SLICE6 AIR Sensor Interface

September 2024

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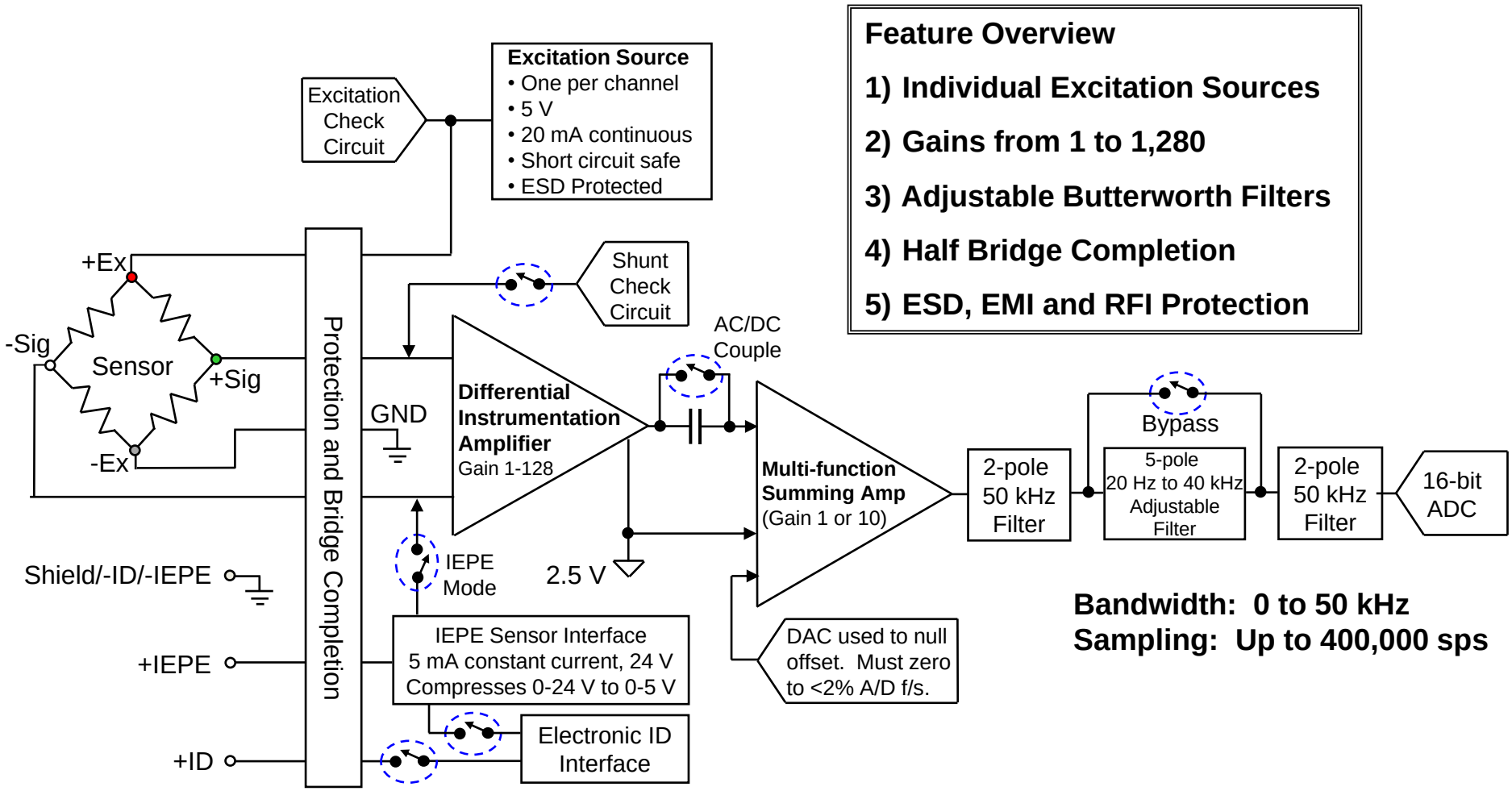
SLICE6 AIR DAS Channel Architecture



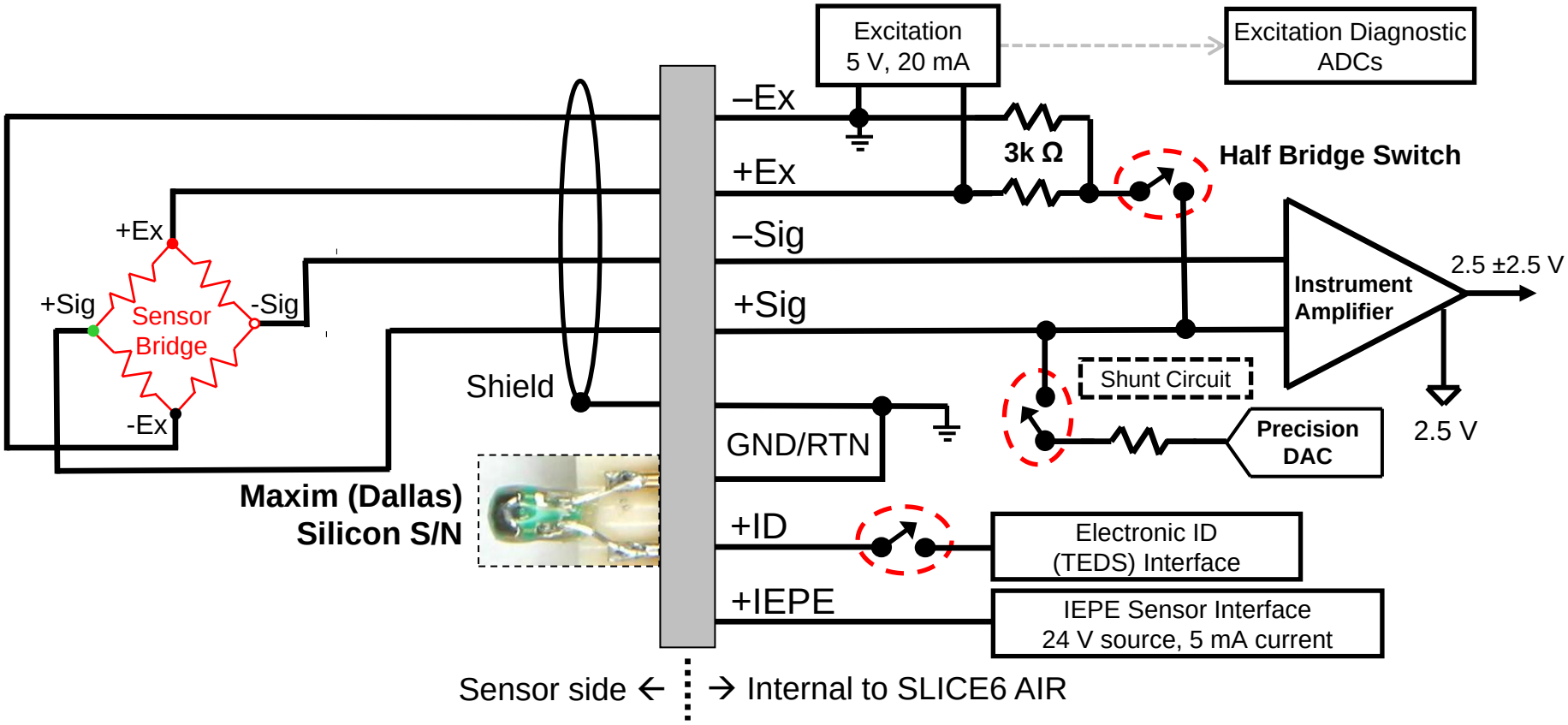
Feature Overview

1) **Individual Excitation Sources**
2) **Gains from 1 to 1,280**
3) **Adjustable Butterworth Filters**
4) **Half Bridge Completion**
5) **ESD, EMI and RFI Protection**

Bandwidth: 0 to 50 kHz
Sampling: Up to 400,000 sps

SLICE6 AIR Sensor Interface – Analog

- +/- Signal are connected to a true differential Instrumentation Amplifier (IA).
- Common Mode Range of the IA is 0-5 V with respect to ground (–Ex).
- +/- Signal inputs must both be connected, either externally or using half bridge completion.
- The maximum signal swing is 0-5 V or ±2.5 V (with a 2.5 V center).



