ARIES® II recording system

GROUND EQUIPMENT

RAM (REMOTE ACQUISITION MODULE)

FEATURES

- 24-bit Delta-Sigma A/D Conversion
- 6 or 8 channels per RAM
- Supports ARIES "Capacity on Demand" and automatic transmission load balancing
- Fully redundant quad-telemetry transmission
- Multi-path telemetry routing
- Optional line communication (for voice or shooting)*
- Automatic error-free data recovery from 320-second (@ 2 ms) on-board shot memory
- Positive Operation LED's provide instant verification of connectivity, power and telemetry functions
- Low distortion test oscillator with ARIES' exclusive fully programmable bit stream allows contractors to test channels and geophones with end-user specified signals
- ARIES' in-field programmable firmware allows logic upgrades to be performed on all RAMs connected to the ARIES Central System

SPECIFICATIONS

Dynamic Range:

123 dB @ 12 dB gain

120 dB @ 24 dB gain

117 dB @ 30 dB gain

135 dB System Dynamic Range

Maximum Input:

.944 V RMS @ 12 dB gain

.214 V RMS @ 24 dB gain

.122 V RMS @ 30 dB gain

Input Impedance:

20 KΩ (differential mode)

Equivalent Input Noise:

.61 µV RMS @ 12 dB gain

.20 µV RMS @ 24 dB gain

.16 µV RMS @ 30 dB gain

* At reduced channel capacity.

Total Harmonic Distortion:

0.0002%

Channel Matching:

Better than 1.0%

Common Mode Rejection:

>105 dB

Time Standard:

+/- 50 ppb (-40 ˚C to +70 ˚C)

Crossfeed Isolation:

>130 dB

Frequency Response:

3 Hz to 1640 Hz

Anti-alias Filters:

-3 dB @ .82 *f*N (Nyquist)

Rejection:

130 dB @ *f*N (Nyquist)

Maximum distance between RAMs:

Up to 656 m (2152')

Operating Voltage:

18 VDC - 30 VDC

Power Consumption:

179 mW / channel (typical)

PHYSICAL

Packaging:

6063 Aluminum

Connectors:

Stainless Steel

Size:

31 cm x 17.3 cm x 8.6 cm

(12.2" x 6.81" x 3.39")

Weight:

3.6 kg (7.94 lb)

Operating Temperature:

-40 ˚C to +70 ˚C

Storage Temperature:

-45 ˚C to +85 ˚C

Humidity:

0% - 100%

Water Depth:

50 m non-intrusive, non-operating

All specifications typical at 25 ˚C @ 2 ms.

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ARIES II FIBER CABLE EQUIPMENT

FTU (FIBER TAP UNIT)

FEATURES

- Provides connection between receiver line (s) and cross lines.
- Supports ARIES' exclusive Network Telemetry functions, easing system deployment over challenging terrain
- Supports ARIES "Capacity on Demand" and automatic transmission load balancing on receiver lines
- Receiver line multi-path telemetry routing
- Positive Operation LED's provide instant verification of connectivity, power and telemetry functions
- ARIES' in-field programmable firmware allows logic upgrades to be performed on all FTUs connected to the ARIES Central
- Incorporates 8 ARIES II A-D Channels and provides full RAM capabilities within the FTU package

SPECIFICATIONS

Operating Voltage:
18 VDC - 30 VDC
Power Consumption:
5.25 W (typical)
Maximum distance between FTUs:
Up to 6 km
Fiber cable currently available in 500 m lengths

CAPABILITIES

Receiver Line Capacity:
2,400 Analog Channels @ 2 ms, 55 meter interval
(132 km live spread / line)
Base Line Capacity:
16,000 Analog Channels @ 2 ms

PHYSICAL

Packaging:	6063 Aluminum
Connectors:	Stainless Steel & Aluminum
Size:	31 cm x 17 cm x 14 cm (12.2" x 6.7" x 5.52")
Weight:	4.9 kg (10.81 lb)
Operating Temperature:	-40 ˚C to +70 ˚C
Storage Temperature:	-45 ˚C to +85 ˚C
Humidity:	0% - 100%
Water Depth:	10 m non-intrusive, non-operating

FIBER BASELINE CABLE

FEATURES

- A cable-based telemetry system is only as good as the cables. ARIES cables are designed and manufactured to the highest specifications to ensure maximum reliability.

