SLICE6 Sensor Interface

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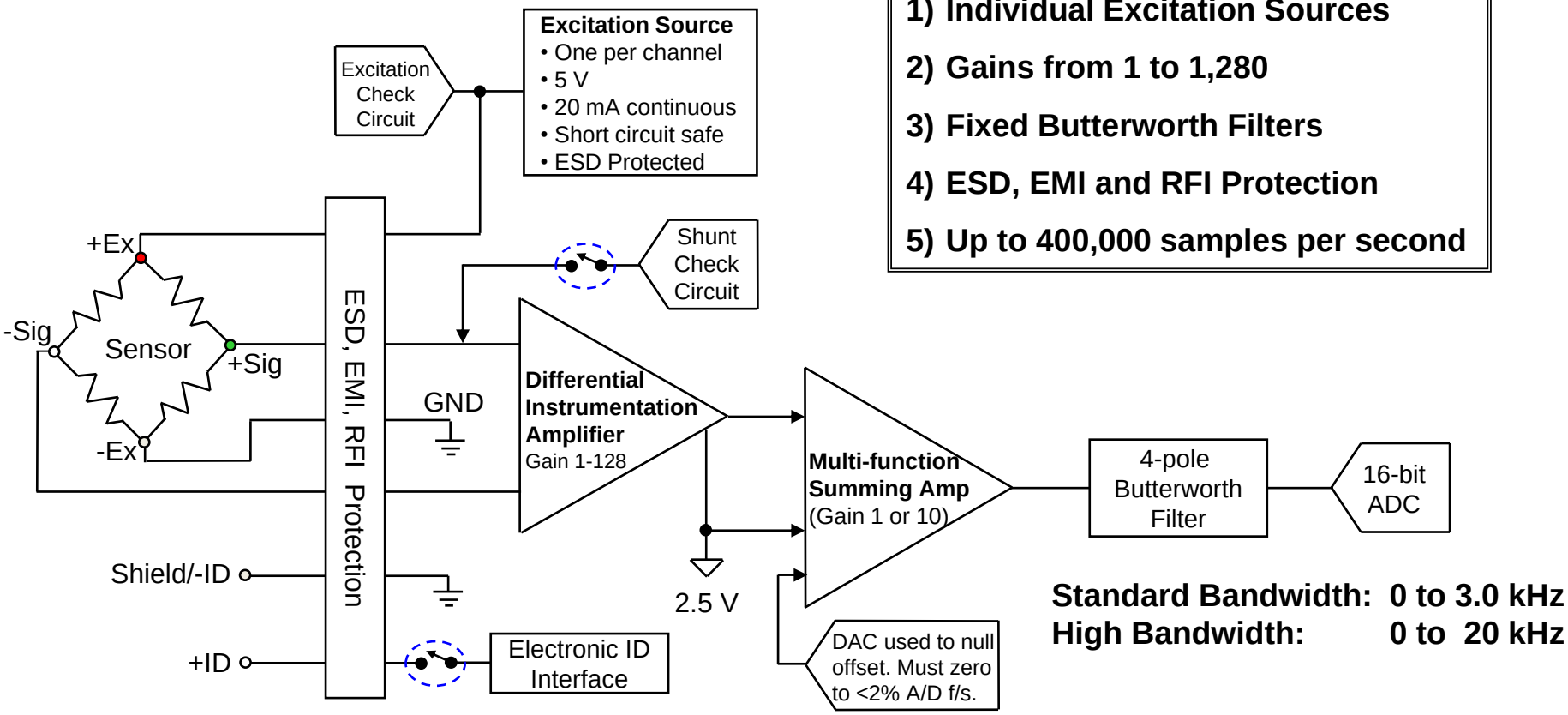
SLICE6 DAS Channel Architecture

Feature Overview

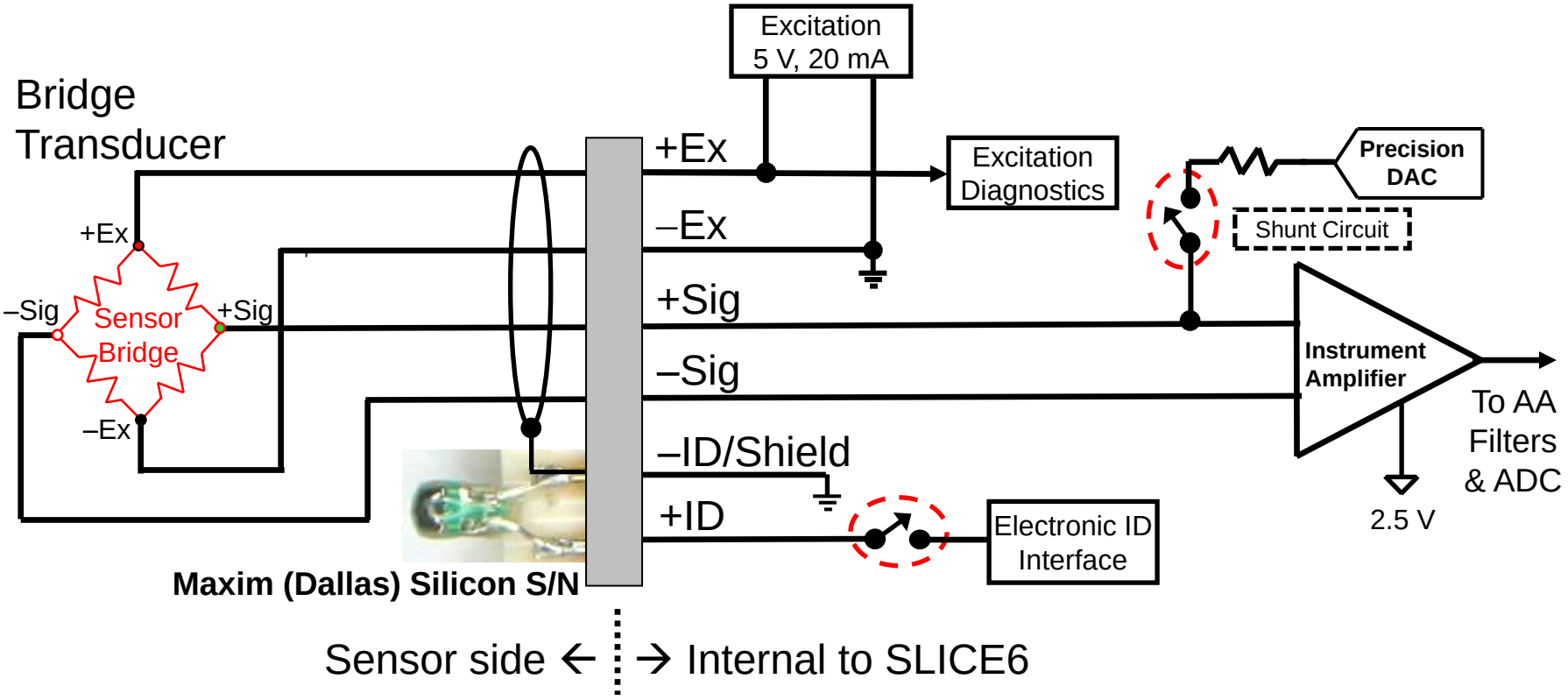
1) **Individual Excitation Sources**
2) **Gains from 1 to 1,280**
3) **Fixed Butterworth Filters**
4) **ESD, EMI and RFI Protection**
5) **Up to 400,000 samples per second**



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

SLICE6 Sensor Interface – Signal

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



SLICE6 DAS Sensor Support

Sensor Type	SLICE6	SLICE6 AIR	Notes
Bridge Transducer • Bridge Completion	✘*	✓	* Use Microcard for bridge completion on SLICE6 modules
Voltage Measurement • Floating Ground Source • Grounded Output Source • DTS Voltage Range Expander	 ✓ ✓ ✓	 ✓ ✓ ✓	Use Range Expander Cable for > 0-5 V single-ended, > ±2.5 V differential
Strain Gauge	✓	✓	* Use Microcard for bridge completion on SLICE6 modules
Potentiometer • 2-wire • 3-wire • 4-wire	 ✓ ✓ ✓	 ✓ ✓ ✓	See Strain Gauge

