

This paper discusses the following topics:

- “44.1 Overview” on page 1
- “44.2 Setting up the KAD/VID/106 ” on page 2
- “44.3 Viewing KAD/VID/106 data” on page 15
- “44.4 Troubleshooting” on page 17

44.1 Overview

The KAD/VID/106 module is a video encoder module that converts one of three composite video (CVBS) inputs or one S-Video input into digital video and compresses it. Compressed video bit-rate is kept constant using multi-pass encoding and padding of the transport stream. Optional audio encoding produces a digital audio data stream. The left and right audio channels can be individually turned on or off. Selection of PAL or NTSC input format is a configurable setting.

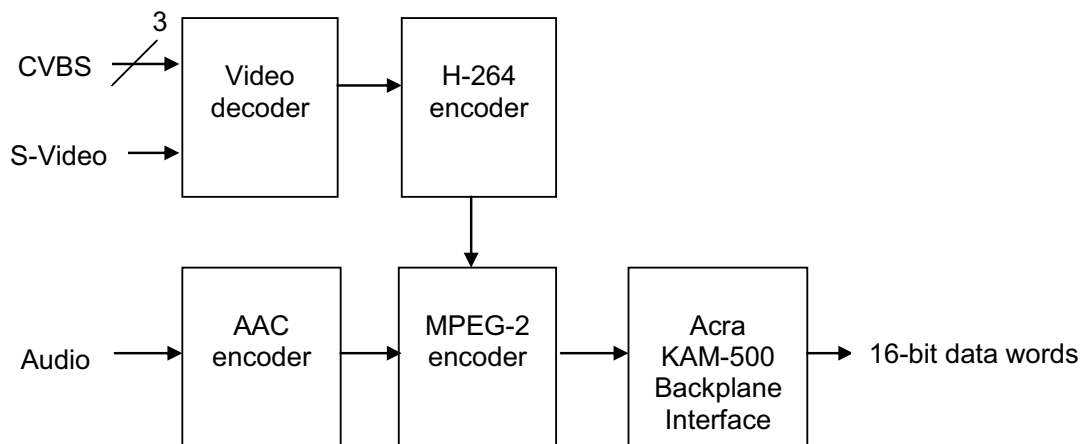


Figure 44-1: KAD/VID/106 block diagram

The KAD/VID/106 compresses video using the baseline profile H264.1 technique. This method encodes each received frame as either an I(ntra coded) frame or a P(redicted) frame depending on the module settings.

I frames take all the information in the received picture and encodes this information using a lossy compression scheme to create a reference frame. This reference frame can be thought of as a *stand alone* frame—it does not need any information from other frames in the video stream to be viewed. This means that each I frame is an accurate representation of the received analog picture.

P frames encode only the changes from the previous frame. This means that P frames need information from previous frames to be viewed. This results in a reduction of bandwidth needed to encode a moving picture—however, if the picture were to change quickly, an accurate representation would not be displayed until the next I frame was processed.

I frames and P frames are grouped together in a Group Of Pictures (GOP). The setting used for GOP determines the image quality and bandwidth.

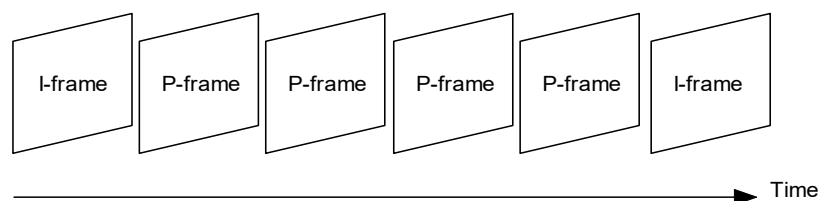


Figure 44-2: GOP with P frame to I frame ratio of 5:1

For more information, refer to http://en.wikipedia.org/wiki/H.264/MPEG-4_AVC#Profiles.

The KAD/VID/106 compresses (optional) audio using Advanced Audio Codec (AAC). The bit-rate for audio is fixed at 64 kbps per channel.

The video and audio are then encoded in an MPEG-2 transport stream. An MPEG-2 transport stream is a fixed length (188 bytes) packet.

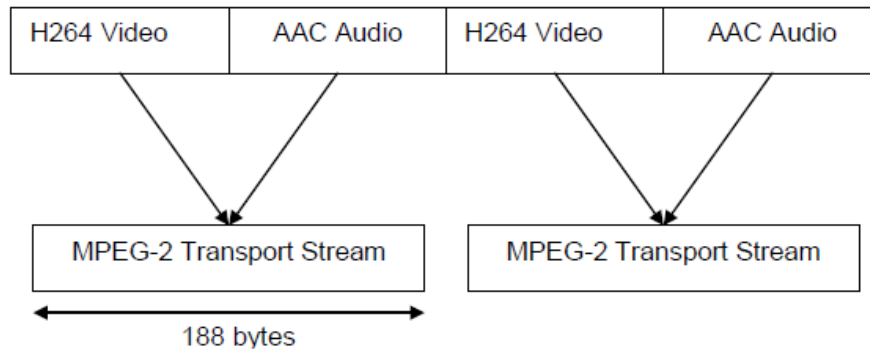


Figure 44-3: Conversion of video and audio to MPEG-2

These packets are then fragmented into 16-bit words, which are put out onto the Acra KAM-500 backplane on a FIFO basis. From there they can be inserted in a PCM frame, a UDP packet, logged to a memory module (such as a KAM/MEM/113), or a combination of all three.

