Manual**



*SurfingMachine*  
**SM-100**

# **Surfing Machine™ SM-100 Cable Modem Installation Manual**

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## 1. Introduction

### **Congratulations on the purchase of your *Surfing Machine™* cable modem.**

Your *Surfing Machine™* is a true cable modem (MODulator-DEModulator) that connects your PC or Ethernet LAN to the Internet and to other multimedia services and networks through your cable TV network at a high-speed transfer rate. Your *Surfing Machine™* not only frees up your telephone lines but gives you unprecedented transmission speeds for accessing the Internet, the World Wide Web, interactive communications, e-mail, file transfers, and data downloads and uploads.

Depending on your cable service's performance, your *Surfing Machine™* will provide downstream (receiving) and upstream (sending) data speeds up to 50 times faster than the fastest 56kbps dial-up (telephone) modem.

Since the cable modem is always on, you can access the Internet, your e-mail, and VPNs (Virtual Private Networks) at your fingertips.

## 2. Intellectual Property Rights

All intellectual property related to this *Surfing Machine*<sup>TM</sup>, as defined below, owned by or which is otherwise the property of HighSpeed Surfing, Inc., or its suppliers, including but not limited to accessories, parts, or software relating thereto (the cable modem system), is proprietary according to federal laws, state laws, and international treaty provisions.

Intellectual property includes, but is not limited to, inventions (patentable or unpatentable), patents, trade secrets, copyrights, software, computer programs, and related documentation and other works of authorship.

You may not infringe on or otherwise violate the intellectual property rights.

Moreover, you agree you will not (and will not attempt to) modify, prepare derivative works of, reverse engineer, decompile, disassemble, or otherwise attempt to create source code from the software.

No title or ownership of intellectual property is transferred to you.

All applicable rights of intellectual property shall remain with HighSpeed Surfing, Inc., and its suppliers.

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### 3. Minimum End-User Software License Terms

**Each end-user sublicense agreement contains terms that are legally sufficient to declare the following:**

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- b) Further copying is prohibited.
- c) Transfer of the licensed software is prohibited.
- d) Reverse assembly, reverse compilation, or other translation of licensed software or any portion thereof is prohibited.
- e) Export of the licensed software in violation of United States and other national laws is prohibited.

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- b) "The software provided hereunder may contain or be derived from portions of materials provided to HSS<sup>TM</sup> under license by a third-party supplier."

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- c) "In no event shall HSS<sup>TM</sup> or its suppliers be liable for special, incidental, consequential, or punitive damages, including, without limitation, damages for lost profits or data, even if such damages were foreseeable."
- d) "The limitations on liability set forth in this agreement are cumulative and are intended and acknowledged by end user to benefit HSS<sup>TM</sup> and third-party suppliers. "

## 4. Rules for Safe Operation

This section provides important information that will help ensure your enjoyment and proper use of the cable modem and its accessory equipment. Please read this section carefully before operating your modem.

**Read and Follow Instructions** - Read all of the safety and operating instructions before operating the modem. Follow all operating instructions.

**Retain Instructions** - Save all of the safety and operating instructions for your future reference.

**Heed Warnings** - Comply with all warnings on the products and in the operating instructions.

**Check Power Sources** - Operate this product only from the type of power source indicated on the product's label. If you are not sure of the type of power supplied to your home, consult your dealer or local power company.

**Do Not Overload** - Do not overload wall outlets or extension cords, as this can result in a risk of fire or electric shock. Overloaded AC outlets, extension cords, frayed power cords, damaged or cracked wire insulation, and broken plugs are dangerous. They may result in a shock or fire hazard.

**Protect and Check Power Cords** - Route power supply cords so that they are not likely to be walked on or pinched by items placed upon or against them. Periodically examine the cord, and, if its appearance indicates damage or deteriorated insulation, have it replaced by your service technician.

Pay particular attention to cords where they are attached to plugs, and examine the points where they exit from the product.

**Check Ventilation** - Slots and openings in the enclosure are provided for ventilation to ensure reliable operation of the

product and to protect it from overheating. Do not block or cover these openings.

Never block these openings by placing the product on a bed, sofa, rug, or other similar surface. Do not place this product in a "built-in" configuration, such as in a bookcase or an equipment rack, unless you provide proper ventilation.