Accelerometer
• Piezoresistive
  • 3-wire (Active)
  • 4-wire
• IEPE
	
	✓
	✓
	✓
		
		✓
		✓
		✓
			Example: Endevco 7264
			Connect like Bridge Transducer Circuit

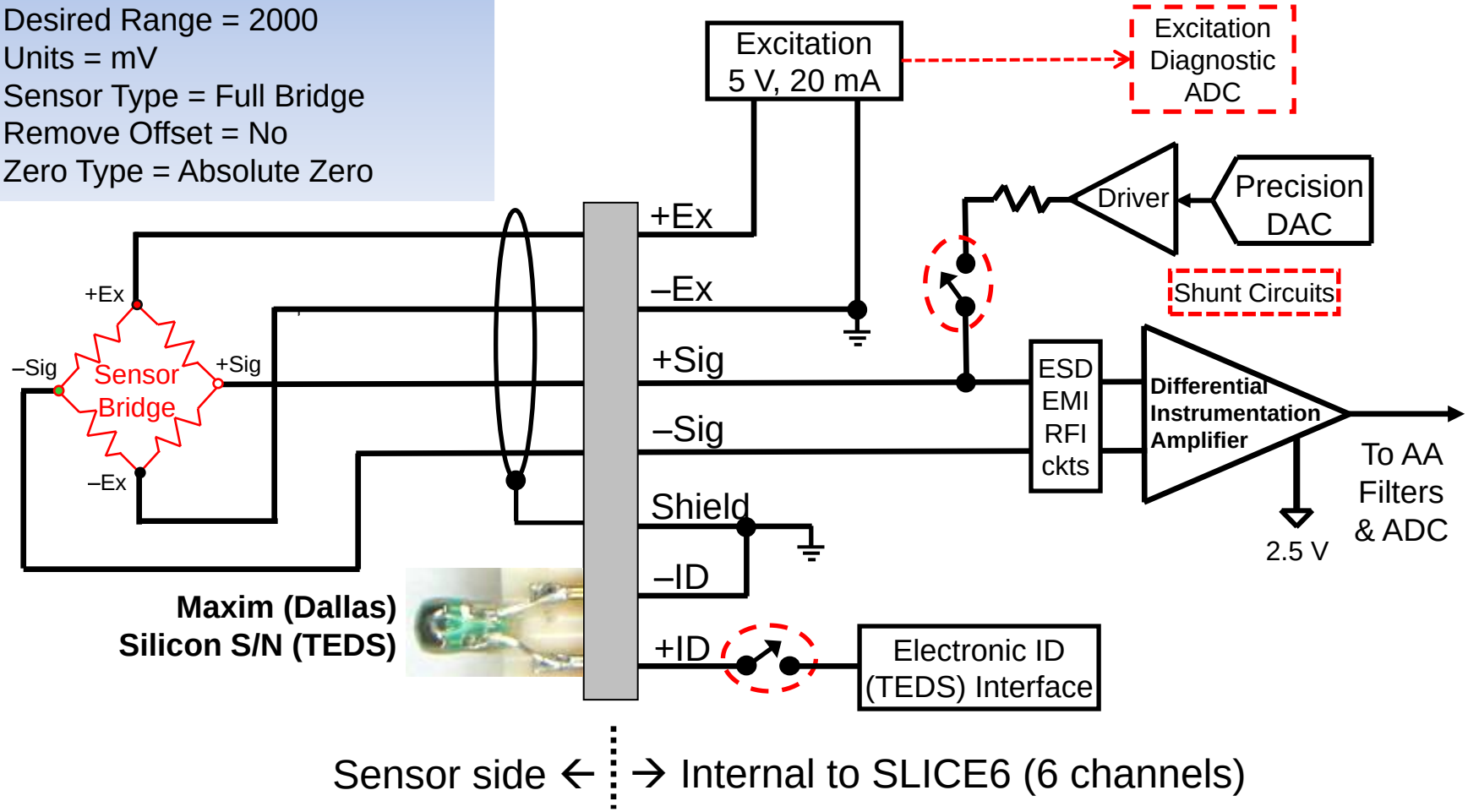
Switch Closure	✓	✓	Use Switch Closure Cable

SLICE6 DAS Sensor Support

Sensor Type	SLICE6	SLICE6 AIR	Notes
Pressure Sensor	✓	✓	Connect like Bridge Transducer Circuit Kulite or similar
Temperature Sensor • 2-Wire • 3-Wire	 ✓ ✓	 ✓ ✓	 Example: AD590 (2-wire) LM35 (3-wire)
Thermocouple (J, K)	✓	✓	Use Texense Thermocouple Adapter Cable
RTD • 2-wire • 3-wire • 4-wire	 ✓ ✓ ✓	 ✓ ✓ ✓	Example: PT100 *See Help Center Article for More Information: Resistance Temperature Detectors (RTDs): Recommended Connection Diagram and Sensitivity Calculations – DTS Help Center (dtsweb.com)
Magnetic Pickup	✓	✓	
Discrete Digital	✓	✓	SLICE6: Use Signal Generator Wiring SLICE6 AIR: Use Dedicated Digital Inputs
TTL Encoder (0-5 V input)	✗	✗	
Quadrature Encoder	✗	✗	

Bridge Transducer Input

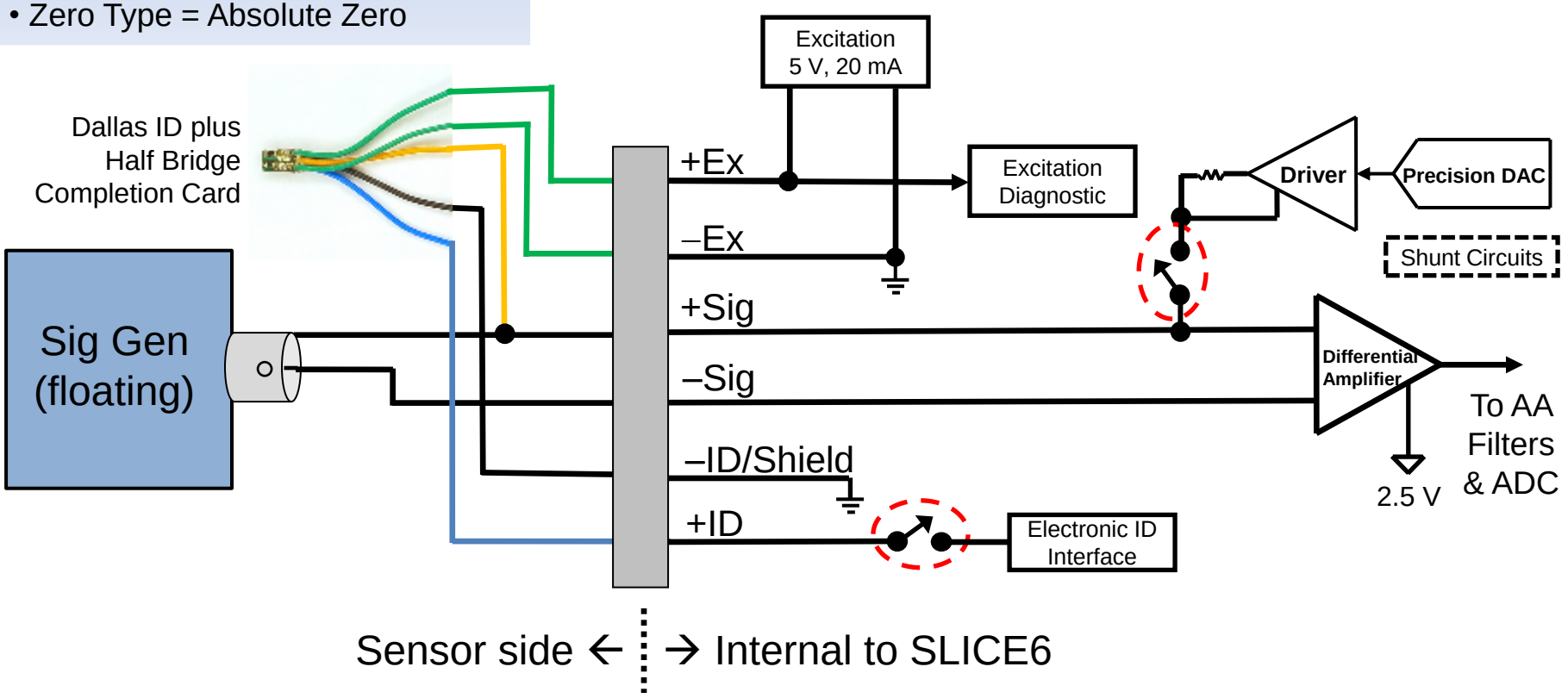
Sensor Settings
- Proportional to Excitation = No
- Sensitivity = 1.000 mV/EU
- Desired Range = 2000
- Units = mV
- Sensor Type = Full Bridge
- Remove Offset = No
- Zero Type = Absolute Zero



