

# InteliCENTRIC<sup>®</sup>



## Eccentricity Gauge

### Non-Contact Eccentricity Diameter, and Flaw Detection

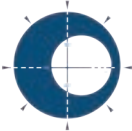
- Non-Contact Eccentricity
- 8 Point Wall Thickness
- Dual or Quad Axis Diameter Measurement
- Super Fast or Lightning Fast Measuring Rates
- Flaw detection
- Integrate to Machine PLC
- Industry 4.0 Data Communications



# InteliCENTRIC<sup>®</sup>



## Eccentricity Gauge

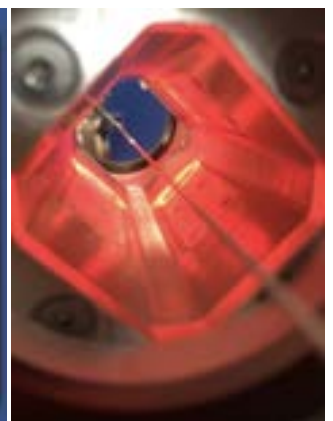


### Non-Contact Eccentricity, Diameter and Flaw Detection

The InteliCENTRIC EG Series Non-Contact Eccentricity, Diameter and flaw detection gauge is designed for measuring insulated wires up to 60mm (2.36") diameter. The EG series has 6 models for both dual and quad axis measurement, with a max scan rate of 10Khz per axis. The new Lightning IME2012-i4 and IME4012-i4 gauges have real time scan rates of 100Khz per axis. This is ideal for High Frequency Data and small Coaxial Cables where eccentricity consistency and flaw detection is critical for cable performance. The larger EG gauges are ideal for Automotive, Instrument and small Energy Cables where wall thickness and diameter are kept at the optimum size to maintain quality and reduce material usage.

Automatic position adjustment ensures the cable is centered within the measuring zone. The SiDi CDI4 display provides a clear visual of 8 Point Wall Thickness, Diameter, Eccentricity and optional features.

Focused on connectivity the InteliCENTRIC EG and IME Series come preloaded with Profibus, Profinet and Ethernet Industrial Protocol for your PLC. Modbus, OPC-UA, RS232, RS485 and WiFi are included as standard providing a wide range of digital communications for Industry 4.0.