**Do Not Use Accessories** - Do not use accessories that have not been recommended by HSS™, as they may be electrical or fire hazards.

**Use the Recommended AC Adaptor** - Use the adaptor that came with your HSS™ cable modem.

**Do Not Use Near Water** - Do not use this product near water (for example, near a bathtub or sink, in a wet basement, or near a swimming pool).

**Do Not Place Near Heat Sources** - Never place this product near or over a radiator or heat register, or near any other heat source (including amplifiers).

**Use Caution in Mounting This Product** - Do not place this product on an unstable surface or support. The product may fall, causing serious injury to a child or adult, as well as serious damage to the product.

**Use Care in Moving Product-and-Cart Combinations** - Avoid sudden stops, excessive force, and uneven surfaces, which may cause the product-and-cart combination to overturn.

**Ground the Cable System** - Be sure that the outside cable system is grounded, so as to provide some protection against voltage surges and build-up of static charges.

Section 810 of the U.S. National Electric Code, ANSI/NFPA No. 70-1984 (Section 54 of the Canadian Electrical Code, Part

1) provides information with respect to proper grounding of the cable system.

**Do not disconnect the RF (Radio Frequency) cable from your cable modem while the power to your modem is on.**

**Unplug Power Before Cleaning** - Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.

**Keep Objects Out of Openings** - Never push objects of any kind into this product through openings, as they may make contact with dangerously high voltages or "short out" parts, which could result in a fire or electric shock. Never spill liquid on the product.

**Protect From Lightning** - Unplug the product from the wall outlet and disconnect the cable system in the event of a lightning storm (or when the product will be left unattended and unused for long periods of time). This will reduce the risk of damage due to lightning and power line surges.

Wait at least 10 seconds after unplugging the AC adapter before plugging it back in.

**Do Not Remove Covers** - Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

**Unplug the product from the wall outlet carefully, as the AC adapter may be hot.**

**Refer servicing to qualified service personnel under the conditions listed below:**

- When the power supply cord or plug is damaged
- If liquid has been spilled or objects have fallen into the product
- If the product has been exposed to rain or water



- If the product does not operate normally after following the operating instructions
- If the product has been dropped or the cabinet has been damaged
- When the product exhibits a distinct change in performance, such as the inability to perform basic functions--this indicates a need for service

**Require Safety Checks After Service** - Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in safe operating condition.

## 5. Installing the Cable Modem

### 5.1 Installation Requirements

Your *Surfing Machine*<sup>TM</sup> requires the following hardware and system configurations:

- **Cable TV network service (CATV)**

If you do not have cable TV network service in your home or office, you will need to contact your local CATV provider and arrange for installation of CATV network service.

- **CATV modem connectivity**

Not every CATV network is presently equipped to offer its subscribers cable modem applications. If your cable TV provider cannot offer the service at this time, ask when it will be available.

- **Ethernet Network Card (NIC)**

An Ethernet Network Card such as NetGear<sup>TM</sup> FA310TX, D-Link DFE-530TX, Linksys<sup>TM</sup> USB 10T, or another adapter supported by your operating system must be installed on your computer.

- **Windows 95/98, Windows NT, Windows 2000, Linux, or Unix operating system**

## 5.2 Inventory

Your *Surfing Machine™* package should contain the following items:

1. *Surfing Machine™* cable modem 1
2. Modem AC adapter 1
3. RJ-45 Ethernet cable 1
4. Installation manual (this manual) 1

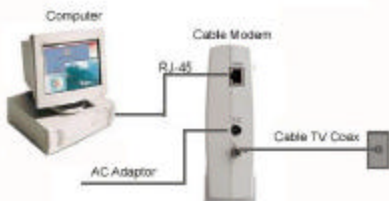


### 5.3 Installation Instructions

To avoid overheating, allow at least one inch of space between the ventilation holes and any object to either side of the unit. The top of the unit should be at least two inches from any obstruction.

Connect the cable modem using the following steps, referring to the figure below.

1. Connect the cable TV coax cable from the wall plate to the cable modem's RF input connector (on the rear panel).
2. Connect the 10Base-T signal cable (RJ-45) from your computer to the cable modem's 10Base-T connector (on the rear panel).
3. Connect the AC adaptor to the cable modem's DC IN 12V 1A jack (on the rear panel). Then plug the AC adaptor into the wall electrical outlet.



