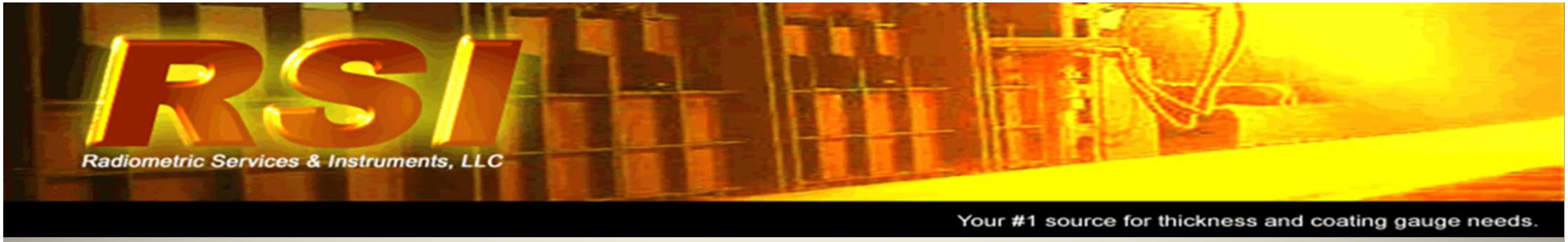
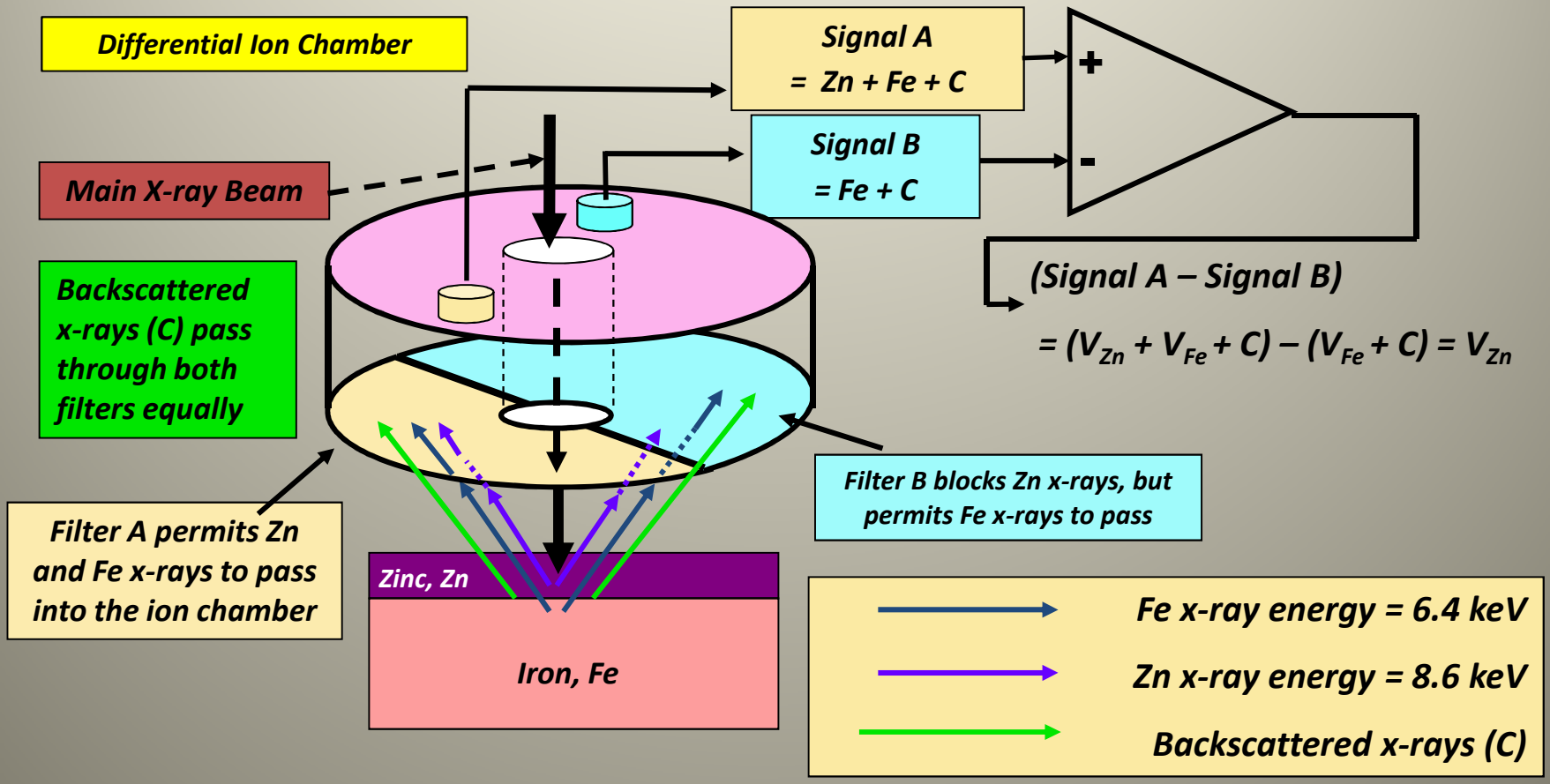


