



# SURFboard® SB6120

## DOCSIS® 3.0 / Euro-DOCSIS 3.0 Cable Modems

The Motorola SURFboard Cable Modem (SB6120) is DOCSIS 3.0 certified and Euro-DOCSIS 3.0 based. It introduces channel bonding of up to 4 downstream channels and 4 upstream channels allowing operators to offer their customers advanced multimedia services with data rates of well over 100 Mbps in each direction – without upgrading their HFC plant. The SB6120 supports all DOCSIS 3.0 features including channel bonding, IPv6, and Advanced Encryption Services.

### Highlights

Compatible with Windows®, Macintosh®, and UNIX® computers

DOCSIS 3.0 Certified and Euro-DOCSIS 3.0 based, featuring:

- Channel bonding of up to 4 downstream channels and 4 upstream channels increasing data rates of well over 100 Mbps in each direction
- Supports IPv4 and IPv6 to expand network addressing capabilities
- Enhanced security: supports AES traffic encryption

Enhanced network management

Ability to provision and manage IP multicast

GigE (RJ-45) data port with Auto Negotiate and Auto MDIX

Front Panel LEDs indicate status and simplify troubleshooting

User-friendly online diagnostics

Remotely configurable and monitorable using SNMP and TFTP

### HIGH VALUE AND INCREASED DATA RATES

Motorola's easy-to-use SB6120 SURFboard DOCSIS 3.0 Cable Modem unlocks the potential of offering innovative high-bandwidth data and multimedia services to customers.

Utilizing the power of DOCSIS 3.0, the SB6120 enables channel bonding of up to 4 downstream channels and 4 upstream channels – which allows an operator to offer their customers advanced multimedia services with data rates of well over 100 Mbps in each direction. The SB6120's higher-speed services enable operators to:

- Protect their installed base of high-speed data customers
- Deliver high-bandwidth, multimedia services
- Deliver competitive, high-capacity commercial services to their business customers

Designed for Service Assurance, the SB6120 is compatible with Motorola's NBBS Device Management Platform and with Motorola's eCare for remote access customer component troubleshooting and configuration eliminating unnecessary truck rolls.

### ECONOMIC AND FLEXIBLE

The Motorola SB6120 SURFboard DOCSIS 3.0 Cable Modem provides operators with an economic option for providing Ultra-Broadband services, with 4X the current maximum user data throughput approximating 160 Mbps in DOCSIS mode and 195 Mbps in Euro-DOCSIS mode\*, without the need for hybrid fiber coax (HFC) plant upgrade. Maximizing an operator's current infrastructure investment, the SB6120 can be deployed without service interruption.

Backwards compatible to DOCSIS 1.0, 1.1 and 2.0, the SB6120 also supports both IPv4 and IPv6, Advanced Encryption Services, and all other DOCSIS 3.0 standards.

As part of Motorola Broadband™ DOCSIS 3.0 Ultra-Broadband family of products, the SB6120 includes an enhanced tuner that supports up to a 1 GHz downstream input allowing operators to increase the frequency spectrum for deployment of new high-value services such as bandwidth on-demand, commercial services, interactive gaming and IPTV to their customers.

The SB6120 features a 10/100/1000Base-T Ethernet (RJ-45) port, as well as intuitive, easy to read front-panel operational status LEDs. Operators can optionally activate dual colored LEDs for their customer to have visual verification of bonded channels and GigE link use.

With Motorola's cable modems, high-speed Internet access has always been at your fingertips – always on and always connected. The SB6120 is the ideal competitive solution for the high-end residential user, the small home office owner, as well as the medium to large business enterprise.

## DATA SHEET

SURFboard® SB6120  
DOCSIS 3.0/Euro-DOCSIS 3.0 Cable Modems

## General Specifications

Cable Interface	75 $\Omega$ F-connector
CPE Network Interface	10/100/1000Base-T Ethernet (RJ-45)
Data Protocol	TCP/IP
Dimensions	5.7 in H x 5.7 in W x 1.5 in D (146 mm x 146 mm x 38 mm)
Power	9W (nominal)
Input Power:	100 to 240 VAC, 50 to 60 Hz

## Environmental

Operating Temperature	32 °F to 104 °F (0 °C to 40 °C)
Storage Temperature	-22 °F to 158 °F (-30 °C to 70 °C)
Operating Humidity	5 to 95% R.H. (non-condensing)

