PRODUCTS AND FUNCTIONS

TEST & DEVELOPMENT

PRODUCT CAPABILITIES	Systems & Software pg. 7			Development pgs. 8-9		Converters, Frame Grabbers & Generators		
	Europa	SDK	TAL	XF Tuner	VPA III	SAM G3	Velocity	Helios
1. Load a test image and header data, and transmit it as ARINC 818				●		●	●	
2. Receive and display an ARINC 818 image and header data				●	●	●	●	
3. Time multiplexing multiple video streams onto a single ARINC 818 link								
4. Capture and analyze an ARINC 818 source, verify ARINC 818 protocol at the byte level, and verify video timing is correct (line and frame timing)					●			
5. Perform robustness testing of an ARINC 818 receiver using a source that includes error injection, timing variation, and header modifications				●				
6. Perform pixel-by-pixel image comparison							●	
7. Factory configured multi-ICD support						●	●	
8. User configurable ICDs				●				
9. Emulate data-only ARINC 818 links or sensor return paths				●			●	
10. Scripting Task Automation Language (TAL)			●				●	
11. Control an ARINC 818 device through an API		●				●	●	●
12. Convert ARINC 818 to HDMI/DVI or HDMI/DVI to ARINC 818 in real time						●	●	●
13. Record an ARINC 818 video stream in real time	●							
14. Play a video file out as an ARINC 818 video stream in real time	●						●	
15. LABVIEW SDK available		●					●	
16. Echo out input or line spy				●	●	●	●	●
17. Switch, split, or broadcast ARINC 818 channels								
18. HD-BNC Copper option available up to 6x				●	●	●	●	●
19. Ethernet streaming future option								
20. Convert ARINC 818 to/from HD-SDI and 3G-SDI							●	
21. IP to implement ARINC 818 in your FPGA								
22. Maximum Link Rate	10.0 Gbps	NA	NA	10.0 Gbps	10.0 Gbps	10.0 Gbps	10.0 Gbps	8x

Great River Technology

RUGGED & FLYABLE

	XI Suite			Switch	Avionics & Mission System Building Blocks				
pgs. 10-11	*pgs. 12-13*			*pg. 14*	*pgs. 15-19*				
XL PCIe	SAM G3 XI	Velocity XI	Helios XI	Spider	IP Core	EB	XMC	VCM	MC-VCM
●	●	●					●		
●	●	●					●		
●									●
●		●					●		
●							●		●
	●	●	●						●
●		●			●		●		●
●	●	●	●				●		
●	●	●	●			●	●	●	●
●		●							
●		●					●		
●	●	●	●	●			●		
				●					●
	●	●	●						
						●			●
		●							●
					●				
32x	10.0 Gbps	10.0 Gbps	8x	8x	10.0 Gbps	4x	10.0 Gbps	4x	8x

PRODUCT VISUAL SHOWCASE

TEST & DEVELOPMENT

Development
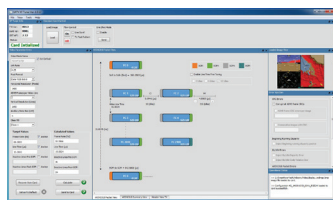
XF Tuner
Robustness Testing
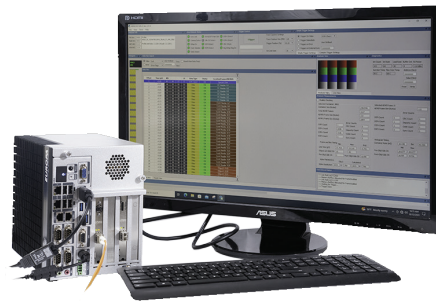
VPA III
Video Protocol Analyzer

XI Suite *User Configurable ICDs*
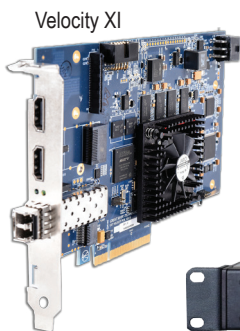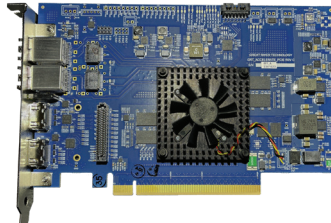
Velocity XI

SAM G3c XI

SAM G3 XI

Helios XI

Converters, Frame Grabbers & Generators

Velocity Plus

XL PCIe

Velocity Dual

SAM G3

Helios

Systems & Software

Europa
SDK
TAL

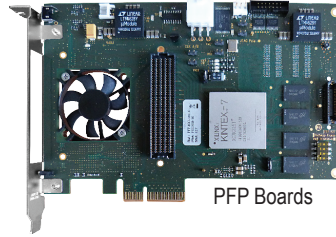*Great River Technology*

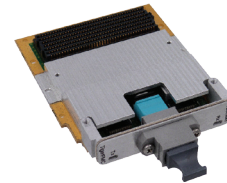ARINC 818 DEVELOPMENT SUITE AND FLYABLE PRODUCTS
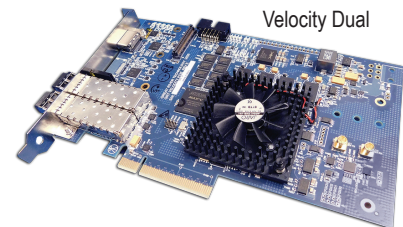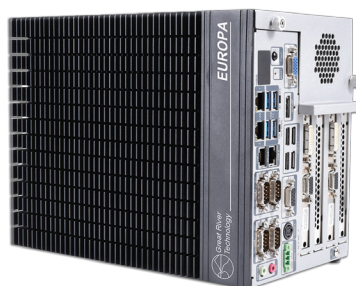
TEST & DEVELOPMENT CONT.

Real-Time Processing & Optical Communications

Spider

PFP Boards

FMC Boards

RUGGED & FLYABLE

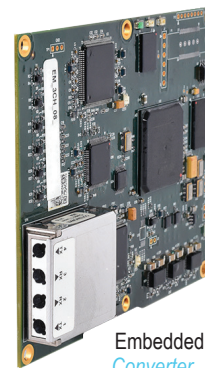## Avionics & Mission System Building Blocks
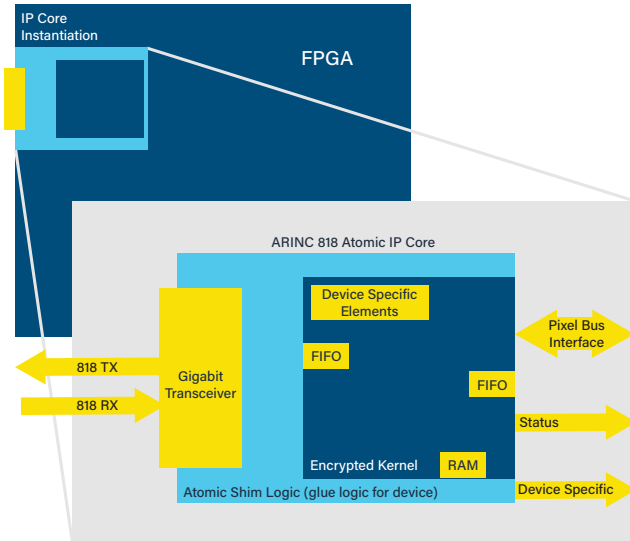
XMC *Frame Grabber/Generator*

