sbRIO-9218 Specifications

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Contents

sbRIO-9218 Specifications

Definitions

Warranted specifications describe the performance of a model under stated operating conditions and are covered by the model warranty.

Characteristics describe values that are relevant to the use of the model under stated operating conditions but are not covered by the model warranty.

- ***Typical*** specifications describe the performance met by a majority of models.
- ***Nominal*** specifications describe an attribute that is based on design, conformance testing, or supplemental testing.

Specifications are ***Typical*** unless otherwise noted.

Conditions

Specifications are valid for the range -40 °C to 70 °C unless otherwise noted.

General Characteristics

Number of channels	2 analog input channels
ADC resolution	24 bits
Type of ADC	Delta-Sigma
Sampling mode	Simultaneous

TEDS support	IEEE 1451.4 TEDS Class 1
Internal master timebase (f_M)	
Frequency	13.1072 MHz
Accuracy	100 ppm

Figure 1. Data Rates

$\frac{f_M \div 256}{n}$, $n = 1, 2, \ldots, 31$ $\frac{f_M \div 256}{n}$, $n = 1, 2, \ldots, 31$

Data rate range (f_S) using internal master timebase	
Minimum	1.652 kS/s
Maximum	51.2 kS/s
Data rate range (f_S) using external master timebase	
Minimum	1 kS/s
Maximum	51.367 kS/s
Overvoltage protection	
Pin 2 to Pin 3	-20 V to 30 V
Any other pin-to-pin	±30 V

Note Be aware when processing acquisitions that include full-scale data. Full-scale data readings indicate that an over-range has occurred in the analog front-end.

±16 V Characteristics

Input coupling	DC
Measurement range	
Typical	±16.3 V
Minimum	±16.0 V

Table 1. ±16 V Accuracy

Measurement Conditions		**Gain Error**	**Offset Error**
Calibrated	Typical, 23 °C ±5 °C	0.08%	0.70 mV
	Maximum, -40 °C to 70 °C	0.20%	9 mV
Uncalibrated[1]	Typical, 23 °C ±5 °C	1.2%	50 mV
	Maximum, -40 °C to 70 °C	2.0%	70 mV

Gain drift	15 ppm/°C
Offset drift	32 µV/°C

Integral non-linearity (INL)	150 µV
Input noise, RMS	
51.2 kS/s	128 µV
25.6 kS/s	107 µV
4.27 kS/s	81 µV
Input impedance	390 kΩ
Input bandwidth, -3 dB	0.49 f_s
Flatness, DC-20 kHz, referred to 1 kHz	
Typical	±30 mdB
Maximum	±50 mdB
Phase non-linearity, DC-20 kHz	0.30°
Input delay	$(40 + [5/512])/f_s + 5.3$ µs
Stopband	
Frequency	0.55 f_s

Rejection	100 dB
Alias-free bandwidth	0.45 f_S
Oversample rate	64 f_S
Rejection at oversample rate (f_S = 51.2 kS/s)	100 dB
Total Harmonic Distortion (THD), 1 kHz, -3 dBFS	-100 dBc
Spurious-Free Dynamic Range (SFDR), 1 kHz, 1 V RMS	101 dB
Crosstalk	
60 Hz, 1 V RMS, common mode	-120 dBFS
1 kHz normal mode, full-scale aggressor	-109 dBFS
CMRR, 60 Hz 1 V RMS-to-earth ground	-120 dBFS
Powered sensor 12 V excitation	
Voltage level	12 V ±5%
Voltage noise, RMS 100 kHz bandwidth	1 mV
Output current	

Typical	50.5 mA
Minimum	46.5 mA
Settling Time (to 1 % of final value after enabling)	200 ms

