MODULATION SCIENCES

Verify your 8vsb coverage

Specifications

MSI-4400A
8vsb Analyzer

MSI 4400A®

8vsb Analyzer/Demodulator

 Toll Free: **800-826-2603**
12A World's Fair Drive, Somerset, NJ 08873 • info@modsci.com • www.modsci.com

Front Panel

Front Panel Indicators

Power LED
Indicates Power is applied to the unit

Unlocked
No Usable 8VSB signal present

SNR
Signal to Noise ratio is outside the set limits

RF Level OK
RF Level is sufficient for accurate measurements[1]

Signal Quality OK
A comprehensive indication that the signal is good, and the unit is per forming correctly. The indication is based on AGC Level, SNR, and all critical loops being locked.
The threshold limits are user configurable

Host Connected
Indicates that the **msi 4400A** is connected to its host PC and is communicating correctly.

Front Panel Controls

Reset
Shrouded switch for hard reset of the unit

Front panel Connections

PC I/O
Standard 25 Pin D-sub male connector for connecting to PC Parallel Port.
This connector is in parallel with a similar connector on the rear panel.

Rear Panel

Rear Panel Inputs/Outputs

Power
IEC Power Entry

Antenna Input
50 ohm, BNC female

Alarms & Control
8 user configurable alarm outputs
External system reset
Standard 15 Pin D-sub female connector
Optically isolated open collector floating transistor outputs
Optically isolated LED input

PC I/O
Standard 25 Pin D-sub male connector for connecting to PC Parallel Port.
This connector is in parallel with a similar connector on the front panel.

TS Parallel
Standard 25 Pin D-Sub female connector

SMPTE 310M (2 connections)
75 ohm BNC female connector

DVB-ASI
75 ohm BNC female connector

Software

Software Requirements

Computer
Pentium III 1.2GHz minimum, 256MB RAM, 1024x768 display, 100MB hard disk space, Parallel Port Interface, Ethernet (10/100)

Operating System
Windows 2000™ or Windows XP™ Professional
Windows XP™ Professional Preferred

Symbol Rate Deviation (PPM)
Accuracy ± 0.5 PPM

Features

Enhanced Features

Adaptive Equalizer
Feed Forward Equalizer range (FFE): 6 ms
Decision Feedback Equalizer range (DFE): 40 ms
Customizable FFE and DFE Energy display and value
Readout value for any FFE and DFE tap position
Ability to stop Adaptation of either or both FFE and DFE
Ability to Zero the Equalizer
Ability to Reduce the Equalizer
Can Save, Recall, Compare or Subtract Equalizer Coefficients

Alarms
Completely User configurable alarms
8 hardware alarms mapped to any measurement parameter
User settable limits
User settable alarm mode

Data Logging
Automatic Logging
'Trend' logging logs data for one year (FIFO)
'Alarm' logging logs data pre- and post- alarm for diagnostic use.

Email
SMTP emails with authentication
Can be triggered on any Alarm event
Dual levels of notification
Buffered One-Shot Operation

Remote Access

Remote Connection

Connection
Connects to host PC which acts as Server to the Remote Client

Protocol
TCP/IP using Internet Explorer Version 5.xx or greater

Physical Interface
10/100 BASE-T Ethernet on Host Computer configured for TCP/IP Protocol

Control and Display
Full application is accessible for viewing and control in the Web Browser.

Mechanical Specifications

Size	Inches	mm.
Height	1.75	45
Width	19	483
Depth	14	356

Mounting

Rack mount
Full rack width 19" (483mm)
Occupies 1RU rack space

Cooling

Operating Temperature
40°C, 104° F maximum
15°C, 59°F minimum

Venting
msi 4400A requires no ventilation. The unit is closed, with no fan or vent holes.

Electrical Power

AC Mains

Voltage
100 - 240 VAC, adaptive across entire range.
No Voltage selection is necessary.

Frequency
50/60 Hz

Power Consumption
50 VA

Fuse
0.25 A, MDL (for 117 VAC)

Power Connection
Standard IEC Power Connector.

RF Characteristics

RF Input

Channels
Channels 2 – 69, North American Broadcast Table

Frequency
54 – 806 MHz, mapped to North American Broadcast Table
70 and 140 MHz Microwave IF and other
channel tables on special order.