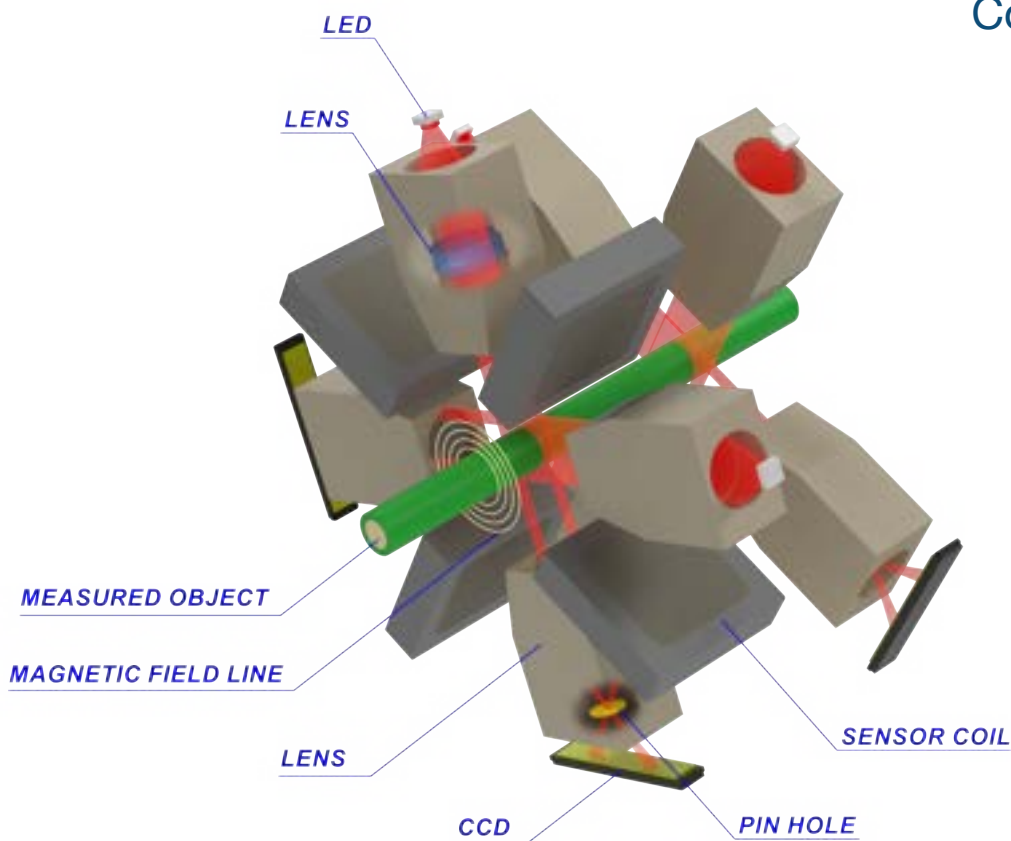


# Measuring Principle

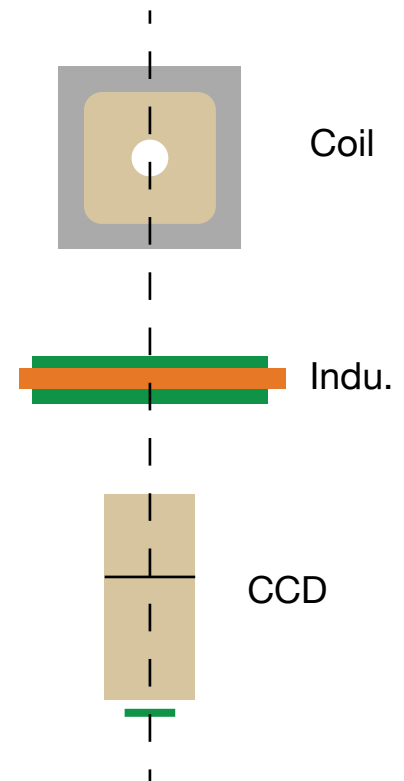
The Eccentricity Gauge combines electromagnetic and optical scanning principles. The optical scanning system is used to measure the diameter and the electromagnetic system is used to determine the conductor position, eccentricity, and 8 point wall thickness.

Optical measurement is done by sending out light from LEDs which shine on the measuring object thus casting a shadow on the CCD receiver. The image information is then evaluated by integrated signal processors.

The optical measurement and magnetic measurement are performed simultaneously at high rates, minimizing inaccuracies caused by wire vibrations, and both measurements are controlled on the same plane to eliminate the errors due to product twists.



## Co-Planer Measurement



# InteliCENTRIC EG Specifications

## Performance

EG2012-i4   EG4012-i4   EG2030-i4   EG4030-i4   EG2060-i4   EG2060-i4

Number of Axes

2

4

2

4

2

4

Gate Size

16mm (0.59")

32mm (1.18")

64mm (2.36")

Min Object Diameter

0.1mm (0.004")

0.2mm (0.008")

Max Object Diameter

12mm (0.472")

28mm (0.472")

58mm (0.472")

Resolution

0.01µm

Diameter Accuracy

+/-1µm (0.00004")

+/-1µm (0.00004")+0.008%

+/-3µm (0.0001")+0.01%

Eccentricity Accuracy

+/-1µm (0.00004")

+/-3µm (0.0001")

