TELEDYNE SP DEVICES
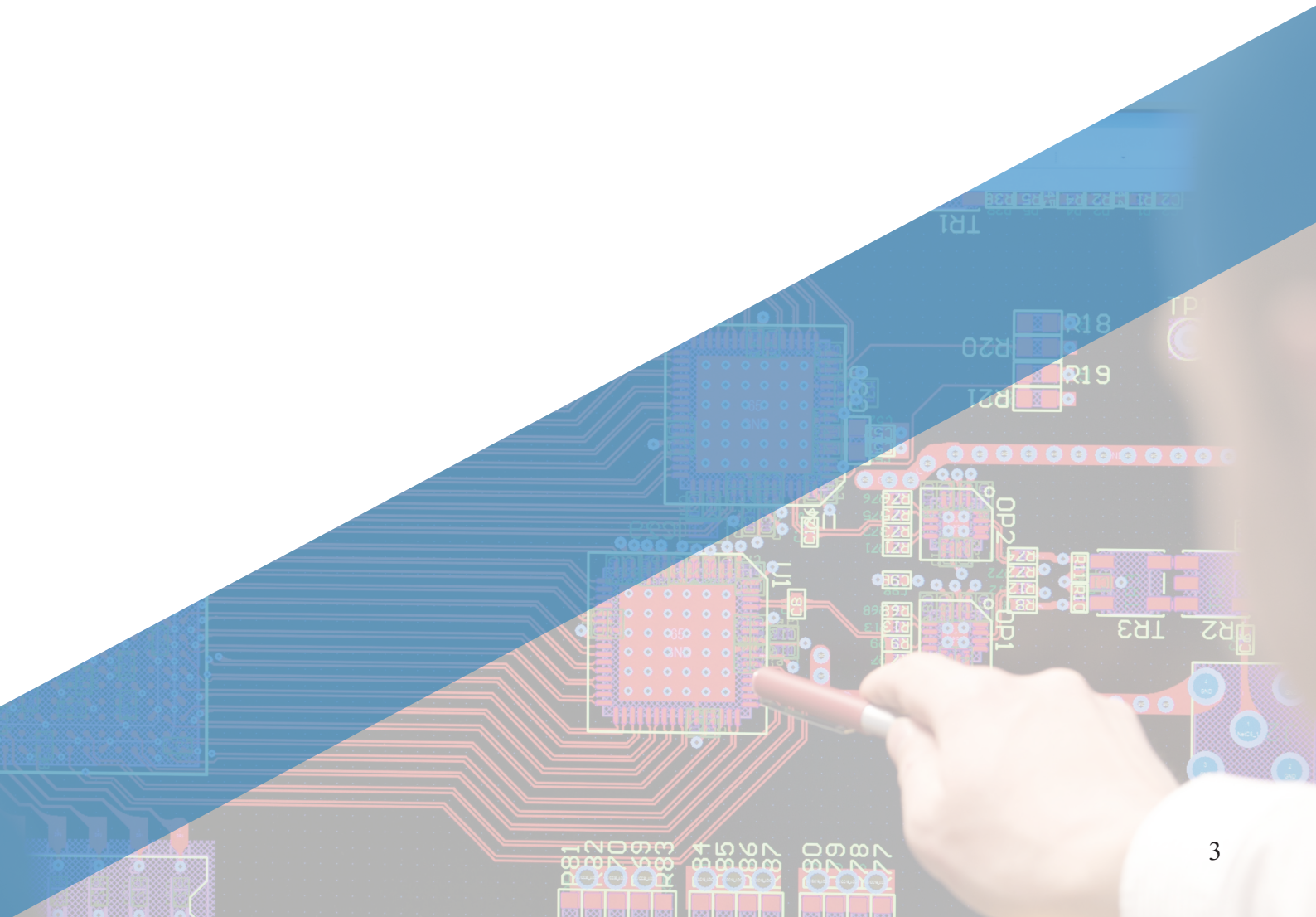## Everywhere**you**look™

COMPANY OVERVIEW

PROVEN. RELIABLE. ADVANCED.