ARINC 818 IP Core

IP Core Instantiation

FPGA

ARINC 818 Atomic IP Core

Device Specific Elements

Pixel Bus Interface

818 TX

Gigabit Transceiver

FIFO

818 RX

FIFO

Status

Encrypted Kernel   RAM

Atomic Shim Logic (glue logic for device)

Device Specific
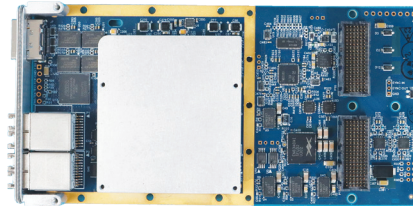
Embedded Board *Converter*

VCM *Single Channel Converter*

MC-VCM *Multi Channel Converter/Switch*

J1   J2   J3   J4

LEARN ARINC 818

ARINC818-ACADEMY.COM

▶ ***GREAT RIVER TECHNOLOGY***

HAS THE TOOLS AND EXPERTISE YOU NEED AT EVERY STAGE OF THE PRODUCT LIFECYCLE.

PLANNING

DESIGN

IMPLEMENTATION

TESTING

VALIDATION

CERTIFICATION

DEPOT MAINTENANCE

Great River Technology specializes in high-performance digital video and data system development for aerospace and military customers.

Our tools and expertise simplify the design and implementation of mission-critical video and data transmission for cockpit displays, avionics graphics generators, infrared cameras, sensors, and flight simulators.

New to ARINC 818?
The Avionics Digital Video Bus is the leading standard for uncompressed digital video used in commercial and military aerospace.

Visit ARINC818-Academy.com, an online academy that combines video instruction for both basic and comprehensive education on Great River Technology products and the ARINC 818 protocol & standard.

Who can use the ARINC 818 Academy?
The Academy supports Aerospace Engineers, Systems Architects, Test Engineers, Tech Fellows and is applicable to every level of experience.

ARINC 818 INSTRUCTIONAL VIDEOS

■ Why ARINC 818?
■ Designing your ICD (Interface Control Document)
■ ARINC 818 revisions 1-3
■ Simulating & Testing ARINC 818 Systems
■ Implementing ARINC 818

PRODUCT DEMOS

■ ARINC 818 Test, Simulation & Development Suite
■ ARINC 818 Flyable Solutions (including IP Core)
■ Video Protocol Analyzer: VPA III
■ Frame Grabber/Video Generators
■ Velocity Plus & Velocity XI
■ Video Converters   ■ ARINC 818 Atomic Core
■ HS SAM   ■ ARINC 818 Switches
■ VCM / MC-VCM   ■ Pantera Switch

Great River Technology

ARINC 818 DEVELOPMENT SUITE AND FLYABLE PRODUCTS

SOFTWARE
Add-On for Specific Products

SDK
SOFTWARE DEVELOPMENT KIT

Complete SDK for Applications Development

Software Development Kit (SDK) for Windows or Linux enables software engineers to write custom applications and integrate GRT products into Automated Test Equipment (ATE).

TAL
TASK AUTOMATION LANGUAGE

Production Tests / DO160 Validation

TAL (Task Automation Language) for Windows or Linux is a high-level scripting language that is used to automate the control of Great River Technology's card products.

Velocity ARINC 818 and Velocity Dual Test applications included with their ARINC 818 card products can execute a TAL script to automate almost any task on one or more cards with no external software required.

Receive TAL commands from any source over a TCP/IP connection, allowing for remote control or automation of GRT's card products from external applications.

- Reproducible and repeatable tests
- Remote control of test equipment
- Control up to 16 GRT cards
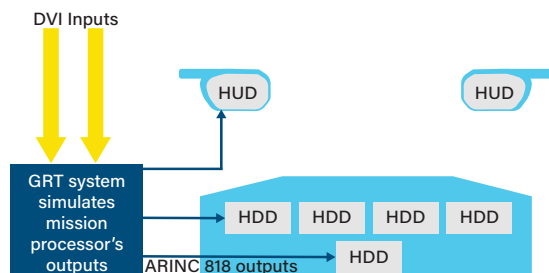- Store test results to log files at timed intervals

▶ EUROPA SYSTEM

HIGH PERFORMANCE SYSTEMS

Europa systems have several base configurations with extensive options for program needs.

- Configured with Velocity cards to match program ICD(s)
- Will arrive fully tested and configured with cards such as the Velocity, XF Tuner, and/or VPA

Europa's compact chassis provides convenience and ease of use for engineering development, flight testing, and field testing of ARINC 818.

- Small enough to support lab testing, where it can easily be moved from one bench top to another
- Rugged enough for flight testing
- Operate Europa remotely without a keyboard or mouse using Windows Remote, making the footprint small enough to locate near any ARINC 818 equipment being tested
- Provides up to two cards, factory configured to specific tasks, such as development and robustness testing with the VPA and XF Tuner
- GRT can configure record/playback systems. Each includes four 1-Terabyte removable drives and StreamPix recording software

DVI Inputs

HUD   HUD

GRT system simulates mission processor's outputs

HDD   HDD   HDD   HDD

ARINC 818 outputs   HDD

ROBUSTNESS TESTING & ERROR INJECTION

▶ XF TUNER GEN 3

The XF Tuner is an ARINC 818 transmitter with programmable protocol parameters including timing, and is capable of injecting protocol errors into the transmitted stream.
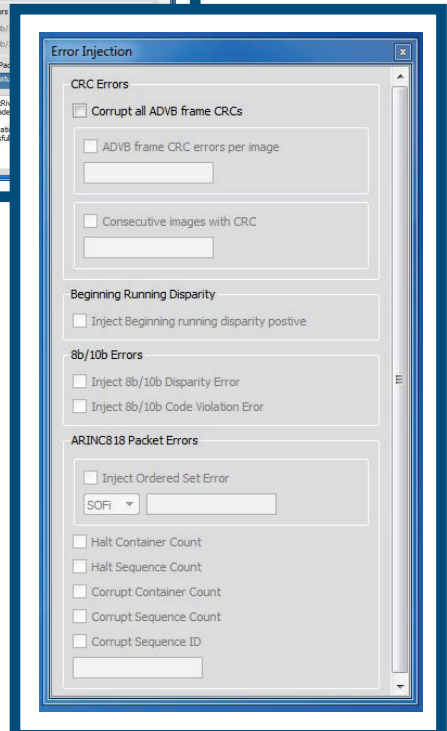
ERROR INJECTION FOR ROBUSTNESS & VALIDATION TESTING

