DMA *Enhanced*

Digital Services Analyzer

Key Feature

- **Full 256-64 QAM testing**
- **RF analog measurements**
- **5-860 MHz input band**
- **Extended dynamic range**
- **IF Measurements**
- **Fast all channels sweep**

- Modularity for multiple applications
- Modularity for easy/cost effective upgrade

- Easy menu driven navigation

- Portable light-weight rugged design
- Protective soft-case
- Rechargeable NiMh battery

The DMA 122/123 **Enhanced** Digital Modulation Analyzers is a field portable measurement instrument designed for cable TV operators interested in measuring the quality of digital Cable TV signal streams.
The instrument consists of a rugged handheld package with all the measurements required to analyze and verify the quality of QAM modulated signals. The DMA Series supports signals formats compliant with the ITU-T j.83 standard adopted in the USA as well as the European DVB-C standard.

The new **DMA advanced** is capable of analog and digital measurement in both **downstream** and **upstream band**.
It as also an extended dynamic range to make possible IF measurements at **Head-end**.

Cable TV and Telecommunications Network operators will benefit from the instrument's ability to provide key in-service measurements required for understanding and verifying the quality of Digital Television signals. Automated measurements include signal level, adjacent channel levels, modulation error ratio (MER), estimated noise margin, error vector magnitude (EVM), and BER before – and estimated BER after - forward error correction (FEC). These measurements allow operators to determine acceptable transmission quality quickly and easily, without removing channels from service.

The DMA Series utilizes a simple menu driven display with a «softkey» interface providing an in-depth analysis of system impairments with only 2 keystrokes.
Designed for the rugged outside plant environment, the instrument is housed in a weather resistant package and is powered by a rechargeable NiMh battery.

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Features

Applicable standards	ETSI ETS 300-800, ETS 300-429, ITU-T J.83 Annex A,B
Impedance	75 Ohm
Dimensions	318 x 170 x 60 (mm); 12.5 x 16.7 x 2.3 (In);
Weight	2.1 Kg
Input Connector	Field replaceable "F" female (BNC optional)
PC Interface	RS232 through an RJ45 connector (adapter included)
Power Supply	230Vac 50Hz (Europe) 110Vac 60Hz (USA)
Battery Type	NiMh
Battery Run Time	2.5h (typical)
Battery Charge Time	4h (typical)
Operating Temperature	-5 to 45°C, 23 to 113 F
Storage Temperature	-15 to 55°C, 5 to 131 F
Printer Support	Seiko DPU-414

Specifications	**DMA 123** **DVB-C**	**DMA 122** **North America**
Applicable Standard	ETS 300 429	ITU-T J.83 Annex B
Modulation supported	64-256 QAM	64-256 QAM
Symbol Rate	5 - 6.956 Mbaud	5.057 - 5.360 Mbaud
Frequency	5 - 866 MHz	5 - 860 MHz
Channel Bandwidth	8 MHz	6 MHz

Digital Measurements

Demodulator Status		
Symbol Lock	Yes	Yes
FEC Lock	Yes(*)	Yes
MPEG Lock	Yes(*)	Yes
	(*) FEC & MPEG lock together	
Modulation Error Ratio		
Range	22-35 dB(64QAM) 30-35 dB(256QAM)	22-38 dB(64QAM) 28-38 dB(256QAM)
Error Vector Magnitude		
Range	1.2%-5.2%(64QAM) 1.1%-1.9%(256QAM)	0.8%-5.2%(64QAM) 0.8%-2.4%(256QAM)
Estimated Noise Margin		
	1-10dB(64QAM) 3-5dB(256QAM)	1-15dB(64QAM) 2-10dB(256QAM)
BER before & after FEC		
	10^{-4}-10^{-9}(64QAM) 10^{-4}-10^{-6}(256QAM)	10^{-4}-10^{-9}(64QAM) 10^{-4}-10^{-8}(256QAM)
Spectrum Analyzer		
Frequency Range	5-870 MHz	5-863 MHz
Level(@ 8MHz Ch Bw, 135KHz RBW)	40-120dBuV (typ)	40-120dBuV (typ)
Constellation resolution		
	8 bits(I,Q)	8 bits(I,Q)
Equalizer		
Dynamic Range	-40 to 10dBc	-40 to 10dBc

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RF Measurements

RF Digital Signal Level Meter

Channel Bandwidth	6 - 8 MHz
Range	40 to 120 dBuV (typ)
Accuracy	
@18 to 25°C	+/- 1.5 dB (<+/- 1dB) (64QAM)
	+/- 1.8 dB (<+/- 1dB) (256QAM)
@ 0 to 40°C	+/- 3 dB
Adjacent channel maximum difference	15 dB (8MHz BW) 10 dB (6MHz BW)
Measurement Units	dBuV, dBmV, dBm, dBpW

RF Analog Signal Level Meter (Video Carrier)

Range	20 to 120 dBuV (typ)
Accuracy	
18 to 25°C	+/- 1.5 dB (typ)
0 to 40°C	+/- 3 dB (typ)
Adjacent channel maximum difference	10dB (analog or digital)
Measurement Units	dBuV, dBmV, dBm, dBpW

RF Analog Signal Level Meter (Audio Carrier)

Range	20 to 120 dBuV (typ)
Accuracy	
18 to 25°C	+/- 1.5 dB (typ)
0 to 40°C	+/- 3 dB (typ)
Adjacent channel maxi mum difference	10dB (analog or digital)
Measurement Units	dBuV, dBmV, dBm, dBpW

RF Analog Signal Level Meter (Video Carrier - Audio Carrier Difference)

Range	Video and audio carriers s imultaneously inside their specification
Accuracy	
18 to 25°C	+/- 2 dB (typ)
0 to 40°C	+/- 3 dB (typ)
Adjacent channel maximum difference	10dB
Measurement Units	dBuV, dBmV, dBm, dBpW

Digital Channel Power to Noise (C/N) (Modulated Signal to Noise)

Range	3 to 40 dB
Accuracy	
18 to 25°C	+/- 2 dB (<+/- 1dB)

Other analog and mixed analog/digital channels measurements

Analog Video Carrier Power to Noise (V.C/N) In Service
Analog Audio Carrier Power to Noise (A.C/N) In Service
Analog Video Carrier Power to Noise (V.C/N) Out of Service
Analog Audio Carrier Power to Noise (V.C/N) Out of Service
All Channels Sweep

Adjacent Channels Level

Signal Level Difference	-25 thru +10 dB (Adjacent to Reference)
Accuracy (18 to 25°C)	+/- 2dB (when only digital channels)
Accuracy (18 to 25°C)	+/- 2dB typ (when mixed analog/digital channels)