OUR COMPANY

Teledyne SP Devices has provided digitizers to customers and original equipment manufacturers (OEMs) since 2004. We strive to be application experts in our target markets so that we can offer our customers differentiated features and capabilities to simplify and improve their system design.
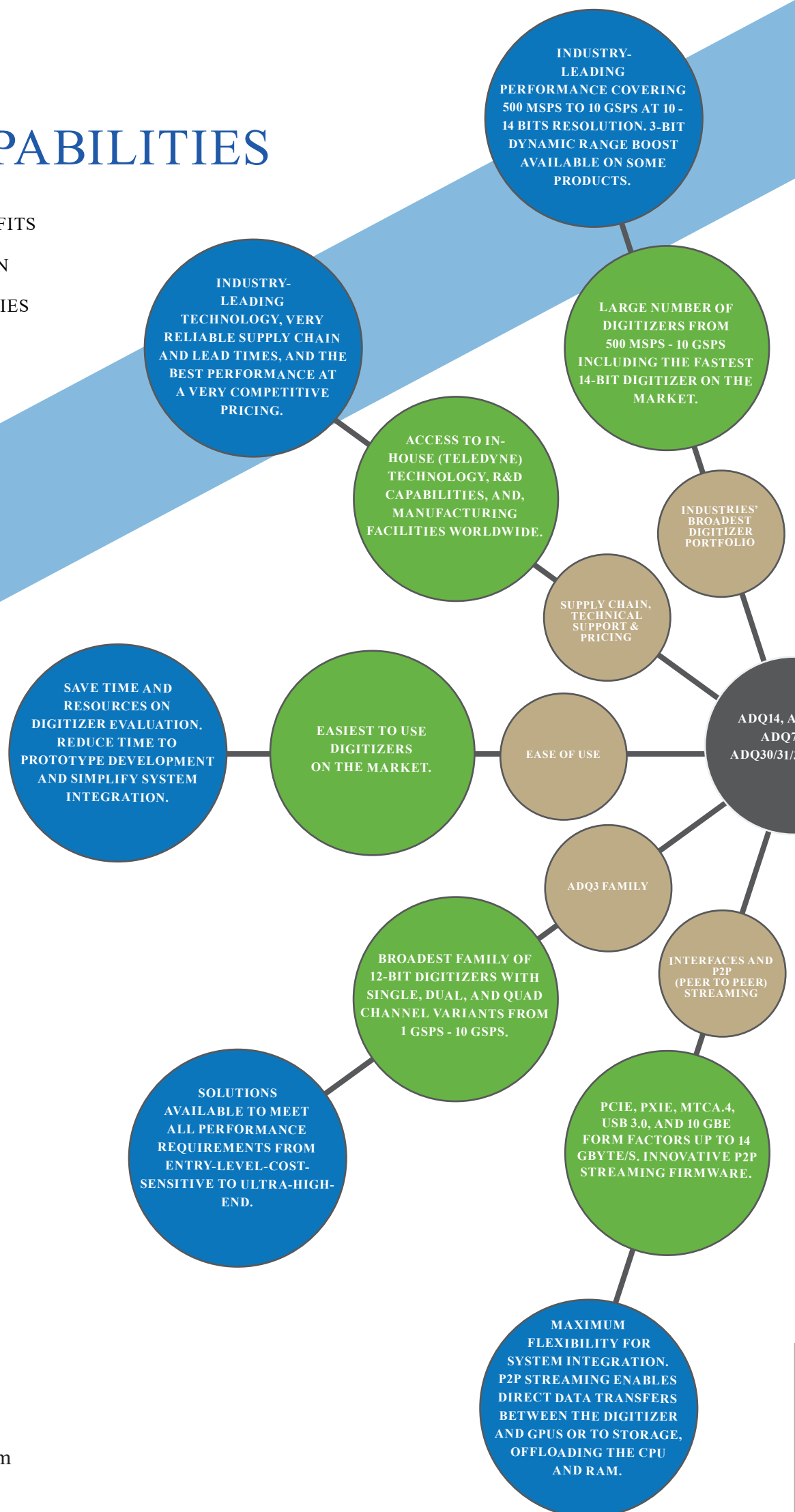
Our engineers make it their mission to provide leading-edge products constantly and consistently. We remain at the forefront of digitizing performance, by anticipating and adapting to ever-evolving technology, thus enabling our customers to deliver the most advanced and competitive products possible.
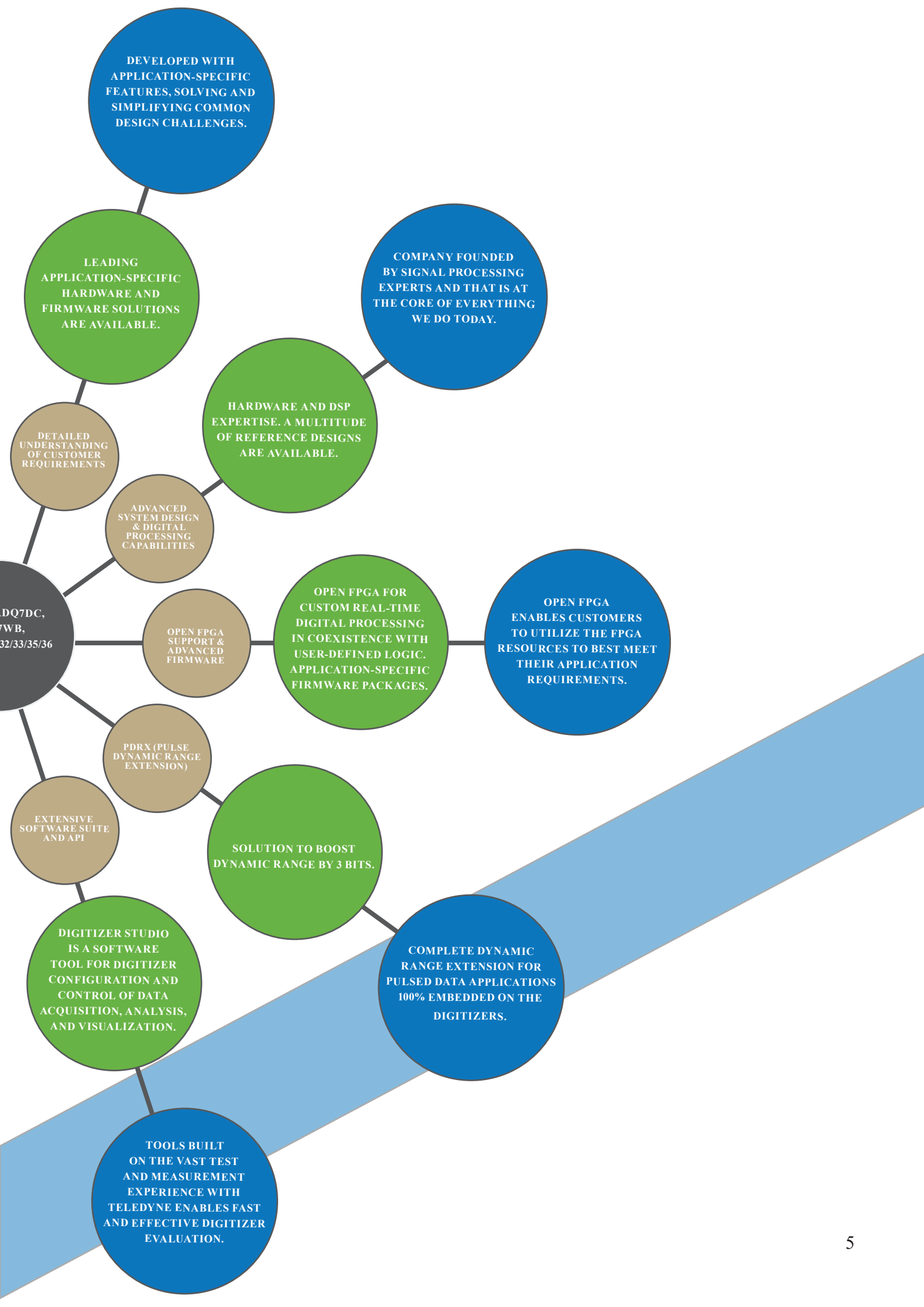
Teledyne SP Devices is part of Teledyne Technologies, an international, multi-billion-dollar company. As a part of the Teledyne family, we have access to some of the industry's most knowledgeable experts, research and development capabilities, and manufacturing facilities worldwide.

