

Strain Gage Signal Conditioner Model 7024



Feature Highlights

- Strain Gage Signal Conditioning
- Includes Power Supply, Excitation, Amplifier, Filter, and Shunt Calibration
- Typical Accuracy of 0.1%
- Current Loop Output (4-20mA)
- 28V Aircraft Power (MIL-STD-704)
- MTBF 90,000 hours (MIL-HDBK-217)
- Tested to MIL-STD-810F and RTCA/DO-160D

Sensors Supported

- Load Cells
- Torque Transducers
- Pressure Transducers
- Strain Gages (with external completion)
- Accelerometers (Piezoresistive)



Description

The 7024 signal conditioner provides everything needed to operate a wide variety of strain gage transducers and to deliver optimal signal output in MIL-SPEC environments. The 7024 Includes:

Power Supply: The 7024 operates directly from 28V Aircraft Power (MIL-STD-704). The unit handles the sags and surges common on the 28V bus including induced effects of lightning (RTCA/DO-160D).

Transducer Flexibility: The 7024 supports full bridge sensors with resistances from 120 Ω to 20,000 Ω . These choices allow the 7024 to operate Load Cells, Torque Transducers, and Pressure Transducers. Quarter and half bridge strain gages can be operated if they are externally completed to form full bridges.

Transducer Excitation: The 7024 has a fixed excitation that provides a highly stable excitation Voltage for transducer excitation. Current limiting is provided.

Transducer Amplification: For maximum resolution of measurement data, the 7024 amplifies strain gage signals with a multi-stage differential amplifier. A fixed gain of 500 is developed internally and fed into a 4-20mA converter. The amplification properly maps 0-20mV transducers into 4-20mA output signals.

Transducer Filtering: The 7024 filters and conditions strain gage signals with active low-pass filtering to eliminate unwanted signal components. Filter is a 400 Hz, 6-pole Bessel style.

Output: The 7024 has a current loop (4-20mA) output. The amplification properly maps 0-20mV transducers into 4-20mA output signals. Current loops are ideal for long cable runs and provide easy multidrop capability.

Calibration: The 7024 contains a built-in shunt calibration function. The shunt calibration resistor of 87.3k Ω generates a half scale tension output for a 350 Ω load cell. A signal line is available to engage the shunt calibration relay remotely.

Applications

- Load/Force Monitoring • Torque Monitoring • Stress-Strain Analysis • Pressure Monitoring •
• Vibration Monitoring •

Electrical Performance: $V_s = 28 V_{DC}$; $T_C = 25^\circ C$ unless otherwise specified.

Parameter	Min.	Typ	Max	Units
Bridge Resistance	120		20,000	Ω
Excitation Voltage		10.000		Volts
Excitation Current ¹		28	100	mA
Amplification		500		Volts/Volt
Input Impedance of Amplifier		10		G Ω
CMRR		110		dB
Filter Cutoff Frequency ²		400		Hz
Filter Cutoff Frequency Accuracy		5		%
Accuracy		0.1		% FSO
Linearity		0.1		% FSO
Zero Offset Temperature Drift		0.0007	0.0015	%FSO/ $^\circ C$
Span Temperature Drift		0.0080	0.0100	%FSO/ $^\circ C$
Excitation Temperature Drift		0.0020	0.0030	%FSO/ $^\circ C$
Current Output (4-20) Load Resistance	50	500	525	Ω
Supply Voltage (V_s) ³	16.5	28	51.5	Volts
Operating Current with 350 Ω full bridge at 10V excitation		75		mA

Note 1: Short circuit protected.

Note 2: Six pole Bessel, 120 db/decade.

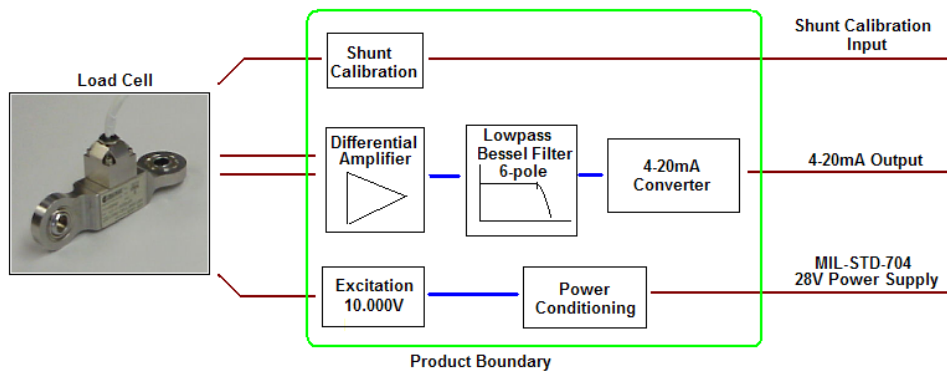
Note 3: Reverse polarity protected, MIL-STD-704 compliant

Environmental Requirements: $V_s = 28 V_{DC}$ unless otherwise specified.

Parameter	Min.	Typ	Max	Units
Operating Temperature	-54		+71	$^\circ C$
Storage Temperature	-54		+85	$^\circ C$
Humidity			100	%
Altitude			35,000	feet
Atmosphere	Explosive Atmosphere as per MIL-STD-810, Method 511.4			

Physical Specification:

Parameter	Specification
Enclosure Type	Environmentally and EMI Sealed Aluminum Enclosure, Iridite Finish
Enclosure Size	5.00" x 2.00" footprint 1.85" height
Weight	10.4 oz (0.65lb)
Terminals	D38999/20FA35SA, Load Cell D38999/20FA35PN, Power, Shunt Calibration, and Output Signal



Specifications are subject to change without notice. Rev A.1

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