



## DSA1491

### SAT/CATV/TV Signal Analyzer



The DSA 1491 is an all format TV/RF signal analyzer providing today's engineer a complete, portable tool for resolving digital video broadcast, transport, or reception challenges. Capable of testing and analyzing digital satellite signals, digital TV broadcast channels, cable QAM channels, and ASI MPEG streams, it is a true all-in-one analyzer. The DSA 1491 features a color touchscreen, which eliminates the need for multiple menus and pushbuttons, and achieves the ultimate in user friendliness. The large 9 inch screen provides unprecedented resolution so the user won't miss problems when analyzing critical constellation and spectrum analyzer test screens. An HDMI interface permits viewing on a larger HDMI monitor or for interface to a multi-viewer system.

The DSA 1491 provides powerful digital TV/RF analysis including MER, BER, PER, EVM, noise margin, constellation, and spectral analysis tests. A pass or fail quality indication simplifies interpretation. Additionally, the modulation type, FEC value, encryption type, MPEG services, video/audio program IDs and MPEG format descriptors are displayed providing advanced RF and MPEG signal analysis.

The DSA 1491 provides a full arsenal of unique tests and control features to assist technicians in troubleshooting all satellite, cable and TV reception systems. Advanced features include an integrated spectrum analyzer, Auto Discovery, SatFinder, DiSeqC commands, dual LNB monitoring, SCR commands, BarScan, tilt, leakage, ingress and logger tests. The DSA 1491 comes equipped with a protective case, AC power adapter, USB cable, various RF adapters and SMART software.

#### APPLICATIONS

- Satellite dish installation and precision alignment for broadcast, military, or government communications facilities
- Maintenance and troubleshooting of satellite or antenna farms, and broadcast, telco, cable, and satellite head-ends
- Satellite or broadcast signal analyzing/monitoring where space conservation is critical, such as in remote satellite trucks
- Troubleshooting of digital TV broadcasts, CATV digital or analog reception and distribution paths
- Maintenance and testing of digital or analog equipment, such as modulators, receivers, decoders

#### KEY FEATURES

- Nine inch high-resolution touch screen user interface simplifies navigation and makes complex measurement tasks simple
- Analyzes MPEG 2/4 SD and HD signals, showing services list, PIDs and decoding free-to-air video
- H.264 and MPEG-2 video decoding; MPEG, AAC, HE-AAC, Dolby AC3 and E-AC3 (DD+) audio decoding
- Descrambling capabilities with interface slot for conditional access module
- Built-in ASI I/O and optional IP I/O interfaces for PID information, decoding and ETR290 analysis. Outputs provide demodulated RF signal to external equipment
- Up to 6 hours active battery life with automatic battery saver

#### SATELLITE ANALYSIS FEATURES

- Satellite tuning from 930 to 2250MHz with transponder navigation available for all worldwide satellites
- Automatically discovers a channel's modulation type, frequency, bandwidth and symbol rate eliminating guesswork
- Digital satellite measurements including constellation, MER, EVM, BER, noise margin, level/power and spectrum analysis
- Unique satellite dish pointing and alignment features ensure dish installation ease and accuracy
- All DiSeqC commands supported - SCR with automatic search, USALS motor protocol

#### BROADCAST/CABLE ANALYSIS FEATURES

- TV/CATV Tuner 4-1000 MHz analyzes both analog and digital broadcast and cable TV/RF signals
- All units include QAM analysis and support one of the digital terrestrial standards - 8VSB, DVB-T/T2, or ISDB-T
- Data Logger for automatic testing and data captures
- SMART PC software for firmware updates, channel/transponder tuning plans and log file management

#### ORDERING INFORMATION

- DSA 1491-ATSC6 – ASI, DVB-S/S2, 8VSB, QAM-B/DVB-C Input
- DSA 1491-DVB6 – ASI, DVB-S/S2, DVB-T/T2 and DVB-C input 6MHz filter
- DSA 1491-DVB8 – ASI, DVB-S/S2, DVB-T/T2 and DVB-C input 8MHz filter
- DSA 1491-ISDB6 – ASI, DVB-S/S2, ISDB-T(b), QAM-B/DVB-C input
- DSA 1491-OPTICAL-OPT – Add-on optical input option
- DSA 1491-GPS-OPT – Add-on GPS receiver option
- DSA 1491-IPTV-OPT – Add-on IPTV input option
- DSA 1491-REMOTE-OPT – License to enable remote Ethernet control

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## SAT/CATV/TV Signal Analyzer

