



# ARINC 818

AVIONICS DIGITAL VIDEO BUS

ADVANCED VIDEO & DATA SYSTEMS



030323

## DEVELOPMENT SUITE & FLYABLE PRODUCTS

# PRODUCTS AND FUNCTIONS

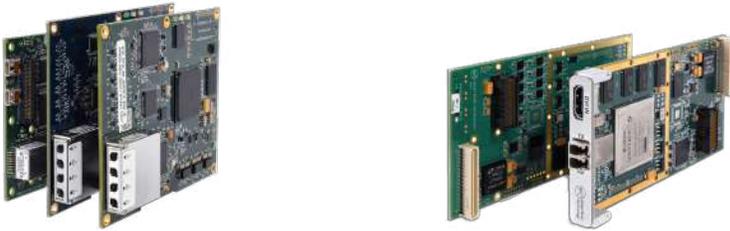
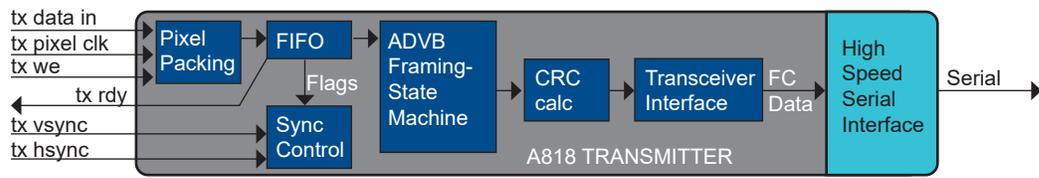
PRODUCT CAPABILITIES	TEST & DEVELOPMENT										RUGGED & FLYABLE			
	XL PCIe	Velocity	Helios	SAM III	VPA III	XF Tuner	SDK	TAL	Recorder	Spider	VCM	MC-VCM	EB	IP Core
1. Upload a test image and header information, and transmit it as ARINC 818	●	●		●		●								
2. Receive and display an ARINC 818 image and header information	●	●		●	●									
3. Time multiplexing multiple video streams onto a single ARINC 818 link	●										●			
4. Capture and analyze an ARINC 818 source and verify ARINC 818 protocol at the byte level, and that video timing is correct (line and frame timing)					●									
5. Do robustness testing of an ARINC 818 receiver using a source that includes error injection, timing variation, and header modifications						●								
6. Send a test pattern through a system and do a pixel-by-pixel comparison	●	●												
7. Implement more than 1 ICD in a test platform and change between ICDs via a software interface	●	●	●	●							●			
8. Support rates up to 32x with 64/66B encoding	●													
9. Prototype an ARINC 818 link (ICD development)		●				●								
10. Implement data-only ARINC 818 links or sensor return paths	●	●									●		●	
11. Scripting development language								●						
12. Control an ARINC 818 device through an API	●	●	●				●				●			
13. Convert ARINC 818 to DVI or DVI to ARINC 818 in real time	●	●	●	●							●	●	●	
14. Record a video file as an ARINC 818 video stream in real time									●					
15. Play a recorded video file as an ARINC 818 video stream in real time	●	●							●					
16. Integrate with LABVIEW	●	●					●							
17. Split or repeat an ARINC 818 signal										●	●			
18. Control (switch) 2+ ARINC 818 channels											●			
19. DVI/HDMI interface	●	●	●	●							●	●	●	
20. Convert ARINC 818 to streaming Ethernet											●		●	
21. Convert ARINC 818 to/from HD-SDI and 3G-SDI		●									●			
22. IP to implement ARINC 818 in your FPGA														●
<b>Maximum Link Rate</b>	32x	10.0 Gbps	8x	10.0 Gbps	10.0 Gbps	10.0 Gbps	NA	NA	10.0 Gbps	6x	4x	10.0 Gbps	4x	10.0 Gbps

# PRODUCT VISUAL SHOWCASE

## TEST & DEVELOPMENT Pages 5-11

<p><b>HDMI / ARINC 818 CONVERTERS</b></p> 	<p><b>FRAME GRABBER / GRAPHIC GENERATOR</b></p> 
<p><b>ROBUSTNESS TESTING &amp; ERROR INJECTION</b></p> 	<p><b>PROTOCOL &amp; TIMING VALIDATION</b></p> 
<p><b>SYSTEMS &amp; RECORDERS</b></p> 	<p><b>REAL-TIME PROCESSING &amp; OPTICAL COMMUNICATIONS</b></p> 