OUR CAPABILITIES

Legend:
- CUSTOMER BENEFITS
- DIFFERENTIATION
- TOP 10 CAPABILITIES
- PRODUCTS

INDUSTRY-LEADING PERFORMANCE COVERING 500 MSPS TO 10 GSPS AT 10 - 14 BITS RESOLUTION. 3-BIT DYNAMIC RANGE BOOST AVAILABLE ON SOME PRODUCTS.

INDUSTRY-LEADING TECHNOLOGY, VERY RELIABLE SUPPLY CHAIN AND LEAD TIMES, AND THE BEST PERFORMANCE AT A VERY COMPETITIVE PRICING.

LARGE NUMBER OF DIGITIZERS FROM 500 MSPS - 10 GSPS INCLUDING THE FASTEST 14-BIT DIGITIZER ON THE MARKET.

ACCESS TO IN-HOUSE (TELEDYNE) TECHNOLOGY, R&D CAPABILITIES, AND, MANUFACTURING FACILITIES WORLDWIDE.

INDUSTRIES' BROADEST DIGITIZER PORTFOLIO

SUPPLY CHAIN, TECHNICAL SUPPORT & PRICING

SAVE TIME AND RESOURCES ON DIGITIZER EVALUATION. REDUCE TIME TO PROTOTYPE DEVELOPMENT AND SIMPLIFY SYSTEM INTEGRATION.

EASIEST TO USE DIGITIZERS ON THE MARKET.

EASE OF USE

ADQ14, A ADQ7 ADQ30/31/

ADQ3 FAMILY

BROADEST FAMILY OF 12-BIT DIGITIZERS WITH SINGLE, DUAL, AND QUAD CHANNEL VARIANTS FROM 1 GSPS - 10 GSPS.

INTERFACES AND P2P (PEER TO PEER) STREAMING

SOLUTIONS AVAILABLE TO MEET ALL PERFORMANCE REQUIREMENTS FROM ENTRY-LEVEL-COST-SENSITIVE TO ULTRA-HIGH-END.