Optical Scan Rate

5,000/Sec/Axis 10,000/Sec/Axis Optional

Update Rate

1ms

Units

selectable mm, inch

## Electrical and Operating Requirements

Power Supply  
85 - 274 Vac

Power Consumption  
300 Watts

Operating Temperature  
5°C - 45°C (41°F - 113°F)

Environmental Protection  
IP 65

# Lightening IME - Providing Real Time Flaw Detection Specifications

## Performance

	IME2012-i4	IME4012-i4
Number of Axes	2	4
Gate Size	16mm (0.59")	
Min Object Diameter	0.1mm (0.004")	
Max Object Diameter	12mm (0.472")	
Resolution	0.01 $\mu$ m / 0.0001Inch	
Diameter Accuracy	+/-1 $\mu$ m (0.00004")	
Eccentricity Accuracy	+/-1 $\mu$ m (0.00004")	
Optical Scan Rate	200,000 Scans/Sec (100,000/Sec/Axis)	400,000 Scans/Sec (100,000/Sec/Axis)
Update Rate	1ms	
Units	selectable mm, inch	

## Electrical and Operating Requirements

Power Supply  
85 - 274 Vac

Power Consumption  
300 Watts

Operating Temperature  
5°C - 45°C (41°F - 113°F)

Environmental Protection  
IP 65

# Connectivity



Analog Speed Input

Analogue input 0 - 10vdc  
Required for Optional PI feedback diameter control and SMFD location



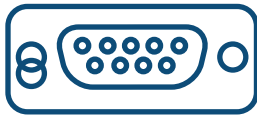
Logic Inputs

Pulse Input 250kHz max frequency, 30v or 50v max pulses on two distinct input Required for Helix Mode, Tolerance Location and Optional SMFD and PI feedback diameter control



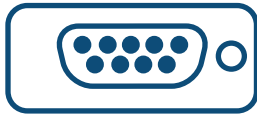
Relay Output

Maximum Voltage 50Vdc / 30 Vac / 0.5A  
Selectable function: Gauge OK, Eccentricity Tolerance exceeded, Upper Tolerance exceeded, Lower Tolerances exceeded, Single Measurement Flaw Detection ( SMFD ) , Over any ( Limit ) , Under any ( Limit ) , Lump & Neck, Lump, Neck, Over average, Under average, Window dirty



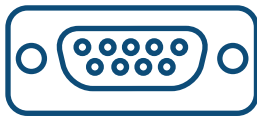
Serial i/o

RS232 Modbus Communications  
USB using RS232 - USB Converter Cable  
ZM4000 Printer Communications



CANBUS

Connects to Proton Products CDi4 Display



iBUS

Ethernet TCP/IP Modbus is the Default Communication. Connect to a PLC using ProfiB-us, ProfiNet, or Ethernet Industrial I/P



Ethernet

Ethernet selectable between OPC-UA and Modbus Products CDi4 Display



WiFi

Connect to a PC or Mobile Device and use the Proton Products Gauge App available for iOS and Android. Ideal for gauge configuration and diagnostics.

# Industry 4.0



More than 200 Data Words are available to communicate with your Industry 4.0 Solution. Data Words are divided into distinct function groups to make it easy to select the ones you require.

Gauge ID Data Words	Model Number, Serial Number, Firmware APP version, Firmware Core Version, Firmware Date
Calibration Data	Last Calibration Date, Days Since Last Calibration, Total Run Time, Calibration Alarm
Validation Data Words	SNR, Signal Amplitude, Good Readings, FFT Amplitude
Wired Network Info	IP Address, Netmask, Gateway
WiFi Network Info	IP Address, Netmask, Gateway, SSID
Measurement Data	Diameter, Eccentricity, Eccentricity Angle

## Smart Sensors Enable Smart Factories

*“Industry 4.0 the Fourth Industrial Revolution is real. In its various shapes, forms, and definitions, it’s happening, accelerating around the world, and Proton Products is an active player in this movement. A Smart Sensor is a Bridge between the Physical World (Measurement of Products and Processes) and the Digital World (MES, ERP Factory Management Systems). The more connected these worlds are, the more informed we become, improving our decision processes which ultimately enable us to reach our goals.”*

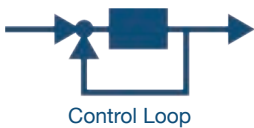
*Proton Products Inc.*

# Enhanced Features

## Gauge Head Add on Hardware



3 analogue (+10V) outputs can be set to X, Y, Z axis output for 2 and 4 axis gauges. Average Eccentricity, Average diameter, diameter error, ovality and ovality error.

