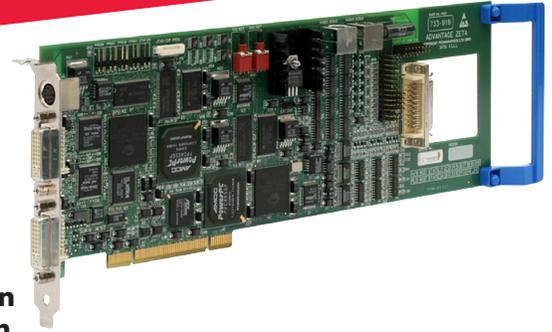




# Advantage Zeta

## Single-slot PCI Radar Input and Scan Conversion Issue 1.1



### Radar Input Architecture

- ◆ Digitisation and processing of analogue or digital radar video
- ◆ PowerPC processor for data processing and control
- ◆ 10-bit 50 MHz sampling of analogue video with programmable lookup table conversion to 8 or 4 bits.
- ◆ PRF rates up to 10 kHz
- ◆ Effective sampling rate from 12 kHz to 50 MHz in 4096 steps
- ◆ Range and inter-return processing by highest wins or lowest wins.
- ◆ Internal test pattern generator

### Radar Inputs

- ◆ Three analogue video inputs
  - 0 to 5 V RMS, 75 Ohms
  - Differential or single-ended
  - Gain and offset control
  - Selectable high/low-pass filters
  - Flexible mixing between inputs
- ◆ 8-bit digital radar video input with clock.
  - RS-422, ECL or single ended
- ◆ Sync (trigger) input
  - Single ended trigger 30 V peak, with programmable threshold, 75R termination on board
  - Differential trigger +/- 10 V, 120R termination option.
- ◆ Single azimuth input
- ◆ ACP/ARP, serial azimuth or 12-bit parallel.

### Radar Scan Conversion

- ◆ Multiple radar display windows
- ◆ PowerPC processor for display processing and control
- ◆ Variable persistence smooth fading with up to 128 levels
- ◆ Supports radars up to 60 rpm
- ◆ Programmable colours for different radar videos.
- ◆ Configurable polar store for display of multiple radars
- ◆ PPI or B-scan display format
- ◆ Any zoom or offset from centre supported
- ◆ Integrated digital video keying of radar with graphics

### Graphics Input

- ◆ Video input from graphics card\*
- ◆ Digital DVI input (DVI-D)
- ◆ Resolutions up to 1600 x 1200
- ◆ Pixel clock: 25 to 120 MHz (L version), or 160 MHz (H version)

\* Consult factory for full range of compatible cards

### Graphics + Radar Output

- ◆ DVI and Analogue RGB output
- ◆ Resolutions from 640 to 1600 x 1200 (same as graphics input)
- ◆ Radar video is semi-transparently mixed with underlay graphics
- ◆ Overlay graphics

### Learn More

Web / [sales.cwembedded.com](http://sales.cwembedded.com)

Email / [sales@cwembedded.com](mailto:sales@cwembedded.com)

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## Overview

From an established product family of radar processing products, Curtiss-Wright's new Advantage Zeta combines radar signal acquisition, scan conversion and graphics mixing onto a single PCI card to offer high-performance in a minimal slot count.

Advantage Zeta accepts radar video, trigger and turning data and scan converts the data into one or more display windows. The card supports PPI or B-scope views of the radar video, driving a high-resolution display at up to 1600 x 1200 pixels with analogue RGB or digital DVI video. Advantage Zeta accepts a graphics signal from any industry-standard DVI-compatible graphics card and supports a multi-layer display of overlay graphics and underlays that are blended with the radar video.

