Overview
Our powerful suite of products and solutions adds value across the entire signal chain. In this Fall 2022 edition of the New Products and Solutions guide, you will find select new product innovations including analog-to-digital converters, amplifiers, analog functions, industrial Ethernet, interface and isolation, optical communications and sensing, power, and processors and microcontrollers for use across a wide range of markets and applications.

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Factory efficiency is use-case dependent—what matters to one equipment line may need to be adjusted to support another. Different measurement capabilities, long operational lifetime, accurate sensor data, and intelligent analysis are required for correct operation and optimization. The precision low power signal chain platform is configurable to support multiple sensing modalities. This signal chain platform scales from single to multiple measurements, has a rich digitally programable feature set to support sensor excitation and biasing, and enables designs that optimize low power consumption while balancing noise and size.

Features and Benefits
► Ultra low battery or loop power for distributed smart factory transmitters
► Digital and diagnostic features add intelligent capabilities
► Fully integrated sensor conditioning and acquisition with high channel density

Learn more about precision low power signal chain solutions at analog.com/precisionlowpower

Parts in Signal Chain
► AD8237
► ADA4505-4
► AD4130-8
► ADR3425
► MAX32655
► ADuM1441
► MAX32670

Applications
► Industrial automation
► Building and infrastructure
► Healthcare
Delivering low noise at high sampling rates (up to 33 MUPS drive and 15 MSPS measurement), this low latency signal chain delivers the noise and latency combination to meet faster control loop response time needs. For hardware in the loop applications, this latency and precision combination enables a system that closely emulates the dynamic system behavior.

**Features and Benefits**
- Combines precision and low latency to yield faster, more accurate test results
- Combination enables the HiL test system to emulate close to real system behaviour
- Built upon leading precision products: 16-bit AD3552R DAC and ADAQ23876 ADC μModule device

Learn more about precision wide bandwidth signal chain platform solutions at analog.com/precisionwidebandwidth

### Parts in Signal Chain
- AD3552R
- ADAQ23876
- ADN4654
- LTC6373
- ADG5421F
- LTC6655
- ADR4525
- AD8065
- ADAQ23875
- ADAQ23878

### Applications
- Instrumentation and measurement
- General-purpose
- Healthcare
Analog-to-Digital Converters

AD4116: Single-Supply, 24-Bit, Sigma-Delta ADC with ±10 V, 10 MΩ Inputs and Buffered Low Level Inputs

The AD4116 is a low power, low noise, 24-bit, sigma-delta analog-to-digital converter (ADC) that integrates an analog front end (AFE) for six fully differential or 11 single-ended, high impedance (≥10 MΩ) bipolar, ±10 V voltage inputs.

Features and Benefits
- Contains both voltage and current inputs for easy conversions
- 10 MΩ iPassives® front end maintains accuracy over longer cable distances
- Fully integrated with band gap internal reference

Applications
- Industrial automation
- Instrumentation and measurement

AD738x-4 Family: Tiny Quad Sim-Sampling ADC Family (16-/14-Bit)

The AD738x-4 and family of quad ADCs offer a unique combination of simultaneous sampling channels and high speeds in a tiny package to optimize system responsiveness in closed-loop applications and reduce form factor by enhancing signal chain channel density. These products significantly simplify both the analog front end and digital back end around the ADC with an integrated on-chip oversampling block and an ability to process wide common-mode signals without the need for complex analog input circuitry.

Family of Products
- AD7380-4: Differential input, quad, external reference simultaneous sampling, 16-bit, SAR ADC
- AD7381-4: Differential input, quad, 14-bit, simultaneous sampling, SAR ADC
- AD7389-4: Differential input, quad, internal reference simultaneous sampling, 16-bit SAR ADC

Features and Benefits
- Up to 16-bit compatible SAR ADC for enhanced system-level performance
- High channel density within a small form factor
- Increased sampling resolution with a 4 MSPS sample rate

Applications
- Communications/5G
- Industrial automation
- Instrumentation and measurement
- Energy
LTC6563: 4-Channel Transimpedance Amplifier with Output Multiplexing

The LTC6563 is a low noise 4-channel transimpedance amplifier (TIA) with 600 MHz bandwidth. The LTC6563 TIA’s low noise, wide linear range, and low power dissipation are ideal for LIDAR receivers using avalanche photodiodes (APDs) and photodiodes (PDs).

