

Acoustic Verification System (AVS)

CMU and Rohde & Schwarz CMW 500 Hardware User Manual

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## 1 Introduction

Spirent Communications AVS is a software and hardware system for use in measuring the end to end quality of mobile devices.

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Version	Author	Notes
1.0	Metrico	Initial draft.
2.0	Andrew Boyden	
3.0	Andrew Boyden	Addition of the R&S CMU 500

## 2 Initial setup of CMU.



Figure 2-1 - CMU Front Panel

- 1. Turn on the CMU 200.
- 2. Press "Menu Select".
- 3. Expand IMT-2000 Mobile Station.
- 4. Select "CDMA2000 Cellular".
- 5. When done, press the "BS Signal" tab.



Figure 2-2 – Overview Screen

	CDMA2000 US CDMA2000 Cellular O CDMA2000 Cell. Connection Cont	verview	Co H-PSK So 03	nnect ntrol ted
UI	Setup	Default Se	ittings	
	<ul> <li>RF Settings</li> <li>RF Channel [BC0]</li> <li>RF Power</li> <li>CDMA Power [Meas]</li> <li>Select "BS Signal" tab</li> <li>OCNSL</li> <li>Imparments [Max</li> <li>Power Control</li> <li>FCH</li> <li>SCH</li> <li>PCH</li> </ul>	Channel Forward Link 384 881.5200 N Signaling - 55.00 dBm On - 2.90 dB	Reverse Link Hz 836.5200 MHz Overview/Channel Quality - 60.00 dBm - 60.00 dBm - 7.00 dB	

Figure 2-3 – BS Signal Tab

- 6. Under "BS Signal" tab Set channel to 384.
- 7. Set CDMA Power to -55 dBm.

- 8. Set the rest of the parameters to match the previous picture..
- 9. When done press, "Network" tab button.



Figure 2-4 – Press Network Tab

- 10. Under the Network Tab expand the System Parameters tree.
- 11. Set System ID Number to 2004.
- 12. Set the rest of the parameters to match the picture above.
- 13. Expand the Network Identity tree.



Figure 2-5 – Network Identity Tree

- 14. Under the Network Identity tree:
  - Set the Network ID Number to 65535.
  - Set the Mobile Country Code to 310.
  - Expand the Mobile Settings tree.
- 15. Under the Mobile Settings tree
  - Set the Mobile Country Code to 310.
  - Set the Mobile Compatibilities Report to On.
- 16. Move to AF/RF settings tab.



Figure 2-6 – RF Setting Tab

- 17. Set RF output to "RF 2".
- 18. Press the "Ext. Att. Output" button.
- 19. Set RF external attenuation output to +10.0 dB.
- 20. Press the "Ext. Att. Output" button.
- 21. Set RF external attenuation input to +10.0 dB.
- 22. Set Speech Encoder to Handset.
- 23. Set Speech Decoder to Handset.
- 24. Move on to the "Service Cfg." settings tab.



Figure 2-7 – Service Configuration Tab

- 25. Always enable R/C3/3.
- 26. Expand the Primary Service Class tree.
- 27. Expand Service Option 68 tree.
- 28. Set the Voice Coder to "8k EVRC-B (low)".

**WARNING:** if Voice Coder option is non-changeable and says "Echo", the CMU you are using does NOT support 8k EVRC-B voice coding and can NOT be used with AVS. Please contact R&S or obtain a CMU that supports this feature.

- 29. Expand the Vocoder Configuration tree.
  - Set the Average Encoding Rate to 6.6 kbps.
  - Click "Execute" on the Initialize Vocoder if necessary.
- 30. Set the "Selected Service Option" to Service Option 68.
- 31. Select "Accept MS Originated Call". Set it to "Force To Selected Primary Service".
- 32. Move on to the "Connections" tab.



Figure 2-8 – Connection Tab

2.1 CDMA 2000 Signaling Configuration

# 3 Preparing a device for testing

1. Insert the special Verizon test SIM card.

**Note:** This card will force the device to only register to the CMU-200 network emulator (instead of a live base station)

2. Place the provided "AVS Alignment Sticker" on the phone in the following images.



Figure 3-1 - Sticker Placement

**WARNING**: Verify that the large hole on the alignment sticker completely covers the handset's earpiece and that none of the handset's earpiece is obstructed.

More examples of the proper way to place the "AVS Alignment Sticker" on the phone:



Figure 3-2 – AVS Sticker Placement

**Note:** The large hole on the alignment sticker completely covers the handset's earpiece and that none of the handset's earpiece is obstructed.

Warning: Ensure the device is set to maximum volume.

# 4 CDMA setup of the R&S CMU200

- 1. Place the device inside the AVS chamber.
- 2. Close the chamber door.
- 3. Verify that "Signal On" is the current status. Signal On will appear in the top right corner of the screen.
- 4. Verify that you are using Service Option 68. This can be done by looking at the top of the CMU screen "SO 68" = 8k EVRC B.
- 5. If the CODEC you wish to test is not shown above, please return to the "Service Cfg." Tab and follow the instructions that are pertinent to the CODEC you wish to test.

	IA2000 US Celular Overv et. Connection Control g		Connect Control Registered	
Contraction entrance     Determined terror pro-     Determined terror period     Contraction Entrance     POH     Poh	Setter Re Options Setter Costors S Covity Captors Capt	Verify device is Registered	Signal Off Unregister Connect MS Int Service	
- Norming Lobas Content Only Normal Content Only Normal Content Only Normal Strength	Make sure "1 <sup>st</sup> Service Class" is "Speech Service"	BCO IN CORRECT OF	Power	

Figure 4-1 – Service Class

6. Verify "1<sup>st</sup> Service Class" is set to "Speech Service".



Figure 4-2 - Sticker Placement

- 7. Wait for the CMU to "register" the phone.
- 8. **REGISTERED** will appear in the top right corner of the screen.



Figure 4-3 – Device Registration

- 9. When the device is registered, establish a call between the simulator and the UE.
- 10. Press the "Connect MS" button on the CMU. This will instruct the CMU to call the device under test. Within several seconds, the mobile will start to ring.
- 11. Open the AVS chamber.
- 12. Answer the call on the device.
- 13. Adjust the handset earpiece volume to maximum volume.



Figure 4-4 - Handset Volume Adjustment



Figure 4-5 - Fastening the Phone

14. Place the device onto the AVS alignment pins using the alignment sticker on the device.

Note: The device's screen should be facedown.

15. The CMU screen will now look like the following screen.



Figure 4-6 – CMU Screen

- 16. Turn on Q-QPSK..
- 17. Close the chamber door.

