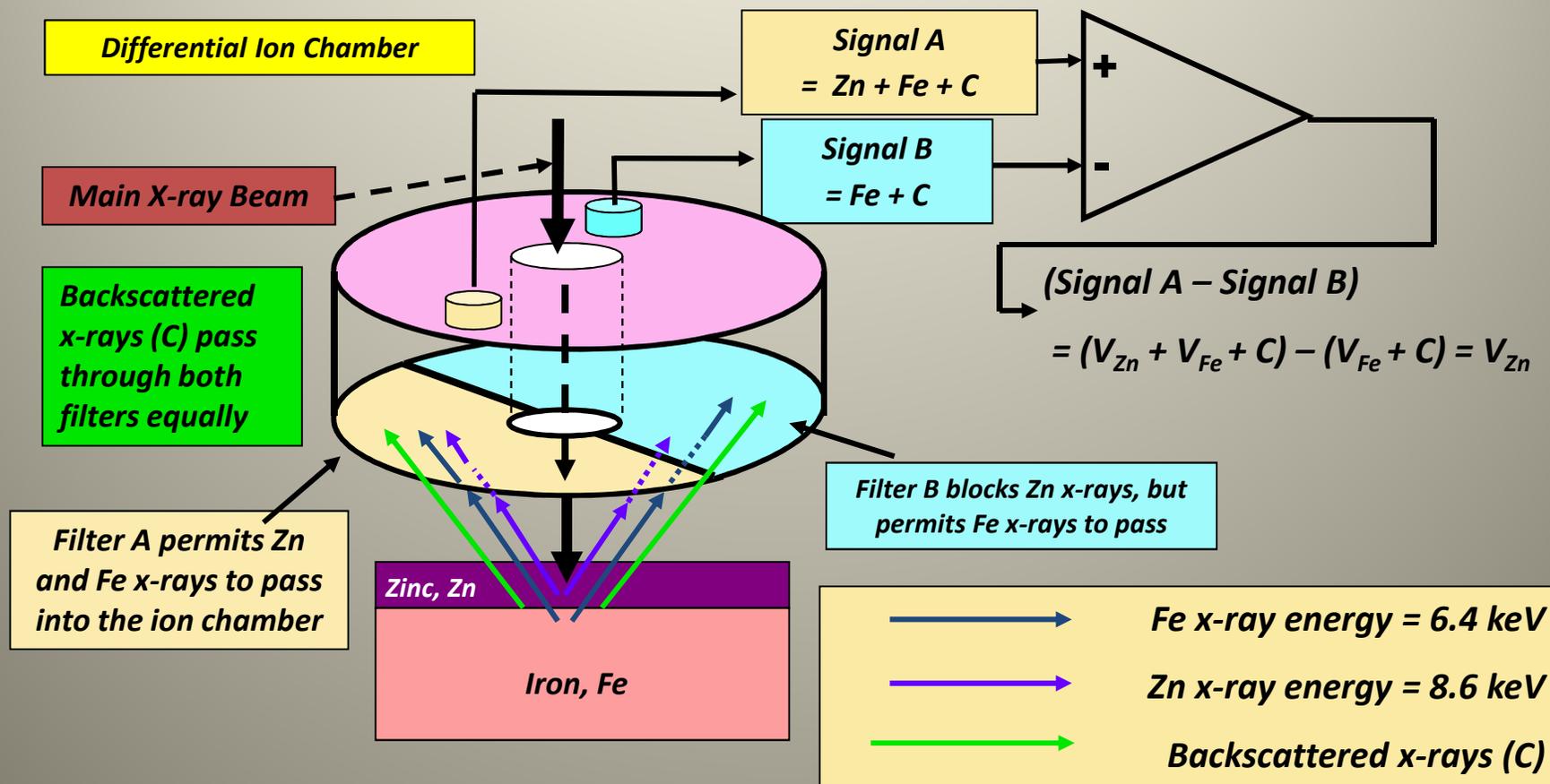


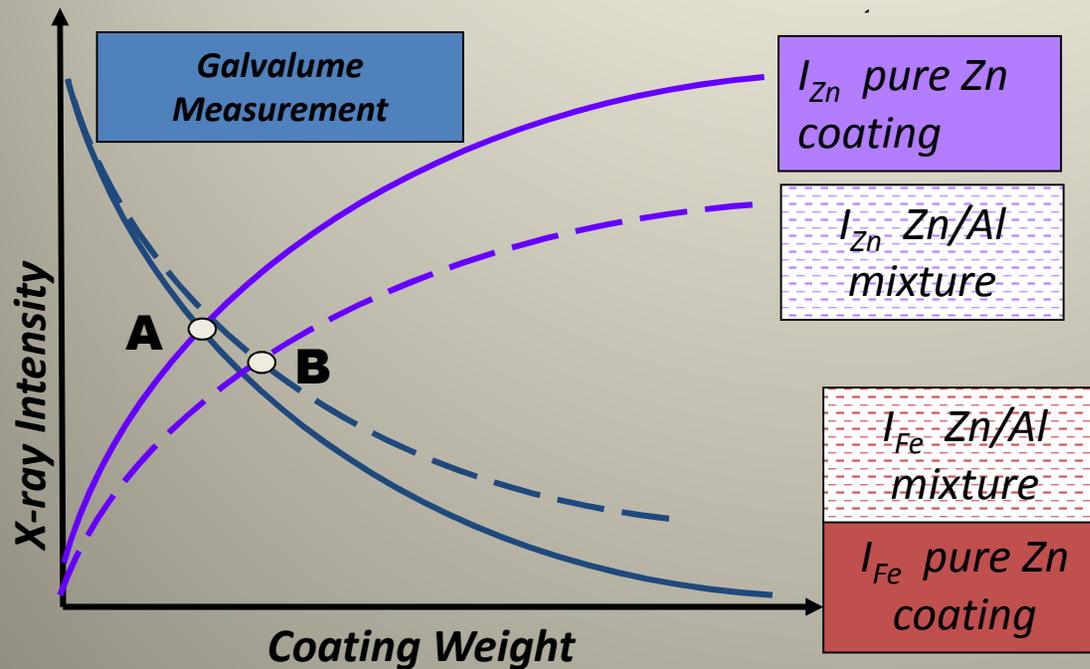
RSI
GaugeMaster
Coating Weight Gauges for
CGL, EGL and ETL

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.

Applications

<i>Coating</i>	<i>Coating Weight (per side)</i>	<i>Source Voltage</i>
Zinc (Zn)	0 to 200 gm/m ²	20kV