Signal Generator (Floating)

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

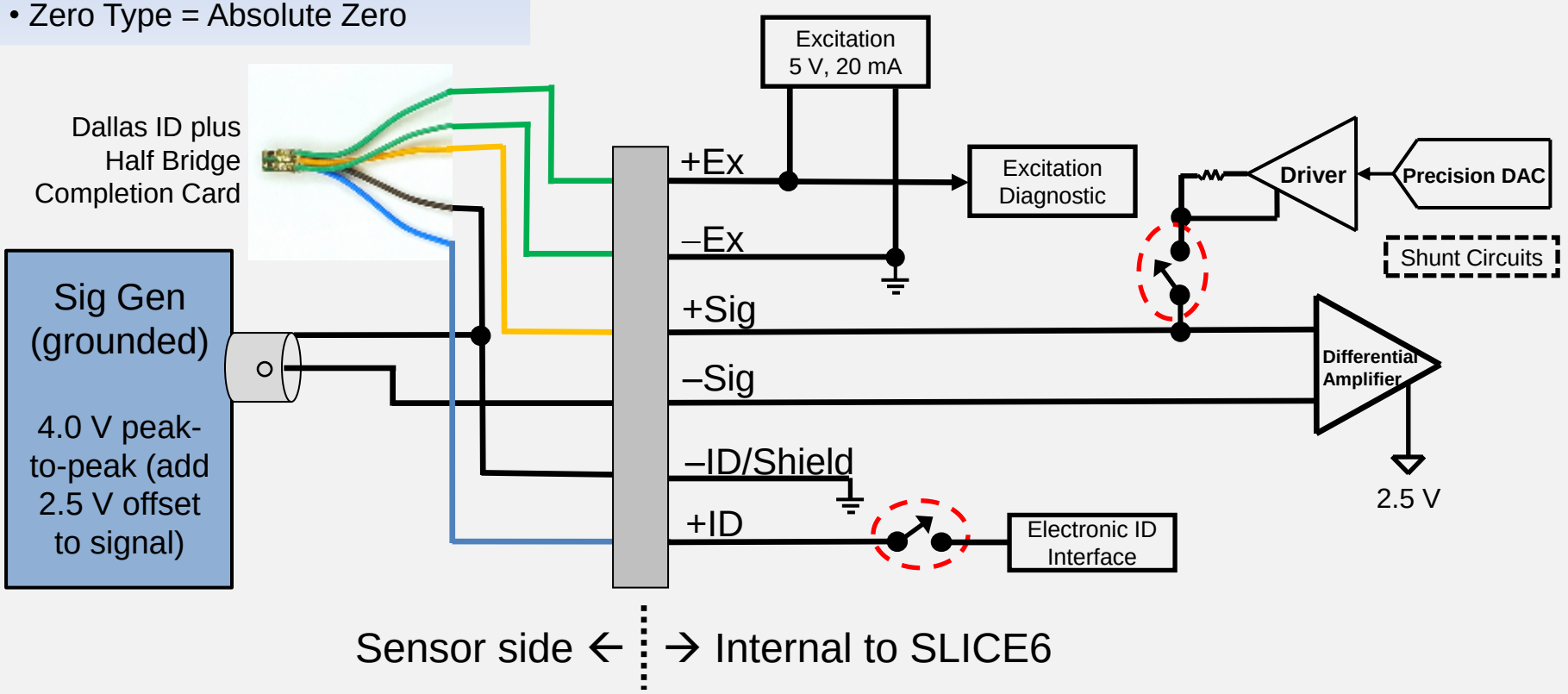
Analog notes:
- Signal generator must float with respect to ground or alternate connection method must be used.
- Input range does not quite extend to 0 and 5 V. Best to use signals under 4.5 V peak-to-peak.



Signal Generator (Grounded)

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

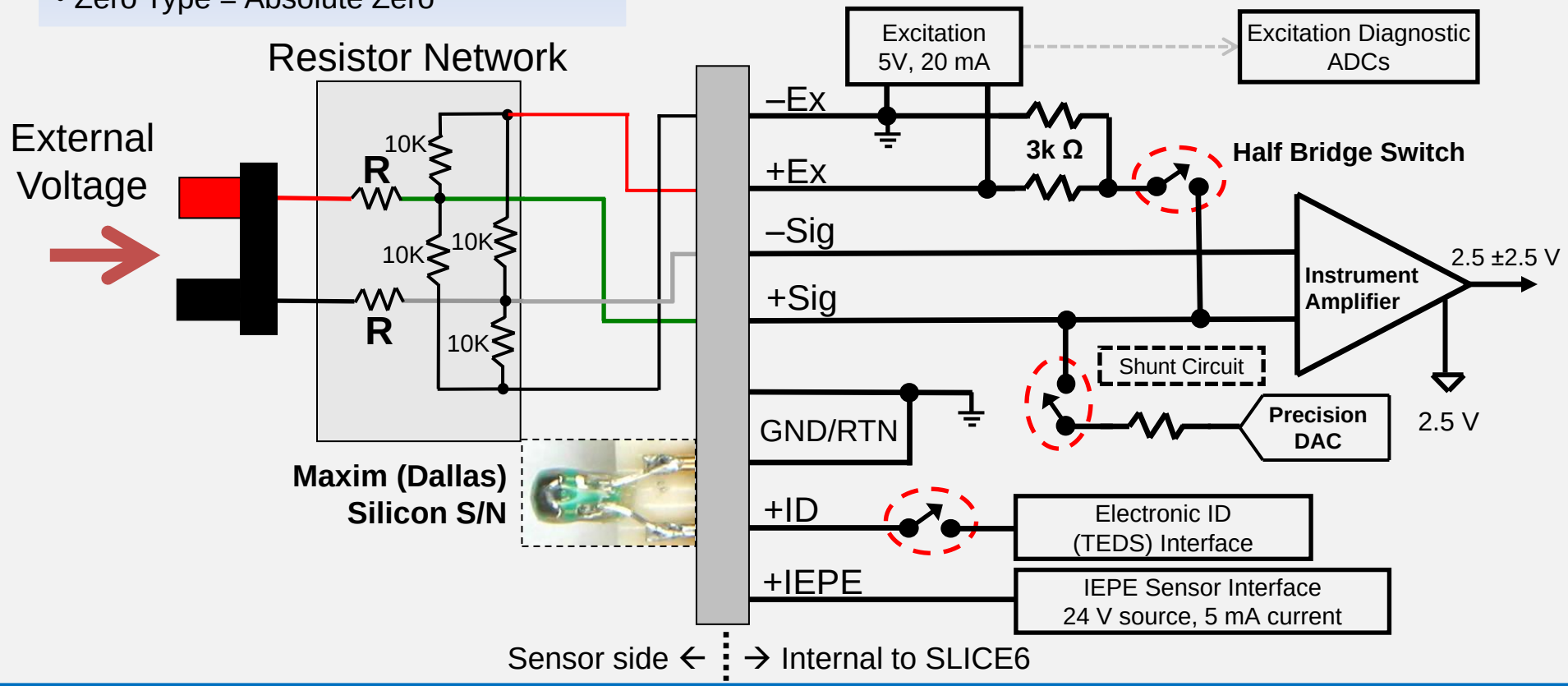
Analog notes:
- Signal generator must be grounded.
- Input range does not quite extend to 0 and 5 V. Best to use signals under 4.5 V peak-to-peak.