44.2 Setting up the KAD/VID/106

44.2.1 Pinout connections

Pinout connections are described in the following table.

Table 44-1: Pinout connections

Connection	Description
CVBS_0_IN CVBS_1_IN CVBS_2_IN	<p>These input connections allow up to three independent composite video sources to be connected.</p> <hr/> <p>NOTE: The KAD/VID/106 can only process one video input at a time.</p>
Y_IN C_IN	<p>These two input connections are used for component (S-Video) inputs. Y_IN corresponds to luminance; C_IN corresponds to chrominance.</p>
CAM_2_GENLOCK_OUT CAM_3_GENLOCK_OUT	<p>Composite video waveforms output a regular sync pulse (every 64 μs for PAL, every 63.5 μs for NTSC) that can be used to synchronize multiple video inputs. When a video source is connected to CVBS_0_IN, its output waveform is available on both GENLOCK outputs. This allows up to two other composite video sources connected to CVBS_1_IN and CVBS_2_IN to be synchronized with the CVBS_0_IN input.</p>
AUDIO_RIGHT_IN AUDIO_LEFT_IN	<p>These are the inputs for audio.</p>
CAM_SEL_BIT_0 CAM_SEL_BIT_1 CAM_SEL_BIT_2	<p>If the Input Source option is set to Camera, then these three inputs can be used to select the input video source.</p> <hr/> <p>NOTE: These connections are internally pulled high; they must be tied to ground as shown in the following table to select the various inputs.</p>

Table 44-2: Camera Select pins (NC – Not Connected)

CAM_SEL_BIT [2:0]			Selected Input
NC	NC	NC	Outputs a simple test pattern
NC	NC	GND	CVBS_0_IN
NC	GND	NC	CVBS_1_IN
NC	GND	GND	CVBS_2_IN
GND	NC	NC	Y_IN, C_IN

44.2.2 Software setup

The KAD/VID/106 can be configured using kSetup or DAS Studio 3.

44.2.2.1 KSM-500 Parameters tab settings

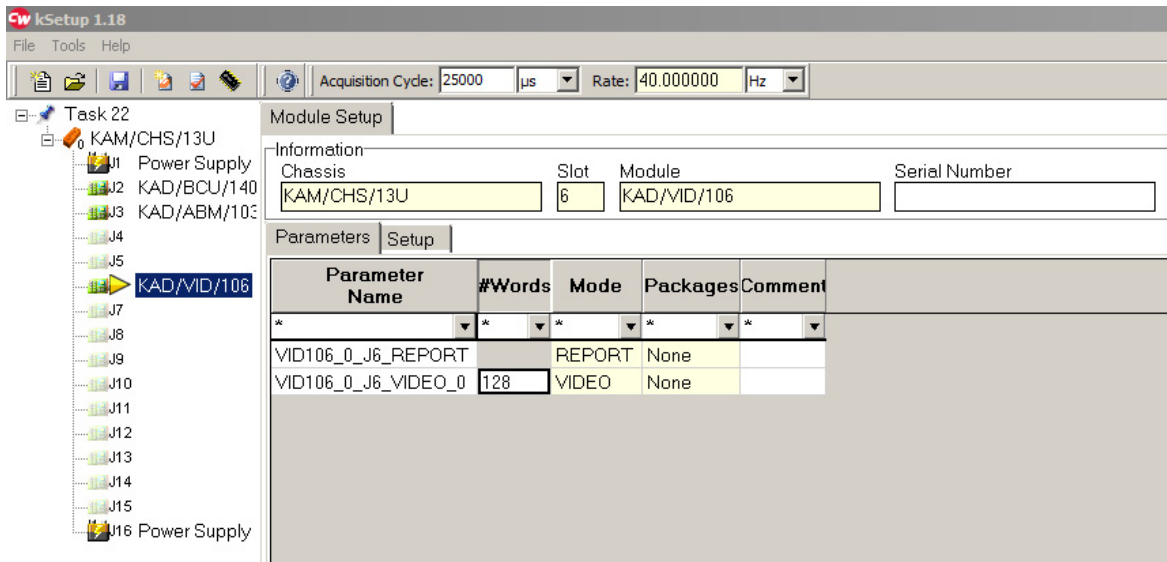


Figure 44-4: Parameters tab in kSetup

The Parameters tab has only two options: Report word and Video words.

Report word

The Report word relates the status of the module. Refer to the *KAD/VID/106* data sheet for bit definitions.

Video words

It is possible to specify more than one data word from the KAD/VID/106. The amount of video words specified should be chosen so as to optimize the available bandwidth. For example, 10 video words placed at 10:1 commutation in the frame is equivalent to 1 video word placed at 100:1 commutation. The advantage lies in the fact that 10:1 commutation is usually easier to achieve than 100:1 commutation.

44.2.2.2 KSM-500 Setup tab settings

Figure 44-5: Setup tab in kSetup

The Setup tab covers video, audio, video source, and timer settings.

Setting	Description
Input Source	If Input Source is set to EEPROM, then this option specifies the video source. The following Input Source options are available.
Camera	There are up to three camera inputs. The module acts as a multiplexer allowing you to switch between cameras. The active channel can be pre-set in the EEPROM during configuration, or it can be read from the configuration of several pins on the connector (see Table 44-1 on page 2). Use this option to select which method the module uses to select the camera input.
TEST	Outputs a simple test pattern
Composite 1	Channel 1 composite
Composite 2	Channel 2 composite
Composite 3	Channel 3 composite
S-Video	YC input (S-video)
Video Format	Determines the output format: PAL (Europe and Asia) or NTSC (The Americas). This setting must match the video source.