RSI

GaugeMaster
Coating Weight Gauges for CGL, EGL and ETL

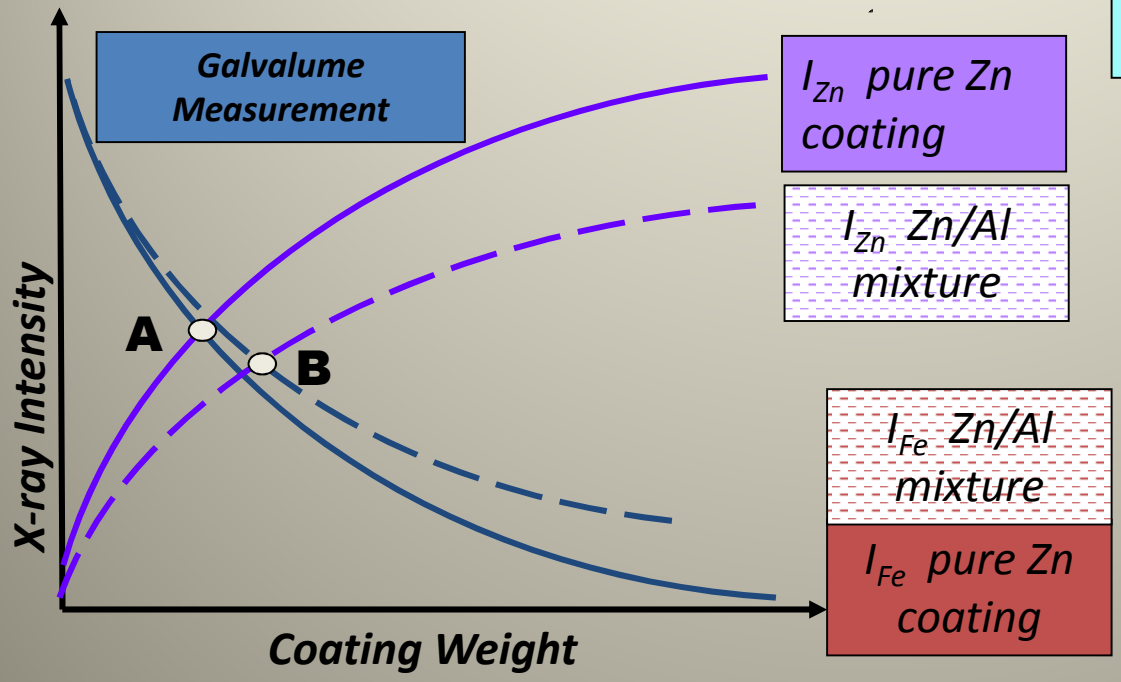
Single Coatings: Zn, Al, Sn, and Cr
Total Coating: Galfan, Galvalume, Galvanneal, Zn/Ni, Zn/Mg
Option: % Fe content, % Al content, % Ni content

Measurement Principle



Metallic Coatings with Binary Mixtures

Galvalume (Zn/Al) and Zinc/Nickel (Zn/Ni) coatings



The addition of Aluminum into the zinc coating causes the intercept A to shift to position B.

This permits the percentage of Al in the Zn/Al mixture to be determined since the differential ion chamber measures both Zn and Fe x-rays.

Fe x-ray energy = 6.4 keV

Zn x-ray energy = 8.6 keV

Applications

Coating	Coating Weight (per side)	Source Voltage
Zinc (Zn)	0 to 200 gm/m^2 0 to 450 gm/m^2 0 to 610 gm/m^2 (extended)	20kV 40kV 40kV
Aluminum (Al)	0 to 300 gm/m^2	20kV
Tin (Sn)	0 to 16.0 gm/m^2	20kV
Chromium (Cr)	0 to 1.0 gm/m^2	10kV
Galvalume (Zn/Al) Galvanneal (Zn/Fe) Zinc Nickel (Zn/Ni)	0 to 200 gm/m^2	20kV

Recent System Orders

Tata Steel – Ijmuiden - ETL
MSC - Walbridge Coatings – EGL
Spartan Steel Coating – CGL
ArcelorMittal – Galati – CGL
Tata Steel – Trostre Works – ETL
ArcelorMittal – I/N Kote – CGL
Ton Dong A thru CN Steel Plant Eng. - CGL

Over 150 systems and upgrades in service around the world

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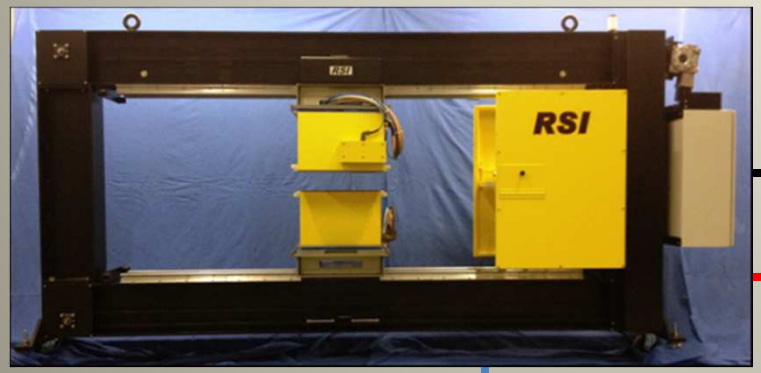
Your #1 source for thickness and coating gauge needs.

Typical Coating Gauge Configuration

O-Frame



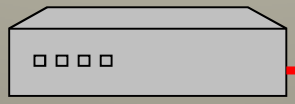
Main Electronic Cabinet (MEC)

Chiller (Source)

Remote Operator's Panel(s)

Communications CPU

Level II



Cabling/Conduit

Fiber Optic or Cat 5

Radiometric Services and Instruments, LLC

GaugeMaster Cabinet

- DIN Rail Mount Power Supplies
- Digital X-ray Control
- Communications CPUs
- Gauge Processor
- Industry Standard I/O Modules

- Technician's Terminal
- Keyboard

Optional Side Mount Air Conditioner for temperatures above 35°C / 95°F

Gauge Processor Configuration...Added Reliability !!!

- Industry Standard "Computer-On-Module", ETX (Embedded Technology eXtended) modules minimize long term “hardware obsolescence” issues.
- Compact Flash Drives for enhanced reliability.
- Separate Processors for system measurement and communications. “Core” measurement software continues to run even if display application software crashes.
- 16 bit - A/D Channels
- Four Independent Analog Output Channels.
- Up to 48 Channels of Digital I/O, configurable.
- Network Connectivity for remote monitoring and troubleshooting.
- Linux Real Time O/S with “C++” language modularized.