Impedance
50 Ohm, BNC Female

Return Loss
Return loss at 75 ohm > 7dB
Return Loss at 50 ohm > 9dB

Signal Levels
Receiver Lock and Valid Transport Stream > -75 dBm
Valid Measurement Data[1] > -55 dBm
Maximum Operating Level = -5 dBm
Damage Level = +5 dBm

Demodulation
8VSB in accordance with ATSC Standard A53/B

Transport Stream Outputs

Transport Stream

SPI Transport Stream
8 Bit Wide LVDS MPEG2 (ATSC compliant)
25 Pin D-Sub Male Connector

SSI Transport Stream(2 Outputs)
Serial SMPTE-310M, 75 Ohm, 19.39Mbps
75 ohm BNC Female Connector

ASI Transport Stream
Asynchronous Serial Interface, 75 ohm, 270Mbps
75 ohm BNC Female Connector

Measurements

Measurement Parameters

Receiver Lock
Indicated by LED on front panel and Status Flag on User Interface

Signal Quality
Indicated by LED on front panel and analog meter on User Interface.
This indication is based on AGC Level, SNR, and all critical loops being locked.
Range 0% to 100%

PreRS BER (ppm)
Numeric Indicator on User Interface.
This indicates errors that can be corrected by the Reed-Solomon decoder.

PostRS BER (ppm)
Numeric Indicator on User Interface.
This indicates errors that cannot be corrected by the Reed-Solomon decoder.

Signal to Noise Ratio (SNR)
Indicated by LED on front Panel and numeric indicator on user interface
Range with equalizers ON: 15dB to 36dB
Range with equalizers OFF: 15dB to 31dB
Accuracy ± 0.5 dB for SNR<30 dB
Accuracy ± 1.0 dB for SNR>30 dB
Deviation of SNR from Equalizer ON: -4.0 dB typical

Equivalent Modulation Error Ratio (MER)
Numeric Indicator on User Interface
Range: 15dB to 36dB
Accuracy ± 1.0 dB for MER<25 dB
Accuracy ± 3.0 dB for MER>25 dB

Equivalent Error Vector Magnitude (EVM)
Numeric Indicator on User Interface
Range: 15dB to 36dB
Accuracy ± 1.0 dB for EVM<25 dB
Accuracy ± 3.0 dB for EVM>25 dB

Constellation Diagram
8VSB Constellation Diagram

Constellation Spread
Numeric Indicator on User Interface
Range: 0% to 100%

Eye Diagram
8 Level Eye Diagram at sample times

Performance[2](D/U)[3]

Interference Condition	For Valid Transport Stream only		For Full Measurement grade[4] performance	
	Narrowband Filter	Wideband Filter	Narrowband Filter	Wideband Filter
Co-Channel of Analog NTSC[5] Signal	+2 dB	+2 dB	+38 dB	+38 dB
Single Adjacent Channel of Analog NTSC[5] Signal	-43 dB	-30 dB	-15 dB	-4 dB
Both Adjacent Channel of Analog NTSC[5] Signal	-36 dB	-24 dB	-11 dB	-1 dB
Single Adjacent Channel of Digital ATSC Signal	-38 dB	-26 dB	-12dB	0 dB
Both Adjacent Channel of Digital ATSC Signal	-33 dB	-20 dB	-8 dB	5 dB

[1] Measurement accuracy is a function of RF performance of the front end. Above –55dBm, the performance of the RF front end does not impair accuracy. Below this level, the measurement accuracy is impaired.

[2] Because of the complexity of D / U measurements, they are taken on a sample basis rather than on every unit. Thus, the measurements must be described as *typical*. However, we have not yet measured one of our own units that does not meet or exceed our typical values.

[3] Performance values are the ratio of ***Desired signal*** to ***Undesired signal*** (D / U) expressed in dB.

[4] "Full measurement grade performance" is defined as the point where the SNR is degraded no more than 0.25 dB by the interfering signal.

[5] Visual to Aural carrier ratio for NTSC signal is 10 dB

MODULATION SCIENCES
12A World's Fair Drive,
Somerset, NJ 08873
800-826-2603
info@modsci.com
www.modsci.com