**Features and Benefits**
- 600 MHz bandwidth and low noise enable narrower LIDAR pulse widths
- Integrated DC cancellation and TILT function accommodate photo sensors
- High speed ADC driver reduces signal path complexity

**Applications**
- Automotive
- Industrial automation
- Aerospace and defense
- Building and infrastructure

MAX40263: 1.8 V, 15 MHz, Low Offset, Low Power, Dual Op Amp

The MAX40263 is a dual-channel operational amplifier with two channels that can be disabled separately with two individual pins. The MAX40263 offers a unique combination of high speed, precision, and low voltage operation, making it ideally suited for many signal processing functions such as filtering and amplification of signals in portable and industrial equipment.

**Features and Benefits**
- 15 MHz bandwidth improves sensor signal integrity
- Lower offset voltage increases sensor resolution by 4x
- Small form factor is ideal for wearable applications

**Applications**
- General-purpose
- Consumer
- Industrial automation
- Healthcare
Max49921: 0 V to 70 V, High Precision Current-Sense Amplifier

The Max49921 is a high precision, unidirectional current-sense amplifier (CSA) with an operating input common-mode range from 0 V to 70 V, though the device is protected against input common-mode voltages down to −42 V and up to +80 V, providing protection against reverse-battery and high voltage spikes.

**Features and Benefits**
- −42 V to +80 V CMR eliminates extra protection diodes needs
- Relaxes the requirements on the TVS diode needed to protect the system

**Applications**
- Automotive
- Industrial automation

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Max98365: Easy to Use, Cost-Effective, 14 V Plug and Play Digital Class D Amplifier

The Max98365 is an easy to use, low cost, digital input Class D amplifier that provides industry-leading, Class AB audio performance with Class D efficiency. The digital audio interface automatically recognizes different PCM and TDM clocking schemes that eliminate the need for PC programming—simply supply power, LRCLK, BCLK, and digital audio to generate sound.

**Features and Benefits**
- Requires no PC registers or programming
- Wide voltage range 3 V to 14 V for direct power supply from 1-cell to 3-cell battery
- Small size drives 14 W of output power

**Applications**
- Consumer
- General-purpose
- Healthcare
- Instrumentation and measurement
Analog Functions

CN0548: Isolated High Voltage, High Current, Measurement Reference Design

The CN0548 is a complete, isolated current and voltage measurement system that is galvanically isolated and will tolerate up to ±250 V between the host controller and measurement grounds. The isolation design includes both digital data and power domain signals; no additional power source is required from the circuit being measured.

<table>
<thead>
<tr>
<th>Features and Benefits</th>
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<tbody>
<tr>
<td>► Wide current and voltage range for multiple application spaces</td>
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<td>► Configurable gain/attenuation settings enable flexible test customization</td>
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<td>► Protects host processor from hazardous voltages</td>
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<td>► Industrial automation</td>
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<td>► Communications</td>
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Industrial Ethernet

EV-RPG2: ADI Chronous Embedded Reference Design for Network Interfacing with Industrial Ethernet

The ADI Chronous embedded reference design (EV-RPG2) is a complete Industrial Ethernet communication interface solution that combines hardware and software to support multiple protocols (PROFINET, EtherNet/IP, or EtherCAT) required by factory networks. Its small form factor and low power, combined with its ease of use, simplify the addition of Ethernet connectivity to any automation equipment, particularly devices networked via line or ring topologies. By solving the complex and time-consuming task of adding Ethernet connectivity, this complete, verified, and proven hardware design and associated multiprotocol software enable development of automation devices. Coming complete with the precertified protocol software of choice, it reduces development risk and overhead, providing fast time to market.

<table>
<thead>
<tr>
<th>Features and Benefits</th>
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<tr>
<td>► Proven and verified hardware and software system design saves development time and risk</td>
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<td>► Precertified multiprotocol software for Ethernet/IP, EtherCAT, and PROFINET</td>
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<td>► Industrial automation</td>
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ADN4693E-1: 3.3 V, 200 Mbps, Full-Duplex, High Speed M-LVDS Transceiver

The ADN4693E-1 is a multipoint, low voltage differential signaling (M-LVDS) transceiver (driver and receiver pair) that can operate at up to 200 Mbps (100 MHz) nonreturn to zero (NRZ). The receiver detects the bus state with a differential input of as little as ±50 mV over the common-mode voltage range of the device. Electrostatic discharge (ESD) protection of up to ±15 kV is implemented on the bus pins. The ADN4693E-1 is designed to the TIA/EIA-899 standard for M-LVDS and complement TIA/EIA-644 LVDS devices with additional multipoint capabilities.