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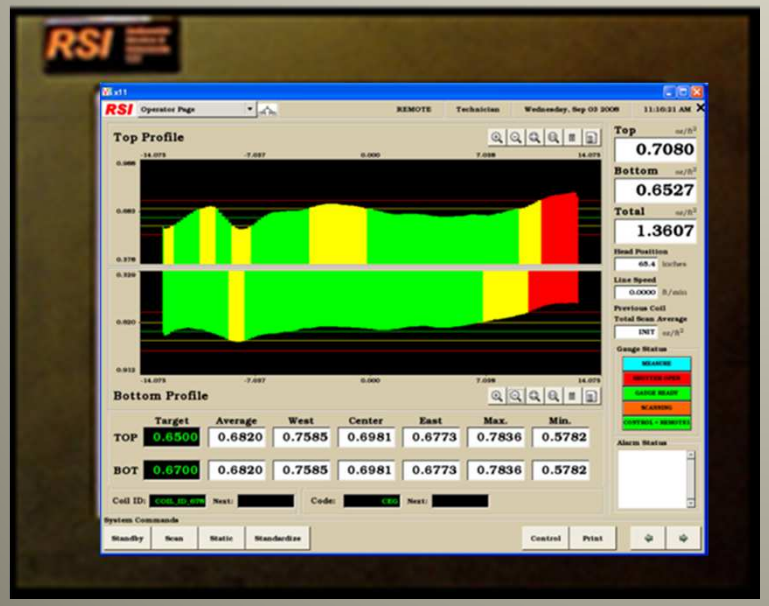
The Technician’s Terminal is mounted on the front door of the MEC. The terminal is used for system configuration, set-up of measurement parameters, diagnostics, fault finding, etc.

The Technician's Terminal can be used as the Operator's Terminal in the event of a problem with the Remote Operator’s Terminal.



- Touchscreen LCD color display
- Rugged, industrial quality for tough environments
- Simple, easy-to-use interface
- Password controlled, multiple access levels
- Display of thickness, deviation from set point together with present and next nominal values
- Manual entry of thickness, alloy/grade
- Gauge status and alarms
- Customer configurable displays

Diagnostic Features

- Accessible via internet for remote diagnostics
- Cabinet temperature, x-ray driver temperature, standard magazine temperature and x-ray source temperature monitoring with alarms
- Full diagnostics with multiple screens
- Calibration curve building capabilities built in; includes curve order selection, display of coefficients and curve error display
- Remote troubleshooting via modem/internet/network capability
- Alarm and event logging by time and date
- Analog input and output scaling
- Digital I/O checks

System Interfaces

- TCP/IP, Profibus or OPC interface to Level II computer
  - Download nominal thickness, tolerances, alloy name, alloy chemistry, etc.
- RS232C serial links available for older systems
- Four scalable analog outputs (standard)….additional outputs are optional
- Isolation amplifiers available for Control Interfaces
  - ± 10 VDC or 4 – 20 mA current loop, 1000 vdc isolation
- Digital Inputs and Outputs (Solid State or Relay) for system status
  - Gauge healthy, measuring, calibrating, on/off-line, etc.

DIN rail mount Power Supplies are protected by circuit breakers and monitored for malfunction and alarmed.

All wiring and terminal blocks associated with the power supplies are color-coded throughout the system for ease of troubleshooting.

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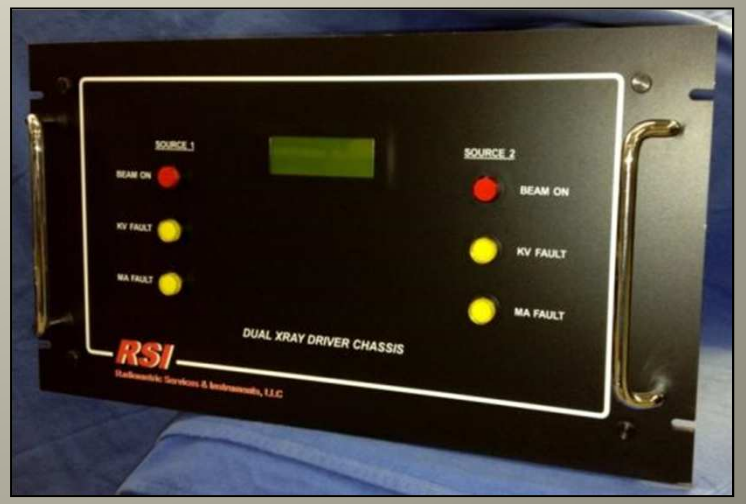
Your #1 source for thickness and coating gauge needs.

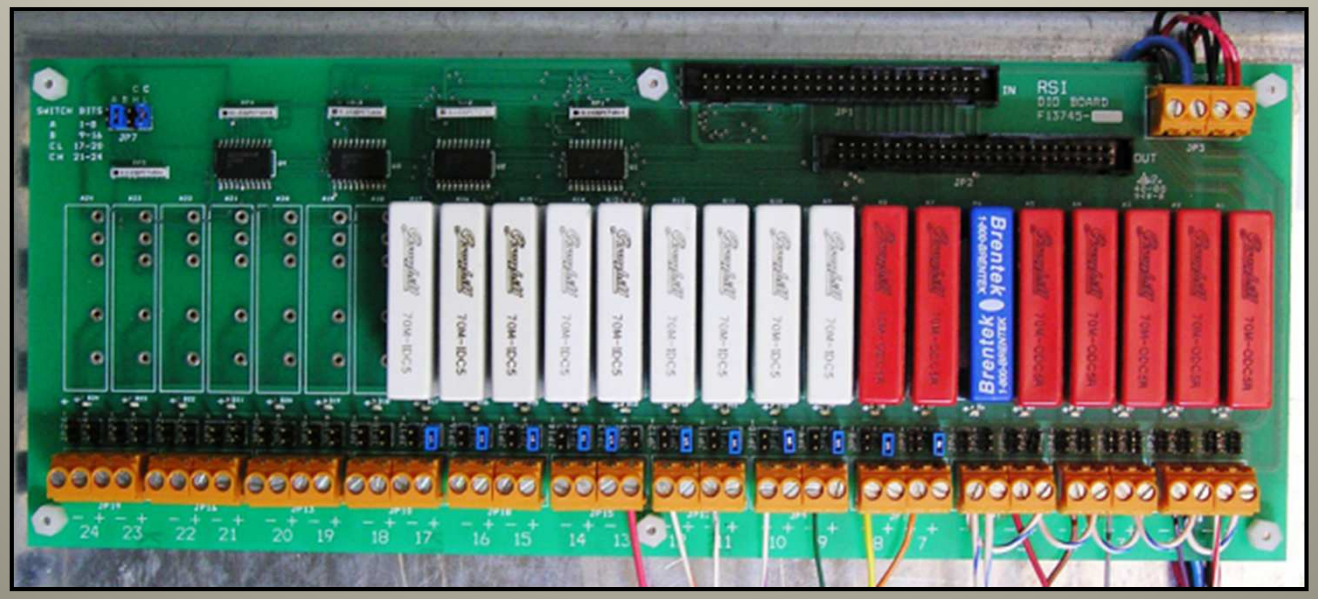
A highly stable Digital X-ray Control System drives the x-ray source(s). A Pentium class CPU is used to regulate the high voltage and current through the x-ray tube. Capable of driving most DMC, MX/DMC and Thermo Radiometrie X-ray sources.