±65 mV Characteristics

Input coupling	DC
Measurement range	
Typical	73.5 mV
Minimum	72 mV

Table 2. ±65 mV Accuracy

Measurement Conditions		**Gain Error**	**Offset Error**
Calibrated	Typical, 23 °C±5 °C	0.13%	8 µV
	Maximum, -40 °C to 70 °C	0.20%	130 µV
Uncalibrated[2]	Typical, 23 °C±5 °C	1.2%	300 µV
	Maximum, -40 °C to 70 °C	2.0%	450 µV

Gain drift	10 ppm/°C

Offset drift	320 nV/°C
Input noise, RMS	
51.2 kS/s	4.3 µV
25.6 kS/s	3 µV
4.27 kS/s	1.3 µV
Input impedance	>10 MΩ
Input bandwidth, -3 dB	0.49 f_S
Flatness, DC-20 kHz, referred to 1 kHz	
Typical	-40 mdB to 0 mdB
Maximum	-150 mdB to 20 mdB
Phase non-linearity, DC-20 kHz	0.2°
Input delay	(40 + [5/512])/f_S + 3.9 µs
Stopband	
Frequency	0.55 f_S

Rejection	100 dB
Alias-free bandwidth	0.45 f_S
Oversample rate	64 f_S
Rejection at oversample rate (f_S = 51.2 kS/s)	100 dB
Total Harmonic Distortion (THD), 1 kHz, -1 dBFS	-95 dBc
Spurious-Free Dynamic Range (SFDR), 1 kHz, -1 dBFS	95 dB
Crosstalk	
60 Hz, 1 V RMS, common mode	-120 dBFS
1 kHz normal mode, full-scale aggressor	-109 dBFS
CMRR, 60 Hz, 1 V RMS-to-earth ground	-133 dBFS
Powered sensor 12 V excitation	
Voltage level	12 V ±5%
Voltage noise, RMS 100 kHz bandwidth	1 mV
Output current	

Typical	50.5 mA
Minimum	46.5 mA
Settling Time (to 1% of final value after enabling)	200 ms

Full-Bridge Characteristics

Input coupling	DC
Measurement range	
Typical	22.1 mV/V
Minimum	21.7 mV/V

Table 3. Full-Bridge Accuracy

Measurement Conditions			Gain	Offset	
				Without Offset Null	≤ 90 days, ±5 °C from Offset Null
Calibrated	3.3 V Excitation	Typical, 23 °C ±5 °C	0.10%	2.4 µV/V	0.5 µV/V
		Maximum -40 °C to 70 °C	0.20%	40 µV/V	5 µV/V
	2 V Excitation	Typical, 23 °C ±5 °C	0.10%	30 µV /V	0.8 µV/V
		Maximum -40 °C to 70 °C	0.20%	87 µV/V	8 µV/V
Uncalibrated[3]	3.3 V Excitation	Typical, 23 °C±5 °C	1.2%	100 µV/V	—

Measurement Conditions			Gain	Offset	
				Without Offset Null	≤ 90 days, ±5 °C from Offset Null
		Maximum -40 °C to 70 °C	2.0%	150 µV/V	—
	2 V Excitation	Typical, 23 °C±5 °C	1.2%	120 µV/V	—
		Maximum -40 °C to 70 °C	2.0%	200 µV/V	—

Gain drift	10 ppm/°C
Offset drift	
3.3 V excitation	100 nV/V/°C
2 V excitation	160 nV/V/°C

Table 4. Input Noise, RMS

Excitation Voltage	Sample Rate		
	4.27 kS/s	25.6 kS/s	51.2 kS/s
3.3 V	0.4 µV/V	1.0 µV/V	1.3 µV/V
2 V	0.7 µV/V	1.6 µV/V	2.1 µV/V

Differential input impedance	>10 MΩ
Input bandwidth, -3 dB	0.49 f_S
Flatness, DC-20 kHz, referred to 1 kHz	