PCIE, PXIE, MTCA.4, USB 3.0, AND 10 GBE FORM FACTORS UP TO 14 GBYTE/S. INNOVATIVE P2P STREAMING FIRMWARE.

MAXIMUM FLEXIBILITY FOR SYSTEM INTEGRATION. P2P STREAMING ENABLES DIRECT DATA TRANSFERS BETWEEN THE DIGITIZER AND GPUS OR TO STORAGE, OFFLOADING THE CPU AND RAM.

DEVELOPED WITH APPLICATION-SPECIFIC FEATURES, SOLVING AND SIMPLIFYING COMMON DESIGN CHALLENGES.

LEADING APPLICATION-SPECIFIC HARDWARE AND FIRMWARE SOLUTIONS ARE AVAILABLE.

COMPANY FOUNDED BY SIGNAL PROCESSING EXPERTS AND THAT IS AT THE CORE OF EVERYTHING WE DO TODAY.

HARDWARE AND DSP EXPERTISE. A MULTITUDE OF REFERENCE DESIGNS ARE AVAILABLE.

DETAILED UNDERSTANDING OF CUSTOMER REQUIREMENTS

ADVANCED SYSTEM DESIGN & DIGITAL PROCESSING CAPABILITIES

ADQ7DC, 7WB, 32/33/35/36

OPEN FPGA SUPPORT & ADVANCED FIRMWARE

OPEN FPGA FOR CUSTOM REAL-TIME DIGITAL PROCESSING IN COEXISTENCE WITH USER-DEFINED LOGIC. APPLICATION-SPECIFIC FIRMWARE PACKAGES.

OPEN FPGA ENABLES CUSTOMERS TO UTILIZE THE FPGA RESOURCES TO BEST MEET THEIR APPLICATION REQUIREMENTS.

PDRX (PULSE DYNAMIC RANGE EXTENSION)

EXTENSIVE SOFTWARE SUITE AND API

SOLUTION TO BOOST DYNAMIC RANGE BY 3 BITS.

DIGITIZER STUDIO IS A SOFTWARE TOOL FOR DIGITIZER CONFIGURATION AND CONTROL OF DATA ACQUISITION, ANALYSIS, AND VISUALIZATION.

COMPLETE DYNAMIC RANGE EXTENSION FOR PULSED DATA APPLICATIONS 100% EMBEDDED ON THE DIGITIZERS.

TOOLS BUILT ON THE VAST TEST AND MEASUREMENT EXPERIENCE WITH TELEDYNE ENABLES FAST AND EFFECTIVE DIGITIZER EVALUATION.

WHY TELEDYNE SP DEVICES

When you work with Teledyne SP Devices, you are also working with Teledyne Technologies. Therefore, we can ensure the most current products, technology, and solutions, but also offer the stability of a large supplier and a long-term partnership with our client.

Our product roadmap defines an offering that generates real and proven value, and our team of signal processing experts, applications team, and support staff work in close collaboration with our customers. We develop local engineering contacts to identify solutions, implement training, and facilitate integration milestones.

- The open architecture provides customer access to the onboard field-programmable gate array (FPGA) for custom real-time signal processing.

- We offer custom engineering to our original equipment manufacturer (OEM) customers through design and integration services. All parts of the products can be customized, including software, firmware, and hardware. This allows our OEM customers to focus on their value-add.

- The applications team is part of our R&D organization and provides signal processing expertise as well as domain knowledge. They work in close collaboration with the customer during the design-in phase to fulfill integration milestones and thereby shorten the time to market.

- The in-house support group consists of experienced developers that work in close collaboration with our R&D team. They are directly involved in the planning of in-house R&D resources and can therefore escalate prioritized support cases so that they can be resolved in a timely manner. We take pride in providing short response times to our customers.

OUR PRODUCTS MAKE A DIFFERENCE

Per Löwenborg, Ph.D.
General Manager

INSPIRING INNOVATION AND BREAKTHROUGHS

APPLICATION EXAMPLES

Teledyne SP Devices' digitizers are developed with application-specific features, solving and simplifying common design challenges.

