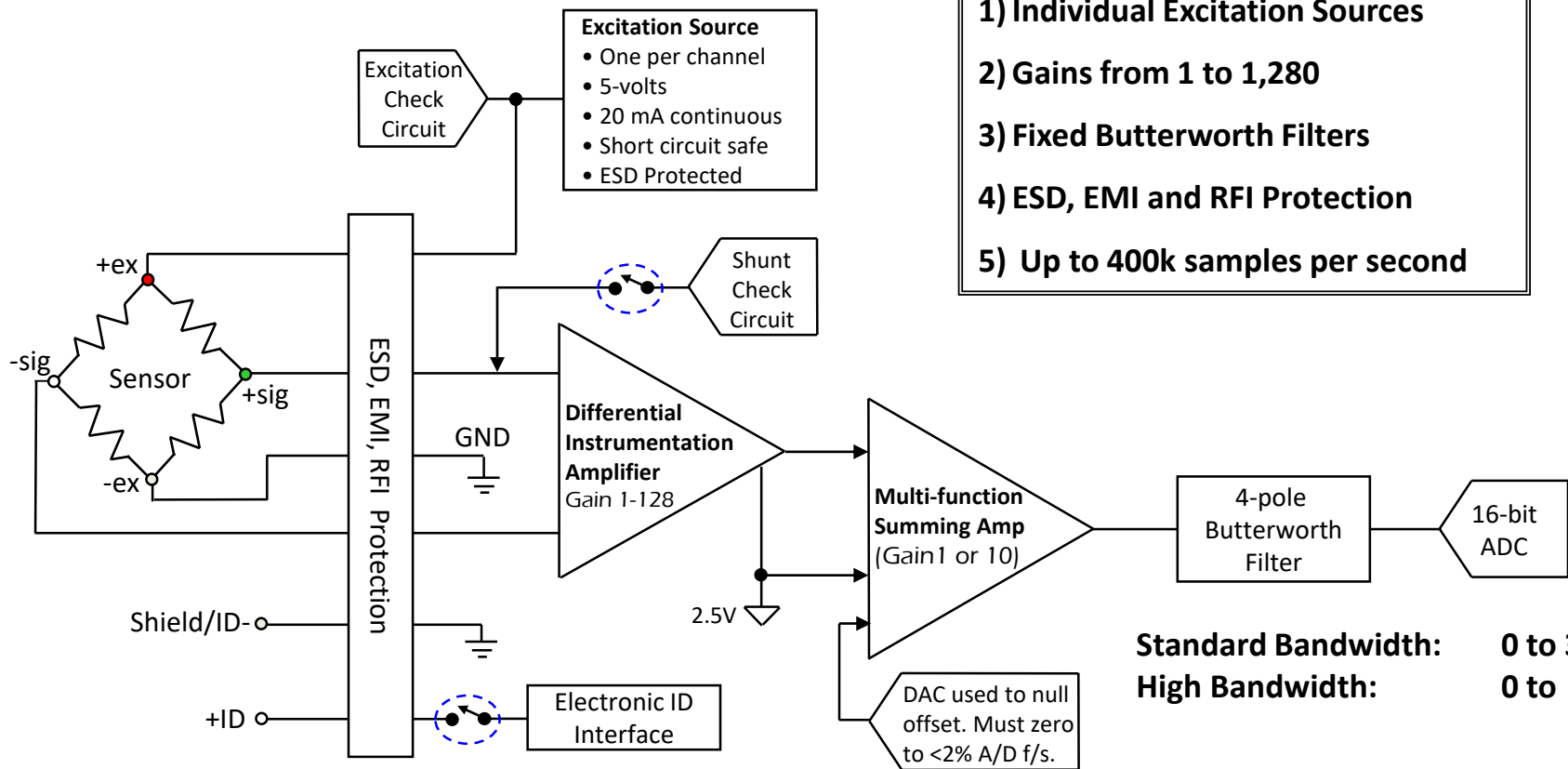




SLICE6 Sensor Interface

November 2019

Mike Beckage/Ariel Muckenhirn



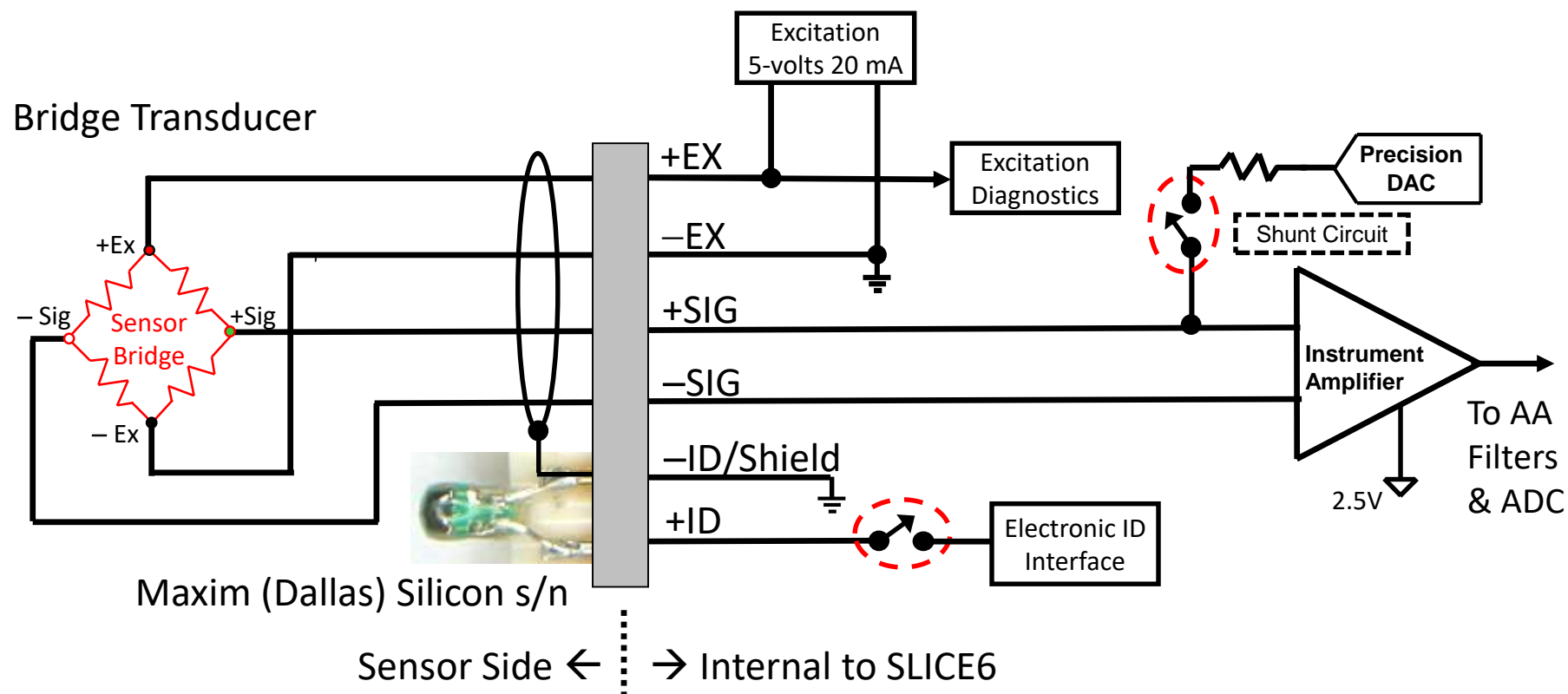
Feature Overview

- 1) Individual Excitation Sources
- 2) Gains from 1 to 1,280
- 3) Fixed Butterworth Filters
- 4) ESD, EMI and RFI Protection
- 5) Up to 400k samples per second