SLICE6 and SLICE6 AIR 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 • 2-wire • 3-wire • Bridge-Completion Module	✓ ✓ ✓	✓ ✓ ✓	
Potentiometer • 2-wire • 3-wire • 4-wire	✓ ✓ ✓	✓ ✓ ✓	See Strain Gauge Use Bridge Transducer diagram

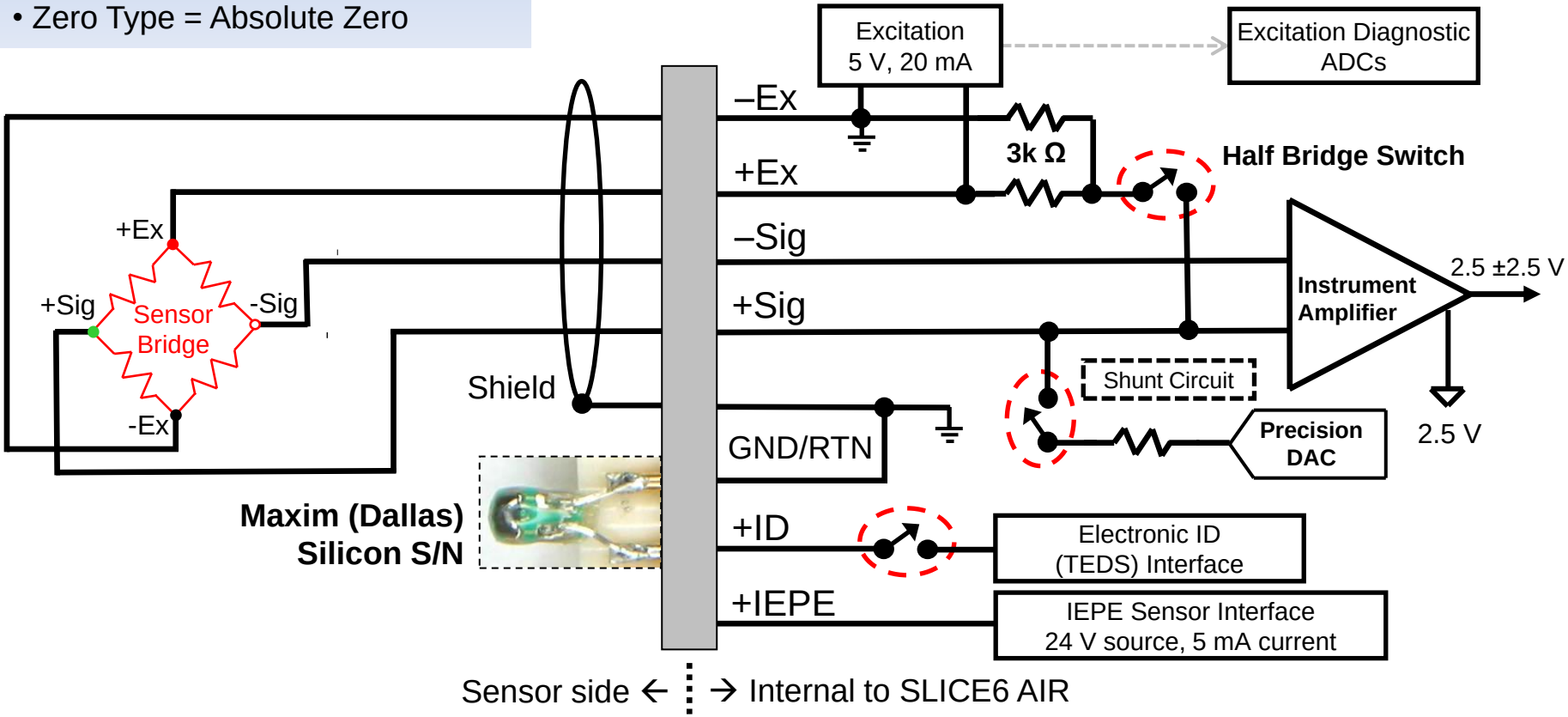
Accelerometer
• Piezoresistive
  • 3-wire (Active)
  • 4-wire
• IEPE
	✓
	✓
	✘
		✓
		✓
		✓
			Example: Endevco 7264

SLICE6 and SLICE6 AIR Sensor Support

Sensor Type	SLICE6	SLICE6 AIR	Notes
Switch Closure	✓	✓	Use Switch Closure Cable
RTD	✓	✓	Example: PT100
Thermocouple Adapter	✓	✓	Example: Texense THA Thermocouple Adapter Article: Sensor Setup DTS Texense Thermocouple Adapter
Magnetic Pickup	✓	✓	
Discrete Digital	✓	✓	SLICE6: Use Signal Generator Wiring SLICE6 AIR: Use Direct Digital Connections

Bridge Transducer Input

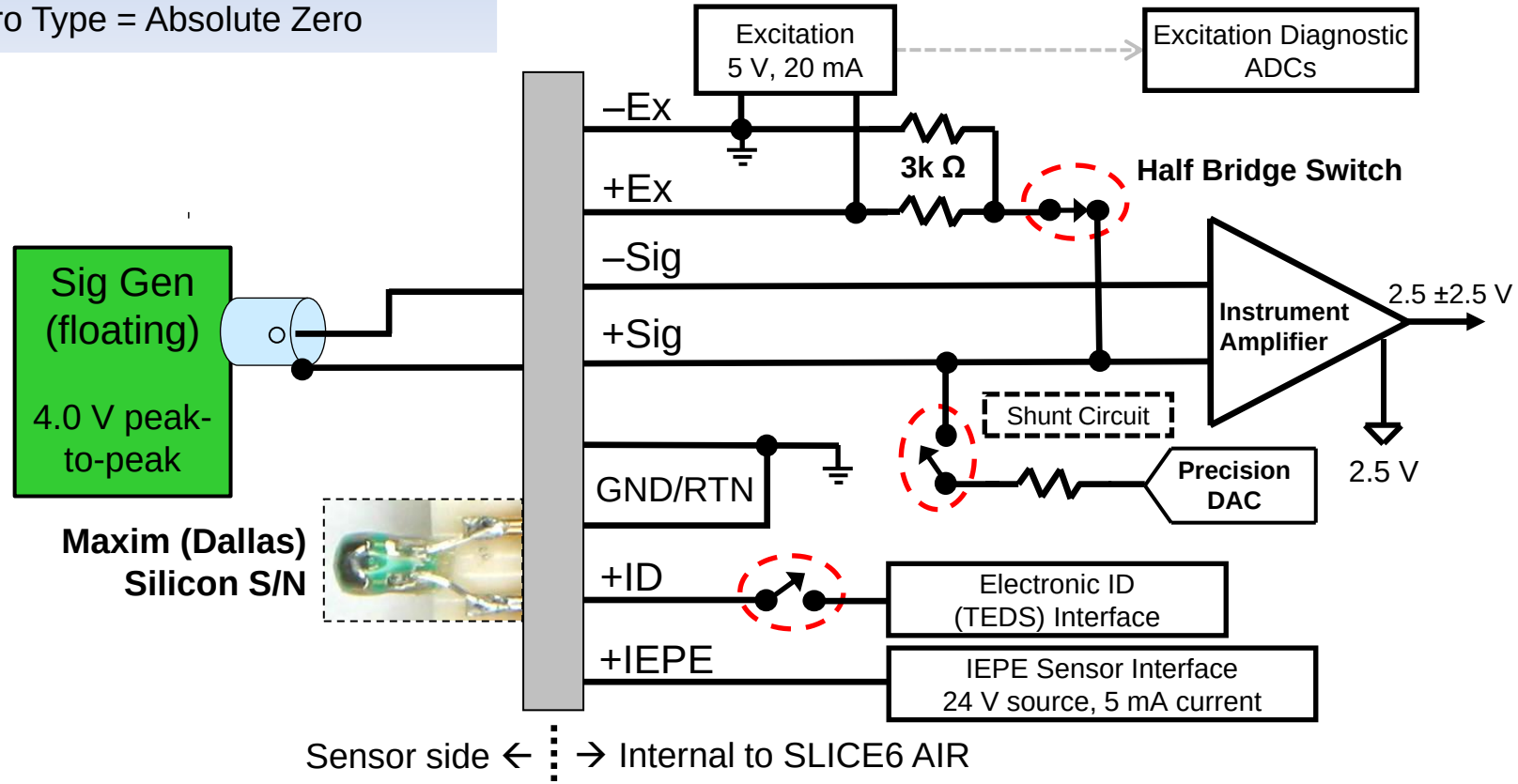
Sensor Settings
- Proportional to Excitation = No
- Sensitivity = 1.000 mV/EU
- Desired Range = 2000
- Units = mV
- Sensor Type = Full Bridge
- Remove Offset = No
- Zero Type = Absolute Zero