- Packet CRC errors [all frames]
- Packet CRC errors [selected frames]
- Ordered Set corruption errors
- Ordered Set beginning running disparity errors
- Halt sequence & container counts

Europa configured with XF Tuner card
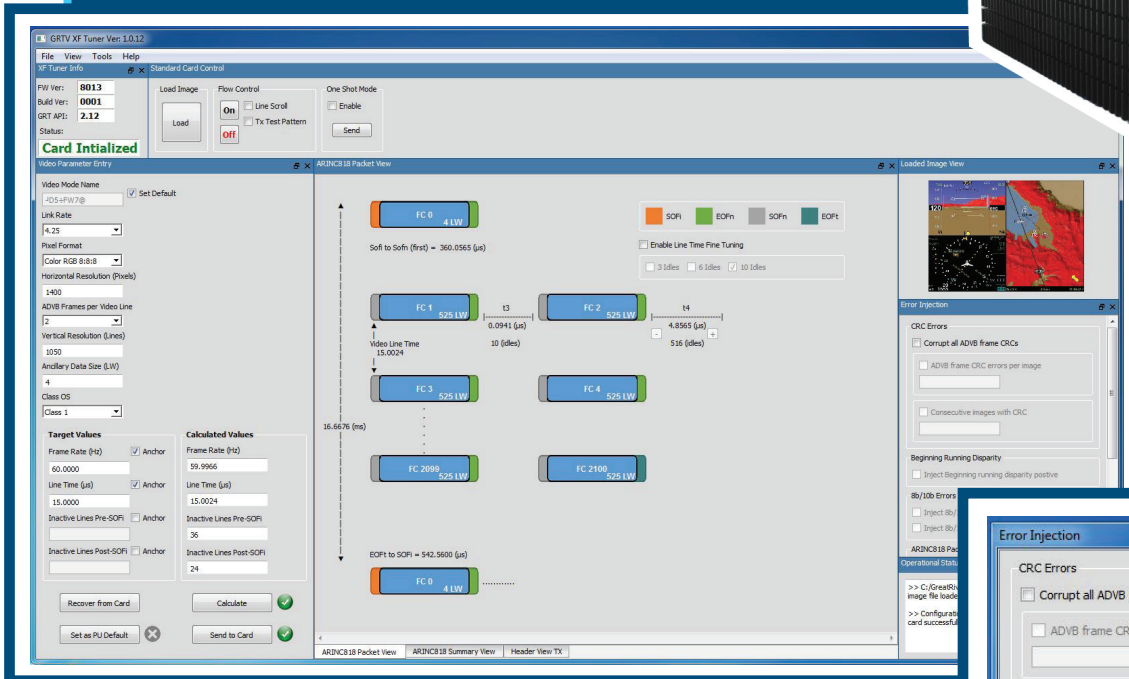
Features:

- Implement ICD link rates: 1x, 2x, 3x, 4x, 5.0 Gbps, 6x, 8x, and 10.0 Gbps
- Set other ARINC 818 parameters: pixel packing, resolution, ADVB frames per line, frame rate, and ancillary data size
- Robustness & qualification testing
- Anchor parameters to prioritize line, frame, or vertical blanking timing
- Adjust and calculate protocol in real time
- Intuitive view of critical timing parameters & video frame structure
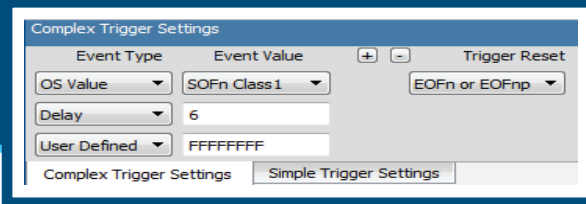- Creation of a library of ICDs

XF TUNER:
GreatRiverTech.com/xftuner

The XF Tuner's Error Injection dock

Great River Technology

ARINC 818 DEVELOPMENT SUITE AND FLYABLE PRODUCTS

PROTOCOL & TIMING VALIDATION

▶ VIDEO PROTOCOL ANALYZER (VPA) GEN III

The VPA Gen III captures ARINC 818 video, provides a complete analysis at multiple levels (payload, ancillary data, FC frame, video line, and video frame), and evaluates line and frame timing.

A COMPLETE SYSTEM AND AN ESSENTIAL TOOL FOR THE ARINC 818 DESIGNER

- User configurable for multiple link rates:
  1x, 2x, 3x, 4x, 5.0 Gbps, 6x, 8x, and 10 Gbps
- Complex, multilayer triggering up to 3 levels within payload or Object 0

Complex Trigger Settings

Event Type	Event Value	+	−	Trigger Reset
OS Value	SOFn Class1			EOFn or EOFnp
Delay	6			
User Defined	FFFFFFFF			

Complex Trigger Settings | Simple Trigger Settings

- Raw data trace captures up to 4 gigabytes, with save and load capability
- Pre- and post-trigger capture settings
- Real-time monitoring of link status, such as Sync Link or SoF Detect
- View live video
- Container & ADVB frame analysis
- Container & ADVB header decoding
- Search captured data for a predefined ordered set
- Error messages for timing, resolution, payload, ancillary data, and more
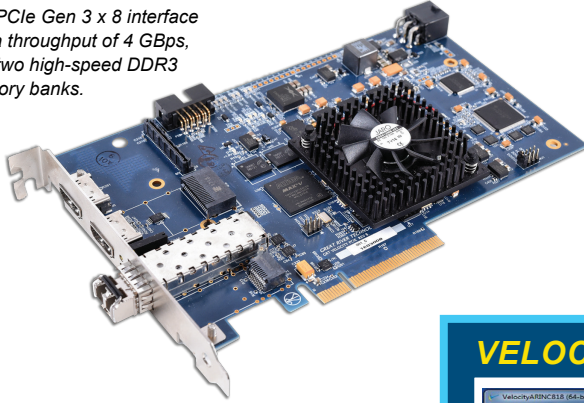- Dockable user-friendly interface

VPA GEN III:
GreatRiverTech.com/
arinc-818-protocol-analyzer
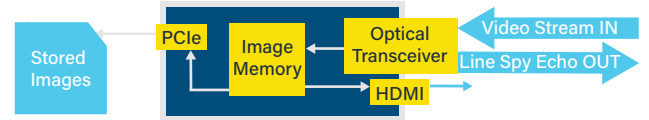
CONVERTERS, FRAME GRABBERS, & GENERATORS

▶ VELOCITY PLUS

The PCIe Gen 3 x 8 interface has a throughput of 4 GBps, with two high-speed DDR3 memory banks.

Factory configured in a variety of interface/conversion modes:

- ARINC 818 to/from HDMI
- ARINC 818 to/from SDI

Block diagram shows card in receive mode

VELOCITY PLUS:
GreatRiverTech.com/velocity

Velocity Plus is a frame grabber, graphics generator, and converter.