	0 to 450 gm/m ²	40kV
	0 to 610 gm/m ² (extended)	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

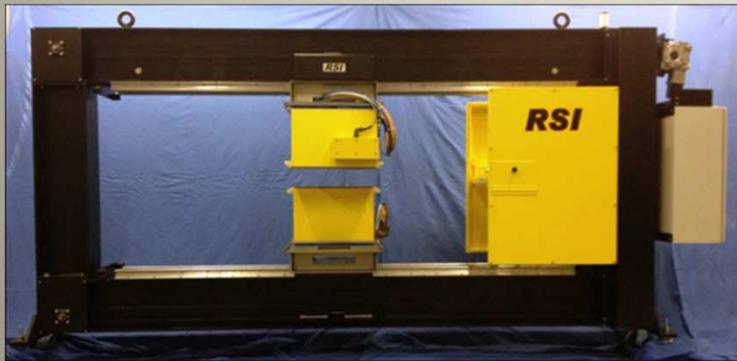
Recent System Orders

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

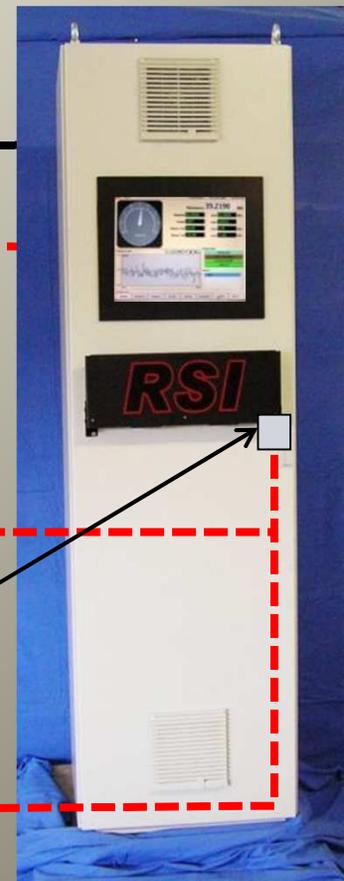
Over 150 systems and upgrades in service around the world