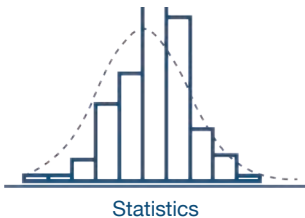


Feedback Control monitors the actual measured diameter compared to a Preset Value and provides a Control Output Signal that can be used to trim the motor output and maintain the product diameter within the Preset Value

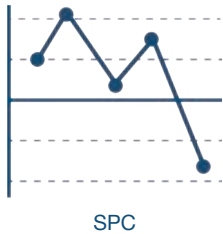
## Gauge Head Add on Software



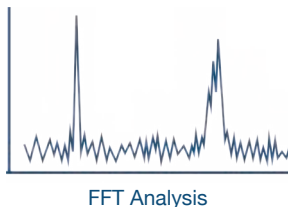
The 10k scanning option upgrades the standard gauge to enable a high scan rate that can be used for effective flaw and defect detection, each scan takes just 1ms to obtain and output a new diameter reading.



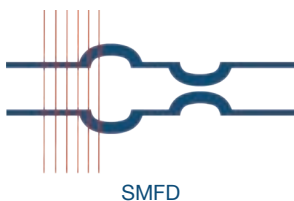
Maximum, Minimum, Mean, Standard Deviation, Cp, Cpk is collected during a selectable time or length period. The results are updated on the SiDi CD14 Universal Display, PGIS Software and can be transmitted digitally.



Statistical Process Control (SPC) enhances the Feedback Control option. Statistical Process Control, "measures" Process Capability and automatically adjusts the control set point to maximize material savings while maintaining control within upper and lower limits



Fast Fourier Transform (FFT) analyzes the diameter data for periodicity. Providing Amplitude versus Frequency data and a graphical representation on the SiDi CD14 Universal Display Unit or PCIS Software.



Single Measurement Flaw Detection (SMFD) analyzes each individual measurement and compares it with the running average. If a Single Measurement is greater than the running average and above a threshold value a Flaw is Detected.  
Note: SMFD is standard on IME Gauges.



# Accessories

## Display



CDi4  
Part No. 00049MC021



CDi4 Panel Mount  
Part No. 00049MC043



CAN 9DD Cable  
Part No. Length Dependent



PCIS EG  
Part No.



USB-RS232\_1.8m Cable  
Part No. GP00000624



Proton MDIS  
Part No.

## Inductor



Induction Tube  
Part No. 00056MC216



Induction Tube Driver  
Part No. 00056MC210



Induction Tube Cable  
Part No. 00056CB004



EG Signal Control Cable  
Part No. 00056CB001



Induction Tube Mounting Kit  
Part No. 00056MC022



HST3  
Part No. 00009MC550

# Accessories



Induction Tube Driver  
Mounting Kit  
Part No. 00056MC023



BOB DGK  
Part No. 00047MC662



BOB 25PIN Cable  
Part No. 00041CT003

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## Power



Mains Cable  
Part No. 00002CM502



Mains Cable (USA)  
Part No. 00047MC917

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## Alarm & Report



A1 Alarm Unit  
Part No. 00025MC001



M16AP Cable  
Part No. 00025CB003



Zebra Label Printer  
Part No. 00043MC033



RS232 9DD Cable  
Part No. Length Dependent

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