Signal Generator (Floating)

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

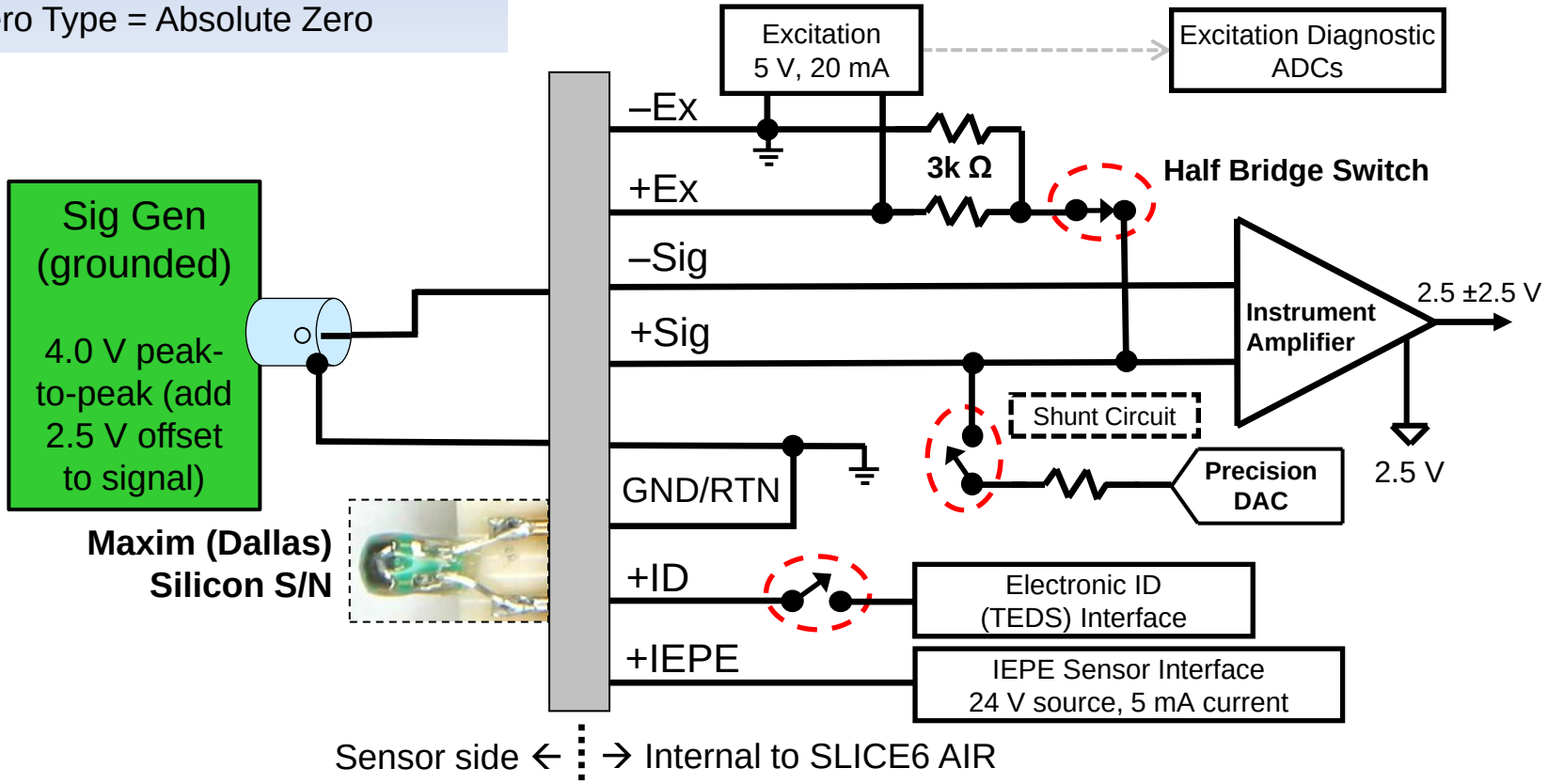
Analog notes:
- Signal generator must float with respect to ground or alternate connection method must be used.



Signal Generator (Grounded)

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

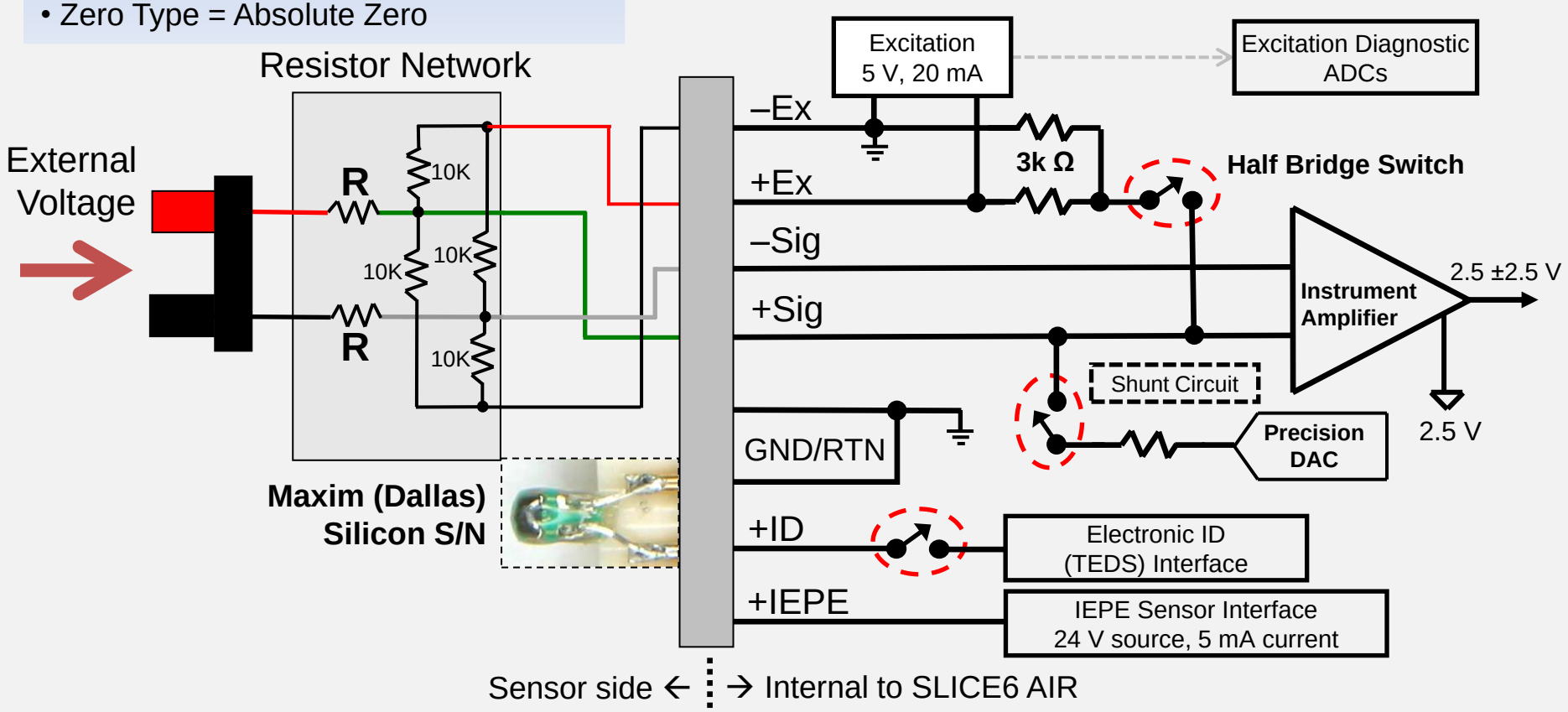
Analog notes:
- Signal generator must be grounded.
- Add 2.5 V of offset to the signal generator output.



