

ARINC IA Project Initiation/Modification (APIM)

1.0 Name of Proposed Project

APIM 12-004B

Aircraft Data Network – 10 GbE Physical and Data Link Layer

Supplement 3 to ARINC Specification 664, Part 2

[Supplement 3 to ARINC Report 803, Fiber Optic design Guidelines](#)

[Supplement 2 to ARINC Report 804, Fiber Optic Active Device Specification](#)

1.1 Name of Originator and/or Organization

Airbus and Boeing

2.0 Subcommittee Assignment and Project Support

2.1 Identify AEEC Group

It is recommended that the Connector Working Group (CWG) of the Cabin System Subcommittee (CSS), [the Fiber Optics Subcommittee \(FOS\)](#), and the Network Infrastructure and Security (NIS) Subcommittee be assigned to perform this work.

2.2. Support for the activity

Airlines: Delta Air Lines, United Airlines

Airframe: Airbus, Boeing

Suppliers: Thales, TE Connectivity, Radiall, Glenair, Panasonic, Lumexis, Amphenol, Souriau, ITT Canon

2.3. Commitment for resources

Airlines: Delta Air Lines, United Airlines

Airframe: Airbus, Boeing

Suppliers: Thales, TE Connectivity, Radiall, Glenair, Panasonic, Lumexis, Amphenol, Souriau, ITT Canon

2.4 Chairmen:

CSS Chairman: Dale Freeman, Delta Air Lines

NIS Co-Chairman: Stephen Arentz, United Airlines

NIS Co-Chairman: Jean-Paul Moreaux, Airbus

[FOS Chairman: Robert Nye, Boeing](#)

2.5. Recommended Coordination with other groups

Cabin Systems Subcommittee (CSS)

Connector Working Group (CWG)

Fiber Optic Subcommittee (FOS)

Network Infrastructure and Security Subcommittee (NIS)

3.0 Project Scope

Update ARINC 664, Part 2, to include the physical and data layer for 10 GbE interface for commercial aircraft. Both copper and fiber will be included.

[Update the fiber optic set to consider implementation of 10GBASE-SR fiber optic](#)

[link](#). The following standards will be affected:

- [ARINC Report 803 to define Link Budget/Optical interface requirements](#)
- [ARINC Report 804 to define the Active Device \(transceiver\) transmit and receive minimal requirements](#)

3.1 Description

This effort will standardize cable and connection devices for use with 10 GbE data buses for multiple high-speed applications.

3.2 Planned usage of the envisioned specifications

New aircraft developments planned to use this specification yes no

Airbus: all future aircraft types

Boeing: all future aircraft types

Other:

Modification/retrofit requirement yes no

Airbus:

Boeing:

Other:

Needed for airframe manufacturer or airline project yes no

Airbus: all aircraft types

Boeing: all aircraft types

Other:

Mandate/regulatory requirement yes no

Program and date:

When is the ARINC standard required? October 2015

What is driving this date? Development of new In-Flight Entertainment Systems

Are 18 months (min) available for standardization work? yes no

If no please specify solution: _____

Patent(s) involved? yes

If YES please describe, identify patent holder: _____

3.3 Issues to be worked

Consensus on a standard contact capable of 10Gb/s Ethernet performance

For 10GbE applications:

- Link details
- Equipment Physical Layer Design considerations
- Aircraft network link components
- Reference Plane Definition

- Link test Guidelines (Appendix F)
- Implementation Guidelines for 10GBASE-T Links
- Listen Only Interface (Research/Investigate)
- [Implementation Guidelines for 10GBASE-SR fiber optic links](#)

4.0 Benefits

The goal is to reduce equipment design, integration and installation cost and to reduce maintenance cost for airlines.

4.1 Basic benefits

Operational enhancements yes no

For equipment standards:

a. Is this a hardware characteristic yes no

b. Is this a software characteristic yes no

c. Interchangeable interface definition yes no

d. Interchangeable function definition yes no

If not fully interchangeable, please explain: _____

Is this a software interface and protocol standard? yes no

Specify: IEEE 802.3

Product offered by more than one supplier yes no

Identify: Thales, Lumexis

4.2 Specific project benefits

Simplify and lower the cost of development, installation, integration and maintenance for 10GbE in commercial aircraft. This is expected to improve the ability of airlines to download and distribution of high volume of entertainment content in cabin systems.

4.3 Benefit for Airlines

Standardization will lower acquisition cost of equipment using this standard. It will also lower maintenance and spare cost across the airlines multiple airplane models.

4.4 Benefit for Airframe Manufacturers

Simplifies the design for high speed links, lowering the cost of interconnection and installation, which ultimately lowers the acquisition cost

4.5 Project Benefit for Avionics Equipment Suppliers

Enables equipment suppliers to design standardized equipment applicable to multiple airplane manufacturers and models with the goal of minimizing their design effort and cost.

5.0 Documents to be Produced and Date of Expected Result

Supplement 3 to ARINC Specification 664 Part 2, October 2015.

[Supplement 3 to ARINC Report 803, April 2016.](#)

[Supplement 2 to ARINC Report 804, April 2016.](#)

Consider the impact on other ARINC Standards, including ARINC Specification 800, Parts 2 and 3.

5.1 Meetings/Expected Document Completion

The following table identifies the number of meetings and proposed meeting days needed to produce the documents described above:

Activity	Mtgs	Mtg-Days (Total)	Expected Completion Date
CSS/CWG/NIS Prepare Supp 3 to ARINC 664 Part 2	4 meetings*	*	April 2016
FOS – Prepare Supp 3 to ARINC 803 FOS – Prepare Supp 2 to ARINC 804	3 meetings*	*	April 2016

***NOTE:** This effort will take place within the regularly scheduled meetings of CSS/CWG, FOS, and NIS. In addition, web and telephone conferences will be held between meetings to review action items and the draft Supplement material.

6.0 Comments

The expertise of the CSS Connector Working Group (CWG) will be used to prepare the draft Supplement, including discussion of proposed material, industry editor, and content review. Final review is suggested as a combined 1 or half-day meeting of CSS/CWG, NIS, and other interested parties.

6.1 Expiration of this APIM

April 2016

Submit completed form to the AEEC Executive Secretary.