You are ready to execute an AVS test.

# 5 VoLTE setup of the R&S CMW 500

## 5.1 Powering Up the Box

Perform the following steps to establish the initial configuration of your Rhodes and Schwarz CMW500 unit.

1. Press the power button on the front panel as shown in the following image.



Figure 5-1 - CMW 500 Front Panel View

- 2. On the box, perform the following steps.
- 3. Click the power button. Wait for the system to cycle up. A splash screen displays prompting you to configure either measurements or the signal generator. Spirent Technologies recommends you configure the signal generator first.

## 5.2 Configuring the Signal Generator

1. Press the signal generator key (shown in the green circle) on the front panel and a screen like the following appears.

Senerator/Signaling Controller		8	Gen Ctrl
	Taskbar entry	State	
≈ CDMA2000			
Generator		OFF	
Signaling		OFF	
🔊 General Purpose RF			
-Generator 1		OFF	
Generator 2		OFF	┝────┥
i≈ GSM			
Generator		OFF	
Signaling		OFF	$\vdash$
∞ WCDMA FDD UE			
Generator		OFF	
Signaling 1		OFF	
· Signaling 2		OFF	
≈ 1xEV-DO	_	_	
<sup>i</sup> Signaling		OFF	
Bluetooth		_	
-Signaling 1		OFF	
Signaling 2		OFF	
l ≈LTE	_	_	
Signaling 1			
Signaling 2		OFF	
Protocol lest	_		
Signaling		•	
Audio 1 Data 1 LIE 1 Measurem & Meas & Signaling	6		

Figure 5-2 – Generator Signaling Controller

2. Set the LTE Signaling 1option to On (**checked**). At the bottom of the screen click the LTE 1 Signaling option and a screen like the following appears.

🚯 LTE Signaling 1 - V3.2.80 - Base V 3.2.60				LTE
Connection Status	PCC S	CCI		Data 1
Cell 🕎	Operating Band	Band 1 🚽	FDD 👻	Meas
Packet Switched 🔼 ON		Downlink	Uplink	
RRC State Idle	Channel	300 Ch	18300 Ch	Go to
-	Frequency	2140.0 MHz	1950.0 MHz	
Lvent Log 16:57:56 A State 'Cell On'	Cell Bandwidth	10.0 MHz 🔹	10.0 MHz	Cata
16:52:31 🕦 State 'Cell Off'	RS EPRE	–85.0 dBm/15kHz		GU (U
16:52:31 State 'Cell On' 16:52:08 Signaling Unit Startup	Full Cell BW Pow.	-57.2 dBm		
16:52:08 Data end to end enabled	PUSCH Open Loo	p Nom.Power	−20 dBm	Routing
16:52:07 () Starting Data Application Unit	PUSCH Closed Lo	op Target Power	–20.0 dBm	
10.43.17 TE Signaling 3.2.60.23	•			
UE Info	Connection Set	пр		
	Sched. RMC	<b>_</b>		
IMEI		5 FL 11	P. 1	
Default Bearer IPv4 address IPv6 prefix		Downlink Up	link	
·····	#RB	<u>−</u> 0C	50 🕈	
Dedicated Bearer TFT Port Range	RB Pos./Start RB	low 🝷 0	low - 0	
	Modulation	QPSK 🔻	QPSK 🔻	
	TBS Idx / Value	5 4392	6 🔽 5160	LTE Signaling
	Throughput	3.953 Mbit/s	5.160 Mbit/s	Run
				Config

Figure 5-3 – LTE Signaling 1

- Verify that the information on your screen matches exactly what is presented on this screen. Downlink Channel: 5230 Uplink: 2320 Cell Bandwidth: 10.0 MHz RS EPRE: -60.0 dBM 15kHz PUSCH Open Loop Nom power: 0 dBm PUSCH Closed Loop Target Power: 0.0 dBm Sched: RMS #RB Downlink: 50 #RB Uplink: 50 RB Pos/Start RB Downlink: low RB Pos/Start RB Uplink: low Modulation Uplink: OPSK Modulation Downlink: OPSK
- 4. When you are satisfied that all the information is exact, press the measurement button on the front panel of the unit and a screen like the following appears.

🚸 Measurement Controller		S	Meas Ctrl
	Taskbar entry	State	
⊕ 1xEV-D0			
TX Measurement			
RX Measurement			>
🕁 Audio			
Measurements 1			
Measurements 2			<u>}</u>
4- Bluetooth			
Multi Evaluation		OFF	
			≻
RX Measurement 2			
G CDMA2000	_		
TX Measurement			<u> </u>
······RX Measurement			
ч <del>о</del> Data Appi.			
Measurement 1		Selected RAN LTE Signaling 1	<u> </u>
Measurement 2		Selected RAN no selection	
🕁 FM Stereo Radio			
Measurement		OFF	
🕀 General Purpose RF			
Measurements			
⊕ GSM			
	-		
DV M			
Audio 1 Data 1 LTE 1			
Measurem 🤀 Meas 🛛 🔂 Signaling	6		

Figure 5-4 – Measurement Controller

- 5. Check the Data Appl, Measurement 1 option.
- 6. Select Audio Measurement 1 and the following screen displays.

🚸 Audio Measureme	nt 1 - V3.2.30		Audio
Scenario External A	Analog Speech Analysis	AF IN Encoder	Sneech
Speech Analysis	]		Analysis
Signaling:	No Connection	Connector: AF	1
Input Level Full-Sca	le (Peak): 1.573 ∨	Output Level Full-Scale (Peak): 1.573 ∨	
High Pass Filter:	6 Hz		
Input Level Lev	itput vel	High Pass	Config

Figure 5-5 – Update Measurements

7. From this screen use the Scenario drop down option to select External Analog Speech Analysis and select External Analog Speech Analysis..