Typical Coating Gauge Configuration

O-Frame



Main Electronic Cabinet (MEC)



Chiller (Source)

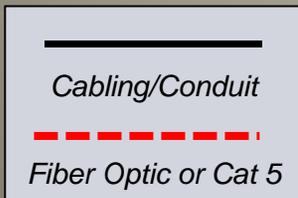
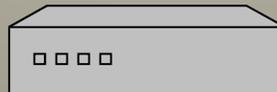


Remote Operator's Panel(s)



Communications CPU

Level II



GaugeMaster Cabinet



DIN Rail Mount Power Supplies

Digital X-ray Control

Communications CPUs

Gauge Processor

Industry Standard I/O Modules

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

Technician's Terminal

Keyboard



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.



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.

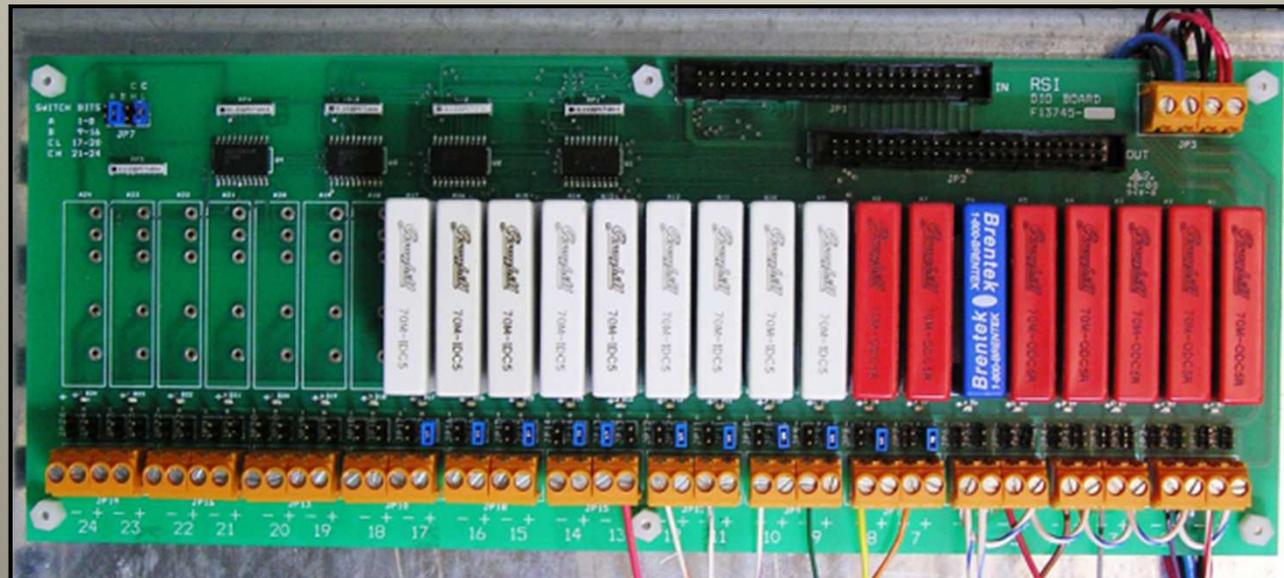


A highly stable Digital X-ray Control System drives the x-ray source(s). A Pentium class CPU is used to regulate the high voltage and current through the x-ray tube. Capable of driving most DMC, MX/DMC and Thermo Radiometrie X-ray sources.

- 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.