Typical	-40 mdB to 0 mdB
Maximum	-150 mdB to 20 mdB
Phase non-linearity, DC-20 kHz	0.2°
Input delay	(40 + [5/512])/f_S + 3.9 µs
Stopband	
Frequency	0.55 f_S
Rejection	100 dB
Alias-free bandwidth	0.45 f_S
Oversample rate	64 f_S
Rejection at oversample rate (f_S = 51.2 kS/s)	100 dB
Total Harmonic Distortion (THD), 1 kHz, -1 dBFS	-95 dBc
Spurious-Free Dynamic Range (SFDR), 1 kHz, -1 dBFS	95 dB
Crosstalk	

60 Hz, 1 V RMS, common mode	-120 dBFS
1 kHz, normal mode, full-scale aggressor	-109 dBFS
CMRR, 60 Hz, 1 V RMS-to-earth ground	-133 dBFS
Shunt calibration accuracy	50 kΩ ±0.2%
Strain excitation voltage	
2 V level	2 V ±3%
3.3 V level	3.3 V ±3%
Output current	
2 V level	17.8 mA
3.3 V level	10.1 mA

IEPE Characteristics

Input coupling	AC
Measurement range	
Typical	5.33 V

Minimum	5.0 V

Table 5. IEPE Accuracy

Measurement Conditions		Gain Error
Calibrated	Typical, 23 °C±5 °C	0.20% (0.017 dB)
	Maximum, -40 °C to 70 °C	0.40% (0.034 dB)
Uncalibrated[4]	Typical, 23 °C±5 °C	1.7% (0.146 dB)
	Maximum, -40 °C to 70 °C	2.0% (0.172 dB)

Residual DC offset	<150 mV
Gain drift	25 ppm/°C
Input noise, RMS	
51.2 kS/s	50 µV
25.6 kS/s	38 µV
4.27 kS/s	25 µV
Input impedance	300 kΩ
Input bandwidth, -3 dB	0.49 f_s
Flatness, 10 Hz-20 kHz, referred to 1 kHz	

Typical	±25 mdB
Maximum	±40 mdB

Phase non-linearity, 100 Hz-20 kHz	0.25°
AC cutoff frequency, -3 dB	0.5 Hz
Input delay	(40 + [5/512])/f_S + 3.9 µs

Stopband

Frequency	0.55 f_S
Rejection	100 dB

Alias-free bandwidth	0.45 f_S
Oversample rate	64 f_S
Rejection at oversample rate (f_S = 51.2 kS/s)	100 dB
Total Harmonic Distortion (THD), 1 kHz, -3 dBFS	-102 dBc
Spurious-Free Dynamic Range (SFDR), 1 kHz, 1 V RMS	107 dB

Intermodulation Distortion (IMD), (CCIF 11 kHz/12 kHz)	-97 dB
Crosstalk	
60 Hz, 1 V RMS, common mode	-120 dBFS
1 kHz normal mode, full-scale aggressor	-109 dBFS
CMRR, 60 Hz, 1 V RMS-to-earth ground	-122 dBFS
IEPE excitation current	
Typical	2.2 mA
Minimum	2.1 mA
Compliance voltage	
Typical	20.5 V
Minimum	19.5 V

If you are using an IEPE sensor, use the following equation to ensure that your configuration meets the IEPE compliance voltage range. This equation must resolve to 0 to 19.5.

Figure 2. IEPE Compliance Voltage Equation

$V_{bias} \pm V_{full\text{-}scale}$ $V_{bias} \pm V_{full\text{-}scale}$

where

- V_{bias}
  is the bias voltage of the IEPE sensor
- $V_{full\text{-}scale}$
  is the full-scale voltage of the IEPE sensor

±20 mA Characteristics

The ±20 mA measurement type requires the NI-9983 measurement-specific adapter. The characteristics are for the sbRIO-9218 used in conjunction with the NI-9983.