SPECIFICATIONS

Standard length: 500m
Weight: 2.83kg/100m (19lbs/1000 ft)
Tensile: 61.18 kg (134.9 lbs), typical
Jacket: Single
OD: 5.8mm (.23")

All specifications typical at 25 ˚C @ 2 ms.

FIBER BASELINE CABLE TESTER

FEATURES

- Verifies fiber cable continuity in both directions and from the recording system.
- Applies power through the baseline to power up the receiver line to activate the positive indicator lights on the ground electronics.

SPECIFICATIONS

Size : 8.56 cm x 6.01 cm x 21.86 cm
(3.37 in x 2.37 in x 8.61 in)
Weight: 2kg (4.41 lb)

ARIES® II recording system

GROUND EQUIPMENT

LTU (LINE TAP UNIT)

FEATURES

- Provides connection between receiver line (s) and cross lines.
- Supports ARIES' exclusive Network Telemetry functions, easing system deployment over challenging terrain
- Supports ARIES "Capacity on Demand" and automatic transmission load balancing
- Fully redundant octal telemetry transmission
- Multi-path telemetry routing
- Optional line communication (for voice or shooting)
- Positive Operation LED's provide instant verification of connectivity, power and telemetry functions
- ARIES' in-field programmable firmware allows logic upgrades to be performed on all LTUs connected to the ARIES Central
- Incorporates 8 ARIES II A-D Channels and provides full RAM capabilities within the LTU package

CAPABILITIES

Receiver Line Capacity:

2,400 Analog Channels @ 2 ms, 55 meter interval

(132 km live spread / line)

Base Line Capacity:

6,000 Analog Channels @ 2 ms*

SPECIFICATIONS

Operating Voltage:

18 VDC - 30 VDC

Power Consumption:

3.4 W (typical)

Maximum distance between LTUs:

Up to 623 m (2043')

PHYSICAL

Packaging:	6063 Aluminum
Connectors:	Stainless Steel
Size:	31 cm x 17 cm x 14 cm (12.2" x 6.7" x 5.52")
Weight:	4.9 kg (10.81 lb)
Operating Temperature:	-40 ˚C to +70 ˚C
Storage Temperature:	-45 ˚C to +85 ˚C
Humidity:	0% - 100%
Water depth:	50 m non-intrusive, non-operating

* Using Optional ARIES II BLR for Intervals >200 m

BLR (BASE LINE REPEATER)

FEATURES

Physically identical to an ARIES II RAM, the ARIES II BLR provides enhanced functionality to the ARIES II baseline by allowing LTUs to communicate at faster rates, over greater distances on copper base line cables.

All specifications typical at 25 ˚C @ 2 ms.

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GROUND EQUIPMENT

ARIES II CABLE

FEATURES

- A cable-based telemetry system is only as good as the cables. ARIES II cables are designed and manufactured to the highest specifications to ensure maximum reliability.

- ARIES II cables boast the highest Strength-to-Weight ratio in the industry. ARIES II is over 50 kg tensile strength per kg weight (per 100 m). That's lighter and more than twice as strong, per kg of cable weight, as any competitor's cable on the market.

SPECIFICATIONS

Land-II (ARIES II)

Weight: 6.59 kg/100 m (14.53 lb / 328 ft)
Tensile: 360 kg (794 lb), typical
Jacket: Single, water blocked heads & takeouts
OD: 8.5 mm (.33 in)

Base Line

Weight: 8.3 kg/100 m (18.3 lb / 328 ft)
Tensile: 340 kg (750 lb), typical
Jacket: Double, water blocked heads
OD: 9.14 mm (.36 in)

Marine Medium Duty

Weight: 13.4 kg/100 m (29.5 lb / 328 ft)
Tensile: 272 kg (600 lb), maximum
204 kg (450 lb), anchor strength
Jacket: Double, fully water blocked
OD: 11.7 mm (.46 in)

