

# Play synchronisation system for the Denon<sup>®</sup> DN-V300/V310 player

## Technical Data

### DVD-DSYN6

Firmware revision 1.00

#### Features

- Play synchronise 2 to 6 Denon DN-V300/V310 players to create visually stunning displays
- Ultra low power consumption from the connected players
- Simple connection to Denon<sup>®</sup> V300/V310 player serial (RS232) port
- Automatically determines number of connected players and adjusts accordingly
- No additional cables or power adaptors are required
- Compatible with DVD media with or without automatic disc PLAY

#### Description

The DVD-DSYN6 accessory permits the PLAY<sup>τ</sup> synchronisation of 2-6\* Denon<sup>®</sup> V300/V310 players when using DVD media<sup>Ⓞ</sup>.

All players are individually controlled and monitored by the DVD-DSYN6, each player having its operational status confirmed on power-up allowing the automatic selection of between 2 and 6 players.

Once the DVD-DSYN6 has determined how many players are connected a PLAY track 1 command is issued followed by a PAUSE command to each player. The DVD-DSYN6 then waits for all active players to become ready and issues a global PLAY track 1. Each player continues to play the inserted media until the 'return-to-beginning' loop programmed at the end of the media



re-starts the program and signals the DVD-DSYN6 to re-issue a PAUSE and repeat the cycle.

#### Applications

The DVD-DSYN6 is primarily for use in automatic multiple player presentations of DVD video material for Point-of-Sale, training / educational, museums and exhibitions.

DVD ACCESSORIES

#### Selection Guide

Description	Part Number
6 channel play synchronisation unit	DVD-DSYN6

Note: \* Custom port numbers are available; please contact your sales representative for more details.

Ⓞ CD-A & Videodisk not supported

τ Note: The DVD-DSYN does not frame synchronise playback between players.

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## Power requirements

The DVD-DSYN is powered from the serial port RTS lines of the connected DVD players. The maximum current draw is 6mA per-channel.

## DVD-DSYN interface

The DVD-DSYN interface connection is a standard DB9 male as specified within the V300/V310 player specification.

Serial communication protocol is 9600 Baud, 1 Start bit, 8 Data bits, 1 Stop bits, No parity for all control commands. All I/O is RS232 and TTL compatible.

## DVD-DSYN interface

Function	DB9 Male
RTS	8
RXD	3
TXD	2
Ground	5
All other connections are N/C	

## DVD control protocol

The DVD-DSYN communicates with each player using the player control protocol. This protocol takes the form of ASCII command strings of format:

[PC,PlayT,1]\r

These strings allow features such as the On-Screen-Display (OSD) to be controlled and media control commands such as PLAY, PAUSE, STOP etc. to be issued to the player.

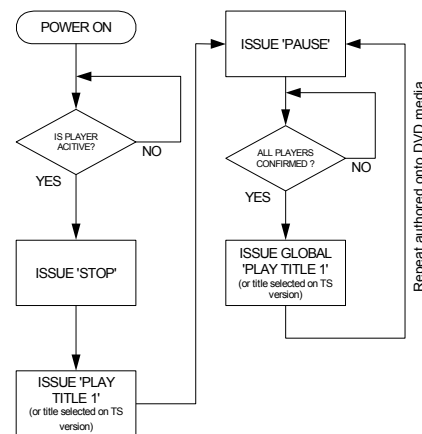
## DVD-DSYN function

Flowchart 1 shows how the DVD-DSYN functions on the Master channel. The master channel will wait for up to 60 seconds for the connected slave players to be switched ON, confirm that a DVD disc is inserted and go into PAUSE. Should a slave player fail to respond within this period the player is 'locked out' by the master and will not be queried when the global PLAY needs to be issued.

The Master channel must ALWAYS be connected to an active player.

Note: Accurate play synchronisation will not be attained until the first loop has been completed. Synchronisation accuracy is dependant on individual players and may be  $\pm 4$  frames.

## Flowchart .1



## DVD Media Authoring

When authoring DVD media for use with the DVD-DSYN product range the following requirements should be adhered to:

- A short (10 frames max.) video black period should be included at the beginning of the presentation to prevent still frame images from being displayed when the DVD-DSYN issues a PAUSE.
- The disc MUST be laid out as a single Title with at least two chapters (Note: Some authoring systems require these two chapters to be authored within title 1 for correct function, incorrect function being indicated by the DVD player not displaying a PAUSE when the media loops back to the beginning).
- AN AUTOMATIC RETURN TO START (TITLE 1 CHAPTER 1) **MUST** BE AUTHORED ON THE MEDIA AT THE END OF THE PRESENTATIONS FINAL CHAPTER TO ALLOW THE DVD-DSYN TO FUNCTION CORRECTLY.
- All discs to be used in one DVD-DSYN application should be authored with approximately the same length of content on each. This will prevent long periods of video black being shown if discs are of significantly different length.

## Electrical Characteristics (T<sub>A</sub> = 25°C Typical)

Parameter	Minimum	Maximum	Units	Notes
Supply Voltage (VCC)	4.5	9	V	
Supply Current per channel	-	6	mA	1
Power-on to global PLAY time	25	60	seconds	
RXData output high level	GND	0.8	V	
RXData output low level	2.4	5.1	V	
TXData input low level	2.4	15	V	
TXData input high level	0.8	-15	V	

## Absolute Maximum Ratings

Parameter	Minimum	Maximum	Units
Supply Voltage	-0.5	+10	V

### Notes:

- Value given is for each channel i.e. for the DVD-DSYN6 value would be 36mA total.