## RUGGED & FLYABLE Pages 11-15

<p><b>EMBEDDED CONVERTERS</b></p>	
<p><b>VIDEO CONVERTERS</b></p>	
<p><b>ATOMIC IP CORE</b></p>	 <pre>             graph LR             subgraph A818_TRANSMITTER [A818 TRANSMITTER]             direction LR             PP[Pixel Packing] --&gt; FIFO[FIFO]             FIFO --&gt; AFM[ADVB Framing-State Machine]             AFM --&gt; CRC[CRC calc]             CRC --&gt; TI[Transceiver Interface]             TI --&gt; HSSI[High Speed Serial Interface]             end             PP -- tx data in --&gt; PP             PP -- tx pixel clk --&gt; PP             PP -- tx we --&gt; PP             FIFO -- Flags --&gt; AFM             AFM -- tx rdy --&gt; PP             AFM --&gt; Sync[Sync Control]             Sync -- tx vsync --&gt; Sync             Sync -- tx hsync --&gt; Sync             TI -- FC Data --&gt; HSSI             HSSI -- Serial --&gt; SerialOut[Serial]             </pre>

# LEARN ARINC 818

VISIT THE ARINC 818 ACADEMY



## ► 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](http://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?

Our videos are designed to support Aerospace Engineers, Systems Architects, Test Engineers, Tech Fellows and are 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: VPAIII
- Frame Grabber/Video Generators
- Velocity Plus & Velocity XI
- Video Converters
- HS SAM
- VCM / MC-VCM
- IP Core
- ARINC 818 Switches
- Pantera Switch



REGISTER @ [ARINC818-ACADEMY.COM](http://ARINC818-ACADEMY.COM)

# HDMI / ARINC 818 CONVERTERS

TEST SUITE

## ► SAM G3 STAND ALONE MODULE

SAM G3 is a portable converter module that converts ARINC 818 to/from HDMI, enabling you to view ARINC 818 video on a standard computer monitor, and transfer live video from a graphics card onto ARINC 818.

SAM G3 is delivered with Windows application software that can connect to the unit via USB. This application enables sending and retrieving 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 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:

## ► HELIOS MULTI-CHANNEL 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. HDMI outputs can also select one of several ARINC 818 inputs, simplifying a connection to an HDMI recorder. ARINC 818 to HDMI conversion provides a way to view live ARINC 818 video on common HDMI monitors. Optional broadcast mode available.

- Factory configurations for 4, 8, or 12 channels
- 19 inch 1U rack
- 100-240 VAC (28 VDC option)
- HDMI connectors (6 locking/6 standard)
- SFP Optical with LC connectors
- A818 to HDMI or HDMI to A818
- A818 link rates from 1x to 8x
- Remote Based controls (LAN) with C API or Web Interface:
  - Query Status
  - Real-time Object 0 Update
  - Control Test Pattern Outputs



HELIOS:  
[GreatRiverTech.com/helios](http://GreatRiverTech.com/helios)



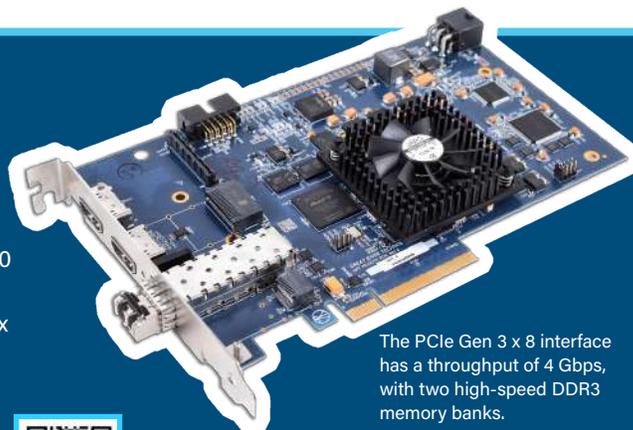
# FRAME GRABBER / GRAPHIC GENERATOR

TEST SUITE

## ▶ VELOCITY PLUS

### VELOCITY PLUS IS A FRAME GRABBER, GRAPHICS GENERATOR, & CONVERTER

- Transmit and receive ARINC 818 video.
- Pre-configured for 1 to 15 ICDs
- Velocity Plus is capable of ARINC 818 link rates up to 10.0 Gbps
- GRT's Frame Grabbers can be integrated with StreamPix DVR Software for real time recording.