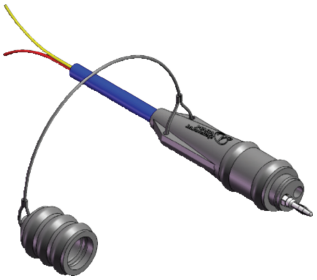
Marine Heavy Duty

Weight: 17.15 kg/100 m (37.8 lb / 328 ft)
Tensile: 727 kg (1603 lb), maximum
204 kg (450 lb), anchor strength
Jacket: Double, fully water blocked
OD: 13.5 mm (.53 in)

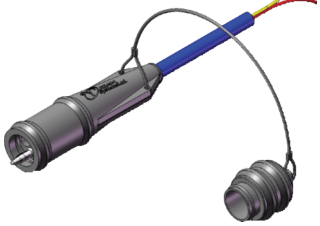
PHYSICAL

Operating Temperature: -45 ˚C to +70 ˚C

TAKEOUT CONNECTORS



KCM– Male



KCM– Female

LCK-Male

LCK-Female

Other takeout connectors are available upon request

ARIES® II recording system

GROUND EQUIPMENT

SEALED LEAD ACID "GEL CELL" BATTERIES

FEATURES

- Simple, inexpensive and reliable power provision to all ARAM ARIES ground equipment

SPECIFICATIONS

Battery Type: Sealed Lead Acid (SLA) "gel-cell"
24 Volts DC, 12 Amp-Hours
24 Volts DC, 17 Amp-Hours

Recharge Time: 12 Amp-Hours Battery
6 Hours (approximate) on Smart Charger
17 Amp-Hours Battery
9 Hours (approximate) on Smart Charger

PHYSICAL

Packaging: Reinforced Nylon with neoprene padding

Size: 12 Amp-Hours Battery
22.9 cm x 12.7 cm x 17.8 cm (9" x 5" x 7")
17 Amp-Hours Battery
20 cm x 23 cm x 18.5 cm (8" x 9" x 7.25")

Weight: 12 Amp-Hours Battery
8.5 kg (18.7 lb)
17 Amp-Hours Battery
11.8 kg (26 lb)

Operating Temperature: -40 ˚C to +70 ˚C

Storage Temperature: -15 ˚C to +40 ˚C

TRANSITION ZONE LITHIUM ION BATTERIES

FEATURES

- High power density Li-Ion batteries provide longer operating times and compact size & weight
- Specifically designed for use with transition zone equipment including the ARIES Marine Case

FEATURES

Battery Type: Lithium Ion
24 Volts DC
15 Amp-Hours

Operating Use: 190 Hours continuous @ 20 ˚C (ARIES II RAM)

Recharge Time: 4 Hours (approximate) on Smart Charger

PHYSICAL

Packaging: Hard Anodized 6061 Aluminium

Size: 28.7 cm x 17.1 cm x 4.8 cm
(11.3" x 6.74" x 1.89")

Weight: 4.1 kg (9.04 lb)

Operating Temperature: -20 ˚C to +60 ˚C

Storage Temperature: -20 ˚C to +35 ˚C

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GROUND EQUIPMENT

ARIES NETLINK

FEATURES

- Provides wireless link for telemetry signals
- Supports ARIES dual-port telemetry
- Wide azimuth antenna for ease of connectivity
- 3 km range (typical)
- Optional 15 m antenna extension cable

SPECIFICATIONS

Operating Frequency:

2.4 GHz - 2.497 GHz (subject to local regulations)

Modulation:

Direct sequence spread spectrum

Transmission Power:

500 mW maximum

(can be firmware limited to 5 mW)

Dynamic power control +4 dBm to +27 dBm

(2.5 mW to 500 mW)

Sensitivity:

106 BER @ -81 dBm; 11 Mbits/sec

Range:

3 km (typical)

Power Consumption:

2.5 W* (typical)

Antenna Height:

Adjustable to 4 m

PHYSICAL

Size*:

18 cm x 18 cm x 135 cm (7" x 7" x 53")

23 cm x 38.1 cm x 53 cm (9" x 15" x 21")

Weight*:

18.5 kg (40.8 lb)

Operating Temperature:

-40 ˚C to +60 ˚C

Storage Temperature:

-45 ˚C to +85 ˚C

Humidity:

0% - 100%

* Per each of 2 Netlink units that comprise a "link"

ARIES II TRANSITION ZONE EQUIPMENT

MARINE CASE

FEATURES

- Instantly converts standard land RAM for use in marine environments up to 75 m water depth
- Simple, reliable and inexpensive solution for today's 3D programs which, as they get larger and larger, frequently face challenging river, lake and bay crossings
- Allows for seamless integration from land to transition zone acquisition
- Optional Service Kit provides all tools, supplies and equipment needed to provide periodic maintenance for the Marine Case

Maintenance kit for marine case and connectors

Marine case that houses pictured battery and RAM

PHYSICAL

Packaging:

Hard Anodized 6063 Aluminum

Connectors:

Hard Anodized Aluminum

Operating Temperature:

-0 ˚C to +60 ˚C

Storage Temperature:

-0 ˚C to +60 ˚C

RAM Case (AMC)

Size:

39.97 cm x 22.73 cm x 18.08 cm

(15.74" x 8.95" x 7.12")

Weight:

16.6 kg loaded with RAM and battery

(36.5 lb)

ARIES II LTU Case (AMT)

Size:

39.95 cm x 27.55 cm x 23.01 cm

(15.73" x 10.85" x 9.06")

Weight:

27.1 kg loaded with LTU and two batteries

(59.7 lb)

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ARIES II RECORDING EQUIPMENT

ARIES II CENTRAL SYSTEM

FEATURES

- Multi-processor PC
- Multiple monitor video support
- Multiple output devices (eSATA HDD, DVD, NAS, LTO, 3592, etc)
- Redundant high capacity internal hard disc drives
- Integrates seismic line interfaces
- Copper or fiber base line support
- Supports ARIES software featuring
  - Fully integrated seismic acquisition software
  - Microsoft compatible project database
  - Integrated project and data QC modules
  - Supports remote internet based monitoring
  - Supports optional vibroseis recording

SPECIFICATIONS

Channel Capacity:

24,000 Channels @ 2 ms, on 4 copper baselines

(600 km² live spread real time)

40,000 Channels @ 2 ms, on 4 fiber baselines

(1,200 km² live spread real time)

Connectivity:

ARIES Line Interface

Source / Aux

eSATA

USB2

LAN

LVD SCSI

HVD SCSI

Firewire (optional)

Parallel & Serial

PHYSICAL

Seismic Processor Module (SPM)

Size: 59.2 cm x 48.3 cm x 17.8 cm (23.3" x 19" x 7")

Weight: 19.9 kg (43.9 lb)

Power: 384 Watts @120 VAC

Tape Drive Module (TDM)

Size: 54.3 cm x 48.3 cm x 17.8 cm (21.4" x 19" x 7")

Weight: 13.4 kg (29.5 lb)

Power: 144 Watts @ 120 VAC

Power Supply Module (PSM)

Size: 59.2 cm x 48.3 cm x 17.8 cm (23.3" x 19" x 7")

Weight: 58.97 kg (130 lb)

Input Power Factor: 0.99 typical (0.8 minimum)

iSys V12 Thermal Plotter

Size: 44 cm x 39 cm x 23 cm (17.25" x 15.25" x 9")

Weight: 17 kg (37.5 lb)

Power: 70 Watts @ 120 VAC

Lightning Protection Unit (Copper Baselines only)

Size: 31 cm x 21.8 cm x 8.6 cm (12.2" x 8.6" x 3.4")

Weight: 4.54 kg (10.0 lb)

Zero Clearance Rack (as pictured above)

Size: 59.1 cm x 60.1 cm x 54.6 cm (23.3" x 24.9" x 21.5")