Scenario	External Analog Speech Analysis 🔻
	Audio Measurement and Generator
Speech	External Analog Speech Analysis
	External Digital Speech Analysis
Signalin	Microphone- and Speakertest

Figure 5-6 - Scenario

8. Verify that all the set values match what appears in this screen.

Signaling: No Connection Input Level Full-Scale (Peak): 1.573V High Pass Filter: 6 Hz Connector: Af-1 Output Level Full-Scale (Peak): 1.573 V

9. Click LTE **Signaling 1** and the following screen displays.

🚸 LTE Signaling 1 - V3.2.80 - Base V 3.2.60					
Connection Status	PCC	scci			Data 1
Cell	Operating Band	Band 13	▼ FDD	-	Meas
Packet Switched Attached		Downlink	Uplink		
RRC State Connected	Channel	5230 Ch	23230	Ch	Go to
<b>F</b>	Frequency	751.0 MHz	782.0	MHz	
Event Log 14:59:44 C EPS Detaur Bearer Established, Id 5	Cell Bandwidth	10.0 MHz	▼ 10.0 MH	Iz 🔽	Goto
14:59:43 RRC Connection Established 14:57:12 State 'Cell On'	RS EPRE	-60.0 dBm/1	5kHz		00 10
14:57:11 RRC Connection Released	Full Cell BW Po	w32.2 dBm			
14:57:11 () Signaling Failure 14:57:11 () State 'Attached'	PUSCH Open Lo	oop Nom.Power	0	dBm	Routing
14:57:10 () EPS Default Bearer Established, ld 5	PUSCH Closed	Loop Target Power	0.0	dBm	
14:57:10 🕇 RRC Connection Established					
UE Info 👻 🗖	Connection Se	etup -			
000004544257425	Sched. KMC	<u> </u>			
IMSI 001010123456789		Downlink	Uplink		
Default Bearer IPv4 address IPv6 prefix	#RB	50		50 -	
5 (VZWINTERN 1/2.22.1.100 fc01:abab:cdcd:ef€ 6 (VZWIMS) 172.22.1.101 fc01:abab:cdcd:ef€	RB Pos./Start R	B low -	0 low -	0	
Dedicated Bearer TFT Port Range	Modulation	OPSK	· · · ·	PSK +	
	TBS Idv / Value	5 4	202 6	5160	LTE
K	Throughput	3.953 Mbit/s	5.160	/bit/s	Signaling
	moognpor	01000 110100	0.1001	1.100	
Audio 1 Data 1 LTE 1 Measurem & Meas & Signaling 1					

Figure 5-7 - LTE Signaling 1

10. Enter all the values shown in this screen into your system.

Operating Band: Band 13 Channel Downlink: 5230 Ch Channel uplink: 2320 Ch Frequency Uplink: 751.0 MHz Frequency Downlink 782.0 MHz Cell Bandwidth: 10. MHz RS EPRE: -60.0 dBm 15 kHz PUSCH Open Loop Nom Power: 0 dBm PUSCH Closed loop Target Power: 0.0 dBm Sched: RMC #RB Downlink: 50 #RB Uplink: 50 RB Pos./Start RB uplink: low RB Pos./Start RB downlink: low Modulation uplink: QPSK Modulation downlink: QPSK



11. Select Data 1 Meas and a screen like the following displays.

Figure 5-8 Data Application Measurement Overview Tab

- 12. Enter all the values shown in this screen into your system.
- 13. Enable speech codec can only be turned on or off if the LTE Signal is in the OFF mode.
- 14. To enable speech code, open the connection status window.

🚸 LTE Signaling 1 - V3.2.80 - Base V 3.2.60 📃 🔀												
Connection Status	PCC	soci		Data 1								
Cell 🔀	Operating Band	Band 13	FDD 🔻	Meas								
Packet Switched 📃 OFF		Downlink	Uplink									
RRC State Idle	Channel	5230 Ch	23230 Ch	Go to								
	Frequency	751.0 MHz	782.0 MHz	<u> </u>								
16:14:10 () LTE Signaling 3.2.80.23	Cell Bandwidth	10.0 MHz	10.0 MHz	Goto								
	RS EPRE	-60.0 dBm/15kHz										
	Full Cell BW Po	w32.2 dBm										
	PUSCH Open L	oop Nom.Power	0 dBm	Routing								
	PUSCH Closed	Loop Target Power	0.0 dBm									
	Connection S	atun										
UE Info 🔫	Sched. RMC	*		<u></u>								
IMEI												
IMSI		Downlink U	lplink									
Length Le	#RB	50 👻	50 👻	<u>}</u>								
Dedicated Bearer TFT Port Range	RB Pos./Start F	RB low - 0	low 🕶 0									
	Modulation	QPSK 🔻	QPSK -	<u></u>								
	TBS ldx / Value	5 4392	6 5160	LTE Signaling								
	Throughput	3.953 Mbit/s	5.160 Mbit/s	OFF								
	Y Y	The second se	Ť.	Config								
				comig in								

Figure 5-9 Connection Status

15. Match the entries in the screen and click Config. A screen like the following displays.

K LTE Signaling Configuration		LTE
PCC  SCC1  Path: Duplex Mode		Data 1 Meas
Duplex Mode Scenario Enable Speech Codec	FDD 1 Cell - 1 RF Out V	Go to
		Go to
B - Network B - Connection B - CQI Reporting		Routing
⊕-UE Measurement Report     ⊕-Messaging (SMS)     ⊕-Shortcut Softkey     ⊕-Message Monitoring		
		LTE Signaling (OFF)
		Config

Figure 5-10 Path

16. Verify 1 Cell – 1 RF out.

- 17. Select the Ping Tab. Note that you can configure these tabs in any order. This document goes left to tight for readability.
- 18. Open the Ping tab and a screen like the following displays.

🗞 Data Application Measurement 1 - V3.2.40													X	RESET						
Select RAN:	LTE	Sign	aling	j 1			-	Ma: Ma:	x. pos: x. pos:	sible T sible T	'hroug 'hroug	ihput ( Ihput C	Jplink Downli	(RAN) nk (RA	: (N):	1. 	5.160 3.953	Mbit/s Mbit/s	;	
Overview		Ping		) IP ei	nf 🚺	) Thi	ough	put		)NS r	eq.		PLog	ging		) IP A	nalys	is		
Ping															-					SAVE
🔶 🔋 Request:	0	Tim	estamp	D:		Laten	cy:													SETUP SETUP
ms																			_	
2.0																				PRINT PRINT
1.5																			-	HELP
1.0																			- {	SYS SYSTEM
0.5																			-	DEVICE DEVICE
0.0																	R	equest	s	WIZARD
-95	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	-10	-5		
Average:						Mini	mum:				-		D	laxim	um:					VIEW
Config —	D. 47	7	1 100				_													
Destination I	P. 17	Z.ZZ.	1.100					'N	o Rep	ly' Co	unt:							-		MEASURE
Interval:	Ŀ		1	000	ms		님													SIGNAL GEN
Timeout:	_			2	S															
Payload:				100	Byte															OFF
Ping count:				100																RESTART STOP
Select Applic																				TASKS TASKS

Figure 5-11 - Data Application Measurement Ping Tab

Conf Destination IP: 172.22.1.100 Interval: 1000 Timeout: 2 Payload: 100 Ping count: 100