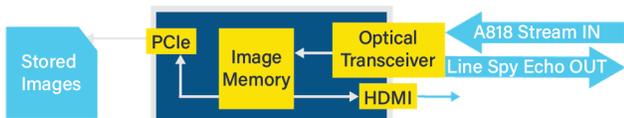
The PCIe Gen 3 x 8 interface has a throughput of 4 Gbps, with two high-speed DDR3 memory banks.



**VELOCITY PLUS:**  
[GreatRiverTech.com/velocity](http://GreatRiverTech.com/velocity)

### Ships with Velocity Software, a powerful tool for testing.

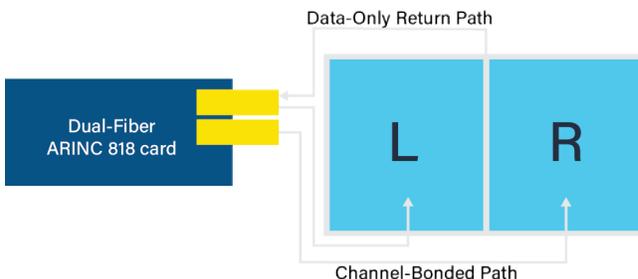
- Status indicators for link synchronization
- Detects the presence of SOFi, EOFt and idle ordered sets, as well as 8b/10b and CRC errors
- Use magnification in GUI to look at region of interest
- Convert to HDMI to see full resolution image



### Factory configured in a variety of conversion modes:

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

A Large Area Display (LAD) card can drive left / right links, while a separate data-only ARINC 818 link feeds back touchscreen coordinates or other command-and-control data.



## SOFTWARE

Sold Separately

### SDK

SOFTWARE DEVELOPMENT KIT

#### Complete SDK for Applications Development

Software Development Kit (SDK) for Windows or Linux enables quick use of real-time image/data retrieval systems, camera and sensor emulators, video generators, or other video-intensive applications.

## TAL

TASK AUTOMATION LANGUAGE

#### Production Tests / DO160 Validation

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

Test applications included with our ARINC 818 card products can execute a TAL script to automate almost any task on one or more of our 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

TAL:

[GreatRiverTech.com/velocity](http://GreatRiverTech.com/velocity)



# FRAME GRABBER / GRAPHIC GENERATOR

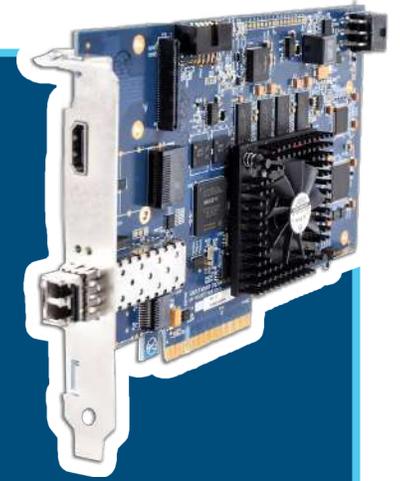
## ▶ VELOCITY XI



### ← VELOCITY XI CONFIGURATION TOOL

The Velocity XI allows the user to implement a new ARINC 818 ICD into hardware using the Velocity XI Configuration Tool.

- Implement almost any ICD
- Acts as an ARINC 818 receiver or transmitter
- Includes all the powerful features of the Velocity Test Application
- Converts ARINC 818 to DVI or HDMI for resolutions on standard monitors
- Create your own library of ICDs to cover all your ARINC 818 programs



### Link Rates

1x, 2x, 3x, 4x, 5.0 Gbps, 6x, 8x, 10.0 Gbps



**VELOCITY XI:**  
[GreatRiverTech.com/velocityxi](http://GreatRiverTech.com/velocityxi)

### Pixel Formats

- 24-bit RGB
- 16-bit RGB
- 8-bit Monochrome
- 16-bit Monochrome

## ▶ 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. 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.



**VELOCITY DUAL CHANNEL:**  
[GreatRiverTech.com/velocitydualch](http://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.



