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Introduction

Motorola's DOCSIS 3.0 Modem includes a number of major enhancements including channel bonding and IPv6. Motorola's DOCSIS 3.0 modems support DOCSIS 1.x, 2.0, and new 3.0 features.

DOCSIS 3.0 provides a number of enhancements earlier versions of DOCSIS, but most notably, channel bonding. Channel bonding enables multiple downstream and upstream channels to be "virtually-bonded" together to be used by a single subscriber. This increases downstream speeds up to 1 Gbps, and upstream throughput up to a minimum rate of 120 Mbps. Additionally, DOCSIS 3.0 supports IPv6and Internet Protocol Television (IPTV).

IPv6 greatly expands the number of Internet addresses that operators may use.

This document was developed to assist all Technical Operations employees with the proper steps of installing, configuring, and troubleshooting the Motorola SB6121 modem.

Installation

The serial number and equipment address can be found on the bottom of the modem. These items will need to be entered into CSG in order for the gateway to operate.

CSG Field	Motorola SB6121 modem
SERIAL NUMBER	HFC MAC ID

Additional Warehouse Information

CSG Equipment Type: M1

CSG Equipment Model: SB6121

CSG Equipment Mode: 0

Installation Procedure

Connect one end of the power adapter into the modem and the other end into power outlet or surge protector.

Connect an active coax cable.

Connect the primary computer to Ethernet port on the modem using a Cat 5 Ethernet cable.

Do not set the modem in an enclosed area, near large appliances, UPS (uninterrupted power supplies), microwaves, computer monitors or 2.4GHz cordless phones.

Rear Panel Connections

1. An RJ-45 Ethernet port to connect the modem to the computer

2. F-connector connects to an active cable drop

3. Connects the modem to the power adapter

Front Panel Display

The front panel LEDs should be used during installation, configuration, and troubleshooting. Use them as a visual reference for how and what the modem is performing.

Key	Light	Off	Flashing	On
1	POWER	Power is disconnected	This light should not flash	Green: Power is properly connected
2	RECEIVE	Receive channel not found	Scanning for a receive (downstream) channel	Green: Downstream channel is connected Blue: Downstream channel is connected with bonded channels
3	SEND	Send channel not found	Scanning for a send (upstream) channel	Green: Upstream channel is connected Blue: Upstream channel is connected with bonded channels
4	ONLINE	Internet connection failed	Scanning for configuration parameters	Connected to the Internet
5	LINK	No connection to the SB6121 Ethernet port is detected	Transmitting or receiving data on the Ethernet port	Amber: A device, computer, or hub is connected via the Ethernet (10Base-T) or Fast Ethernet (100Base-T) port Blue: High-speed Gigabit Ethernet connection to the PC
6	Power	Powers on and off the cable modem		
During normal operation, the POWER, RECEIVE, SEND, and ONLINE lights are ON. The LINK light flashes when the cable modem is transferring data.				

Start-Up Sequence

The SB6121 goes through a series of steps when first connected to power and RF signal.

The SB6121 start-up steps are:

A. Power On Self Test (POST). If LED remains off, modem is faulty.

B. Scanning downstream frequencies.

C. Scanning upstream frequencies.

D. Downstream and upstream acquired. Modem processing for DHCP, TFTP, and TOD.

E. Ready. PC/Activity is solid when a CPE is connected and blinks when transmitting or receiving data.

F. Powered off.

G. Modem is successfully registered but Network Access Control (NACO) is disabled via DOCSIS® configuration file.

H. Performing firmware upgrade

DOCSIS 3.0 modems have dual-colored LEDs to visually determine if channel bonding and Gigabit Ethernet is enabled.

Troubleshooting Tips

Rule out RF

Use the front panel LEDs as well as a SLM to rule out potential signal issues. If the RF levels are acceptable, most issues can be corrected by restarting the cable modem. To restart the Motorola SB6121:

1. Shutdown the computer

2. Unplug the cable modem from power and wait approximately 1 minute.

3. Plug the cable modem back into power.

4. Observer the LED light up sequence as detailed above.

5. Restart the computer.

LEDs and Error conditions

Light	Turns off during Startup:	Turns off during normal operation:
RECIEVE	The downstream (RECEIVE) channel cannot be acquired.	The downstream channel was lost.
SEND	The upstream (SEND) channel cannot be acquired.	The upstream channel was lost.
ONLINE	IP registration was unsuccessful.	IP registration was lost.
POWER	Verify the power connection.	Verify the power connection.

Troubleshooting Tips

- Release and Renew the IP address on computer if its unable to access the internet or the modem's setup page

- Reboot the computer

- Disable the proxy settings in the computer's web browser, and temporarily disable any firewall software during the setup of the gateway.

- Always use straight-through cables, not cross over cables

User Guides, Drivers, and Datasheets can be found at:

http://broadband.motorola.com/consumers/support