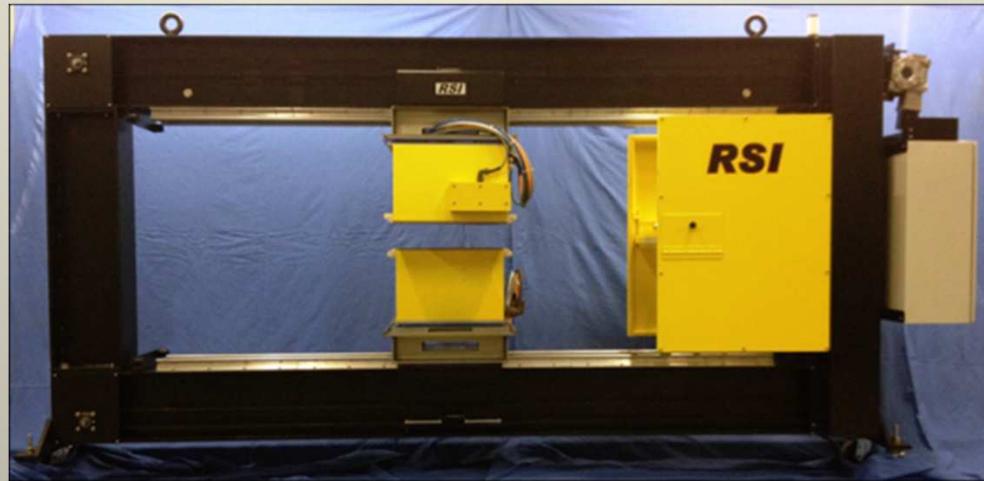
Industry Standard I/O Modules are mounted on a circuit board. Terminal strips provide a convenient and easy connection point for the customer's wiring. Each module has a LED status indicator for ease of identification.



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



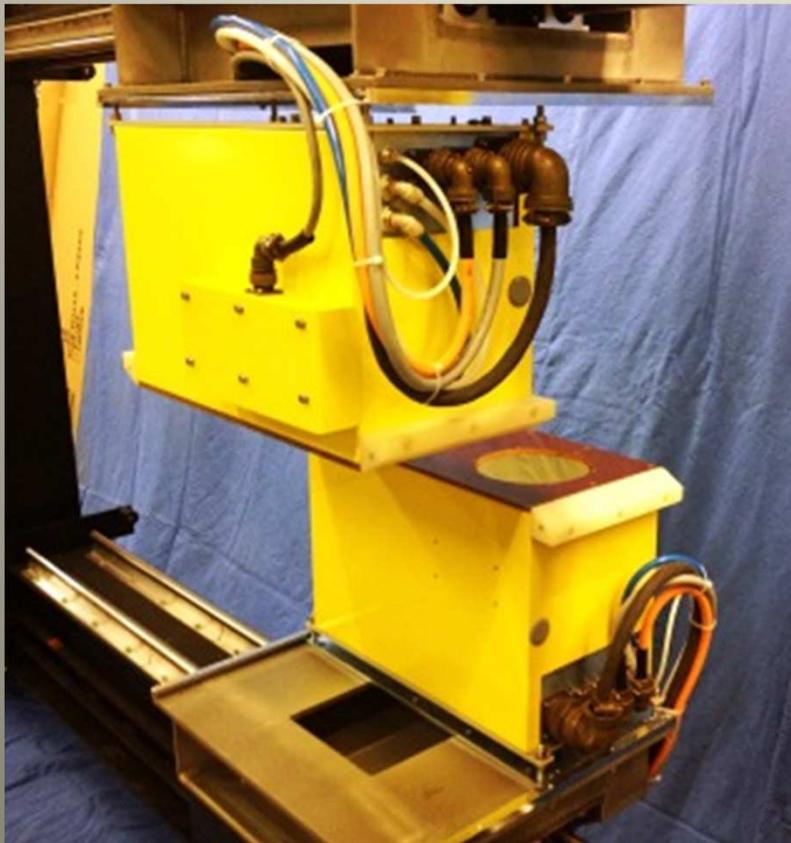
- Measuring heads are mounted on rugged O-frame available in standard sizes to cover various strip widths. Single beam scanners can be supplied for locations where O-frames are not suitable.
- Servo motors with integral position encoders deliver excellent sensor positioning accuracy
- Fast scan speeds; 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