- Supports ARINC 818 link rates from 12.0 Gbps to 32X (28.05 Gbps)
- ARINC 818 requires that link rates in this range use 64B/66B encoding
- Dual-channel, factory configured card supports multiple ICDs
- Accompanied by powerful test software
- Windows and Linux based SDK are sold separately

# ROBUSTNESS TESTING & ERROR INJECTION

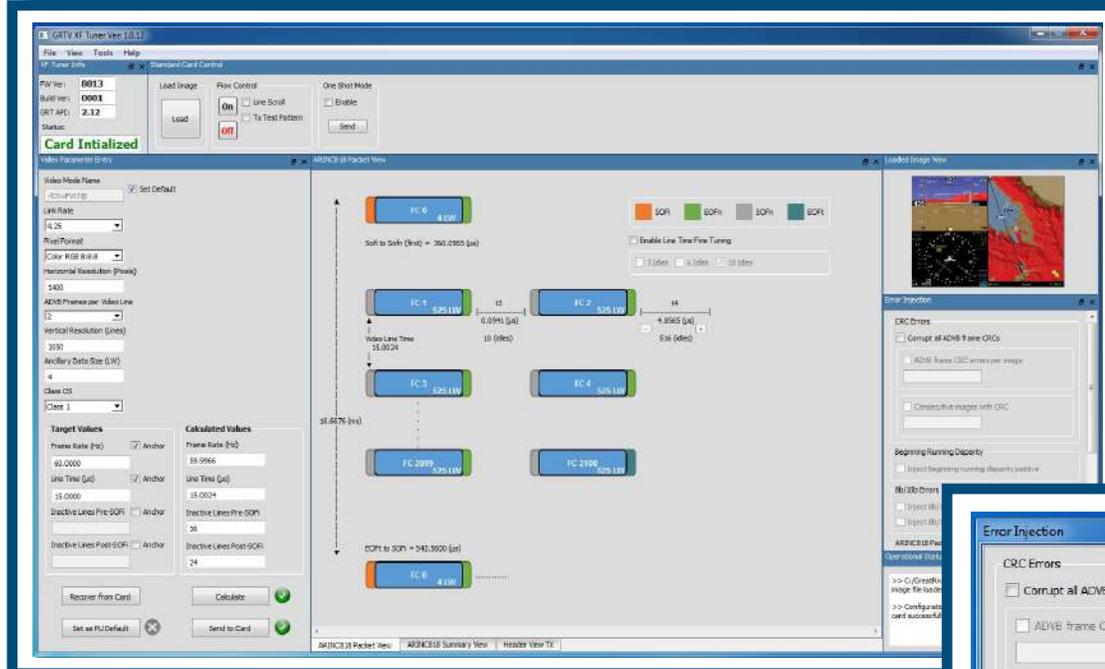
## ▶ XF TUNER GEN 3

TEST SUITE

The XF Tuner GUI provides a representation of an ARINC 818 video frame detailing protocol components including timing, number of FC frames, and resolution.



