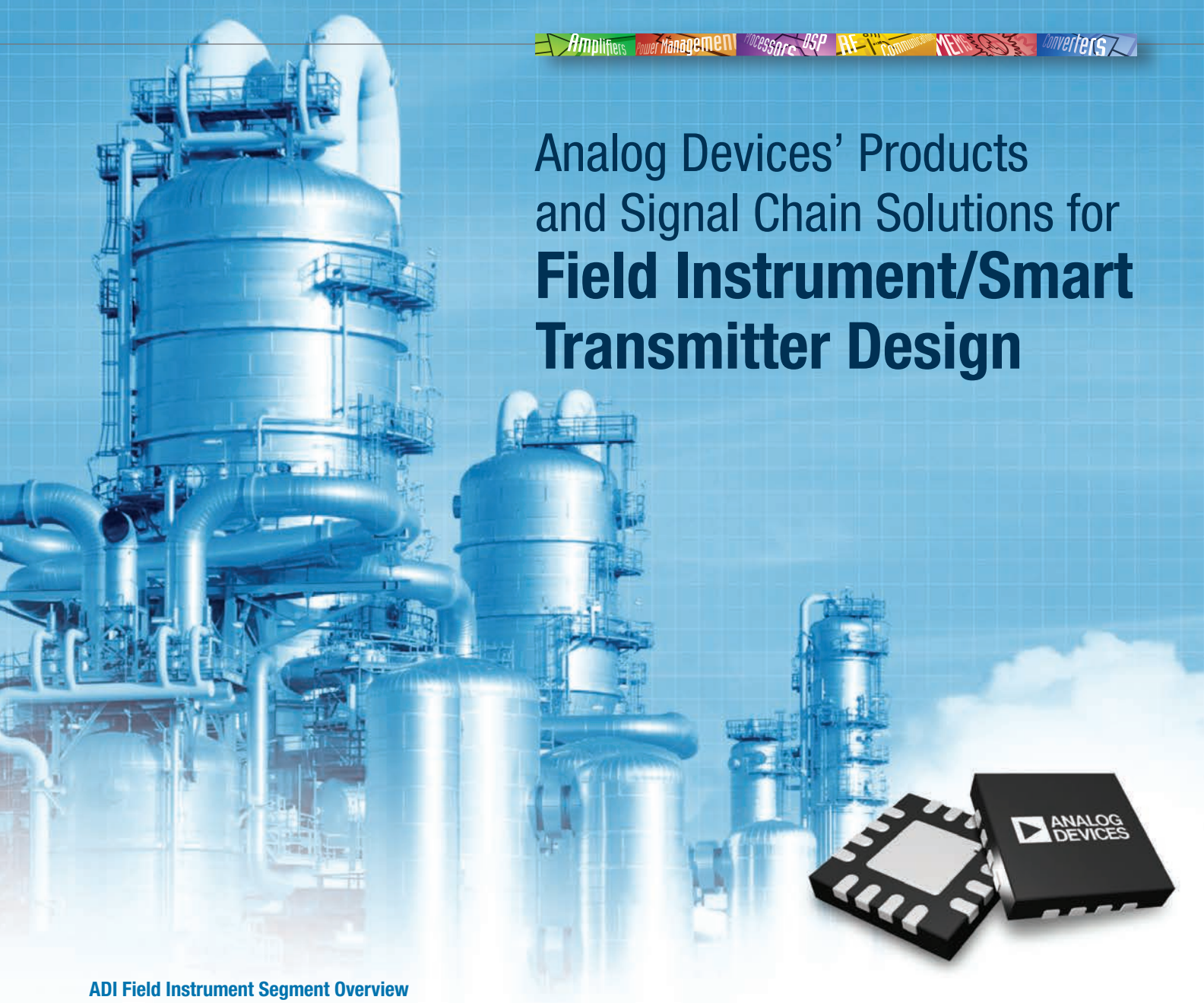
Analog Devices' Products and Signal Chain Solutions for **Field Instrument/Smart Transmitter Design**



ADI Field Instrument Segment Overview

Analog Devices is a leading supplier of industrial precision signal measurement solutions. These products are designed into field instruments in process and manufacturing plants across a wide range of industries including chemical and pharmaceutical, hydrocarbon (oil and gas), environmental (waste water and treatment), and food and beverage. The combination of ADI's proven system expertise in industrial applications and a comprehensive portfolio of products with leading performance vs. power makes ADI a strong partner for engineers designing field instruments.

Main Challenges and System Considerations

- High reliability, longevity of supply, and lower assembly and manufacturing costs
- Operation in harsh environments requiring support for a wide temperature range
- Limited available power for loop-powered instruments drives the need for components with high performance at very low power
- Increasing end market need for higher levels of functional safety

Why Choose ADI?

- ADI is a technology leader in precision converters and signal processing with a long history of serving the needs of industrial customers
- ADI is continually investing in core technology and application specific products to meet current and future industrial needs
- Best-in-class signal chain solutions for precision measurement over a wide range of sensor inputs with high accuracy and very low power
- ADI's dedicated team of industrial application engineers provides system expertise to support our customers through their complete design cycle
- Long product life cycles, superior reliability, and on time delivery

Field Instrument Applications

- Temperature transmitters
- Pressure transmitters
- Electromagnetic flow transmitters
- Ultrasonic flow transmitters
- Differential pressure flow transmitters