## Downstream

Modulation	64 or 256 QAM
Capture Bandwidth	100 MHz (edge to edge)
Maximum Theoretical Data Rate**	
DOCSIS	171.537 Mbps (4 channels) / 42.884 (single channel) @ 256 QAM at 5.36 Msym/s
Euro-DOCSIS	222.464 Mbps (4 channels) / 55.616 (single channel) @ 256 QAM at 6.952 Msym/s
Bandwidth	
DOCSIS	$\leq$ 24 MHz
Euro-DOCSIS	$\leq$ 32 MHz
Symbol Rate	
DOCSIS	64 QAM 5.057 Msym/s; 256 QAM 5.361 Msym/s
Euro-DOCSIS	64 QAM 6.952 Msym/s; 256 QAM 6.952 Msym/s
Operating Level Range	-15 to 15 dBmV
Bonded Channel RF	
Level Tolerance	10dBmV
Input Impedance	75 $\Omega$ (nominal)
Frequency Range	DOCSIS and Euro-DOCSIS 108 to 1002 MHz (edge to edge), Optional 91 to 1002 MHz (edge to edge)
Frequency Plan	
Euro-DOCSIS	Annex A
DOCSIS	Annex B
J-DOCSIS	Annex B, modified for Japan Frequencies
Security	DOCSIS 3.0 Security (3PI+, EAE, SSD)
Network Management	SNMP v2 & v3
Provisioning	Supports IP addressing using IPv4 and/or IPv6 (dual stack)



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## Upstream

Modulation	QPSK and 8, 16, 32, 64, 128 QAM
Maximum Channel Rate**	
DOCSIS	131.072 Mbps (4 channels) / 32.768 Mbps (single channel): @ 128 QAM at 6.4 MHz
Euro-DOCSIS	131.072 Mbps (4 channels) / 32.768 Mbps (single channel): @ 128 QAM at 6.4 MHz
Channel Width	200 kHz, 400 kHz, 800 kHz, 1.6 MHz, 3.2 MHz, 6.4*** MHz
Symbol Rates	160, 320, 640, 1280, 2560, 5120*** ksym/s
Operating Level Range	Level range per channel (Multiple Transmit Channel mode disabled, or only Multiple Transmit Channel mode enabled with one channel in the TCS)
	DOCSIS/Euro-DOCSIS
	TDMA
	Pmin to +57 dBmV (32 QAM, 64 QAM)
	Pmin to +58 dBmV (8 QAM, 16 QAM)
	Pmin to +61 dBmV (QPSK)
	S-CDMA
	Pmin to +56 dBmV (all modulations), where:
	Pmin = +17 dBmV, 1280 kHz modulation rate
	Pmin = +20 dBmV, 2560 kHz modulation rate
	Pmin = +23 dBmV, 5120 kHz modulation rate
	Level range per channel (two channels in the TCS)
	TDMA
	Pmin to +54 dBmV (32 QAM, 64 QAM)
	Pmin to +55 dBmV (8 QAM, 16 QAM)
	Pmin to +58 dBmV (QPSK)
	S-CDMA
	Pmin to +53 dBmV (all modulations), where:
	Pmin = +17 dBmV, 1280 kHz modulation rate
	Pmin = +20 dBmV, 2560 kHz modulation rate
	Pmin = +23 dBmV, 5120 kHz modulation rate
	Level range per channel (three or four channels in the TCS)
	TDMA
	Pmin to +51 dBmV (32 QAM, 64 QAM)
	Pmin to +52 dBmV (8 QAM, 16 QAM)
	Pmin to +55 dBmV (QPSK)
	S-CDMA
	Pmin to +53 dBmV (all modulations), where:
	Pmin = +17 dBmV, 1280 kHz modulation rate
	Pmin = +20 dBmV, 2560 kHz modulation rate
	Pmin = +23 dBmV, 5120 kHz modulation rate
Output Impedance	75 Ω (nominal)
Frequency Range	DOCSIS 5-42 MHz (edge to edge), Euro-DOCSIS and optional DOCSIS 5 to 65 MHz (edge to edge)
Compatibility	PC: 90496, Pentium, or later; Windows Vista™, 2000, or XP or Linux® with Ethernet connection (older versions of Windows, although not specifically supported, will work with this cable modem) Macintosh: Power PC or later; OS 9 or higher, Ethernet connection UNIX: Ethernet connection Home Networking: Ethernet router or wireless access point

\* Actual speeds will vary, and are often less than the maximum possible. Data transmission speed is approximate and depends on the configuration and capacity of your network, as well as the amount of traffic on the network.

\*\* Actual data throughput will be less due to physical layer overhead (error correction coding, burst preamble, and guard interval).

\*\*\* With A-TDMA- or S-CDMA-enabled CMTS.

\*\*\*\* With S-CDMA-enabled CMTS.

Certain features may not be activated by your service provider, and/or their network settings may limit the feature's functionality. Additionally, certain features may require a subscription. Contact your service provider for details.

All features, functionality, and other product specifications are subject to change without notice or obligation. DOCSIS 3.0 modem capabilities are dependant on the services available through the CMTS. Please verify with your CMTS vendor their specific DOCSIS 3.0 implementation roadmap.



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