Europa configured with Xf Tuner card

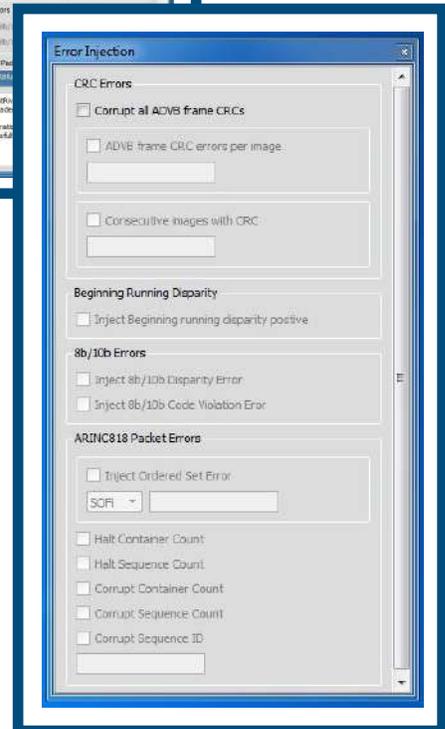


### Features:

- 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

### Error Injection for Robustness & Validation Testing:

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



The XF Tuner's Error Injection dock



**XF TUNER:**  
GreatRiverTech.com/xf-tuner

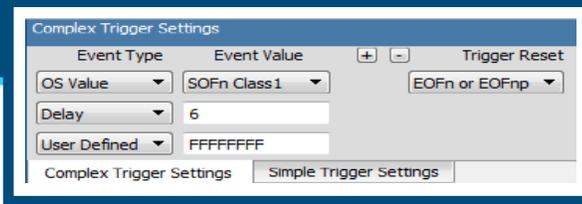
# PROTOCOL & TIMING VALIDATION

## VIDEO PROTOCOL ANALYZER (VPA) GEN III ◀

The VPA Gen III captures ARINC 818 video, provides a complete analysis at multiple levels (byte, 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



TEST SUITE

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



VPA GEN III:  
[GreatRiverTech.com/arinc-818-pro](http://GreatRiverTech.com/arinc-818-pro)

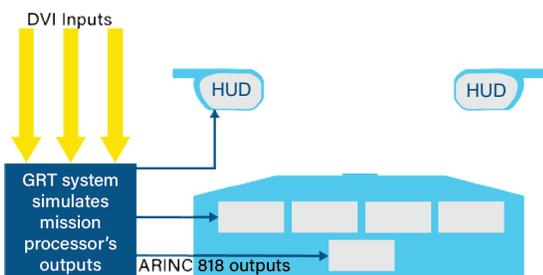
Offset	Time (µs)	MS	LS	Data Type	Status	Location(Frame:WORD)
-2	-0.03	00	00	SOLE OS	OK	
-1	-0.01	00	00	SOLE OS	OK	
0	-0.00	00	00	SOLE OS	OK	
1	-0.01	11	11	Data	OK	Special Char
2	-0.03	22	22	Data	OK	FC Header: 0-1
3	-0.05	33	33	Data	OK	FC Header: 0-2
4	-0.07	44	44	Data	OK	FC Header: 0-3
5	-0.09	55	55	Data	OK	FC Header: 0-4
6	-0.11	66	66	Data	OK	FC Header: 0-5
7	-0.13	77	77	Data	OK	Cont Header: 0-7
8	-0.15	88	88	Data	OK	Cont Header: 0-8
9	-0.16	99	99	Data	OK	Cont Header: 0-9
10	-0.18	AA	AA	Data	OK	Cont Header: 0-10
11	-0.20	BB	BB	Data	OK	Cont Header: 0-11
12	-0.22	CC	CC	Data	OK	Cont Header: 0-12
13	-0.24	DD	DD	Data	OK	Cont Header: 0-13
14	-0.26	EE	EE	Data	OK	Cont Header: 0-14
15	-0.28	FF	FF	Data	OK	Cont Header: 0-15
16	-0.30	10	10	Data	OK	Cont Header: 0-16
17	-0.31	11	11	Data	OK	Cont Header: 0-17
18	-0.33	22	22	Data	OK	Cont Header: 0-18
19	-0.35	33	33	Data	OK	Cont Header: 0-19
20	-0.37	44	44	Data	OK	Cont Header: 0-20
21	-0.39	55	55	Data	OK	Cont Header: 0-21
22	-0.41	66	66	Data	OK	Cont Header: 0-22
23	-0.43	77	77	Data	OK	Cont Header: 0-23
24	-0.45	88	88	Data	OK	Cont Header: 0-24
25	-0.47	99	99	Data	OK	Cont Header: 0-25
26	-0.48	AA	AA	Data	OK	Cont Header: 0-26
27	-0.50	BB	BB	Data	OK	Cont Header: 0-27
28	-0.52	CC	CC	Data	OK	Cont Header: 0-28
29	-0.54	DD	DD	Data	OK	Object 0: 0-29
30	-0.56	EE	EE	Data	OK	Object 0: 0-30
31	-0.58	FF	FF	Data	OK	Object 0: 0-31

## HIGH PERFORMANCE SYSTEMS

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

- GRT configures systems with Velocity cards to match your program ICD(s).
- Systems can include an XF Tuner (p. 8) and/or a VPA (p. 9).
- Your system will arrive fully tested and configured with cards such as GPS, RAID, video, XF Tuner, or VPA.