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

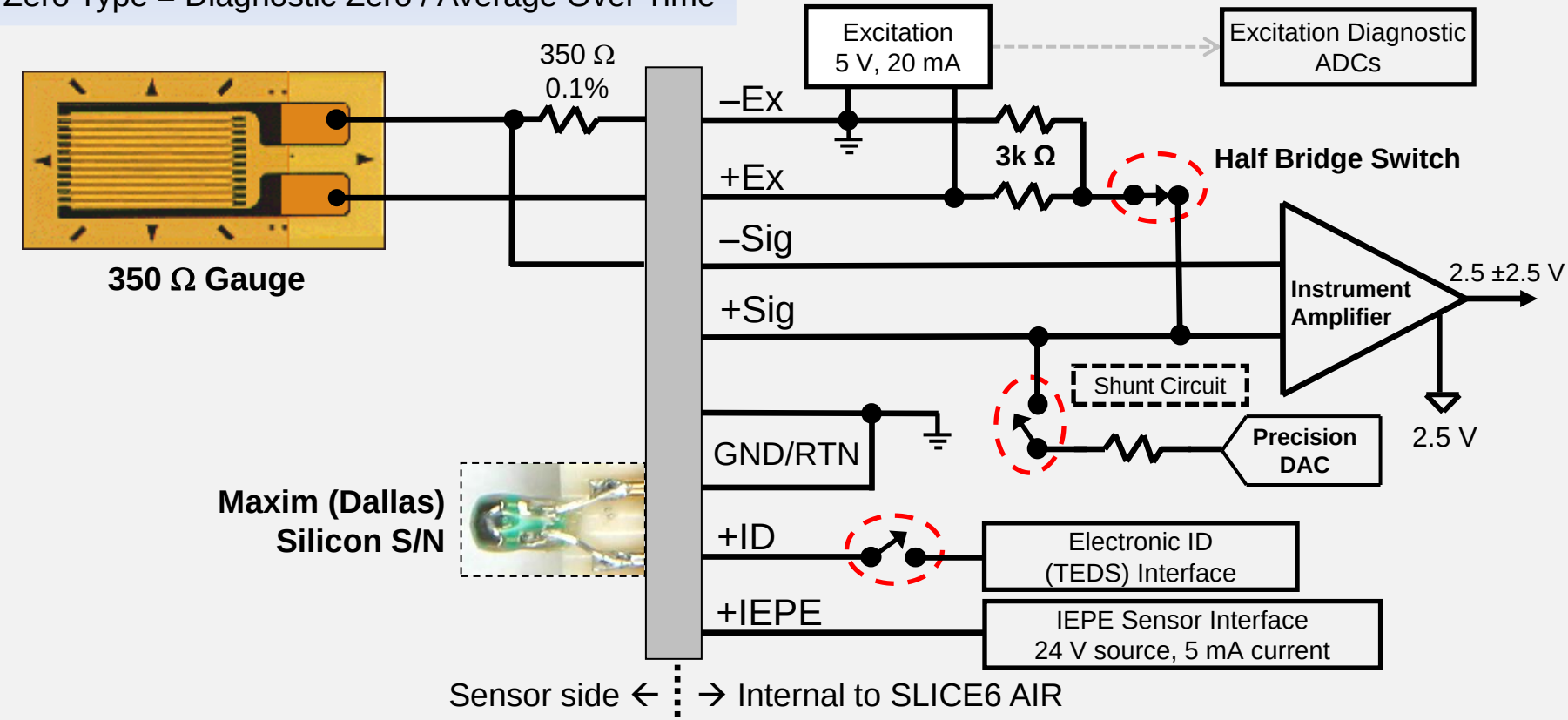
For more information on using a voltage range expander, see this article:
- Voltage Range Expander: Measuring High Voltages from 5V to 800V



Strain Gauge (2-Wire)

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

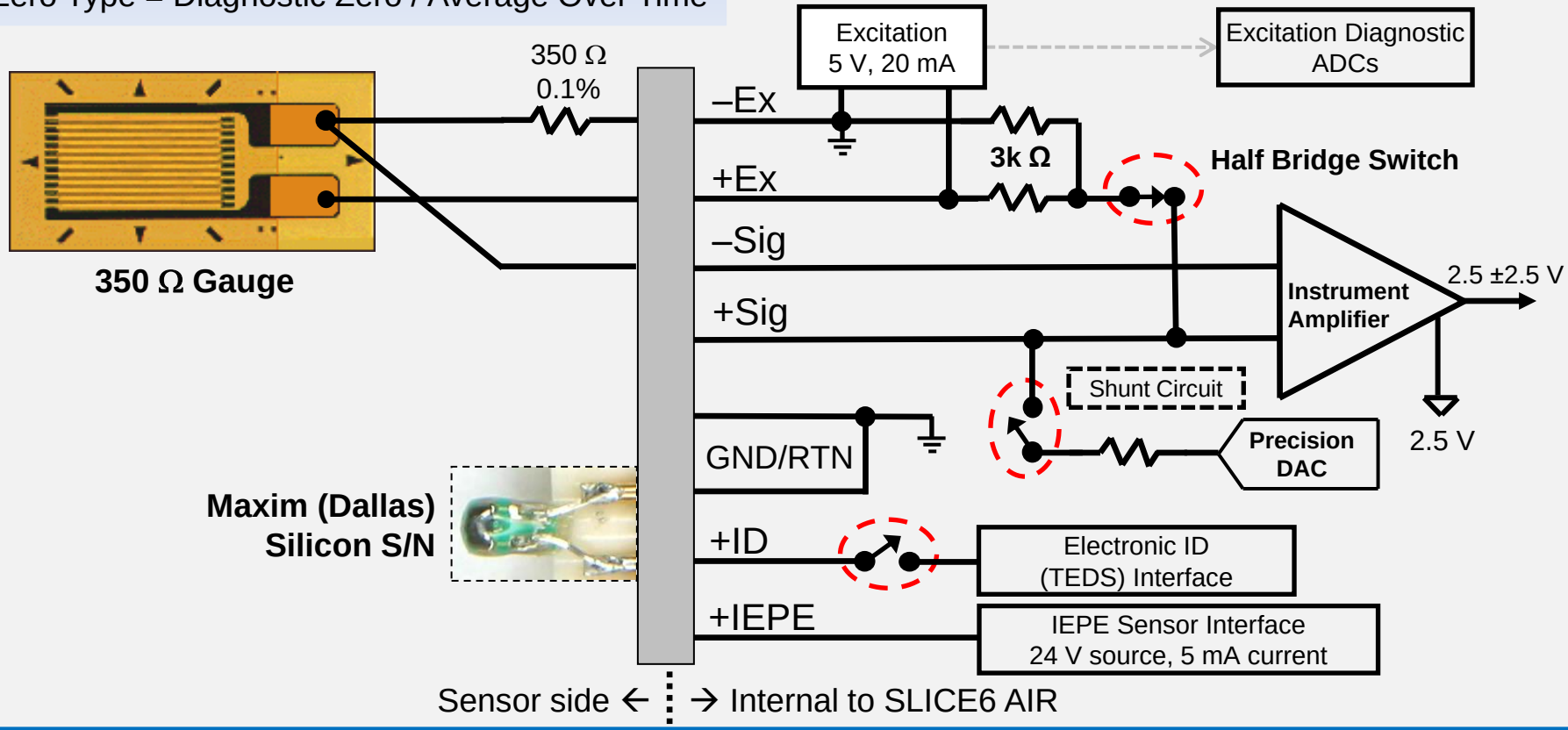
Notes:
- NOT RECOMMENDED for cable length runs longer than 6 meters.



Strain Gauge (3-Wire)

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

Notes:
- NOT RECOMMENDED for cable length runs longer than 6 meters.