- Transmit and receive ARINC 818 video
- Pre-configured for up to 15 video formats
- ARINC 818 link rates of up to 10.0 Gbps
- Frame Grabbers can be integrated with StreamPix DVR Software for real time recording
- Optional SDK and scripting (TAL) available

### VELOCITY ARINC 818 TEST APPLICATION

- Status indicators for link synchronization
- Detects the presence of SOFi, EOFt and idle ordered sets, as well as 8b/10b and CRC errors
- Magnification option in GUI to look at region of interest
- Convert to HDMI to see full resolution image

▶ VELOCITY DUAL CHANNEL ARINC 818 RECEIVER CARDS

High bandwidth, multi-channel capture from 2 sources simultaneously that can be completely asynchronous of each other, but must be the same ICD.

- Each ARINC 818 stream can be captured to a host computer memory via PCIe DMA transfers and viewed in the test application. If desired, the user can select one of the ARINC 818 streams to be routed to HDMI transmit.

- The ARINC 818 transmit can be set to either transmit a test pattern or echo out the individual ARINC 818 receiver channels.

- Equipped with full-featured test application.

- Optional SDK and scripting (TAL) available.
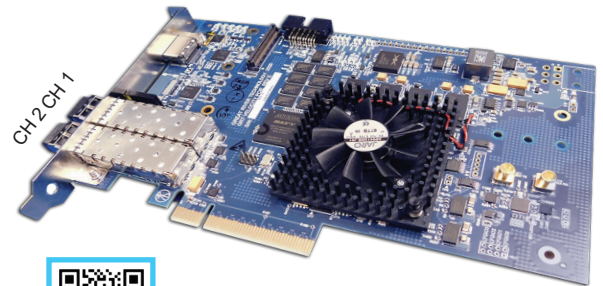
VELOCITY DUAL CHANNEL:
GreatRiverTech.com/velocitydualch

▶ XL HIGH-SPEED, HIGH-RESOLUTION FRAME GRABBER

The XL card supports high link rates used on high-resolution sensors, cameras, and 4K+ displays for modern avionics and mission systems. The XL card is an ARINC 818 frame grabber and generator that includes a video concentrator (multiple video streams on a single link) and de-concentrator.

Coming 2025

- Supports ARINC 818 link rates from 12.0 Gbps to 32X (28.05 Gbps) with 64B/66B encoding
- Dual-channel, factory configured card supports multiple ICDs
- Equipped with full-featured test application
- Optional SDK available

CONVERTERS, FRAME GRABBERS, & GENERATORS

▶ SAM G3 PLUS

SAM G3 Plus is a portable stand-alone converter module that converts ARINC 818 to/from HDMI and enables the viewing of ARINC 818 video on a standard computer monitor or transfers live video from a graphics card onto ARINC 818.

The module is delivered with Windows application software that can connect to the unit via USB. This application enables sending and retrieving single images to/from the unit, viewing the status of incoming video, managing video formats stored in the unit, and controlling multiple SAM units at once.

SAM G3 PLUS FEATURES

- Supports multiple ICD formats (up to 15, factory configured) that are easily selectable via a touch screen on the unit
- Loaded formats can be of different conversion directions (ARINC 818 to/from HDMI) and can be different ARINC 818 link rates, video resolutions, and pixel types
- Supports ARINC 818 link rates up to 10 Gbps

SAM G3 PLUS:
GreatRiverTech.com/sam-product-line

▶ HELIOS MULTICHANNEL ARINC 818/HDMI CONVERTER SYSTEM

The Helios converts up to 12 channels of ARINC 818 to/from HDMI in a 1U 19-inch rack mountable system. ARINC 818 to HDMI conversion provides a way to view live ARINC 818 video on common HDMI monitors.

Applications:

- Pilot training simulators
- Cockpit development
- Flight test recording of ARINC 818 (requires additional equipment)
- Factory test of ARINC 818 equipment

HELIOS:
GreatRiverTech.com/helios

Features:

- Factory configurations for 4, 6, 8, or 12 channels
- ARINC 818 link rates from 1x to 8x
- 19 inch 1U rack
- 100-240 VAC (28 VDC option)
- HDMI connectors (6 locking/6 standard)
- A818 to HDMI or HDMI to A818
- Remote-based controls (LAN) with C API or Web Interface:
    - Query status
    - Control test pattern outputs
- SDK included

DISCOVER ARINC 818 @ GREATRIVERTECH.COM

Great River Technology

11

GRT XI SUITE

USER CONFIGURABLE ICDs

All products in the GRT XI Suite have ICD parameters that are user configurable using the GRT XI Configuration Application. The XI Config App allows the user to clone compatible video formats across any XI suite device type. For parameter limitation queries, contact GRT.
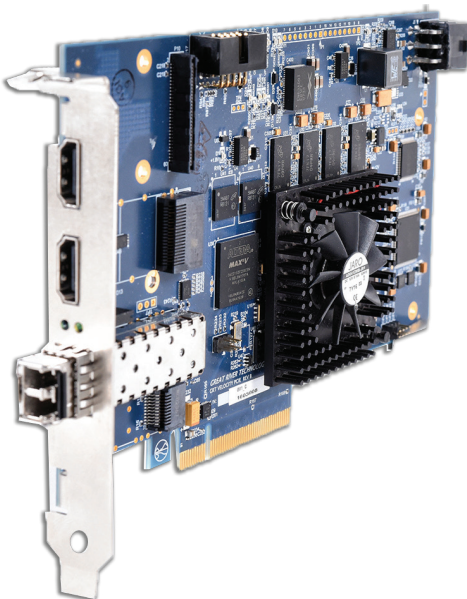
Setable Parameters:

- Conversion Direction
- Link Rate
- Pixel Packing Mode
- Resolution
- Ancillary Data Size
- Class OS
- Frame Rate
- Line Time

GRT XI Config App supports SAM G3 XI, SAM G3c XI, Velocity XI, and Helios XI.

Video Parameter Entry

Video Mode Name
Test_H15

Link Rate
6.375

Pixel Format
Color RGB 8:8:8

Horizontal Resolution (Pixels)
2560

ADVB Frames per Video Line
4

Vertical Resolution (Lines)
1024

Ancillary Data Size (LW)
4

Class OS
Class 1

Device Video Port
WXGA 1280x800 @ 60Hz

Device Direction
HDMI-to-A818

Target Values

Frame Rate (Hz) ☑ Anchor
15.0010

Line Time (µs) ☑ Anchor
30.0020

Inactive Lines Pre-SOFi ☑ Anchor
718

Inactive Lines Post-SOFi ☐ Anchor

Calculated Values

Frame Rate (Hz)
15.0007

Line Time (µs)
30.0016

Inactive Lines Pre-SOFi
718

Inactive Lines Post-SOFi
479

☑ Overwrite Object0 TX

Calculate

Generate VPA Profile

Add to List

Update Selected

▶ VELOCITY XI

Velocity XI provides all of the functionality of Velocity Plus and adds user configurability for ICD parameters.

