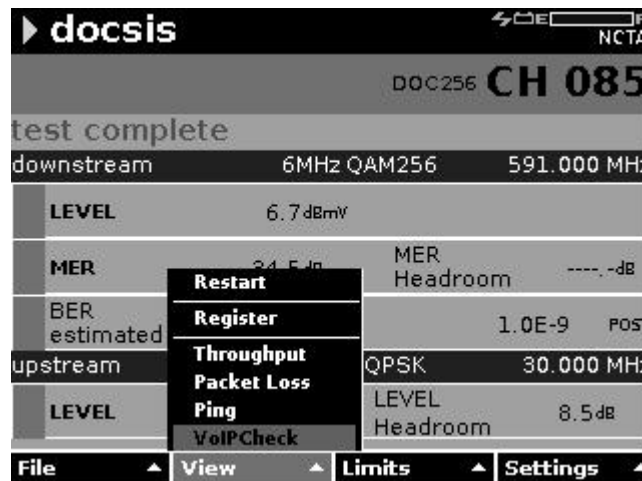


Application Note - VoIPCheck Test

The VoIPCheck test is a way of testing VoIP call statistics without MTA provisioning for need for a monthly phone number fee. The VoIPCheck test is a continuous test continuously updating the values of the test results. During a VoIPCheck test, packet loss, jitter, delay, R-Value and MOS will be displayed with the ability to view Live, Extreme, and Average values.

Soft key menus provide easy access to common functions such as limit sets, other DOCSIS tests, and a Reset softkey. Since the VoIPCheck test will be using DOCSIS, it can only be done after the meter has successfully ranged and registered with the CMTS, this test will not be available if Ranging Only is set in the DOCSIS configuration. It will also not be available if registration with the CMTS has failed.

Once the meter has successfully registered with the CMTS, the test options will be enabled on the Range Result screen.



The DSAM v2.4 release will enable the user to see two different screens. The user will first see a summary table of the Packet Stats and Quality of the VoIPCheck test between the DSAM meter and the closest routing point, usually the CMTS. This screen will have pass fail indicators so easy verification of the test's results can be made.

CMTS Loop		CODEC: G.711u Jitter Buffer Size: 150ms		
Packets		Current	Max	Avg
PacketLoss		0.0%	0.0%	0.0%
Jitter		2.1	24.5	2.2
Delay		8.1	33.6	8.5
Quality		Current	Min	Avg
MOS		4.2	4.2	4.2
R-value		93	93	93

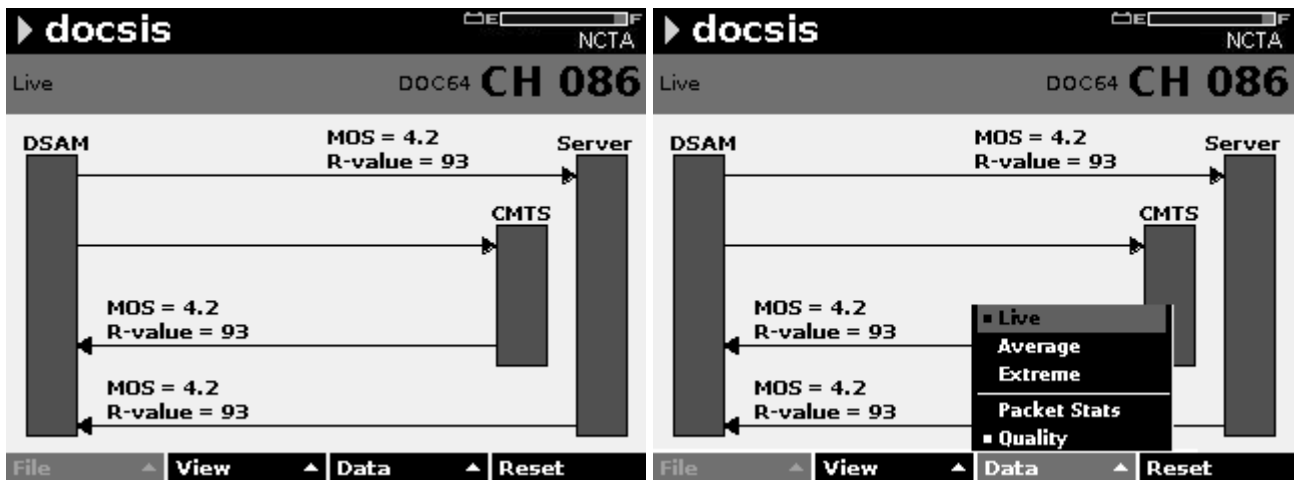
From the CMTS table summary screen the user can then dive further into the VoIP network by switching over to the segmentation screen. The segmentation screen labeled “Segmentation” under the View softkey shows a loop from the CMTS and also communicates to an Advanced IP Server that can be positioned anywhere in the network.

CMTS Loop		CODEC: G.711u Jitter Buffer Size: 150ms		
Packets		Current	Max	Avg
PacketLoss		0.0%	0.0%	0.0%
Range		24.5		2.2
Register		33.6		8.5
Quality		Current	Min	Avg
MOS		4.2		4.2
R-value		93		93

DSAM		Server	
DSAM	Server	pkt loss = 0.0%	jitter = 3.9 mS
DSAM	CMTS	jitter = 3.4 mS	Delay = 9.6 mS
CMTS	Server	pkt loss = 0.0%	
DSAM	Server	jitter = 4.2 mS	Delay = 18.5 mS

This extra communication between the DSAM and the Advanced IP Server allows the technician to view the voice network past the CMTS to the portion of the network in which the server resides. It is recommended that the Advanced IP Server be positioned next to the Media Gateway so as to resemble an Off-Network call. This is a good way to see when the network is experiencing IP problems either in a router or other IP backbone equipment.

The segmentation screen also allows the user to jump between Packet Stats screen and a Quality screen via the Data softkey. The Packet Stats shows data on packet loss, delay, and jitter, while the Quality screen displays the test’s MOS and R-value. From either the Packet Stats screen or the Quality screen the Technician can choose to view the Live, Average, or Extreme values of that screen. The technician can also restart the VoIPCheck test by pressing the Reset button.



When it comes to voice quality measurements it is important to know what the resulting information means. The results of the tests will vary from system to system and even house to house. So it is good for the technician to be able to look at the results and quickly know if there is a problem in the system which needs correcting. The chart below shows a general starting point of what a technician should be looking for when performing a VoIP test. The Goal is the results that should be targeted by the technician and cable operator. The last column shows where a call will start to go bad, resulting in a lower quality phone conversation. Keep in mind this table is merely a guideline, all systems will vary.

Test Criteria	Measurement	Goal	Start Seeing Degradation on Call Quality
	Delay (1-way)	< 100 ms	> 150 ms
	Jitter	< 10 ms	> 15 ms
Service Level Test	Packet Loss	< 1%	> 2%
	R-Value	> 70	< 60
	MOS	> 3.6	< 3
	MER	30dB(64), 33dB (256)	25dB(64), 28dB(256)
RF	PRE-FEC BER	1.00E-09	1.00E-07
At Home	Rx - Level	-5~+5 dBmV	<-10dBmV or >+10dBmV
	Tx - Level	35 ~45 dBmV	< 30dBmV or >50dBmV
	MER	32dB(64), 35dB (256)	28 dB(64), 31dB(256)
RF	PRE-FEC BER	1.00E-09	1.00E-07
At Node	Freq Response	< 4dB	> 5dB
	Upstream SNR	>35dB	<25dB
CMTS	CMTS Loading	<50%	>80%