Input coupling	DC
Measurement range	
Typical	24.4 mA
Minimum	23.0 mA

Table 6. ±20 mA Accuracy

Measurement Conditions		**Gain Error**	**Offset Error**
Calibrated	Typical, 23 °C±5 °C	0.40%	5 µA
	Maximum, -40 °C to 70 °C	0.60%	42 µA
Uncalibrated[5]	Typical, 23 °C±5 °C	1.5%	100 µA
	Maximum, -40 °C to 70 °C	2.0%	150 µA

Gain drift	35 ppm/°C
Offset drift	105 nA/°C

Shunt resistance	3.01 Ω
Input noise, RMS	
51.2 kS/s	1.4 µA
25.6 kS/s	1.0 µA
4.27 kS/s	0.5 µA
Input impedance	45 Ω ±30%
Input bandwidth, -3 dB	0.49 f_S
Input delay	(40 + [5/512])/f_S + 3.9 µs
Stopband	
Frequency	0.55 f_S
Rejection	100 dB
Alias-free bandwidth	0.45 f_S
Oversample rate	64 f_S
Rejection at oversample rate (f_S = 51.2 kS/s)	100 dB

Crosstalk	
60 Hz, 1 V RMS, common mode	-120 dBFS
1 kHz normal mode, full-scale aggressor	-109 dBFS
CMRR, 60 Hz, 1 V RMS-to-earth ground	-99 dBFS
Powered sensor 12 V excitation	
Voltage level	12 V ±5%
Voltage noise, RMS, 100 kHz bandwidth	1 mV
Output current	
Typical	50.5 mA
Minimum	46.5 mA
Settling Time (to 1% of final value after enabling)	200 ms

±60 V Characteristics

The ±60 V measurement type requires the NI-9987 measurement-specific adapter. The characteristics are for the sbRIO-9218 used in conjunction with the NI-9987.

Input coupling	DC
Measurement range	

Typical	±62.1 V
Minimum	±60 V

Table 7. ±60 V Accuracy

Measurement Conditions		**Gain Error**	**Offset Error**
Calibrated	Typical, 23 °C±5 °C	0.3%	3 mV
	Maximum, -40 °C to 70 °C	0.6%	40 mV
Uncalibrated[6]	Typical, 23 °C±5 °C	1.3%	200 mV
	Maximum, -40 °C to 70 °C	2.0%	300 mV

Gain drift	30 ppm/°C
Offset drift	120 µV/°C
Integral non-linearity (INL)	15 mV
Input noise, RMS	
51.2 kS/s	500 µV
25.6 kS/s	420 µV
4.27 kS/s	320 µV

Input impedance	1.49 MΩ
Input bandwidth, -3 dB	Lesser of 7 kHz or 0.49 f_S
Flatness, DC to 500 Hz, referred to DC, $f_S \geq 1.652$ kS/s	0.2 dB
Input delay	$(40 + [5/512])/f_S + 27.2$ µs
Stopband	
Frequency	0.55 f_S
Rejection	100 dB
Alias-free bandwidth	0.45 f_S
Oversample rate	64 f_S
Rejection at oversample rate (f_S = 51.2 kS/s)	100 dB
Total Harmonic Distortion (THD), 8 V RMS, 500 Hz	-80 dBc
Spurious-Free Dynamic Range (SFDR), 8 V RMS, 500 Hz	-80 dB
Crosstalk	
60 Hz, 1 V RMS, common mode	-120 dBFS

1 kHz, normal mode, full-scale aggressor	-70 dBFS
CMRR, 60 Hz, 1 V RMS-to-earth ground	-89 dBFS

Half-Bridge Mode Characteristics

The half-bridge measurement type requires the NI-9986 measurement-specific adapter. The characteristics are for the sbRIO-9218 used in conjunction with the NI-9986.

