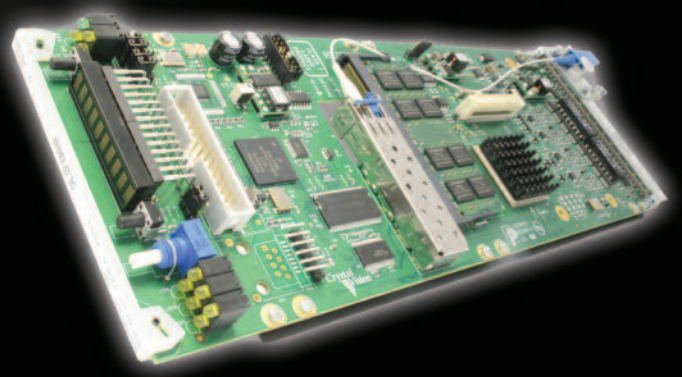
Crystal Vision

AVDELAY 3G

3G/HD/SD audio/video delay



AVDELAY 3G is a unique way of dealing with large lip-sync problems on incoming 3Gb/s, HD or SD signals containing up to four groups of embedded audio.

Broadcast engineers are increasingly looking for innovative ways to get signals from one side of the world to the other, but sending the video and audio signals back to base by different methods (satellite, Skype, ISDN and so on) can result in a timing difference of several seconds between the vision and audio commentary. That's where AVDELAY 3G comes in. You can use it to match the video and audio: with independently adjustable video and audio delays, it provides up to ten seconds of video delay along with ten seconds of audio delay.

No longer do you need to buy multiple boards to provide this functionality. AVDELAY 3G is a unique one-board solution that replaces separate audio and video delays, making it both more cost-effective and easier to control.

- Perfect for correcting large lip-sync errors: the relative audio/video timing can be changed by several seconds in either direction, with independently adjustable video and audio delay
- Use it with any source: works with 3Gb/s, HD and SD and up to four groups of embedded audio
- Cope with big differences between the audio and video: provides up to ten seconds of video delay in SD, five seconds in HD and two seconds in 3Gb/s, along with ten seconds of audio delay
- Flexible adjustments allow you to get the audio and video sync just right: with the video delay adjustable in seconds and frames, and the audio adjustable in seconds, video frames and milliseconds
- Delay your audio channels differently: each mono audio channel can be assigned to any one of four separate audio delay blocks, or can bypass the delay completely
- Sophisticated handling of Dolby E: including automatic guardband alignment
- Optional integrated fibre input/output connectivity means you won't be limited by cable lengths
- One-board solution replacing separate audio and video delays – perfect for sitting on the central router as a resource
- Save rack space: 100mm x 266mm module allows 12 AVDELAY 3G in 2U (six in 1U and two in desk top box)
- Flexible control: select from board edge, front and remote panels, GPIs, SNMP and PC software

A UNIQUE SOLUTION TO LIP-SYNC PROBLEMS

The AVDELAY 3G audio/video delay has been designed for use with incoming 3Gb/s, HD or SD signals containing up to four groups of embedded audio that have a big timing difference between the video and audio paths. The audio and video delays are independently adjustable, allowing you to change the relative audio/video timing by several seconds in either direction – and so correct any lip-sync errors.

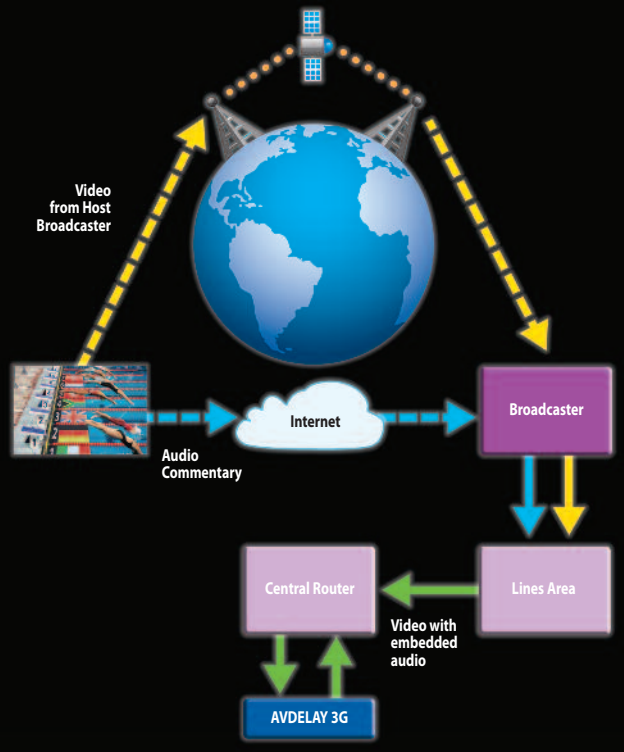
WHY DO YOU NEED AN AVDELAY 3G?

