



# Celestia

## Cabin Management & Technology System Technical Overview & Features

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# Evolving the Passenger Experience



First translating aviation sun visor

First aviation in-seat LCD's

First automotive flat-panel display

First remote electronics IFE

First and only, full range of 4K OLEDs

World's largest 97" 4K OLED

*Aurria*: in-seat AudioSphere

*Celestia*: operator designed CMS

1980

1994

1997

2010

2021

2023

2024

2025

# Cabin Management & Technology System

## Celestia

**Operator Developed | Passenger Focused**

Our storied lineage of visionary insight and precise execution reaches a pivotal new chapter with the introduction of *Celestia*. The world's premier Cabin Management & Technology System, developed by a global VIP operator, has already proven itself to be one of the best and most reliable Cabin Management Systems in the market.

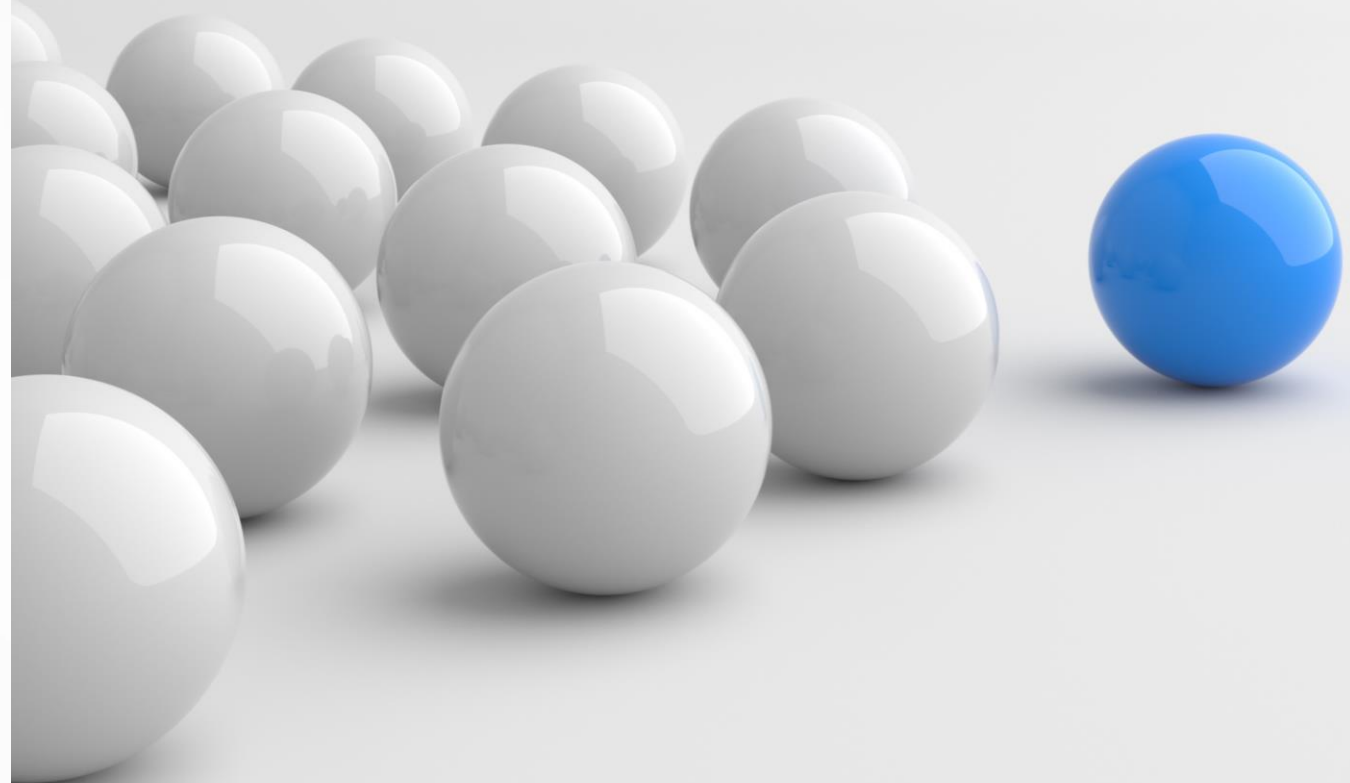
Celestia is reliable, easy to customize, and easy to configure and is set apart from other cabin management systems. Where configuration, customization, and changes are measured in days and not months, where a rare failure of a component is isolated, where built in diagnostics monitor key performance parameters, and where system uptime is of paramount importance.