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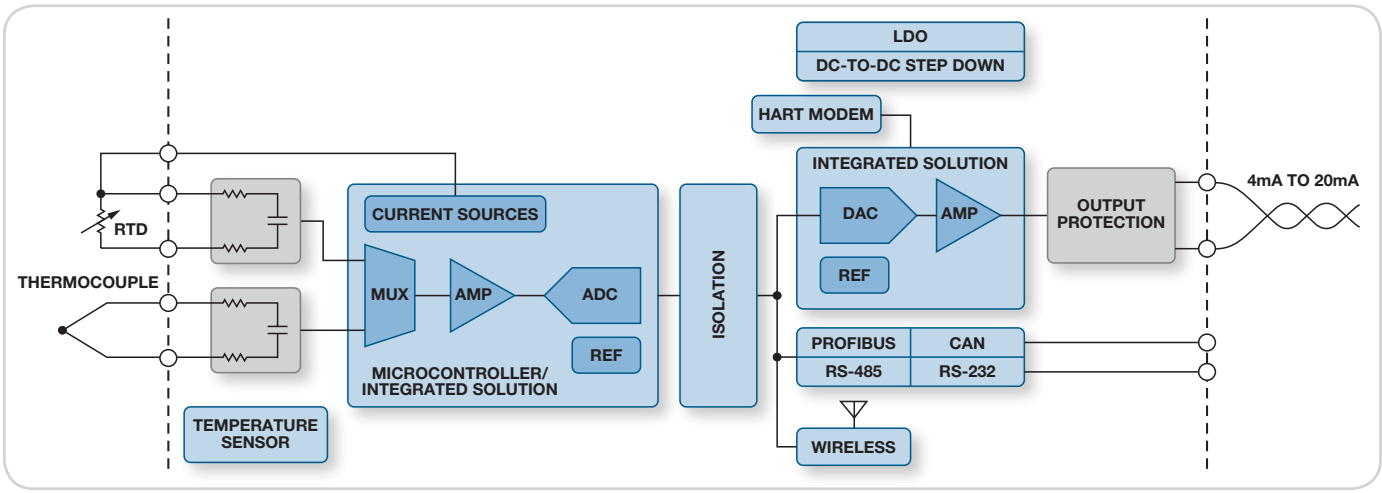
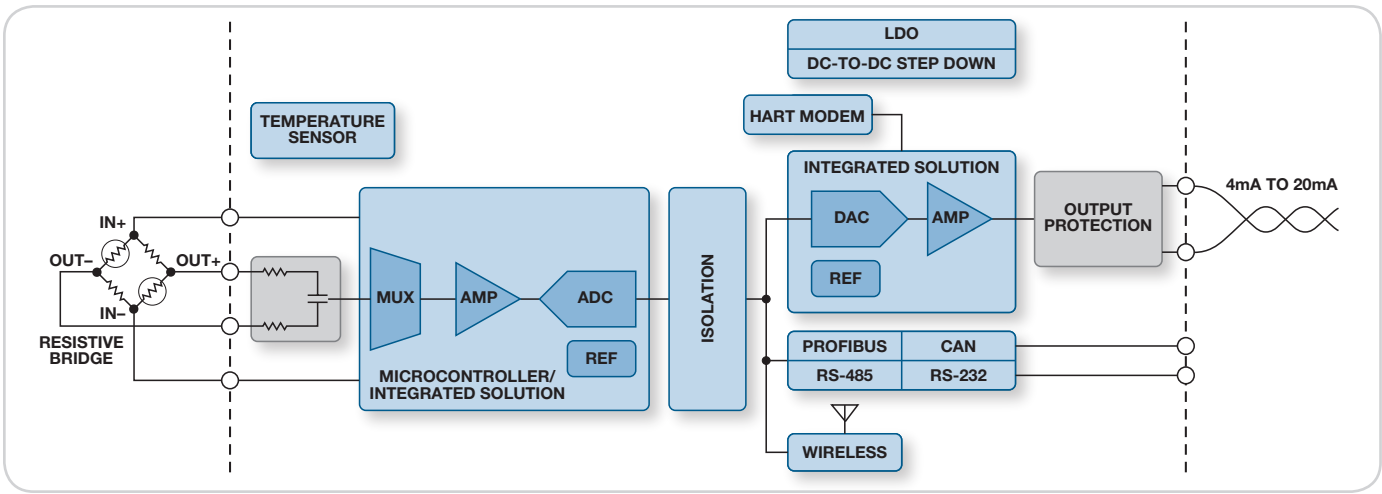
Temperature Transmitter



Pressure Transmitter



Pressure and Temperature Analog Front End

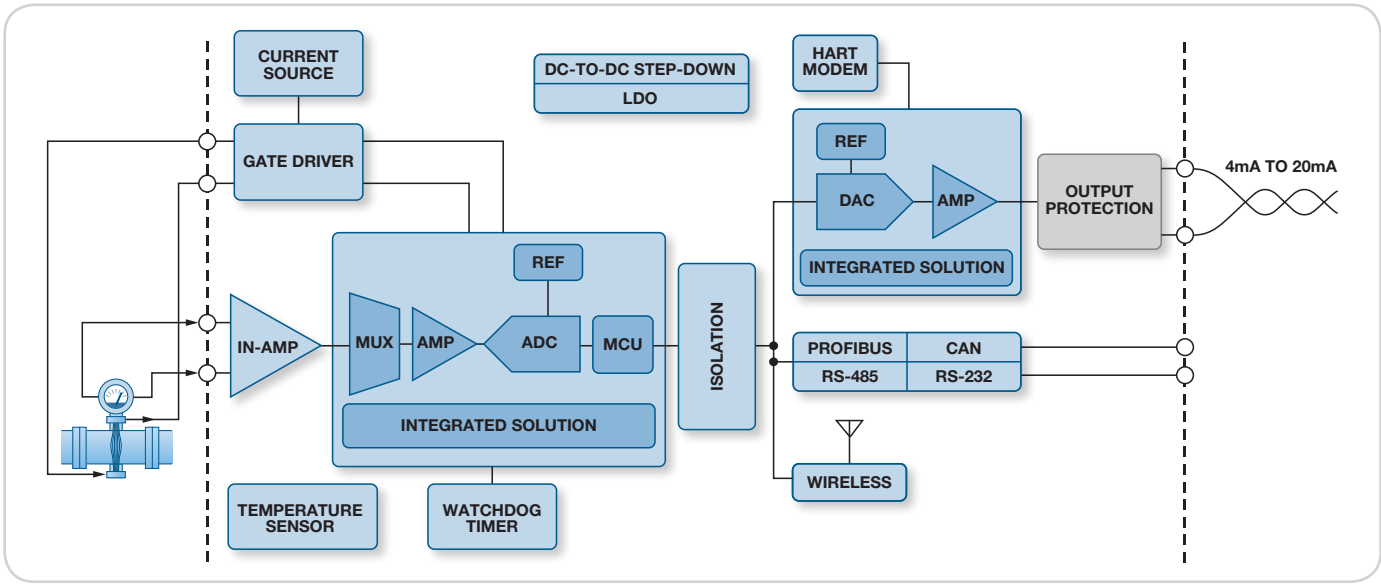
A wide portfolio of very low power precision converters and integrated solutions to meet the requirements of temperature and pressure transmitters.