- Implement almost any ICD
- Acts as an ARINC 818 transmitter or receiver
- Includes the Velocity Test Application
- Converts ARINC 818 to DVI or HDMI for resolutions on standard monitors
- Create a library of ICDs to cover multiple ARINC 818 programs
- SDK is available for base Velocity Plus functionality

VELOCITY XI:
GreatRiverTech.com/velocityxi

▶ *SAM G3 XI*

SAM G3 XI is a user configurable, portable, converter module that converts ARINC 818 to/from HDMI. Suited for benchtop applications, the module allows the user to view ARINC 818 video on a standard computer monitor, and transfer live video from a graphics card into ARINC 818.

SAM G3 XI is delivered with the SAM View Application and the GRT XI Config App.

SAM View Application

SAM G3 XI:
GreatRiverTech.com/sam-g3-xi

SAM G3c XI

COMPACT STAND ALONE MODULE

- All of the original SAM G3 XI functionality in a smaller package without a touchscreen, measuring 6.8" x 4.4" x 1.4"
- Easily turn on and off a test pattern with the flip of a switch
- Ideal for rack mounted or permanent solutions

SAM G3c XI:
GreatRiverTech.com/sam-g3c-xi

▶ HELIOS XI

Convert up to 12 user configured channels of ARINC 818 to/from HDMI in a 1U 19-inch mountable rack system. SDK is available for base Helios functionality.

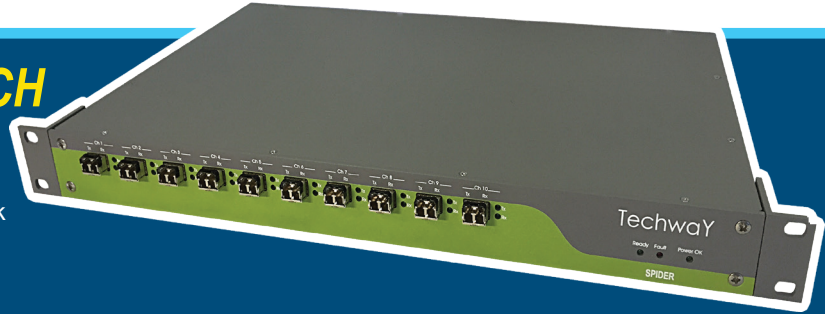**HELIOS XI:**
GreatRiverTech.com/helios-xi

REAL-TIME PROCESSING & OPTICAL COMMUNICATIONS

10X10 ARINC 818 SWITCH

TECHWAY SPIDER

- Compliant with ARINC 818 Supplement 2
- Up to 10 inputs/10 outputs and supports link rates up to 8x per link
- ICD independent
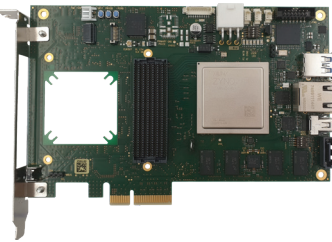- SPIDER is manageable by web or SNMP

▶ PCIe FPGA PROCESSING BOARDS

TECHWAY pioneers highly versatile FPGA PCIe boards for Signal or Video applications such as RADAR, Electronics Warfare, Avionics and more. The PFPs are designed to provide the best price/performance/watt balance, delivering a cost-effective solution for applications that require high-end capabilities.

Fully compliant with common standards (VITA 57.4, PCIe, AXI4, etc.) to fit application needs, these boards can be seamlessly integrated in standard PCs environment (drivers available for both Windows and Linux) or in stand-alone mode in your own enclosure.

TECHWAY PFP-ZU+ is an easily deployable, multi-purpose PCIe Gen3 x4 board open for development with FMC+ site based on the latest Xilinx's SoC (System on Chip) called Zynq UltraScale+. Its Arm processor provides access to multiple interfaces which easily allows for the designing of stand-alone equipment.

TECHWAY PFP-IV is a multi-purpose PCIe Gen3 x16 board with FMC+ site based on the powerful Xilinx Kintex UltraScale+ FPGA. This board is dedicated to extreme high-speed 25G applications such as 100 GbEth communications, 4/6 GHz ADC/DAC, ARINC 818, AURORA, JESD, sFPDP, etc.

3 Configurations Available:

- Zynq UltraScale+ 7CG MPSoC
- Zynq UltraScale+ 11EG MPSoC, Video/Graphic processor
- Zynq UltraScale+ 7EV MPSoC, FMC+ site, Video/Graphic processor, and Video compression

2 Configurations Available:

- Kintex UltraScale+ KUP11 FPGA
- Kintex UltraScale+ KUP15 FPGA,
- Options available: FireFly™ optical module, ZynqUltraScale+ MPSoC SoM

PFP DEVELOPMENT KIT

All PFP boards come with a Development Kit that includes the tools below for easy integration - reducing time, risk, and cost.

VHDL
- IP (PCIe, Memory Controller)
- Vivado tools

EMBEDDED OS for SoC
- BSP (PetaLinux)
- Vitis tools

HOST
- Windows and Linux drivers
- C++ API

REFERENCE DESIGNS
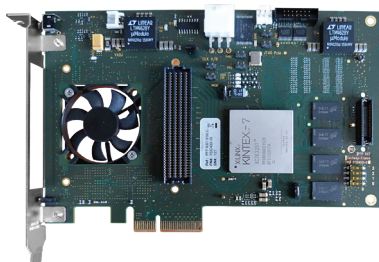
TECHWAY PFP-KX7+ is a multipurpose PCIe Gen2 x4 board featuring an FMC+ slot and leveraging the AMD (Xilinx) Kintex-7 architecture. Renowned for their versatility, PFP-KX7+ boards offer real-time processing capabilities, thanks to a well-balanced technology blend that includes Kintex-7 FPGA, FMC+ site, DDR3 memory, a management system, 12 HSS on FMC+, programmable clock generator, and more.

Beyond their role as development boards, PFPs serve as deployable platforms adopted by various OEMs, showcasing proven 24/7 operational reliability.

REAL-TIME PROCESSING & OPTICAL COMMUNICATIONS

Our European partner TECHWAY develops advanced hardware for signal and video processing in real-time applications, including high-speed optical communication FMC boards.

TECHWAY
SIGNAL VISION SYSTEM

TECHWAY PRODUCTS:
Techway.com/products

▶ VITA 57.4 OPTICAL INTERFACES

TECHWAY WildcatFMC

Based on Radiall D-Lightsys® technology, WildcatFMC is Mil/Aero oriented. These cards are rugged to meet the toughest environmental constraints with dedicated packaging including metal-based connectors.