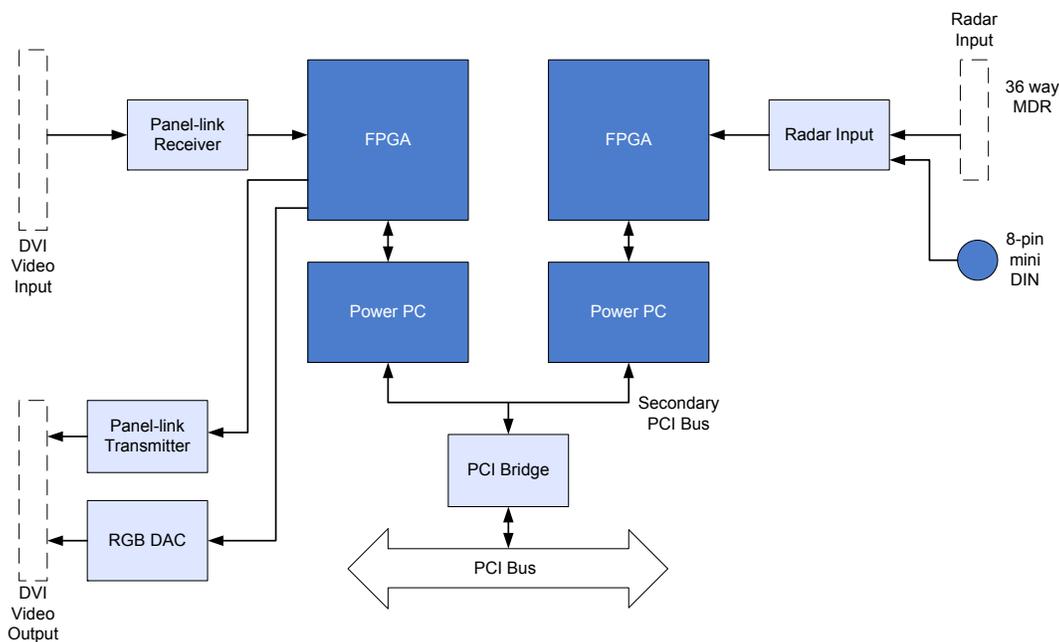
## Radar Input Options

Advantage Zeta supports a number of radar input options, including ACP/ARP, RADDs, serial and parallel azimuths. Up to three analogue videos may be connected with one, or a programmed combination of the three, selected for acquisition. The card also supports up to 8 digital radar inputs, which may be mixed with the selected analogue video. Range correlation is supported allowing the card to sample radar video at up to 50 MHz and reduce down to a programmed return length of 2048 or 4096. PRFs of up to 10 kHz are supported with optional azimuth correlation used to reduce the output data to either 2048 or 4096 azimuths per scan in scanning mode.

The Advantage Zeta is designed to be used in any standard PCI chassis with motherboard or passive backplane architecture. Since video acquisition and processing are entirely local to the card, the only PCI traffic is from low data rate messages to move radar windows, change view geometry or adjust an operating parameter. Drivers are available to support the Advantage Zeta in Windows, Solaris and Linux environments.

The card features dual PowerPC processors to support control of the radar input sub-system and radar display presentation.

Figure 1: Advantage Zeta Core Processing Architecture





## Radar Combined With Graphics

Curtiss-Wright pioneered the use of industry-standard DVI graphics cards in radar display architectures over five years ago. The approach means that systems integrators can incorporate the latest PCI or PCI express designs into their system architecture, getting the best graphics performance at the lowest price. The DVI output from the graphics card becomes an input to Advantage-Zeta, which intelligently mixes the radar video picture with the incoming graphics picture to create a composite, multi-layer display that can then drive a DVI or analogue RGB monitor.

## Software Support

Advantage Zeta can be supplied with drivers to support the development of custom application software, or alternatively Curtiss-Wright offers its out-of-the-box radar display software Metroview and Metrochart, which provide a complete userinterface for radar display, optionally with nautical charts and target overlays. Consult the factory for more details on the range of Metroview and Metrochart products.

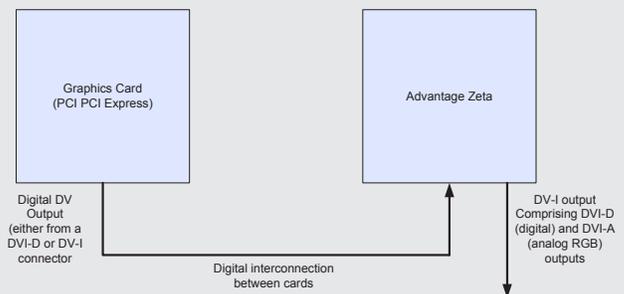
## PCI Bus Interface

Standard PCI v2.2 interface (32-bits, 33 or 66 MHz, 3.3 V or 5 V signalling) Secondary PCI bus always runs at 66 MHz

## Displaying underlay and overlay graphics with Advantage Zeta

Advantage Zeta is designed to work with industry standard PCI or PCI express graphics cards with DVI output. The output of the graphics card becomes an input to Advantage Zeta, which then inserts the scan converted radar picture into the graphics.