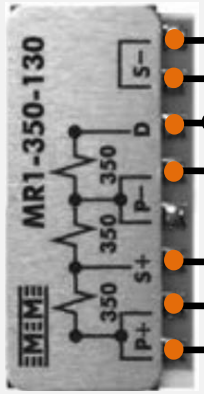
Strain Gauge (Full Bridge)

Sensor Settings

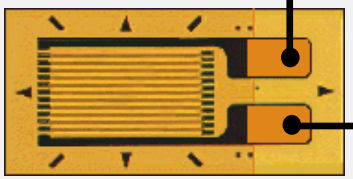
- Proportional to Excitation = Yes
- Sensitivity = *per sensor specs (mV/V/EU)*
- Desired Range = *per sensor specs*
- Units = µS
- Sensor Type = Full Bridge
- Remove Offset = Yes
- Zero Type = Diagnostic Zero / Average Over Time

Connection notes:

- Recommended for longer cable runs. Bridge completion module should be placed as close as possible to strain gauge location.

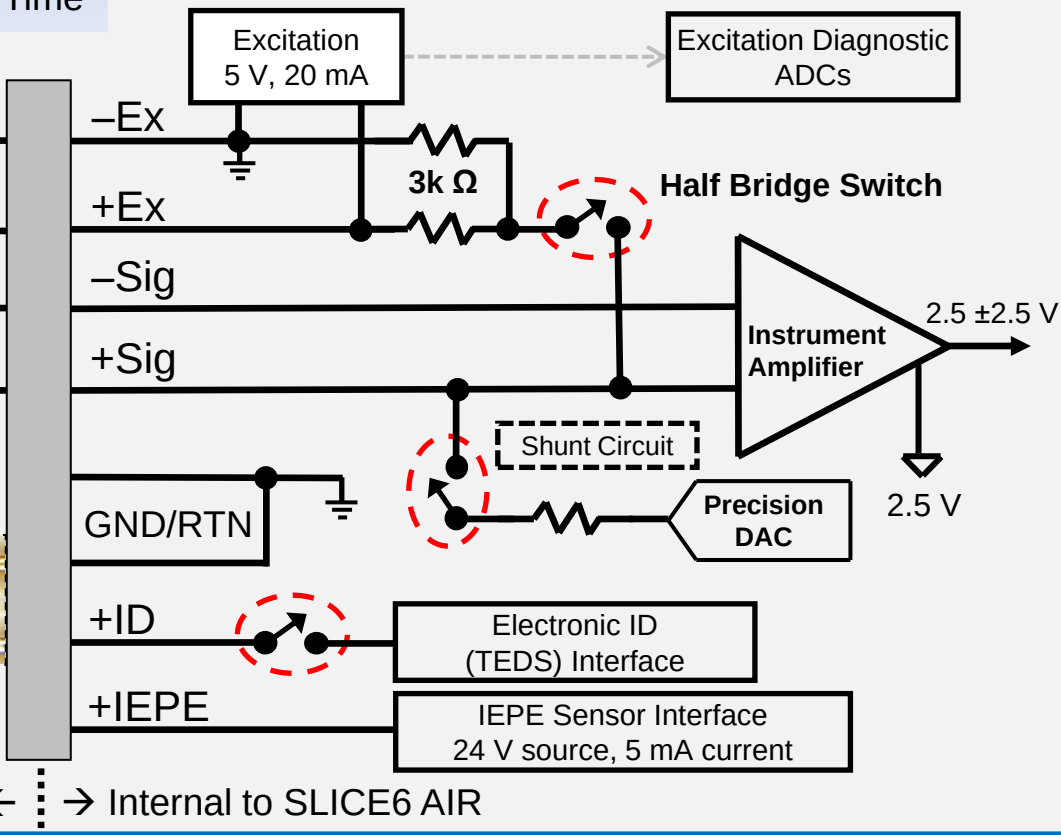


Micro-Measurements Bridge Completion Module



350 Ω Gauge

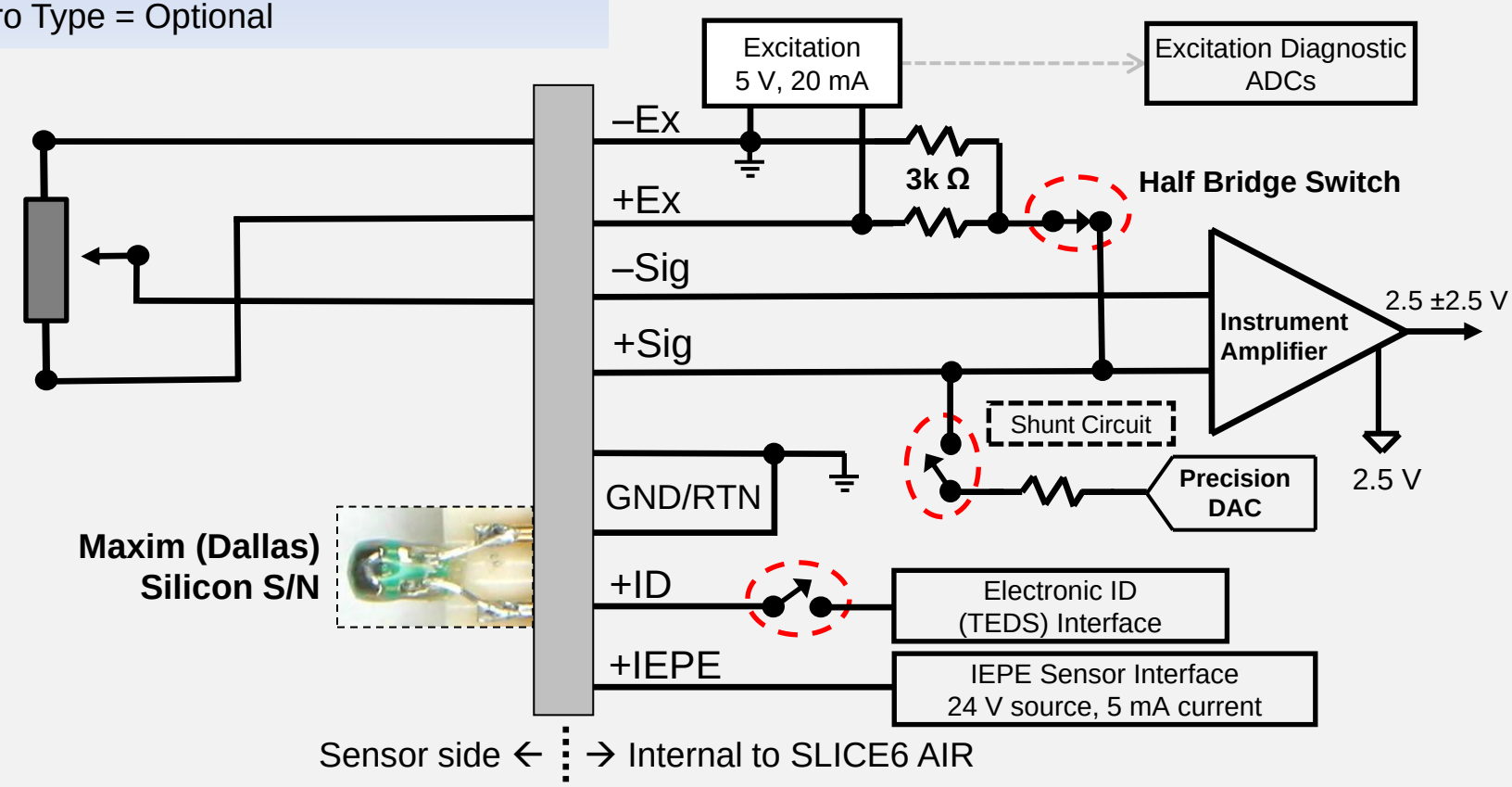
Maxim (Dallas) Silicon S/N



Potentiometer: 3-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 = Half Bridge
- Remove Offset = Optional
- Zero Type = Optional

