



# Universal Diagnostic Monitor UDM V2

## High-performance, full-featured CDMA Diagnostic Monitor

The UDM is a full-featured Diagnostic Monitor (DM) that allows developers, field and drive test teams, certification test teams and service providers to monitor and analyze the performance of CDMA mobile devices and networks. UDM is the first commercially available DM supporting real-time position-location charting and analysis.

The UDM has been developed using the Spirent Universal Tool Suite (UTS), a chipset-independent architecture that supports solutions for CDMA mobile device provisioning and analysis. With UTS, the UDM can achieve manufacturer and chipset independence through the use of UTS Device Drivers. Generic device drivers for QUALCOMM-based CDMA mobile devices are supplied. The UTS architecture also provides tremendous flexibility in scripting and automated control with its open COM-based interface.

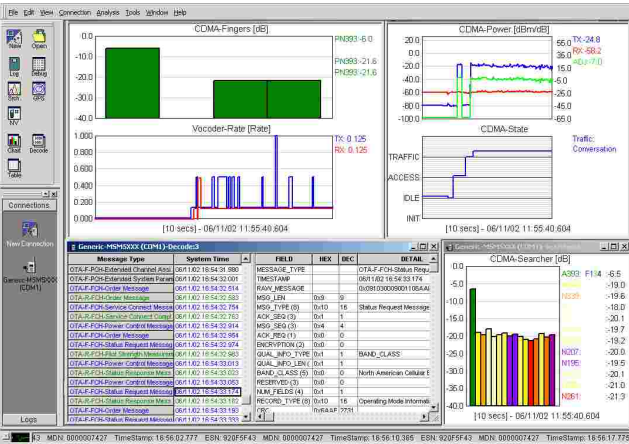
The UDM V2's Software Router (SoftRouter™) technology offers capabilities that far exceed those of conventional DMs, enabling connection to multiple CDMA devices and multiple software applications simultaneously. This feature allows direct, side-by-side

comparisons of CDMA devices. It also allows play back of multiple data logs and graphs while recording new logs from multiple CDMA devices. SoftRouter™ technology is key to enabling closed-loop test automation with the UDM, either integrated with other Spirent test systems, or as part of a user-developed solution.

The UDM supports real-time display and logging of key IS-95A/B and IS-2000 parametric data with fully customizable charts and tables. It also supports Over-The-Air (OTA) message logging and integrated real-time

message decoding. GPS positional data may be recorded and decoded within the OTA logs. Advanced playback features allow replay of all previously logged data, including OTA messages and graphical data, at user-selectable rates.

With the UTS device drivers, flexible charting, open scripting, comprehensive logging, versatile playback capabilities and unique built-in SoftRouter™, the UDM delivers industry-leading capabilities that greatly exceed those of traditional diagnostic monitors.



*The UDM uses real-time, customizable graphs and tables to display performance of connected CDMA devices.*

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### Major Features:

- Manufacturer and chipset independence with UTS device drivers
- Support for 3G data and IS-801-1 Location Services
- E911 Compliance Pass/Fail based upon FCC criteria.
- GPS data logging with GIS export facility
- SoftRouter™ supports simultaneous mobile device monitoring and control for complete test automation
- Simultaneous logging and display of data from multiple CDMA mobile devices
- Real-time display and charting of device performance and status information
- IS-95A/B and IS-2000 Over-The-Air (OTA) message logging with integrated decoder
- Includes drivers for QUALCOMM-based CDMA mobile devices
- Integrated playback of previously-logged data at a user-selectable rate