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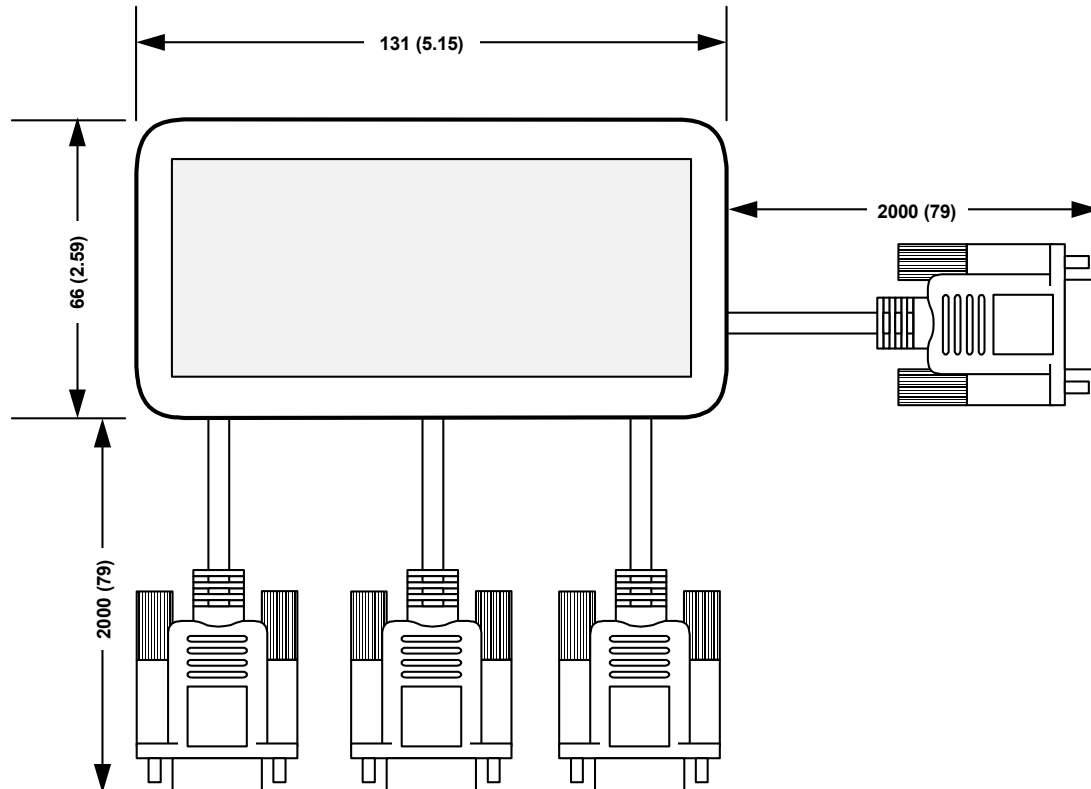
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## Environmental

Parameter	Minimum	Maximum	Units
Operating Temperature	0	70	°C
Storage Temperature	-10	80	°C
Humidity	0	80	%
Dimensions	See below		
Weight	575g		
Immunity & emissions	EMC compliance to 89/336/EEC		

## Mechanical Specifications – Units millimetres (inches)

DVD-DSYN4 shown only as guidance



## Installation

1. Power-up and insert the DVD media into each player and power-down again.
2. Connect each DVD-DSYNn port, starting with the 'MASTER', to a player SERIAL port.
3. Power-up each player (all within 30 seconds), or all together, and wait for the DVD-DSYN6 to STOP, PLAY and PAUSE and then all players will be set-off together. At the end of the title the loop command authored onto the media will restart chapter 1, pause and set-off all players together again.

### Notes:

- **One player must always be connected to the 'Master port'.** If a port on the DVD-DSYN6 is not required it can be left unconnected. However, it should be noted that on power-up the DVD-DSYN6 will wait for the unconnected port(s) to time-out for a period of one (1) minute before any PLAY instruction is issued.
- All connected players should be powered-up within a period of thirty (30) seconds to ensure that player(s) are not locked out. If a player becomes locked out the DVD-DSYN6 will not wait for this port to complete its title before issuing a global play.
- The program DISC must be already inserted on power-up for the DVD-SYNn to take control.
- Always use good quality media to ensure good synchronisation. PLAY synchronisation accuracy is dependant on individual players and may be  $\pm 4$  frames.

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### WEEE Consumer Notice

This product is subject to Directive 2002/96/EC of the European Parliament and the Council of the European Union on Waste of Electrical and Electronic Equipment (WEEE) and, in jurisdictions adopting that Directive, is marked as being put on the market after August 13, 2005, and should not be disposed of as unsorted municipal/public waste. Please utilise your local WEEE collection facilities in the disposition and otherwise observe all applicable requirements. For further information on the requirements regarding the disposition of this product in other languages please visit [www.designersystems.co.uk](http://www.designersystems.co.uk)



### RoHS Compliance

This product complies with Directive 2002/95/EC of the European Parliament and the Council of the European Union on the Restriction of Hazardous Substances (RoHS) which prohibits the use of various heavy metals (lead, mercury, cadmium, and hexavalent chromium), polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE).

#### Declaration of Conformity

**Apparatus name / model number** DVD-DSYN  
**Conformity via** Generic Standard EN50081-1  
Generic Standard EN50082-1

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**Manufacturer** Designer Systems, 15 Andrew Place, Truro, Cornwall  
TR1 3HZ, United Kingdom

**Description of apparatus** DVD control device

**Conformity criteria** For use only within commercial, residential and light industrial applications

**We certify that the apparatus identified above conforms to the requirements of Council Directive 89/336/EEC & 73/23/EEC**

**Signed.**  **Date** 1/10/99

Having made this declaration the CE mark is affixed to this product, its packaging, manual or warranty.

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