- Backwards Compatible with existing DMC, MX/DMC and Thermo Radiometrie X-ray Driver Chassis and PCB's.
- Ethernet Connectivity: X-ray source high voltage and current are regulated via Ethernet link to the Main CPU.
- Temperature Monitoring of x-ray power driver and x-ray source. Overheating problems are quickly recognized and averted, minimizing production delays.
- Increased Accessibility for ease of maintenance.



Industry Standard I/O Modules are mounted on a circuit board. Terminal strips provide a convenient and easy connection point for the customer's wiring.

Each module has a LED status indicator for ease of identification.



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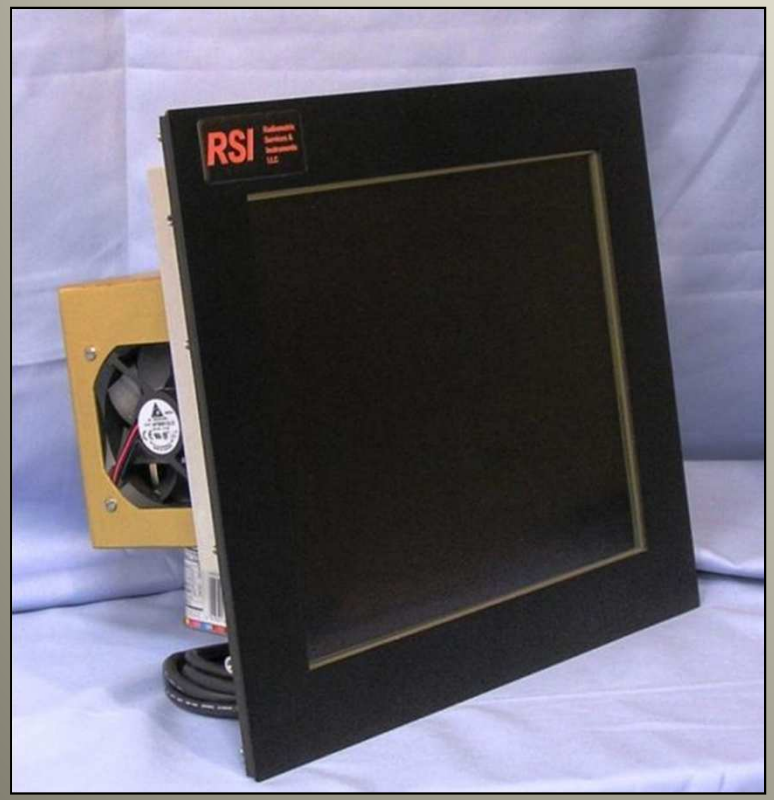
The Remote Operator's Panel permits the viewing and entry of measurement values and parameters. Multi-level password control allows access to system extensive diagnostic and configuration tools.



- Touchscreen LCD color display
- Rugged, industrial quality for tough environments
- Display of thickness, deviation from set point together with present and next nominal values
- Manual entry of thickness, alloy/grade
- Gauge status and alarms
- Mounting options…Surface, Desktop, or Rack
- Chassis mounted CPU simplifies installation
- Ethernet fiber-optic interface
- Optional keyboard, trackball and mouse operation

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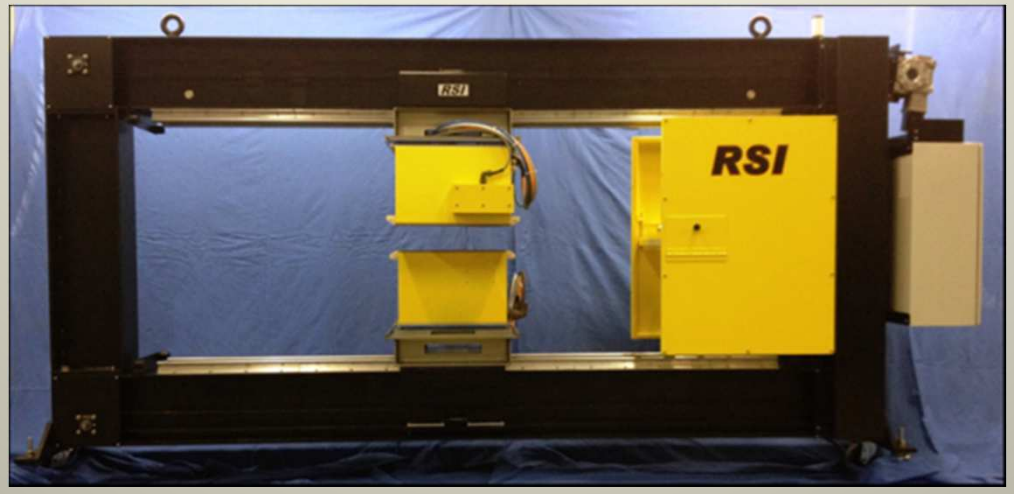
Your #1 source for thickness and coating gauge needs.



- Measuring heads are mounted on rugged O-frame available in standard sizes to cover various strip widths. Single beam scanners can be supplied for locations where O-frames are not suitable.
- Servo motors with integral position encoders deliver excellent sensor positioning accuracy
- Fast scan speeds; up to 300 mm/second (12 inches/second) with digitally adjustable speed.
- Multiple Measurement modes:
  - Single Point - Measuring heads positioned at any point across the strip
  - Continuous Scanning – Measuring heads scan continuously from edge to edge
  - Triple Spot – Measurements at selectable distances from the near, center and far edge of strip