### Applications:

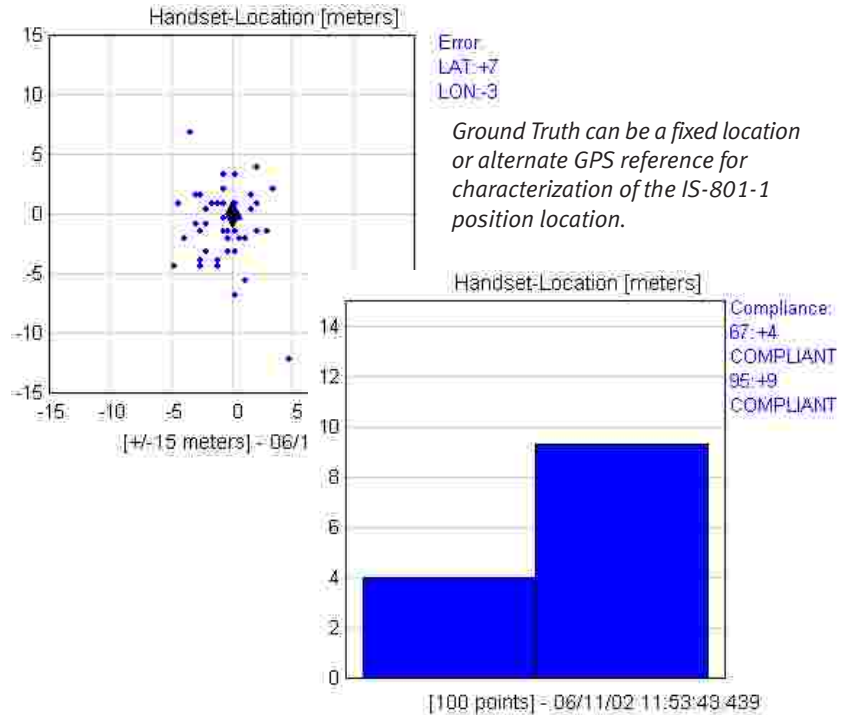
- Product Design and Development
- Product Verification and Validation
- Deployment and Field Test
- Certification and Performance Test
- Compliance and Interoperability Labs



Analyze | Assure | Accelerate™

## E911 and Position Location Testing

The UDM is the first to integrate the FCC's OET Bulletin No. 71 statistical compliance methodology into a simple easy to read pass/fail chart. UDM builds upon Spirent's industry leading Position Location Test System (PLTS) solution by expanding position-location testing capabilities into the field environment. UDM supports full IS-801-1 message logging and decoding as well as location charting, and statistical error analysis. The UDM performs the statistical analysis for E911 Phase II mobile based solution: 50 meters for 67 percent of calls, and 150 meters for 95 percent of calls automatically.

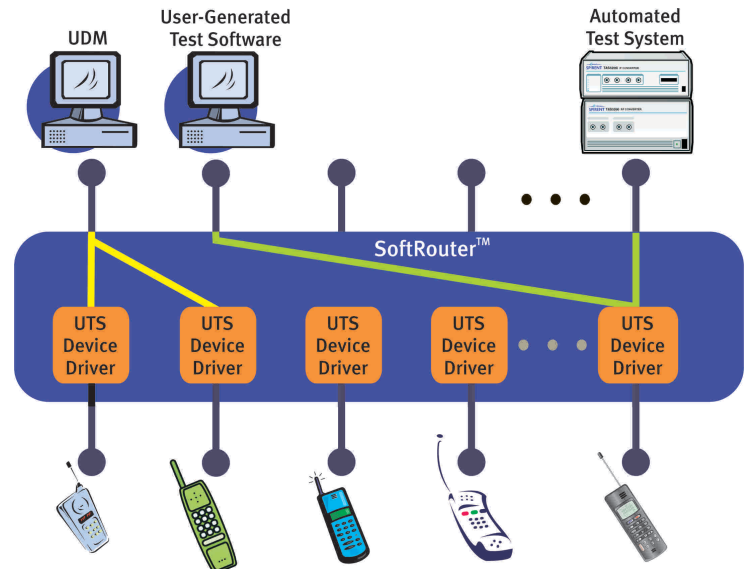


The Compliance chart provides a simple Pass/Fail relative to FCC statistical requirements.

## SoftRouter™ Technology

The SoftRouter™, inherent to Spirent's UTS architecture, provides the capability to simultaneously connect, control and analyze multiple CDMA mobile devices. SoftRouter™ technology allows side-by-side comparisons of both mobile devices and networks.

For automated testing, the SoftRouter™ manages the device connection port, allowing the UDM to continue to monitor the device while it is being controlled by multiple programs, such as the Spirent TASKIT/C2K test executive in the C2K-ATS CDMA2000 Automatic Test System, or a user-generated test solution.