Where traditional systems simply provide control, Celestia provides an experience: relaxation, entertainment, productivity, and security.

Celestia is also about proven cutting-edge performance, providing 4K video distribution and playback on the highest performing 4K OLED screens in the market, providing DRM capable hardware, shared storage resources for content, passenger-controlled bandwidth, 4K 3D moving maps, multi-lingual support, and state-of-the-art audio and video experiences.

Simply stated, Celestia is in a class of its own.

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A V I A T I O N





## Celestia System Characteristics

Celestia CMS is a joint-partnership with an established VIP / VVIP operator and supplier. The IP based architecture was designed with an **operator-mindset**, which translates to an intuitive, responsive, configurable, reliable, repairable and future-proof system.

Its 17-year, diverse-platform and thousands of hours operational-history, prove its many values and benefits compared to competing CMS systems.

Continually developing over time, Celestia has evolved to be highly-functional, supporting 4K video and all the required functions to satisfy the most demanding VIP customers.

New features are being developed continually and are added over-the-air.

# Operator Benefits

Key Benefits include:

## Reliability

- Fault tolerant design – utilizes secondary Ethernet backbone for fail-safe network connectivity
- Distributed network where any component failure is localized and does not affect the rest of the system
- Temperatures, voltages, and performance are easily monitored enabling preventive maintenance and excellent up-time
- Intuitively manage and monitor systems, sub-systems, zones, rooms, and individual boxes
- Hot swap, plug-n-play components
- Installed on multiple aircraft and platforms flying since 2007 with over 17,000hrs of flight-time

## Performance

- Highly responsive system, low latency
- Content storage with video & audio syncing
- 4K UHD video performance

## Flexibility

- Agile and responsive supplier with proven experience and history in the VIP market
- Customizable HTML based GUI's and CMS controls
- Control with iOS and Android PEDs, switch panels, and/or touchscreens
- Bandwidth Management
- The same reliable IP based network has been in use since 2007 and evolved to be ultra-contemporary today
- Future products and functionality will easily integrate into the existing eco-system

## Support

- Rosen's signature personal attention tech support for the life of the aircraft
- Readily available spares
- Remote tech support access while in-flight
- Upgradeable performance without system changes
- Managed obsolescence with system/component upgradability

# Completion Center **Benefits**

Key Benefits include:

## **Less wiring**

- With many devices powered over POE, significantly less power wiring to run
- Many devices can be daisy chained (up to 16)

## **Easy setup**

- Systems can be designed and configured in a matter of weeks.
- All CMTS components have been installed and in use have been delivered with EASA Form 1. All testing completed under an STC

## **Support**

- Rapid resolution of issues and responses to needs
- On-site systems and engineering support to aid in system power up and debugging procedures
- Full system bench to verify and configure all components prior to installation processes
- Configuration, installation, training, and proven full aircraft support for the life of the aircraft.

## **Scalability**

- Adding, moving, removing, or upgrading functionality is easy with the IP architecture

## **Interface Variety**

- Easily connect, control, and monitor aircraft interfaces with discrete, PWM, relays, RS232, RS485, CAN bus and ethernet.

## **System Monitoring**

- Easily manage and monitor systems, sub-systems, zones, rooms, and individual boxes
- Remote tech support access while in-flight

## **Fault Tolerance**

- Plug-n-play component replacement and autoconfiguration
- Live sub-system isolation for local reboot and repair...no effect to full system

## NextGen Technologies

In conjunction with Celestia's proven performance and reliability, the addition of NextGen Features allows passengers to radically transform the cabin environment for even the most tech-savvy passenger.

- *Aurria* In-seat AudioSphere
- *Theia* smart IFE display architecture
- Sky Cinema full Dolby 5.1, 7.1 & theatrical Atmos
- Touchless holographic controllers
- Digital windows & skylights
- Point-of-interest augmented reality (AR)
- Cabin Li-Fi connectivity
- Individual reading / disinfection lights
- Automatic smart cupholders

The dynamic future-proof, scalability of Celestia integrated with NextGen features not only enhances system performance and, ultimately, the passenger experience; these additional technologies also improve system size, weight and power efficiency by leveraging cutting edge materials and components such as carbon composite, Gallium Nitride and the very latest audio and display technologies.