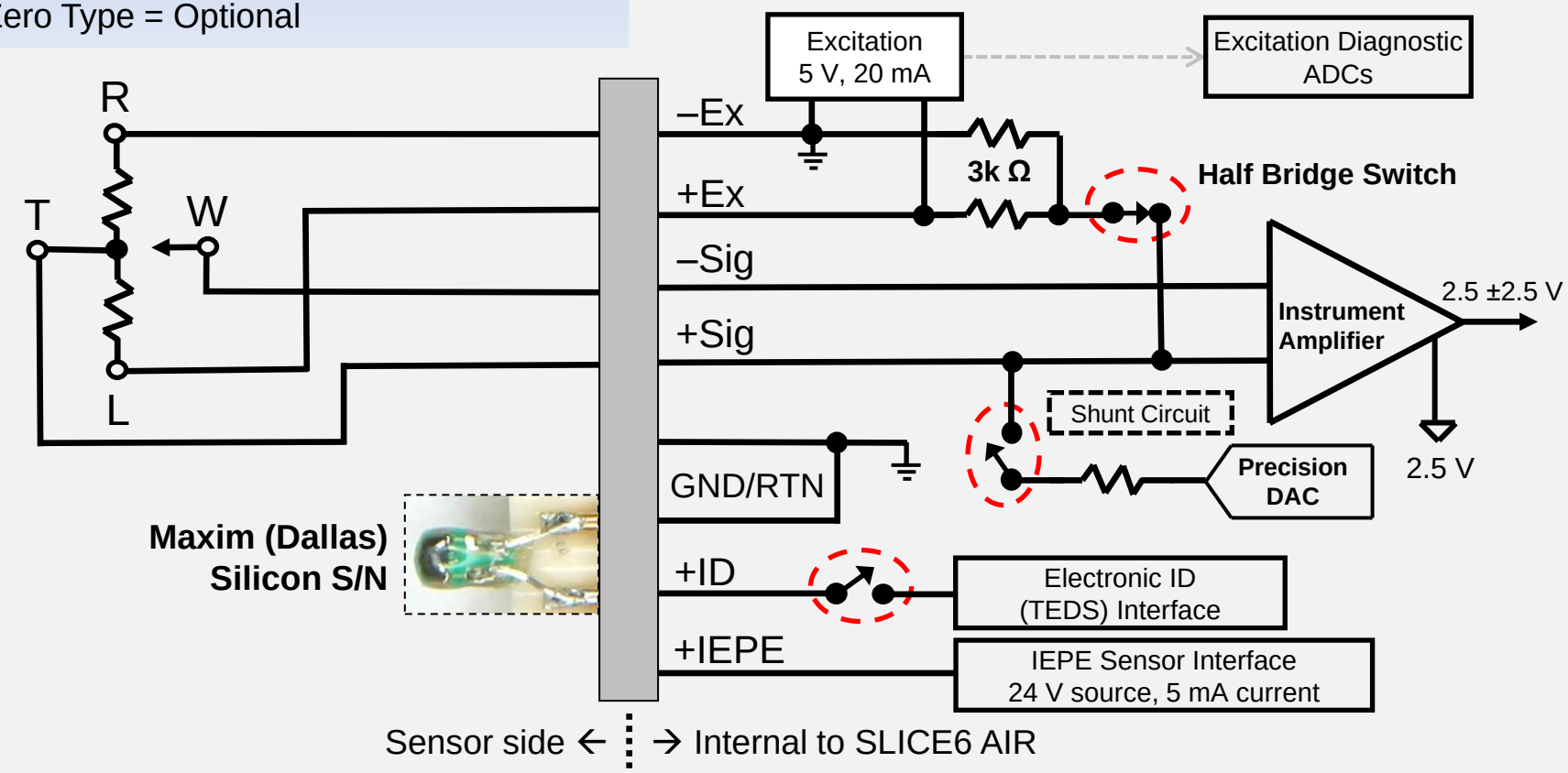
Notes:
- You can make absolute or relative measurements with potentiometers.
- For absolute measurements, you may have to use the “absolute” zero method and adjust the initial engineering units (EU) value based on the sensor calibration. See software manuals for descriptions of Zero Type.



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 = Half Bridge
- Remove Offset = Optional
- Zero Type = Optional

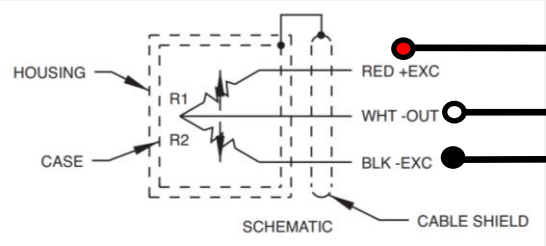
Notes:
- You can make absolute or relative measurements with potentiometers.
- For absolute measurements, you may have to use the “absolute” zero method and adjust the initial engineering units (EU) value based on the sensor calibration. See software manuals for descriptions of Zero Type.



Accelerometer: 3-Wire

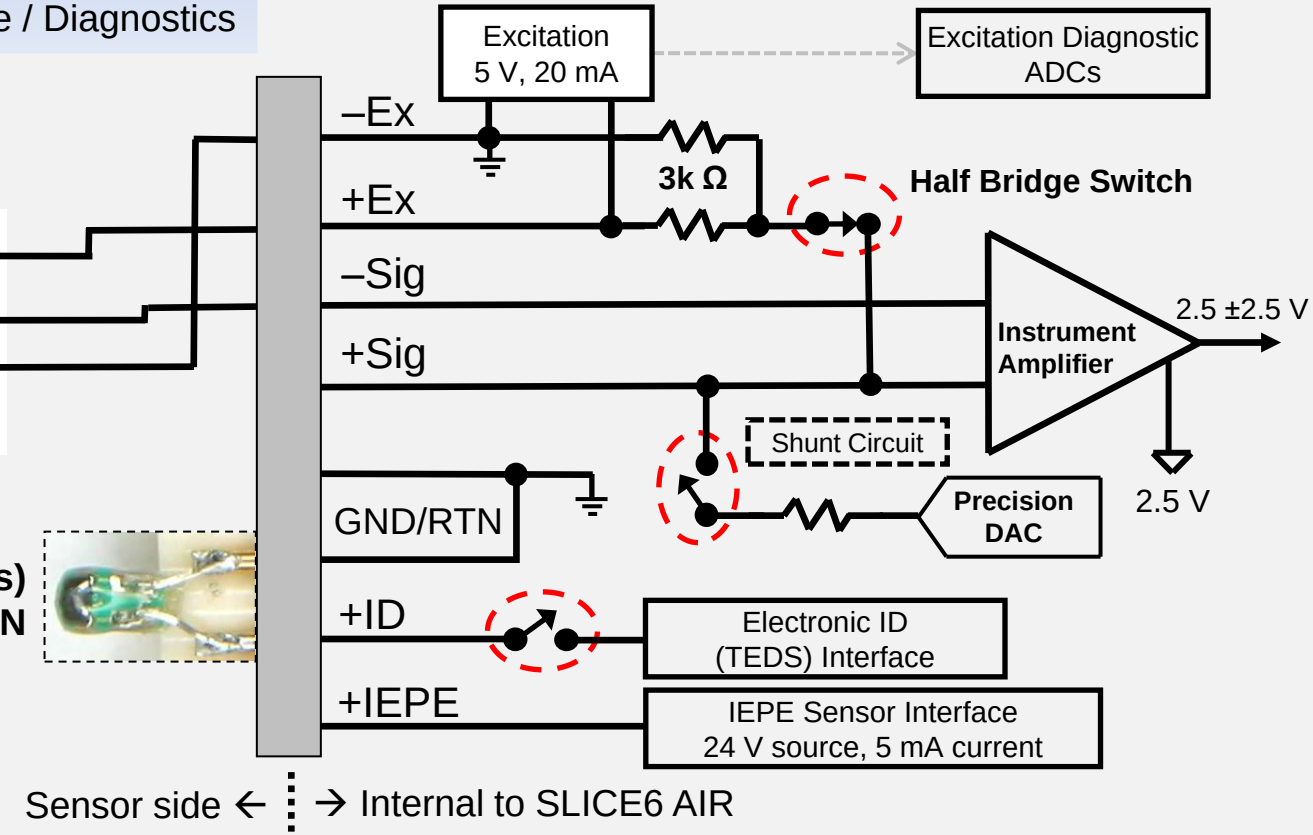
Sensor Settings
- Proportional to Excitation = Yes
- Sensitivity = *per sensor specifications*
- Desired Range = *per sensor specifications*
- Units = g
- Sensor Type = Half Bridge
- Remove Offset = Yes
- Zero Type = Average Over Time / Diagnostics

Notes:
- Noise performance may not be as good as a full bridge accelerometer.
- Thermal drift may be higher than with a full bridge accelerometer.