20. Click the Config tab on the bottom right and a screen like the following appears.

🚯 Data	Applica	ntion Measur	ement 1 - V3.	2.40						Ping
Select	RAN:	LTE Signa	aling 1	•	Max. pos: Max. pos:	sible Throu sible Throu	ghput Uplink (RAN): ghput Downlink (RA	5.160 N): 3.953	Mbit/s Mbit/s	Ping
0verv	view	Ping	_ IPerf	Through	put 🛛 💿 🛙	NS req.	💿 IP Logging	📄 IP Analys	sis	
Ping									· · · · ·	Configure
🔶 🖟 Re	equest:	0 Time	stamp:	Latency:						Services
m	s					,				
2.0										
1.5										
		🚯 Ping conf	ig						8	Network
1.0		Destina	ntion IP		172.22.1	.100				Impairm.
		Interva	I		<b>1000</b> m	s 👻				
0.5		Timeou	ıt		2 s 👻					
0.0		Payloa	d		100 Byt	e				Display
	-95	<sup>i</sup> -Ping co	ount		100					<u>}</u>
Average	e:									Marker
Cont	fig									
Destin	ation									0
Interva										Parameter
Timeo	ut:									ļ
Payloa	ad:									LTE 1
Ping c	ount:									Signaling ON
Calast		Υ <u></u>	Ý	Ť		Υ T	Ť	- Y		
Applic										Config

Figure 5-12 - Data Application Measurement Ping Tab Configuration Option

Destination IP: 172.22.1.100 Interval: 1000 ms Timeout: 2 Payload: 100 Bytes Ping count: 100

22. Open the I Perf tab and a screen like the following appears.

🚸 Data Applic	ation Meas	urement 1 - V3.2.40									lperf service
Select RAN:	LTE Sig	naling 1	•		Max. possib Max. possib	le Throug le Throug	hput Uplink hput Downli	(RAN): nk (RAN)	5.160 ): 3.953	Mbit/s Mbit/s	Iperf OFF
Test Duration	: 1000	s diren	Thro	ughpu lionte		s req.	O IP Log	ging	O IP Analysi	s	Configure Services
Use V	Vin.size (KB)	- Uplink -	Us	e	Win. size (KB)	Parall conn	el Bitrat	e	- Downlink	-	Expand
✓ 1 TCP	0	Mbit/s		<b>1</b> TC	P 0		1 0.00	Mbit/s		Mbit/s	Table
<b>2</b> TCP	0	Mbit/s		<b>2</b> TC	P 0		1 0.00	Mbit/s		Mbit/s	Network
<b>3</b> TCP	0	Mbit/s		<b>3</b> TC	P 0		1 0.00	Mbit/s		Mbit/s	Impairm. OFF
Uplink Downlink	Mbit/s 80								% 80	Lost Packets	Display
	60								40		
	20								20		Signaling Parameter
Lost Packets (%	):	1 2	3		L 5		3		8		LTE 1 Signaling ON
Select Applic		Ĭ				Ĭ			Ì		Config

Figure 5-13 - Data Application Measurement Iperf Tab

Select RAN: LTE Signaling 1 Test Duration: 1000 Server, select 1 TCP. Clients select 1 TCP with parallel

24. Click Config on the lower right and a screen like the following appears.

🚸 D2	🚸 IPerf Config	112 3 A	٥		ſ	Iperf service
Sel	Test Duration	1000 s 🚽				Iperf
0	Packet Size	1470				OFF
Test	⊟⊡Servers	Use	Protocol	Port	Win. size (kByte)	Configure
S	-1	$\checkmark$	TCP 🔻	5001	0	Services
Us	-2		тср 🔻	5002	0	Expand
	-3		ТСР 💌	5003	0	Table
	4		ТСР 💌	5004	0	
Г	5		ТСР 🔻	5005	0	<ul> <li>Network</li> <li>Impairm.</li> </ul>
	-6		тср 🔻	5006	0	- OFF
	7		ТСР 🔻	5007	0	
	8		ТСР 💌	5008	0	Display
	⊟⊸Clients	Use Protocol	Port UE IP Add	ress Win.size (kByte)	Para. Conn. Bit rate	
	-1	TCP -	5001 172.22.1.1	00 0	1 0.00 Mbit/s	
	-2	🗆 ТСР 🔻	5002 172.22.1.1	00 0	1 0.00 Mbit/s	
	3	🗆 ТСР 🔻	5003 172.22.1.1	00 0	1 0.00 Mbit/s	Parameter
	4	TCP 🔻	5004 172.22.1.1	00 0	1 0.00 Mbit/s	-
Lost	-				OK Cance	LTE 1 Signaling
Sele App	ect lic					Config

#### Figure 5-14 - Data Application Measurement Iperf Tab Configuration (part I)

25. Enter all the values on your system match the values shown in the screen.

Test Duration: 1000 Packet Size: 1470 Servers, use TCP on Port 5001 Clients, use TCP on {Port 5001 UE IP Address: 172.22.1.100 Parallel Conn: 1

26. Scroll down and the bottom half of the screen displays.

🚯 D	🚯 IPerf Config			0							1	Iperf service
Sel	-2			тср			5002			0		Iperf
	3			тср			5003			0	F	OFF
Test	4			тср			5004			0	ŀ	Configure
_ S	5			тср	•		5005			0		Services
Us	6			тср	•		5006			0		Exnand
	7			тср	•		5007			0		Table
Г	8			тср	•		5008			0		<u> </u>
	⊡⊸Clients	Use	Protocol	Port	UE IP Addr	ess	Win.size (kByte)	Para. Conn.	Bit rate		;	Network Impairm.
	-1		TCP 🔻	5001	172.22.1.10	00	0	1	0.00	Mbit/s	F	
	2		TCP 🔻	5002	172.22.1.10	00	0	1	0.00	Mbit/s	ŀ	Display
	3		TCP 🔻	5003	172.22.1.10	00	0	1	0.00	Mbit/s	L	
	4		TCP 🔻	5004	172.22.1.10	00	0	1	0.00	Mbit/s	L	
	5		TCP 🔻	5005	172.22.1.10	00	0	1	0.00	Mbit/s	L	
	6		TCP 🔻	5006	172.22.1.10	00	0	1	0.00	Mbit/s	L	Pignaling
	7		TCP 🔻	5007	172.22.1.10	00	0	1	0.00	Mbit/s	L	Parameter
	8		TCP 🔻	5008	172.22.1.10	00	0	1	0.00	Mbit/s 🖵		
Lost									OK	Cancel		Signaling ON
Sele App	ect lic											Config

Figure 5-15 - Data Application Measurement Iperf Tab Configuration (part I)

- 27. Enter all the values shown in this screen into your system.
- 28. Select Throughput and a screen like the following appears.