Standard Bandwidth: 0 to 3.0 kHz
High Bandwidth: 0 to 20 kHz

SLICE6 Sensor Interface – Signal Generator

- +/- Signal are connected to a true Differential Instrumentation Amplifier (IA)
- Common Mode Range of the IA is 0.1 to 5.0 volts with respect to ground and -excitation.
- +/- Signal inputs must both be connected externally to a full bridge.
- The maximum signal swing is ± 2.4 volts (with a 2.5 volt center)

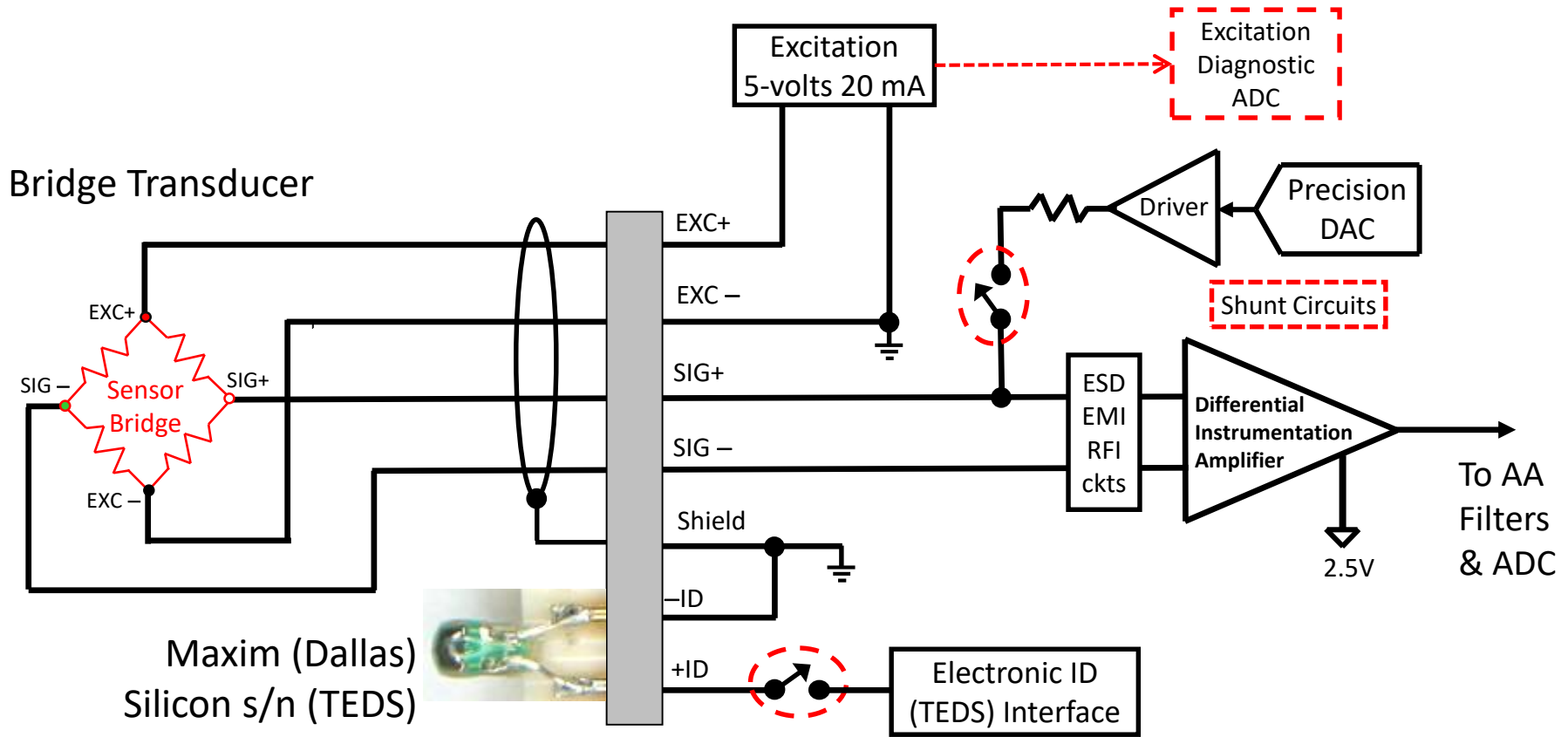


Sensor Type	SLICE6	SLICE6 AIR	Notes
Bridge Transducer • Bridge Completion	x*	✓	*Use Microcard for bridge completion on SLICE6 modules
Voltage Measurement	✓	✓	Use Voltage Expander Cable for > 0-5V single-ended, > ±2.5 V differential
Strain Gauge	✓	✓	
Potentiometer • 2-wire • 3-wire • 4-wire	✓ ✓ ✓	✓ ✓ ✓	See Strain Gauge Use Bridge Transducer diagram
Accelerometer • Piezoresistive • 3-wire (Active) • 4-wire • IEPE	✓ ✓ x	✓ ✓ ✓	EX: Endevco 7264
Switch Closure	✓	✓	Use Switch Closure Cable
Pressure Sensor	✓	✓	Connect like Bridge Transducer Circuit Kulite or similar
Temperature Sensor	✓	✓	EX: AD590 (2-wire), LM35 (3-wire)
Thermocouple (J, K)	✓	✓	Use Texense Thermocouple Adapter Cable



SLICE6 DAS Sensor Support

Sensor Type	SLICE6	SLICE6 AIR	Notes
RTD <ul style="list-style-type: none">• 2-wire• 3-wire• 4-wire	✓ ✓ ✓	✓ ✓ ✓	EX: PT100
Magnetic Pickup	✓	✓	
Discrete Digital	✓	✓	SLICE6: Use Signal Generator Wiring SLICE6 Air: Use Dedicated Digital Inputs
TTL Encoder (0-5V Input)	✗	✗	
Quadrature Encoder	✗	✗	



Sensor Side ← ⋮ → Internal to SLICE6 (6-channels)

