I. General Information

PRODUCT TESTED:	Ultra Max Advanced Digital System FCC ID: BVCUMADSNE	
TEST DATE:	June 1-2, 2000	
SUMMARY OF RESULTS:		
47 CFR 15.207	CONDUCTED EMISSIONS	PASS
47 CFR 15.209	RADIATED EMISSIONS	PASS

1.1 Test Methodology

Both conducted and radiated emissions testing were performed according to the procedures in ANSI C63.4-1992, and the requirements of 15.31, 15.33, 15.35, 15.207, and 15.209. Radiated emissions measurements were performed at a distance of 10 meters and the results extrapolated to the distance specified per 15.31 and 15.209.

1.2 Test Facility

The shielded room conducted emissions measurement facility is located at Sensormatic Electronics Corporation Headquarters at 951 Yamato Road, Boca Raton, Florida, 33431. The radiated emissions site is located at Sensormatic Electronics Corporation manufacturing location, 6600 Congress Avenue, Boca Raton, Florida 33487. These sites have been found acceptable by and are on file with the FCC per FCC letter 31040/SIT 1300F2.

1.3 Test System Description.

The ADS system consists of a power pack and separate antennas. The power pack consists of a power supply, transmit electronics, receive electronics and data processing electronics. The power supply accepts inputs of 85 – 250 V, 50-60 Hz. The transmit antenna consists of a multi-turn magnetic loop that

can take the form of a pedestal mounted vertically or a floor mount antenna of the same magnetic loop configuration that is typically buried in the floor. The worst case configuration was the vertical pedestal and the data recorded is taken from that configuration.

The product tested was an engineering prototype built to production drawings.

II. Conducted Emissions

Conducted emissions data are presented in Section V “Data”, Part A “Conducted Emissions”. The product demonstrated compliance with the requirements of 15.207. Signals were broadband per 15.207 b and qualified for the 13 dB relaxation. The product was tested at 120 V, 60 Hz.

III. Radiated Emissions

Radiated emissions data are presented in Section V “Data”, Part B “Radiated Emissions”. The product demonstrated compliance with the requirements of 15.209. Radiated emissions measurements were performed at 10 meters. Propagation loss was determined measuring the emissions at 10, 15, 20, and 30 meters and extrapolating the results to 300 meters as required.

Maximum radiation was determined by first assessing symmetry while applying incremental rotation of the turntable. The product exhibited quadrant symmetry. Measurements were taken at radials of 22.5° throughout one quadrant; the measurement antenna was rotated for maximum pickup about the vertical axis of the measurement antenna at each radial. The maximum emission was determined to be with the measurement loop antenna in the vertical polarization, parallel to the radiating loop of the pedestal.

The product was tested at input voltages ranging from 102 – 138 V, 60 Hz with no measurable change in transmitter output.

IV. LIST OF MEASURING EQUIPMENT

The equipment used for determining compliance of the Ultra Post system with the requirements of 15.207 and 15.209 is marked with an "X" in the first column of the table below.

	Model	Description	Vendor	Serial #
X	ALP -70	Loop Antenna	Electro Metrics	163
	3110B	Biconnical Antenna	Electro Metrics	1017
	3146	Log Periodic Antenna	EMCO	3909
	3825/2	Line Imp Stable Network	EMCO	1562
X	3816/2NM	Line Imp Stable Network	EMCO	9703 1064
	6060B	Frequency Generator	Giga-tronics	5850202
	FM2000	Isotropic Field Monitor	Amplifier Research	15171
	FP2000	Isotropic Field Probe	Amplifier Research	15214
	888	Leveler	Amplifier Research	14998
	75A220	Low Band Amplifier	Amplifier Research	15208
	10W1000A	High Band Amplifier	Amplifier Research	15138
	PEFT Junior	EFT Generator	Haefely Trench	083 180-16
	PEFT Junior	Capacitive Cable Clamp	Haefely Trench	083-078-31
	NSG435	ESD Simulator	Schaffner	1197
	NSG431	ESD Simulator	Schaffner	1267
X	HP8591EM	EMC Analyzer	Hewlett - Packard	3520A00190
		Power Source	Pacific Instruments	
	F-2031	EM Injection Clamp	Fischer Cust. Comm.	30
	FCC-801-M3-16	Coupling Decoupling Nwk	Fischer Cust. Comm.	58
	FCC-801-M3-16	Coupling Decoupling Nwk	Fischer Cust. Comm.	59
	F-33-1	RF Current Probe	Fischer Cust. Comm.	304
	EM 7600	Transient Limiter	Electro-Metrics	187
	Roberts Ant	Tunable Dipole Set	Compliance Design	003282
	Roberts Ant	Tunable Dipole Set	Compliance Design	003283
	HP8594E	Spectrum Analyzer	Hewlett Packard	3246A00300
X	HP8447F Opt 64	Dual Preamplifier	Hewlett Packard	2805A03473