RSI

Radiometric Services & Instruments, LLC

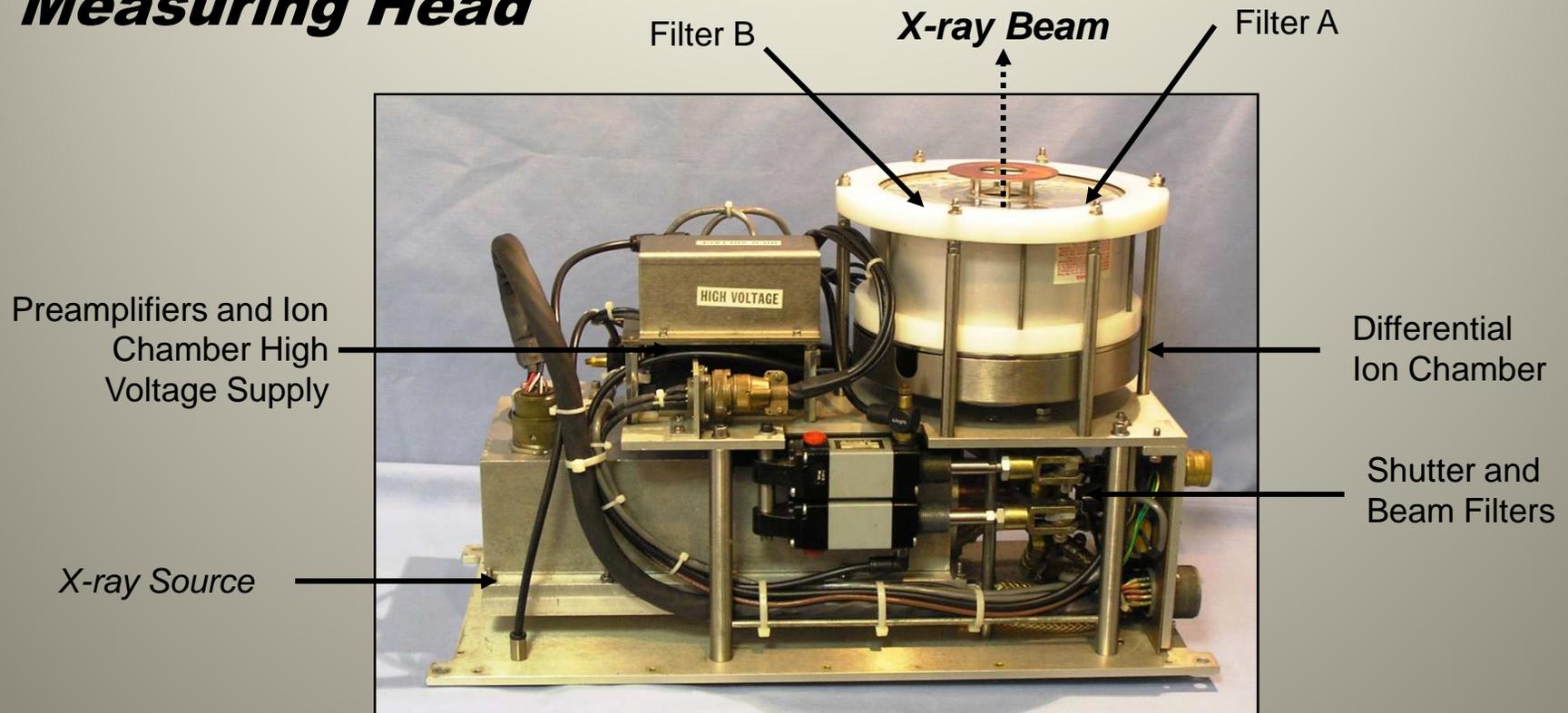
Your #1 source for thickness and coating gauge needs.