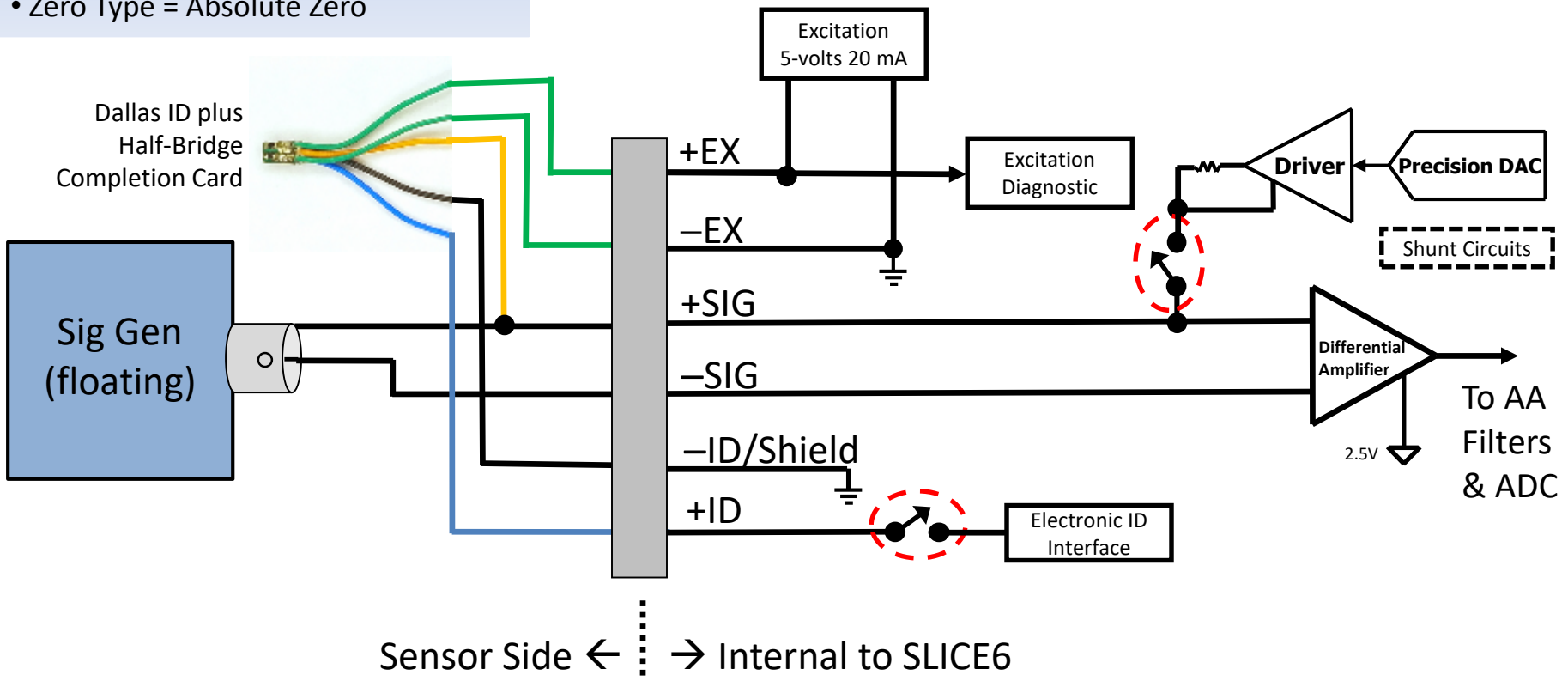
SLICE6 Sensor Interface – Signal Generator

Sensor Settings

- Proportional to Excitation = No
- Sensitivity = 1.000 mV/EU
- Desired Range = 2000
- Units = mV
- Sensor Type = Full-Bridge
- Remove Offset = No
- Zero Type = Absolute Zero

Analog Notes:

- Signal generator must float WRT ground or alternate connection method must be used.
- Input range does not quite extend to 0 & 5 volts. Best to use signals under 4.5-volts p-p.



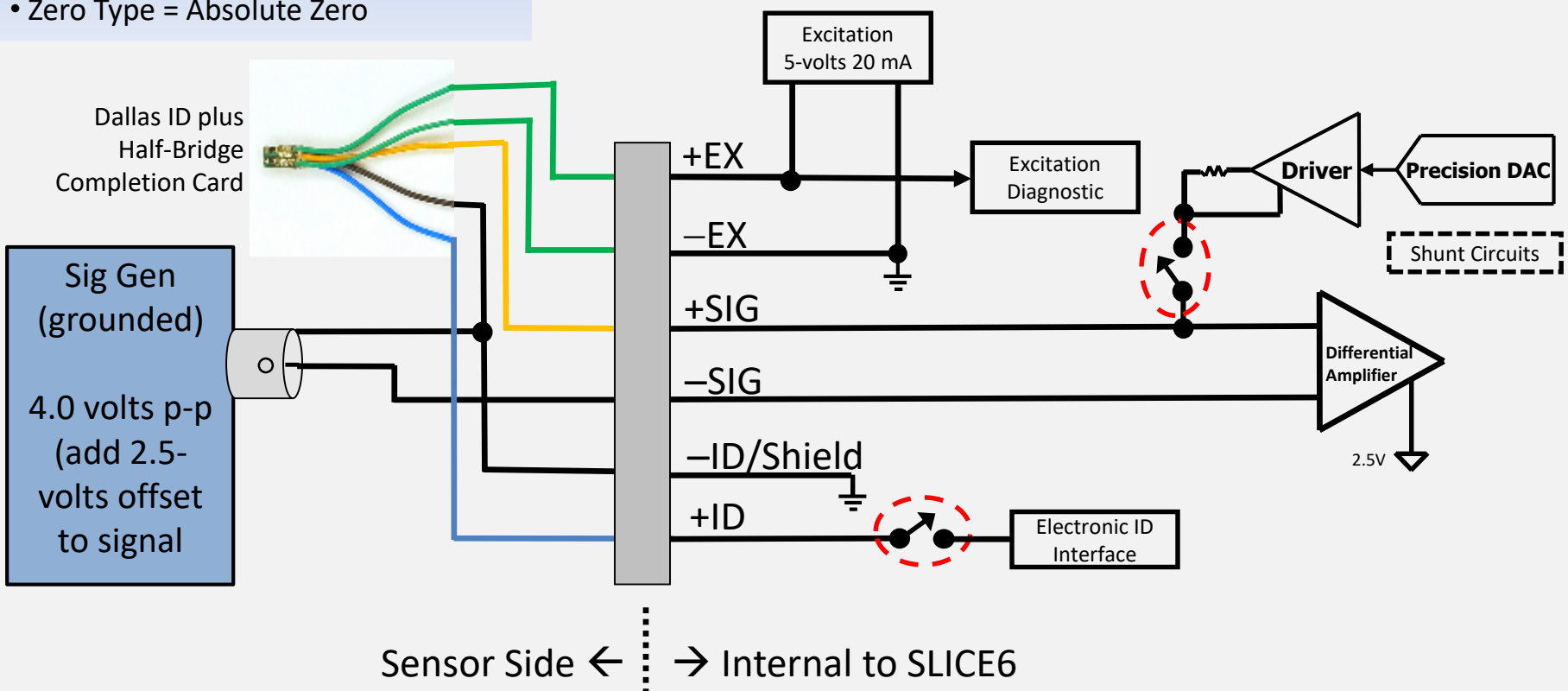
SLICE6 Sensor Interface – Signal Generator

Sensor Settings

- Proportional to Excitation = No
- Sensitivity = 1.000 mV/EU
- Desired Range = 2000
- Units = mV
- Sensor Type = Full-Bridge
- Remove Offset = No
- Zero Type = Absolute Zero

Analog Notes:

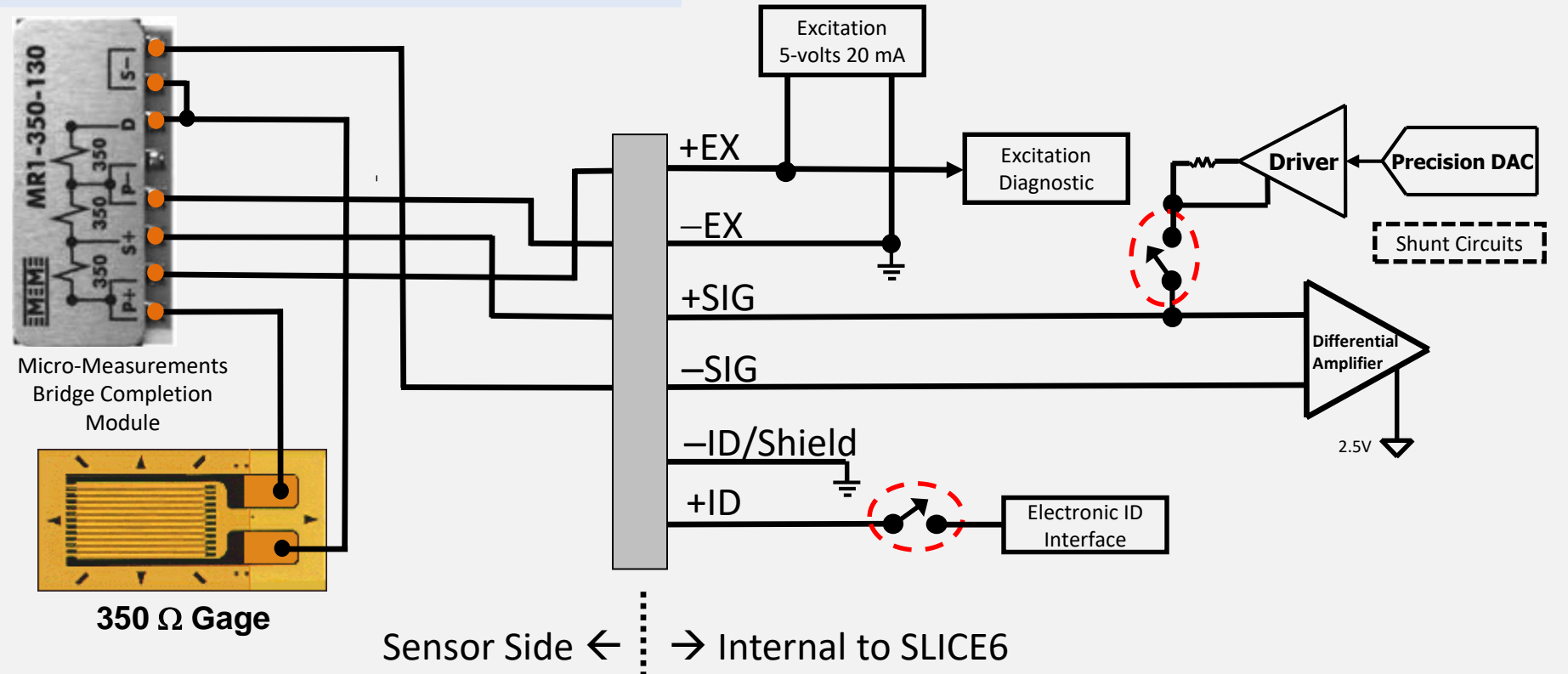
- Signal generator must be grounded.
- Input range does not quite extend to 0 & 5 volts. Best to use signals under 4.5-volts p-p.



- Sensor Settings**
- Proportional to Excitation = Yes
 - Sensitivity = *per sensor specs (mV/V/EU)*
 - Desired Range = *per sensor specs*
 - Units = μS
 - Sensor Type = Full-Bridge
 - Remove Offset = Yes
 - Zero Type = Diagnostic Zero / Average Over Time

Connection Notes:

- Bridge completion module should be located as close as possible to strain gauges(s)

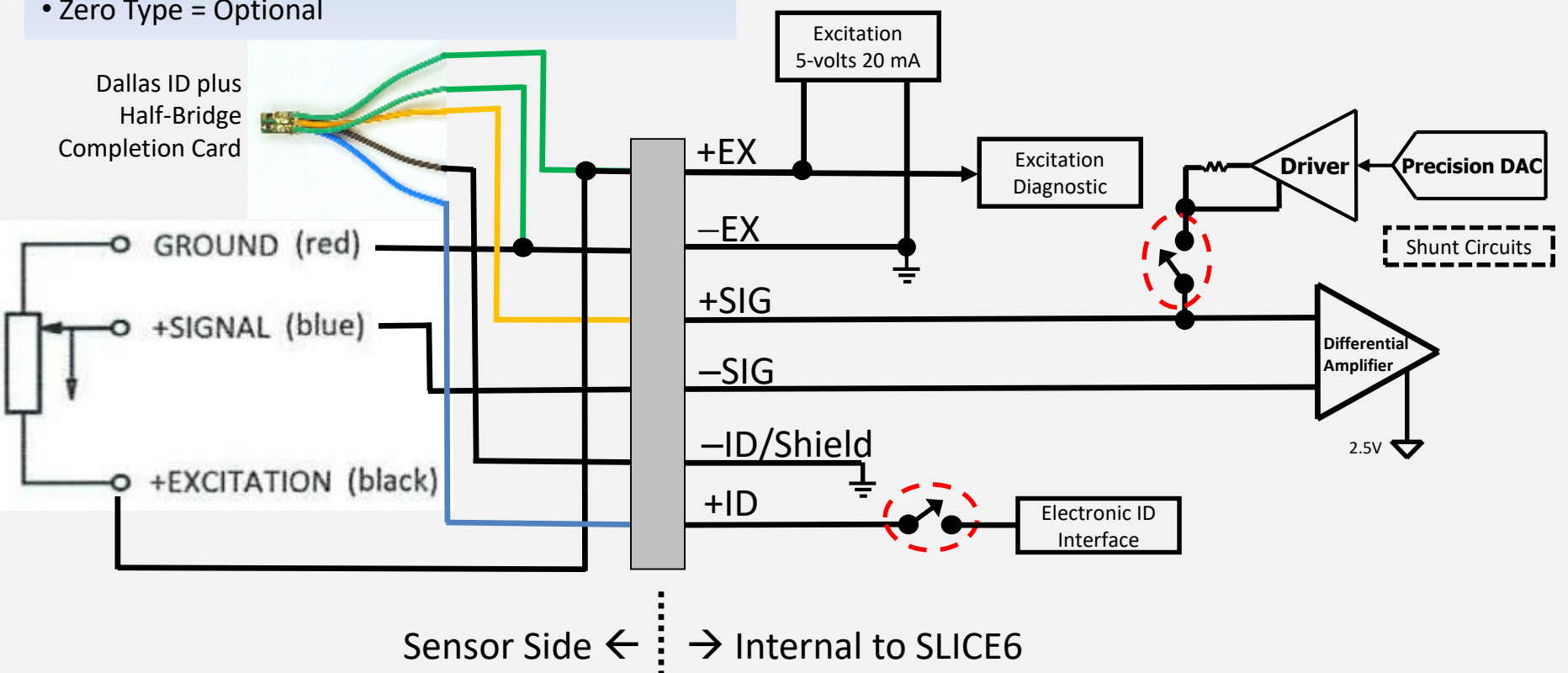


Sensor Settings

- Proportional to Excitation = Yes
- Sensitivity = *per sensor specs (mV/V/EU)*
- Desired Range = *per sensor specs*
- Units = mV
- Sensor Type = Full-Bridge
- Remove Offset = No
- Zero Type = Optional

Zero Type Notes:

- For potentiometers without bridges, there may be initial engineering units (EU) that need to be taken into account for zeroing. This affects zeroing type. See manual for descriptions of Zero Type.