- 4 full duplex 10 Gbps links, Front MTP12-F or C-MTITAN connector
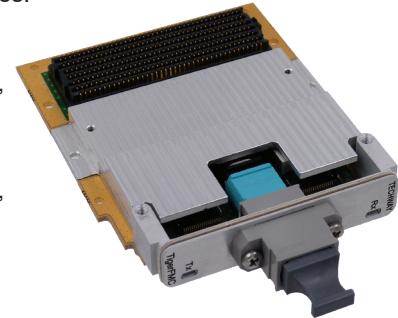- 12 full duplex 10 Gbps links, Front 2x MTP12-F or C-MTITAN connectors

TECHWAY TigerFMC

Based on Samtec FireFly™ technology, TigerFMC is designed for industrial environments.

These cards are offered in standard or extended temperature ranges.

- 12 full duplex 14 Gbps links, MTP24-M connector
- 4 full duplex 25 Gbps links, MTP12-M connector

TECHWAY SFP/SFP+ FMC

The high-speed serial link FPGA mezzanine card provides up to four SFP/SFP+ slots, accommodating both copper and fiber interfaces to meet the project need of sufficient interfaces.

As an additional feature, the FMC card SFP SFP+ offers an optional upper FMC connector, redirecting all unused signal to another mezzanine for enhanced flexibility.
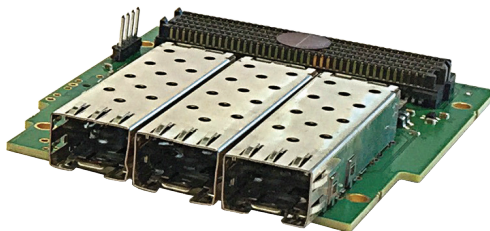
TECHWAY ADC125 FMC

The ADC FMC FPGA mezzanine card utilizes two dual LTC2185 analog-to-digital converters (ADC) from Linear Technology to offer high-performance signal conversion.

This card provides the flexibility to sample signals using either an external or on-board sampling clock. A trigger input is available for the precise channel synchronization needed to obtain one-sample accuracy.
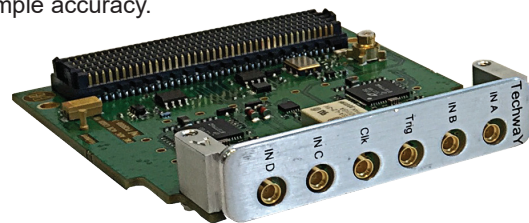
VITA 17.3 AND 17.1 sFPDP PLATFORM

Serial Front Panel Data Port (sFPDP) is a high-speed low-latency serial communications protocol for use in high-speed data transfer applications.

TECHWAY RAVEN

Implements 4 sFPDP channels with receive/transmit engine for high-performance data-processing. Based on Xilinx FPGA, this PCIe sFPDP platform supports up to 10 Gbps data. RAVEN implements VITA 17.1 and 17.3 sFPDP standards and offers the following functionalities: Flow Control, CRC, Framed/Unframed, Copy/Loop Mode. This platform is compliant with copper or fiber thanks to its SFP+ slots.

Great River Technology
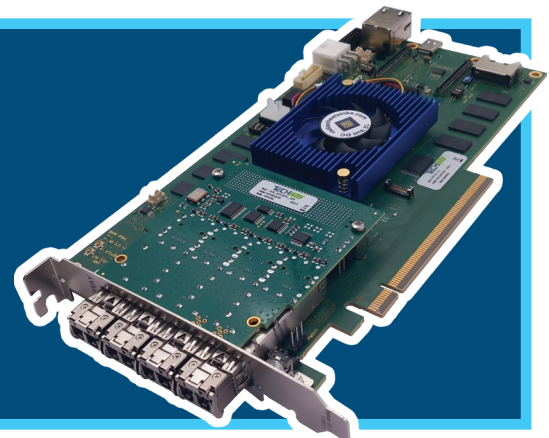
RUGGED & FLYABLE

ARINC 818
IMPLEMENTATION OPTIONS

Flight rugged building blocks allow system architects the freedom to mix old and new video formats seamlessly: HD-SDI, 3G-SDI, HDMI, RS-170, NTSC, ARINC 818, HOTLink, or Ethernet.

Choose an ARINC 818 IP implementation:

- In an FPGA
- On small, embedded board that can be incorporated into a chassis
- Stand-alone switches and converters (VCM and MC-VCM)

ARINC 818 IP CORE:
GreatRiverTech.com/arinc-818-ipcore

ARINC 818 IP in an FPGA:

IN YOUR FPGA

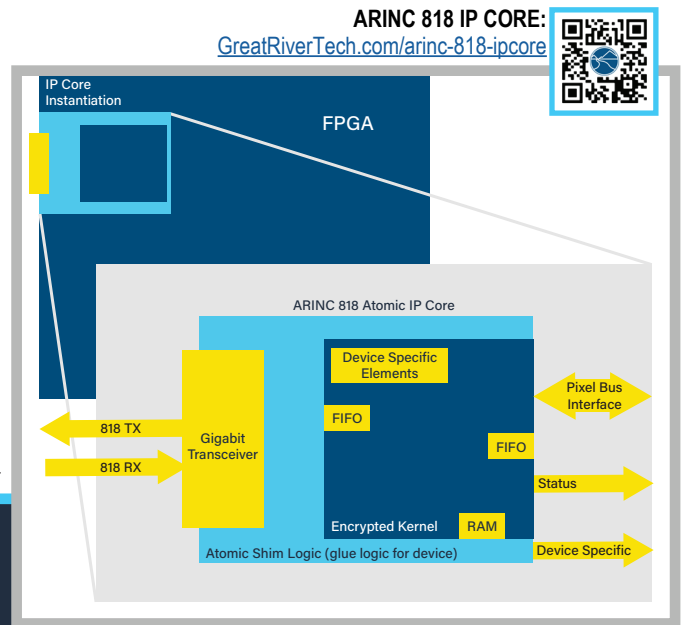The ARINC 818 Atomic transceiver IP core provides an easy way to implement ARINC 818 compliant interfaces in common FPGAs. The IP core pairs with the high speed serial tiles of the FPGA (e.g., GX or GT tiles) to achieve ARINC 818 interfaces up to 10.0 Gbps. The core can be used for transmit only, receive only, or for transmit and receive applications.

The IP core has flexible compile time settings allowing for various link speeds, line segmentations, and line synchronization methods. The core can be configured for various resolutions and pixel packing methods.

Transmitted ancillary data can use default values (set at compile time) or data can be updated in real time via register interface.

The Atomic IP core is delivered as encrypted VHDL. The Atomic IP Core development packages are delivered with a development board and a reference design. GRT also offers an Airborne Atomic IP Core package with all elements to support DO-254 certification. GRT offers the IP Core for a broad range of Intel, Xilinx (AMD), and MicroSemi FPGAs.