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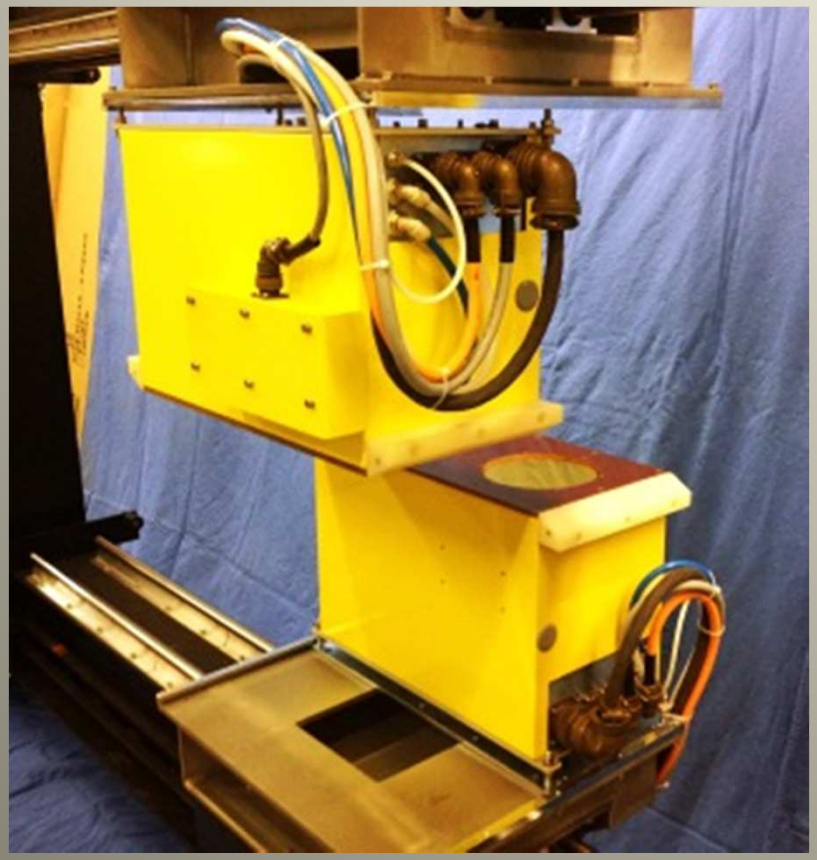
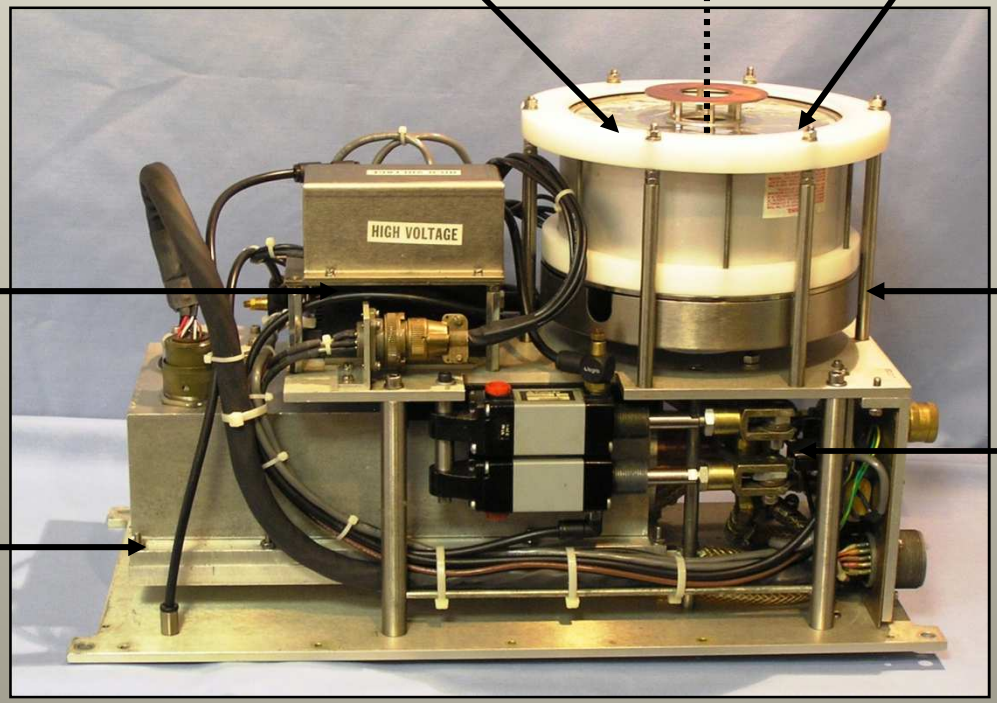
GaugeMaster Coating Gauges



Measuring Head



Unique differential ion chamber design reduces errors due to substrate thickness and Compton backscatter thereby improving measurement sensitivity and accuracy

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Your #1 source for thickness and coating gauge needs.

50 kV X-ray Source can be operated at any energy according to application

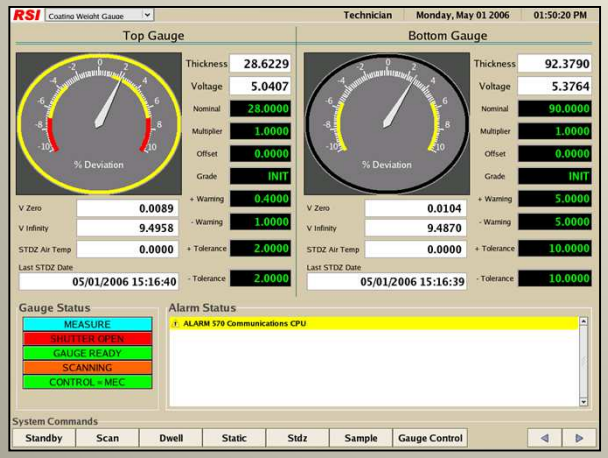
High Power design provides faster measurements, better noise to signal ratio for improved accuracy

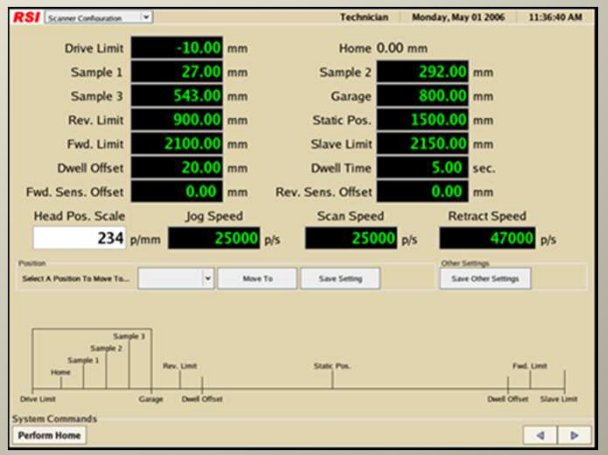
Enhancements in engineering design to improve performance and reliability