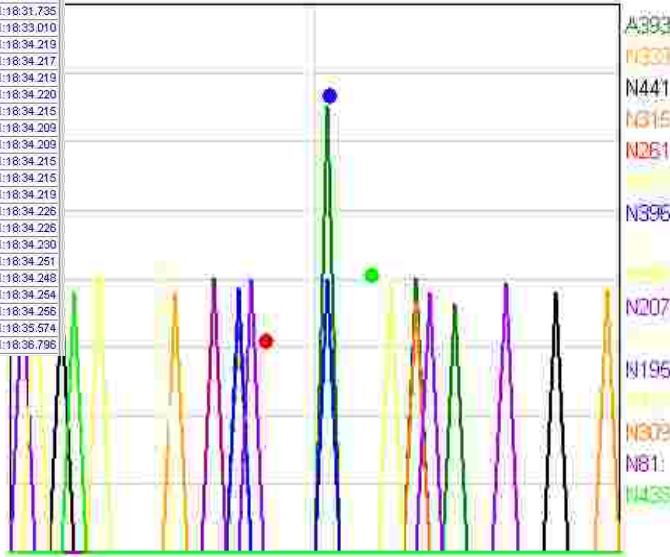
The UDM's use of the UTS architecture with built in SoftRouter™ allows for side-by-side performance comparison of multiple devices from different manufacturers.

Examples of UDM Capabilities

Software Trace Debug View

System Time	MESSAGE	LVL	MOB	LIN	TIME
06/12/02 21:18:31.731	Sort Prio, 4 Neig, chps=256, win=80	1	srchzz.o	6774	06/12/02 21:18:31.731
06/12/02 21:18:31.735	Last Wakeup: Aset_eng=5645, Rx=-59dB	2	srchzz.o	11526	06/12/02 21:18:31.735
06/12/02 21:18:31.010	RF sleeping	0	rftsm.o	7917	06/12/02 21:18:31.010
06/12/02 21:18:34.219	Enabled digital Rx power	0	rftsm.o	5761	06/12/02 21:18:34.219
06/12/02 21:18:34.217	RF card in PCS mode	1	rftcs.o	611	06/12/02 21:18:34.217
06/12/02 21:18:34.219	Card mode: 1 - Chan: 150	0	rftcs.o	718	06/12/02 21:18:34.219
06/12/02 21:18:34.220	Digital initialized	0	rftsm.o	6429	06/12/02 21:18:34.220
06/12/02 21:18:34.215	skipped=93, residual=26672, early=24576	1	srchzz.o	1565	06/12/02 21:18:34.215
06/12/02 21:18:34.209	Wakeup roll: SymbComb ph=1 offset=6144	2	srchint.o	659	06/12/02 21:18:34.209
06/12/02 21:18:34.209	RF warmup complete	0	rftsm.o	6503	06/12/02 21:18:34.209
06/12/02 21:18:34.215	Roq Lst: r1=441, r2=48	1	srchzz.o	6399	06/12/02 21:18:34.215
06/12/02 21:18:34.215	e1=173, e2=200	1	srchzz.o	6402	06/12/02 21:18:34.215
06/12/02 21:18:34.219	Slept 93 rolls + 26672 chips, slew=0	2	srchzz.o	7542	06/12/02 21:18:34.219
06/12/02 21:18:34.226	PH Pos=55 TH=65 THB=1	1	srchpcht.o	972	06/12/02 21:18:34.226
06/12/02 21:18:34.226	GPCH ZERO   =2 Q= -35 TH1=399	2	srchpcht.o	997	06/12/02 21:18:34.226
06/12/02 21:18:34.230	RF ready to sleep	0	rftsm.o	7639	06/12/02 21:18:34.230
06/12/02 21:18:34.251	Sleep now: Rx=-60, Pn=393, ecio=-4	1	srchzz.o	5988	06/12/02 21:18:34.251
06/12/02 21:18:34.248	RF sleeping	0	rftsm.o	7917	06/12/02 21:18:34.248
06/12/02 21:18:34.254	Sort Prio, 4 Neig, chps=256, win=80	1	srchzz.o	6774	06/12/02 21:18:34.254
06/12/02 21:18:34.256	Last Wakeup: Aset_eng=5466, Rx=-59dB	2	srchzz.o	11526	06/12/02 21:18:34.256
06/12/02 21:18:35.574	RF sleeping	0	rftsm.o	7917	06/12/02 21:18:35.574
06/12/02 21:18:36.798	Enabled digital Rx power	0	rftsm.o	5761	06/12/02 21:18:36.798