# Summary

Driven by Vision, Supported by Technology

Evolving the Passenger Experience

Unparalleled Performance

Proven Capabilities & Reliability

A Legacy of World-Class Support

Integrated Partnerships – A New Approach



EXIT

120

ROSEN  
AVIATION

ROSEN

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AVIATION

# Celestia System Specification

Key system attributes include:

- Dual, redundant 2.5GB Ethernet backbone
- De-centralized cabin management & technology system – designed for ultra-reliability and backward compatibility
- 115VAC (variable frequency), 28VDC, and POE powered devices
- Fault tolerant design – utilizes secondary Ethernet backbone for fail-safe network connectivity
- Plug-n-play component replacement and autoconfiguration
- Sub-system isolation for local reboot and repair, with no effect to full system
- System configuration tool to configure and program complex LOPA's – measured in days, not months
- HTML based GUIs, easily customizable
- Aircraft sub-systems controlled by small controller boxes, which interface with connected network switches
- Content storage with video & audio syncing and low latency
- Connections & interfaces for all aircraft subsystems (Ethernet, RS232, RS485, ARINC 429, CAN bus)
- Push button, PED, and touchscreen control options
- Betria's FlightPath3D moving map integrated onto Linux network switch with moving map data available to all devices and monitors
- DRM compliant hardware
- Monitoring of all functions, status, and key system parameters
- Highly responsive, low latency
- Adaptable bandwidth management
- Configuration, installation, training, and proven full-aircraft support for the life of the plane.
- All components have been installed and in use, having been delivered with EASA Form 1 with all testing completed under an STC

# Celestia Components Overview

## Network Switch and Power Supply (NDPU2) *The Backbone*

The Celestia Network Switch and Power Supply (NDPU2) functions as the primary component and backbone of the Cabin Management & Technology System.

NDPU2 is an integrated Ethernet switch for up to 89 peripheral devices while also supplying power to its peripheral devices over ethernet (POE).

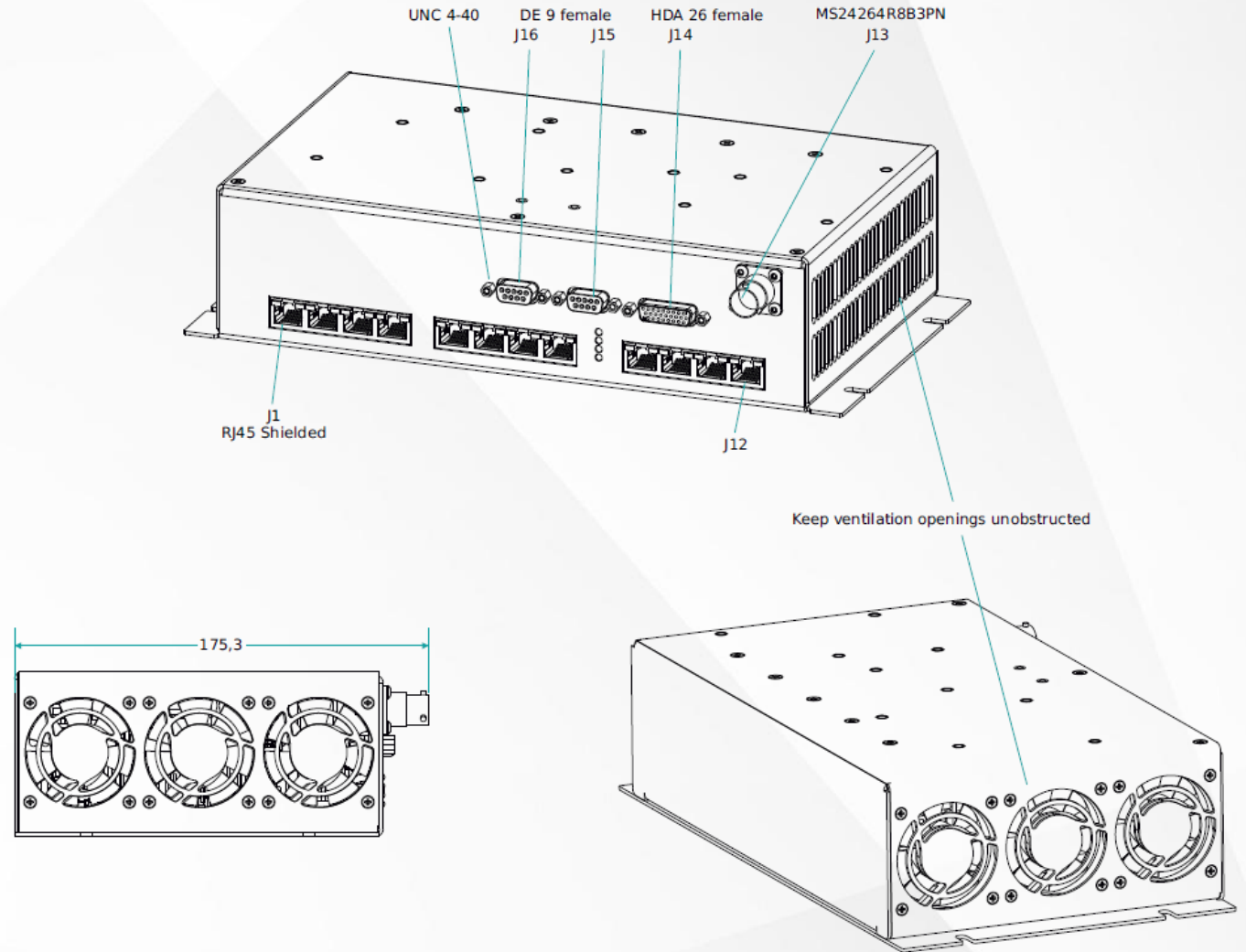
Additionally, it has 4 backbone Ethernet interfaces to supply a meshed cabin network with redundant links, as well as 2TB self-contained storage.