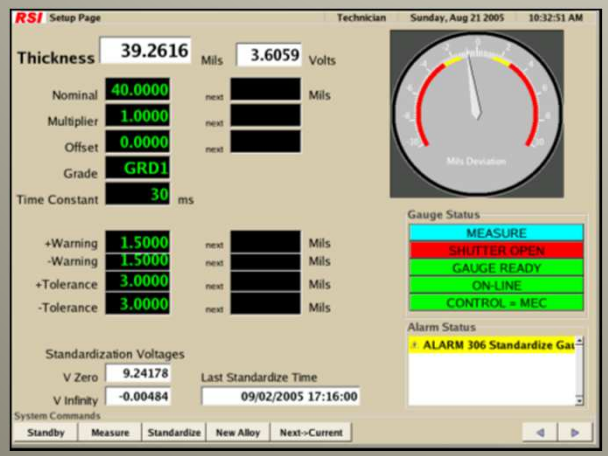
- Redesigned High Voltage (HV) modules improve reliability
- HV module changes to enhance internal cooling and extend life of x-ray tube
- Ceramic X-ray Tube
- Internal temperature sensor for temperature monitoring

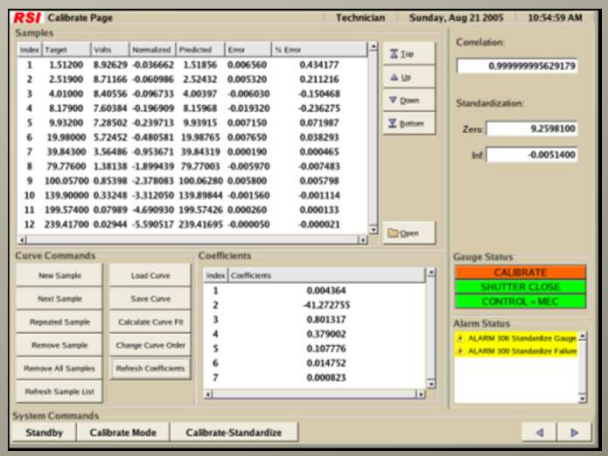
DMC compatible

Gauge Setup and Configuration Pages









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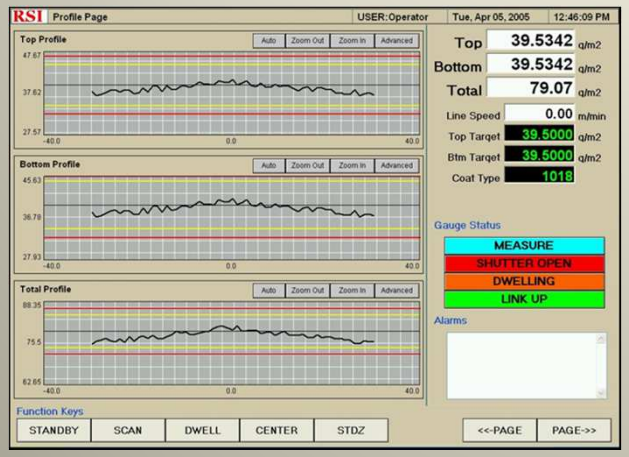
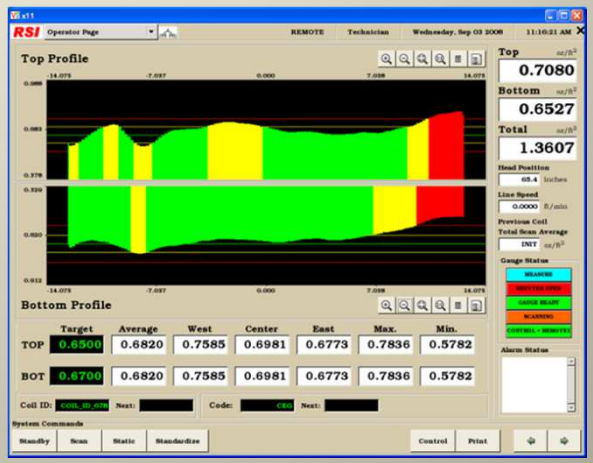
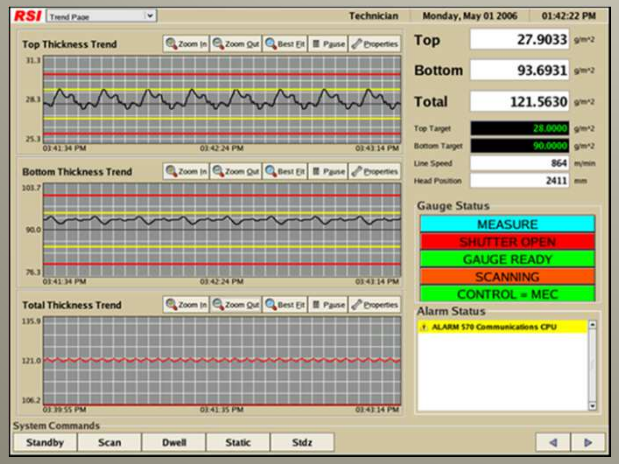
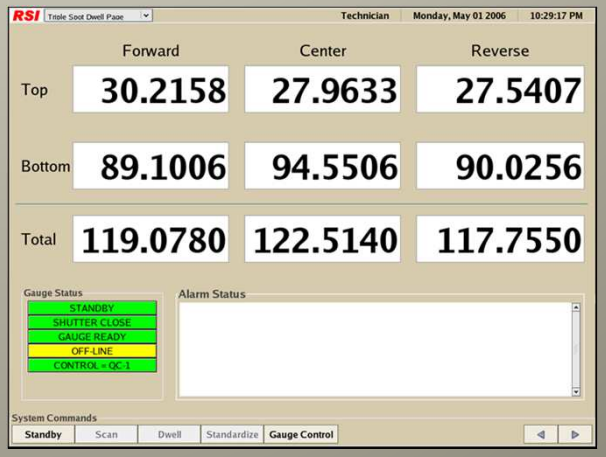
Operator Pages