Part Number	Description	Key Features and Benefits	
Integrated Digital Temperature Sensor			
ADT7320/ADT7420	±0.25°C accurate, 16-bit SPI/I²C temperature sensor	• ±0.25°C accuracy from –20°C to +105°C at 3.3 V • Ultralow temperature drift: 0.0073°C	• Easy implementation • Low power
ADC			
AD7793/AD7794/ AD7799	16-/24-bit, 3-channel/6-channel, low noise, low power, Σ-Δ ADC with on-chip in-amp	• 16-bit/24-bit versions available • Low power: 400 μA • Internal programmable gain amplifier • 4 ppm/°C on-chip reference (AD7793/AD7794) • Programmable current sources (AD7793/AD7794) • Low-side power switch (AD7794, AD7799)	• Burnout currents • Internal clock and buffer • Simultaneous 50 Hz and 60 Hz rejection • 4.17 SPS to 400 SPS output data rate • Supply: 2.7 V to 5.25 V • Temperature: –40°C to +105°C
Microcontroller			

ADuCM360/ ADuCM361	Low power precision analog microcontroller, ARM Cortex™-M3 with dual/single Σ-Δ ADCs	• Analog performance
		  • Dual PGA and 24 bit, 4 kSPS ADCs
		  • 12 multiplexed analog inputs
		  • 12-bit DAC
		• Digital performance
		  • 32-bit ARM Cortex-M3 processor
		  • 128 kB flash, 8 kB SRAM
			• Power consumption only 1 mA with core operating at 500 kHz (both ADCs on, input buffers off, PGA gain of 4, one SPI port on, and all timers on)
			• Package and temperature
			  • 48-lead LFCSP (7 mm × 7 mm)
			  • –40°C to +125°C

ADuC7060/ ADuC7061	Low power, precision analog microcontroller, dual Σ-Δ ADCs, flash/EE, 16-/32-bit ARM7TDMI®	• Dual 24-bit 8 kSPS Σ-Δ ADCs • Single 14-bit DAC • ARM7TDMI 16-/32-bit RISC controller • 32 kB flash and 4 kB SRAM	• UART, SPI, GPIO, PWM • Nominal supply 2.5 V • Temperature range: –40°C to +125°C

Electromagnetic Flow Transmitter



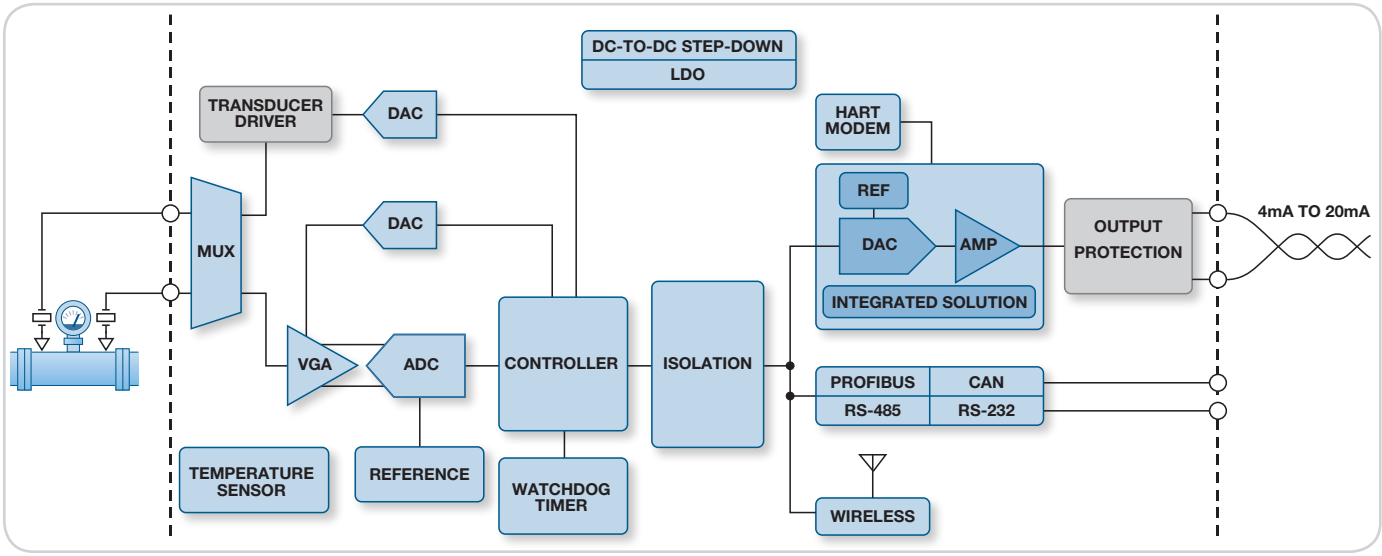
Electromagnetic Flow Transmitter Analog Front End