The power indicator LED on the modem's front panel will light up if power is present at the outlet. The modem will start operating once power is connected. No additional operator intervention is required. The cable modem will automatically find the data channel, register, and connect to your computer.

Check the cable modem status by looking at the indicator lights (LEDs) on the front panel (see 5.4, Getting Acquainted with the Cable Modem).

## 5.4 Getting Acquainted with the Cable Modem

The cable modem has five status LEDs for diagnostics. You can monitor the LEDs during installation and operation.

### **Surfing Machine™ Front Panel, LED Indicator Lights**

The front panel has five LED lights that indicate the operating status of your *Surfing Machine™*'s functions:



When you power up the *Surfing Machine™*, all the LEDs flash to indicate that the modem is automatically performing self-diagnostic routines.

*NOTE: When your Surfing Machine™ is on and in a fully operational state, the top three LEDs should be green and illuminated continuously. The Data LED should flash when data is being transmitted or received. The Test LED should only be on when the modem is initially powered up.*

The following list explains each of the cable modem status LEDs. This list will help you to diagnose problems.

### **Power LED**

- After the cable modem is turned on and the diagnostics are completed, the green Power LED is illuminated and remains continuously lighted while the modem is operational.

### **Cable LED**

- The Cable LED is off when no downstream RF carrier is present or when the power is off.
- A slowly flashing green LED indicates that a downstream RF carrier is present and that ranging is in progress.
- A rapidly flashing green LED indicates that registration is in progress.
- A solid green LED indicates that the cable modem is registered and ready to transfer data.

### **PC LED**

- The PC LED is off when no Ethernet carrier is present or when the power is off.
- A solid green LED indicates that an Ethernet carrier is present.

### **Data LED**

- The Data LED is off when there is no data movement through the cable modem or when the power is off.
- A flashing green LED indicates that data is being transmitted and received through the cable modem.

### **Test LED**

- The Test LED is off when the initial self-test of the cable modem is OK or when the power is off.
- A flashing LED indicates that the initial self-test of the cable modem is in progress, or that cable modem software downloading is in progress.
- A solid LED indicates a failure of the cable modem self-test.

## 6. Troubleshooting

### 1. Parts are missing.

Contact HighSpeed Surfing, Inc. (see page 2).

### 2. All LEDs on the front panel are off.

See front panel diagram on page 12.

- Check the power connection to make sure the cable modem is properly plugged in.

### 3. The Power LED is off.

- Check the power outlet.

*For the following conditions, contact your CATV operator or retailer:*

- The power adapter may be defective.
- The cable modem may be defective.
- The Power LED may be defective.

### 4. The PC LED is off.

- There is no power to the PC. Check the power outlet.
- The cable to the Ethernet link is not connected.
- The Ethernet adapter may not be properly configured. (Contact the Ethernet adapter manufacturer. If the adapter was supplied by your CATV provider, contact your CATV provider.)

### 5. I'm having problems connecting to the Internet.

See Installation Instructions on page 11.

**6. After several attempts, the cable modem still will not operate properly.**

Unplug the power adapter plug from the back of the cable modem and wait 20 seconds. Plug the power adapter back into the modem. The cable modem will restart.

If these actions do not remedy the problem, call the HighSpeed Surfing, Inc., Helpline at (800) 757-7001. The Helpline staff can resolve problems and recommend service when needed.



## **Appendix A: Cable Modem FAQs**

### **How does a cable modem work?**

High and low electrical voltage levels represent digital signals. How fast these levels can switch and still be transmitted is determined by the "bandwidth" of the transmission system. The pair of wires used in a telephone connection has greatly limited bandwidth because of its electrical characteristics. So we connect a device called a modem between the computer output and the phone line. The modem generates an electrical wave whose strength and phase change in step with the highs and lows of the computer's digital output. The "smoothness" of the resulting signal allows data to be transmitted at a higher rate.

A cable modem MODulates and DEModulates electrical signals in the same sense that the telephone modem does. However, since coaxial cables can carry much higher wave frequencies, cable modems are far more sophisticated. Cable modems can contain a tuner, a bridge, a router, an encryption/decryption device, an SNMP agent, and an Ethernet hub. Furthermore, none of the activity caused by these circuits and codes disturbs your regular cable TV reception.