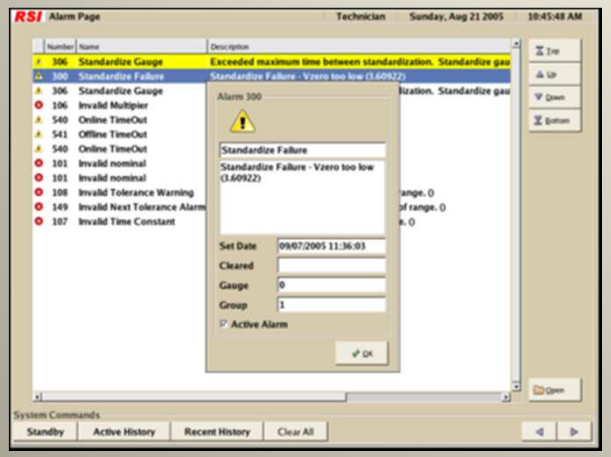


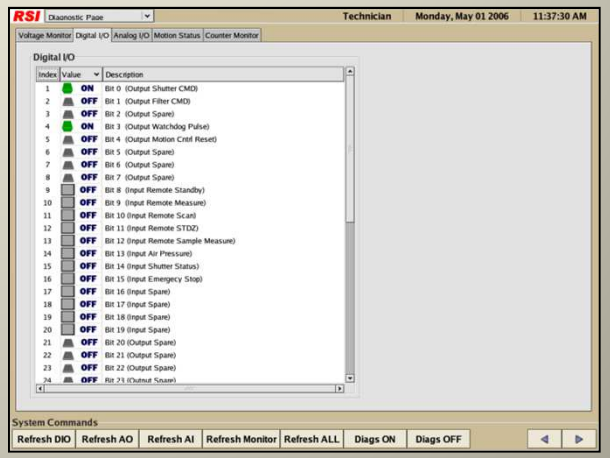


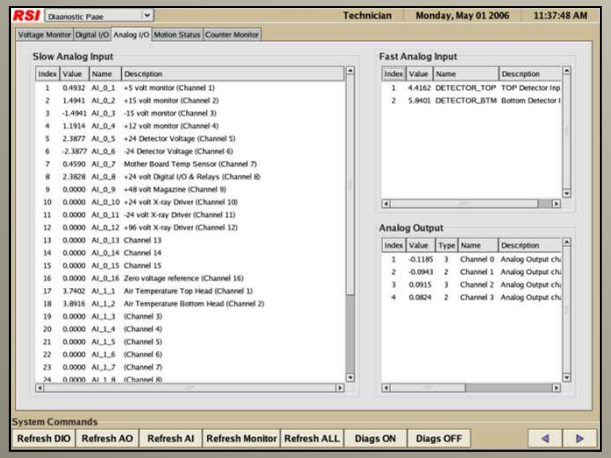


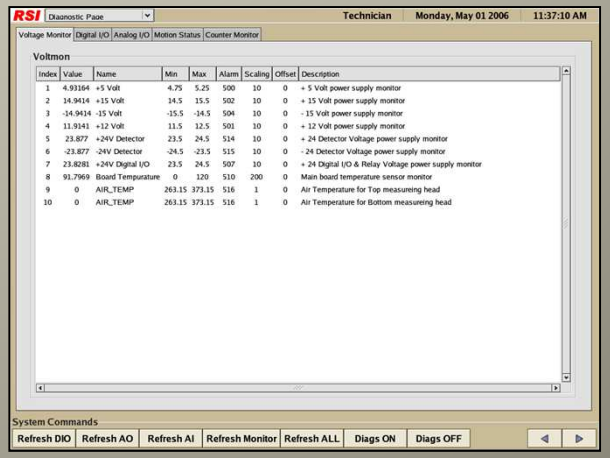


Diagnostics and Alarm Pages









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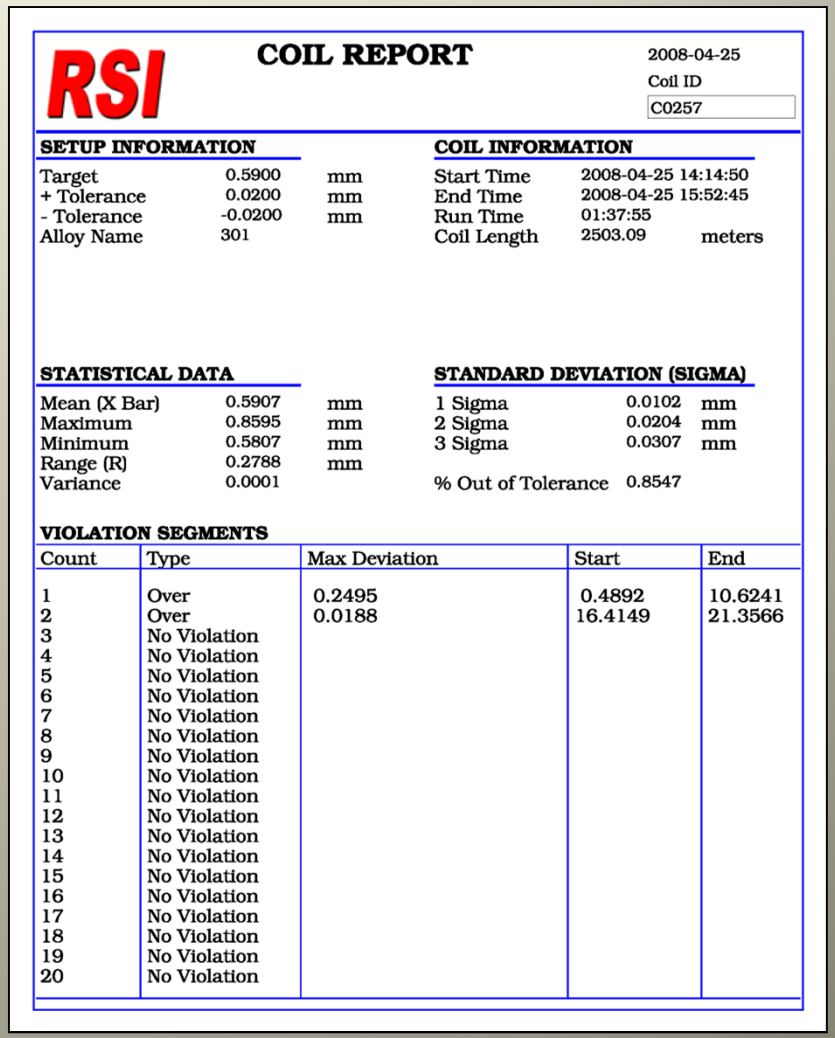
*Coil Report Package**