GaugeMaster Coating Gauges



Radiometric Services and Instruments, LLC

Measuring Head



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

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

RSI Coating Weight Gauge Technician Monday, May 01 2006 01:50:20 PM

Top Gauge

Thickness: 28.6229
Voltage: 5.0407
Nominal: 28.0000
Multiplier: 1.0000
Offset: 0.0000
Grade: INIT
+ Warning: 0.4000
- Warning: 1.0000
+Tolerance: 2.0000
-Tolerance: 2.0000

V Zero: 0.0089
V Infinity: 9.4958
STDZ Air Temp: 0.0000
Last STDZ Date: 05/01/2006 15:16:40

Bottom Gauge

Thickness: 92.3790
Voltage: 5.3764
Nominal: 90.0000
Multiplier: 1.0000
Offset: 0.0000
Grade: INIT
+ Warning: 5.0000
- Warning: 5.0000
+Tolerance: 10.0000
-Tolerance: 10.0000

V Zero: 0.0104
V Infinity: 9.4870
STDZ Air Temp: 0.0000
Last STDZ Date: 05/01/2006 15:16:39

Gauge Status: MEASURE, SHUTTER OPEN, GAUGE READY, SCANNING, CONTROL = MEC

Alarm Status: ALARM 379 Communications CPU

System Commands: Standby, Scan, Dwell, Static, Stdz, Sample, Gauge Control

RSI Scanner Configuration Technician Monday, May 01 2006 11:36:40 AM

Drive Limit: -10.00 mm Home: 0.00 mm

Sample 1: 27.00 mm Sample 2: 292.00 mm
Sample 3: 543.00 mm Garage: 800.00 mm
Rev. Limit: 900.00 mm Static Pos.: 1500.00 mm
Fwd. Limit: 2100.00 mm Slave Limit: 2150.00 mm
Dwell Offset: 20.00 mm Dwell Time: 5.00 sec
Fwd. Sens. Offset: 0.00 mm Rev. Sens. Offset: 0.00 mm

Head Pos. Scale: 234 p/mm Jog Speed: 25000 p/s Scan Speed: 25000 p/s Retract Speed: 47000 p/s

Position: Select A Position To Move To... Move To Save Setting Other Settings: Save Other Settings

Diagram: Drive Limit, Home, Sample 1, Sample 2, Sample 3, Rev. Limit, Gauge, Dwell Offset, Static Pos., Fwd. Limit, Dwell Offset, Slave Limit

System Commands: Perform Home

RSI Setup Page Technician Sunday, Aug 21 2005 10:32:51 AM

Thickness: 39.2616 Mils: 3.6059 Volts

Nominal: 40.0000
Multiplier: 1.0000
Offset: 0.0000
Grade: GRD1
Time Constant: 30 ms

+Warning: 1.5000
-Warning: 1.5000
+Tolerance: 3.0000
-Tolerance: 3.0000

Standardization Voltages: V Zero: 9.24178, V Infinity: -0.00484, Last Standardize Time: 09/02/2005 17:16:00

Gauge Status: MEASURE, SHUTTER OPEN, GAUGE READY, ON-LINE, CONTROL = MEC

Alarm Status: ALARM 306 Standardize Gat

System Commands: Standby, Measure, Standardize, New Alloy, Next-Current

RSI Calibrate Page Technician Sunday, Aug 21 2005 10:54:59 AM

Index	Target	Volts	Normalized	Predicted	Error	% Error
1	1.51200	8.92629	-0.036662	1.51856	0.006560	0.434177
2	2.51900	8.71166	-0.060986	2.52432	0.005320	0.211216
3	4.01000	8.40556	-0.096733	4.00397	-0.006030	-0.150468
4	8.17900	7.60384	-0.196909	8.15968	-0.019320	-0.236275
5	9.93200	7.28502	-0.239713	9.93915	0.007150	0.071987
6	19.98000	5.72452	-0.480581	19.98765	0.007650	0.038293
7	39.94300	3.56486	-0.953671	39.84119	0.000190	0.000465
8	79.77600	1.38138	-1.899439	79.77903	-0.005970	-0.007483
9	100.05700	0.85398	-2.378083	100.06280	0.005800	0.005798
10	139.90000	0.33248	-3.312050	139.89844	-0.001560	-0.001114
11	199.57400	0.07989	-4.690930	199.57426	0.000260	0.000133
12	239.41700	0.02944	-5.590517	239.41695	-0.000050	-0.000021