Setting	Description																		
Video Resolution	Determines the resolution of the displayed image. The following resolutions are available (pixel x pixel).																		
CIF	352 x 288 (PAL) 352 x 240 (NTSC)																		
2CIF	704 x 288 (PAL) 704 x 240 (NTSC)																		
D1	704 x 576 (PAL) 704 x 480 (NTSC)																		
Video compression GOP	Determines the amount of P frames to I frames in the output video. Allowed values range from All (all I frames) to 60 (1 I frame every 60 P frames). A higher P:I frame ratio reduces the amount of bandwidth needed for a given video application. However, the video stream takes longer to recover should any bit errors occur.																		
Input Video Bitrate	H.264 encoding produces a bit stream with an average bit-rate close to the value specified in this setting. The video words that you want to transmit (later referred to as Sampling Video Rate), must have a value higher than the value set in this field.																		
	<table border="1"> <thead> <tr> <th>Video input rate (kbps)</th> <th>Sampling Video Rate with audio (kbps)</th> <th>Sampling Video Rate without audio (kbps)</th> </tr> </thead> <tbody> <tr> <td>250 (KAD/VID/106/B only)</td> <td>Not supported</td> <td>380 (KAD/VID/106/B only)</td> </tr> <tr> <td>512</td> <td>700</td> <td>560</td> </tr> <tr> <td>750</td> <td>960</td> <td>820</td> </tr> <tr> <td>900</td> <td>1150</td> <td>990</td> </tr> <tr> <td>1000</td> <td>1230</td> <td>1090</td> </tr> </tbody> </table>	Video input rate (kbps)	Sampling Video Rate with audio (kbps)	Sampling Video Rate without audio (kbps)	250 (KAD/VID/106/B only)	Not supported	380 (KAD/VID/106/B only)	512	700	560	750	960	820	900	1150	990	1000	1230	1090
Video input rate (kbps)	Sampling Video Rate with audio (kbps)	Sampling Video Rate without audio (kbps)																	
250 (KAD/VID/106/B only)	Not supported	380 (KAD/VID/106/B only)																	
512	700	560																	
750	960	820																	
900	1150	990																	
1000	1230	1090																	
Temporal Decimation	Determines the number of frames per second (fps) displayed in the video output. This setting can be used as a crude method to reduce bandwidth. For example, displaying 12.5fps uses just over half the bandwidth needed to display 25fps.																		
Audio Channel	Determines which audio channels (if any) are to be used.																		
Turn on timer overlay	The KAD/VID/106 can display BCD time in the video output. Select this check box to enable this option.																		
Horizontal Placement/ Vertical Placement	Determines the location of the timer in x y co-ordinates in pixels from the top-left corner of the screen.																		
Text Color	Determines the timer text color.																		
Background	Determines the background shading of the timer.																		
Time Server	This determines the time source of the KAD/VID/106. If Time-Slave is selected, the KAD/VID/106 gets its time from an IRIG source (such as a KAD/BCU/XXX or KAM/TCG/XXX module). If Free-Running is selected, then the KAD/VID/106 counts its own time from power on without reference to an outside time source.																		
Packetization	Packetization can only be used with aperiodic Ethernet transmission modules such as the KAD/BCU/140. DAS Studio 3 is recommended to be used for such a setting. Refer to the <i>DAS Studio 3 User Manual</i> for more information.																		
FIFO (snarfer) Video Parameters' Prefix Name	See "44.2.3.2 DAS Studio 3 - Using video over PCM" on page 11.																		
Enable 12 bits video	This setting is reserved for future use.																		