Part Number	Description	Key Features and Benefits	
Instrumentation Amplifier			
AD8228	Low gain drift precision instrumentation amplifier	• Fixed G = 10, 100 • Wide power supply range: ±2.3 V to ±18 V • 2 ppm/°C max gain drift • 100 dB CMRR to 10 kHz (G = 10)	• 650 kHz –3 dB bandwidth (G = 10) • 2 V/μs slew rate • 8 nV/√Hz @ 1 kHz min • 0.8 μV/°C max voltage offset drift
Multiplexer			
ADG1611	1 Ω typical on resistance, ±5 V, +12 V, +5 V, and +3.3 V quad SPST switches	• 1 Ω on resistance	• 0.2 Ω on resistance flatness
ADG1411	1.8 Ω max on resistance, ±15 V/12 V/±5 V, *i*CMOS® quad SPST switch	• 1.5 Ω on resistance	• 0.3 Ω on resistance flatness
Amplifier			
ADA4077-2	4 MHz, 7 nV/√Hz, low offset and drift, high precision amplifier	• Low offset voltage: 25 μV max • Low offset voltage drift: 0.25 μV/°C max	• Low input bias current: <1.0 nA max • Low noise: 7 nV/√Hz typical • Low supply current: 400 μA per amplifier typical
Voltage Reference			
ADR3412/ADR3420 ADR3425/ADR3430 ADR3433/ADR3440 ADR3450	Low power, 10 ppm/°C CMOS voltage reference (1.20 V/2.048 V/2.50 V/3.00 V/3.30 V/4.096 V/5.00 V)	• Low quiescent current: 100 μA max • Initial accuracy: ±0.1% • Max temperature coefficient: 8 ppm/°C	• Low frequency noise: <10 μV p-p (0.1 Hz to 10 Hz) • Wide temperature range: –40°C to +125°C operation
ADC			
AD7192	4.8 kHz ultralow noise 24-bit Σ-Δ ADC with PGA	• 4.7 Hz to 4.8 kHz output data rate • PGA: gain from 1 to 128	• Offset drift: 5 nV/°C • Gain drift: 1 ppm/°C
Microcontroller			

ADuCM360/
ADuCM361
	Low power precision analog microcontroller, ARM Cortex-M3 with dual/single Σ-Δ ADCs	• Analog performance
		  • Dual PGA and 24-bit, 4 kSPS ADCs
		  • 12 multiplexed analog inputs
		  • 12 bit DAC
		• Digital performance
		  • 32-bit ARM Cortex-M3 processor
		  • 128 kB flash, 8 kB SRAM
			• Power consumption only 1 mA with core operating at 500 kHz (both ADCs on, input buffers off, PGA gain of 4, one SPI port on, and all timers on)
			• Package and temperature
			  • 48-lead LFCSP (7 mm × 7 mm)
			  • –40°C to +125°C

Digital Processor			
ADSP-BF504/ ADSP-BF504F/ ADSP-BF506F	ADSP-BF50x fixed-point DSP	• 400 MHz Blackfin® core • True 12-bit, dual SAR ADC (ADSP-BF506F) • UART, SPI, SPORT, and CAN interfaces for communications	• PPI for LCD display interface • 32 MB executable flash (ADSP-BF504F/ ADSP-BF506F)

Ultrasonic Flow Transmitter



Ultrasonic Flow Transmitter Analog Front End

Part Number	Description	Key Features and Benefits	
Multiplexer			
ADG1611	1 Ω typical on resistance, ±5 V, +12 V, +5 V, and +3.3 V quad SPST switches	• 1 Ω on resistance	• 0.2 Ω on resistance flatness
ADG1411	1.8 Ω max on resistance, ±15 V/12 V/±5 V, iCOMS, quad SPST switch	• 1.5 Ω on resistance	• 0.3 Ω on resistance flatness
Integrated Digital Temperature Sensor			
ADT7320/ADT7420	±0.25°C accurate, 16-bit SPI/I²C temperature sensor	• ±0.25°C accuracy from –20°C to +105°C at 3.3 V • Ultralow temperature drift: 0.0073°C	• Easy implementation • Low power
ADC			
AD9609/AD9629/ AD9649	10-/12-/14-bit, 20 MSPS/40 MSPS/65 MSPS/ 80 MSPS, 1.8 V analog-to-digital converter	• 2 V p-p analog input • 1.8 V to 3.3 V parallel and SPI interface • 74.3 dBFS SNR at 9.7 MHz input	
Variable Gain Amplifiers			

AD8331/AD8332/ AD8334	Single/dual/quad VGA with ultralow noise preamplifier and programmable R_{IN}	• LNA:
		  • Ultralow noise: 0.74 nV/√Hz; 2.5 pA/√Hz
		  • Active termination match via external resistor
			• VGA:
			  • 48 dB gain range
			  • Postamplifier with 12 dB gain switch: output SNR optimized for 10-/12-bit ADCs
			  • Fully differential
			  • Selectable output clamping levels

DAC			

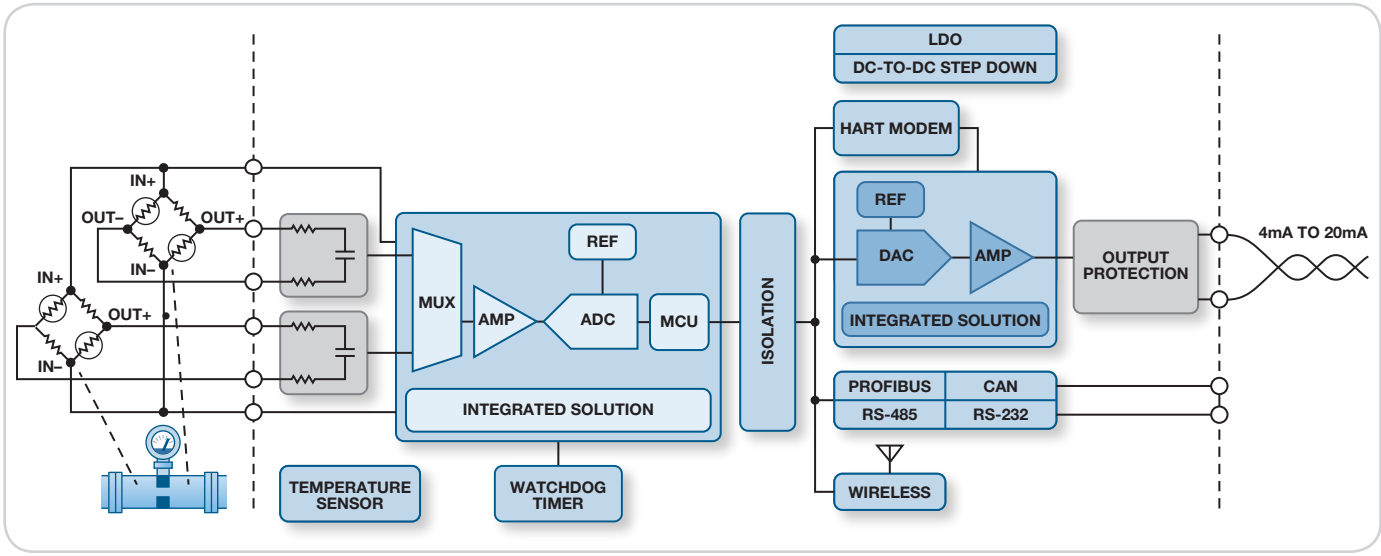
AD5641	2.7 V to 5.5 V, 100 μA, 14-bit *nano*DAC,® SPI interface in LFCSP and SC70	• Minimum board area
		  • 14-bit in SC70 or 2 mm × 3 mm 6-lead LFCSP
			• Low power DAC
			  • Max 100 μA supply current