The intelligent video mixing on Advantage Zeta allows the graphics card to display both underlay graphics, which are mixed with the radar video, and overlay graphics. The application programmer can control which graphic elements appear as underlays or overlays, allowing filled maps to be drawn that are semi-transparently mixed with the radar, and other graphics features that overlay the radar.





## Connectors

For radar input, basic radar signals (ACP, ARP, trigger and radar) can be input to the front-panel mini DIN connector. For full access use the on-board MDR connector with a flying lead to a separate front-panel connector.

- ◆ Radar Input (basic): 8-pin mini DIN socket on board for ACP, ARP, trigger and video (differential inputs, with 120 Ohm termination, or singleended termination into 75 Ohms). See table 1 for pin connections.
- ◆ Radar Input (complete): 36-way MDR socket on board. Suitable plus are 3M 10316-300VE or the Molex 52316-3611. See table 2 for pin connections.
- ◆ Graphics input:
  - DVI-D socket
- ◆ Graphics + Radar output
  - DVI-I socket

Table 1: Pin connections for 8-pin mini DIN radar input

Pin	Signal
1	Radar Video 1[H]
2	Radar Video 1[L]
3	Sync[H]
4	ACP[H]
5	ARP[H]
6	Sync[L]
7	ACP[L]
8	ARP[L]

Table 2: Pin connections for 36 way MDR radar input connector

Pin	Signal	Pin	Signal
1	Radar Video 1[H]	19	Digital Input 2[H]
2	Digital Input 1[H]	20	Radar Video 1[L]
3	Sync_Diff[H]	21	Digital Input 2[L]
4	Digital Input 1[L]	22	Sync_Diff[L]
5	Radar Video 2[H]	23	Digital Input 4[H]
6	Digital Input 3[H]	24	Radar Video 2[L]
7	0V	25	Digital Input 4[L]
8	Digital Input 3[L]	26	0V
9	Radar Video 3[H]	27	0V
10	0V	28	Radar Video 3[L]
11	Sync_SE[H]	29	Digital Input 6[H]
12	Digital Input 5[H]	30	0V
13	CLK[H]	31	Digital Input 6[L]
14	Digital Input 5[L]	32	CLK[L] or 0V
15	ARP[H]	33	Digital Input 8[H]
16	Digital Input 7[H]	34	ARP[L]
17	ACP[H]	35	Digital Input 8[L]
18	Digital Input 7[L]	36	ACP[L]



## Power Consumption

- ◆ +3.3 V 2.85A typical 3.3 A max
- ◆ +5 V 500 mA typical 750 mA max
- ◆ +12 V 130 mA typical 175 mA max
- ◆ -12 V 220 mA typical 270 mA max

The 3.3 V power can come from the PCI bus or from the 5 V line using an on-board regulator on the Advantage-Zeta (link selectable).

## Environmental

- ◆ CWCEC Level 0 build
- ◆ Operating temperature: 0 to 55°C
- ◆ Storage temperature: -40 to +85°C

## Software Support

- ◆ API Programming library: PARIS
  - C programming interface to control radar acquisition, scan conversion and windowing display in X Windows or Microsoft Windows
- ◆ Application Software Support: Metroview, MetroChart
- ◆ O/S support: Windows, Linux, Solaris
- ◆ Host support: 32-bit Intel x86 and SPARC. For 64-bit support please consult the factory

## Physical & Mechanical

- ◆ Full length PCI card
- ◆ Dimensions: 312 x 107mm

## Part Numbers

### Advantage Zeta hardware

- ◆ 733000 Advantage Zeta-L Supports display resolutions up to 1280 x 1024
- ◆ 733001 Advantage Zeta-H Supports display resolutions up to 1600 x 1200

### Cables

- ◆ 733500 Radar input PC I/O backplate with MDR socket and lead to connector on Advantage Zeta
- ◆ 733501 Radar input cable. 8-pin mini DIN to 4 x BNC for ACP, ARP, trigger and video

## Warranty

This product has a one year warranty.

## Contact Information

To find your appropriate sales representative:

Website: [www.cwembedded.com/sales](http://www.cwembedded.com/sales)

Email: [sales@cwembedded.com](mailto:sales@cwembedded.com)

## Technical Support

For technical support:

Website: [www.cwembedded.com/support](http://www.cwembedded.com/support)

Email: [support1@cwembedded.com](mailto:support1@cwembedded.com)

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