Searcher Signal Traces

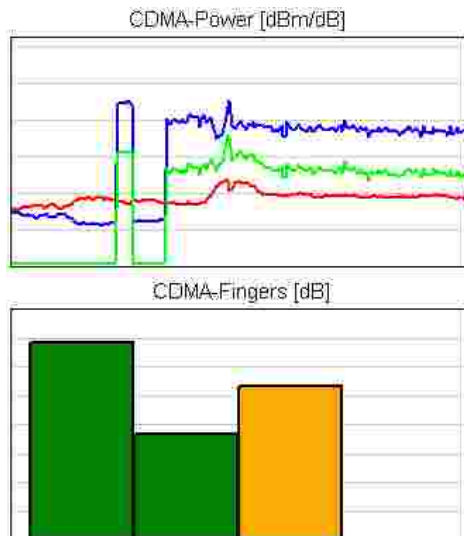


Real-Time Message Decoding

FIELD	HEX	DEC	DETAIL
MESSAGE_TYPE			OTA-F-801-Position Determination Data Message
TIMESTAMP			06/06/02 00:20:59.865
RAW_MESSAGE			0x410001010DB9CE73A3B95DACD919C2113A4
SESS_START (1)	0x0	0	
SESS_END (1)	0x1	1	
SESS_SOURCE (1)	0x0	0	
SESS_TAG (5)	0x1	1	
PD_MSG_TYPE (8)	0x0	0	Position Determination Data Message
NUM_REQUESTS (4)	0x0	0	
NUM_RESPONSES (4)	0x1	1	
RESERVED (3)	0x0	0	
UNSOL_RESP (1)	0x0	0	Solicited response element
RESP_TYPE (4)	0x1	1	Provide Location Response
RESP_PAR_LEN (8)	0x0	13	
TIME_REF_CDMA (14)	0x2D67	11623	
LAT_REF (25)	0x739D1D	7576851	40.645450 degrees north of equator

Comprehensive Filter Masks

Power & Finger Charts



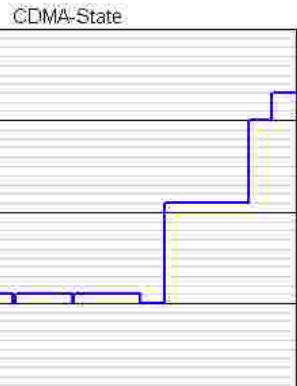
User-Defined Table Views

CDMA-Band Class:	1:8-2.0 GHz PCS
CDMA-State:	Idle/Sleep
CDMA-Channel:	150
Handset-Electronic Serial Number:	9205F43
Handset-Mobile Directory Number:	000007427
CDMA-Network ID:	0
CDMA-System ID:	4119
Handset-Software Version:	D.05 Oct 09 2001 (Carmen_M)
CDMA-Time Stamp:	20:36:53.519

Pilot List	Active Set:	Pilot	Strength (dB)
	393	-9.000000	
Candidate Set:	396	-16.000000	
	483	-11.000000	
Neighbor Set:	195	-23.500000	
	390	-25.000000	
	207	-31.500000	
	477	-31.500000	
	438	-31.500000	
	441	-31.500000	
	426	-26.000000	
	429	-31.500000	
	309	-26.500000	
	261	-26.000000	
	81	-31.500000	
	339	-22.500000	
	48	-31.500000	
	315	-25.500000	
Remaining Set:			

State Chart Over Time





## Powerful Logging Capabilities

UDM makes it easy to collect and analyze mobile device and over-the-air message logs. All key CDMA parametric data is displayed and logged in real time, with fully customizable charts and tables. In a field or drive test environment, GPS positional data may be recorded and decoded within the OTA logs; just one GPS connection provides data for all connected devices.