Correlation: 0.99999995629179

Standardization: Zero: 9.2598100, Inf: -0.0051400

Gauge Status: CALIBRATE, SHUTTER CLOSE, CONTROL = MEC

Alarm Status: ALARM 306 Standardize Gauge, ALARM 300 Standardize Failure

System Commands: Standby, Calibrate Mode, Calibrate Standardize

Diagnostics and Alarm Pages

RSI Alarm Page Technician Sunday, Aug 21, 2005 10:45:48 AM

Number	Name	Description
306	Standardize Gauge	Exceeded maximum time between standardization. Standardize gauge
306	Standardize Failure	Standardize Failure - Vz zero too low (3.60922)
106	Invalid Multiplier	Standardize Failure - Vz zero too low (3.60922)
540	Online TimeOut	
541	Offline TimeOut	
540	Online TimeOut	
101	Invalid nominal	
101	Invalid nominal	
108	Invalid Tolerance Warning	
149	Invalid Next Tolerance Alarm	
107	Invalid Time Constant	

Alarm 300

Standardize Failure
Standardize Failure - Vz zero too low (3.60922)

Set Date: 09/07/2005 11:36:03

Cleared: 0

Gauge: 0

Group: 1

Active Alarm

System Commands: Standby Active History Recent History Clear All

RSI Diagnostic Page Technician Monday, May 01, 2006 11:37:30 AM

Voltage Monitor | Digital I/O | Analog I/O | Motion Status | Counter Monitor

Index	Value	Description
1	ON	Bit 0 (Output Shutter CMD)
2	OFF	Bit 1 (Output Filter CMD)
3	OFF	Bit 2 (Output Spare)
4	ON	Bit 3 (Output Watchdog Pulse)
5	OFF	Bit 4 (Output Motion Ctrl Reset)
6	OFF	Bit 5 (Output Spare)
7	OFF	Bit 6 (Output Spare)
8	OFF	Bit 7 (Output Spare)
9	OFF	Bit 8 (Input Remote Standby)
10	OFF	Bit 9 (Input Remote Measure)
11	OFF	Bit 10 (Input Remote Start)
12	OFF	Bit 11 (Input Remote STDZ)
13	OFF	Bit 12 (Input Remote Sample Measure)
14	OFF	Bit 13 (Input Air Pressure)
15	OFF	Bit 14 (Input Shutter Status)
16	OFF	Bit 15 (Input Emergency Stop)
17	OFF	Bit 16 (Input Spare)
18	OFF	Bit 17 (Input Spare)
19	OFF	Bit 18 (Input Spare)
20	OFF	Bit 19 (Input Spare)
21	OFF	Bit 20 (Output Spare)
22	OFF	Bit 21 (Output Spare)
23	OFF	Bit 22 (Output Spare)
24	OFF	Bit 23 (Output Spare)

System Commands: Refresh DIO Refresh AO Refresh AI Refresh Monitor Refresh ALL Diags ON Diags OFF