Figure 5-16 - Data Application Measurement Throughput Tab

- 29. Enter all the values shown in this screen into your system.
- 30. Click Config on the lower right and a screen like the following appears.



#### Figure 5-17 - Data Application Measurement Throughput Tab Configuration

31. Enter all the values shown in this screen into your system.

Interval:1 Max array size: 1000 Traces visibility, vDAU Overall throughput is enables for the uplink and the downlink

32. Click the DNS req tab and a screen like the following appears.

🚸 Data Application Me	easurement 1 - V3.	2.40					DNS Requests
Select RAN: LTE S	ignaling 1		x. possible Throug x. possible Throug	hput Uplink (RAN): hput Downlink (RAI	<b>5.160</b> N): <b>3.953</b>	Mbit/s Mbit/s	DNS Requests
Overview O	ing 🛛 🔘 IPerf	O Throughput	ODNS req.	🔵 IP Logging	🛛 🕛 IP Analysi	s	
DNS Requests							Configure
Request Count:			0				Services
Client IP	Reque /Applic	sted Domain ation	Reso Dom	lved IP/ ain	Timestamp		
							Network Impairm. OFF
							Signaling Parameter
							LTE 1 Signaling OFF
Select Applic							Config

Figure 5-18 Data Application Measurement DNS Req Tab

- 33. Enter all the values shown in this screen into your system.
- 34. Click Config on the lower right and a screen like the following appears.

🚸 Data Application IV	leasurement 1 -	₩3.2.40						DNS Requests
Select RAN: LTE	Signaling 1	•	Max. possible Max. possible	Throughput Upli Throughput Dov	nk (RAN): vnlink (RAN):	5.160 3.953	Mbit/s Mbit/s	DNS Requests
Overview O	Ping 📄 💿 IP e	rf 📔 🔵 Throug	hput 🛛 💿 DNS	req. 📃 💿 IP L	.ogging 🛛 🔘	IP Analysi	is	OFF
DNS Requests							1	Configure
Request Count:			0					Services
Client IP	Req /App	juested Domain Ilication	1	Resolved IP/ Domain	Ti	mestamp		
								Network Impairm. OFF
					🗞 DNS Config Max. Index Co	ount: 1	000	Signaling Parameter
					0	( Ca	ncel	LTE 1 Signaling ON
Select Applic								Config

## Figure 5-19 Data Application Measurement DNS Req Tab Configuration

35. Enter all the values shown in this screen into your system.

Max. Index Count: 1000

36. Click IP logging and a screen like the following appears.

🚯 Data Application Measurement 1 - V3.2.40												
Select RAN:	LTE Signa	ling 1	•	Max Max	. possible . possible	Throu <u>c</u> Throu <u>c</u>	hput Uplink hput Down	k (RAN): Ilink (RAI	N):	5.160 3.953	Mbit/s Mbit/s	IP Logging
Overview	O Ping	_ IPe	rf 📋 💿 Throug	hput	O DNS	req.	😑 IP Lo	gging	O IP	Analysi	s	
IP Logging											· · ·	Configure
Logging Interfa	ce:		U-Plane IP							_		Services
Log File Folder	r:		Z:\ip_logging									
Log File Name	:		DataApplMeas1	_U-Plan	ie_IP_001	.рсар						
Canal Canal	lysis(DAUSI	nare)										
📛 Z:\ip_logg	jing(DAUSh	are)										Network Imnairm.
DataApp	IMeas1_U-P	Plane_IP	_000.pcap		2 KB		08.10.	2014 15	5:13:44			OFF
												Ļ
												Signaling
												Parameter
Selected File:	Z:\ip_analys	sis										LTE 1
											Open	Signaling OFF
Salact	. odd	Ϋ́		-		-	Ì			Υ		
Applic		er	Z Rename	Cor	) y	Pa	ste	XDel	ete			Config

Figure 5-20 Data Application Measurement IP Logging

- 37. Enter all the values shown in this screen into your system.
- 38. Click Config on the lower right and a screen like the following appears.

🚸 Data Applica	ation Measure	ment 1 - V3	.2.40									IP Logging
Select RAN:	LTE Signal	ing 1	•	Ma: Ma:	c possible c possible	Throug Throug	hput Uplini hput Down	k (RAN): link (RAN	۷):	5.160 3.953	Mbit/s Mbit/s	IP Logging
Overview	💿 Ping	⊖ IPerf	📄 🕘 Throug	hput	O DNS	req.	O IP Lo	gging	O IP	Analysi	is	
IP Logging											,	Configure
Logging Interfa	ace:	U.	Plane IP									Services
Log File Folde	er:	Z:*	\ip_logging									
Log File Nam	e:	Da	ataApplMeas1	_U-Plar	ne_IP_001	.рсар						
					_							
Caracteria Caracte	lysis(DAUSha	are)			]							
Caller C	ging(DAUSha	nre)										Imnairm
DataApr	olMeas1_U_PI	ane IP 0	00.ncan		2 KB		08 10	2014 15	•13•44			OFF
	🎨 IP Logging	Config		_							<b>X</b>	
	Logging	Interface		U-	Plane IP		<b>-</b>					
	Log File	Name		Dat	aAppIMea	s1_U-P	lane_IP_00	01.pcap				
	⊟⊸Advance	d setting	6									<u>}</u>
	File S	Size		0 1	MB							
	Pack	et Counte	er	0								
												Signaling
												Furdineter
Selected Fil					_							LTE 1
									0k	Ca	ancel	Signaling ON
Select Applic	Add folder	r 🗹	Rename	Co	ру	Pa	ste	X Del	ete			Config

#### Figure 5-21 - - Data Application Measurement IP Logging Tab Configuration

39. Enter all the values shown in this screen into your system.

Logging Interface: U-Plane IP File size: 0 Packet Counter: 0

40. Click IP Analysis and a screen like the following appears.

🚯 Data Application Measurement 1 - V3.2.40	IP Analysis
Select RAN:       LTE Signaling 1       Max. possible Throughput Uplink (RAN):       5.160 Mbit/s       Mbit/s         Max. possible Throughput Downlink (RAN):       3.953 Mbit/s	IP Analysis
Overview Ping IPerf Throughput DNS req. IP Logging IP Analysis	
TCP Analysis IP Connectivity	Configure
Tput TCP Win. Retrans. Overhead Tp Conn. L4 Prot. L7 Prot. IP Source Pour	Services
0 bit/s OK OK 0	
τ τ τ τ τ τ τ τ τ τ τ τ τ τ τ τ τ τ τ	
Data Pie Charts Layer Data (Byte) %	Network Impairm. OFF
0 0.00 %	
Flow Throughput and Event Trigger Voice Over IMS	
I Details Flows Call Origin State Start (t)	
50	Signaling Parameter
	LTE 1
-100 -80 -60 -40 -20	Signaling OFF
Select Select Assign View View	Config

