www.ams-corp.com

AMS Cable Testing

Condition Monitoring, System Health, Aging Management, & Troubleshooting

The CHAR Cable Condition Monitoring System measures the health and integrity of a cable by performing a series of nondestructive electrical tests that can be administered from the measurement end of the cable circuit. This allows testing of most cable circuits and end devices while saving test personnel exposure to harsh environments. AMS has been providing equipment and services for troubleshooting and condition monitoring of electrical cable systems for more than twenty years.

FEATURES	ADVANTAGES	BENEFITS
Suite of Industry Standard Electrical Measurements	Perform electrical cable tests with single-ended measurements	• Build and maintain a cable aging management database • Automated test sequencing, database management, analysis, and trending tools • Troubleshooting, system health monitoring, predictive maintenance • Automatically acquire hundreds of cable tests using pre-configured test sequences
Test Sequences for Common Plant Systems	Pre-configured by AMS experts to fully characterize any plant system under test	• Simplifies data trending • Automatic statistical analysis flags outliers • Automatic report generation
Proprietary RTDR Test	Locate and diagnose noise susceptibility in shielded cables	• Improve nuclear instrumentation reliability • Prevent SCRAMs from SRM and IRM channels during plant startup • Harden shielded systems against EMI noise interference
FDR for Cable Insulation Aging Management	Remotely quantify cable insulation aging Identify cable “hot spots”	• Locate and monitor thermal and radiation insulation degradation • Reduce personnel exposure to harsh temperature and radiation environments • Simplify acquisition and maintenance of a cable aging management database
Improved Dynamic TDR	Identify loose connections with real time monitoring TDR	• Save TDR snap-shots to document intermittent connections • Reduce time and resources for cable circuit troubleshooting
Integrated High Voltage Power Supply	Measure DC insulation resistance and neutron detector health	• Measure insulation resistance (IR) up to 1,000 DC volts • Perform IV (plateau curve) testing of neutron detector health up to 3,000 DC volts
New 80 Channel Multiplexer	Apply CHAR System measurements to 80 differential channels	• Test all CRDM/CEDM coils and cables in less than a 12-hour shift • Test all LPRM detectors in one 12-hour shift • Dramatically reduce the time required to make and break connections

10CFR50 Appendix B Program

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NOISE VOLTAGE MEASUREMENT

Sample Time:	0.5 seconds
Sample Rate:	5 kHz
Record Length:	2,500 points
Coupling:	DC
Input Impedance:	1 MΩ
Range:	±100 mV to ±1,000 V
Voltage Resolution Accuracy:	12 bit

Voltage (with Self-Cal):	(0.3 ppm of reading + 1.0 ppm of range) to (3.0 ppm of reading + 0.01 of range) (range dependent)
Voltage (without Self-Cal):	(3.0 ppm of reading + 2.0 ppm of range) to (3.0 ppm of reading + 0.02 of range) (range dependent)

GENERAL SPECIFICATIONS

Operating Envronment:	Temperature: 0 to 55° C Humidity: < 0.95% RH
Suggested Warm Up:	5 minutes (if stored at ambient temp >20° C) 30 minutes (if stored at ambient temp <20° C)
Power Requirements:	110-240 VAC, 50 to 60 Hz, 300 watts max
Dimensions:	Approximately 18.5" (W) by 16" (D) by 9" (H)
Weight:	Approximately 40 lbs

WAVEFORM CAPTURE

Number of Channels:	2 (simultaneously sampled)
Coupling:	DC or AC
Input Impedance:	50 Ω or 1 MΩ (user selectable)
Voltage Resolution:	12 bits
Voltage Range:	0.2 to 20 Vpk-pk (user selectable)
DC Voltage Accuracy:	(±0.65% of input + 1.3 mV) to (±0.65% of input + 10.0 mV) (range dependent)
AC Voltage Accuracy:	±0.06 dB to ±0.09 dB (input impedance dependent)
Bandwidth:	up to 150 MHz
Sample Rate:	3 kS/s to 4 GS/s (user selectable)
Trigger:	Edge, Window, Hysteresis, Video, Digital, Immediate and Software
Record Length:	up to 60,000 points

CONTROL COMPUTER

Processor:	Pentium 1 GHz or better
Memory:	≥2 GB of Ram
Hard Drive:	≥700 MB of free space
Communications:	1 Ethernet port (≥ 100 Mb/s)
Display:	1280 x 1024 pixels (minimum resolution)
Operating System:	Windows 7 (recommended), Windows XP
Printer:	Windows compatible

TIME DOMAIN REFLECTOMETRY (TDR)

Pulse Type:	Square wave
Pulse Amplitude: (into 50 Ω)	±1.1 V
Pulse Repetition:	145 Hz (±5%)
Pulse Duty Cycle:	49.9%
Pulse Rise Time: (10% to 90%)	Approximately 650 ps (into 50 Ω)
Reference Impedance:	50 Ω
Rho Resolution:	488.4µ
Sampling Rate:	4 GS/s (for cable systems ~ ≤ 4,000 ft in length) 1 GS/s (for cable systems ~ 4,000 – 16,000 ft in length)
Record Length:	60,000 points

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