ARIES® II recording system

ARIES II RECORDING EQUIPMENT

ARIES II SPM LITE

FEATURES

- Optional, portable system
- Optimized for 2D acquisition
  - 1 Baseline cable connection
  - 1 Built-in monitor
  - 1 Optional external monitor
- Dynamite and Vibroseis* acquisition support
- Multi-processor PC (Dual Xeon Quad-Core)
- Multiple output devices (eSATA HDD, DVD, USB, etc)
- Redundant high capacity internal hard disc drives, 2.25 TB (RAID-5)
- ARIES software features
  - Fully integrated seismic acquisition software
  - Microsoft compatible project database
  - Integrated project and data QC modules
  - Remote, internet-based monitoring

SPECIFICATIONS

Channel Capability:

Intended for low channel count systems (<2000)

Power Supply:

120 - 240 VAC (auto-switching), 50 Hz or 60 Hz

Connectivity:

External Video (2nd Monitor option, DVI-I)

Parallel x1

Serial x2

USB2 x3

LAN x2

eSATA x2

ARIES Line Interface

Source / Aux

LVD SCSI

Options:

iSys Plotter (LAN)

LTO tape drive

Second video monitor

12 VDC inverter

PHYSICAL

Size:

44.13 cm (W) x 33.66 cm (H) x 22.86 cm (D)

(17.38" (W) x 13.25" (H) x 9.0" (D))

Weight:

19.96 kg (44.0 lb)

Operating Temperature:

+10 ˚C to +50 ˚C maximum

+10 ˚C to +45 ˚C recommended

Storage Temperature:

-10 ˚C to +60 ˚C

Humidity:

Operating 10% to 80% non-condensing

Storage 10% to 90% non-condensing

Power:

300.0 Watts (2.50 A) @ 120 VAC (max)

222.0 Watts (1.85 A) @ 120 VAC (typical)

297.6 Watts (1.24 A) @ 240 VAC (max)

223.2 Watts (0.93 A) @ 240 VAC (max)

* Vibroseis software is optional

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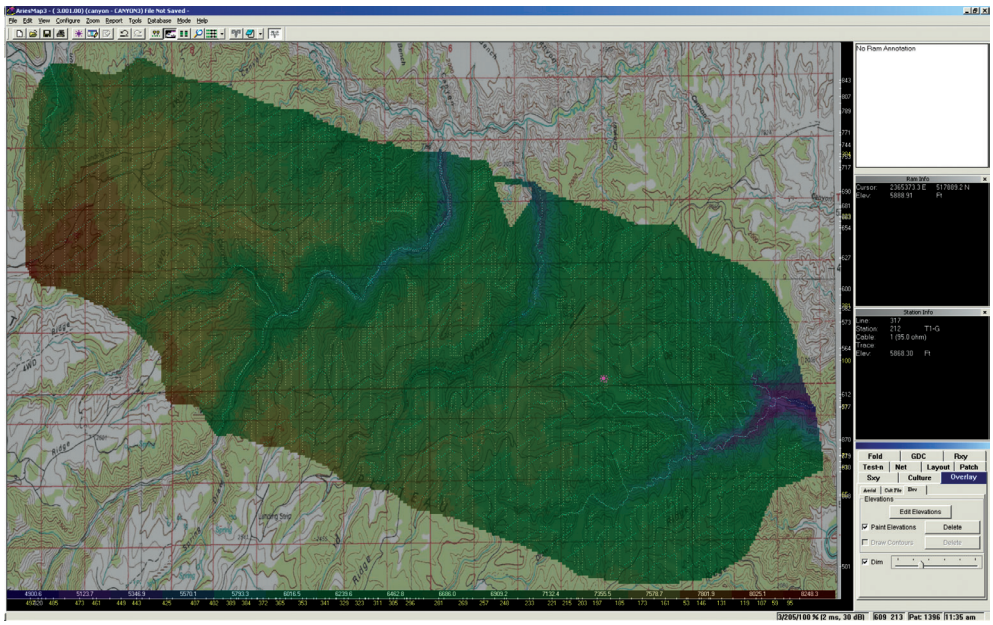
PROJECT MANAGEMENT

