Evaluating Your Cable Internet Connection

This document describes how to use diagnostic information that you can find on your Motorola cable modem to determine if there may be problems with your cable Internet connection. Your cable Internet connection includes the coax cable that connects to the back of your cable modem and related cabling, connectors and splitters within your home. It also includes the connection from your home to the telephone pole and through your neighborhood to your service provider's central site. Problems in any part of your cable Internet connection can result in degraded service or no service at all.

Your Motorola cable modem or cable modem gateway provides a number of readings that can be helpful in evaluating the quality of your cable Internet connection. If you experience problems with your cable modem Internet connection, these readings may help indicate where the problem lies.

Problems that may be related to your cable Internet connection:

- No connection to Internet
- Frequent disconnections from Internet (from multiple times a day to several times a month)
- Slow Internet
- Frequent buffering or dropping of streaming video

Note that here we are not addressing your wireless connections, if any. We're addressing the link between your cable modem and the Internet, which is best tested with a good Ethernet or wireless connection between your cable modem or gateway and the computer or other device you're using for the readings discussed below.

How to find readings that relate to your cable Internet connection

To find readings that may shed light on these issues, first log in to your cable modem's Configuration Manager. If the model number of your Motorola cable modem starts with 'MB', Type **192.168.100.1** in the address bar of your browser, go

to that address, enter the Username **admin** and Password **motorola**, then click the Login button.

Otherwise, Type **192.168.0.1** in the address bar of your browser, go to that address, enter the Username **admin** and Password **motorola**, then click the Login button.

This will bring you to the cable modem's Basic Status and Settings page. Click the Advanced button in the upper right. This will bring you to the **Status → Software** page. Hover over the Status menu item, and then select the Connections submenu.

What do your readings mean (Downstream)?

Look under the tab labeled Downstream Bonded Channels. You will see from 8 to 16 channels listed, 8 if you have an 8x4 cable modem and 16 if you have a 16x4 cable modem.

Downstream Bonded Channels

Channel	Lock Status	Modulation	Channel ID	Freq. (MHz)	Pwr (dBmV)	SNR (dB)	Corrected	Uncorrected
1	Locked	QAM256	13	615.0	-2.9	37.8	0	0
2	Locked	QAM256	9	591.0	-2.5	38.4	0	0
3	Locked	QAM256	10	597.0	-2.5	38.4	0	0
4	Locked	QAM256	11	603.0	-2.5	38.3	0	0
5	Locked	QAM256	12	609.0	-2.6	38.2	0	0
6	Locked	QAM256	14	621.0	-3.3	37.5	1	0
7	Locked	QAM256	15	627.0	-3.3	37.4	0	0
8	Locked	QAM256	16	633.0	-3.1	37.5	0	0
9	Locked	QAM256	17	639.0	-3.1	37.5	0	0
10	Locked	QAM256	18	645.0	-3.3	37.4	0	0
11	Locked	QAM256	19	651.0	-3.4	37.4	0	0
12	Locked	QAM256	20	657.0	-3.5	37.4	0	0
13	Locked	QAM256	21	663.0	-3.7	37.3	0	0
14	Locked	QAM256	22	669.0	-3.9	37.2	0	0
15	Locked	QAM256	23	675.0	-4.0	36.6	0	0
16	Locked	QAM256	24	681.0	-4.1	37.1	0	0
Total							1	0

There may be from 1 to 16 channels shown with Lock Status 'Locked'. For the 'Locked' channels, note the Power level(s) shown in the Pwr column. These should all be between -15 and +15dBmV; and they should also all be within three dB of each other. In the sample above, the power levels range from -4.1 to -2.5 dB, so they are within a range of 1.6dB.

Now note the Signal to Noise ratio(s) shown in the SNR (dB) column. The Signal to Noise ratios should also all be within three dB of each other. Recommended Signal to Noise ratios are:

Power level (dBmV)	SNR
-15 to -6	33 dB or higher
-6 to +15	30 dB or higher

Finally, note the Uncorrected column. Your cable modem uses sophisticated techniques to compensate for data packets that may have errors introduced by impairments on your connection. Some types of impairments do not affect power or signal to noise ratios, but do cause large numbers of uncorrected packets.

A small number of uncorrected packets won't matter much. However, a large number, particularly if it is a significant fraction (roughly 20% or more) of the corrected packets value, can indicate a serious problem. What counts as a large number depends on the amount of traffic through your cable modem, but it will typically be in the thousands or tens of thousands.

What do your readings mean (Upstream)?

Look under the tab labeled Upstream Bonded Channels. You should see four channels listed.

Upstream Bonded Channels ⓘ

Channel	Lock Status	Channel Type	Channel ID	Symb. Rate (Ksym/sec)	Freq. (MHz)	Pwr (dBmV)
1	Locked	ATDMA	5	5120	36.5	40.3
2	Locked	ATDMA	6	5120	30.1	40.3
3	Locked	ATDMA	7	5120	23.7	38.3
4	Not Locked	Unknown	0	0	0	0.0

There may be from 1 to 4 channels shown with Lock Status 'Locked'. For the 'Locked' channels, note the Power level(s) shown in the Pwr column. These should all be within three dB of each other. In the sample above, the power levels are within a range of 2.0dB.

Upstream power level limits depend on the number of upstream channels locked.

Upstream Channels Locked	Power Limits (dBmV)
1	35 to 57
2 to 4	35 to 54

For some networks, the power limits for 3 to 4 channels are 35 to 51 dBmV. Ideal levels are approximately 40 to 50 dBmV for single channels, 37 to 48 dBmV each for 2 to 4 channels.

Interpreting your readings and addressing cable Internet connection issues

In summary, you have a possible connection problem if any of these conditions is true:

- No downstream channel is locked.
- No upstream channel is locked.
- For a locked channel, downstream power level is outside the range of -15 to +15 dBmV.
- For a locked channel, downstream power level is more than three dB different from any other locked channel's power level.
- For a locked channel, downstream signal to noise ratio is more than three dB different from any other locked channel's signal to noise ratio.
- Large numbers of uncorrected packets (thousands or more) are reported, and this is a significant fraction (20% or more) of the corrected packets.
- For a locked channel, downstream signal to noise ratio is greater than 33dB, or 30dB for power levels from -6 to +15 dBmV as described above.
- For a single locked upstream channel: power level is outside the range of 35 to 57 dBmV.
- For two to four locked upstream channels: power level is outside the range of 35 to 54 dBmV.

If you have a possible connection problem, you should do the following. First, check the coax cable connection at the back of your cable modem. The connector should be tightened snugly. If you can, you should also check the cable connections to any coaxial wall outlet and/or coax splitter in your home.

If your problems persist after these checks, you should ask your service provider to check your connection. They may be able to resolve your issue by running checks from their central site without visiting your location.

If your connection problem continues after doing these checks, it is likely that your troubles with Internet connectivity are not due to your cable Internet connection. In that case please check your manual or the Motorola Mentor section of this website to see if there is a problem with your cable modem.