IN YOUR CHASSIS

EMBEDDED BOARD
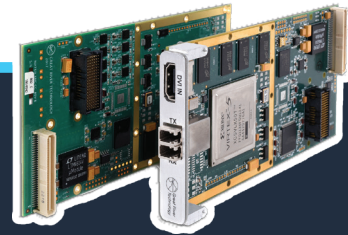
XMC BOARDS

IN OUR CHASSIS
VIDEO CONVERTER MODULES

SINGLE CHANNEL VCM

MULTI-CHANNEL VCM

▶ *EMBEDDED BOARDS*

Small, Embedded Board (EB) converters can be incorporated into a sensor, processor, or display. EBs are developed according to DO-254, and variants have been certified to DAL A.

The EBs are designed with features that ensure reliability and contribute to the certification process, including: watchdog timer, SEU monitoring & reconfigure, stale image detection, and fault discretes.

One board can supply 2 channels of DVI to ARINC 818 and 1 channel of ARINC 818 to DVI for 1, 2, or 3 channel applications.

Custom board options are available. Contact GRT with requirements.

Dimensions:
3.0"x3.8" (76mm x 97mm)
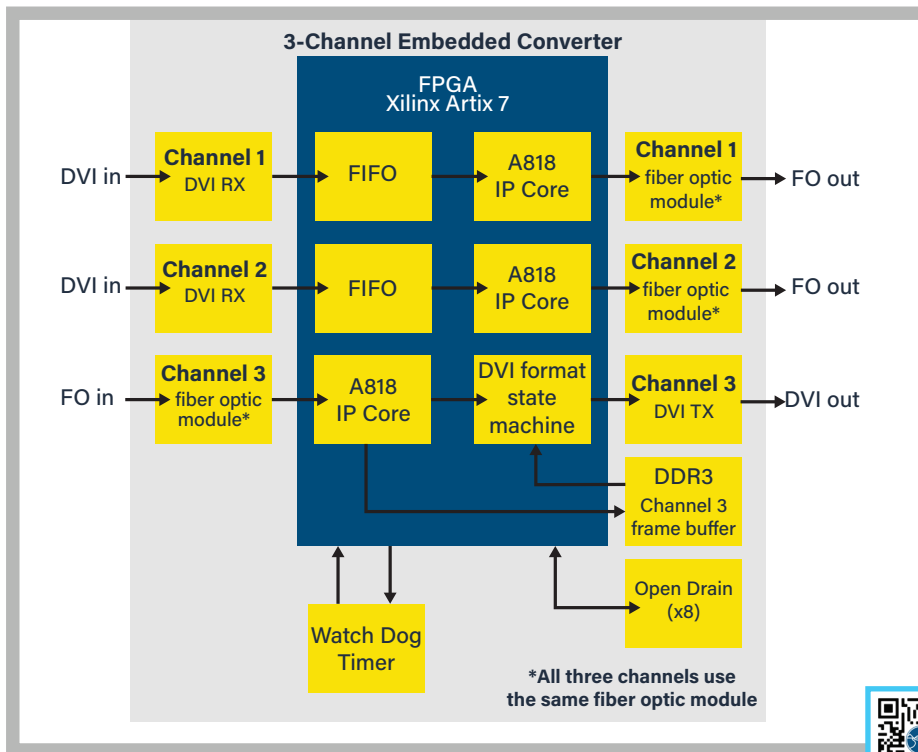
3-Channel Embedded Converter

FPGA
Xilinx Artix 7

| DVI in → | **Channel 1** DVI RX | → | FIFO | → | **A818** **IP Core** | → | **Channel 1** fiber optic module* | → FO out |

| DVI in → | **Channel 2** DVI RX | → | FIFO | → | **A818** **IP Core** | → | **Channel 2** fiber optic module* | → FO out |

| FO in → | **Channel 3** fiber optic module* | → | **A818** **IP Core** | → | DVI format state machine | → | **Channel 3** DVI TX | → DVI out |

DDR3
Channel 3 frame buffer

Open Drain (x8)

Watch Dog Timer

***All three channels use the same fiber optic module**

- Low Power: <8 watts
- ARINC 818 to/from: DVI, VGA, LVDS
- LC or ARINC 801 Fiber options available
- Link rates: 1x, 2x, 3x, 4x
- The module contains supervisory logic to monitor and report stream and fault status to the host system DS, or Ethernet

EMBEDDED BOARDS:
GreatRiverTech.com/embeddedboards

▶ *VELOCITY XMC*
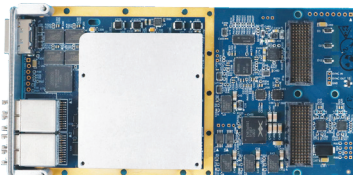
The Velocity XMC is a rugged form factor of Velocity Plus.

- ARINC 818 link rates up to 10.0 Gbps
- VITA66 optic transceiver option available
- Supports display resolutions up to 4K at 30Hz
- Windows and Linux SDKs enable integration into VPX platforms
- Heat spreader for integration into system level cooling
- 256 MB DDR3 Memory
- 3 levels of ruggedization available

FLYABLE AVIONICS & MISSION SYSTEMS BUILDING BLOCKS

▶ VCM

VCM

Video Converter
Module

VCM:
GreatRiverTech.com/vcm

- Factory configured for a specific ARINC 818 ICD
- Converts ARINC 818 to/from DVI or VGA
- Can be certified to DO-254 and DO-160

Contact us to discuss other analog or digital video formats.

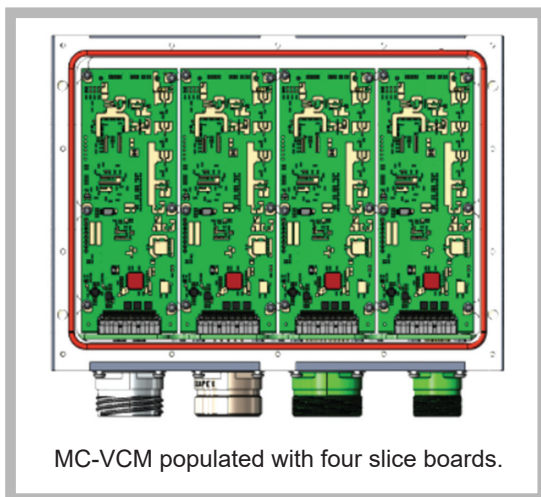## ▶ MC-VCM

AVIONICS & MISSION VIDEO ARCHITECTURE

The MC-VCM (Multi-Channel Video Converter Module) is an extremely flexible platform designed for flyable environments including helicopter and fixed-wing applications.