High Speed DAC			

AD9705	10-bit, 175 MSPS TxDAC® digital-to-analog converter	• 175 MSPS DAC update rate
		• SFDR to Nyquist
		  • 84 dBc at 5 MHz output
		• Wide supply range 1.7 V to 3.6 V
			• Low power dissipation
			  • 12 mW at 80 MSPS, 1.8 V
			  • Power-down mode: <2 mW
			• On-chip 1 V reference

Digital Processor			
ADSP-BF504/ ADSP-BF504F/ ADSP-BF506F	ADSP-BF50x fixed-point DSP	• 400 MHz Blackfin core • True 12-bit, dual SAR ADC (ADSP-BF506F) • UART, SPI, SPORT, and CAN interfaces for communications	• PPI for LCD display interface • 32 MB executable flash (ADSP-BF504F/ ADSP-BF506F)

Differential Pressure Flow Transmitter



Differential Pressure Flow Transmitter Analog Front End

Part Number	Description	Key Features and Benefits	
Integrated Digital Temperature Sensor			
ADT7320/ADT7420	±0.25°C accurate, 16-bit SPI/I²C temperature sensor	• ±0.25°C accuracy from –20°C to +105°C at 3.3 V • Ultralow temperature drift: 0.0073°C	• Easy implementation • Low power
Multiplexer			
ADG5409	High voltage latch-up proof 4-channel/8-channel multiplexers	• Latch-up proof • 8 kV HBM ESD rating	• Low on resistance: 13.5 Ω
ADG5209	High voltage latch-up proof 4-channel/8-channel multiplexers	• Latch-up proof • 0.4 pC charge injection	• Low on resistance: 160 Ω
Amplifier			
AD8226	Wide supply range, rail-to-rail output instrumentation amplifier	• Fully specified: –40°C to +125°C • Gain of 1 to 1000 • 2.2 V to 36 V supply range	• Input noise: 22 nV/√Hz • 350 μA typical supply current
ADC			
AD7794/AD7799	16-/24-bit, 3-channel/6-channel, low noise, low power, Σ-Δ ADC with on-chip in-amp	• 16-/24-bit versions available • Low power: 400 μA • Internal programmable gain amplifier • 4 ppm/°C on-chip reference (AD7794) • Programmable current sources (AD7794) • Low-side power switch	• Burnout currents • Internal clock and buffer • Simultaneous 50 Hz and 60 Hz rejection • 4.17 SPS to 400 SPS output data rate • Supply: 2.7 V to 5.25 V • Temperature: –40°C to +105°C
Microcontroller			

ADuCM360/ ADuCM361	Low power precision analog microcontroller, ARM Cortex-M3 with dual/single Σ-Δ ADCs	• Analog performance
		  • Dual PGA and 24-bit, 4 kSPS ADCs
		  • 12 multiplexed analog inputs
		  • 12-bit DAC
		• Digital performance
		  • 32-bit ARM Cortex-M3 processor
		  • 128 kB flash, 8 kB SRAM
			• Power consumption only 1 mA with core operating at 500 kHz (both ADCs on, input buffers off, PGA gain of 4, one SPI port on, and all timers on)
			• Package and temperature
			  • 48-lead LFCSP (7 mm × 7 mm)
			  • –40°C to +125°C

ADuC7060/ ADuC7061	Low power, precision analog microcontroller, dual Σ-Δ ADCs, flash/EE, 16-bit/32-bit ARM7TDMI	• Dual 24-bit 8 kSPS Σ-Δ ADCs • Single 14-bit DAC • ARM7TDMI 16-bit/32-bit RISC controller • 32 kB flash and 4 kB SRAM	• UART, SPI, GPIO, PWM • Nominal supply 2.5 V • Temperature range: –40°C to +125°C

Isolation, Power, and Communication

A wide range of supporting products to meet the various isolation, power, and communications requirements for temperature, pressure, and flow transmitters.