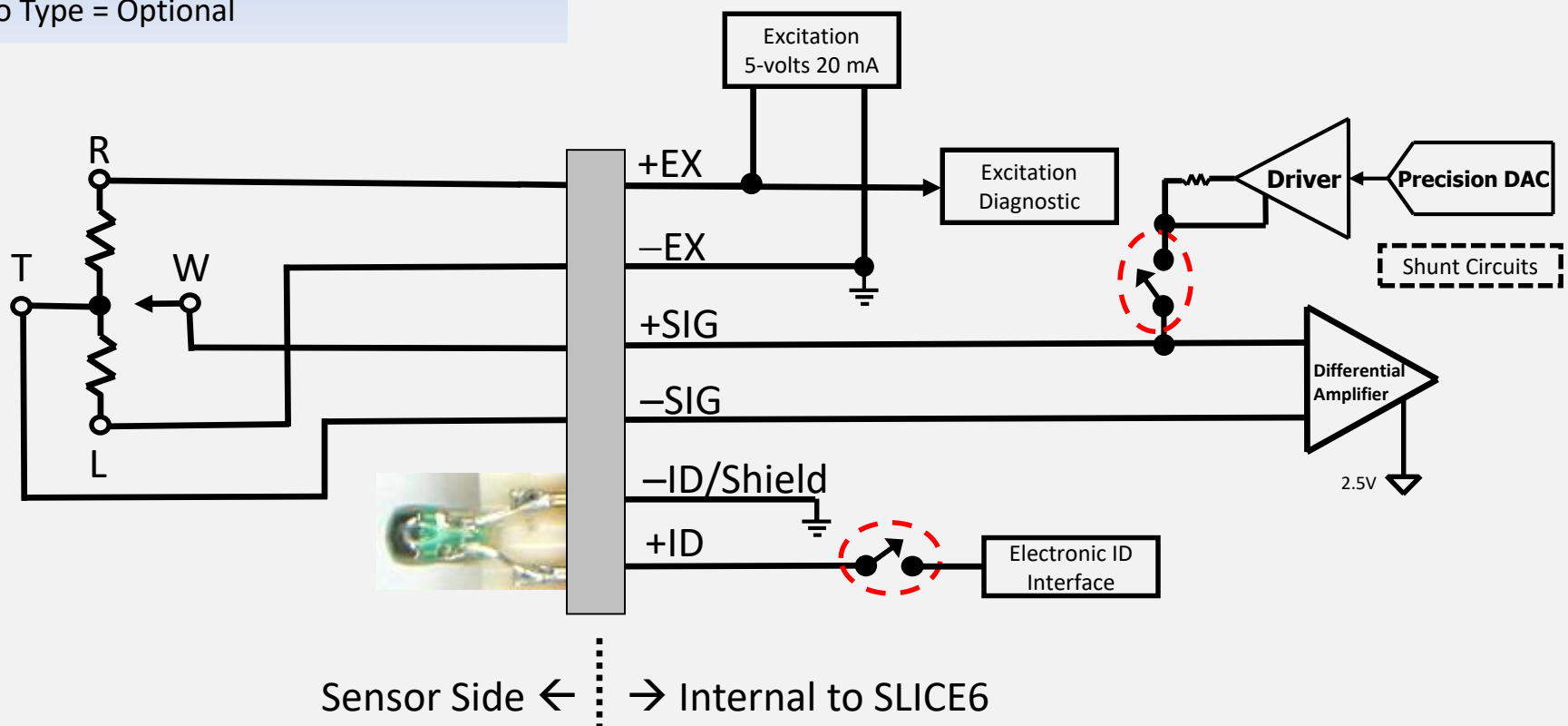


Sensor Settings

- Proportional to Excitation = Yes
- Sensitivity = *per sensor specs (mV/V/EU)*
- Desired Range = *per sensor specs*
- Units = *per sensor specs*
- Sensor Type = Full-Bridge
- Remove Offset = Optional
- Zero Type = Optional

Zero Type Notes:

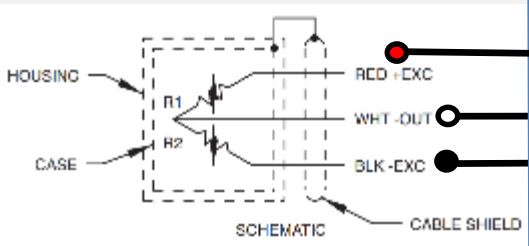
- For potentiometers without bridges, there may be initial engineering units (EU) that need to be taken into account for zeroing. This affects zeroing type. See manual for descriptions of Zero Type.



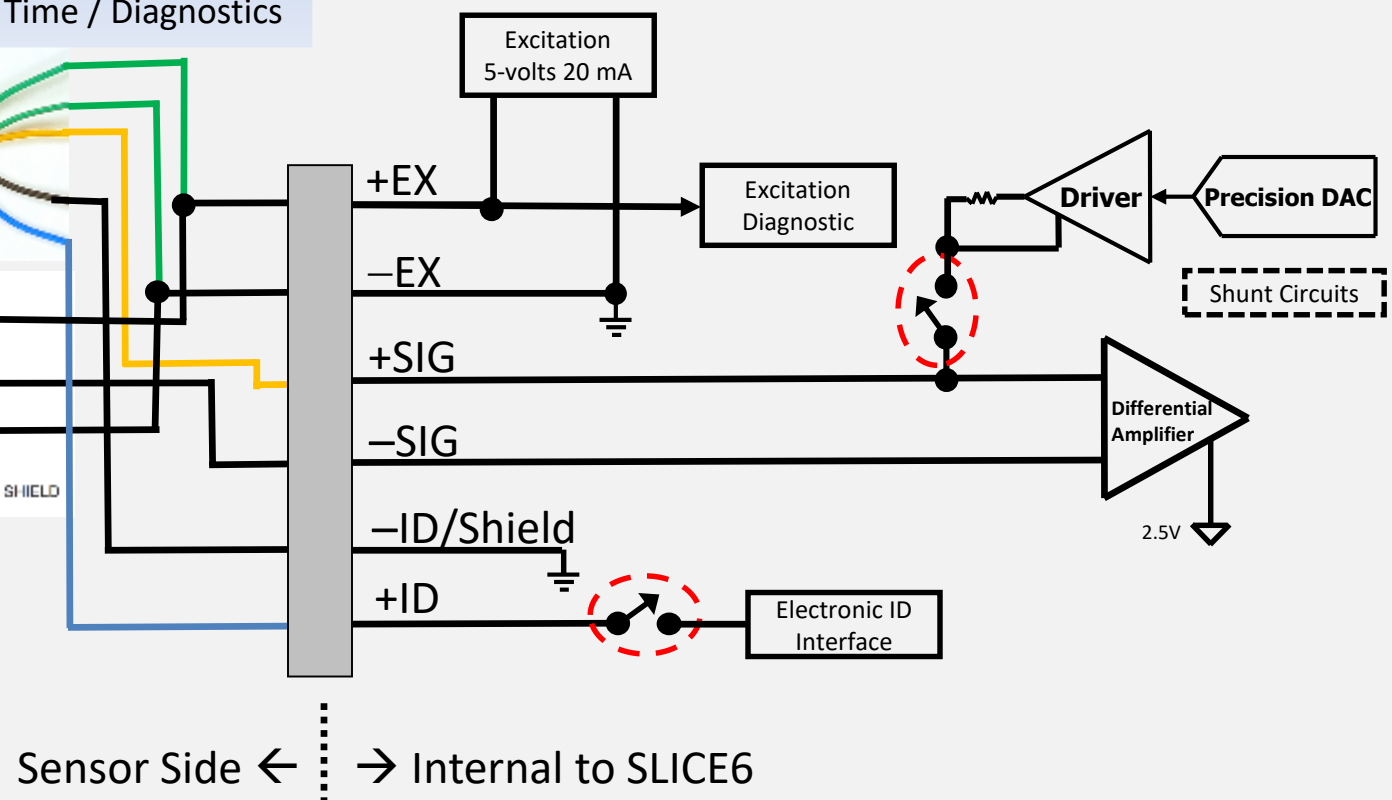
SLICE6 Sensor Interface – Accelerometer (3-Wire)

- SLICEWare Sensor Settings
- Proportional to Excitation = Yes
 - Sensitivity = $0.25mV/V/EU$ *
 - Desired Range = 2000*
 - Units = g
 - Sensor Type = Full-Bridge
 - Remove Offset = Yes
 - Zero Type = Average Over Time / Diagnostics