44.2.2.3 DAS Studio 3 Settings tab

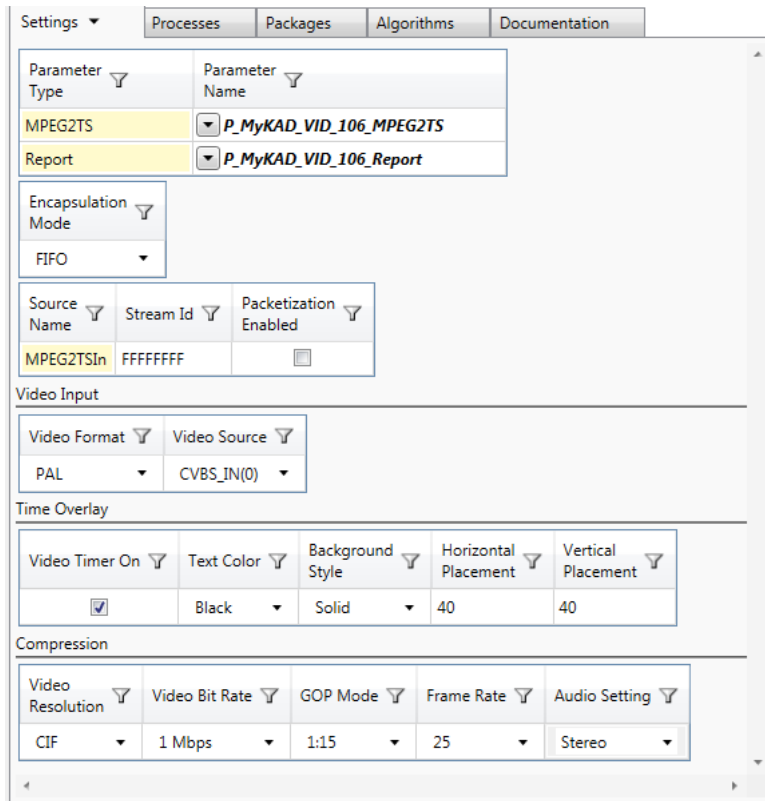


Figure 44-6: Settings tab in DAS Studio 3

Setting	Description
Parameter Type/Name	The parameter type MPEG2TS is the MPEG2 transport stream of H.264 encoded video data and AAC encoded audio data used for FIFO. The Report provides a status of the KAD/VID/106. Refer to the <i>KAD/VID/106</i> data sheet for details.
Encapsulation Mode	There are two encapsulation modes: FIFO or Packetizer. Packetization can only be used with aperiodic Ethernet transmission modules such as the KAD/BCU/140. When using Packetizer mode, the Packetization Enabled check box must be selected and the Stream ID field must be filled in.
Source Name	Name of the iNET-X packetizer channel for the audio and video MPEG-2 transport stream.
Stream ID	Type in a stream ID when Encapsulation Mode is enabled.
Packetization Enabled	Packetization can only be used with aperiodic Ethernet transmission modules such as the KAD/BCU/140.
Video Format	Determines the output format: PAL (Europe and Asia) or NTSC (The Americas). This setting must match the video source.
Video Source	If Input Source is set to EEPROM, then this option specifies the video source. The following Input Source options are available.
CVBS_IN(0)	Single ended composite video inputs.
CVBS_IN(1)	
CVBS_IN(2)	
Y/C_IN	YC input (S-video)

Setting	Description																					
Test	Outputs a simple test pattern																					
CameraSelect(2:0)	There are up to three camera inputs. The module acts as a multiplexer allowing you to switch between cameras. The active channel can be pre-set in the EEPROM during configuration, or it can be read from the configuration of several pins on the connector (see Table 44-1 on page 2). Use this option to select which method the module uses to select the camera input.																					
None	No video source is selected. Use when only audio is required to be captured on the KAD/VID/106.																					
Video Timer On	The KAD/VID/106 can display BCD time in the video output. Select this check box to enable this option.																					
Text Color	Determines the timer text color.																					
Background Style	Determines the background shading of the timer.																					
Horizontal Placement/ Vertical Placement	Determines the location of the timer in x y co-ordinates in pixels from the top-left corner of the screen.																					
Video Resolution	Determines the resolution of the displayed image. The following resolutions are available (pixel x pixel).																					
CIF	352 x 288 (PAL) 352 x 240 (NTSC)																					
2CIF	704 x 288 (PAL) 704 x 240 (NTSC)																					
D1	704 x 576 (PAL) 704 x 480 (NTSC)																					
Input Video Bitrate	H.264 encoding produces a bit stream with an average bit-rate close to the value specified in this setting. The video words that you want to transmit (later referred to as Sampling Video Rate), must have a value higher than the value set in this field.																					
	<table border="1"> <thead> <tr> <th>Video input rate (kbps)</th> <th>Sampling Video Rate with audio (kbps)</th> <th>Sampling Video Rate without audio (kbps)</th> </tr> </thead> <tbody> <tr> <td>250 (KAD/VID/106/B only)</td> <td>Not supported</td> <td>380 (KAD/VID/106/B only)</td> </tr> <tr> <td>512</td> <td>700</td> <td>560</td> </tr> <tr> <td>750</td> <td>960</td> <td>820</td> </tr> <tr> <td>900</td> <td>1150</td> <td>990</td> </tr> <tr> <td>1000</td> <td>1230</td> <td>1090</td> </tr> <tr> <td>2000</td> <td>2320</td> <td>2180</td> </tr> </tbody> </table>	Video input rate (kbps)	Sampling Video Rate with audio (kbps)	Sampling Video Rate without audio (kbps)	250 (KAD/VID/106/B only)	Not supported	380 (KAD/VID/106/B only)	512	700	560	750	960	820	900	1150	990	1000	1230	1090	2000	2320	2180
Video input rate (kbps)	Sampling Video Rate with audio (kbps)	Sampling Video Rate without audio (kbps)																				
250 (KAD/VID/106/B only)	Not supported	380 (KAD/VID/106/B only)																				
512	700	560																				
750	960	820																				
900	1150	990																				
1000	1230	1090																				
2000	2320	2180																				
GOP Mode	Determines the amount of P frames to I frames in the output video. Allowed values range from All (all I frames) to 60 (1 I frame every 60 P frames). A higher P:I frame ratio reduces the amount of bandwidth needed for a given video application. However, the video stream takes longer to recover should any bit errors occur.																					
Frame Rate	Determines the number of frames per second (fps) displayed in the video output. This setting can be used as a crude method to reduce bandwidth. For example, displaying 12.5fps uses just over half the bandwidth needed to display 25fps.																					
Audio Setting	Determines which audio channels (if any) are to be used.																					

44.2.3 Using Video

There are no inherent differences between video data and other types of Acra KAM-500 data, except that video data generally uses a far greater bandwidth.