- Time-of-flight mass spectrometry

- Distributed optical fiber sensing

- Swept-source OCT

- LiDAR

- ATE

- Big physics

- Automated test equipment

- Analytical instrumentation

- Quantum physics

- Aerospace & Defense

- and many more!
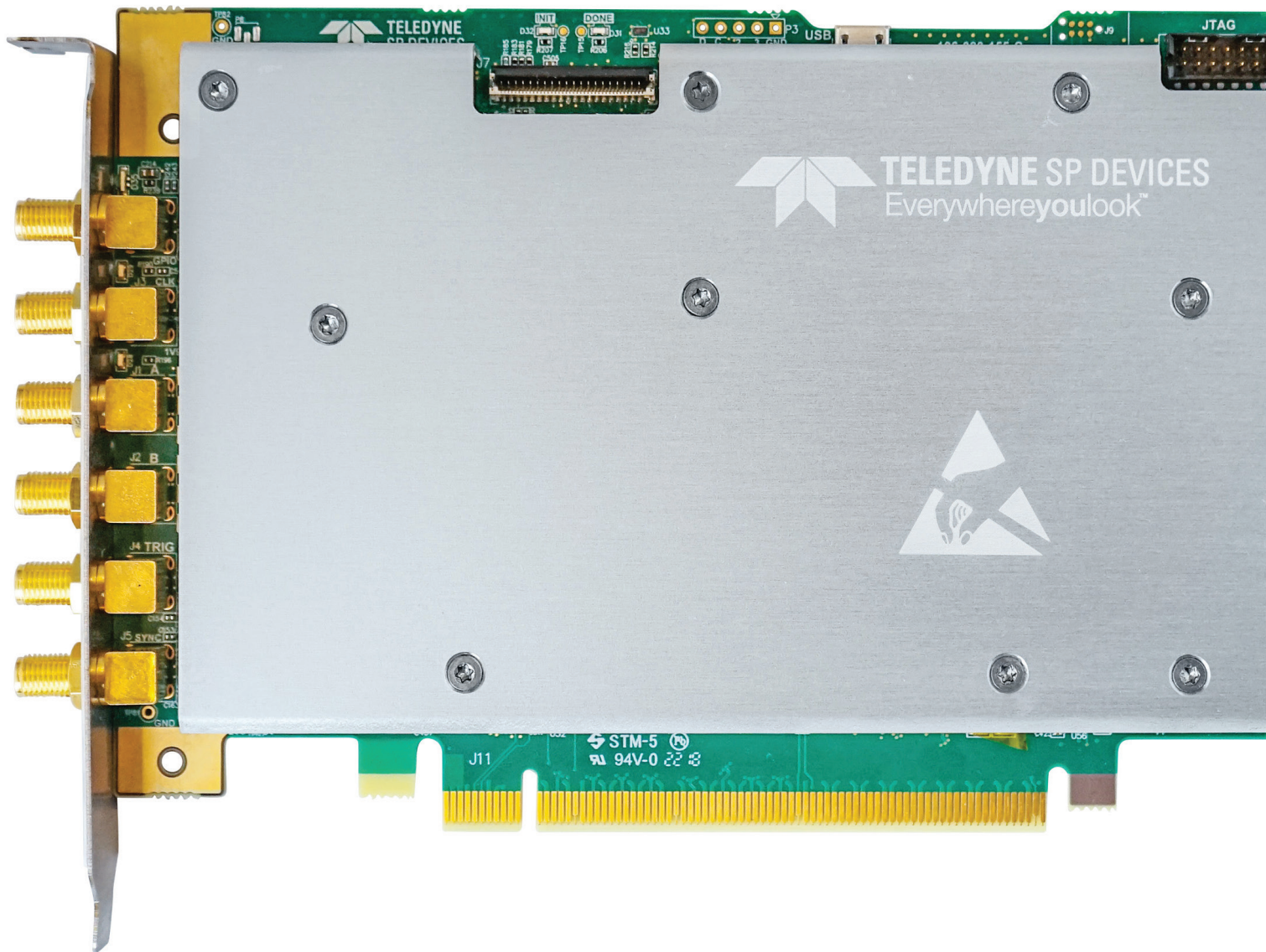
BREAKING BOUNDARIES TAKING YOU FORWARD

- Dual Gain Pulse Dynamic Range Extension (PDRX) boosts dynamic range by 3 bits

- Peer-to-peer streaming to GPU or SSD storage at rates up to 14 Gbyte/s

- Multiple digitizers can stream to the same GPU for aggregate rates up to 28 Gbyte/s

- Daisy-chain triggering for picosecond timing accuracy in high-channel-count systems operating at Giga sample per second sampling rates

- Easy-to-use application programming interface (API) that helps simplify development, code reuse, and maintenance

OUR PRODUCTS

Teledyne SP Devices offer high-performance digitizers using an open FPGA architecture, capable of enabling new applications. Our extensive product portfolio enables cost-optimized system-level solutions that meet the highest quality standards. Here are a few of the benefits:

- Hardware modules offer flexible operation by supporting AC- or DC-coupling, adjustable DC-offset, programmable input voltage range, advanced triggering, multi-channel synchronization, and more.

- All products support custom real-time DSP through an open FPGA architecture – a crucial requirement for many of today's systems.

- Additional stand-alone firmware packages simplify operation by providing rich sets of application-specific functions without any need for firmware development.

- Data streaming of up to 14 Gbyte/s is supported, and selected products support peer-to-peer streaming to graphics processing units (GPUs) as well as to disk storage.