Input coupling	DC
Measurement range	
Typical	22.1 mV/V
Minimum	21.7 mV/V

Table 8. Half-Bridge Accuracy

Measurement Conditions			Gain	Offset	
				Without Offset Null	≤ 90 days, ±5 °C from Offset Null
Calibrated	3.3 V and 2 V excitation	Typical 23 °C±5 °C	0.10%	700 µV/V	45 µV/V
		Maximum -40 °C to 70 °C	0.20%	1,000 µV/V	90 µV/V
Uncalibrated[7]	3.3 V and 2 V excitation	Typical 23 °C±5 °C	1.2%	800 µV/V	—
		Maximum -40 °C	2.0%	1.1 mV/V	—

Measurement Conditions			Gain	Offset	
				Without Offset Null	≤ 90 days, ±5 °C from Offset Null
		to 70 °C			

Gain drift	10 ppm/°C
Offset drift	1.3 µV/V/°C

Table 9. Input Noise, RMS

Excitation Voltage	Sample Rate		
	4.27 kS/s	25.6 kS/s	51.2 kS/s
3.3 V	0.4 µV/V	1.0 µV/V	1.3 µV/V
2 V	0.7 µV/V	1.6 µV/V	2.2 µV/V

Input bandwidth, -3 dB	0.49 f_s
Flatness, DC-20 kHz, referred to 1 kHz	
Typical	-40 mdB to 0 mdB
Maximum	-150 mdB to 20 mdB
Phase non-linearity, DC-20 kHz	0.2°
Input delay	(40 + [5/512])/f_s + 3.9 µs

Stopband	
Frequency	0.55 f_S
Rejection	100 dB
Alias-free bandwidth	0.45 f_S
Oversample rate	64 f_S
Rejection at oversample rate (f_S = 51.2 kS/s)	100 dB
Total Harmonic Distortion (THD), 1 kHz, -1 dBFS	-95 dBc
Spurious-Free Dynamic Range (SFDR), 1 kHz, -1 dBFS	95 dB
Crosstalk	
60 Hz, 1 V RMS, common mode	-120 dBFS
1 kHz, normal mode, full-scale aggressor	-85 dBFS
CMRR, 60 Hz, 1 V RMS-to-earth ground	-73 dBFS
Strain excitation voltage	
2 V level	2 V ±3%

3.3 V level	3.3 V ±3%
Output current	
2 V level	17.8 mA
3.3 V level	10.1 mA

Quarter-Bridge Characteristics

The quarter-bridge measurement type requires the NI-9984 or NI-9985 measurement-specific adapter. The characteristics are for the sbRIO-9218 used in conjunction with the NI-9984 or the NI-9985.

Input coupling	DC
Measurement range	
Typical	22.1 mV/V
Minimum	21.7 mV/V

Table 10. Quarter-Bridge Accuracy

Measurement Conditions			**Gain**	**Offset**	
				Without Offset Null	**≤ 90 days, ±5 °C from Offset Null**
Calibrated	3.3 V and 2 V excitation	Typical 23 °C±5 °C	0.10%	700 µV/V	45 µV/V
		Maximum -40 °C	0.20%	1,000 µV/V	90 µV/V

Measurement Conditions			Gain	Offset	
				Without Offset Null	≤ 90 days, ±5 °C from Offset Null
		to 70 °C			
Uncalibrated[8]	3.3 V and 2 V excitation	Typical 23 °C±5 °C	1.2%	800 µV/V	—
		Maximum -40 °C to 70 °C	2.0%	1.1 mV/V	—

Gain drift	10 ppm/°C
Offset drift	1.3 µV/V/°C
Quarter-bridge completion resistance	
NI-9984	120 Ω
NI-9985	350 Ω

Table 11. Input Noise, RMS

Excitation Voltage	Sample Rate		
	4.27 kS/s	25.6 kS/s	51.2 kS/s
350 Ω, 3.3 V	0.4 µV/V	1.0 µV/V	1.3 µV/V
120 Ω, 2 V	0.7 µV/V	1.6 µV/V	2.2 µV/V

