

eBook

ARINC IP Cores & Solutions

High Bandwidth Avionics Video & Data
Communication Platforms



What is ARINC?

ARINC standards are the foundation of modern avionics communication, enabling deterministic transfer of mission-critical data and high-bandwidth video across aircraft subsystems. They are widely used in commercial, defense, and unmanned aerospace platforms where reliability and real-time performance are essential.

iWave offers a complete portfolio of ARINC-compliant IP cores and production-ready solutions, including converters, recorders, analyzers, and tester platforms to accelerate cockpit display, mission computing, and flight test system development.

ARINC defines standardized protocols for connecting avionics equipment in safety-critical environments. Key standards include ARINC 429 for sensor and control data, ARINC 664 (AFDX) for deterministic Ethernet networking, and ARINC 818 for uncompressed, low-latency digital video transport.



Why ARINC?

- Enables deterministic & reliable communication for safety-critical avionics systems
- Supports standardized interoperability across aircraft subsystems & vendors
- Provides low-latency, uncompressed video transport for cockpit & mission displays
- Ensures robust data exchange for sensors, flight controls, & mission computers
- Scales efficiently from legacy data buses to next-generation Ethernet & high-speed video networks

ARINC Applications

Cockpit Displays & Mission Computers

Real-time avionics video and data communication
Primary flight display and mission processing integration
Low-latency, deterministic subsystem connectivity

Surveillance Video Distribution

High-bandwidth uncompressed video transport (ARINC 818)
Sensor-to-display video streaming for situational awareness
Reliable mission-critical airborne video networks

UAV & Defense Avionics Platforms

Rugged communication for unmanned and defense platforms
Secure, deterministic data exchange across avionics payloads
Supports next-gen mission and sensor architectures

Flight Test Instrumentation & Recording

ARINC video capture, monitoring, and protocol validation
Recorder and analyzer solutions for compliance testing
Accelerates aircraft certification and flight qualification

ARINC IP Cores & Solutions

What & Why ?



ARINC IP Core Portfolio

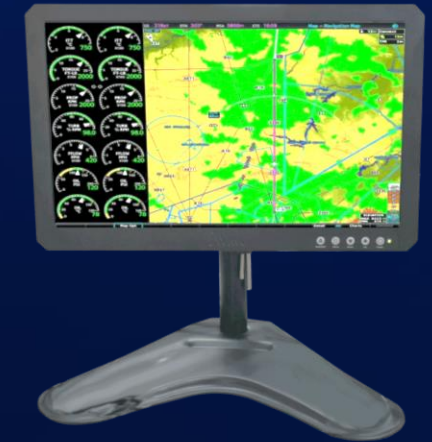
- ARINC 818-2 TX/RX (FC1x to 10Gbps)
- ARINC 818-3 High-Speed Video IP (up to 28Gbps)
- ARINC818-2 Switch IP Core
- ARINC664 P7 IP Core
- ARINC 429 Protocol IP Core
- Production-ready FPGA validated cores

ARINC Solution Platforms

- ARINC 818 Frame Grabber (PCIe Gen3 x8)
- ARINC Smart Large Area Display
- ARINC 818 Monitor for cockpit and mission systems
- ARINC818 Converter Cards
- Portable Analyzer for protocol verification
- ARINC818-2 Recorder

Power & Rugged Design

- Aerospace-grade thermal and mechanical design
- Low-latency video transport with high reliability
- Qualified for defense and avionics deployments



Why consider iWave ARINC Solutions?

- Proven ARINC-compliant IP and platforms for avionics video networks, High-bandwidth, uncompressed digital video with deterministic performance
- Seamless integration with cockpit displays, mission computers, and ISR payloads
- Custom ICD and quick integration support
- Complete ecosystem: IP cores, hardware, validation, and customization
- Production-ready solutions with long-term lifecycle support from iWave
- iWave Specializes in DO-178C and DO-254 compliance with certification support for IP cores and products.