Sampling video bandwidth for a PCM stream can be calculated as follows:

$$\text{Sampling video bit rate} = \text{number of video words} \times \text{number of bits per video word} \times \text{video sampling rate}$$

A similar approach can be used to calculate the bandwidth for placement in a UDP packet or logging to a memory module.

The video bit rate needed depends on the application. The following table provides optimal settings for outputs of various quality.

Table 44-3: KAD/VID/106 optimal video settings

Bit-rate (Mbps)	Resolution	Frame rate (fps)	GOP
Optimal PAL video settings			
0.512	CIF	12.5	5
0.512	2CIF	25	15
0.512	D1	12.5	5
0.75	CIF	25	15
0.75	D1	25	5
0.9	CIF	25	5
0.9	D1	25	15
1	2CIF	25	15
1	D1	25	15
2	2CIF	25	5
2	D1	25	15
5	2CIF	25	5
5	D1	25	5
10	2CIF	25	5
10	D1	25	5
Optimal NTSC video settings			
0.75	CIF	30	5
0.75	2CIF	30	15
0.75	D1	1	5
0.9	CIF	30	5
0.9	2CIF	30	15
0.9	D1	1	5
0.9	D1	15	15
1	2CIF	30	5
1	D1	30	15
2	2CIF	30	5

Table 44-3: KAD/VID/106 optimal video settings (continued)

Bit-rate (Mbps)	Resolution	Frame rate (fps)	GOP
2	D1	30	5
5	2CIF	30	5
5	D1	30	5
10	2CIF	30	5
10	D1	30	5

The KAD/VID/106 is unique amongst Acra KAM-500 modules in that it does not support different sample rates. If video data is being sent to more than one destination in the system (such as a PCM frame, UDP packet, or memory module) it must be sampled at exactly the same rate by the destination modules. kProgram will not flag this as an error.

44.2.3.1 KSM-500 - Using video over PCM

In order to ease placement and save bandwidth for PCM transmission, we recommended using multiples video words. To demonstrate this, refer to the settings in the following figure.

Figure 44-7: Using multiple video words (KSM-500)

The Input Video Bitrate is set to 0.9 Mbps. This provides the optimal video as shown in the KAD/VID/106 data sheet and Table 44-3 on page 8.

With audio off, we require a sampling video bit rate at least 10% higher than 0.9 Mbps, that is at least 0.99 Mbps.

The following figure shows a PCM shape, which illustrates a sampling video rate.

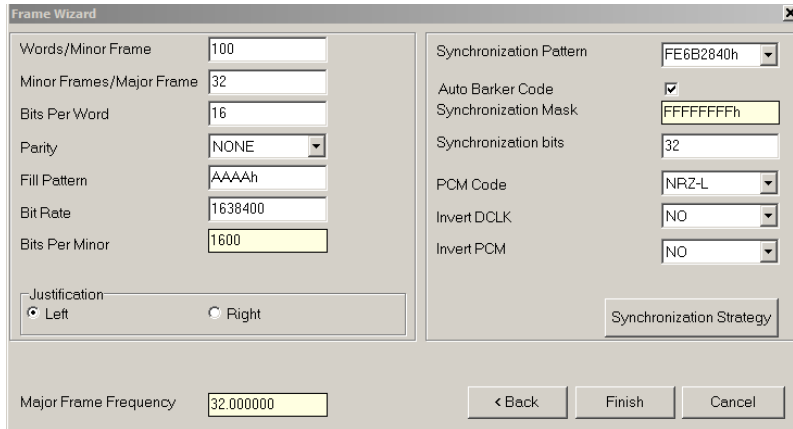


Figure 44-8: Sampling video rate PCM shape

Because we need to achieve 0.99 Mbps where the PCM bit-rate is 1.6384 Mbps, we need to cover at least 61% (0.99/1.6384) of the PCM with video words. Therefore, we set 64 video words commutated at 1:1.

To know the exact sampling video bit rate used, the video words being commutated 1:1 within this PCM gives 1024 Hz. Therefore, 1024 Hz × 64 Video Words × 16 bits = 1048576 bps, which is 10% higher than the Input Video Bitrate (0.9 Mbps).