Input bandwidth, -3dB	0.49 f_S
Flatness, DC-20 kHz, referred to 1 kHz	

Typical	-40 mdB to 0 mdB
Maximum	-150 mdB to 20 mdB
Phase non-linearity, DC-20 kHz	0.2°
Input delay	(40 + [5/512])/f_S + 3.9 µs
Stopband	
Frequency	0.55 f_S
Rejection	100 dB
Alias-free bandwidth	0.45 f_S
Oversample rate	64 f_S
Rejection at oversample rate (f_S = 51.2 kS/s)	100 dB
Total Harmonic Distortion (THD), 1 kHz, -1 dBFS	-95 dBc
Spurious-Free Dynamic Range (SFDR), 1 kHz, -1 dBFS	95 dB
Crosstalk	
60 Hz, 1 V RMS, common mode	-120 dBFS

1 kHz, normal mode, full-scale aggressor	-85 dBFS
CMRR, 60 Hz, 1 V RMS-to-earth ground	-73 dBFS
Strain excitation voltage	
2 V level	2 V ±3%
3.3 V level	3.3 V ±3%
Output current	
2 V level	17.8 mA
3.3 V level	10.1 mA

Safety Voltages

Isolation Voltages

Temporary Overvoltage—An overvoltage condition of a relatively long duration.

Isolation	
Channel-to-channel, channel-to-Vsup inputs (up to 5,000 m)	
Continuous	60 V DC, Measurement Category I
Withstand	1,000 V RMS, verified by a 5 s dielectric withstand test
Channel-to-earth ground (up to 3,000 m)	

Continuous	60 V DC, Measurement Category I
Withstand	1,000 V RMS, verified by a 5 s dielectric withstand test
Channel-to-earth ground (up to 5,000 m)	
Continuous	60 V DC, Measurement Category I
Withstand	860 V RMS
Vsup inputs-to-earth ground (up to 5,000 m)	
Continuous	60 V DC, Measurement Category I
Withstand	1,000 V RMS, verified by a 5 s dielectric withstand test
Temporary overvoltage protection	
Pin 2 to pin 3	-20 V to 30 V
Any other pin-to-pin	±30 V

Caution Any excitation output voltage to earth ground must remain below 60 V DC for each channel. To determine excitation output voltage to earth ground for a channel, add the maximum excitation voltage to the maximum potential on pin 3. The maximum excitation voltages are 2 V +3% and 3.3 V +3% for the bridge excitations, 12 V +5% for the +12 V excitation, and 22 V for the IEPE excitation.

Attention Toute tension d'excitation de sortie par rapport à la terre doit

rester inférieure à 60 V CC pour chaque voie. Pour déterminer la tension d'excitation de sortie par rapport à la terre pour une voie, ajoutez la tension d'excitation maximale au potentiel maximal sur la broche 3. Les tensions d'excitation maximales sont de 2 V +3% et 3,3 V +3% pour les excitations de pont, 12 V +5% pour l'excitation +12 V, et 22 V pour l'excitation IEPE.

Measurement Category

Warning Do not connect the product to signals or use for measurements within Measurement Categories II, III, or IV, or for measurements on MAINs circuits or on circuits derived from Overvoltage Category II, III, or IV which may have transient overvoltages above what the product can withstand. The product must not be connected to circuits that have a maximum voltage above the continuous working voltage, relative to earth or to other channels, or this could damage and defeat the insulation. The product can only withstand transients up to the transient overvoltage rating without breakdown or damage to the insulation. An analysis of the working voltages, loop impedances, temporary overvoltages, and transient overvoltages in the system must be conducted prior to making measurements.