**1/2 Bridge Accel*
(or similar)

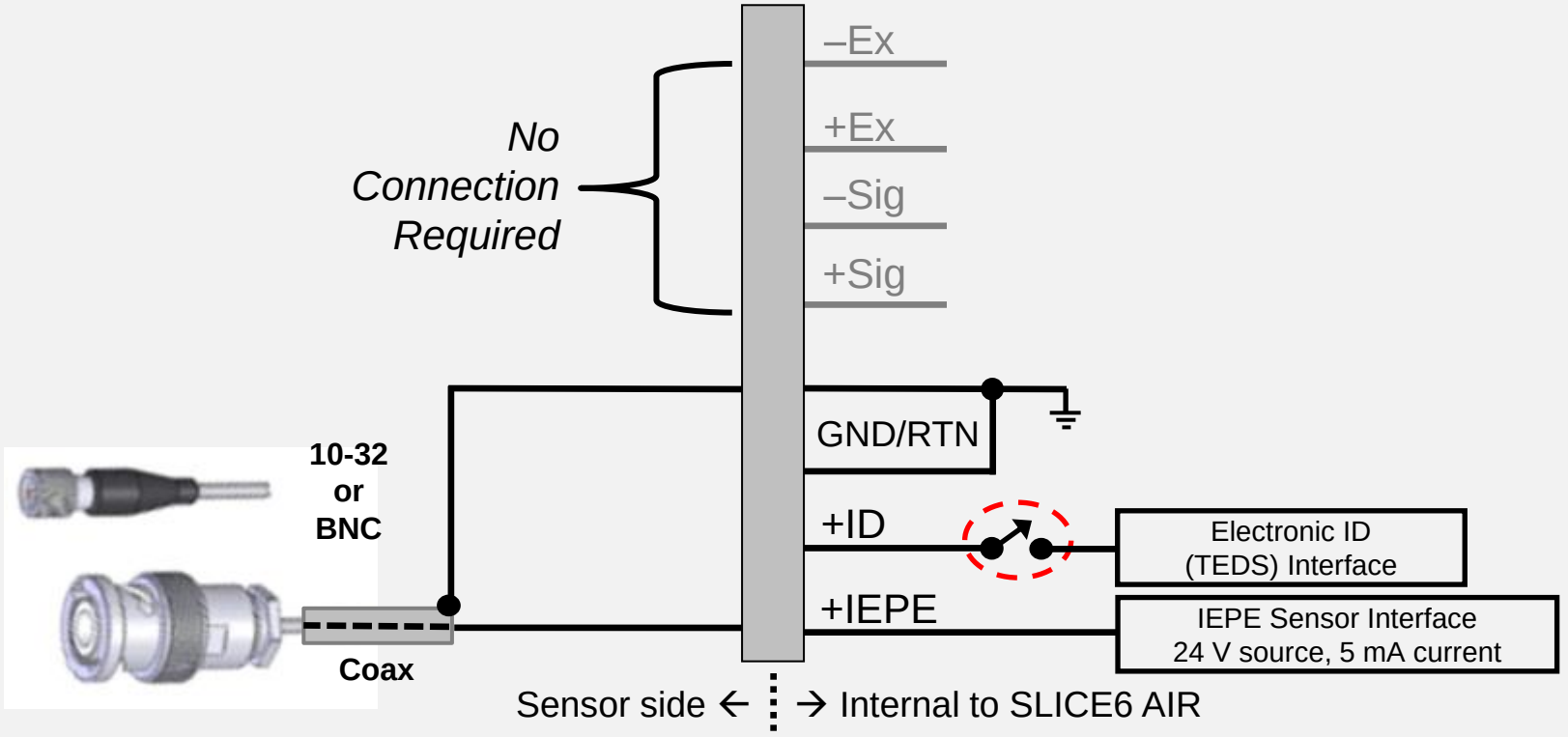
Maxim (Dallas)
Silicon S/N



IEPE Accelerometer

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

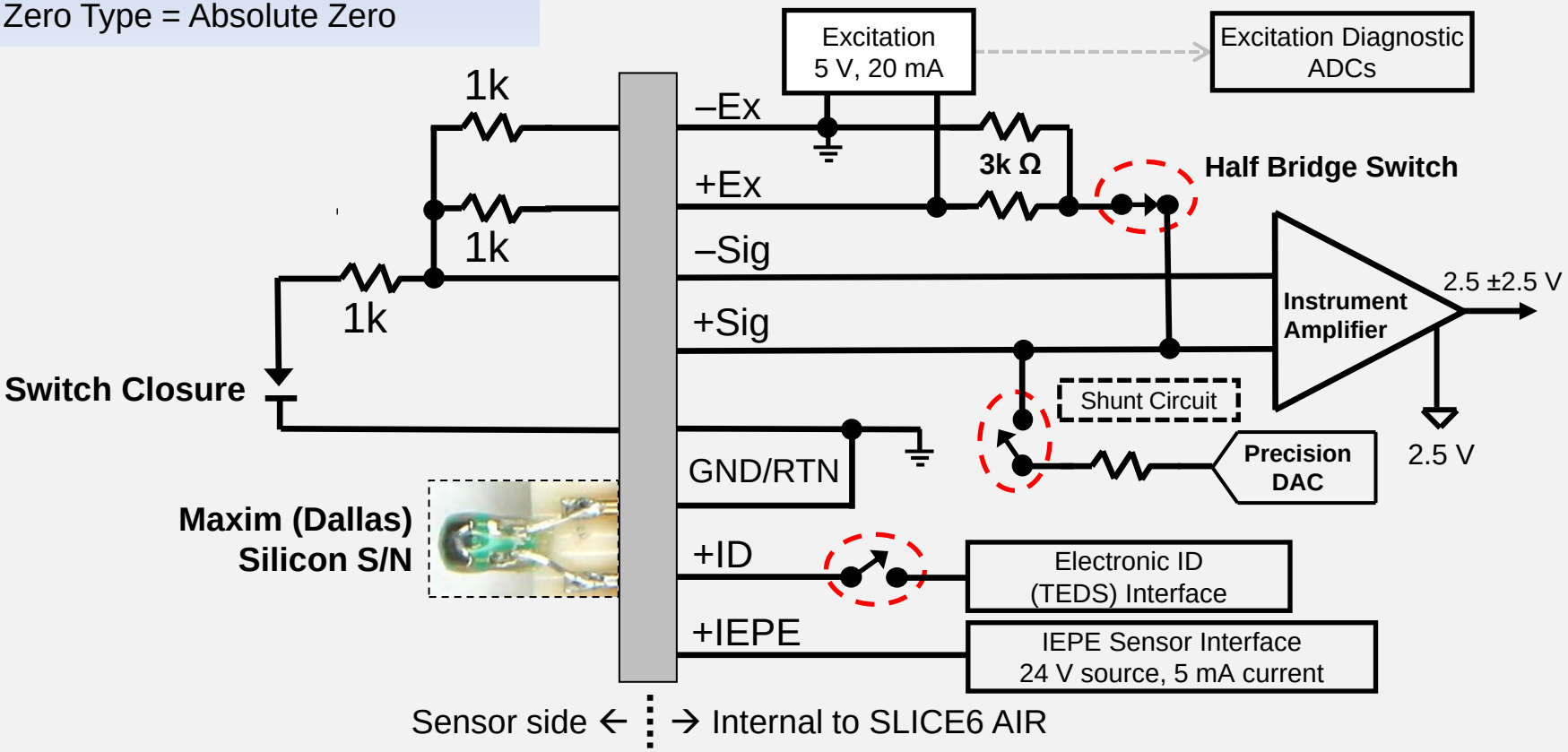
Notes:
- For DTS DAS, both AC and DC coupling are supported. See this article for more information: https://support.dtsweb.com/hc/en-us/articles/204237393-SLICE-IEPE-AC-or-DC-Coupling-