### Example application: cockpit display development



**Systems & Recorders:**  
[GreatRiverTech.com/arinc-818-video-recorder](http://GreatRiverTech.com/arinc-818-video-recorder)



## EUROPA SYSTEM

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 channels factory configured to specific tasks
- GRT can configure record/playback systems. Each includes four 1-Terabyte removable drives and StreamPix recording software

Capacity	Europa	Helios	Titan
Cards*	1-2	N/A	1-14
ARINC 818 channels	1-2	4-12	1-14
ARINC 818 recording channels	1	0	1-8
Terabyte storage	1-2	0	10-24

### Venues

Cockpit simulation labs		✓	✓
Engineering development	✓	✓	✓
Qualification testing	✓	✓	✓
Flight tests	✓		✓
Factory production		✓	✓
Maintenance and repair		✓	✓
Flight simulators/pilot training		✓	✓

### Options (availability depends on configuration)

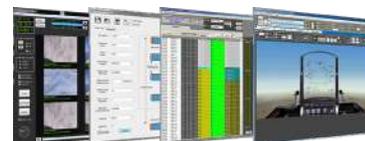
Video capture to GUI	✓		01
Video conversion (HDMI)	✓	✓	all
Video record/playback	✓		01
Video playback			01
Video generation	✓		all
Protocol analysis	✓		02
Robustness testing	✓		02
Remote control	✓	✓	01, 02
Compression			01
Data removal (to ground station)			01

\*Total number of Velocity, GPS, RAID, video, audio, and Xf Tuner cards.

## TITAN UP TO 14-CH SYSTEM

This 19-inch rack-mounted system works for factory automated testing (ATE), flight testing, and simulation systems. Four configurations are available:

- Titan 01 & 04: Multi-channel recorders
- Titan 02: Test/simulation system
- Titan 03: High-capacity converter



Titan recorders can be configured to record and play out one to eight ARINC 818 channels for later analysis. For factory ATE, Titan-02 can accommodate multiple ARINC 818 RX and TX channels to test video sources and cockpit displays in production. Titan-03 can be factory configured to start automatically from power-up without the need for software interaction. It can also be factory configured to operate remotely.



All models are versatile systems that can be factory loaded to match your ICDs and chosen functions.

# REAL-TIME PROCESSING & OPTICAL COMMUNICATIONS

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



TEST & EMBEDDED

## ▶ 10X10 ARINC 818 SWITCHES

### TECHWAY SPIDER

- Compliant with ARINC 818 Supplement 2
- Up to 10 inputs/10 outputs and supports link rates up to 6x per link
- ICD independent
- SPIDER is manageable by web or SNMP



Techway Products:  
[Techway.com/products](http://Techway.com/products)

## ▶ VITA 57.4 OPTICAL INTERFACES

### 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

### 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



## ▶ PCIe FPGA PROCESSING

**TECHWAY PFP-ZU+** is a multi-purpose PCIe x4 Gen3 board with FMC+ site based on the latest Xilinx's SoC (System on Chip) called Zynq UltraScale+. Using Arm processor, you have access to multiple interfaces which allows you to design stand-alone equipment easily.

#### 3 Configurations Available:



- Zynq UltraScale+ 7CG MPSoC, PCIe x4 Gen3, FMC+ site
- Zynq UltraScale+ 11EG MPSoC, PCIe x4 Gen3, FMC+ site, Video/Graphic processor
- Zynq UltraScale+ 7EV MPSoC, PCIe x4 Gen3, FMC+ site, Video/Graphic processor, and Video compression

**TECHWAY PFP-IV** is a multi-purpose PCIe x16 Gen3 board with FMC+ site based on the powerful Xilinx Kintex UltraScale+ FPGA. This board is dedicated for extreme high-speed 28G applications such as 100 GbE communications, 4/6 GHz ADC/DAC, ARINC 818, AURORA, JESD, sFPDP, etc.

#### 2 Configurations Available:

- Kintex UltraScale+ KUP11 FPGA, PCIe x16 Gen3, FMC+ site
- Kintex UltraScale+ KUP15 FPGA, PCIe x16 Gen3, FMC+ site
- Options available: FireFly™ optical module, ZynqUltraScale+ MPSoC SoM



**Software Package:** drivers, Board Support Package, and firmware development kit included for Windows and Linux.

## ▶ 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 Kintex-7 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.