V. Data

Part A contains conducted emissions data; Part B contains radiated emissions data.

Part A **Conducted Emissions**

Project Name	Conducted Emissions	Filename	Ads216ne_CondEMI_6-2-00.doc
EUT Name	ads216 non-European	Serial Number	N/A
Engineer	Fadi Ayoub	Limits	FCC Class A 48dB
Date of Test	06/02/2000 1:26:39 PM	Test Name	Conducted Emission
Reg. Technician	Stephen Krizmanich		

Comments	Line input 120V, 60Hz; 2 ProMax pedestals (Mica) 16A each pedestal, firing simultaneously; 4 ferrite antennas; remote alarm; Steward ferrite 28A2024-0A0, 2 turns on remote alarm cable located inside P/P; TX phase flipping; 2 noise cancellation antennas. EUT passes FCC Class Conducted Emissions by virtue of 15.207(b) which states, “If the level of the emission using the quasi-peak instrumentation is 6dB or more higher than the level of the same emission measured with instrumentation having an average detector and a 9khz minimum bandwidth, that emission is considered broadband and the level obtained with the quasi-peak detector may be reduced by 13dB for comparison to the limit”.

Table 1. Signal List

Signal	Freq (MHz)	Peak Amp (dBuV)	QP Amp (dBuV)	Avg Amp (dBuV)	Corrections (dB)	Adjusted QP	Limi (dB
1	2.391	66	57	32	13	44	48
2	2.895	57	52	28	13	39	48
3	0.524	58	55	32	13	42	48
4	19.36	56	54	34	13	41	48