Lip-sync is a common problem. In the past there was a timing difference of maybe one or two video frames. But we're starting to see situations where the timing relationship is much greater – sometimes *seconds* difference between the video and audio. Why?

This increase in timing difference has been caused by broadcasters looking for innovative ways to get signals from one part of the world to another without having to use expensive dedicated satellite links. They will often take the host broadcaster's international video feed and then send the audio commentary back to base using an inexpensive method such as the Internet. The video path going via satellite links could be delayed by one or two seconds, while the delay for the audio commentary could be variable – almost instant in the case of something like Skype or significantly longer with ISDN. When the signals arrive back at base there could therefore be several seconds timing difference between the audio commentary and vision – quite critical for a sporting event, for example, where the commentary needs to coincide with the action.

Although the video and audio come in separately, they are often packaged up as video with embedded audio and sent off to the production area. And this is when AVDELAY 3G might sit on a central router as a resource, with its ability to deal with four groups of embedded audio. When the broadcast engineer has signals coming in that need the A/V adjustment, he simply routes these signals through the AVDELAY 3G.

Getting signals from one side of the world to the other can introduce a time difference between the video and audio paths...



HOW MUCH DELAY DO YOU GET?

Having both audio and video delay means that AVDELAY 3G can cope with the lip-sync being out in either direction – for example, if the audio is earlier than the video, then AVDELAY 3G can be used to delay the audio to let the video catch up.

With different standards having different amounts of data, the maximum video delay will change depending on the video standard. The audio delay is not affected by the video standard. The minimum video and audio processing delay is one frame.

Video format	Maximum video delay (seconds)	Maximum audio delay (seconds)
625	10.2	10
525	8.5	10
720p50	5.0	10
720p59.94	4.2	10
1080i50	5.2	10
1080i59.94	4.25	10
1080p50	2.5	10
1080p59.94	2.1	10

HOW DO YOU ADJUST THE DELAY?

To adjust the video and audio delay, you need to view the source on a monitor and match the video and audio by eye.

AVDELAY 3G has been designed with maximum flexibility when it comes to setting or bypassing the various delays. The video delay is adjustable in seconds and frames. The audio delay is adjustable in seconds, video frames and milliseconds. The video and audio will jump instantly to the new delay setting, allowing you to rapidly correct lip-sync errors.

Dealing with the embedded audio is particularly flexible. There are four separate audio delay processors and each delay block can have its own delay timing – providing you with a total of four different audio delays at the same time on AVDELAY 3G. Ideal if you have a number of audio tracks coming in via different mechanisms, such as Skype and ISDN. The audio is de-embedded, with each mono audio channel then individually assigned to any one of the four audio delay blocks – or set to bypass the delay completely. So you can assign all 16 mono channels to a single delay block, or use all four!

Assign which audio signal goes through which delay block on a track per track basis

Three default buttons allow you to set all the video and audio delays to 0, 5 or 10 seconds, giving you a useful starting point for making your adjustments.

LOOKING AFTER YOUR DOLBY E

AVDELAY 3G provides sophisticated handling of Dolby E audio, automatically aligning the guardband with the outgoing video.

Dolby E can be assigned to the four audio delay blocks in the same way as other audio, and the delay applied to the Dolby E will be the delay setting rounded to the nearest time that gives the correct guardband alignment. The Dolby E channels are maintained as pairs and both channels of a Dolby E signal will be assigned to the same delay.

FLAG UP FAULTY SIGNALS

AVDELAY 3G includes signal status reporting with 21 video and audio alarms available, which makes it useful for flagging up faulty signals. The status indications include input video missing, audio groups missing, audio silence and Dolby E presence. Video missing and audio groups missing will assert an alarm immediately, while the silence alarms can be delayed by up to 128 seconds before an alarm is asserted to prevent false alarming during quiet audio periods. One GPI output is reserved for alarm indication (and can be assigned any number of the alarm conditions), while warnings of any problems can be provided via Statesman alarms or SNMP traps.