Range Expander

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

For more information on using a voltage range expander, see this article:
- Voltage Range Expander: Measuring High Voltages from 5V to 800V



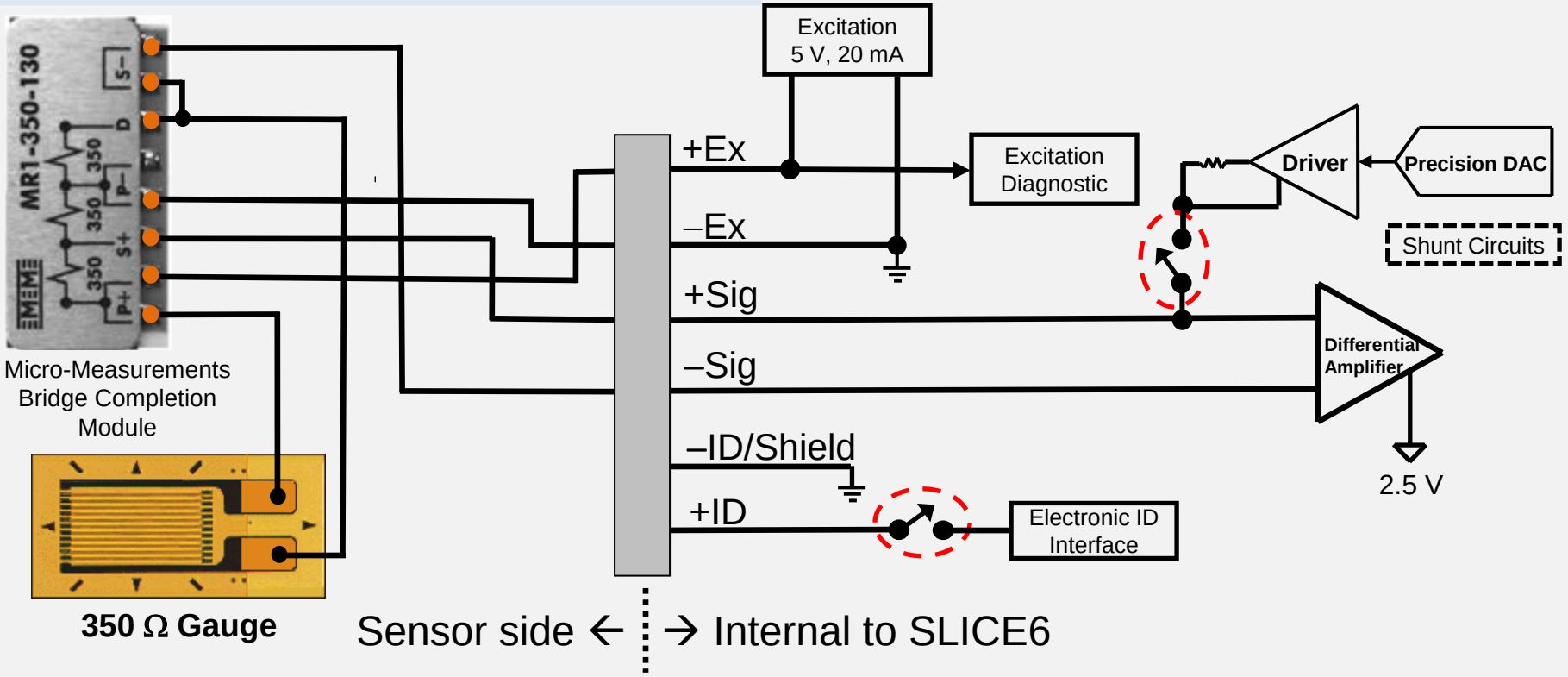
Strain Gauge (Full Bridge)

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:

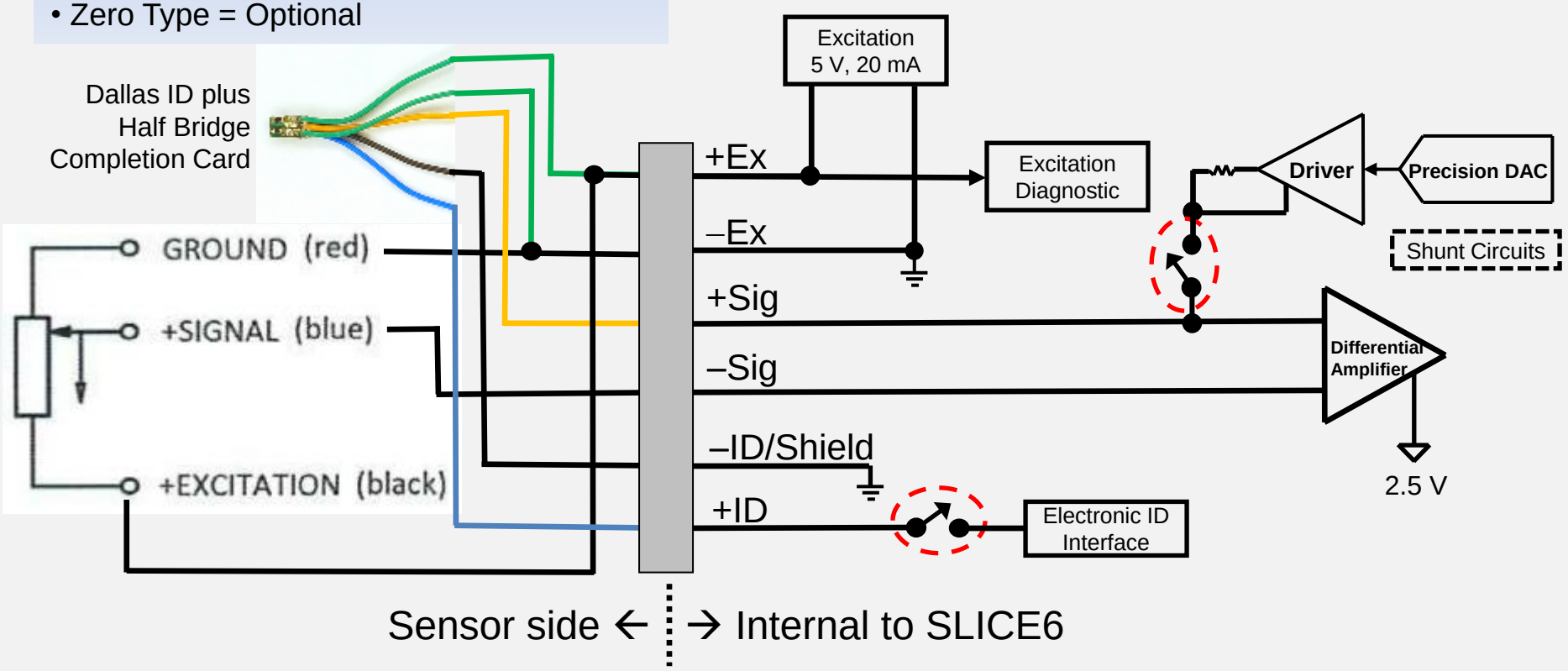
- Bridge completion module should be located as close as possible to strain gauges(s).