Figure 1. L1 Full Range

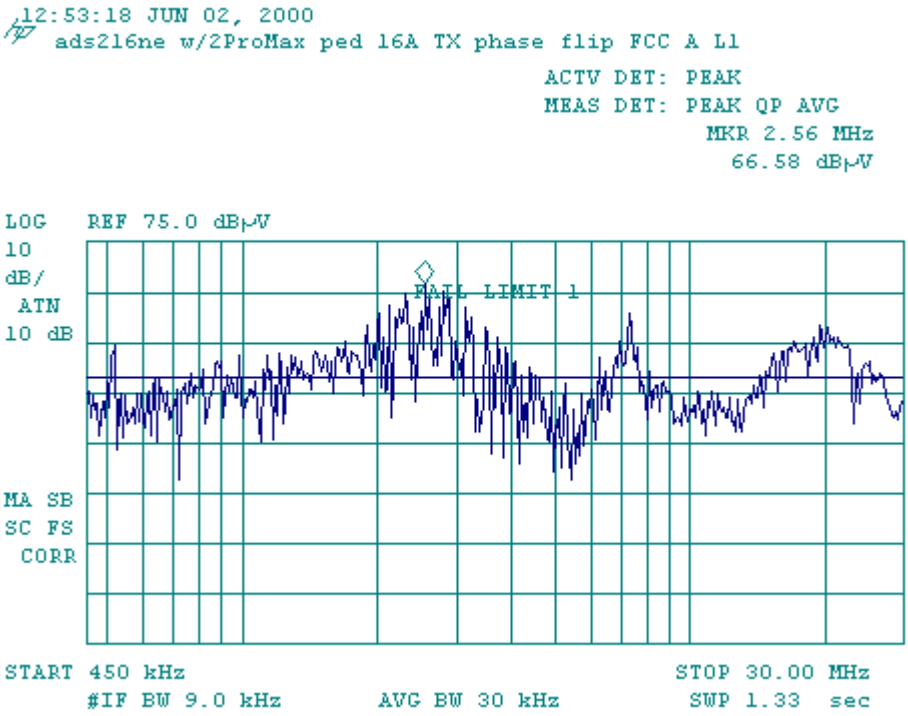


Figure 2. L2 Full Range

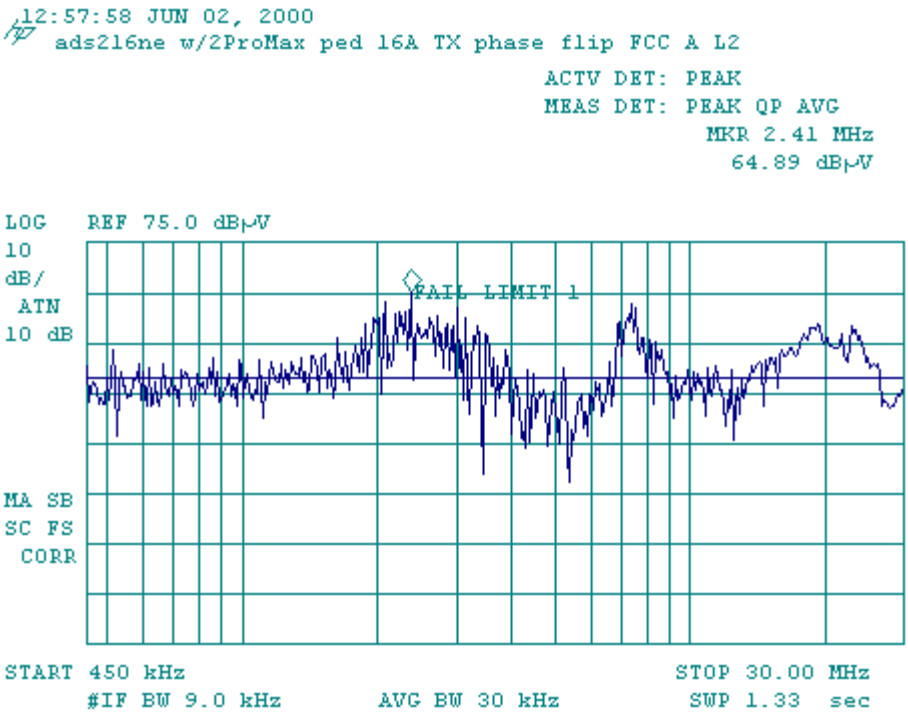


Figure3

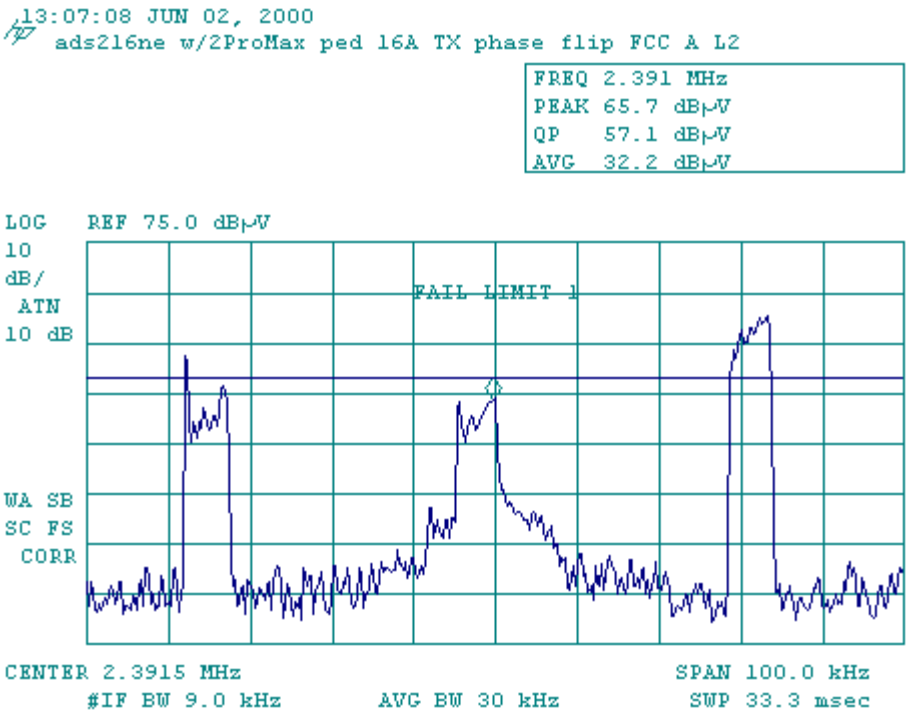

13:07:08 JUN 02, 2000
ads216ne w/2ProMax ped 16A TX phase flip FCC A L2
FREQ 2.391 MHz
PEAK 65.7 dBµV
QP 57.1 dBµV
AVG 32.2 dBµV
LOG REF 75.0 dBµV
10
dB/
ATN
10 dB
FAIL LIMIT 1
WA SB
SC FS
CORR
CENTER 2.3915 MHz
SPAN 100.0 kHz
#IF BW 9.0 kHz
AVG BW 30 kHz
SWP 33.3 msec