FIBRE CONNECTIVITY – ON THE BOARD

It is easy to give AVDELAY 3G integrated fibre input/output connectivity – while still only using a single frame slot. Simply request either the FIP fibre input option or FOP fibre output option to be fitted to the motherboard by Crystal Vision.

Designed for SMPTE 297-2006 short-haul applications the FIP is used to receive an optical input and the FOP to transmit an optical output using a Class I laser. If a FIP is fitted, you can select your video input source to be taken either from the input BNC or the optical input. If a FOP is fitted, you'll get a copy of the output on fibre.

Having the fibre integral to the board reduces the need to use up additional rack space for separate fibre optic transmitters and receivers – and also saves you money.

AVDELAY 3G can also support CWDM lasers if required.

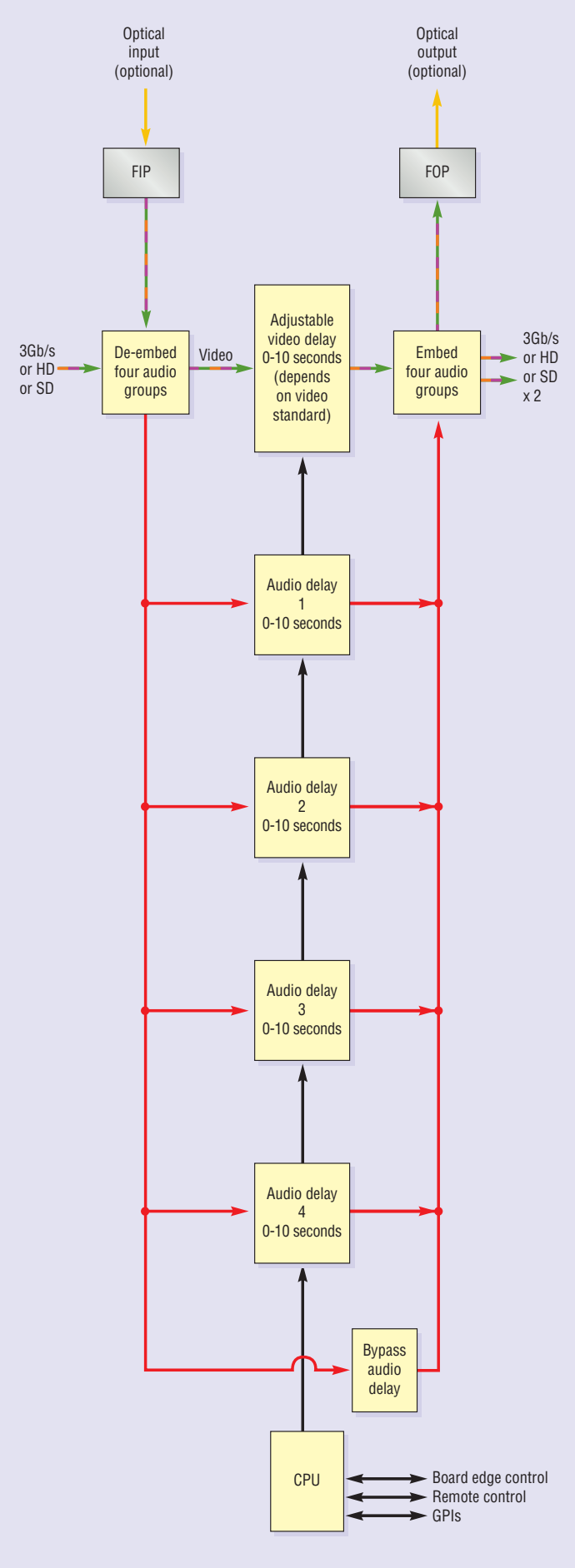
FRAMES AND CONTROL

AVDELAY 3G is a space-saving 100mm x 266mm module which fits in the standard Crystal Vision frames – available in 2U, 1U and desk top box sizes – and with up to 12 boards fitting in 2U. The one 3Gb/s, HD or SD input and two outputs are accessed by using the RM62 frame rear module.