Potentiometer: 3-Wire

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

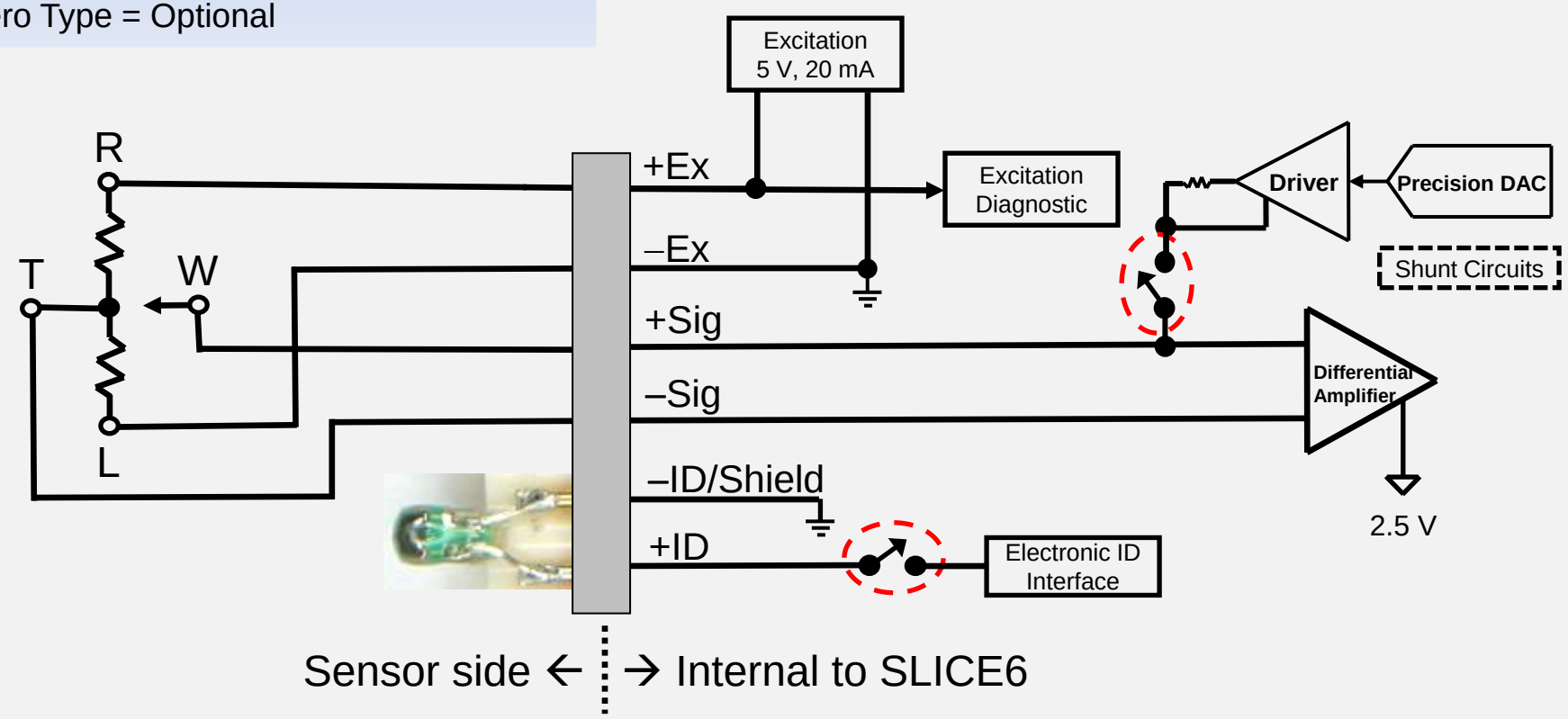
Zero Type notes:
- For potentiometers without bridges, there may be initial engineering units (EU) that need to be taken into account for zeroing. This affects zeroing type. See manual for descriptions of Zero Type.



Potentiometer: 4-Wire

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

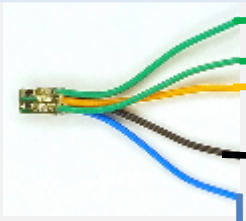
Zero Type notes:
- For potentiometers without bridges, there may be initial engineering units (EU) that need to be taken into account for zeroing. This affects zeroing type. See manual for descriptions of Zero Type.

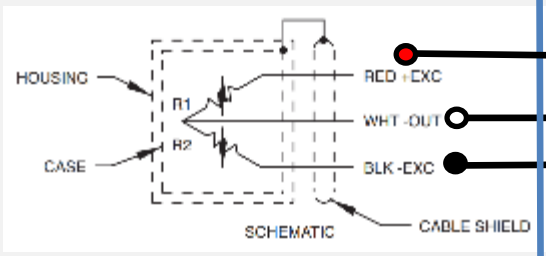


Accelerometer: 3-Wire

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)