Applies to VCM & MC-VCM:

Environmental Conditions, DO-160G
(partial list; detailed list in datasheet; subject to change)

Sec 4: Temperature and Altitude Overpressure..........A1/A2

Sec 5: Temperature Variation ....B

Sec 6: Humidity ....A

Sec 7: Shock & Crash Safety ....B

Sec 8: Vibrations ....R(C/C1)

Sec 10: Water Proofness..Y

Sec 11: Fluids Susceptibility, Cleaning Fluids ....F

Sec 12: Sand and Dust...D

Sec 13: Fungus Resistance, Analysis ....F

Sec 14: Salt Fog (Spray) ....S

Sec 15: Magnetic Effect...Z

Sec 16: Power Input ....B (50 ms)

Sec 17: Voltage Spike ....A

Sec 18: AF Conducted Susceptibility..........................B

Sec 19: Induced Signal Susceptibility.........................ZC

Sec 20: RF Radiated and Conducted Susceptibility...R

Sec 21: RF Radiated and Conducted Emissions ....M

Sec 22: Lightning Induced Transient A1/A2J2M2

Sec 24: Icing..A

Sec 25: ESD Susceptibility ....A (equipment off)

Sec 26: Fire, Flammability, Analysis C

Factory configured according to customer requirements for conversion, switching, and ICD specification.

MC-VCM populated with four slice boards.

The MC-VCM includes a separate switch controller board, capable of switching 12 channels of video. It also includes four slots for converter "slice" boards for new video protocols and interfaces.
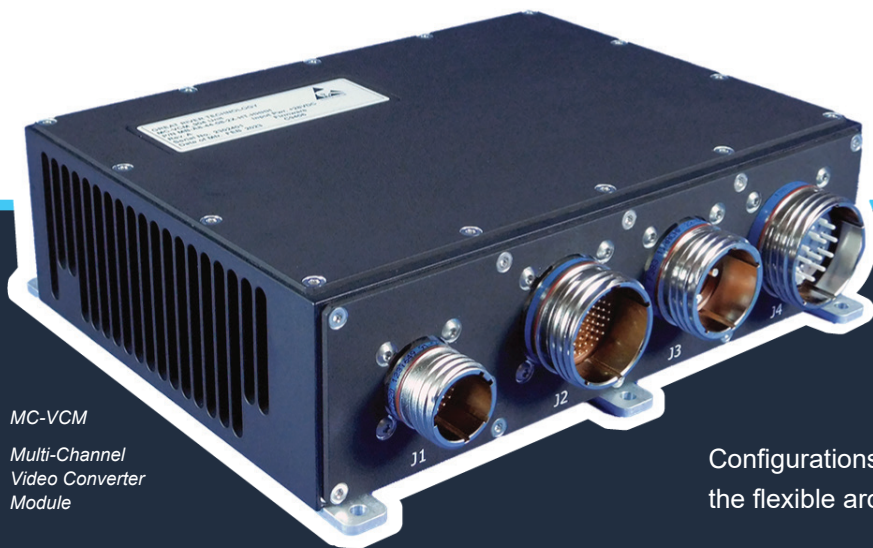
Great River Technology

ARINC 818 DEVELOPMENT SUITE AND FLYABLE PRODUCTS

▶ *MC-VCM* CONT.

FACTORY CONFIGURATIONS

- ■ **Available I/O:** ARINC 818 conversion to or from HDMI, DVI, 3G/HD-SDI, NTSC/PAL, STANAG 3350, HOTlink, Ethernet, RS-170
- ■ **Available command and control:** RS485/422, ARINC 429, or Ethernet
- ■ Divide channels between protocols (e.g., 2 channels 3G/HD-SDI, 2 channels NTSC)
- ■ Link rates: 1x, 2x, 3x, 4x, 5.0 Gbps, 6x, 8x or other custom rates
- ■ Video concentrator to ARINC 818 or 1 GbE
- ■ **Future upgrade:** GPU based video compression and decompression

EXAMPLE CONFIGURATIONS

- ■ 4 or 8 Ch ARINC 818 Switch
- ■ 4 or 8 Ch ARINC 818 Switch
    + 4 channels of HDMI conversion
- ■ 4 or 8 Ch ARINC 818 Switch
    + 6 channels of 3G/HD-SDI conversion
- ■ 4 or 8 Ch ARINC 818 Switch
    + 4 channels of RS-170 conversion
- ■ 4 Ch ARINC 818 Switch
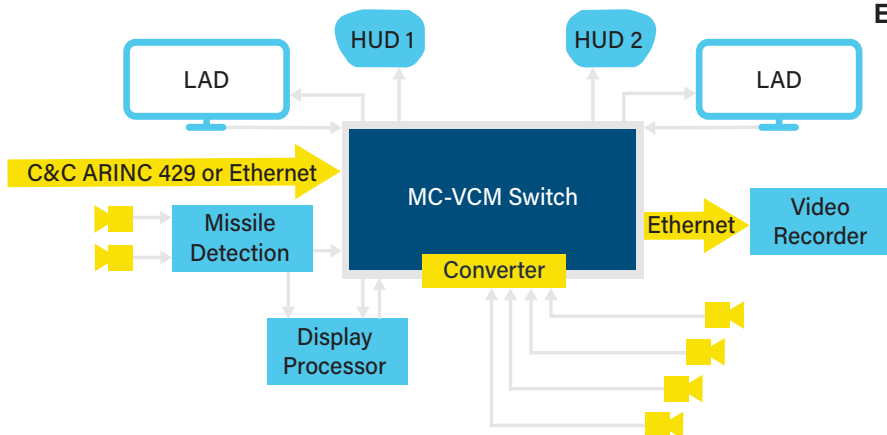   + 4 channels conversion
    + Ethernet streaming

MC-VCM

Multi-Channel
Video Converter
Module

MC-VCM:
GreatRiverTech.com/mc-vcm

Configurations are virtually limitless due to the flexible architecture.

Example Avionics System Using MC-VCM

Connect older cameras and sensors, together with newer, high-resolution large area displays, HUDs, and EO/IR sensors.

- ■ Video COAX support is available through a D38999 connector with coax inserts, or via individual DIN 1.0/2.3 coax

RUGGED & FLYABLE

Great River Technology

ADVANCED VIDEO & DATA SYSTEMS

We are the world's leader in ARINC 818 implementation. Working with us is fast and easy! You'll get support from the same engineers who design our products.

NORTH AMERICA SALES

CONTACT US!
GreatRiverTech.com/sales

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- **CHINA:** Watertek
- **EUROPE:** Techway
- **INDIA:** Zing Technologies
- **ISRAEL:** Reciotec
- **SOUTH KOREA:** Realtimewave

SOME OF OUR ARINC 818 CUSTOMERS INCLUDE:

NORTH AMERICA

- BAE
- Boeing
- CAE Canada
- CMC
- Collins Aerospace
- Flight Safety
- General Dynamics
- Honeywell
- Kranze
- L3 Harris
- Lockheed Martin
- Northrup Grumman
- Raytheon

ASIA

- Avic Optronics
- CARERI
- COMAC
- Elbit
- Elop
- HAL
- KAI
- Samtel
- Savic

EUROPE

- Airbus
- BAE Sysytems
- Curtiss-Wright
- Dassault
- GE Aviation
- Leonardo
- MBDA
- SAAB Avionics
- Thales
- General Dynamics

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