FEATURES

- Project management functions are predominantly controlled within a spatially correct interface... "Map View"
- Map View is designed to present critical information to the observer in the most easily understood form: graphically
- Import critical information from SPS, SEG-P1, Geo-Tiff or user-defined tables and display it on Map overlays.
- Track vehicle and personnel locations and monitor for speed, location or safety compliance
- Perform telemetry QC and trouble-shooting referenced to real world graphics, manage deployment and trouble-shooting crews relative to actual ground locations, access and obstacles
- Observers receive context-relevant information in real time (automatic alerts generated from drill logs, for example, warn the observer that the current shot point is a shallow hole)



SPECIFICATIONS

- Deployment and acquisition planning
- Personnel & vehicle tracking, compliance monitoring (speed, lockouts, safety equipment, movement cessation), logging Channel & sensor test results; tests multiple sensor types simultaneously (land and marsh geophones, for example) displays results relative to type-specific parameters
- True Source and Receiver X-Y's from survey, elevation displays, map overlays
- Telemetry functions, connectivity, test results
- Source location (C.O.G., average, limits)
- Multiple-source movement planning, source-driven acquisition
- Real-time binning display by fold, offset & azimuth
- Real-time spread noise monitor
- Continuous recording mode— for microseismic operations

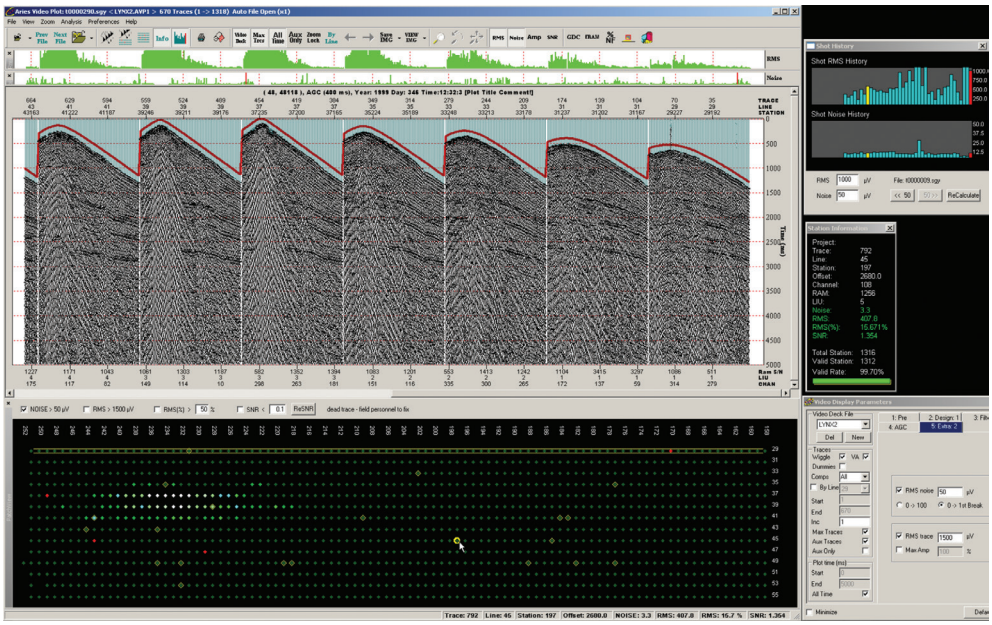
ARIES II SOFTWARE

DATA QUALITY CONTROL

FEATURES

Great Quality Control software is only great if it's usable... ARIES software is widely believed to offer the most powerful, easiest to use interface in the industry.