Figure 5-22 Data Application Measurement IP Analysis Tab

Select RAN: LTE Signaling 1

42. Click Config on the lower right and a screen like the following appears.

🚯 Data Application Measurement 1 - V3.2.40			IP Analysis
Select RAN: LTE Signaling 1	Max. possible Throughput Uplin Max. possible Throughput Dow	nk (RAN): 5.160 nlink (RAN): 3.953	Mbit/s Mbit/s
Overview Ping IPerf Thr	roughput 📔 💿 DNS req. 📗 💿 IP L	ogging 🛛 🔘 IP Analysi	s UFF
TCP Analysis	IP Connectivity		Configure
Tput TCP Win. Retrans. Ove	erhead Tp L Conn. L4 Prot. L wn Ur L Status	.7 Prot. IP Source	Sou Services
0 bit/s OK OK	OK 0		
•			
Data Pie Charts Lavor Data (Buto) %			Network Impairm.
Ayer     Data (byte)     N	1		
TCP Analysis Settings			
TCP Window Size Thre	eshold	90.0 %	
	reshold	10.0 %	
Flow Thr TCP Overhead Thresho	ld	50.0 %	
50			Signaling Parameter
		Ok Ca	ncel Signaling
Select Select Export DB		Assign View	Config

### Figure 5-23 Data Application Measurement IP Analysis Tab Configuration

- 43. Enter all the values shown in this screen into your system.
  - TCP Analysis Settings: 90.0 %
  - TCP Retransmission Threshold: 10%
  - TCP Overhead Threshold: 50%

# 5.3 Setting Data Application Control (Appling the Main Configuration Options)

From Data Print Measure select Configure on the upper right and the following screen displays.

🚯 Data Applicati	on Control								Overview
DAU Unit <mark>ON</mark>	l.								DNS
Overview	轟 IP Config	O DNS	○ FTP	) 💿 H	TTP 📔 😑 IMS	; ]			Server
LAN DAU Sta	atus: Notconi	nected	-						
「 Current DAU	IP∨4 Settings				Current DA	U IPv6	Settings ———		FTP
IPv4 Address:	172.22.1.201					fi	r01:cafe::1/64		Server
Subnet Mask:	255 255 0 0				IPv6 Address	: ''	cor.culc1704		
									НТТР
Gateway IP:	n/a				Default Route	r: n	/a		OFF
Domain Name	e Service (DNS)	(	OFF		File Transfe	r Proto	col Service (FTP)	OFF	
	Primary	5	Secondary						IMS Service
Туре:	No DNS	l l	No DNS		FTP Service	Гуре:	FTP Server		
IPv4 Addr:	n/a	1	n/a						
IPv6 Addr:	n/a	1	n/a						
									<u>├</u>
Hypertext Tra	nsfer Protocol	(HTTP)	OFF		IP Multimed	ia Serv	/ice (IMS)	ON	
				_	IMS Server T	/pe:	intern IMS		<u>}</u>
External Conne	ection:			True	Mobile Statu	5:	registered		
IPv6 Support:				True	IP Address:	fcC	)1:abab:cdcd:efe1:		<u> </u>
						_			DAU
								Close	
Select Applic	Network Drive map								

#### Figure 5-24 Data Application Measurement Overview

From this screen perform the following options.

1. Enter all the values shown in this screen into your system.

Domain Name Service (DNS): Off File Transfer Protocol Service (FTP: Off Hypertext Transfer Protocol (HTTP): Off IP Multimedia Service (IMS) On IMS server Type: intern IMS Mobile Status: registered Ip Address: fc01: abab:cdcd:efe1

2. Click IP Config and the following appears.

🚯 Data Application Control	E 🛛 IP Con	fig
DAU Unit OII		
Overview 🚺 P Config DNS FTP H	TTP OIMS	
LAN DAU Status: Not connected 👫		
Current DAU IPv4 Settings	Current DAU IPv6 Settings	
IPv4 Address: 172.22.1.201	folliosferil@4	
Subnet Mask: 255.255.0.0	IPv6 Address: ICU1.cale1/64	
Gateway IP: n/a	Default Router: n/a	
IPv4 Address Configuration	LAN(DAU) IPv6 Address Configuration	
Automatic R&S CMW500 Network (standalone)	Automatic Nais CMW300 NetWork (standalone)	
Mobile IPv4 Addresses	Automatic Mobile IPv6 Prefixes	
172.22.1.100	fc01:abab:cdcd:efe0::/64	
172.22.1.101	fc01:abab:cdcd:efe1::/64	
172.22.1.103	fc01:abab:cdcd:efe2::/64	
172.22.1.104	fc01:abab:cdcd:efe3::/64	
172.22.1.105	fe04ahahededofo4vi64	
172.22.1.106	Routing	
470 00 4 407	Manual Routes	
F General Configuration	Prefixes via Routers	
MTU: 1500 P		
MITO. 1300 B		
	DAU	
	Unit	
	Close	
Select Network Applic Drive map	Config	

Figure 5-25 – IP Config

- 3. Enter all the values shown in this screen into your system.
- 4. Click DNS Config and a screen like the following appears.

🚯 Data Application Control			DNS
DAU Unit ON			Local DNS
Overview 🛛 🏭 IP Config 🚺 DNS	FTP HTTP I HTTP		Server
Domain Name System			OFF
DNS Server Info for the mobile —			
Primary DNS Server: No DNS	Secondary DNS Server: No I	DNS	
Current IPv4 Address: n/a	Current IPv4 Address: n/a		
Current IPv6 Address: n/a	Current IPv6 Address: n/a		
Local DNS entries			
Domain	IP		<u> </u>
www.dau.dau	172.22.1.201		Test Primary
www.dau.dau	fc01:cafe::1		Foreign DNS
			Server
Application services			
Application	Domain	Protocol Port	<u> </u>
pcscf	dau.dau	UDP 5060	
L			
			DAU
			Unit
		Close	
Select Network			Config
Applic Drive map			g

Figure 5-26 - DNS

- 5. Enter all the values shown in this screen into your system.
- 6. Click FTP and a screen like the following appears.