Size: 11.8" x 6.1" x 2.7"

Weight: TBD

Input voltage: 115VAC

Input frequency: 360-800Hz



# Celestia Components Overview

## Video Decoder & Encoder Unit (VDEU4K)

### **Smart Video**

The Video Decoder & Encoder Unit (VDEU4K) serves as the video distribution and control box for all video signals.

VDEU4K drives monitors and touchscreen switch panels and has a variety of inputs and outputs including RS485. VDEU4K receives POE from NDPU2.

Size: 7.4" x 5.0" x 1.9"

Weight: 2.2 lbs

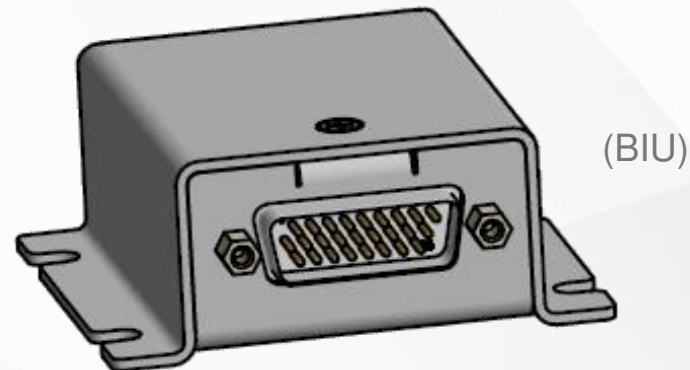
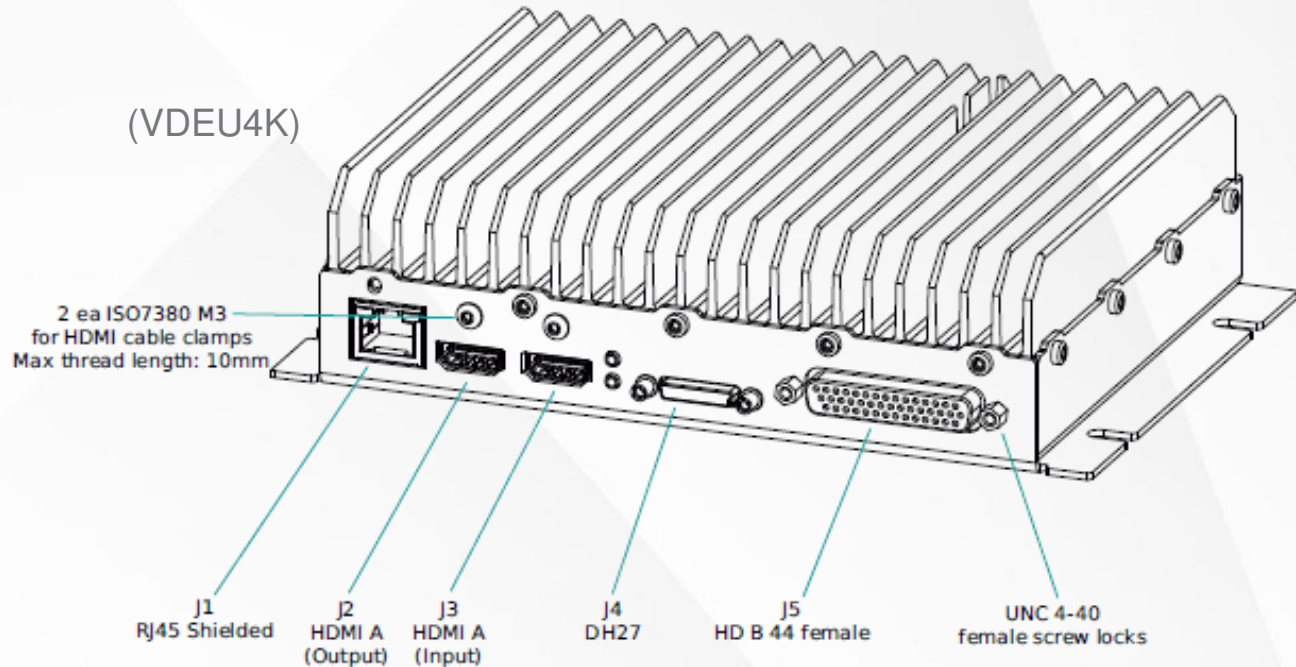
Max heat power: 28W