ARINC IP Cores Portfolio

ARINC 818-2 IP Core

- High Bandwidth, Low Latency, Uncompressed Digital Video Transmission
- Video Resolution – 4K @ 30fps
- Pixel Format – Monochrome, RGB, YCbCr, RGBA
- Transmission Medium – Optical or 75-ohm Copper

ARINC 818-3 IP Core

- High Resolution, High Frame Rate Video
- Support up to 28Gbps Link Rate
- Video Resolution – 4K @ 60fps and above
- Pixel Format – Monochrome, RGB, YCbCr, RGBA

ARINC818-2 Switch IP Core

- Multi-cast, Broadcast, Unicast Low Latency Video Switching in Mission Computers.
- Progressive Video Format up to Full HD @ 60fps
- Link Rate – FC 1x, 2x, 3x, 4x
- Real-Time Control & Monitor Through Web Browser

ARINC 664 P7 IP

- Introduces Ethernet Redundancy with Deterministic Time Packet Transfer
- Up to 8 transmit receiving ports
- Integrity checker and Redundancy management at the Receive side
- Supports BAG values of 1ms, 2ms, 4ms, 8ms, 16ms, 32ms, 64ms and 128ms

ARINC 429 IP

- High performance, unidirectional Digital Information transfer system for reliable transfer of aircraft system.
- Configurable number of TX & RX Lines
- Data Rate: 12.5 & 100 Kbps low & high
- Transmission Medium – 78x shielded twisted pair cable

ARINC Solutions Portfolio for Test Benches



ARINC 818-2 Single Channel Converter

- Compact, lightweight single-channel ARINC ↔ HDMI/DP converter
- Supports standard/custom video up to 2K @ 60fps



ARINC 818-2 Multi-Channel Converter

- Multi-Channel, supports up to 2 Channel, ARINC to HDMI & vice versa up to FC – 32x / 28Gbps.
- Quick ARINC 818-2 ICD customization as per requirement.



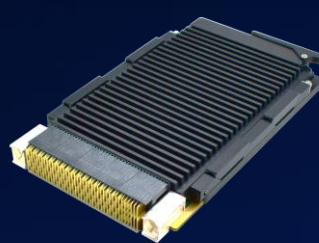
ARINC 818 Frame Grabber

- Captures high-resolution ARINC video and transfers data to host PC via PCIe
- PCIe Gen3 x8 interface with up to 64 Gbps bandwidth



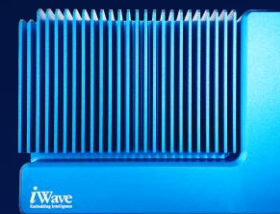
ARINC 818 Analyzer

- Portable Handheld ARINC Data Analyzer for Field & Test Bench Usage.
- Supports link rates from 1x (1.0625 Gbps) up to 10 Gbps as FC Std.



ARINC 818 Tester

- SFP-based copper/optical support for capturing and analyzing multiple virtual links
- Supports 100/1000 Mbps full-duplex Ethernet connectivity



ARINC 664 Tester

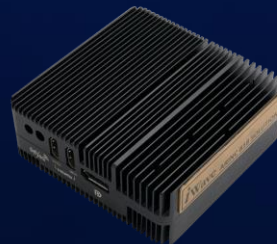
- Supports 100/1000 Mbps full-duplex Ethernet with SFP-based copper/optical interfaces
- Provides AFDX simulation, fault injection, & traffic shaping

ARINC Solutions Portfolio for Flyable Units



ARINC 818-2 Converter 3U VPX COTS Module

- Flight Tester 3U COTS module for LRU/System-level ARINC sourcing or sinking
- Rugged platform for high-speed avionics video & data processing



ARINC 818 Recorder

- ARINC video recording with H264/H65 encoder with Recording & Playback support.
- Link Rate Supported: Up to FC8x and 10Gbps.



Rugged ARINC 818 Video Converter Module

- DO-160G Qualified Flyable Module with ARINC 818 to HDMI/DVI Conversion & vice versa
- Protocol conversion option for either HDMI IN/OUT or DVI IN/OUT Interface

Avionic Display Solutions



ARINC Smart Large Area Display

- High-performance cockpit display with wide touchscreen interface
- Supports ARINC 818 video input over optical or copper SFP links
- Includes ARINC 664, ARINC 429, HDMI/DVI, and SMPTE interfaces
- 21.5" high-brightness AMLCD with superior color rendering
- Built-in memory for mission and map data storage
- Rugged avionics-grade design with optimized video graphics processing



ARINC 818 Monitor

- Supports ARINC 818 video up to UHD @30fps and 2K @60fps
- Single SFP input with optical or copper media support
- Rugged 15.6" AHVA TFT LCD with Full HD @60fps output
- High-brightness display with wide viewing angles and VESA mounting
- Built-in "no video" source detection
- Quick ARINC 818 ICD customization support

Unique Features of ARINC IP Cores & Solutions

iWave extends ARINC IP Core & avionics communication capabilities with production-ready engineering features that reduce risk and accelerate certification.