### SATELLITE MEASUREMENT

Frequency Range:	SAT: 930 - 2250 MHz
Measure Tuning:	By satellite transponder or freq.
Digital Modulation types:	DVB-S, DVB-S2 Single Stream, DVB-S2 Multi-Stream
Digital Measurements:	Power, Noise Margin, Pre/Post-FEC BER, PER, MER, EVM, Constellation Diagram
Dynamic range:	30 to 130 dB $\mu$ V
Measurement Accuracy:	1.5 dB typical
LNB Control:	V(13V) or H(18V), 22kHz tone, DiSEqC 1.0 and 2.0 SCR and MOTOR
Symbol Rate:	DVB-S- 1 to 45MS/s, DVB-S2- 2 to 45MS/s

### TV/CABLE MEASUREMENT

#### Analog Measurement

Frequency Range:	47 to 1000MHz
Dynamic range:	5 to 126 dB $\mu$ V (-50 to 66 dBmV)
Measure Tuning:	By RF channel or freq.
Freq. Resolution:	50kHz
Analog Measurement:	Video level, audio level, A/V ratio, C/N
Measurement Accuracy:	+/- 1.5 dB (1.0 dB typical)
Level Measurement Resolution:	0.1 dB
A/V Ratio:	4 to 26dB
C/N Ratio:	5 to 45dB
Measure Filter Bandwidth:	100 Khz @ -3 dB

#### Digital Measurement

Frequency Range:	4 to 1000MHz Digital Cable
Frequency Resolution:	50kHz
Digital TV Modulation types:	8VSB (optional) DVB-T/T2 (optional) ISDB-T (optional)
Digital Measurements:	Level, Noise Margin, Pre-Viterbi (bBER), After-Viterbi (aBER), MER, Constellation Diagram
BER Measurement:	bBER/aBER up to 1 x 10 <sup>-9</sup>
MER Measurement:	up to 40dB
Constellation Diagram:	16-32-64-128-256 QAM

### SPECTRUM ANALYZER

Frequency Range:	4 to 2250 MHz
RF Level Range:	5 to 130dB $\mu$ V
Resolution Bandwidth	
TV/CATV:	100kHz
SAT:	4MHz/1MHz selectable
Span	
TV/CATV:	5MHz to Full TV/CATV Band
SAT:	50MHz to Full Sat Band
Frequency Sweep:	up to 80ms
Special Functions:	max hold, spectrum save/recall, markers

### ASI INPUT

ASI Packet Length:	188 or 204 bytes
ASI Bitrate:	0 to 216Mb/s

### TRANSPORT STREAM FUNCTIONS

ETR101290 v1.2.1 Analysis	
Modulation Parameters ID:	Modulation type, FEC, symbol rate,
Video Decoding:	MPEG-2 MP@ML, MPEG-4/AVC/H.264
Audio Decoding:	MPEG, AAC, HE-AAC, Dolby AC3 and E-AC3 (DD+)
Bitrate measurement	
MPEG Program/Services ID:	A/V PIDs, service ID #, video services name list
Modulation Parameters ID:	Modulation type, FEC, symbol rate
Encryption/CA System ID:	Encryption type indicated
MPEG Header Data:	Video format, aspect ratio, MPEG profile/level, audio format, language

### GENERAL SPECIFICATIONS

Dimensions:	12.7 x 6.9 x 2.4in (323 x 175 x 60mm)
Weight	
Bare instrument:	4.9lbs (2.2kg)
Instrument with battery:	5.7lbs (2.6kg)
Instrument with battery and bag:	6.8lbs (3.1kg)
Environmental	
Operating Temperature:	0 to 50C
Storage Temperature:	-25 to 70C
Humidity:	Up to 90% non-condensing
Power:	External adapter 110-240VAC 50-60Hz, 12VDC/3A output
Battery:	Li-Polymer 10A with up to 6 hours of run time
Display:	9 inch 16:10 800x480 LCD backlit touchscreen display

### STANDARD ACCESSORIES

Soft padded case
AC power adapter
USB cable
F to F, F to BNC, F to N adapters



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### OPTICAL INPUT

Wavelength Range:	WL 1310 – 1490 (1625 for US) – 1550
Input Level Range:	-40dBm to +10dBm
Level Resolution:	0.1dB
Level Measurement Accuracy:	0.5dB

### LAN IPTV

Protocols:	Unicast, Multicast, RTP, UDP
FEC:	ProMPEG COP3/SMPTE2022
Packet Size:	1 to 7 MPEG TS Packets
TS Bitrate:	0 to 216Mb/s
IP Stream Jitter:	0 to 1000ms

### GPS RECIEVER

DC at RF input:	5VDC automatic
RF Level Sensitivity:	-160dBm
Frequency:	L1 (1575, 42MHz)
Noise Figure:	1.5dB typ.
Position Accuracy:	2.5M
Hotstart Autonomous:	1s
Timepulse Frequency:	10MHz and 1pps
Received SAT:	up to 12