Mise en garde Ne pas connecter le produit à des signaux dans les catégories de mesure II, III ou IV et ne pas l'utiliser pour des mesures dans ces catégories, ou des mesures sur secteur ou sur des circuits dérivés de surtensions de catégorie II, III ou IV pouvant présenter des surtensions transitoires supérieures à ce que le produit peut supporter. Le produit ne doit pas être raccordé à des circuits ayant une tension maximale supérieure à la tension de fonctionnement continu, par rapport à la terre ou à d'autres voies, sous peine d'endommager et de compromettre l'isolation. Le produit peut tomber en panne et son isolation risque d'être endommagée si les tensions transitoires dépassent la surtension transitoire nominale. Une analyse des tensions de fonctionnement, des impédances de boucle, des surtensions temporaires et des surtensions transitoires dans le système doit être effectuée avant de procéder à des mesures.

Measurement Category I is for measurements performed on circuits not directly connected to the electrical distribution system referred to as ***MAINS*** voltage. MAINS is

a hazardous live electrical supply system that powers equipment. This category is for measurements of voltages from specially protected secondary circuits. Such voltage measurements include signal levels, special equipment, limited-energy parts of equipment, circuits powered by regulated low-voltage sources, and electronics.

Note Measurement Categories CAT I and CAT O are equivalent. These test and measurement circuits are for other circuits not intended for direct connection to the MAINS building installations of Measurement Categories CAT II, CAT III, or CAT IV.

Environmental Characteristics

Temperature	
Operating	-40 °C to 70 °C
Storage	-40 °C to 85 °C
Humidity	
Operating	10% RH to 90% RH, noncondensing
Storage	5% RH to 95% RH, noncondensing
Pollution Degree	2
Maximum altitude	5,000 m

Power Requirements

Module Power Requirements

Maximum power consumption from chassis	
Active mode	900 mW maximum
Sleep mode	500 µW maximum
Maximum thermal dissipation, from -40 °C to 70 °C	
Active mode	1.5 W maximum
Sleep mode	550 mW maximum

Vsup Power Requirements

Vsup input voltage range	9 V to 30 V
Maximum power consumption from Vsup	
Active mode	2 W maximum
Sleep mode	400 mW maximum

Physical Characteristics

Connector type	DSUB

Weight	49.0 g (1.73 oz)

Compliance Standards

Safety Compliance Standards

This product is designed to meet the requirements of the following electrical equipment safety standards for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA C22.2 No. 61010-1

Note For safety certifications, refer to the product label or the Product Certifications and Declarations section.

EMC Standards

This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326-1 (IEC 61326-1): Class A emissions; Industrial immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- AS/NZS CISPR 11: Group 1, Class A emissions
- ICES-001: Class A emissions

Note Group 1 equipment (per CISPR 11) is any industrial, scientific, or medical equipment that does not intentionally generate radio frequency energy for the treatment of material or inspection/analysis purposes.

Note In Europe, Australia, and New Zealand (per CISPR 11) Class A equipment is intended for use in non-residential locations.

Environmental Standards

This product meets the requirements of the following environmental standards for electrical equipment.

- IEC 60068-2-1 Cold
- IEC 60068-2-2 Dry heat

Calibration

You can obtain the calibration certificate and information about calibration services for the sbRIO-9218 at ni.com/calibration.

Calibration interval	2 years

Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and to NI customers.

For additional environmental information, refer to the ***Engineering a Healthy Planet*** web page at ni.com/environment. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

EU and UK Customers

- **Waste Electrical and Electronic Equipment (WEEE)**—At the end of the product life cycle, all NI products must be disposed of according to local laws and regulations. For more information about how to recycle NI products in your region, visit ni.com/environment/weee.

电子信息产品污染控制管理办法（中国RoHS）

- **中国RoHS**— NI符合中国电子信息产品中限制使用某些有害物质指令

(RoHS)。关于NI中国RoHS合规性信息，请登录 ni.com/environment/rohs_china。(For information about China RoHS compliance, go to ni.com/environment/rohs_china.)

Product Certifications and Declarations

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for NI products, visit ni.com/product-certifications, search by model number, and click the appropriate link.

NI Services

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