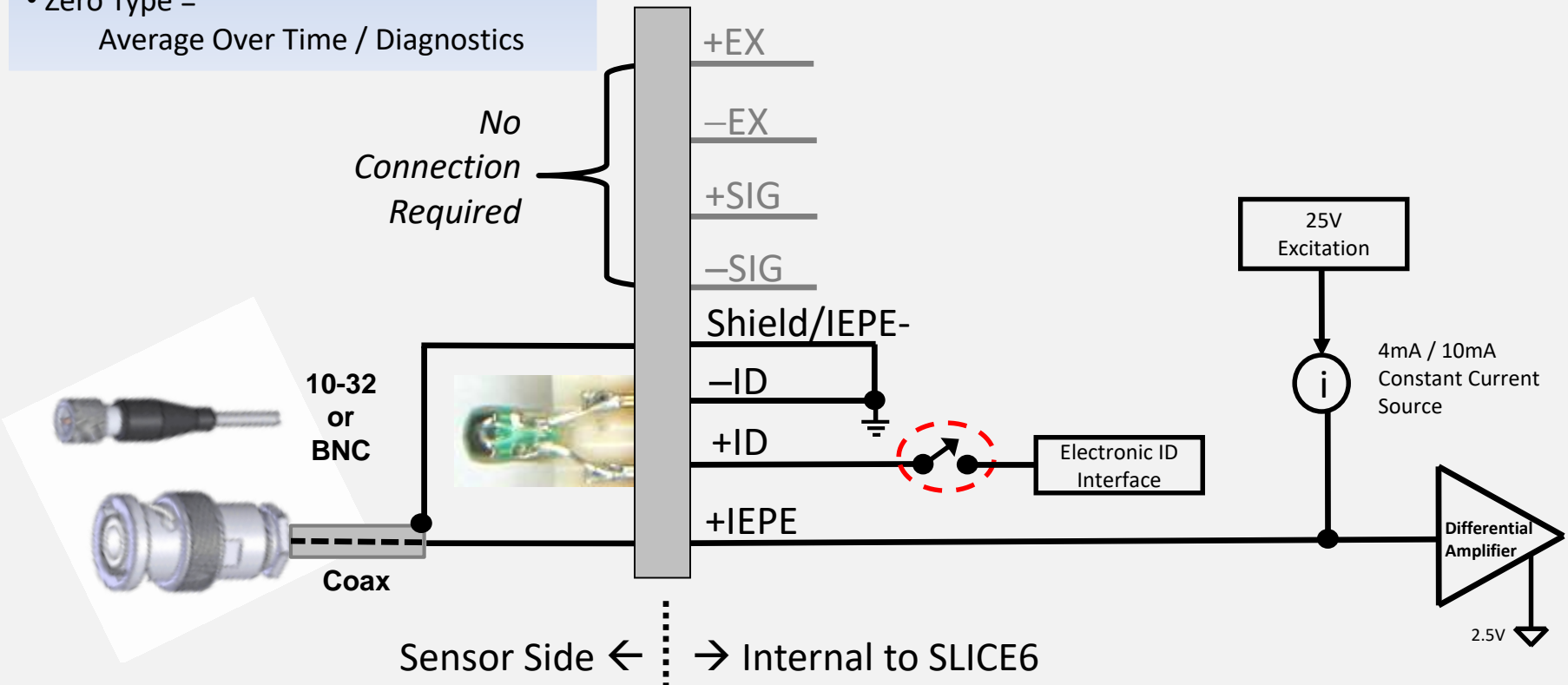
Dallas ID plus Half-Bridge Completion Card



*Endevco 7264 (or similar)



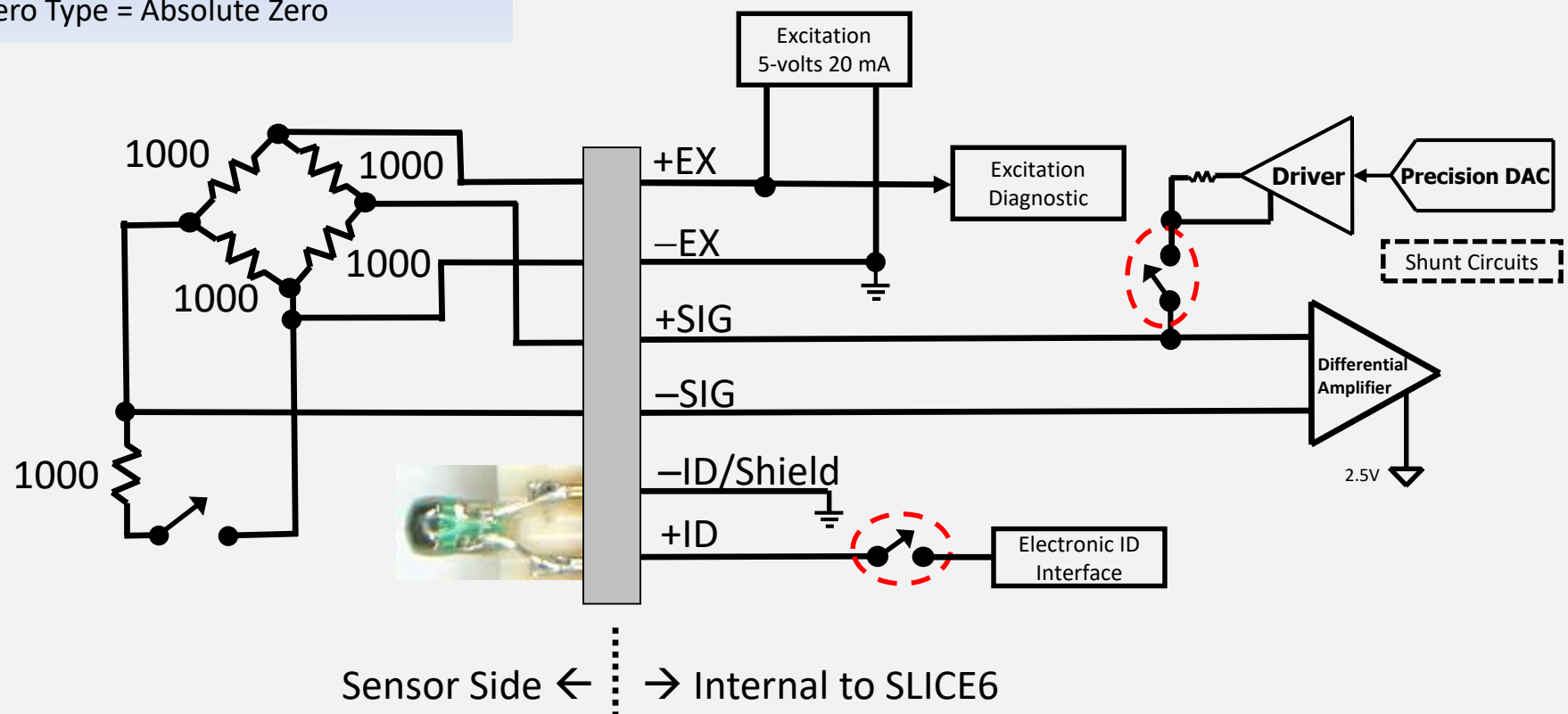
- Sensor Settings**
- Sensitivity = *per sensor specs (mV/EU)*
 - Desired Range = *per sensor specs*
 - Units = mV
 - Sensor Type = IEPE
 - Coupling = *per sensor specs*
 - Remove Offset = Yes
 - Zero Type =
Average Over Time / Diagnostics



SLICE6 Sensor Interface – Switch Closure

Sensor Settings

- Proportional to Excitation = No
- Sensitivity = *per sensor specs (mV/EU)*
- Desired Range = *per sensor specs*
- Units = mV
- Sensor Type = Full-Bridge
- Remove Offset = No
- Zero Type = Absolute Zero