# FLYABLE AVIONICS & MISSION SYSTEMS BUILDING BLOCKS

RUGGED & FLYABLE

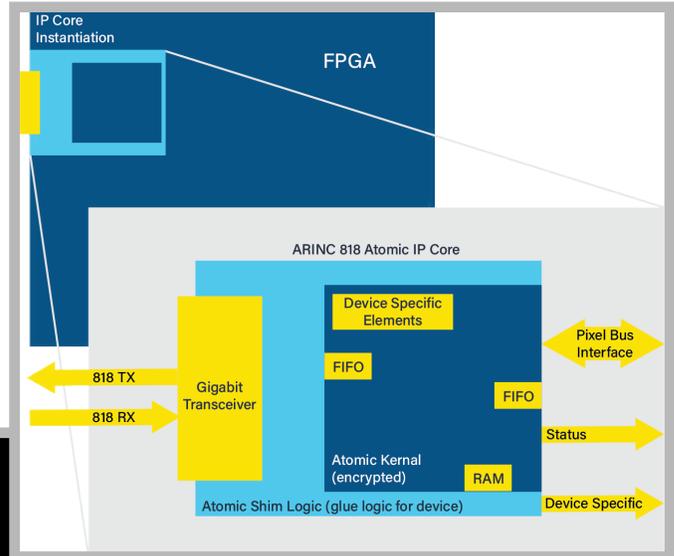
## ARINC 818 IMPLEMENTATION OPTIONS

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 your ARINC 818 IP implementation:

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

ARINC 818 IP in your 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 Gb/s. 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. 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.

ARINC 818 IP CORE:

[GreatRiverTech.com/arinc-818-ipc](http://GreatRiverTech.com/arinc-818-ipc)



### IN YOUR CHASSIS



EMBEDDED BOARDS



XMC BOARDS

### IN OUR CHASSIS

VIDEO CONVERTER MODULES



SINGLE CHANNEL VCM



MULTI-CHANNEL VCM

# FLYABLE AVIONICS & MISSION SYSTEMS BUILDING BLOCKS

**RUGGED & FLYABLE**

## 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.

- Low Power: 5 to 10 watts
- ARINC 818 to/from: DVI, RS-170, LVDS, or Ethernet
- LC or ARINC 801 Fiber options available

Our flyable 1-, 2-, and 3-channel cards embed in your chassis. A 3-channel board can supply 2 channels of DVI to ARINC 818 and one channel of ARINC 818 to DVI.

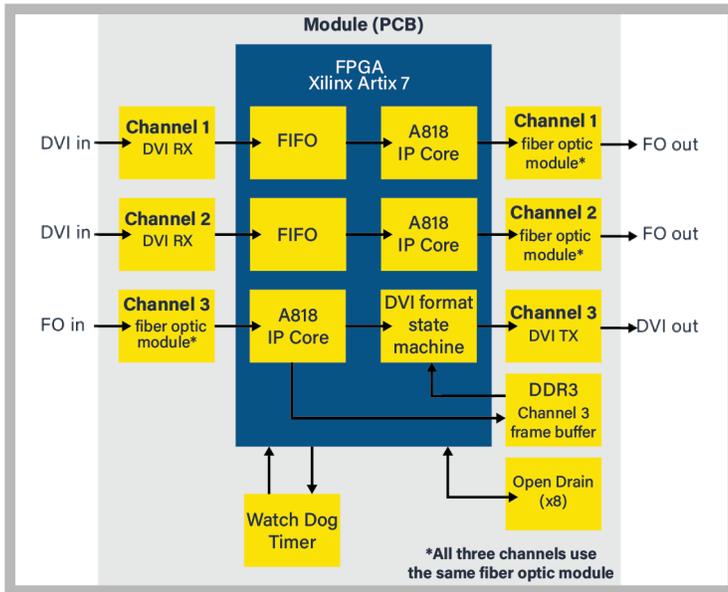


2-Channel  
EB Converter

### EB DIMENSIONS

1-channel	2-channel	3-channel
69 x 71mm (2.7 x 2.8")	79 x 90mm (3.0 x 3.5")	76 x 97mm (3.0 x 3.8")

3-Channel Embedded Converter:



- The module utilizes an FPGA to perform two types of video format conversions..
- The module contains supervisory logic to monitor and report stream and fault status to the host system.