Excitation
5 V, 20 mA

+Ex

–Ex

+Sig

–Sig

–ID/Shield

+ID

Excitation Diagnostic

Driver

Precision DAC

Shunt Circuits

Differential Amplifier

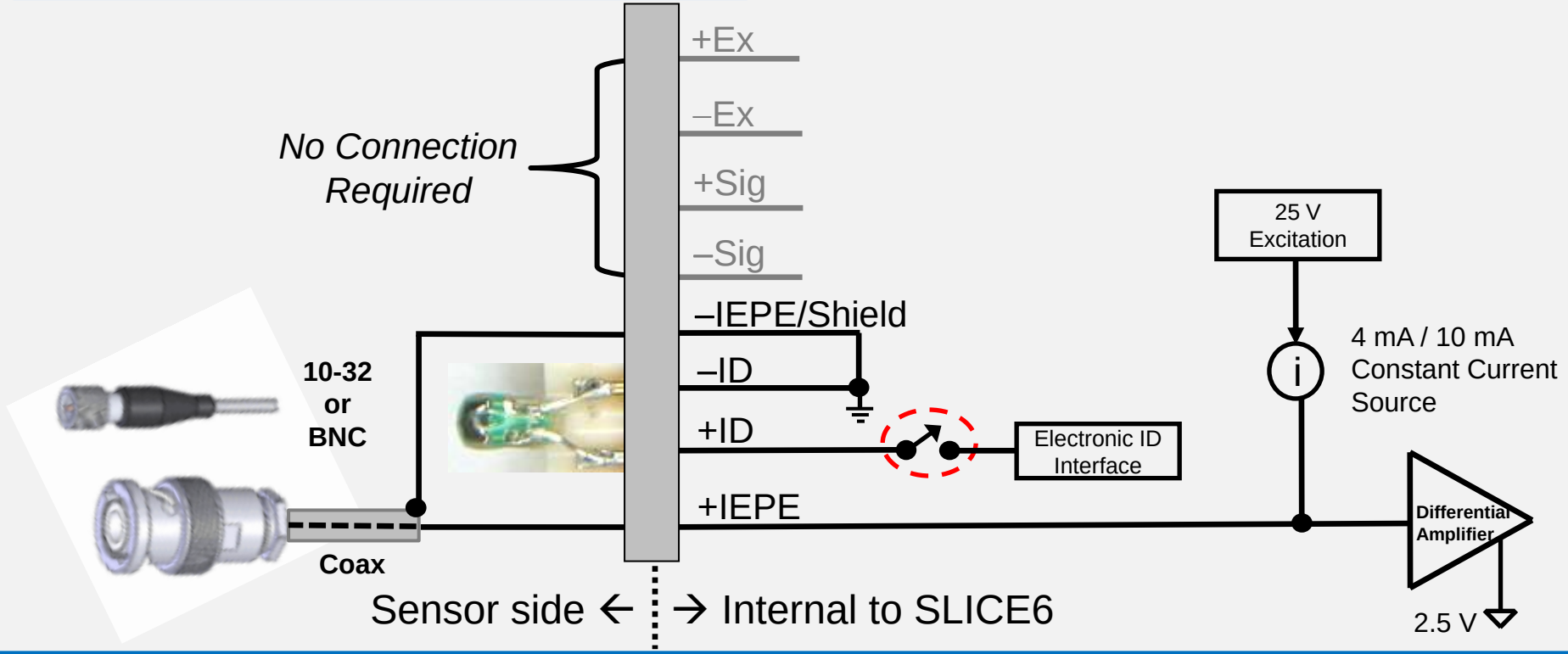
2.5 V

Electronic ID Interface

Sensor side ← → Internal to SLICE6

IEPE Accelerometer

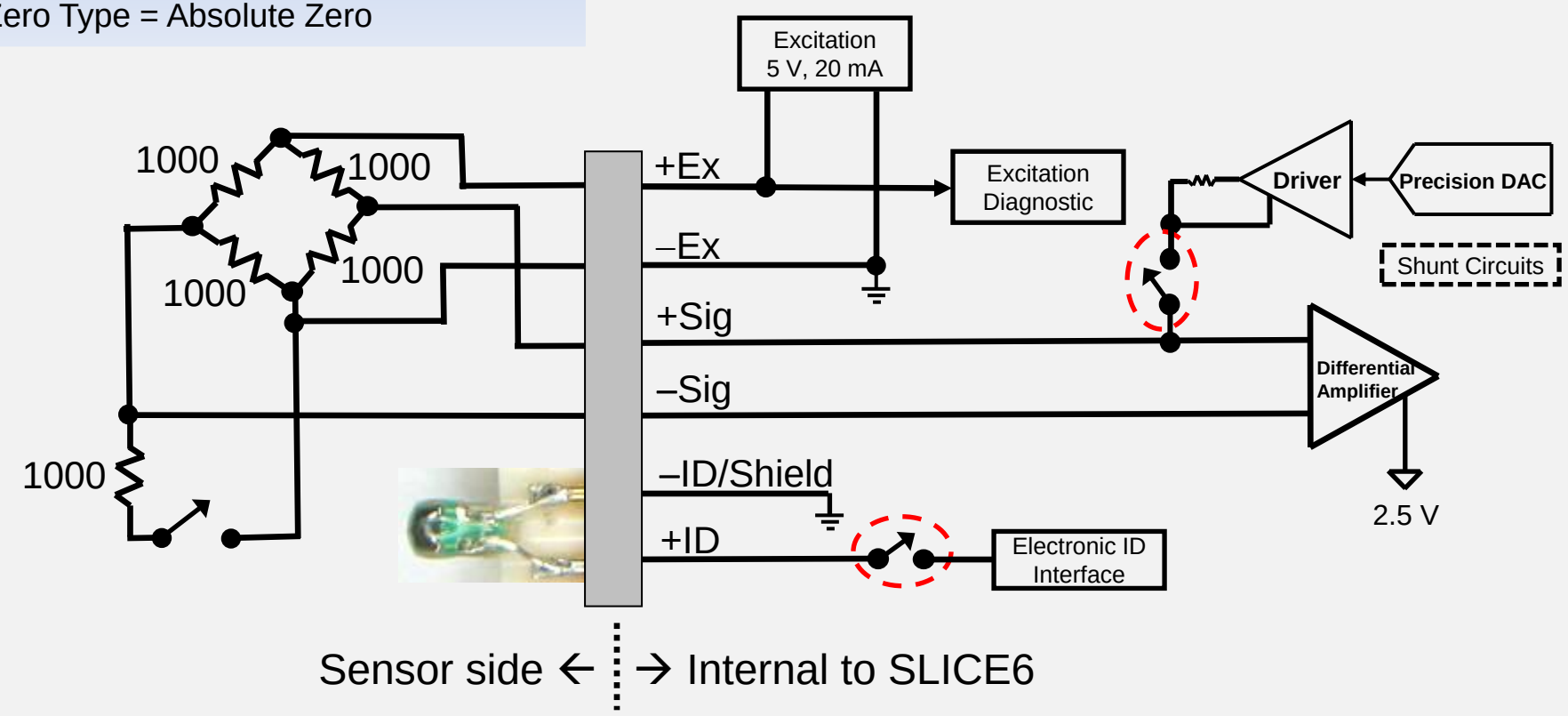
Sensor Settings
- Sensitivity = *per sensor specs (mV/EU)*
- Desired Range = *per sensor specs*
- Units = mV
- Sensor Type = IEPE
- Coupling = *per sensor specs*
- Remove Offset = Yes
- Zero Type = Average Over Time / Diagnostics



Switch Closure

Sensor Settings

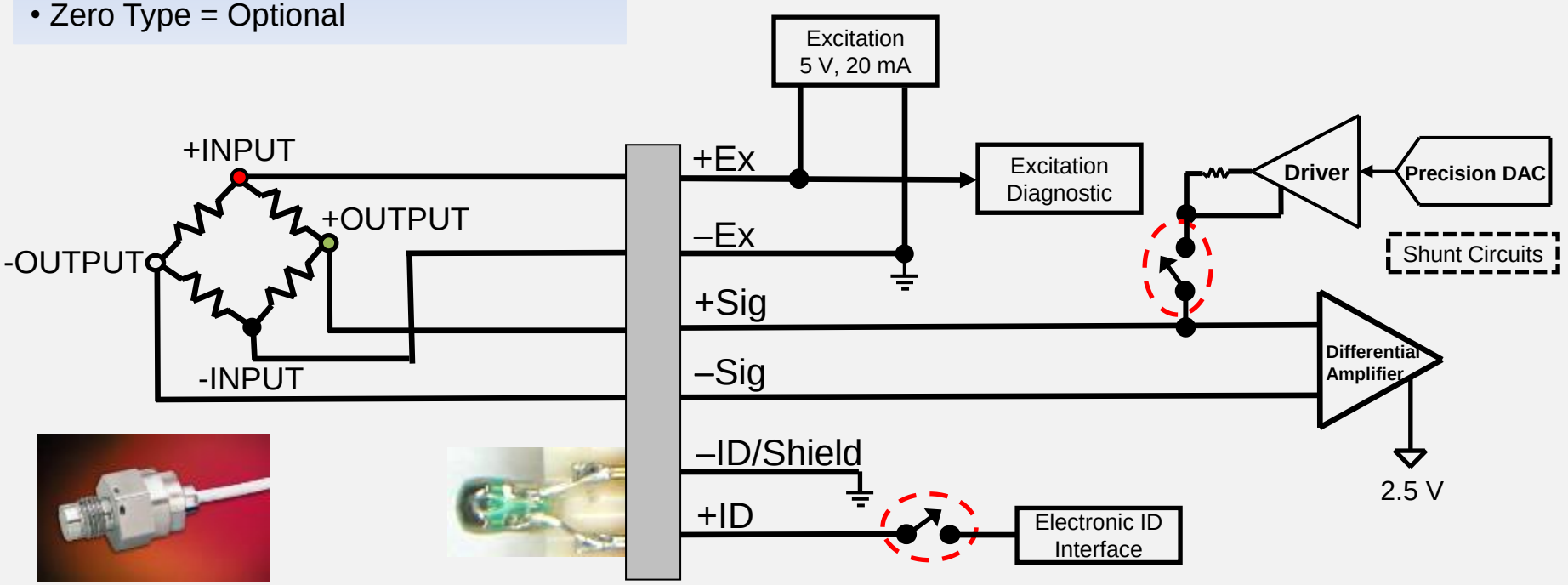
- Proportional to Excitation = No
- Sensitivity = *per sensor specs (mV/EU)*
- Desired Range = *per sensor specs*
- Units = mV
- Sensor Type = Full Bridge
- Remove Offset = No
- Zero Type = Absolute Zero



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.