A powerful data logging format provides the capability to display, log, decode, and playback a multitude of data such as OTA messages, CDMA parameters, analog parameters, and handset unique messages. Independent filters are provided to ensure logging and display of only pertinent data. Transport controls provide advanced playback features to replay all previously logged data, including OTA messages and graphical data, at user-selectable rates.

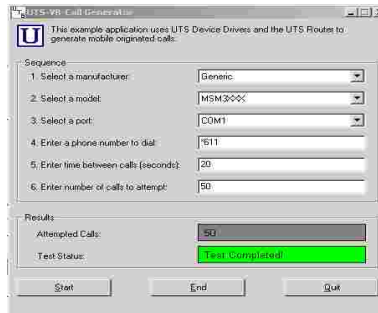
Message Type	System Time	FIELD	HEX	DEC	DETAIL
OTA.F.PCH-Extended C	06:05:02.23:41:47.001	MESSAGE_TYPE			OTA-R-001-Position Determination Data Message
OTA.F.PCH-Extended S	06:05:02.23:41:47.041	TIMEAMP			06:05:02.23:42:09.674
OTA.F.PCH-Extended S	06:05:02.23:41:47.041	RAW_MESSAGE			0x000010544C64F5FF066460004D000003403
OTA.F.PCH-Order Mess	06:05:02.23:41:47.473	SESS_START (1)	0x0	0	
OTA.F.PCH-Order Mess	06:05:02.23:41:47.713	SESS_END (1)	0x0	0	
OTA.R.F.CH-Phase Streng	06:05:02.23:41:47.841	SESS_SOURCE (1)	0x0	0	
OTA.R.F.CH-Phase Streng	06:05:02.23:41:48.333	SESS_TAG (5)	0x6	6	
OTA.R.F.CH-Phase Streng	06:05:02.23:41:48.332	FD_MSD_TYPE (6)	0x0	0	Position Determination Data Message
OTA.F.PCH-Order Mess	06:05:02.23:41:49.393	NUM_REQUESTS (4)	0x0	0	
OTA.F.PCH-Order Mess	06:05:02.23:41:49.485	NUM_RESPONSES (4)	0x1	1	
OTA.F.PCH-Order Mess	06:05:02.23:41:49.574	RESERVED (3)	0x0	0	
OTA.F.PCH-Order Mess	06:05:02.23:41:49.774	UNSQL_RESP (1)	0x0	0	Solicited response element
OTA.F.PCH-Order Mess	06:05:02.23:41:49.794	RESP_TYPE (4)	0x5	5	Provide Pilot Phase Measurement
OTA.R.F.CH-Order Mess	06:05:02.23:41:49.843	RESP_PAR_LEN (8)	0x44	68	
OTA.F.PCH-Order Mess	06:05:02.23:41:50.013	TIME_REF_MS (24)	0x0C86FF	13320655	13320655 ms
OTA.R.F.CH-Order Mess	06:05:02.23:41:50.082	OFFSET_PWL (1)	0x1	1	
OTA.F.PCH-Order Mess	06:05:02.23:41:50.113	MOB_SYS_T_OFFSET (14)	0x3FFC	16380	-0.2000 TIA/EIA-95-B chp(s)
OTA.F.PCH-Extended Ha	06:05:02.23:41:50.253	REF_PN (9)	0x68	104	6668 PN chp(s)
OTA.F.PCH-Order Mess	06:05:02.23:41:50.274	REF_PILOT_STRENGTH (6)	0x12	18	-9.0 dB
OTA.R.F.CH-Phase Streng	06:05:02.23:41:52.182	BAND_CLASS (6)	0x0	0	
OTA.R.F.CH-Order Mess	06:05:02.23:41:52.643	CDMA_FREQ (11)	0x180	384	
OTA.R.F.CH-Order Mess	06:05:02.23:41:52.675	BASE_ID (16)	0x136	310	
OTA.R.F.CH-Order Mess	06:05:02.23:42:03.753	SD (19)	0x16	22	
OTA.R.F.CH-Order Mess	06:05:02.23:42:03.892	NEP (16)	0x0	0	
OTA.F.PCH-General Har	06:05:02.23:42:03.873	TOTAL_RX_PWR (5)	0x0	13	
OTA.F.PCH-Order Mess	06:05:02.23:42:07.593	PART_NUM (3)	0x0	0	1 = part number
OTA.F.PCH-Order Mess	06:05:02.23:42:07.593	TOTAL_PARTS (3)	0x0	0	1 = total number of parts
OTA.R.F.CH-Order Mess	06:05:02.23:42:07.619	NUM_PILOTS_P (6)	0x0	13	