### EMBEDDED BOARDS

[GreatRiverTech.com/embeddedboards](http://GreatRiverTech.com/embeddedboards)

## VELOCITY XMC BOARD



The Velocity XMC is a rugged form factor of Velocity Plus.

- VITA66 optic transceiver option available
- Supports display resolutions up to 4K at 30Hz
- Windows and Linux SDKs enable integration into VPX platforms
- Cooling plate improves the performance and reliability
- 256 MB DDR3 Memory
- Operating temperature 0-50 degrees celsius, extended temperatures available
- Relative humidity 5 to 95%

# FLYABLE AVIONICS & MISSION SYSTEMS BUILDING BLOCKS

RUGGED & FLYABLE

## ► 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 analog or digital video formats.



**VCM**  
Video Converter Module



**VCM**  
[GreatRiverTech.com/vcm](http://GreatRiverTech.com/vcm)

## ► 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.

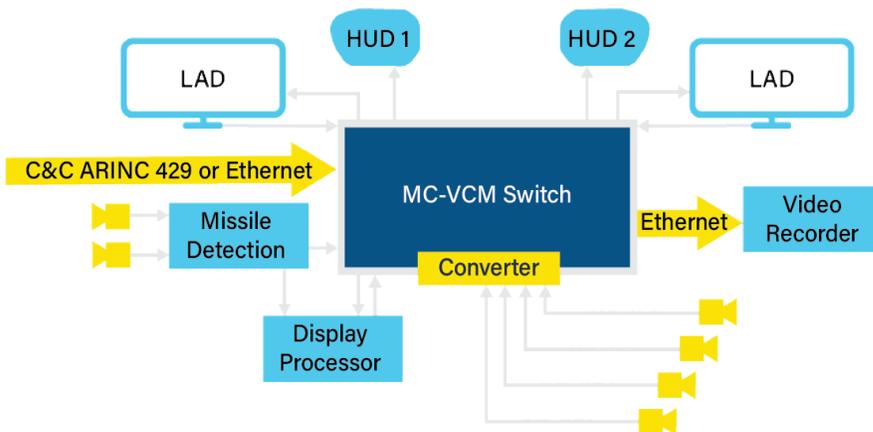
#### Applies to VCM & MC-VCM:

- Environmental Conditions, DO-160G (partial list; detailed list in datasheet; subject to change)
- Sec 4: Temperature and Altitude Overpressure.....A2
  - Sec 5: Temperature Variation .....B
  - Sec 7: Shock & Crash Safety .....B
  - Sec 8: Vibrations .....B1
  - Sec 15: Magnetic Effect.....Z
  - Sec 16: Power Input .....B (50 ms)
  - Sec. 22: ESD Susceptibility .....A

The MC-VCM is factory configured according to customer requirements for conversion, switching, and ICD specification.

#### Example Avionics System Using MC-VCM

The MC-VCM enables you to connect older cameras and sensors, together with newer, high-resolution large area displays, HUDs, and EO/IR sensors.



- Command and control is available through RS485, ARINC 429, or Ethernet.
- Video COAX support is available through a 38999 connector with coax inserts, or via individual DIN 1.0/2.3 coax

# FLYABLE AVIONICS & MISSION SYSTEMS BUILDING BLOCKS

RUGGED & FLYABLE

## ► MC-VCM FACTORY CONFIGURATIONS

- ARINC 818 conversion to or from HDMI, DVI, 3G/HD-SDI, NTSC/PAL, STANAG 3350, HOTlink, Ethernet, RS-170, CVBS
- 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, 10.0 Gbps or other custom rates
- Video concentrator to ARINC 818 or Ethernet (1-10) GbE
- **Optional configuration:** MC-VCM can be used as a platform to develop custom applications. Customers can access the FPGA to incorporate proprietary image processing or sensor fusion algorithms.

## 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

- **4-Channel Converter/Switch**
- **8-Channel Switch**
- **4-Channel Video Concentrator**

The configurations are virtually limitless due to its flexible architecture.

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.



MC-VCM populated with four slice boards.



**MC-VCM**  
[GreatRiverTech.com/mc-vcv](http://GreatRiverTech.com/mc-vcv)



# 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



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[GreatRiverTech.com/sales](http://GreatRiverTech.com/sales)

### OUR DISTRIBUTORS

- **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
- Reciotec
- Samtel
- Savic

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- SAAB Avionics
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