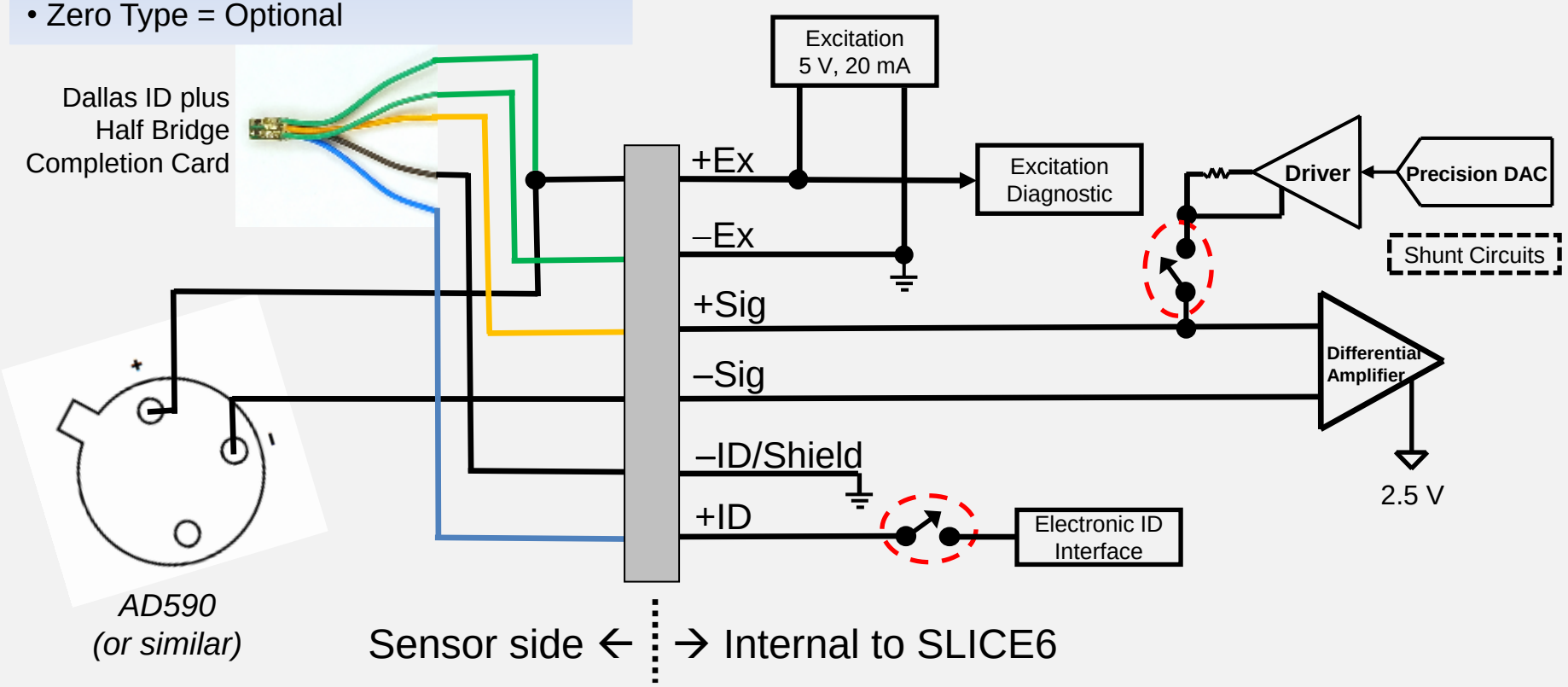
**Kulite HEL-375*
(or similar)

Sensor side ← → Internal to SLICE6

Temperature Sensor: 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 = Optional

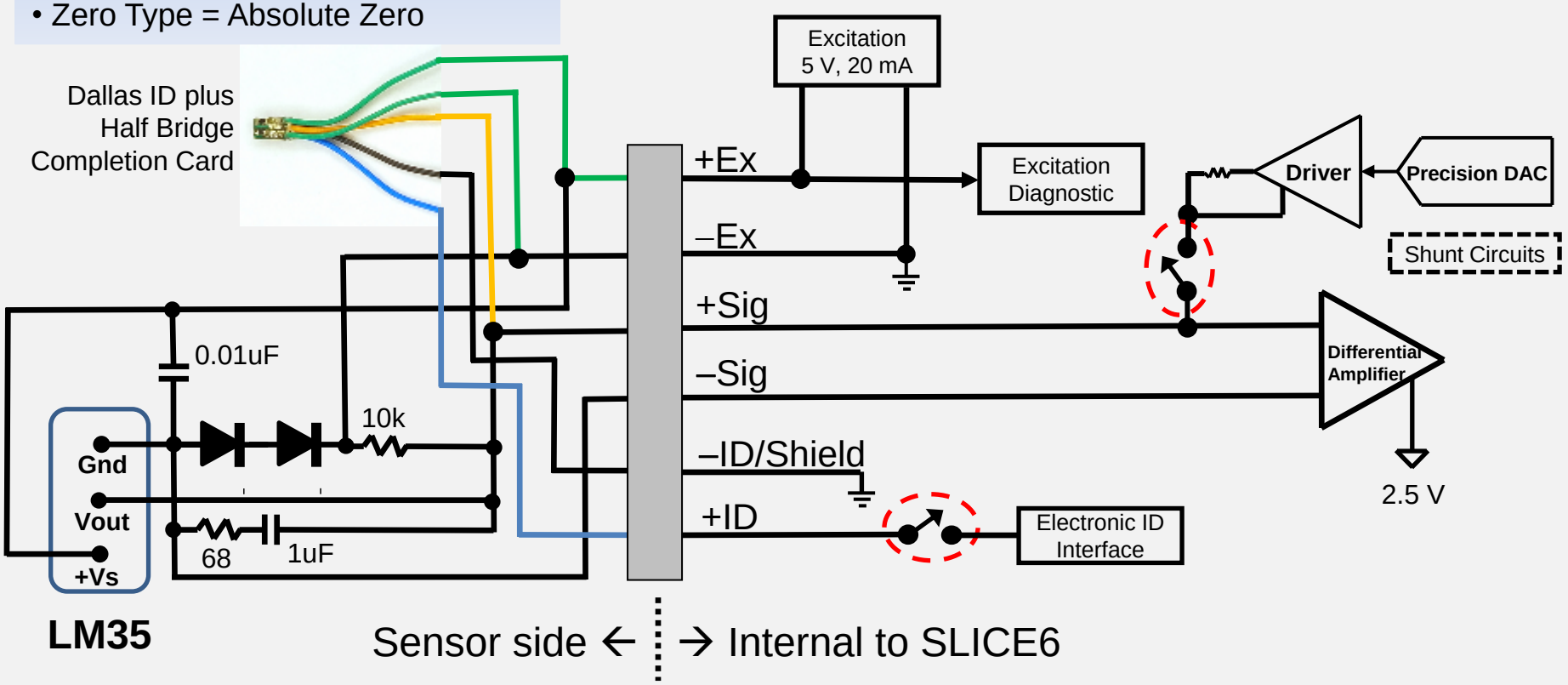
Zero Type notes:
- There are absolute sensors and gauge sensors. The type of sensor being used will determine Zero Type.



Temperature Sensor: 3-Wire

Sensor Settings
- Proportional to Excitation = No
- Sensitivity = *10 (mV/C)**
- Desired Range = *150**
- Units = C
- Sensor Type = Full Bridge
- Remove Offset = No
- Zero Type = Absolute Zero

Initial EU notes:
- When using temperature sensors, some units will output a non-zero value at 0 deg C. These sensors will need to have an initial EU value entered into the Sensor Settings.