Figure 4

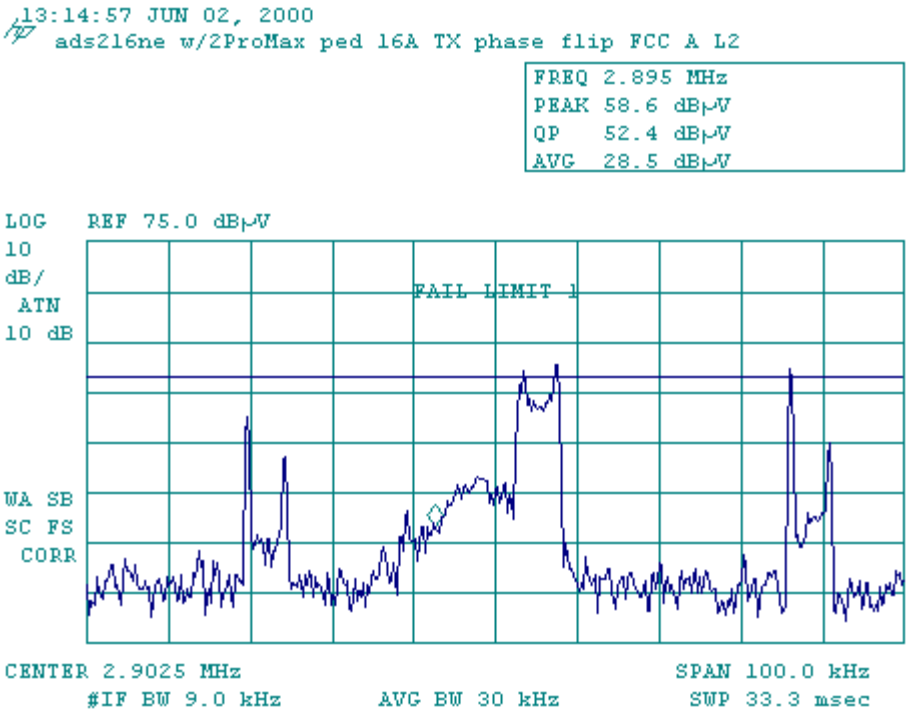

13:14:57 JUN 02, 2000
ads216ne w/2ProMax ped 16A TX phase flip FCC A L2
FREQ 2.895 MHz
PEAK 58.6 dBµV
QP 52.4 dBµV
AVG 28.5 dBµV
LOG
10
dB/
ATN
10 dB
REF 75.0 dBµV
FAIL LIMIT 1
WA SB
SC FS
CORR
CENTER 2.9025 MHz
SPAN 100.0 kHz
#IF BW 9.0 kHz
AVG BW 30 kHz
SWP 33.3 msec