End-to-End ARINC Video & Data Pipeline Ownership

- ✓ IP cores to complete hardware platforms
- ✓ ARINC 818 capture, conversion & display
- ✓ Full system-level avionics integration expertise
- ✓ In-house design, validation & manufacturing

Deterministic, Safety-Critical Avionics Architectures

- ✓ Low-latency, mission-critical transport
- ✓ Fault-tolerant aerospace-grade designs
- ✓ Built for cockpit, ISR & flight systems
- ✓ Aerospace-grade reliability with long lifecycle support

Scalable ARINC IP Core & Platform Portfolio

- ✓ ARINC 818-2/3 IP cores up to 28Gbps
- ✓ ARINC 429 & ARINC 664 (AFDX) support
- ✓ PCIe frame grabbers, VPX COTS modules & smart displays
- ✓ Scalable from evaluation to deployed avionics platforms

Certification & Customization Support

- ✓ Quick ICD customization for aircraft programs
- ✓ DO-178C/DO-254 compliance & certification support
- ✓ Production-ready platform to reduce integration risk
- ✓ Engineering support from prototype to volume deployment
- ✓ In-house chamber for temperature and humidity testing and product certification.

Deliverables

ARINC IP Deliverables



FPGA:

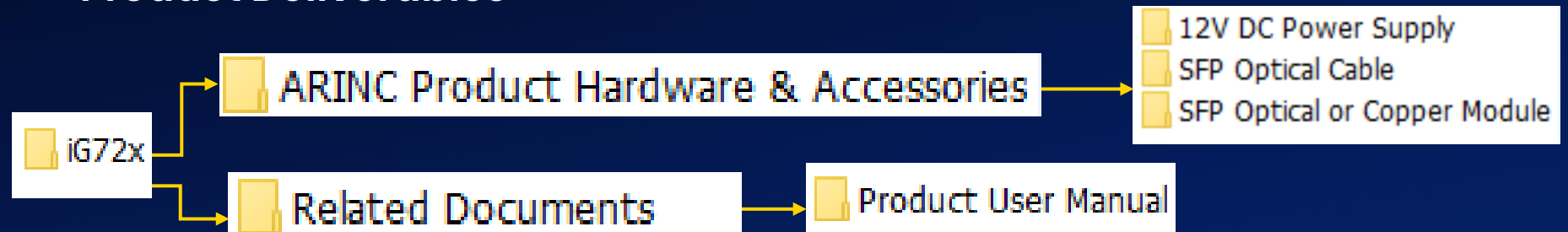
- IP core netlist for the user target FPGA/SoC devices
- Project with IP example design compiled with IP netlist using the FPGA vendor-provided toolchain for the selected evaluation development kit.
- IP Integration Manual
- IP Datasheet



Software:

- BareMetal/Petalinux Firmware for reference
- User manual

Product Deliverables



Resources

Technical Articles

- [Article – How iWave's Frame Grabber is Used in Medical Imaging Applications](#)
- [Article – Advancing Avionics Networking with iWave's ARINC 664 End System IP Core and Tester Platform](#)

Videos

- [Video – Explore the iWave's ARINC 818-2 Single Channel Converter demonstration!](#)
- [Video – Explore the ARINC 818 Analyser Receive, transmit, and analyse ADVB frames via an SFP module #iwave](#)
- [Video – Introducing the iWave ARINC 818 Video Protocol Analyzer](#)
- [Video – Explore iWave's Rugged ARINC 818 Monitor: Advanced Display Solution](#)
- [Video – iWave's ARINC 664 Tester Demo Complete Solution for AFDX Protocol Validation](#)
- [Video – ARINC 818-2 Recorder Demo | High-Speed Video Recording Simplified by iWave](#)
- [Video – ARINC 818-2 Multi-Channel Converter Demonstration | iWave](#)
- [Video – ARINC 818 Expertise: IP Cores, COTS Modules, and Solutions | iWave](#)
- [Video – Webinar : High-Speed Avionics system design with ARINC 818-2](#)
- [Video – ARINC818 Real-time video converter modules for Avionics application](#)
- [Video – Ultra-low latency video streaming with ARINC818 conversion cards](#)
- [Video – ARINC 818 | ARINC 818 IP core on Microsemi PolarFire FPGA | iWave](#)
- [Video – iWave Systems showcasing the wide range of ARINC818 Solutions at the upcoming DEFEXPO 2020](#)
- [Video – iWave's ARINC 818 2 IP Core on Altera Stratix IV GX Development Kit](#)
- [Video – iWave's ARINC 818 2 IP Core on Xilinx Kintex 705 Evaluation Board](#)

Thank You

We are here to
Accelerate Embedded Innovation

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INDIA | USA | GERMANY | EUROPE | TAIWAN | KOREA | JAPAN | DUBAI