

ARINC 818-2 Single Channel Converter Aircraft Cockpit Video Display

ARINC 818 stand-alone & portable converter module

Introduction

Aircraft relay information through diverse sensors and cameras, processed via complex video systems for display in the cockpit. ARINC 818 protocol standard was developed to handle any video format to support interoperability. Since its adoption more than a decade ago, ARINC 818 continues to expand for real-time video applications due to its low latency, robustness, and high-throughput capabilities.

Our customer, a leading global provider of technologically advanced solutions and services for the aerospace and defense industry, sought an [ARINC solution](#) from iWave capable of seamlessly converting video formats between ARINC 818-2 to HDMI/DP standard. The objective was to enable translation of ARINC video standard to HDMI and DP video standard, facilitating the display of avionics data on monitors or workstations equipped with HDMI and DP sinks. This capability is crucial for various applications such as Pilot training simulators, Mission computer, and Cockpit development, and Factory test of ARINC 818 equipment.

The solution should also support a high degree of configurability allowing for seamless adaptation to various ARINC 818 Interface Control Documents (ICDs). This adaptability is essential for alignment with specific application requirements while ensuring strict compliance with the ARINC 818 standard.

Challenges

- Develop a stand-alone and portable ARINC 818 converter module
- Seamlessly adapt to different ARINC 818 ICDs
- Convert ARINC 818-2 to/from HDMI standard
- Convert ARINC 818-2 to DP standard

Solution Highlights

Recognizing the requirements of the client, iWave delivered a cutting-edge stand-alone [ARINC 818-2](#) Single Channel converter module that exhibits adaptability to diverse ARINC ICDs, precisely tailored to meet the client's unique requirements.

- Integrated ARINC 818-2 Tx & Rx IP on Zynq UltraScale+ MPSoC powered Single Board Computer
- On board 8GB eMMC Flash
- Supports 4K HDMI Input & Output Ports
- Supports Display Port
- Dual USB 3.0

The ARINC 818 converter module was designed using the [Zynq UltraScale+ MPSoC powered Single Board computer](#) (SBC), incorporating ARINC 818 IP to provide a comprehensive solution. To enhance local storage capabilities, the module features onboard DDR4 and eMMC Flash storage. Furthermore, to view or stream live ARINC 818 videos on a standard computer monitor, the ARINC 818 Converter module boasts 4K HDMI Input and Output ports and DP 1.2a output Ports. The ARINC 818 Converter comes with a 12V, 5A AC adaptor and has dimensions of 118.6mm x 97.3mm x 46.8mm, weighing 550gms.



iWave's [ARINC 818-2](#) transmitter and receiver IP was implemented in the SBC to make it compliant with ARINC 818-2 standard specification. Supported configurations encompass various conversion directions, including both ARINC 818 to HDMI and HDMI to ARINC 818 or ARINC 818 to DP. Additionally, these configurations may differ in terms of ARINC 818 link rates (such as FC 1x, 2x, 3x, 5x, 6x, 8x & 12x), video resolutions up to 4K @ 60fps, and pixel types.

This adaptability ensures that the system can be tailored to meet the specific application requirements of different scenarios, all while ensuring strict compliance with the ARINC 818 standard.

The ARINC 818 Single Channel Converter effortlessly handles diverse video inputs from HDMI, a test pattern generator (TPG), or a video source file sourced from USB/on-board eMMC. It then efficiently transmits the video via ARINC 818-2 Tx. ARINC video input from external source is received over ARINC 818 Rx and converted and displayed over HDMI/DP ports. Additionally, the option to store the received data in a USB/on-board eMMC adds versatility to its functionality.

Integrating an embedded test pattern generator into the ARINC 818 Converter, enables the generation of video test patterns in scenarios where an external video source is unavailable for feeding the ARINC device. It ensures compliance with the ARINC 818 standard, aids in efficient troubleshooting during development and facilitates seamless system integration testing.

The incorporation of USB ports in the ARINC 818 converter module offers strategic advantages for storing and utilizing [ARINC data](#). The ARINC data is seamlessly recorded through the conversion of ARINC 818-2 data into a video format utilizing the embedded VCU. This process involves encoding the ARINC data and securely storing it in the connected USB drive. This configuration ensures efficient handling of ARINC data, providing a robust and accessible storage solution in avionics systems.

The primary challenge in avionics is the cost and time required to develop, qualify, and train new capabilities that can integrate seamlessly into existing systems. And, with its unparalleled design-to-deploy expertise, iWave can be a dependable partner in bringing your ideas into time-to-market products.

For more information or inquiries, please contact mktg@iwavesystems.com.



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