Part Number	Description	Key Features and Benefits	
Isolation			
ADuM3481	3.75 kV rms quad-channel digital isolator	• Small package: 20-lead SSOP • Low dynamic power consumption	• Low voltage I/O: 1.8 V to 5.5 V • 50 year lifetime at 565 V pk
ADuM4401	5 kV rms quad-channel digital isolator	• Low power operation • Reinforced isolation rating	• 16-lead SOIC wide package • 50 year lifetime at 565 V pk
ADuM1401	2.5 kV rms quad-channel isolator	• Low power consumption • 16-lead SOIC wide package	• 50-year lifetime at 565 V pk
Integrated DAC			
AD5421	16-bit, serial input, loop-powered, 4 mA to 20 mA DAC	• 16-bit resolution and monotonicity, pin selectable NAMUR-compliant ranges • Internal regulator and reference • Total unadjusted error (TUE): 0.05% max • Output TC: 3 ppm/°C typ	• Very low power: quiescent current: 300 µA max • HART compatible
AD5420	16-bit, serial input, single-channel, 4 mA to 20 mA current source DAC	• Current output ranges: 4 mA to 20 mA, 0 mA to 20 mA, or 0 mA to 24 mA • ±0.01% FSR typical total unadjusted TUE	• ±3 ppm/°C typical output drift • On-chip reference and output fault detection • HART compatible
DAC			
AD5660/AD5662	Single *nano*DAC, 16-bit monotonic DAC	• 12-bit accuracy guaranteed • On-chip, 1.25 V/2.5 V, 5 ppm/°C reference (AD5660) • Tiny 8-lead SOT-23 and MSOP packages	• Power-on reset to 0 V or midscale • 10 µs settling time
Power Management/LDO			
ADP160	Ultralow quiescent current 150 mA, CMOS linear regulator	• Input voltage range: 2.2 V to 5.5 V • I_Q = 11 µA at 10 mA load	• Max output current: 150 mA • Low dropout voltage: 195 mV @ 150 mA load
ADP1720	50 mA, high voltage, micropower linear regulator	• Wide input voltage range: 4 V to 28 V • I_Q = 74 µA at 1 mA load	• Max output current: 50 mA • Low dropout voltage: 275 mV @ 50 mA load
Power management/DC-DC step-down			
ADP2441	36 V, 1 A, synchronous step-down dc-to-dc regulator	• Wide input voltage range: 4.5 V to 36 V • High efficiency up to 94% • Adjustable output down to 0.6 V	• ±1% output voltage accuracy • Adjustable frequency 300 kHz to 1 MHz
ADP2370	High voltage, 1.2 MHz/600 kHz, 800 mA, low quiescent current buck regulator	• Input voltage range: 3.2 V to 15 V, output current: 800 mA • Quiescent current <14 µA in power saving mode (PSM)	• >90% efficiency • Force PWM pin (SYNC), 600 kHz/1.2 MHz frequency pin (FSEL)
Amplifier			

AD5749	Industrial current out driver, single-supply, 55 V compliant with programmable ranges	• I_{OUT} range
		  • 4 mA to 20 mA, 0 mA to 24 mA
		  • 0.03% accuracy (TUE)
		  • 2 ppm/°C full scale output drift
			• 11.8 V to 55 V supply range
			• Diagnostic/fault detection
			• Digital input cyclical redundancy check
			• External 4.096 V reference

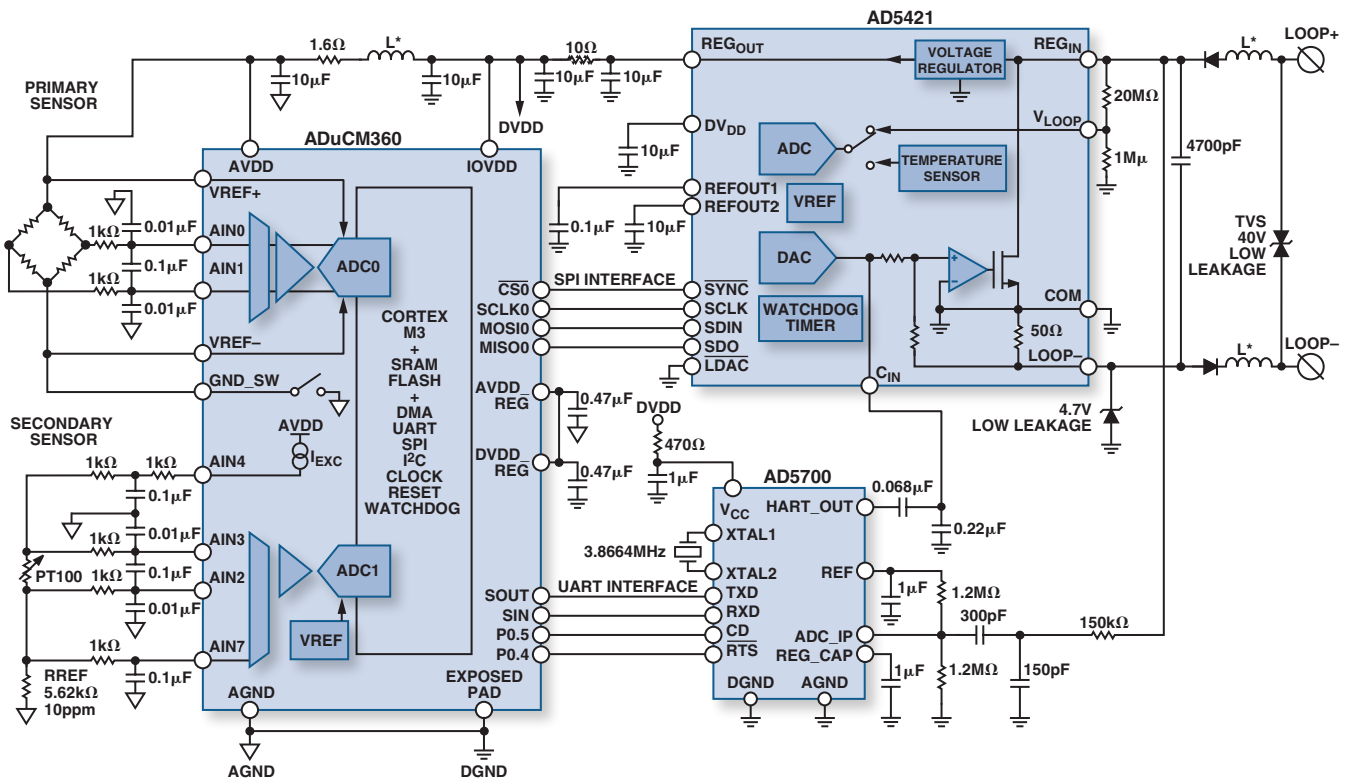
Voltage Reference			
ADR3525	Micropower, precision, 2.5 V voltage reference	• Max temperature coefficient (TC): 5 ppm/°C (B grade) • 100 µA max quiescence current	• Output noise (0.1 Hz to 10 Hz): 18 µV p-p at 2.5 V (typical) • 8-lead MSOP
ADR4525	Ultralow noise, high accuracy 2.5 V voltage reference	• ±0.02% max initial error • Output noise (0.1 Hz to 10 Hz): <1.25 µV p-p @ 2.5 V_{OUT} typical	• Max temperature coefficient (TC) : 2 ppm/°C • Input voltage range: 3 V to 15 V
ADR291	Low noise micropower precision voltage reference (2.5 V)	• Supply range: 2.8 V to 15 V • Supply current 12 µA max	• Low noise: 8 µV and 12 µV p-p (0.1 Hz to 10 Hz) • 10 ppm/°C • –40°C to +125°C operating temperature range