- ARIES software accommodates the widest possible spectrum of user expertise
- ARIES "Patchview™" provides the industry's only reliable visual QC tool for mega-channel operations
- Live traces are analyzed for RMS Signal, Noise, S:N/R and adjacent trace correlation, results are presented as information-rich pixels, color indicates user dictated pass/fail criteria, shade indicates signal amplitude levels; an observer can quickly and reliably QC tens of thousands of receiver points at a glance
- Patchview is integrated with more traditional QC displays including real or screen-simulated "Paper Plots", trace-by-trace RMS, noise, or S:N plots, first-break analysis
- ARIES interface allows observers to click on any trace, either in Patchview or screen plot, to receive detailed station information or to add comments to the project database for that trace
- ARIES also provides shot histograms for RMS amplitude and noise... allowing QC personnel to quickly assess the impact of changing field conditions on data quality
- Patchview provides real time shot-by-shot analysis, reporting and logging of valid vs. invalid traces for contract compliance monitoring
- ARIES FRAM provides frequency and amplitude analysis including deconvolution, filter paneling; agc, exponential or fixed scaling, correlation, cross-correlation, f-k spectra, and a host of plotting options
- ARIES GDC (Geophysical Data Characterization) provides real-time and histogram analysis of geophysical attributes on a trace-by-trace, shot-by-shot or bin-by-bin basis and can present simple pass-fail criteria to the observer or rich statistical data to sophisticated QC personnel



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ARIES II RECORDING EQUIPMENT

ARIES II ANTU

FEATURES

- Multi-processor PC (Core 2 Quad Mobile)
- Multiple output devices (eSATA HDD, DVD, USB, etc)
- Integrates seismic line interface
  - Single copper baseline support (ARIES I and ARIES II)
- Supports limited ARIES software features
  - Does not support acquisition
  - Does support all line and sensor testing

SPECIFICATIONS

Channel Capability:

2,400 channels per receiver line (max@2ms, 55m Takeouts)

6,400 channels total (max@2ms)

Power Supply:

120 - 240 VAC (auto-switching), 50 Hz or 60 Hz, 12 VDC OUT

Connectivity:

Parallel x1

Serial x2

USB2 x3

LAN x1

eSATA x2

ARIES Line Interface

Options:

iSys Plotter (LAN)

12 VDC inverter

PHYSICAL

Size:

47 cm x 37 cm x 15 cm

(18.5" x 14.6" x 5.9")

Weight:

13.61 kg (30.0 lb)

Operating Temperature:

+10 ˚C to +40 ˚C

Storage Temperature:

-10 ˚C to +60 ˚C

Humidity:

Operating 10% to 80% non-condensing

Storage 10% to 90% non-condensing

Power:

126 Watts (1.05A) @ 120 VAC (max)

91.2 Watts (0.76A) @ 120 VAC (typical)

127.4 Watts (0.53A) @ 240 VAC (max)

99.6 Watts (0.42A) @ 240 VAC (typical)

ARIES II ADDITIONAL EQUIPMENT

ARIES SMART CHARGER

FEATURES

- Provides comprehensive charging, maintenance and monitoring facilities to manage system's battery fleet
- Performs discharge / recharge functions to monitor and extend battery life
- Includes software, running on client supplied PC connected via RS232 port, which provides battery health reports, including battery charge and discharge curves
- Charges both Lithium Ion and Sealed Lead Acid batteries
- Seven operating modes
- Charges 10 batteries simultaneously

SPECIFICATIONS

Operating Voltage:

120 VAC - 240 VAC (auto-switching)

50 Hz or 60 Hz

Power Consumption:

850 W max charging 10 SLA Batteries

1200 W max charging 10 Lithium Ion Batteries

Operating Temperature:

Limited to battery's operating temp.

Storage Temperature:

-45 ˚C to +85 ˚C

Humidity:

10% - 80% non condensing

PHYSICAL

Size:

45.2 cm x 32.54 cm x 17.3 cm

(17.8" x 12.6" x 6.8")

Weight:

13.83 kg (30.5 lb)

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ARIES II ADDITIONAL EQUIPMENT

SERVICE AND REPAIR KITS

FEATURES

- The Service & Maintenance station provides a PC-based test station capable of performing all system tests on ARIES ground equipment, as well as tools, test fixtures and equipment needed to perform periodic maintenance and repairs.

FEATURES

- The service toolkit provides a complete set of industrial quality tools needed to perform all maintenance, repairs to ARAM equipment.