

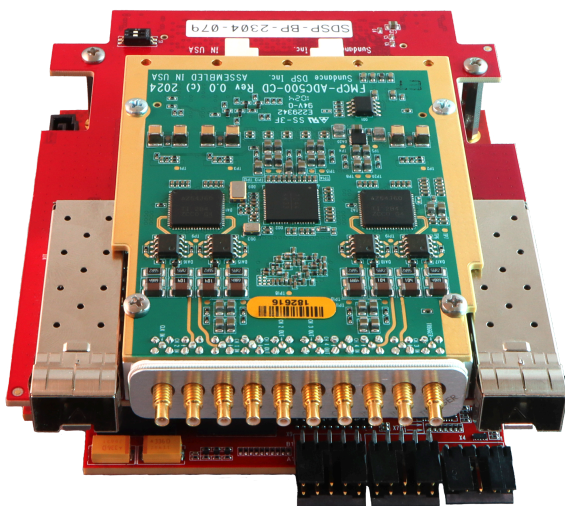


# Data Logger 300 (DL300)

## High-Performance Data Acquisition & Processing System

### Overview

The Data Logger 300 (DL300) is a **high-speed, high-precision data acquisition and processing system** designed for applications that demand real-time performance, large data throughput, and seamless integration. Combining **high-speed analog-to-digital conversion, powerful FPGA-based processing, and ultra-fast data transfer capabilities**, the DL300 delivers an **end-to-end solution** for signal intelligence, scientific research, and advanced communication systems.



Whether you need to capture **high-resolution signals**, process data in **real-time**, or **transmit large volumes of information across high-speed networks**, the DL300 provides the flexibility and scalability to meet your demands. The system is built with modularity in mind, allowing for expansion and customization based on specific project requirements. Its **synchronization capabilities** ensure deterministic operation, making it ideal for **multi-device setups and distributed computing environments**.

With an **optimized design for performance and reliability**, the DL300 is the perfect choice for engineers, researchers, and developers working on **cutting-edge applications in RF signal processing, high-speed communications, and embedded AI**.



## Key Features & Benefits

- ✓ **Ultra-Fast Signal Capture:** High-resolution, multi-channel analog-to-digital conversion
- ✓ **Real-Time Data Processing:** FPGA-powered architecture for custom algorithm implementation
- ✓ **High-Speed Networking:** Multi-gigabit Ethernet & PCIe interfaces for rapid data transfer
- ✓ **Scalable & Flexible:** Modular design with expansion options for custom applications
- ✓ **Deterministic & Synchronized:** Clocking & triggering for real-time, multi-board setups
- ✓ **Rugged & Reliable:** PCIe104-based architecture built for harsh environments

## Built on the Rugged PCIe104 Form Factor

The DL300 system is designed based on the PCIe104 form factor, a ruggedized, stackable architecture specifically developed for harsh environments. PCIe104 provides high reliability, shock resistance, and compact modularity, making it the preferred choice for aerospace, defense, and industrial applications where performance under extreme conditions is critical.

### Key Features of PCIe104

- ✓ **Rugged, Reliable Design:** With no backplane or cables, the PCIe104 standard ensures secure, high-speed connections that withstand vibration, shock, and temperature extremes.
- ✓ **Compact & Stackable:** The small PCIe104 footprint allows for high-density system integration, supporting multi-board stacking for expanded capabilities.
- ✓ **High-Speed PCIe Interconnects:** DL300 leverages PCIe Gen2 lanes for high-bandwidth, low-latency data communication between processing and acquisition modules.
- ✓ **Extended Temperature & Harsh Environment Tolerance:** Designed to function in aerospace, defense, and industrial settings, ensuring stable operation in extreme conditions.
- ✓ **Modular & Scalable Architecture:** The stackable PCIe104 standard allows seamless expansion with additional signal processing, networking, or storage modules, adapting to mission-specific requirements.