Part Number	Description	Key Features and Benefits	
HART Modem			
AD5700/AD5700-1	Low power HART modem	• HART-compliant fully integrated FSK modem • 115 μA maximum supply current in receive mode • On-chip oscillator (AD5700-1)	• 4 mm × 4 mm, 24-lead LFCSP • Buffered HART output • Suitable for intrinsically safe applications
PROFIBUS			
ADM1486	5 V, high speed, low power, half duplex RS-485 PROFIBUS transceiver	• 30 Mbps data rate • 2.1 V min differential output with 54 Ω termination	• Low power 0.8 mA I_{CC}
ADM2485/ ADM2486	2.5 kV single isolated, high speed, half duplex RS-485 transceiver	• Fully isolated digital interface • 50 nodes on bus • 5 V or 3.3 V operation	• 16 Mbps/20 Mbps data rate (ADM2485/ADM2486) • Integrated oscillator driver for external transformer (ADM2485)
RS-485			
ADM2587E	2.5 kV signal and power isolated, ±15 kV ESD protected, full/half duplex RS-485 transceiver 500 kbps	• Fully isolated digital interface • *iso*Power® integrated isolated dc-to-dc converter • ±15 kV ESD protection on RS-485 I/O pins • 5 V or 3.3 V operation	• Connect up to 256 nodes on one bus • Open- and short-circuit, fail-safe receiver inputs
ADM2482E	2.5 kV signal isolated, ESD protected, full/half duplex RS-485 transceiver with transformer driver 16 Mbps	• Integrated oscillator driver for external transformer • ±15 kV ESD protection on RS-485 I/O pins	• 5 V or 3.3 V operation • 256 nodes on bus • Open- and short-circuit, fail-safe receiver inputs
ADM2490E	5 kV signal isolated, high speed (16 Mbps), ESD protected, full duplex RS-485	• ±8 kV ESD protection on RS-485 I/O pins • Suitable for 5 V or 3 V operation	• Receiver open-circuit fail-safe design
CAN			
ADM3051	High speed industrial CAN transceiver with bus protection for 24 V systems	• Physical layer CAN transceiver • 5 V operation	• High speed data rates up to 1 Mbps
ADM3052	5 kV rms isolated CAN transceiver with integrated high voltage, bus side linear regulator	• Fully isolated digital interface • Integrated V+ linear regulator • Bus side powered by V+ and V–	• 11 V to 25 V operation on V+ • High speed data rate up to 1 Mbps
ADM3053	2.5 kV rms signal and power isolated CAN transceiver with integrated isolated dc-to-dc converter	• Fully isolated digital interface • Signal and power isolation • 5 V or 3.3 V operation	• High speed data rate up to 1 Mbps • Slop control for reduced EMI
ADM3054	5 kV rms signal isolated high speed CAN transceiver with bus protection	• Fully isolated digital interface • 5 V or 3.3 V operation • High speed data rate of up to 1 Mbps	• Short-circuit protection on CANH and CANL against shorts to power/ground in 24 V systems
RS-232			
ADM3251E/ ADM3252E	Isolated single-/dual-channel RS-232 line driver/receiver	• Fully isolated digital interface • 2.5 kV fully isolated (power and data) RS-232 transceiver • *iso*Power integrated, isolated dc-to-dc converter	• 460 kbps data rate • 15 kV ESD protection on R/N and TOUT pins
ADM3101E	±15 kV ESD protected, 3.3 V single-channel RS-232 line driver/receiver	• 460 kbps data rate • 0.1 μF charge pump capacitors	
Wireless			
ADuCRF101	Precision analog microcontroller ARM Cortex-M3 with RF transceiver	• 6-channel 12-bit SAR ADC • Low power consumption • Integrated RF transceiver: 862 MHz to 928 MHz and 431 MHz to 464 MHz	• 32-bit ARM Cortex-M3 processor • 128 kB flash, 16 kB SRAM • UART, I²C, and SPI serial I/O • 64-lead LFCSP
ADF7023-J	High performance, low power, ISM band FSK/GFSD/MSK/GMSK transceiver IC	• Ultralow power • Frequency bands: 902 MHz to 958 MHz • Data rate supported; 1 kbps to 300 kbps	• Flexible firmware programmable system controller and packet processor
ADF7242	Low power IEEE 802.15.4/proprietary GFSK/FSK zero-IF 2.4 GHz transceiver IC	• Frequency range (global ISM band) 2400 MHz to 2483.5 MHz • Programmable data rates and modulation	• Low power consumption • High sensitivity

Circuits from the Lab Reference Designs

Analog Devices Circuits from the Lab® Reference Designs are engineered and tested by our technology and applications experts to ensure both performance and function. Low cost hardware is available to allow for evaluation and rapid prototyping with several development platforms. Thorough documentation and design files are provided to ease application understanding and minimize system integration issues.

CN0267 Complete 4 mA to 20 mA Loop-Powered Field Instrument with HART Interface



NOTES
1. L* = FERRITE BEAD, 0.3Ω @ DC, 1kΩ @ 100MHz.
2. THE ADuCM360 EXPOSED PAD IS CONNECTED TO DGND.

Features and Benefits

- Low power, small footprint
- 4 mA to 20 mA loop-powered field instrument
- HART compliant interface
- Registered by HART Communication Foundation (HFC)

For more information on this reference circuit, visit *www.analog.com/cn0267*.