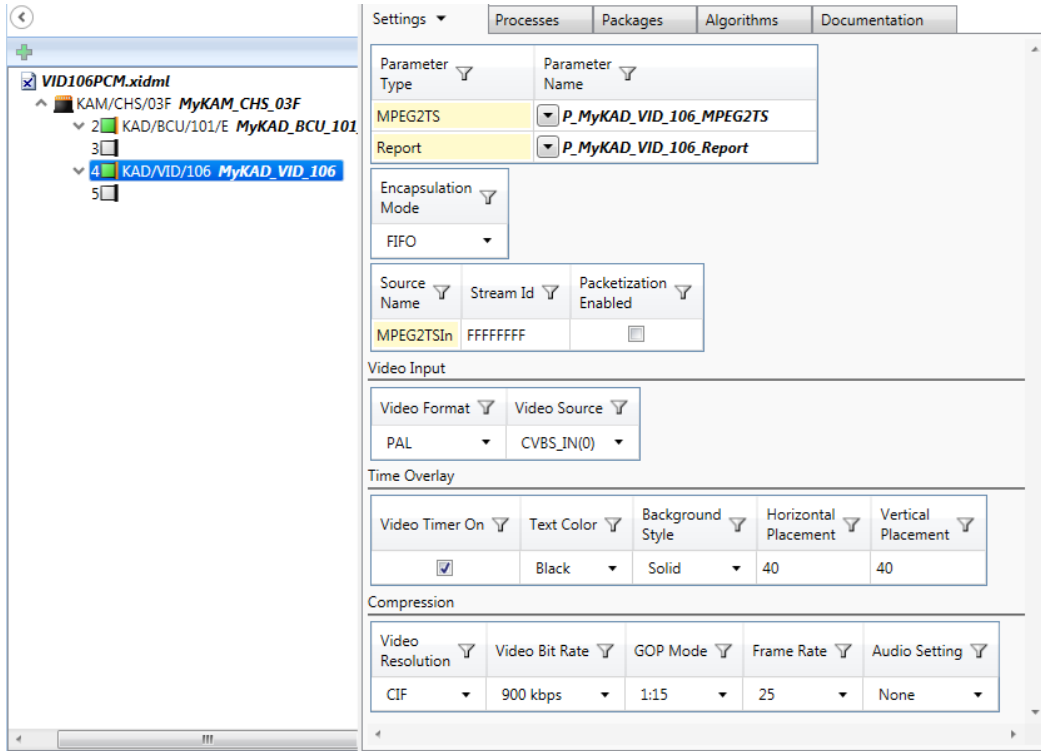
Chassis	Module	Parameter Name	Enabled	Placed	Word Index	Minor Frame	Desired Rate	Real Rate	Commutation
KAM/CHS/13U	KAD/VID/106	VID106_0_J3_VIDEO_0_44	Yes	Yes	45	0	100	1024.000	1:1
KAM/CHS/13U	KAD/VID/106	VID106_0_J3_VIDEO_0_45	Yes	Yes	46	0	100	1024.000	1:1
KAM/CHS/13U	KAD/VID/106	VID106_0_J3_VIDEO_0_46	Yes	Yes	47	0	100	1024.000	1:1
KAM/CHS/13U	KAD/VID/106	VID106_0_J3_VIDEO_0_47	Yes	Yes	48	0	100	1024.000	1:1
KAM/CHS/13U	KAD/VID/106	VID106_0_J3_VIDEO_0_48	Yes	Yes	49	0	100	1024.000	1:1
KAM/CHS/13U	KAD/VID/106	VID106_0_J3_VIDEO_0_49	Yes	Yes	50	0	100	1024.000	1:1
KAM/CHS/13U	KAD/VID/106	VID106_0_J3_VIDEO_0_50	Yes	Yes	51	0	100	1024.000	1:1
KAM/CHS/13U	KAD/VID/106	VID106_0_J3_VIDEO_0_51	Yes	Yes	52	0	100	1024.000	1:1
KAM/CHS/13U	KAD/VID/106	VID106_0_J3_VIDEO_0_52	Yes	Yes	53	0	100	1024.000	1:1
KAM/CHS/13U	KAD/VID/106	VID106_0_J3_VIDEO_0_53	Yes	Yes	54	0	100	1024.000	1:1
KAM/CHS/13U	KAD/VID/106	VID106_0_J3_VIDEO_0_54	Yes	Yes	55	0	100	1024.000	1:1
KAM/CHS/13U	KAD/VID/106	VID106_0_J3_VIDEO_0_55	Yes	Yes	56	0	100	1024.000	1:1
KAM/CHS/13U	KAD/VID/106	VID106_0_J3_VIDEO_0_56	Yes	Yes	57	0	100	1024.000	1:1
KAM/CHS/13U	KAD/VID/106	VID106_0_J3_VIDEO_0_57	Yes	Yes	58	0	100	1024.000	1:1
KAM/CHS/13U	KAD/VID/106	VID106_0_J3_VIDEO_0_58	Yes	Yes	59	0	100	1024.000	1:1
KAM/CHS/13U	KAD/VID/106	VID106_0_J3_VIDEO_0_59	Yes	Yes	60	0	100	1024.000	1:1
KAM/CHS/13U	KAD/VID/106	VID106_0_J3_VIDEO_0_60	Yes	Yes	61	0	100	1024.000	1:1
KAM/CHS/13U	KAD/VID/106	VID106_0_J3_VIDEO_0_61	Yes	Yes	62	0	100	1024.000	1:1
KAM/CHS/13U	KAD/VID/106	VID106_0_J3_VIDEO_0_62	Yes	Yes	63	0	100	1024.000	1:1
KAM/CHS/13U	KAD/VID/106	VID106_0_J3_VIDEO_0_63	Yes	Yes	64	0	100	1024.000	1:1

Figure 44-9: Frame Builder showing video words at 1024Hz

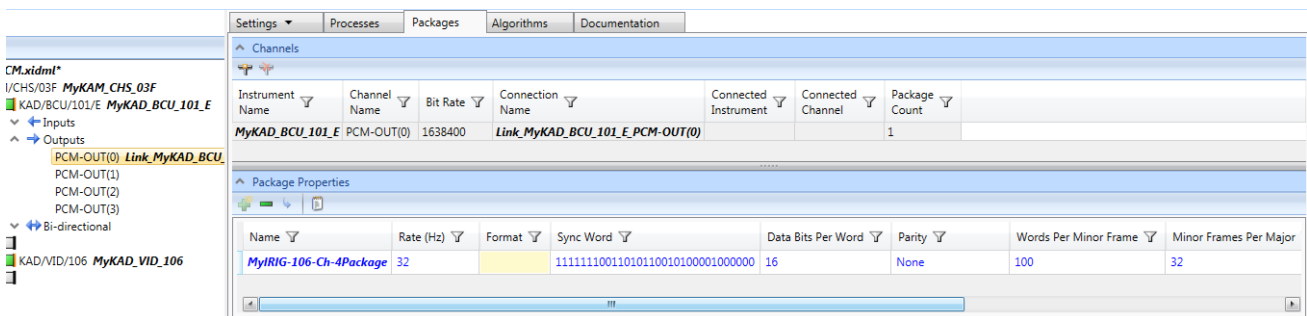
44.2.3.2 DAS Studio 3 - Using video over PCM

In order to ease placement and save bandwidth for PCM transmission, we recommended using multiples video words. To demonstrate this, refer to the following.