### Ideal for Aerospace & Defense Applications

The DL300 system is built to meet the rigorous demands of aerospace, defense, and industrial sectors, making it ideal for mission-critical applications, including:

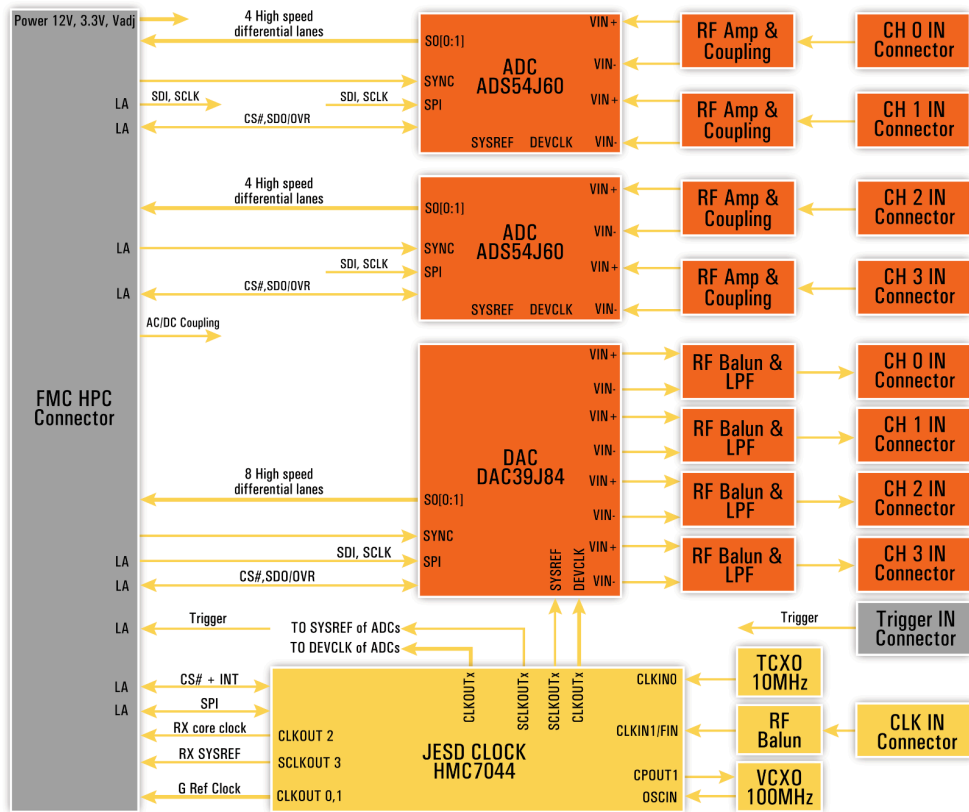


- ✓ **Electronic Warfare (EW) & Signal Intelligence (SIGINT):** Real-time RF signal acquisition and processing in extreme conditions
- ✓ **Avionics & Flight Data Recording:** Compact and rugged solution for airborne applications
- ✓ **Radar & Sonar Systems:** High-speed data acquisition and processing
- ✓ **Autonomous Systems & UAVs:** Reliable embedded computing for unmanned aerial and ground-based platforms