Reference Circuits for Field Instruments

	Circuit Description	Functions	Key Features and Benefits
Loop-Powered			
CN0267	Complete 4 mA to 20 mA Loop-Powered Field Instrument with HART Interface	• Sensors signal conditioning • Digital processing • Analog communication	• Complete 4 mA to 20 mA loop-powered field instrument • HART compliant interface • Registered by HART Communication Foundation (HCF) • Low power, small footprint
CN0300	Complete Closed-Loop Precision Analog Microcontroller Thermocouple Measurement System with 4 mA to 20 mA Output	• Sensors signal conditioning • Digital processing • Analog communication	• Complete 4 mA to 20 mA loop-powered field instrument • Thermocouple and RTD measurement • Single chip solution with Cortex processing core
CN0319	4 mA to 20 mA Loop-Powered Temperature Monitor Using the Integrated PWM On the ADuCM360 Precision Analog Microcontroller	• Sensors signal conditioning • Digital processing • Analog communication	• Complete 4 mA to 20 mA loop-powered field instrument • Thermocouple and RTD measurement • 24-bit input, 14-bit output resolution
CN0145	4 mA to 20 mA Loop-Powered Temperature Monitor Using the ADuC7060/ADuC7061 Precision Analog Microcontroller	• Sensors signal conditioning • Digital processing • Analog communication	• Complete 4 mA to 20 mA loop-powered field instrument • RTD measurement • 24-bit precision conversion with integrated processor
CN0289	Flexible, 4 mA to 20 mA, Loop-Powered Pressure Sensor Transmitter with Voltage or Current Drive	• Sensors signal conditioning • Analog communication	• Complete 4 mA to 20 mA loop-powered field instrument • Optimized for pressure sensors • Analog only design
CN0206	Complete Type T Thermocouple Measurement System with Cold Junction Compensation	• Sensors signal conditioning	• Thermocouple and thermister measurement • Low power, 500 μA max • Low system noise of 0.2° for T-type thermocouple
CN0009	4 mA to 20 mA Process Control Loop Using the AD5662 DAC	• Analog communication	• Loop-powered 4 mA to 20 mA output • 16-bit resolution
CN0314	Precision, Low Cost, Highly Programmable 4 mA to 20 mA Current Loop Using the AD8420 Low Power Instrumentation Amplifier	• Analog communication	• Transmitter or receiver board for 4 mA to 20 mA systems • Gain and scaling jumpers for different input types • Connects directly to ADC driver boards for modular evaluation experience
CN0247	12-Bit ,1 MSPS SAR ADC and Driver with Total Power Dissipation Less Than 5 Milliwatts	• Sensors signal conditioning • Data acquisition	• 12-bit, 1 MSPS data acquisition • Single supply • 5 mW power
Nonloop-Powered			
CN0303	MEMS-Based Vibration Analyzer with Frequency Response Compensation	• Sensor signal conditioning	• High-*g* MEMS-based vibration analyzer • Flat response to 22 kHz • 70 *g*, 250 *g*, and 500 *g* range
CN0270	Complete 4 mA to 20 mA HART Solution	• Analog communication	• 4 mA to 20 mA output • HART compliant solution • Low power
CN0064	16-Bit Fully Isolated 4 mA to 20 mA Output Module Using the AD5662 DAC, ADuM1401 Digital Isolator, and External Amplifiers	• Analog communication	• 4 mA to 20 mA output • Digitally isolated • 16-bit resolution
CN0179	Less Than 200 μA, Low Power, 4 mA to 20 mA, Process Control Current Loop	• Analog communication	• Low power 4 mA to 20 mA output • 12-bit, 14-bit, or 16-bit resolution
CN0313	EMC Compliant RS-485 Transceiver Protection Circuits	• Digital communication	• Robust EMC compliant RS-485 transceiver interface • Tested to specific ESD, EFT, and surge levels

Online Tools And Resources

To learn more about products, signal chain solutions, and technical expertise offered by Analog Devices to help engineers meet today's field instrument design challenges, visit *processcontrol.analog.com/fieldinstruments*.

Signal Chain Designer—
www.analog.com/signalchaindesigner

Signal Chain Designer™ is an advanced selection and design environment that accesses verified product combinations and tested applications circuits, which can be customized or newly created according to your specifications.

Analog Filter Wizard™—*www.analog.com/filterwizard*

This online tool simplifies the filter design process with an intuitive user interface and easily accessible tutorials and help.

ADIsimPower—*www.analog.com/adisimpower*

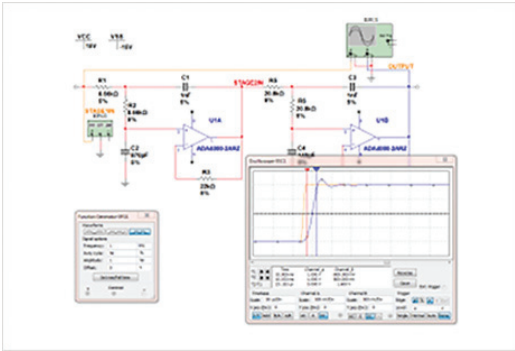
ADIsimPower™ is a collection of downloadable Excel spreadsheets that produce complete power designs optimized to your design goals. Get a schematic, bill of materials, and performance data customized to your specific needs in minutes.

ADIsimDAC—*www.analog.com/adisimdac*

The purpose of the ADIsimDAC™ tool is to assist the user with finding Analog Devices DACs and DAC application circuits. It takes user inputs along with typical parametric data to sort, select, and suggest applicable DACs, system components, and circuits solutions.

Multisim ADC Component Evaluator, ADI Edition—*www.analog.com/multisim*

The free downloadable version of NI Multisim™ 12.0 is tailored for circuit design with ADI components in a SPICE simulation environment.



Circuits from the Lab Reference Designs

For a complete list of Analog Devices Circuits from the Lab Reference Designs for field instrument designs, visit *www.analog.com/circuits*.

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ADI is committed to the establishment and continuous improvement of world class systems and processes aimed at satisfying our customers' evolving needs.

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For information about product life cycle, visit *www.analog.com/product_status_info*.

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