Figure 5

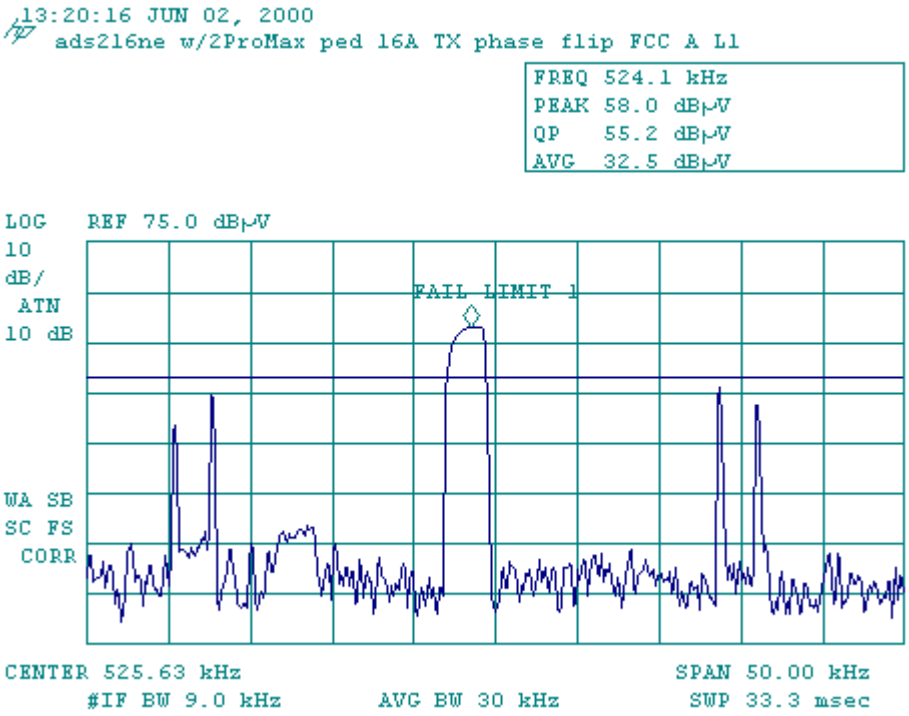


Figure 6

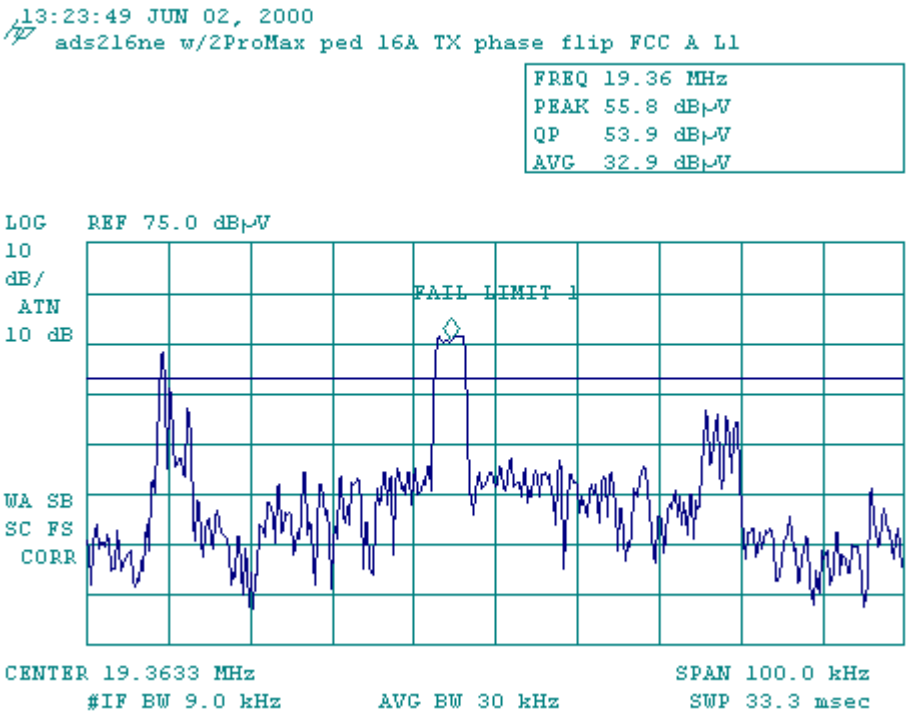
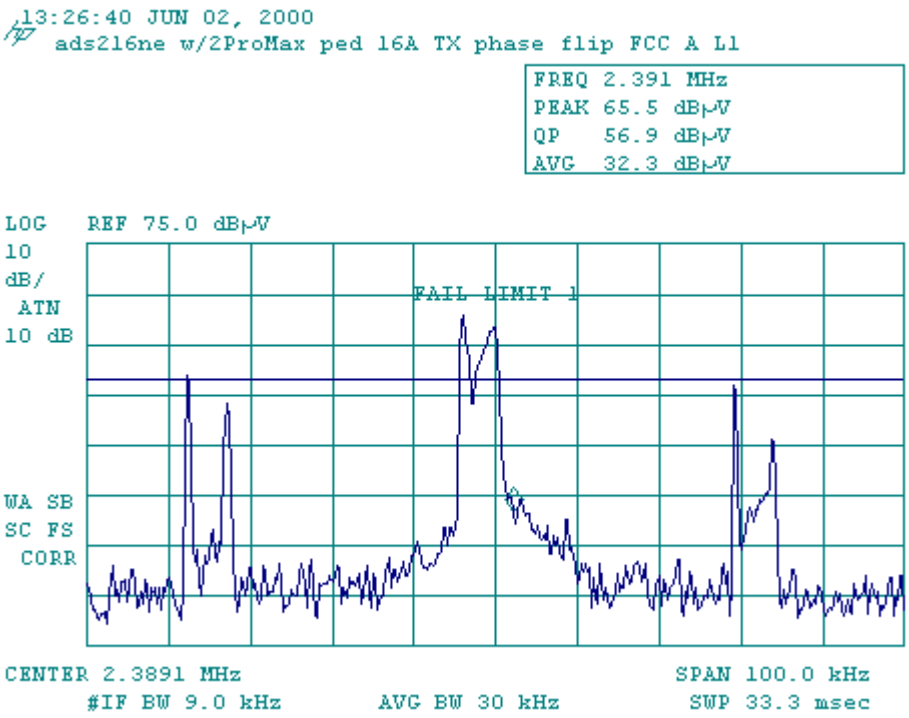