The flexible control options include board edge switches, an active front panel on the frame, a remote control panel, GPIs, SNMP and the Statesman PC software.

Up to 16 user-defined presets can be stored and recalled – ideal for saving you time in those situations where you know you are going to get a certain delay between the signals. You can store that delay setting in a preset and then quickly recall it as required.

THE INPUTS AND OUTPUTS



SPECIFICATION

MECHANICAL

Standard Crystal Vision module 266mm x 100mm

Weight: 200g

Power consumption: 11 Watts (plus 0.6 Watts for FIP or FOP)

INTEGRATED FIBRE OPTIONS

AVDELAY 3G can be given integrated fibre connectivity by fitting either the FIP fibre input option or FOP fibre output option. The chosen option should be fitted at the factory

To access the optical inputs or outputs an RM62 frame rear module must be used

When fitted with a FIP or FOP, AVDELAY 3G can be housed in any frame slot position but due to its extra height it is not possible to place Standard Definition or audio boards directly above it when the AVDELAY 3G is in even numbered slot positions. 3Gb/s and HD boards do not share this restriction

FIP and FOP meet the SMPTE 297-2006 short-haul specification, allowing operation with single-mode and multi-mode fibre

Connector type: SC/PC

FIP:

Optical wavelength: 1260-1620nm

Input level maximum: -1dBm

Input level minimum: Typical -20dBm (-18dBm 3Gb/s pathological)

FOP:

Optical power: Max -0.0dBm, min -5.0dBm (typical -2.0dBm or 630uW)

Fibre pigtail: Single-mode 8/125uM

Optical wavelength: 1290-1330nm (1310 typical)

Extinction ratio: 7.5dB

Laser safety classification: Class 1 (EN 60825), Class I (21CFR1040.10)

VIDEO INPUT

One 3Gb/s, HD or SD input

When using FIP fibre input option allows selection between one optical and one BNC input

270Mb/s or 1.5Gb/s or 3Gb/s serial compliant to EBU 3267-E, SMPTE 259, SMPTE 292-1 and SMPTE 424/425-A

3Gb/s cable equalisation up to 80m using Belden 1694A. HD cable equalisation up to 140m with Belden 1694A or equivalent (approx. 100m with Belden 8281). SD cable equalisation >250m Belden 8281 or equivalent

Input return loss: -15dB for 50MHz to 1.5GHz

VIDEO OUTPUTS

Using RM62 rear module with no fibre option or FIP fibre input option: Two 3Gb/s, HD or SD outputs

Using RM62 rear module with FOP fibre output option: Two 3Gb/s, HD or SD outputs along with a copy of the output on fibre

270Mb/s or 1.5Gb/s or 3Gb/s serial compliant to EBU 3267-E, SMPTE 259, SMPTE 292-1 and SMPTE 424/425-A

EMBEDDED AUDIO

Can contain up to four groups of embedded audio

MAXIMUM VIDEO/AUDIO DELAYS

The maximum video delay will change depending on the video standard. The maximum audio delay remains the same, irrespective of standard

Video format	Max video delay	Max audio delay
625	10.2 seconds	10 seconds
525	8.5 seconds	10 seconds
720p50	5.0 seconds	10 seconds
720p59.94	4.2 seconds	10 seconds
1080i50	5.2 seconds	10 seconds
1080i59.94	4.25 seconds	10 seconds
1080p50	2.5 seconds	10 seconds
1080p59.94	2.1 seconds	10 seconds

MINIMUM VIDEO/AUDIO DELAYS

Minimum video and audio processing delay of one frame

AUDIO/VIDEO DELAY ADJUSTMENTS

Audio and video delay are independently adjustable, allowing the user to change the relative audio/video timing in either direction

Video delay is adjustable in seconds and frames

The audio delays are adjustable in seconds, video frames and milliseconds

Three default buttons allow the operator to set all the video and audio delays to 0, 5 or 10 seconds

The video and audio will jump instantly to the new delay setting

AUDIO DELAY BLOCKS

There are four separate audio delay processors and each mono audio channel can be assigned to any one of them, or to bypass the delay completely

DOLBY E

Dolby E can be assigned to the four audio delay settings in the same way as other audio. Both channels of a Dolby E signal will be assigned to the same delay