- Products are available in PCIe, PXIe, MTCA.4, USB 3.0, and 10 GbE form factors.
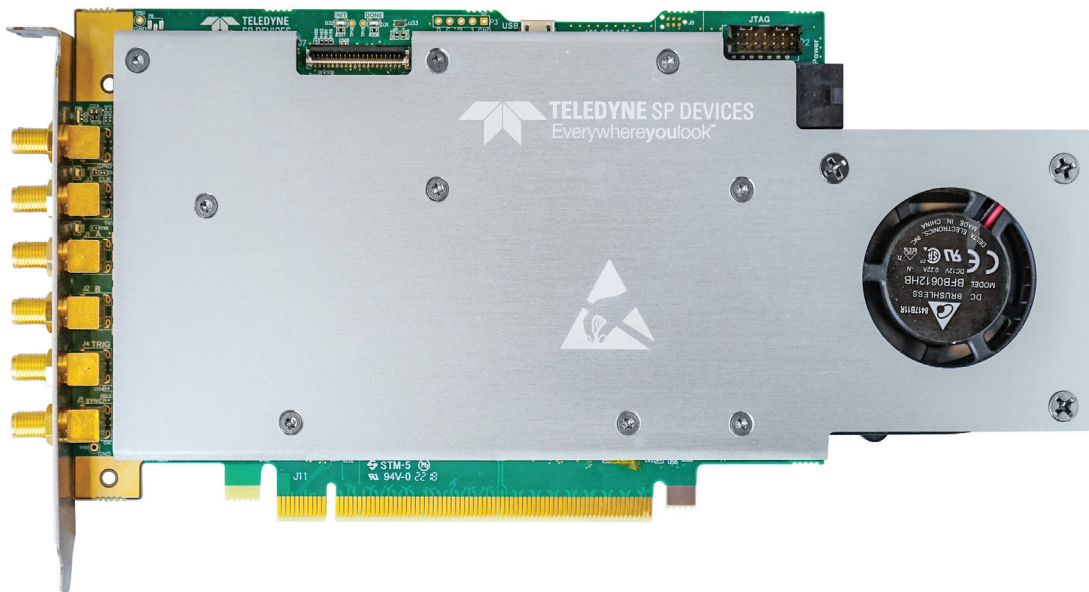
# SELECTED PRODUCTS

ADQ7DC
14-bit, 10 GSPS Digitizer

Key Features

- 10 or 5 GSPS sampling rate with 14 bits resolution

- Single/Dual channel

- Open FPGA for custom real-time DSP

- Available in PXIe, PCIe, MTCA.4, USB 3.0, and 10 GbE form factors

- Multi-channel synchronization capabilities

- Peer-to-peer streaming to GPU or SSD

- Application-specific firmware helps shorten design time

Example Applications

- Time-of-flight mass spectrometry

- LiDAR

- RF sampling

ADQ14
14-bit, 2 GSPS Digitizer

Key Features

- 2, 1 or 0.5 GSPS sampling rate with 14 bits resolution

- Single/Dual/Quad channel

- Open FPGA for custom real-time DSP

- Available in PXIe, PCIe, MTCA.4, USB 3.0 and 10 GbE form factors

- Multi-channel synchronization capabilities

- Peer-to-peer streaming to GPU

- Application-specific firmware helps shorten design time

Example Applications

- Swept-source OCT

- LiDAR

- Distributed optical fiber sensing

- RF sampling

Digitizer Studio
Evaluation Software
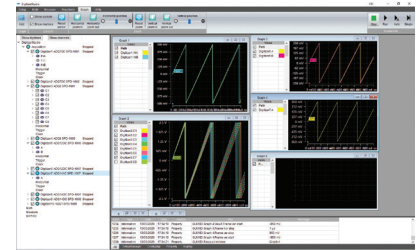
Key Features

- Offers quick access to the complete set of underlying API commands via an easy-to-use graphical user interface (GUI)

- Ideal tool for evaluation and integration

- New generation of software framework which can easily be updated with additional functionality

- Diagram view helps improve understanding of the underlying hardware architecture

- Powerful measurement, math, and graph functions

- Flexible control of a large number of digitizers in multi-channel installations