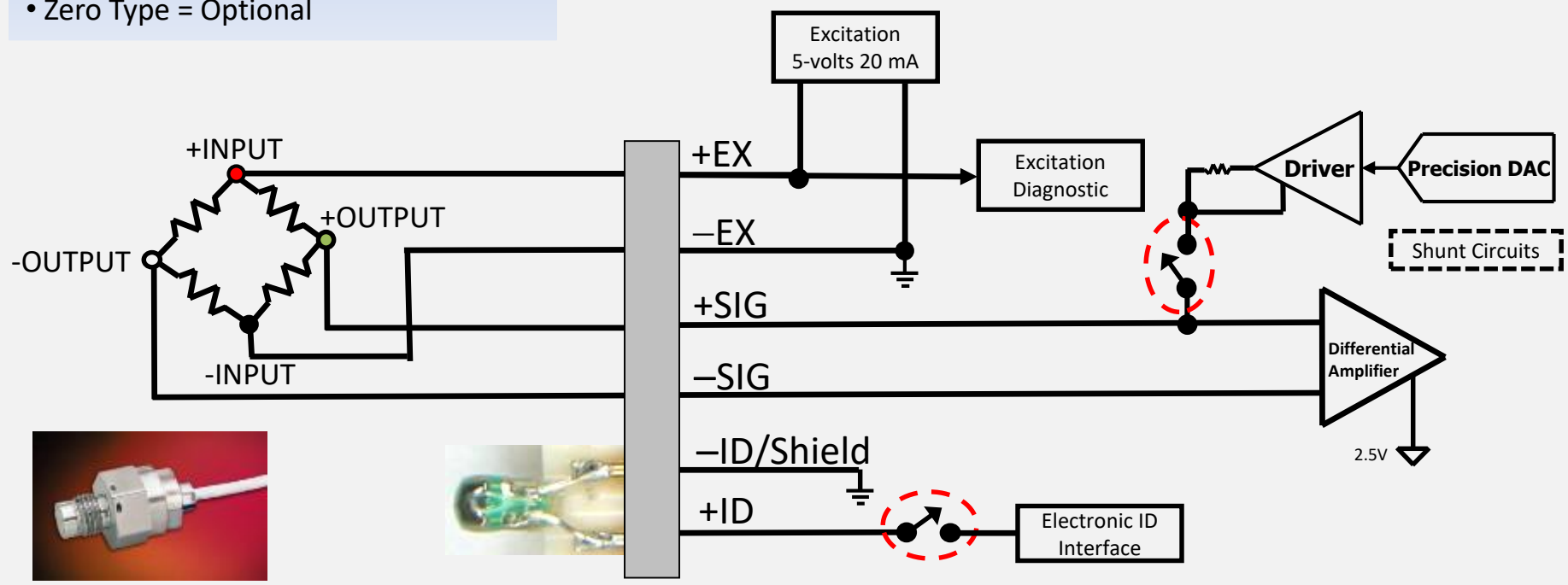
SLICE6 Sensor Interface – Pressure Sensor

Sensor Settings

- Proportional to Excitation = Yes
- Sensitivity = *per sensor specs (mV/EU)*
- Desired Range = *per sensor specs*
- Units = mV
- Sensor Type = Full-Bridge
- Remove Offset = Yes
- Zero Type = Optional

Zero Type Notes:

- There are absolute sensors and gauge sensors. The type of sensor being used will determine zero type.



*Kulite HEL-375
(or similar)

Sensor Side ← → Internal to SLICE6

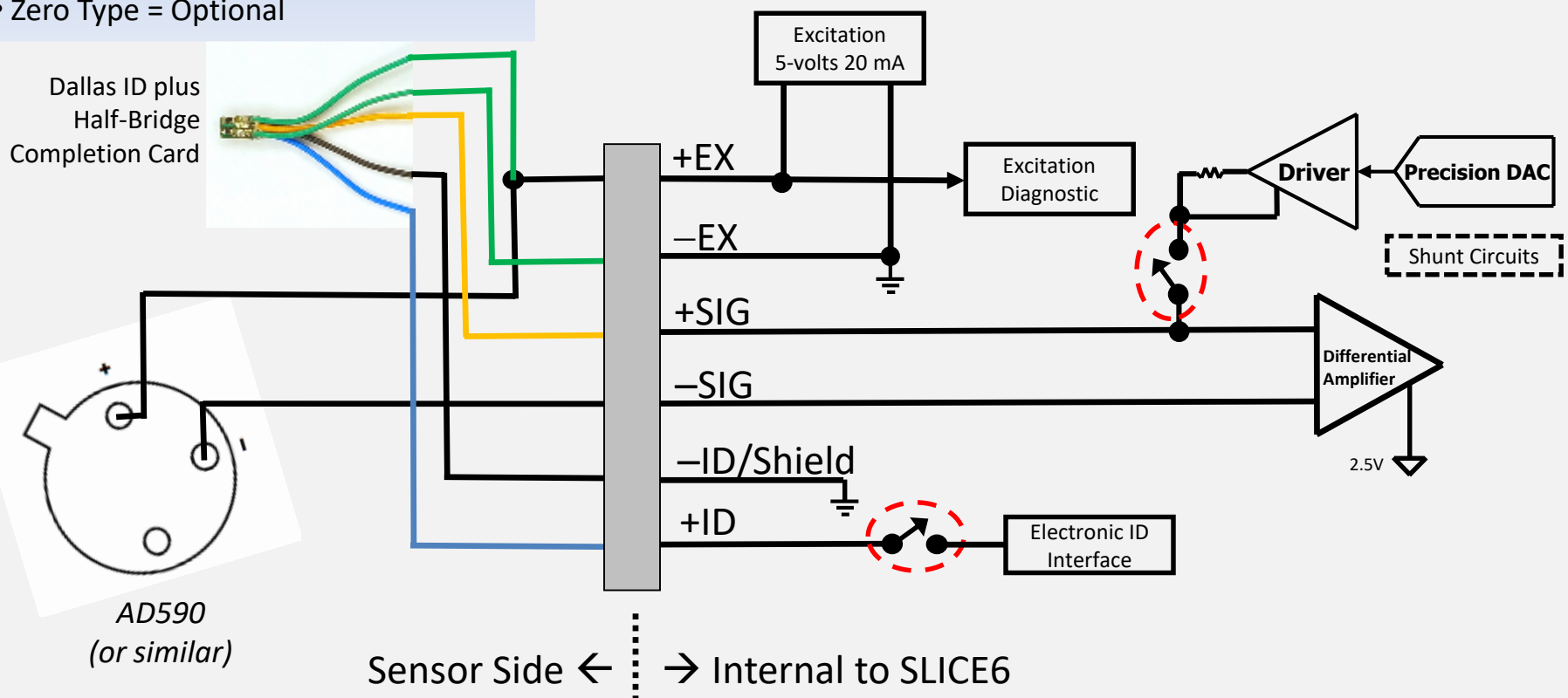
SLICE6 Sensor Interface – Temperature Sensor

Sensor Settings

- Proportional to Excitation = No
- Sensitivity = *per sensor specs (mV/EU)*
- Desired Range = *per sensor specs*
- Units = mV
- Sensor Type = Full-Bridge
- Remove Offset = No
- Zero Type = Optional

Zero Type Notes:

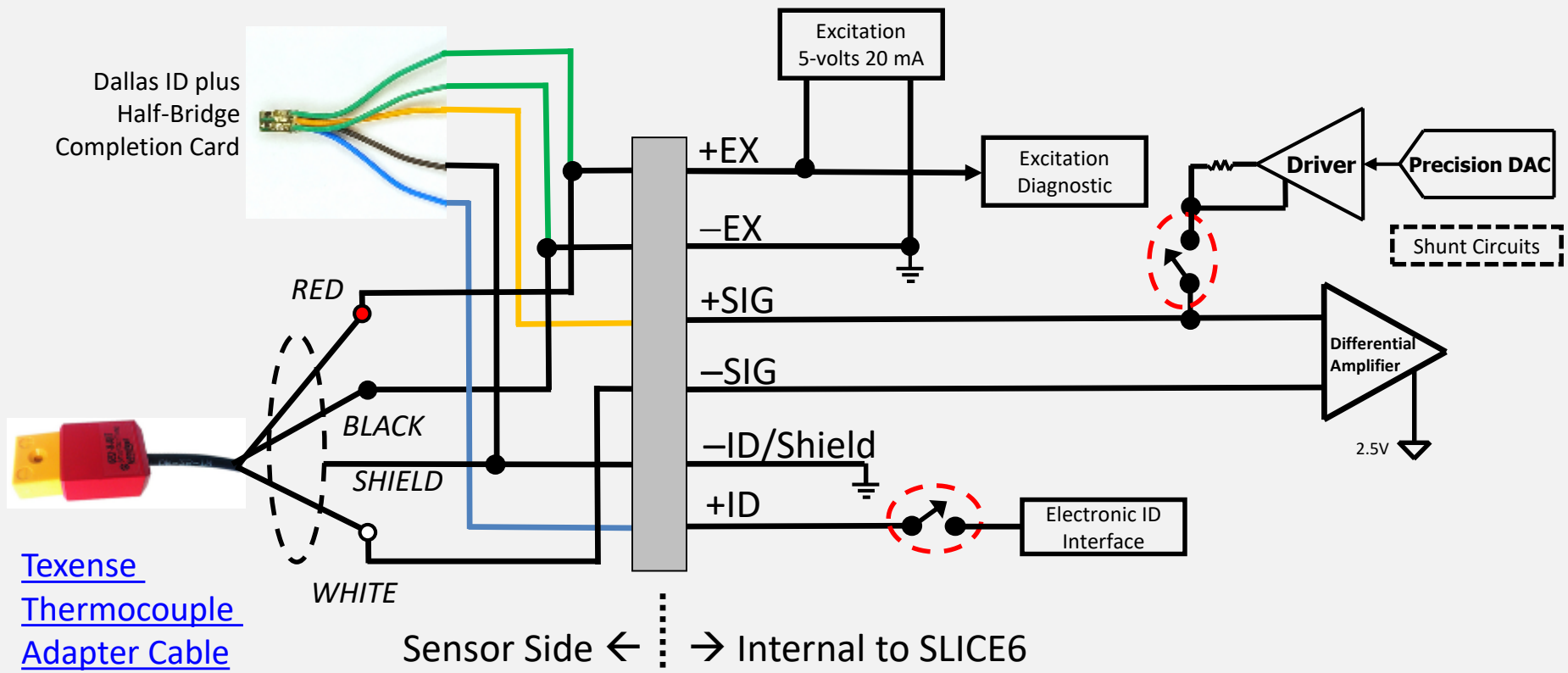
- There are absolute sensors and gauge sensors. The type of sensor being used will determine zero type.



Sensor Settings

- Proportional to Excitation = No
- Invert = Yes
- Remove Offset = No
- Zero Type = Absolute Zero

For more information on the Texense Thermocouple Adapter Cable, see this article:
 • [Sensor Setup - DTS \(Texense\) Thermocouple Adapter](#)



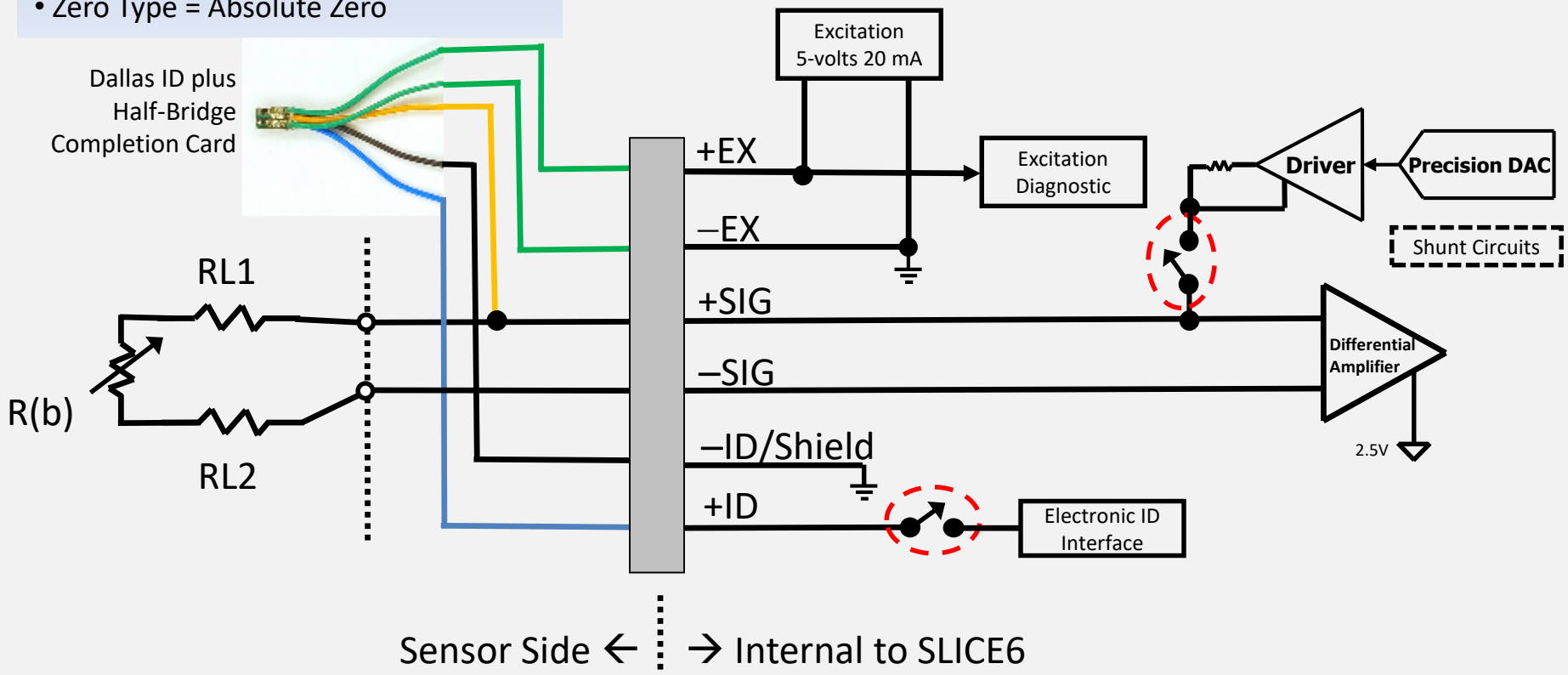
SLICE6 Sensor Interface – RTD (2-Wire)

Sensor Settings

- Proportional to Excitation = No
- Sensitivity = *per sensor specs (mV/EU)*
- Desired Range = *per sensor specs*
- Units = mV
- Sensor Type = Full-Bridge
- Remove Offset = No
- Zero Type = Absolute Zero

For more information on RTDs, see this article:

- [Resistance Temperature Detectors \(RTDs\): Recommended Connection Diagram and Sensitivity Calculations](#)



SLICE6 Sensor Interface – Magnetic Pickup

Sensor Settings

- Proportional to Excitation = No
- Sensitivity = *per sensor specs (mV/EU)*
- Desired Range = *per sensor specs*
- Units = mV
- Sensor Type = Full-Bridge
- Remove Offset = No
- Zero Type = Absolute Zero

Analog Notes:

- SLICE6 input range is 0-5 volts WRT SLICE power ground and –Excitation.
- Both sides of input amplifier must be connected
- Signal generator must float WRT ground or alternate connection method must be used.
- Input range does not quite extend to 0 & 5 volts. Best to use signals under 4.5-volts p-p.