### **How does a cable modem connect to a computer?**

The 10Base-T Ethernet connection used in this cable modem is emerging as the most popular type of connection. This connection has been used for years to allow business computers to talk to each other in a LAN (Local Area Network).

An Ethernet card must be installed in your computer for the cable modem to work.

### **What is DOCSIS?**

Data Over Cable Service Interface Specifications (DOCSIS) defines interface requirements for cable modems involved in high-speed data distribution over a cable television network. On November 17,

1997, Cable Television Laboratories, Inc. (Cable Labs), and its members established a formal path of certification for cable modem equipment suppliers to obtain interoperability seals for their products based on DOCSIS specifications. This certification process provides cable modem equipment suppliers with a fast, market-oriented method for attaining cable industry acknowledgment of compliance with DOCSIS.

The seal is meant to give purchasers confidence that their modem equipment complies with specifications, and that their equipment inter-operates with DOCSIS products made by other vendors.

### **What do I need in order to use a cable modem?**

- a cable operator that provides DOCSIS high-speed data service
- a computer (the cable modem is platform-independent)
- a standard 10Base-T Ethernet connection (installed on your computer)

### **Can I watch cable TV while using a cable modem?**

Yes, your cable wire is split at your home so you can do both at the same time.

### **Can I have cable modem service but not subscribe to cable TV?**

Yes, you may have one or both.

## How much faster is a cable modem connection than other Internet connections?

A cable modem connection is many times faster than other Internet connections. Cable modems transfer data with a maximum downstream data flow rate of 40Mbps. You can usually expect a 4-10Mbps steady downstream data flow. Take a 10MB file as an example.

MODEM SPEED/TYPE		TRANSFER TIME	
9.6Kbps	Telephone Modem	2.3	Hours
14.4Kbps	Telephone Modem	1.5	Hours
28.8Kbps	Telephone Modem	46	Minutes
56Kbps	Telephone Modem	24	Minutes
128Kbps	ISDN Modem	10	Minutes
1.54Mbps	T1 Connection	52	Seconds
4Mbps	Cable Modem	20	Seconds
10Mbps	Cable Modem	8	Seconds

*Transfer Rate for a 10-Megabyte File*

## How long does it take to log on?

Your cable modem is always on; the connection is always open, so you never have to wait for a slow log-on procedure.

## Appendix B: Product Specifications

Your *SM-100 Surfing Machine™* cable modem is **CableLabs® Certified™**.

### Downstream

Demodulation:	64QAM/256QAM
Physical speed:	30Mbps (64QAM)/40Mbps (256QAM)
Error correction:	Reed Solomon + Trellis (Enhances Annex B)
Frequency range:	88 MHz to 860 MHz (edge-to-edge) in 62.5 kHz steps
Bandwidth:	6 MHz
Input signal level:	-15 dBmV to +15 dBmV
Input impedance:	75 ohms
Return loss:	> 6 dB from 88 MHz to 860 MHz

### Upstream

Demodulation:	QPSK/16QAM
Physical speed:	320, 640, 1280, 2560, 5120Kbps (QPSK) 640, 1280, 2560, 5120, 10240Kbps (16QAM)
Error correction:	Reed Solomon
Frequency range:	5 to 42 MHz (edge-to-edge), in 1 Hz steps
Bandwidth:	200, 400, 800, 1600, 3200 kHz
Output signal level:	8 dBmV to 58 dBmV (QPSK) 8 dBmV to 55 dBmV (16QAM)

### SNMP Management

MIB group:	MIB II, MCNS MIB
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### Interface

DTE:	IEEE802.3/10Base-T
Cable:	F type female 75ohm

## **Power**

Modem power input: 12V DC  
Power consumption: 8 W (max)

## **Mechanical**

Size: 1.96 in. (width) x 8.07 in. (depth) x 5.96 in. (height)  
Weight: 2.1 lb.

## **Environmental**

Operating temperature: 0° to 40° Fahrenheit  
Humidity: 10% to 90% (non-condensing)  
Storage temperature: -20° to 60°  
Safety: UL1310, UL1950  
Emissions: FCC Part 15, Class B

## Appendix C: FCC Compliance

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

- Reorient or relocate the receiving antenna of the radio/TV.
- Increase the distance between the cable modem and the radio/TV receiver.
- Plug the cable modem into an outlet that does not share the same circuit as the radio/TV.