RSI Diagnostic Page Technician Monday, May 01, 2006 11:37:48 AM

Voltage Monitor | Digital I/O | Analog I/O | Motion Status | Counter Monitor

Index	Value	Name	Description
1	0.4932	AL_0_1	+5 volt monitor (Channel 1)
2	1.4941	AL_0_2	+15 volt monitor (Channel 2)
3	-1.4941	AL_0_3	-15 volt monitor (Channel 3)
4	1.1914	AL_0_4	+12 volt monitor (Channel 4)
5	2.3877	AL_0_5	+24 Detector Voltage (Channel 5)
6	-2.3877	AL_0_6	-24 Detector Voltage (Channel 6)
7	0.4590	AL_0_7	Mother Board Temp Sensor (Channel 7)
8	2.3828	AL_0_8	+24 volt Digital I/O & Relays (Channel 8)
9	0.0000	AL_0_9	+48 volt Magazine (Channel 9)
10	0.0000	AL_0_10	+24 volt X-ray Driver (Channel 10)
11	0.0000	AL_0_11	-24 volt X-ray Driver (Channel 11)
12	0.0000	AL_0_12	+96 volt X-ray Driver (Channel 12)
13	0.0000	AL_0_13	Channel 13
14	0.0000	AL_0_14	Channel 14
15	0.0000	AL_0_15	Channel 15
16	0.0000	AL_0_16	Zero voltage reference (Channel 16)
17	3.7402	AL_1_1	Air Temperature Top Head (Channel 1)
18	3.8916	AL_1_2	Air Temperature Bottom Head (Channel 2)
19	0.0000	AL_1_3	(Channel 3)
20	0.0000	AL_1_4	(Channel 4)
21	0.0000	AL_1_5	(Channel 5)
22	0.0000	AL_1_6	(Channel 6)
23	0.0000	AL_1_7	(Channel 7)
24	0.0000	AL_1_8	(Channel 8)

Index	Value	Name	Description
1	4.4162	DETECTOR_TOP	TOP Detector Inp
2	5.8901	DETECTOR_BTM	Bottom Detector I

Index	Value	Type	Name	Description
1	-0.1195	1	Channel 0	Analog Output ch.
2	-0.0961	2	Channel 1	Analog Output ch.
3	0.0915	3	Channel 2	Analog Output ch.
4	0.0824	2	Channel 3	Analog Output ch.

System Commands: Refresh DIO Refresh AO Refresh AI Refresh Monitor Refresh ALL Diags ON Diags OFF

RSI Diagnostic Page Technician Monday, May 01, 2006 11:37:10 AM

Voltage Monitor | Digital I/O | Analog I/O | Motion Status | Counter Monitor

Index	Value	Name	Min	Max	Alarm	Scaling	Offset	Description
1	4.93164	+5 Volt	4.75	5.25	500	10	0	+ 5 Volt power supply monitor
2	14.9414	+15 Volt	14.5	15.5	502	10	0	+ 15 Volt power supply monitor
3	-14.9414	-15 Volt	-15.5	-14.5	504	10	0	- 15 Volt power supply monitor
4	11.9141	+12 Volt	11.5	12.5	501	10	0	+ 12 Volt power supply monitor
5	23.877	+24V Detector	23.5	24.5	514	10	0	+ 24 Detector Voltage power supply monitor
6	-23.877	-24V Detector	-24.5	-23.5	515	10	0	- 24 Detector Voltage power supply monitor
7	23.8281	+24V Digital I/O	23.5	24.5	507	10	0	+ 24 Digital I/O & Relay Voltage power supply monitor
8	91.7969	Board Temperature	0	120	510	200	0	Main board temperature sensor monitor
9	0	AIR_TEMP	263.15	373.15	516	1	0	Air Temperature for Top measuring head
10	0	AIR_TEMP	263.15	373.15	516	1	0	Air Temperature for Bottom measuring head

System Commands: Refresh DIO Refresh AO Refresh AI Refresh Monitor Refresh ALL Diags ON Diags OFF

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

RSI		COIL REPORT		2008-04-25	
				Coil ID	
				C0257	
SETUP INFORMATION			COIL INFORMATION		
Target	0.5900	mm	Start Time	2008-04-25 14:14:50	
+ Tolerance	0.0200	mm	End Time	2008-04-25 15:52:45	
- Tolerance	-0.0200	mm	Run Time	01:37:55	
Alloy Name	301		Coil Length	2503.09	meters
STATISTICAL DATA			STANDARD DEVIATION (SIGMA)		
Mean (X Bar)	0.5907	mm	1 Sigma	0.0102	mm
Maximum	0.8595	mm	2 Sigma	0.0204	mm
Minimum	0.5807	mm	3 Sigma	0.0307	mm
Range (R)	0.2788	mm	% Out of Tolerance 0.8547		
Variance	0.0001				
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 expensive 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