- Runs both on Windows and Linux

ADQ3X FAMILY
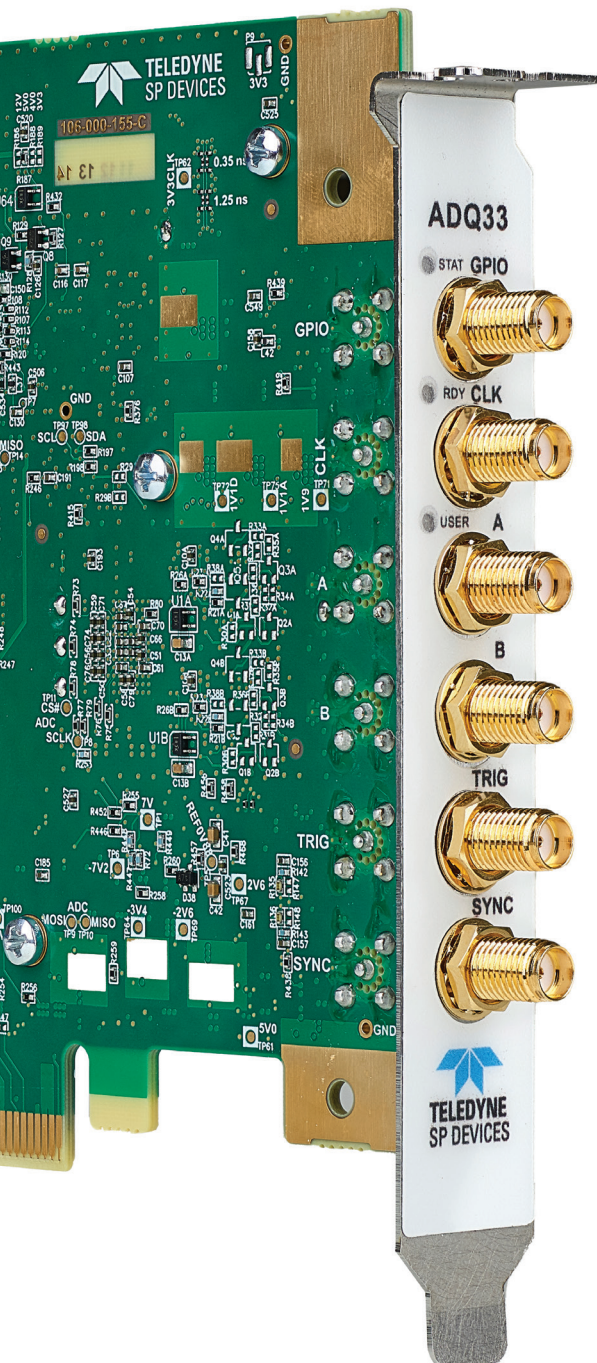
ADQ30
12-bit, 1 GSPS Digitizer