🗞 Data Application Control	FTP
DAU Unit OII	FTP
Overview 📲 IP Config 💿 DNS 💽 FTP 💿 HTTP 😜 IMS	Service
File Transfer Protocol	OFF
FTP Service Type     ● FTP Server	
C FTP Traffic Generator	
FTP Server Settings	
Allow connection from external network (LAN-DAU):	
Enable IPv6 support: 🔽	
Allow anonymous users:	Add FTP
Allow anonymous user to upload data to server:	account
FTP User Accounts Permissions	er alla
Delete Download Upload	Eait Zuser
	account
	Pomouo
	× user
	account
	Unit
Close	ON
Select Network Applic Drive map	Config

Figure 5-27 FTP

FTP Service Type: FTP Server

8. Click HTTP and a screen like the following appears.

🚯 Data Applicat	tion Control						нттр
DAU Unit <mark>ON</mark>	)						нттр
0verview	👬 IP Config	O DNS	○ FTP	<b>HTTP</b>	⊖ IMS		Service
Hypertext Tra	nsfer Protocol					, I	UFF
Allow connecti	ion from external	network: 💌					
Enable IPv6 su	upport:	▼					
							DAU
						Close	
Select Applic	Network Drive map						Config

### Figure 5-28 - HTTP

- 9. Enter all the values shown in this screen into your system.
- 10. Click IMS and a screen like the following appears.

🚯 Data Application Control						_ 🛛	IMS service
DAU Unit OII							
Overview 📑 IP Config 💿 DNS 💿 FTP	HTTP [	😑 IMS					IMIS
IP Multimedia Subsystem							
-				Ise IMS	Server	intern IMS	
IMC Status	D CSCE Add	aaa >Mahi	ile ``	000 1100	ocriver.	intern imo	
	P-CSCF Add	ess->mob	ne —				
running	P-CSCF Addres	SS:			fcU1:ca	fe:U:U:U:U:U:1	
	IMS Settings						
Info	User Authent.					Off	
15:06:47 🕦 UE is subscribed for 'reg' event 🔹	Private User ID		0010	01012345	6789@ti	est.3gpp.com	Deregister
15:06:47 🕦 Mobile registered	Authent. Algor.	XOR					Mobile
15:06:47 UE registered for +g.3gpp.icsi-ref="u	Key 0001 0203 0405 0607 0809 0A0B 0C0D 0Ethex						
14:33:44 MS Server ON	RAND	5555 5555	5555	5555 555	5 5555 5	5555 5555 hex	SMS
14:33:43 MGW successfully started	AME					0000 hex	over IMS
14-33-43 A IMS Sanvar Startun	AKA Version					AKAv1-MD5	
- Mahila Infa	Kev Type					OPc	Vaica
Mobile Status registered	Authent, OPc	CB9D CD0	C5 B92	25 8E6D	CA47 60	37 9FB8 hex	over IMS
IP Address fc01:abab:cdcd:efe1::1	RESLength					32	
Public User ID sip:+11234567890@test.3gpp.cor	IP Sec					Off	
Private User ID 001010123456789@test.3gpp.cor	Integrity Algor				ΗN	1AC MD5 96	
Home Domain test.3gpp.com	Encrypt Algor					NO CIPH	
	Enerjpt: Figer.						DAU
						Class	Unit
						Close	
Select Network Applic Drive map							Config

Figure 5-29 - IMS

- Enter all the values shown in this screen into your system.
   To configure Voice over IMS and create an outgoing call click Config and a screen like the following displays.

🚯 Data Application Control							IMS service
DAU Unit <mark>ON</mark>							
Overview 🛛 🚑 IP Config 📃 D	NS 🗍 💿 FTP 🗍	● HTTP	😑 IMS				IMS
IP Multimedia Subsystem	🚯 Voice over I	MS					
IMS Status	IMS voice s Use Precondit Audio Routing Media Endpoi	ettings tions: : mt IP Address IMS	:	Wit	hout Pre A	conditions udioboard 172.22.2.2	
Into							
14:51:11 UE is subscribed for 'rea'	Call Type:	🖉 Audio				-	Deregister
14:51:11 Mobile registered	AMR Type:	Wideband				-	Mobile
14:51:11 Register Request Receive 14:49:16 IMS Server ON	AMR Codec:	0 🗆 6.60	kbit/s 1	8.85 kbit/s	2 💌 1	2.65 kbit/s	SMS
14:49:16 MGW successfully started	1	3 14.25 6 19.85	kbit/s 4   kbit/s 7	15.85 kbit/s 23.05 kbit/s	8 2	8.25 kbit/s 3.85 kbit/s	
Mobile Info	Video Codec:	H.263					Voice
Mobile Status						🤳 Call	over IMS
IP Address fc01:abab:cdcd:efe0:	3						
Public User ID sip:+11234567890@	2					Close	
Private User ID 001010123456789@	2					Close	
Home Domain	test.3gpp.com	Encrypt. Alg	jor.			NO_CIPH	DAU
						Close	Unit ON
Select Network Applic Drive map							Config

Figure 5-30 – Configuring Voice Over IMS

- 13. Enter all the values shown in this screen into your system.14. Verify or enter that the Call Type is Audio (not Video)..
- 15. AMR must equal wideband.
- 16. The AMR Code must be checked and equal to 12.65.

🚸 Data Application Control							IMS service
DAU Unit <mark>ON</mark>							
Overview 🛛 📇 IP Config 👘 🔘 D	NS OFTP	HTTP	😑 IMS				IMS
IP Multimedia Subsystem	🚯 Voice over I	MS				8	
IMS Status	<ul> <li>IMS voice s</li> <li>Use Precondit</li> <li>Audio Routing</li> <li>Media Endpoi</li> </ul>	ettings tions: :: nt IP Addres:	5:	Witl	nout Prec Au	conditions Idioboard 172.22.2.2	
	Voice over	IMS ———					
Info	-			Ringing		<b>`</b>	
14:55:20 hours ringing.	Call Type:	Αudio				-	Deregister Mobile
14:55:14 CE is subscribed for 'reg'	e AMR Type:	Wideband				-	
14:55:14 () Mobile registered	AMR Codec:	0 🗆 6.60	kbit/s 1	8.85 kbit/s	2 🔽 12	2.65 kbit/s	SMS
14:55:14 🔒 Register Request Receive	ec .	3 🗌 14.25	kbit/s 4	15.85 kbit/s	5 🗌 18	3.25 kbit/s	over IMS
14:53:20 A UE is unsubscribed from 1		6 🗌 19.85	kbit/s 7	23.05 kbit/s	8 🗆 23	3.85 kbit/s	
Mobile Info	<ul> <li>Video Codec:</li> </ul>	H.263					Voice 🔍
Mobile Status					[	🤳 Call	over IMS
IP Address fcu1:abab:cdcd:eteu	<u>ا</u> لــــــ						
Public User ID sip:+112345678900 Private Licer ID 0010101234567890	2					Close	
Home Domain	tect Bann com	En amont Al					
	rest.5gpp.com	Encrypt. A	igur.			NO_CIPH	DAU
						Close	Unit ON
Select Network Applic Drive map			Ĭ				Config

Figure 5-31 – When the call begins the telephone symbol next to ringing will begin to rotate.

