

## RS-400 RADIATION PORTAL MONITORING SYSTEM



### 4 PMT Technology Detector Size 5,000 cu. ins.

The RS-400 system is a 4PMT based super-coincidence fully digital system specially designed for the difficult operating conditions of many Steel and Scrap processing plants. These advanced technology systems offer very high sensitivity performance with minimum false and nuisance alarms through advanced digital design and spectral analysis. This system uses large volume detectors for optimum vehicle coverage. Typically, long detectors suffer substantially from signal loss using conventional technology, as a result RSI has developed a 4PMT technology utilizing PMTs at both ends of the detector for greatly improved signal collection and spectral shape.

The system is fully modular to make it easily configurable to suit local logistics and permit fast, easy maintenance. The system operates independently however, has direct Ethernet connectivity to plant networks that permit a fully integrated plant design with RSO overview on all installed systems. USB/Serial connectivity also enables system configuration to suit user needs for local displays, local or network printers, scale computer integration etc.

### The Complete Service Solution

The RS-400 system design incorporates many advanced ideas to make fast easy local maintenance practical. These features include easy-open doors (latch = no screws), doors latch open, very rugged PMT mounts for reliability and easy access electronics tray with all electronics modules for fast changes. A major new feature is Internet based service support permitting the RSI Service Department direct overview for trouble shooting; in most cases we can advise which module to change. US stocking of parts with overnight support adds to the complete service solution.

### Features

- 5000 cu ins (4698 cu ins actual) detector assemblies - max 16 detectors
- Fully digital system design - no user adjustments
- 4 PMT technology for high sensitivity + high noise rejection on long detectors
- 10/sec data sampling rate for optimum data analysis
- Advanced 128 channel spectrometer system
- Full spectral NASVD analysis for high sensitivity with essentially zero false and void alarms
- Minimum nuisance alarms due to advanced signal screening and pattern recognition
- Direct connection to the plant network enabling RSO overview of all alarms on all systems
- Real-time (1/sec) error reporting to RSI service via the Internet for fast support and system overview
- 15" color touch screen display for easy user interfacing
- Alarm classification to sort alarms into scrap and non-scrap categories for easier control
- 48V operation to minimize voltage drops on long cables
- Automatic system sensitivity monitoring with auto gain correction
- Modular system design for easy servicing
- System designed for easy on site service by local staff for "instant" service support

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## System Specifications

### CONTROLLER

- Size = 14.7"H x 14.5"W x 3.9"D (373 x 368 x 99mm)  
115/220V AC operation 25 lb (11.5 Kg)
- CPU = high power custom designed Industrial embedded system gives high reliability over a wide temperature range
- NO SYSTEM HARD-DRIVE = all memory storage on solid state memory (8GB)
- OPERATING SYSTEM = the system runs Windows CE this is a specially developed operating system for industrial systems and unlike standard Windows it permits real-time operation
- IP66 rated enclosure with internal heat sinking and no system fan for safe operation even in high dust areas
- CONNECTIVITY = Ethernet, USB, VGA and Serial connections for user interfaces

### SYSTEM

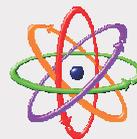
- Advanced alarm analysis of full spectrum data utilizing very advanced mathematical NASVD techniques
- Spectral analysis permits rejection of the majority of false, rain and void alarms prevalent in most systems without reducing system sensitivity
- Many nuisance alarms can be removed from the system by identifying unique spectral shapes
- 10/sec data sampling of full spectral data
- 1/sec Error reporting to RSI service computer via the Internet enables fast fault diagnosis
- Full Ethernet connectivity to local plant network
- RSO overview of all system alarms via plant network
- Internet connectivity via the plant network to RSI service and permits multi-plant connectivity
- RSI overview (via Internet) for alarm validation and reporting
- 24/7 tech support for fast responsive support from technical people
- Touch screen VGA display for local alarm response
- Variety of printer options to suit local logistics
- System sensitivity analysis and auto correction to minimize signal loss with no radioactive sources required to test system performance
- RFID TAGS = the system supports "Radio-Frequency Identification" tags that permit absolute vehicle identification in a very cost effective manner.

### MODELS AVAILABLE

- RS-400/10000 = 2 detector system
- RS-400/15000 = 3 detector system
- RS-400/20000 = 4 detector system
- RS-400/25000 = 5 detector system
- RS-400/30000 = 6 detector system
- Max 16 detectors for special applications

### DETECTORS

- VOLUME = 5000 cu in/detector (4698 cu in actual volume)
- SIZE = 32.2"W x 90"H x 7.2"D (818 x 2286 x 183mm)  
- approx 290 lbs (132 Kg)
- Fully DIGITAL system design for high performance and hi reliability
- PHOTO-TUBES (PMT) = 4 PMTs with low noise buffer amplifiers for improved performance over older 2PMT technology. Prevents hi signal loss on these long detectors
- COINCIDENCE COUNTING = very advanced digital FPGA design for fast coincidence on all 3 PMTs simultaneously giving very high noise rejection, high throughput and good spectral shape
- SPECTROMETER = 128 channel spectrometer on each PMT permits accurate spectral analysis. This digital FPGA based spectrometer gives full spectrum 10/sec data sampling for analysis
- HVPS = individual High Voltage Power Supply on each PMT improves reliability
- VEHICLE PRESENCE MODULE = separate FPGA based module uses 4 optical sensors with fast 500Hz resolution to permit accurate determination of vehicle speed and presence
- MODULAR = fully modular system design, 3 easy to change modules contain all system electronics and if any are changed it is Plug-and-Play with automatic parameter adjustment - no user adjustments
- EASY OPEN BOX = specially designed one-button-open detector box assembly for easy access including auto lock hinges to hold the door open for service
- SHOCK MOUNTS = each scintillator is specially shock mounted to minimize shock and vibration effects that shorten system life



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