Features and Benefits
- Integrated single transmitter and receiver for high density backplane applications
- IEC ESD protection exceeds HBM level of protection
- Reliable operation of a multipoint network

Applications
- Industrial automation
- Instrumentation and measurement
- Communications/5G

ADuM4166 Family: 3.75 kV to 5.7 kV rms Digital Isolators for Isolated USB 2.0 High Speed

The ADuM4166 family of high speed USB 2.0 digital isolators simplifies system design, and single-chip compact isolation of USB ports with automatic USB 2.0 mode/speed selection allows for full compatibility. High speeds of 480 Mbps support faster software upgrades and video streaming, while enhanced EMC robustness meets medical application needs.

Features and Benefits
- Transparently isolates all ports including hosts easing design challenges
- Supports battery-powered applications
- Enhanced robustness meets medical requirements for insulation

Applications
- Healthcare
- Industrial automation
- Instrumentation and measurement
- General-purpose

Family of Products
- ADuM4166: 5.7 kV rms isolation, 8 mm creepage and clearance package (downstream clock input)
- ADuM4165: 5.7 kV rms isolation, 8 mm creepage and clearance package (upstream clock input)
- ADuM3166: 3.75 kV rms isolation, half size package (downstream clock input)
- ADuM3165: 3.75 kV rms isolation, half size package (upstream clock input)
Optical Communications and Sensing

CN0569: Infrared Gesture Recognition Module

The CN0569 uses gesture recognition applications to detect reflected IR light and generate a response based on the object's position. The CN0569 is ideal for monitoring buildings, public spaces, and noisy environments, where the background noise and ambient sounds make it difficult for voice-activated systems to accurately capture data.

Features and Benefits
- Dual photodiode sensors reduce false tracking
- Highly integrated optical front end reduces system footprint
- Open-source algorithm provides a tested example

Applications
- Building and infrastructure
- Consumer
- Healthcare

Power


The LT7182S is a dual-output monolithic PolyPhase DC-to-DC synchronous step-down regulator. It can deliver up to 6 A of continuous current from both channels simultaneously and can support loads up to 8 A from either channel. The LT7182S features the second generation Silent Switcher architecture with integrated V_IN bypass capacitors for fast, clean, low overshoot switching edges delivering high efficiency at high switching frequencies while minimizing EMI emissions.

Features and Benefits
- Achieves ultrahigh regulation with ±0.25% output voltage accuracy in dual output applications
- I²C-based PMBus serial interface and integrated EEPROM for system monitoring
- Silent Switcher 2 architecture for high efficiency at high switching frequencies

Applications
- General-purpose
- Industrial automation
- Communications/5G
- Aerospace and defense
LT8356-1: 100 V\textsubscript{IN}/120 V\textsubscript{OUT} LED Controller with Exponential PWM and Scalable Dimming

The LT8356-1 is a DC-to-DC controller designed to drive high current LEDs. The fixed frequency, current mode architecture results in stable operation over a wide range of supply and output voltages. A voltage feedback pin serves as the input for several LED protection features and makes it possible for the converter to operate as a constant-voltage source. The LT8356-1 can implement boost, buck-boost mode, buck-mode, SEPIC, and flyback LED drivers. This product is also AEC-Q100 qualified.

**Features and Benefits**
- Achieves uniform brightness changes over complete dimming range for better human eye perception
- Capable of external PWM high dimming range up to 20,000:1
- Supports high voltage LED strings with low EMI

**Applications**
- Automotive
- Industrial automation
- General-purpose

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LTC2980-24: 24-Channel PMBus Power System Manager

The LTC2980-24 is a 24-channel PMBus power system manager that adds extensive digital control and monitoring to an analog power system. It's used to sequence, trim (serve), margin, supervise, manage faults, provide telemetry, and create fault logs. PMBus commands support power supply sequencing, precision point-of-load voltage adjustment, and.margining.

**Features and Benefits**
- Improves accuracy of 24 supplies to optimize performance
- Internal nonvolatile EEPROM memory for fault logging and maintaining configuration

**Applications**
- Communications/5G
- General-purpose
**LTC7803/LTC7805/LTC7819: 40 V, Low $I_Q$ Synchronous Step-Down Controllers**

The single output LTC7803, dual output LTC7805, and triple output LTC7819 showcase the latest technology in switching regulator step-down DC-to-DC controllers. All products feature up to 3 MHz operating switching frequency and very low $I_Q$, along with PassThru™/100% duty cycle capability and spread spectrum frequency modulation.