17. Push the call button

# 6 CMDA setup of the R&S CMW500

To configure the CDMA Signaling options, perform the following steps.

1. Press the Sig Gen key on the front panel, select "CDMA2000 Signaling"

🚯 Generator/Signaling Controller			Gen Ctrl
	Taskbar entry	State	
🐟 General Purpose RF			
-Generator 1		OFF	
Generator 2		OFF	
≈ 1×EV-DO			
Signaling		OFF	
≈ CDMA2000		_	
Signaling		OFF	
≪GSM		_	
- Signaling		OFF	
l ≈ LTE	_	_	
-Signaling 1		OFF	
Signaling 2		OFF	
Sinnaling 1	_	OFF	
Signaling 1 Signaling 2		OFF	
Signamy 2 ≪WLAN			
		OFF	
Signamig	1		
	×	× × ×	Ŵ.
			Config

Figure 6-1 – Generate Signaling Controler.

2. From the front CDMA screen select the Config button in the lower right hand corner and a screen like the following displays.

🚸 CDMA2000 Signaling - V3.2.81 - Base V 3.2.60									CDMA2000
Connection Status		Base S	tation (	Control					CDMA2000 1
Cell		Band C	lass	BC 0: US	Cellul	ar		-	TX Meas
		Channe	I		384 Ch				CDMA2000 1
Mobile Station On		Frequer	ICY.	Forv 881	vard 520 MH	7	Reverse 836 520	MHz	RX Meas
RX Power underdriven		opuer	.c,	001.	520 1111	12	050.520	miliz	<u>├</u>
1st Service Option		CDMAI	Power	-60	.00 dB	m			
Voice Coder		SID		20	004	NID		65535	Go to
Forward Reverse									
Radio Configuration									
FCH MUX Option hex hex		Event	log						Routing
SCHO MOX Option nex nex		16:53:0	07: RTT	UDA is a	ictive			<b></b>	
		16:53:0	06: Sign	nal On					
MS Info 👻		16:53:0	01: Link	Handler	Version	: 05.90_5	3A222D	7	
		16:53:0	D1: Link	Handler	Slot: A1	000 (4)			
Dialed Number		16:53:0	J1: Link	Handler	IP: 172.	22.1.30		<b>_</b>	$\vdash$
Global Emergency Call			<b>.</b>						
MS Protocol Revision		Mobile	Station	i Contro	I				
		Precon	figuratio	n values:					
		1st Sen	vice Opti	ion SO	68 (Sp	eech)		+	Rignaling
				Eon	vard/Re	verce			Parameter
MEID		Desilie of			varunto	10130		CI/	- diditotor
Max EIRP		Radio C	ontigura	$\frac{3}{3}$			<u>н</u> -Р	SN	CDMA2000
MS IPv4 Address									Signaling
IMS IPv6 Prefix									Run
Connect 1st SO	Send Broado	ast	Send S	sмs					Config

### Figure 6-2 – Connection Status.

- 3. Verify you have the same settings as are displayed on this screen.
- 4. Click Config and a screen like the following displays.

🚯 CDI	CDMA2000 Signaling Configuration	×		CDMA2000
Conn	Scenario	Standard Cell		CDM42000
Cell			-	TX Meas
Mohilo	-Enable Speech Codec	M		
Bildow	⊟ System			CDMA2000
	E RF Output (TX)			RX Meas
FCH M	Connector	RF1COM 💌	Hz	
SCHO	Converter	RFTX1 -		
Euro	External Attenuation	20.00 dB	5535	Go to
Even	⊟-RF Input (RX)			
14:40	Connector	RF1COM -		
Not F	Comvertor			Routing
14:40	Converter			
	External Attenuation	20.00 dB		1
MS Ir				
Dia	Band Class	BC U: Korean Cellular	•	
Gle	Channel	384 Ch		1
M8	-Forward Link Frequency	881.5200000 MHz	PSK	
MC	Reverse Link Frequency	836.5200000 MHZ		Ļ
NN	DS Frequency Offiset	U.U KIIZ		Signaling
FS		-60.00 dBm		Parameter
ME	-Output Power	-60.00 dBm		
Ma	Expected Power Mode	Open Loon Bule		CDMA2000
MS	Expected Fower Mode			Sig
IBM	Manilal Exported Dower	1.00 ABM		
	Connect 1st SO	Send SMS		Config

Figure 6-3 – CDMA Configuration Screen 1.

5. Configure the CMW per the following screen shots.

CDI TO CDMA2000 Signaling Configuration							CDMA2000
Conn Cell	CDMA Power	-60.00 dBm			*	<u> </u>	CDMA2000 TX Meas
Mobile FCH M	Expected Power Mode Manual Expected Power	Open Loop Rule - 0.00 dBm				Hz	CDMA2000 RX Meas
SCH0 SCH0 Even	-AWGN Level	Normal ▼ □ 0.00 dB				5535	Go to
14:40 14:40 Not F 14:40	⊡-Physical Layer 1st Service Option Radio Configuraton (Fw	SO 68 (Speech) 3/3 H-	PSK				Routing
14.40	⊟Code Channels	Level	Spreading Factor	Walsh Code	QOF		
MS Ir —Dia —Gia —ME	PICH Sync PCH ECH		64 64 64 64	0 32 1 8	0	• PSK	
MC NN ME ES	-SCH0 -OCNS -FCH Frame Offset	□ -7.00 dB Eb/Nt: ▼ -1.47 dB 0	128	35	0		Signaling Parameter
Ma MS MS	SCHO Frame Offset	U Forward 1	Reverse 1		×		CDMA2000 Sig ON
	Connect 1st SO		Send	SMS			Config

Figure 6-4 – CDMA Configuration Screen 2.



Figure 6-5 – CDMA Configuration Screen 3.



Figure 6-6 – CDMA Configuration Screen 4.



Figure 6-7 – CDMA Configuration Screen 5.



Figure 6-8 – CDMA Configuration Screen 6.

This completes the configuration.