AVDELAY 3G automatically aligns the guardband with the outgoing video. The delay applied to the Dolby E will be the delay setting rounded to the nearest time that gives the correct guardband alignment

LED INDICATION OF:

Power supplies on board

HD/SD input

Input audio groups present

GPI output 6 active

GPI INPUT LEVELS

Active pull to ground, pulled up to +5V through 7 kohm

GPI OUTPUT LEVELS

Electrically: Open collector transistors 30V, 270 ohm current limit resistors. Pulled up to +5V through 7 kohm

GPI INPUTS

Four GPI inputs can recall one of 16 presets

GPI OUTPUTS

One GPI output (GPI 6) is reserved for alarm indication. It may be assigned any number of 21 video and audio alarms:

Video Missing

Input group 1 missing

Input group 2 missing

Input group 3 missing

Input group 4 missing

Silence group 1 channels 1 and 2

Silence group 1 channels 3 and 4

Silence group 2 channels 1 and 2

Silence group 2 channels 3 and 4

Silence group 3 channels 1 and 2

Silence group 3 channels 3 and 4

Silence group 4 channels 1 and 2

Silence group 4 channels 3 and 4

Dolby E on input group 1 channels 1 and 2

Dolby E on input group 1 channels 3 and 4

Dolby E on input group 2 channels 1 and 2

Dolby E on input group 2 channels 3 and 4

Dolby E on input group 3 channels 1 and 2

Dolby E on input group 3 channels 3 and 4

Dolby E on input group 4 channels 1 and 2

Dolby E on input group 4 channels 3 and 4

Video missing and input groups missing will assert an alarm immediately. The silence alarms can be delayed by up to 128 seconds before an alarm is asserted to prevent false alarming during quiet audio periods

LOCAL CONTROL

Intuitive board edge interface with two select buttons, shaft encoder and ten character alphanumeric display

REMOTE CONTROL

RS422/485

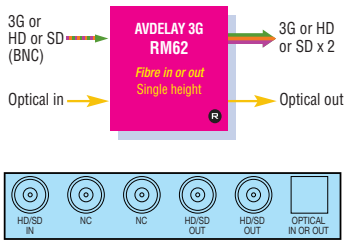
19200 baud, 8 bits, 1 stop no parity

Control from frame active front panel and remote panel

Statesman allows control from any PC on a network

SNMP monitoring and control available as a frame option

REAR MODULE CONNECTIONS



RM62

ORDERING INFORMATION

AVDELAY 3G	3G/HD/SD audio/video delay
FIP	Fibre input option for AVDELAY 3G motherboard providing integrated fibre input connectivity
FOP	Fibre output option for AVDELAY 3G motherboard providing integrated fibre output connectivity. For CWDM laser output options, contact Crystal Vision
Indigo 2AE	2U frame with active front panel featuring Statesman CPU and integrated control panel for up to 12 Crystal Vision modules
Indigo 2SE	2U frame with active front panel featuring Statesman CPU for up to 12 Crystal Vision modules
Indigo 1AE	1U frame with active front panel featuring Statesman CPU and integrated control panel for up to six Crystal Vision modules. Power supply redundancy available with Indigo 1AE-DP
Indigo 1SE	1U frame with active front panel featuring Statesman CPU for up to six Crystal Vision modules. Power supply redundancy available with Indigo 1SE-DP
Indigo DT	Desk top box with passive front panel for up to two Crystal Vision modules
Indigo DTSE	Desk top box with active front panel featuring Statesman CPU for up to two Crystal Vision modules
RM62	Single slot frame rear module. Allows maximum number of boards in frame (12 in 2U, two in desk top box). Includes optional fibre input/output connectivity. **When using no fibre**, gives access to one 3Gb/s, HD or SD input and two 3Gb/s, HD or SD outputs. **When using fibre input**, allows you to select between one fibre and one BNC 3Gb/s, HD or SD input, and gives access to two 3Gb/s, HD or SD outputs. **When using fibre output**, gives access to one 3Gb/s, HD or SD input and two 3Gb/s, HD or SD outputs, along with one copy of the output on fibre
REMIND-E	19" Ethernet remote control panel
Statesman	PC Control System
SNMP	SNMP monitoring and control

Performance and features are subject to change. Figures given are typical measured values. AVDELAY3G1213

Crystal Vision

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