1. With a KAD/VID/106 module in context, click the **Settings** tab to show the following screen.

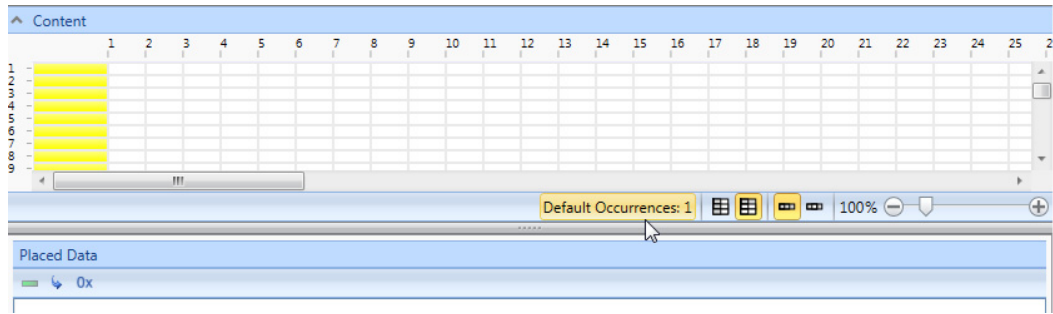


2. Set **Video Bit Rate** to **900 kbps**.
This provides the optimal video as shown in the *KAD/VID/106* data sheet and Table 44-3 on page 8.
3. Set **Audio Setting** to **None**.
This requires a sampling video bit rate at least 10% higher than 900 kbps, that is at least 990 kbps.
4. Now select a controller module (such as *KAD/BCU/101*) in the Navigator and then click the **Packages** tab.
5. Add a package with the following PCM shape, which illustrates a sampling video rate.

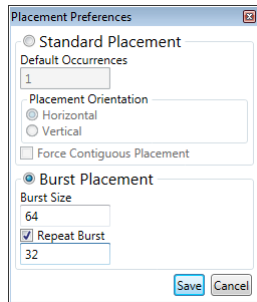


Because we need to achieve 990 kbps where the PCM bit-rate is 1638.4 kbps, we need to cover at least 61% ($990 / 1638.4$) of the PCM with video words. Therefore, we need 64 video words commutated at 1:1, which is 64×32 video burst words.

- In the **Content** pane, click **Default Occurrences**.

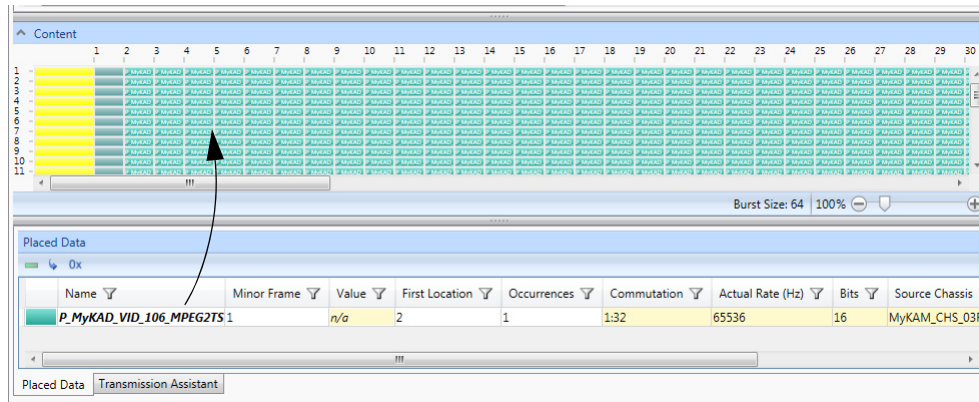


- The **Placement Preferences** dialog box opens.



Select the **Burst Placement** radio button, set **Burst Size** to **64**, select the **Repeat Burst** check box, set **Repeat Burst** to **32**, and then click **Save**. (This results in 64 × 32 video words.)

- Now drag the video parameter **P_MyKAD_VID_106_MPEG2TS** from the **Placed Data** pane to the **Content** pane.



To know the exact sampling video bit rate used, video words is showing 65536 Hz for the **Actual Rate**. Therefore, $65536 \times 16 \text{ bits} = 1048576 \text{ bps}$, which is 10% higher than the Video Bit Rate (900 kbps).

44.2.3.3 KSM-500 - Using video over Ethernet

Video data can be placed in a UDP packet. However, due to the different transmission mechanisms between Ethernet packets and PCM frames, care has to be taken when using video over Ethernet.