## Bus Input/Output Unit (BIU)

### **Integrated Connection**

The Bus Input/Output Unit (BIU) connects Celestia's many smart components to the control box.

BIU is essentially an RS485 aggregator box, taking in a variety of RS485 inputs and outputs via Ethernet to the NDPU2.



# Celestia Components **Overview**

## Six-Channel Audio Decoder & Amplifier (AMP6)

### **Premium Audio**

The Six-Channel Audio Decoder & Amplifier (AMP6) connects audio data with associated speaker systems to distribute premium audio throughout the cabin.

AMP6 supports 5.1 surround sound and can also work with cabin P/A systems (additional component needed). AMP6 connects to NDPU2, but is independently 115VAC powered

Size: 15.4" x 12.6" x 3.1"

## Display Unit 24" (DU24)

### **Control Interface**

The DU24 Display Unit allows control of Celestia's functions through an intuitive touchscreen interface, including cabin control, diagnostics and entertainment functions.

The DU24 can also serve as an input and output for stereo audio signals. DU24 is primarily accessed by flight crew.

(AMP6)



(DU24)



# Celestia Components Overview

## Three-Channel Discrete Control Unit (DCU3)

### ***Input and Output Control***

The connection to Celestia's control is established via a TIA-485 bus. The two wire connection and very small housing makes the DCU3 an optimum choice for distributed installation directly at loads to be switched like lights, heaters, window shades.

DCU3 is also ideal for input sources like pushbuttons or discrete outputs of other units.

Size: 2.6" x 2.7" x 1.1"

Power: 28VDC

## LED Dimmer Unit (LDU)

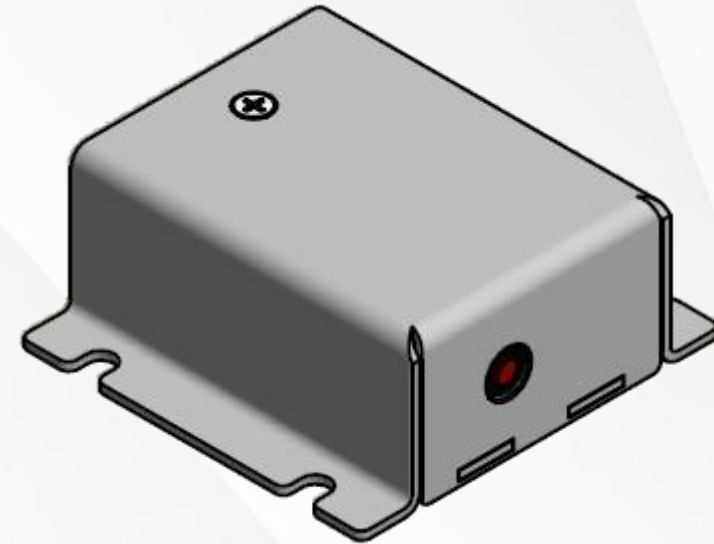
### ***Dynamic Cabin Lighting***

LDU allows passengers and crew to modulate LED lighting systems on board the aircraft to create an optimized lighting environment for sleep, entertainment or productivity. Each unit can control up to four (4) low power 28VDC LED lights.