Key Features

- 1 GSPS sampling rate with 12 bits resolution

- Single channel

- Open FPGA for custom real-time DSP

- PCIe

- Multi-channel synchronization capabilities

- Peer-to-peer streaming to GPU

- Application-specific firmware helps shorten design time

Example Applications

- Time-of-flight mass spectrometry

- Distributed optical fiber sensing

- LiDAR

ADQ33
12-bit, 1 GSPS Digitizer

Key Features

- 1 GSPS sampling rate with 12 bits resolution

- Dual channel

- Open FPGA for custom real-time DSP

- PCIe

- Multi-channel synchronization capabilities

- Peer-to-peer streaming to GPU

- Application-specific firmware helps shorten design time

Example Applications

- Distributed optical fiber sensing

- Swept-source OCT

- LiDAR

ADQ32
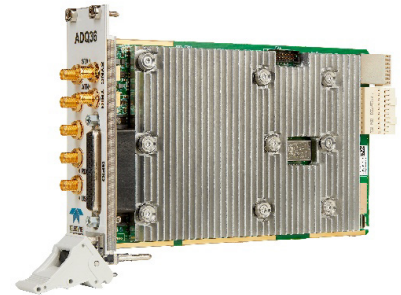### 12-bit, 5 GSPS Digitizer

Key Features

- 5 or 2.5 GSPS sampling rate with 12 bits resolution

- Single/Dual channel

- Open FPGA for custom real-time DSP

- PCIe

- Multi-channel synchronization capabilities

- Peer-to-peer streaming to GPU

- Application-specific firmware helps shorten design time

Example Applications

- Time-of-flight mass spectrometry

- Distributed optical fiber sensing

- Swept-source OCT

ADQ36
Evaluation Software


Key Features

- 5 or 2.5 GSPS sampling rate with 12 bits resolution

- Dual/Quad channel

- Open FPGA for custom real-time DSP

- PXIe

- Multi-channel synchronization capabilities

- Peer-to-peer streaming to GPU

- Application-specific firmware helps shorten design time

Example Applications

- LiDAR

- Beam position monitoring

- High energy physics

LEADING TECHNOLOGY TO ENSURE YOUR SUCCESS
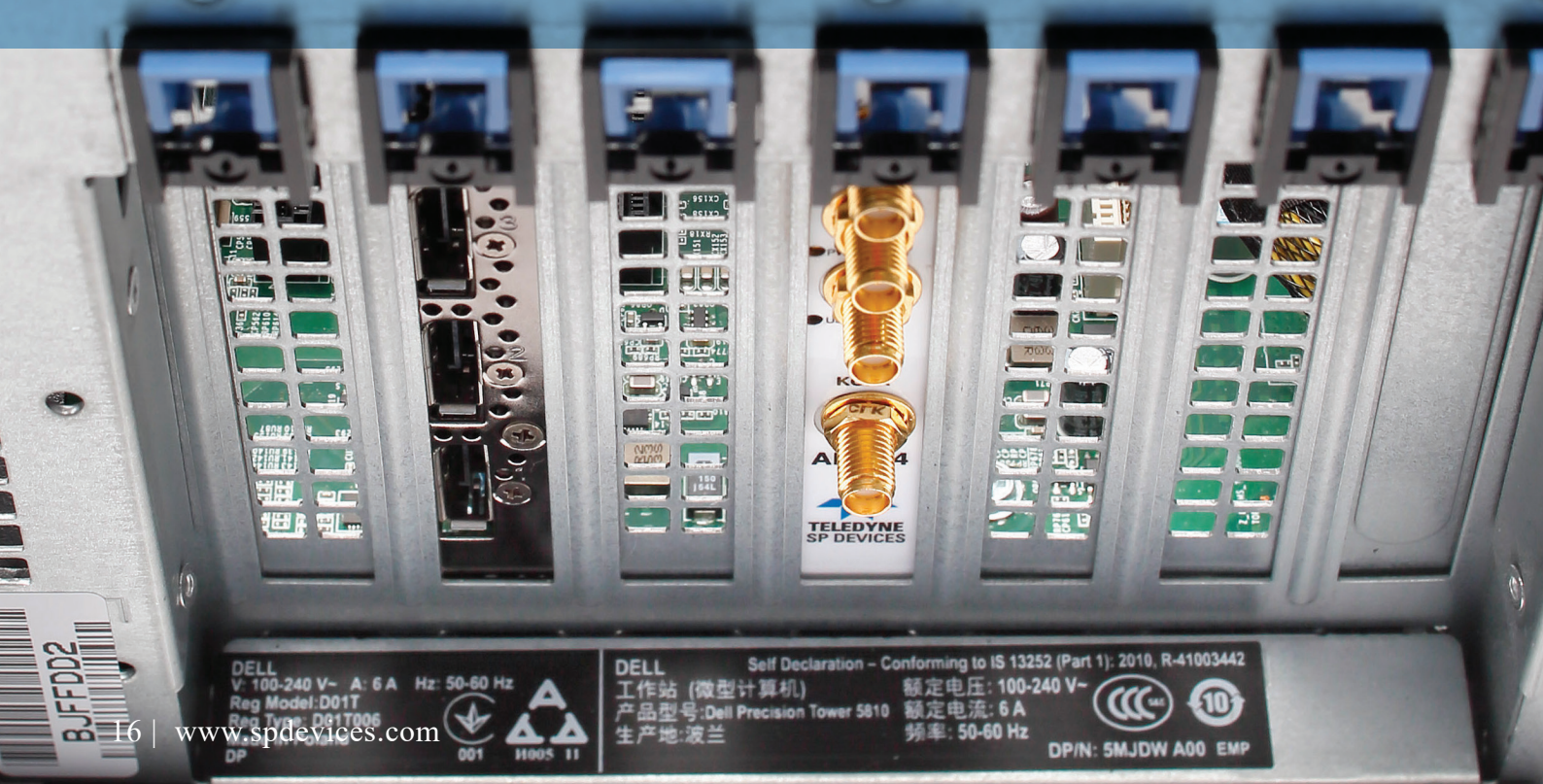
TECHNOLOGY

Teledyne SP Devices uses state-of-the-art components and the most recent design methodologies and tools in our R&D.

- Patented DSP solutions improve the performance of analog-to-digital converters (ADCs) beyond datasheet specifications:

  - ADX removes ADC time-interleaving errors to achieve unparalleled spurious-free dynamic range (SFDR). This is crucial in frequency-domain applications and provides an industry-leading dynamic range.

  - DBS corrects for baseline drift and pattern noise caused by temperature variations and component aging. It is used in time-domain applications and has contributed to significant advances in applications such as time-of-flight mass spectrometry and LiDAR.

- Every aspect of each product can be customized, enabling the reuse of existing infrastructure. This permits a cost-effective alternative to in-house development while keeping development cycles short.

MANUFACTURING & QUALITY FOCUS

As an ISO-certified company, we offer products that meet the highest quality standards. Our manufacturing capabilities and facilities provide complete quality, production, and test control.

- Teledyne SP Devices is ISO 9001-certified and all our development and manufacturing is performed according to well-established documented processes.

- Our primary Electronic Manufacturing Services (EMS) partner is a large well-renowned company that operates globally. They are both ISO 9001- and ISO 14001-certified and can produce thousands of units per month.

- Final assembly and testing are performed in-house to ensure compliance with specifications. Test result reports are created and stored automatically for each product.

- We offer traceable calibration via an accredited partner according to ISO 9001 and ISO/IEC 17025.

WHEN COMPROMISE IS NOT AN OPTION

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