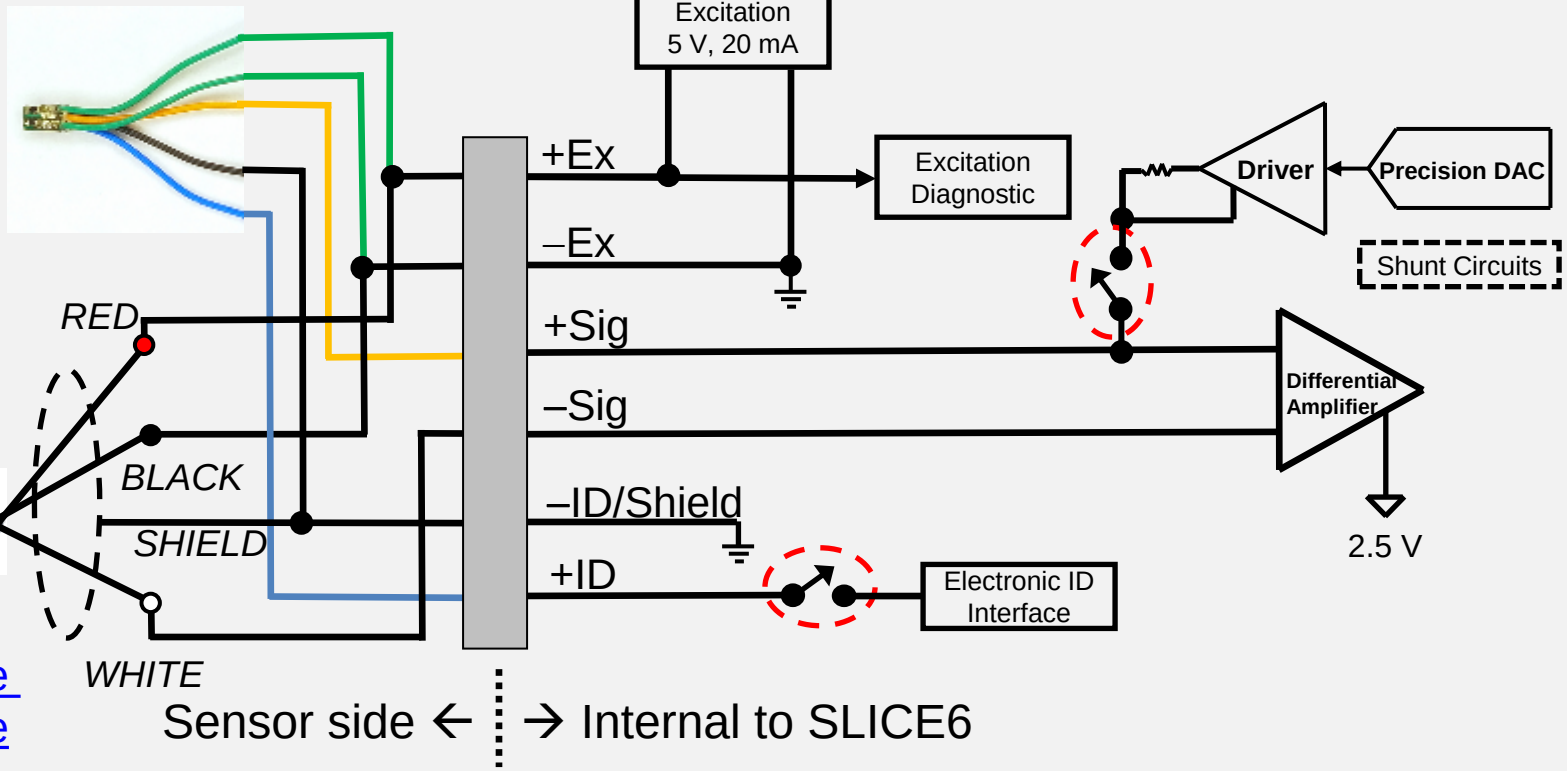


Thermocouple Adapter (J & K)

Sensor Settings
- Proportional to Excitation = No
- Invert = Yes
- Remove Offset = No
- Zero Type = Absolute Zero
- Inverted/Polarity = YES / Negative

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

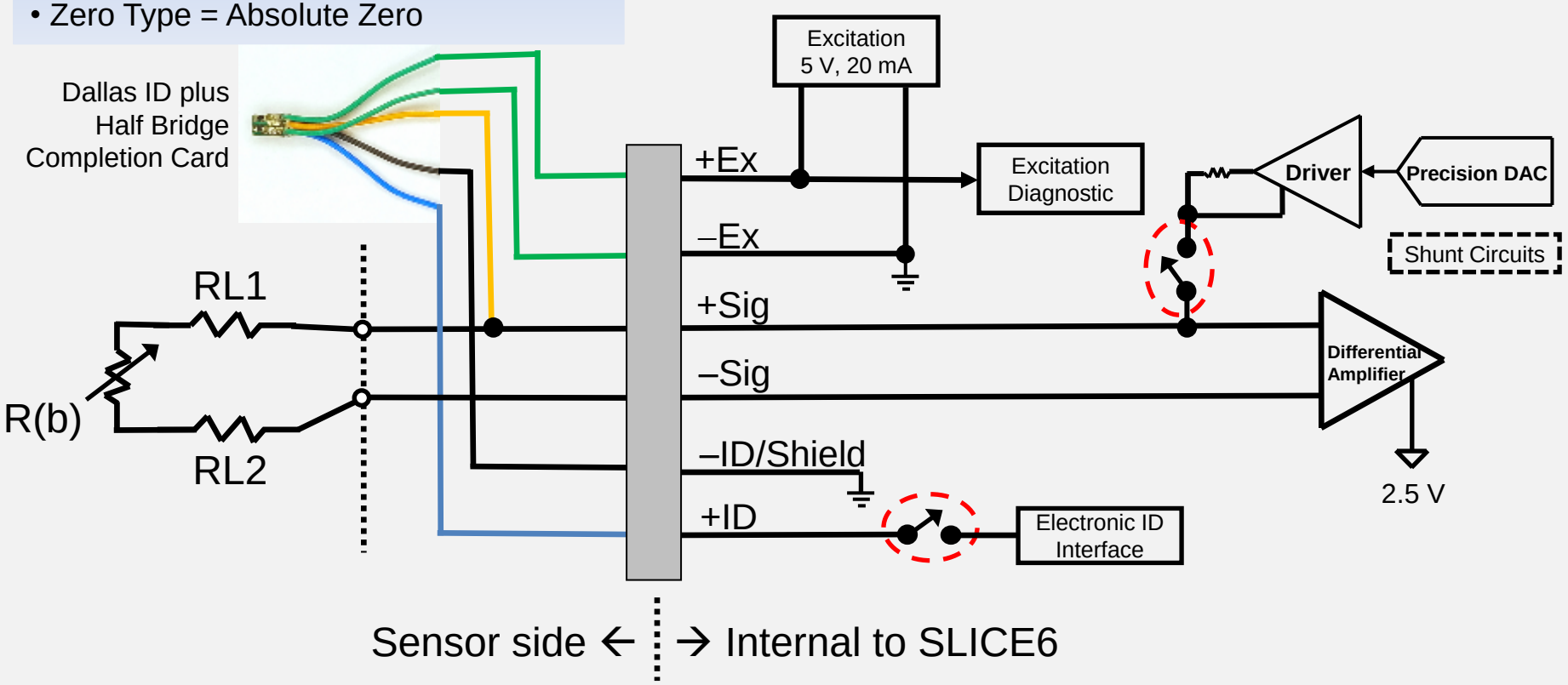
For Guidance on Sensor Settings for the Thermocouple Adapter, see this article on the DTS Help Center: Sensor Setup - DTS (Texense) Thermocouple Adapter – DTS Help Center (dtsweb.com)



Resistance Temperature Detector: 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



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 V with respect to SLICE power ground and –Ex.
- Both sides of input amplifier must be connected.
- Signal generator must float with respect to ground or alternate connection method must be used.
- Input range does not quite extend to 0 and 5 V. Best to use signals under 4.5 V peak-to-peak.