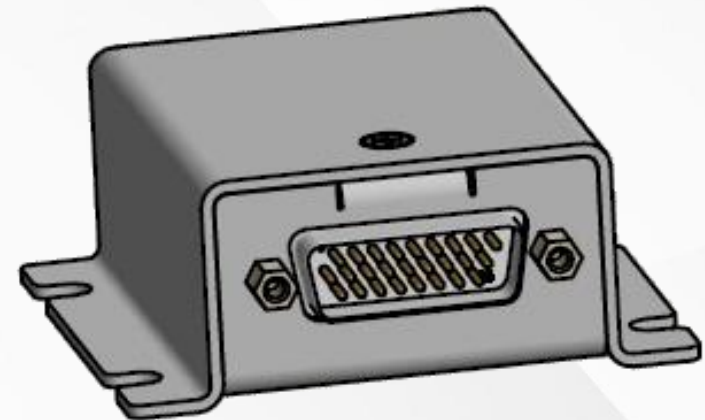
Size: 2.6" x 2.7" x 1.1"

Power: 28VDC

(DCU3)



(LDU)





# Celestia Components Overview

## USB Charging Supply 4-Way (UCS4) *Personal Device Support*

UCS4 provides on-demand power for up to four (4) personal devices via USB-A &/or USB-C charging ports.

Each USB port can supply a maximum of 60W charging power to passenger devices and can also be configured for more efficient low power charging at 10W.

Size: 3.6" x 5.1" x 1.0"  
Power: 28VDC

## Passenger Display Panel 5" (PDP5) *Passenger Interface*

PDP5 is one of Celestia's responsive and intuitive touchscreen passenger interface displays, allowing passengers to control and manage an array of cabin functions. Specifically designed for thin panel applications.

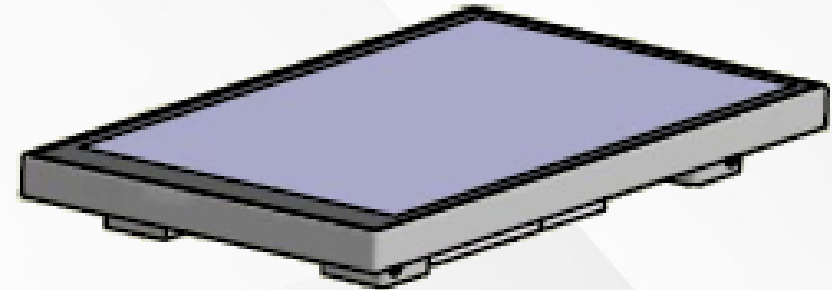
Cabin data, as well as POE, are supplied via VDEU4K.

Size: 4.9" x 2.8" x 0.6"

(UCS4)



(PDP5)



# Celestia Components **Overview**

Passenger Display Panel 6" Wide Aspect Ratio (PDP6W)

## ***Passenger Interface***

PDP6W provides the same intuitive passenger control in a sleek, wide aspect ratio format for additional GUI options.

Additionally, PDP6W can be used for cabin signage and safety indicators in applicable locations of the aircraft. Specifically designed for thin panel applications.

Size: 7.5" x 1.8" x .5"

Switch Panel One Button (PSP1)

## ***Passenger Interface***

PSP1 is a general one button switch panel with LED backlight for easy to see illumination.

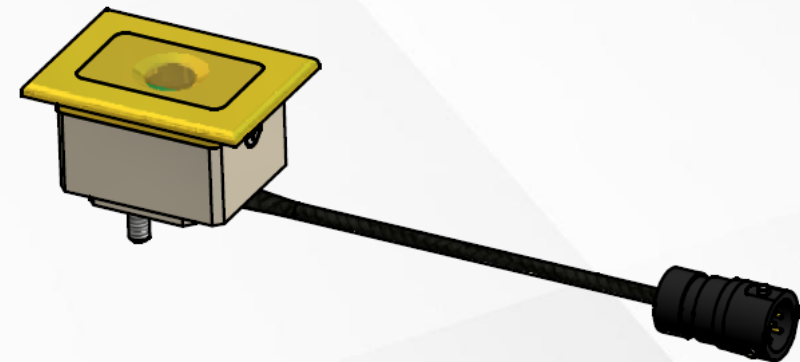
The graphics for PSP1 can be easily customized for various aircraft integrations. PSP1 is a discrete switch controller and must be connected to DCU3, from which it also receives power.