Switch Closure

Sensor Settings at 5 V Excitation
- Proportional to Excitation = No
- Sensitivity = 83.3 *mV/EU*
- Desired Range = 10 EU
- Units = Switch Closure
- Sensor Type = Half Bridge
- Remove Offset = No
- Zero Type = Absolute Zero

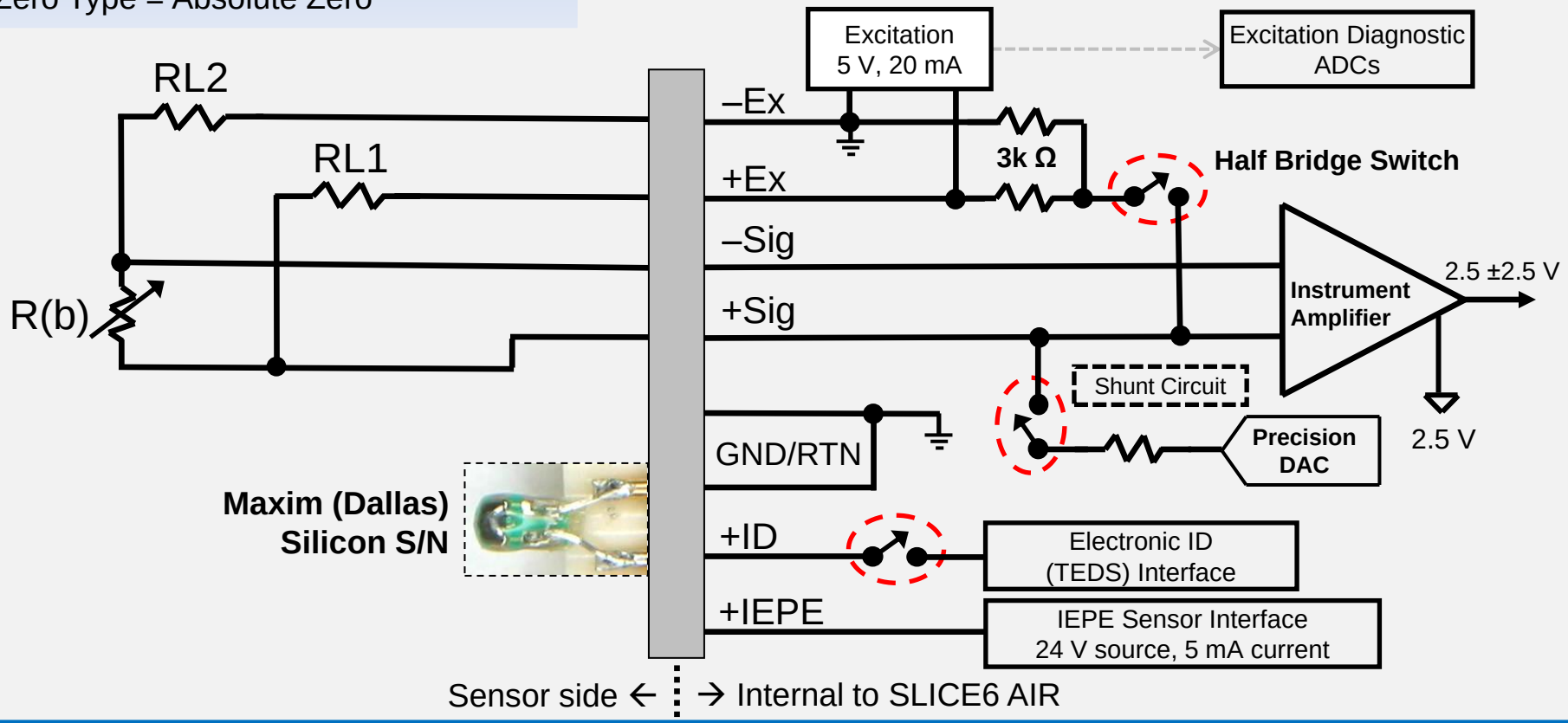
Notes:
- Resistor network and connections protect DAS from potential harmful exposures (ESD, EMI, etc.).
- As shown, sensor settings will result in a 0 to 10 unit step upon switch closure incident.



RTD: 4-Wire

Sensor Settings
- Proportional to Excitation = No
- Sensitivity = *per sensor specs (mV/EU)*
- Desired Range = *per sensor specs*
- Units = Deg C or Deg F
- 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

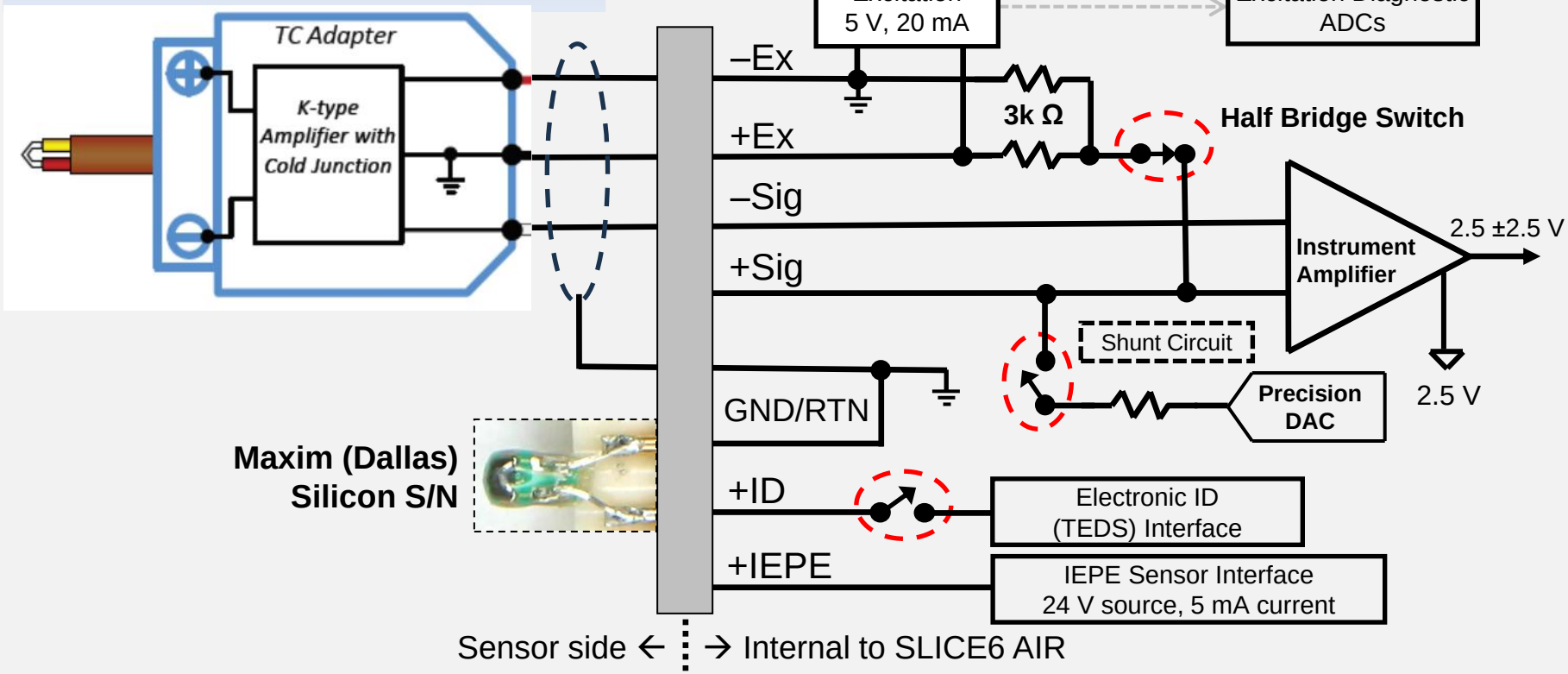


Thermocouple Adapter

Sensor Settings
- Proportional to Excitation = No
- Sensitivity = Per Sensor Specs*
- Desired Range = ½ *Full Sensor Range**
- Units = *per sensor specs**
- Sensor Type = Half Bridge
- 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)



Magnetic Pickup

Sensor Settings

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