Figure 7


13:26:40 JUN 02, 2000
ads216ne w/2ProMax ped 16A TX phase flip FCC A L1
FREQ 2.391 MHz
PEAK 65.5 dBµV
QP 56.9 dBµV
AVG 32.3 dBµV
LOG REF 75.0 dBµV
10
dB/
ATN
10 dB
FAIL LIMIT 1
WA SB
SC FS
CORR
CENTER 2.3891 MHz
SPAN 100.0 kHz
#IF BW 9.0 kHz
AVG BW 30 kHz
SWP 33.3 msec

Part B

Project Name	ADS 216NE	Filename	ADS Radiated Emissions
EUT Name	ADS ProMax	Serial Number	
Engineer	Fadi Ayoub	Phone Number	
Date of Test	6/1/00	Test Name	Radiated Emissions 47CFR15.209
Reg. Technician	Steve Krizmanich	Proj. Ldr	Don Umbdenstock

Freq	S.A.	Det	BW	Ant Fac	A>V	DCF	ACF	Correct'd	FCC Limit
kHz	dBuA			dB	dB	dB		dBuV/m	dBuV/m
58	71.9	pk	9kHz	11.0	51.5	-88.6	-16.8	29.0	32.3/300
116	25.8	pk	9kHz	5.0	51.5	-88.6	-16.8	-23.1	26.3/300
174	37.0	pk	9kHz	1.5	51.5	-88.6	-16.8	-15.4	22.8/300
232	22.8	pk	9kHz	-1.5	51.5	-88.6	-16.8	-32.6	20.3/300
290	29.7	pk	9kHz	-3.2	51.5	-88.6	-16.8	-27.4	18.4/300
348	13.1	pk	9kHz	-4.5	51.5	-88.6	-16.8	-45.3	16.8/300
406	19.7	pk	9kHz	-5.5	51.5	-88.6	-16.8	-39.7	15.4/300
464	7.8	pk	9kHz	-6.6	51.5	-88.6	-16.8	-52.7	14.3/300
522	5.7	pk*	9kHz	-7.6	51.5	-28.6	-16.8	4.2	33.3/30
580	noise	qp	9kHz	-7.8	51.5	-28.6	-16.8		32.3/30

* = qp is typically 3dB lower

reading

58/10	max	pk	9k		71.9				
58/20	max	pk	9k		53.7				
58/30	max	pk	9k		43.5				

Part 3 Calculation of Distance Correction Factor

Dist_Corr_Factor = 20 log(Test Dist / 300)P = 20 P log (Test Dist / 300)
DCF(300) = -88.6273
DCF(30) = -28.6273

Where P is the roll-off exponent . P is found as follows:

P = (Level(at Distance 1) - Level(at Distance 2)) / 20 log (Distance 2 / Distance 1)
=(71.9-
43.5)/(20*log(30/10))
3.0

Ave Val: AV = 20 log(pk val x % duty cycle)

ads 216 Non European - ProMax Pedestals (Mica) 16A firing simultaneously
TX Phase flipping - 120vac 60hz - 9 feet between pedestals

Date Tested: 06/01/00