**Family of Products**
- **LTC7803**: 40 V low $I_Q$, 3 MHz synchronous step-down controller with spread spectrum
- **LTC7805**: 40 V low $I_Q$, dual, 2-Phase 100% duty cycle synchronous step-down controller
- **LTC7819**: 40 V low $I_Q$, triple output, 3-phase synchronous step-down controller

**Features and Benefits**
- Up to 3 MHz switching frequency reduces form factor
- Very low $I_Q$ increases battery run-time during standby mode

**Applications**
- Automotive
- Industrial automation
- Instrumentation and measurement
- Aerospace and defense

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**LTM4673: Quad Output μModule Regulator with Digital Power System Management**

The LTM4673 is a quad output, dual 12 A and dual 5 A, switching mode DC-to-DC step-down μModule regulator integrated with 4-channel power system manager used to sequence, trim (servo), margin, supervise, manage faults, provide telemetry, and create fault logs.

**Features and Benefits**
- Supports multiple power rails from 5 A to 24 A
- Monitors status and faults to increase reliability
- Drop-in compatible with non-PMBus® version for future proofing

**Applications**
- General-purpose
- Instrumentation and measurement
- Communications/5G
- Industrial automation
MAX31329: Low Current, Real-Time Clock with I²C, Power Management, and Integrated Crystal

The MAX31329 low current, real-time clock (RTC) is a timekeeping device that provides timekeeping current in nanoamperes, thus extending battery life. The MAX31329 incorporates an integrated crystal oscillator, which eliminates the need for an external crystal. Other features include one digital Schmitt trigger input (DIN), time-of-day alarms, interrupt outputs, programmable square-wave output, and a serial bus timeout mechanism.

Features and Benefits
- Low time keeping current 240 nA extends battery life
- Integrated crystal oscillator improves timekeeping accuracy

Applications
- Industrial automation
- Instrumentation and measurement
- Healthcare

MAX16602/MAX20790: Controller IC Voltage Regulator Chipset

The MAX16602 and MAX20790 chipset achieves greater than 95% efficiency and supports designs from 60 A to 800 A. This high current multiphase voltage regulator chipset offers advanced self-protection and power features, including accurate temperature monitoring and fast overcurrent protection.

Features and Benefits
- Coupled inductor technology supports switching at lower frequencies to increase efficiency
- Dual side cooling capability enables high density designs
- Extensive telemetry reporting monitors temperature, faults, and input voltage/current/power

Applications
- Communications
- Industrial automation
- Instrumentation and measurement
- General-purpose
MAX77857: 2.5 V to 16 V Input, 7 A Switching Current High Efficiency Buck-Boost Converter

The MAX77857 is a high efficiency, high performance, fully integrated buck-boost converter with I^2C serial interface targeted for systems requiring a wide input voltage range (2.5 V to 16 V). It features 7 A switching current and can supply up to 6 A output current in buck mode and up to 4 A in boost mode. It operates in PWM mode and implements an automatic SKIP mode to improve light-load efficiency.

Features and Benefits
► Enables 20 W+ in a small 48 mm² solution size
► Four I^2C subnode addresses allow multiple ports
► Eight current limit selections for a variety of different power rails

Applications
► Consumer
► Healthcare

MAXESSENTIAL02: Essential Analog Power Toolkit

This toolkit offers a selection of nine power conversion devices on miniature test boards designed for mounting on breadboards. This sample box allows for a hands-on evaluation of an array of power conversion solutions before purchasing a full-featured evaluation board, including LDOs, buck, boost, and buck-boost controllers with representative products from the nanoPower Technology™, uSLIC™ module, and Continua™ families for line and battery-powered applications.

Features and Benefits
► Choice of power product development boards for early design integration
► Wide range of power spanning buck, boost, buck-boost, LDO, nanoPower Technology switching converter and module

Applications
► Consumer
► Healthcare
► Energy
► General-purpose

Processors and Microcontrollers

MAX32672: High Reliability, Tiny, Ultra Low Power Arm Cortex-M4F Microcontroller with 12-Bit 1 MSPS ADC

The MAX32672 is an ultra low power, cost-effective, highly integrated, and highly reliable 32-bit microcontroller enabling designs with complex sensor processing without compromising battery life. It combines a flexible and versatile power management unit with the powerful Arm Cortex-M4 processor with a floating-point unit (FPU).

Features and Benefits
► Ultra low power Arm Cortex-M4F MCU with 12-bit ADC
► Financial grade crypto engines and security architecture
► Robust code execution with error correcting code on all embedded memories for harsh environments

Applications
► Industrial automation
► Building and infrastructure
► General-purpose
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