Size: 5.4" x 1.2" x 1.3" (with umbilical connector)

(PDP6W)



(PSP1)



# Celestia Components **Overview**

PSP2, PSP3, PSP4, PSP6, PSP6 Plus, PSPP6  
***Passenger Interface***

Celestia features additional button panels ranging from two (2) to six (6) customizable button arrangements.

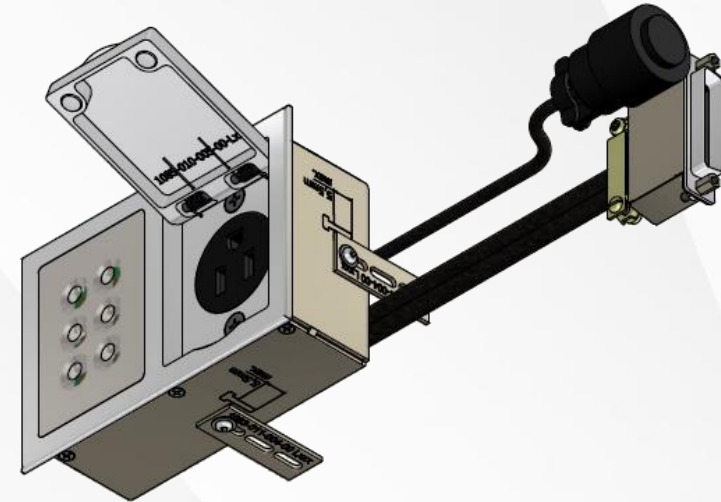
Like PSP1, the line of PSP buttons is equipped with LED backlighting. PSP2 through PSPP6 require dedicated 28VDC power and have built in relays. PSP buttons are configured as RS485 output to control boxes.

Real Time Clock Unit (RTC)  
***Reliability and Synchronization***

RTC implements a real time clock independent of all other devices, dedicated solely to always keeping the system in perfect synchronization.

RTC supports diagnostic data reporting and maintains time keeping even during power glitches thanks to a built-in coin cell battery in addition to integrated 28VDC power input.

(PSPP6)



# Celestia Components Overview

## ARINC429 Interface Unit (429IU)

### **Protocol Converter**

429IU allows all devices in the Celestia ecosystem to communicate and function seamlessly.

The unit allows TIA485 asynchronous serial interface components to communicate with components that are equipped with MARK 33 DITS interface.

## 4:1 HDMI Multiplexer (HDMIMux)

### **Smart Video**

HDMIMux allows control and management of up to four (4) independent HDMI video inputs, up to 4K resolution.

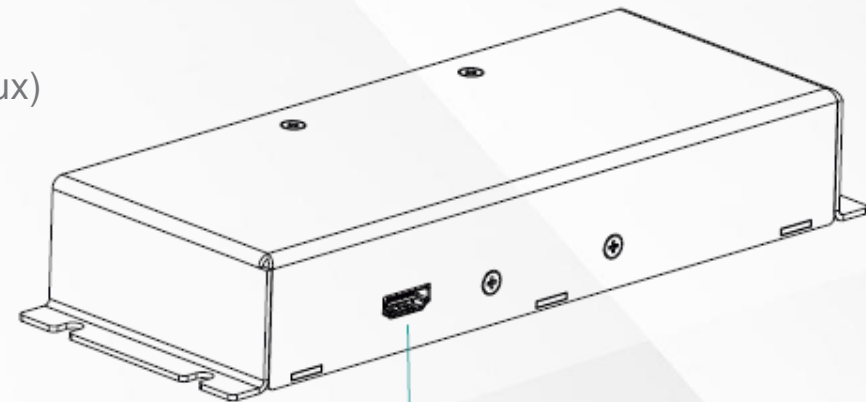
At any time, the video signal of one video source input can be routed to the desired video output. HDMIMux can receive 5V USB power from control boxes such as VDEU4K, or standard 28VDC aircraft power.

Size: 8.5" x 3.0" x 1.4"

(429IU)



(HDMIMux)



J4  
Type A  
HDMI Input #4