(Summary Report)

- Coil Data stored in .pdf or .csv format
- May be printed (printer optional)
- Store up to 2000 reports
- Up to 12,000 data points per coil
- Report includes
  - Coil Summary
  - Statistics
  - Out-of-tolerance report
  - Coil length calculation
  - Coil Histogram
  - Coil Length Profile

* Requires Remote Operator's Station



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COIL REPORT

2008-04-25

Coil ID C0257

SETUP INFORMATION

Target	0.5900	mm
+ Tolerance	0.0200	mm
- Tolerance	-0.0200	mm
Alloy Name	301	

COIL INFORMATION

Start Time	2008-04-25 14:14:50	
End Time	2008-04-25 15:52:45	
Run Time	01:37:55	
Coil Length	2503.09	meters

STATISTICAL DATA

Mean (X Bar)	0.5907	mm
Maximum	0.8595	mm
Minimum	0.5807	mm
Range (R)	0.2788	mm
Variance	0.0001	

STANDARD DEVIATION (SIGMA)

1 Sigma	0.0102	mm
2 Sigma	0.0204	mm
3 Sigma	0.0307	mm
% Out of Tolerance	0.8547	

VIOLATION SEGMENTS

Count	Type	Max Deviation	Start	End
1	Over	0.2495	0.4892	10.6241
2	Over	0.0188	16.4149	21.3566
3	No Violation			
4	No Violation			
5	No Violation			
6	No Violation			
7	No Violation			
8	No Violation			
9	No Violation			
10	No Violation			
11	No Violation			
12	No Violation			
13	No Violation			
14	No Violation			
15	No Violation			
16	No Violation			
17	No Violation			
18	No Violation			
19	No Violation			
20	No Violation			

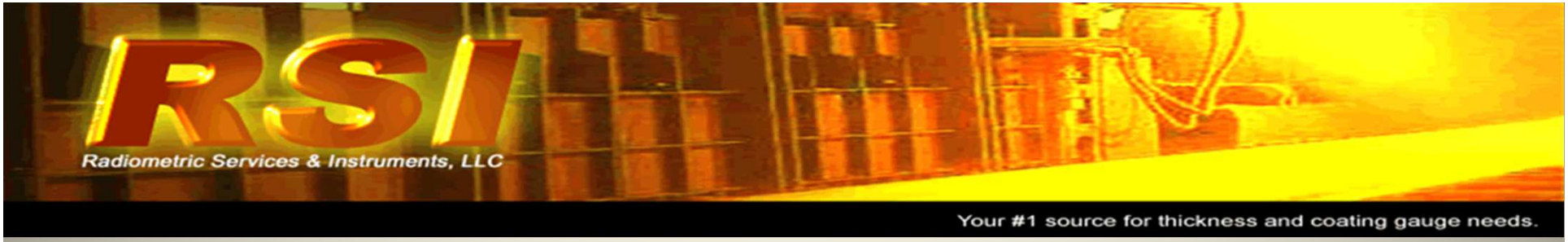
Coil Review Package

(Requires Coil Report Package)

- The Coil Review Package stores ALL collected data for each coil in a system hard drive (Coil Report Package only saves a condensed summary of the coil data)
- A technician may use this feature to perform a detailed analysis of any selected portion of a coil
- Up to 200 coils may be saved using this format

Upgrade Packages Available for DMC Model 420, 800, 480 and Radiometrie RM 318M Coating Gauges

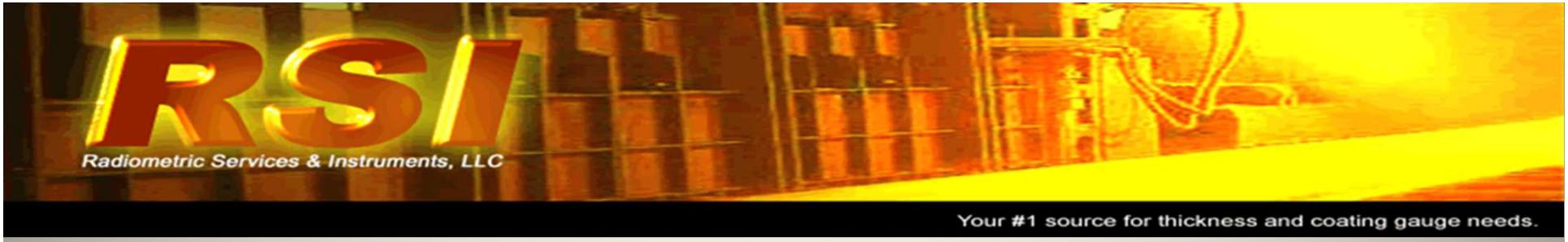
- Upgrades are the most cost-effective solution to gauge obsolescence. Roughly half the cost of a new gauge.
- No need to purchase expense new gauges to benefit from newer technologies. Existing measurement sensors are often be retrofitted with the latest technology as part of the upgrade.
- Reusing the existing measuring frames, sensors and cabling minimizes installation costs and keeps down-time to a minimum. Most upgrades can be completed in just a few days.
- Modernizing and reusing existing measurement sensors negates the purchase of expensive new sensors to support the system



RSI …now #1 in Service Support!

RSI provides more service support than any other North American supplier, using experienced test and service personnel

- Free emergency service Hot Line (+1) 717-476-9012
- North American Service from Frederick, MD, Wheeling, WV and Detroit, MI
- European Service from the UK and Italy
- Service in Asia from Beijing, China
- Maintenance contracts designed to meet your requirements
- Discounts on spare parts
- Wipe tests
- Competitive Service Rates
- Visit our website: www.rsi-xray.com



Why Work with RSI ?

- Our thickness gauges and coating gauges are proudly **Made in the USA**
- Field Service and Technical Support are always available
- Free telephone hot line for customer emergencies
- Affordable preventive maintenance contracts and call-out service
- Fast turn-around on fully tested repairs – large inventory of spare parts
- Our x-ray sources and detectors are mechanically and electrically backwards compatible with those used in many older gauges
- An experienced technical staff with a proven track record
- We have more than 200 years of combined gauging experience

At RSI, the Customer is #1