OTA.R.F.CH-Order Mess	06:05:02.23:42:07.643	PILOT_PN_PHASE (19)	0x1A004	106000	6668.2500 TIA/EIA-95 PN chp(s)
OTA.R.F.CH-Order Mess	06:05:02.23:42:07.674	PILOT_STRENGTH (6)	0x12	18	
OTA.R.F.CH-Order Mess	06:05:02.23:42:09.934	RMS_ERR_PHASE (6)	0x1C	28	
OTA.R.F.CH-Order Mess	06:05:02.23:42:09.952	PILOT_PN_PHASE (19)	0x30D76	249874	15623.3750 TIA/EIA-95 PN chp(s)
OTA.F.PCH-General Har	06:05:02.23:42:12.533	RMS_ERR_PHASE (6)	0x1E	30	
OTA.R.F.CH-Order Mess	06:05:02.23:42:12.762	PILOT_PN_PHASE (19)	0x4A008	279534	17409.3750 TIA/EIA-95 PN chp(s)
OTA.F.PCH-General Har	06:05:02.23:42:17.533	PILOT_STRENGTH (6)	0x2E	46	
OTA.F.PCH-General Har	06:05:02.23:42:17.455	RMS_ERR_PHASE (6)	0x2B	43	
OTA.R.F.CH-Order Mess	06:05:02.23:42:17.583	PILOT_PN_PHASE (19)	0x13077	77943	4871.4375 TIA/EIA-95 PN chp(s)
OTA.R.F.CH-Order Mess	06:05:02.23:42:25.653	PILOT_STRENGTH (6)	0x25	35	
OTA.R.F.CH-Order Mess	06:05:02.23:42:28.315	RMS_ERR_PHASE (6)	0x21	33	
OTA.F.PCH-Extended Sy	06:05:02.23:42:26.840	PILOT_PN_PHASE (19)	0x21008	135176	8448.5000 TIA/EIA-95 PN chp(s)
OTA.F.PCH-Feature Ind	06:05:02.23:42:26.980	PILOT_STRENGTH (6)	0x2D	45	
OTA.F.PCH-Order Mess	06:05:02.23:42:26.980	RMS_ERR_PHASE (6)	0x2D	45	
OTA.F.PCH-Feature Ind	06:05:02.23:42:26.900	PILOT_PN_PHASE (19)	0x38D2C	196802	12300.1250 TIA/EIA-95 PN chp(s)
OTA.F.PCH-Order Mess	06:05:02.23:42:26.940				

The UDM's comprehensive logging function records and decodes IS-95A/B, IS-2000 and IS-801-1 messages, CDMA parameters, and unique device messages into easy to understand language.

## Enhanced Automation and Scripting Environment

UDM uses the Spirent UTS COM-based interface, which combines with the SoftRouter™ to provide advanced automation and scripting capabilities for ultimate flexibility and control of CDMA devices. The open interface makes automated device testing accessible by allowing users to generate test executables and scripts in any COM-based language, such as VBScript or Visual Basic.

Software Development Kit (SDK) is available to accelerate your automation efforts. The SDK contains: the UDM Instrument API to provide remote control of inherent UDM functionality, Decoder API to allow client applications such as a test executive to decode and trigger based on OTA message fields, and a Client Interface Specification that defines the SoftRouter™ interfaces to Control and Monitor the device under test.



The UDM's open COM-based UTS architecture forms a flexible and powerful Scripting environment, allowing advanced monitoring and control of CDMA devices.

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### UDM Ordering Information

#### UDM V2

- UDM CD-ROM
- UDM User Documentation
- UDM Security Module

Please contact your sales representative for pricing and option information.