## System Capabilities

### Ultra-Fast Data Acquisition:

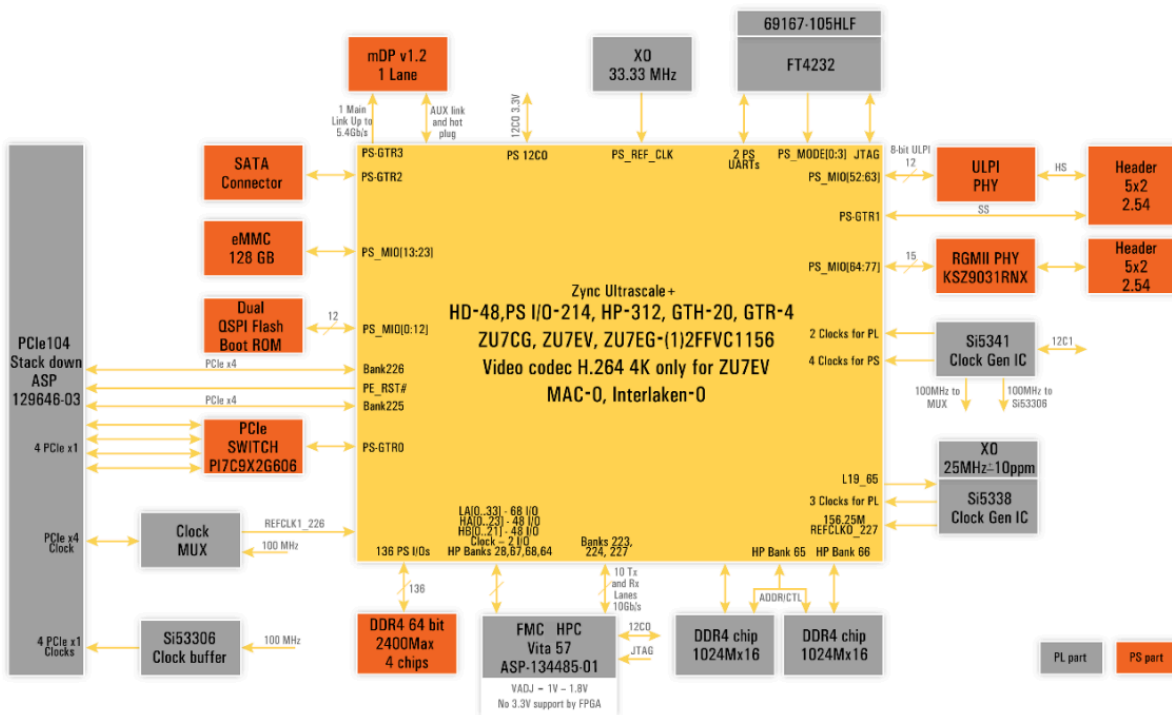
- ✓ **4-channel 1 GSPS 16-bit ADC** for high-fidelity signal acquisition
- ✓ **16-bit 2.8 GSPS quad DAC** for precision waveform generation
- ✓ **JESD204B high-speed data interface** with FPGA connectivity
- ✓ **Clock synchronization & triggering capabilities** for multi-board integration
- ✓ **Ideal for RF signal processing, SDR, and medical imaging applications**



## High-Performance Processing Platform

- ✓ Xilinx Zynq Ultrascale+ MPSoC for FPGA and ARM-based processing
- ✓ 8GB DDR4 PS memory & 4GB DDR4 PL memory for high-speed data buffering
- ✓ FMC HPC connector supporting 10 GTH transceivers for high-speed data transfer
- ✓ PCIe Gen3 connectivity for efficient system integration

✓ Flexible I/O including SATA, USB 3.0, Gigabit Ethernet, and DisplayPort



## High-Speed Data Transfer & Networking

- ✓ Dual SFP+ (10GbE) interfaces for ultra-fast data transfer
- ✓ Seamless connectivity with FPGA for networked applications
- ✓ Optimized for high-bandwidth data logging, real-time streaming, and distributed computing applications

## Applications

### Software-Defined Radio (SDR) & Wireless Communications

The DL300 is ideal for modern SDR applications, enabling high-speed RF signal capture, demodulation, and real-time waveform generation. Its low-latency architecture and high bandwidth support make it perfect for:

- ✓ Next-generation 5G and 6G development
- ✓ Wideband signal analysis and spectrum monitoring
- ✓ Military and defense communication systems



- ✓ **Satellite and aerospace communication systems**

## **Radar, Electronic Warfare (EW), and Signal Intelligence (SIGINT)**

Designed for **high-resolution, real-time signal processing**, the DL300 delivers unparalleled performance in:

- ✓ **Radar signal acquisition & Doppler processing**
- ✓ **Threat detection & electronic countermeasures**
- ✓ **Real-time interception & spectral analysis**
- ✓ **Electronic surveillance & reconnaissance**

## **High-Speed Data Logging & Scientific Research**

For researchers working in **high-energy physics, radio astronomy, or biomedical imaging**, the DL300 provides:

- ✓ **Precise waveform capture for experimental analysis**
- ✓ **Ultra-fast data buffering & storage for massive datasets**
- ✓ **Real-time data correlation for multi-sensor environments**

## **Medical Imaging & Biomedical Signal Processing**

The system's high-precision **A/D and D/A conversion capabilities** make it ideal for:

- ✓ **MRI, CT, and ultrasound imaging systems**
- ✓ **Electrophysiology & brain-computer interface (BCI) applications**
- ✓ **Real-time monitoring of biomedical signals**

## **Embedded High-Performance Computing & AI Acceleration**

With its **powerful FPGA-based computing and real-time processing**, the DL300 is a perfect fit for:

- ✓ **Edge AI applications requiring real-time decision-making**
- ✓ **Autonomous systems & robotics**
- ✓ **AI-based signal classification & feature extraction**