The KAD/VID/106 places the Video words out onto the backplane in an order which is transparent to the user. This poses no problem when using PCM—each parameter is always read at a specific time by the controller module and then placed in a specific location in the PCM frame. However, when sampling using Ethernet, the UDP packet is not transmitted until it is full. This means that video parameters can appear out of order. Consequently, the MPEG-2 transport stream makes no sense to a decoding device.

There are three methods to get around this constraint:

- Use only one video word and transmit it as many times as necessary in the UDP packet. The disadvantage with this method is that the task may not compile due to timing considerations.

Parameters		Setup							
Parameter Name	#Words	Mode	Packages						
*	*	*	*						
VID106_0_J4_REPORT		REPORT	None						
VID106_0_J4_VIDEO_0	1	VIDEO	None						

Chassis	Module	Parameter Name	Enabled	Placed	Word Index	Minor Frame	Desired Rate	Real Rate	Commutator
KAM/CHS/09U	KAD/VID/106	VID106_0_J4_REPORT	Yes	No	N/A	N/A	100	50.000	1:1
KAM/CHS/09U	KAD/VID/106	VID106_0_J4_VIDEO_0	Yes	No	N/A	N/A	100	50.000	1:1

Figure 44-10: Transmitting one video word many times in a UDP packet

- Place the video parameters in a PCM frame to force the ordering in the UDP packet (even if the PCM frame is not going to be used). If this method is to be used, ensure the video parameters do not occur more than 188 times in a single packet. The disadvantage with this method is that it uses up PCM bandwidth.
- Use Video Parameters' Prefix Name field on the KAD/VID/106 module Setup tab and set the video parameter name as shown in the following figure.

• FIFO (snarfer)

Video Parameters' Prefix Name:

Figure 44-11: Setting the video parameter name

This setting allows the software to *thread* all the video words, that is, force the order on the backplane.

Sampling video bit rate is the acquisition cycle × packets per acquisition cycle × occurrences × number of video words × 16.

44.2.3.4 DAS Studio 3 - Using video over Ethernet

Video data can be placed in a UDP packet. Video parameters can be transmitted as a FIFO parameter or as a packetizer.

The following figure shows a KAD/VID/106 module in context with the **Settings** tab selected. **Encapsulation Mode** is set to FIFO.

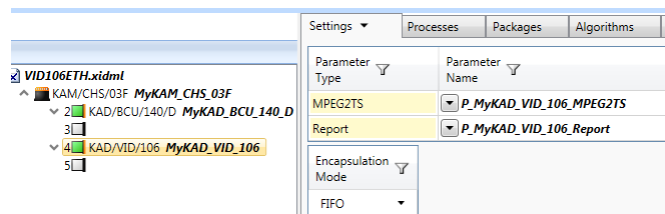


Figure 44-12: Encapsulation Mode set to FIFO

In the following figure, the KAD/BCU/140 is in context. The **Packages** tab is selected and we can see a KAD/BCU/140 package transmitting video.

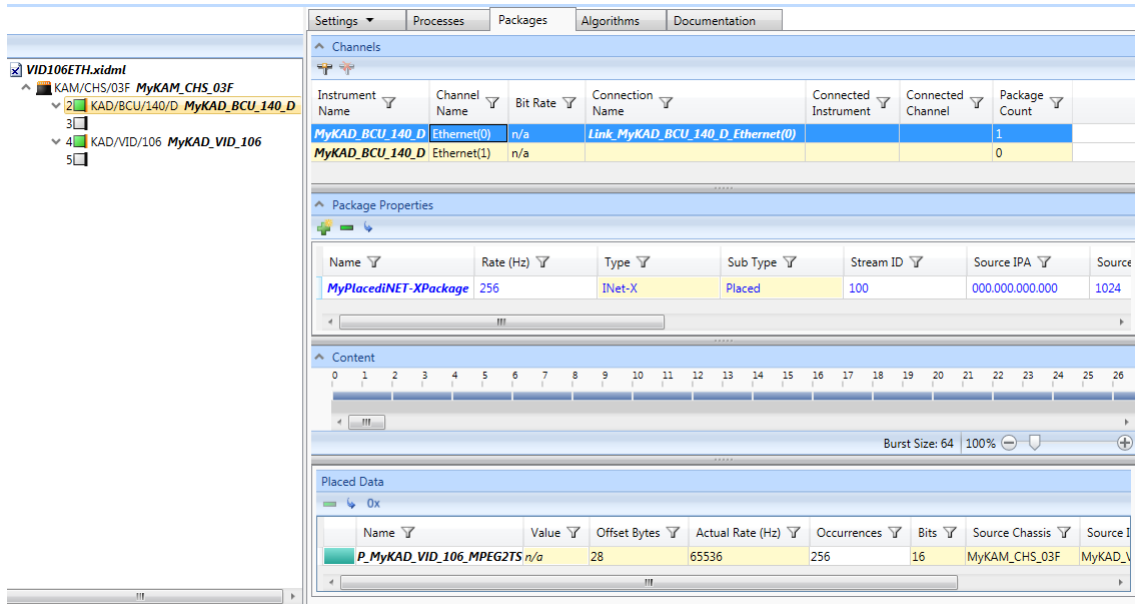


Figure 44-13: KAD/BCU/140 package transmitting video

The sampling video bit rate is the rate of the packet × occurrences × 16. Therefore, in the previous example: 256 × 256 × 16 = 1048576 bps.

Now we change **Encapsulation Mode** to **Packetizer** as shown in the following screen. A **Stream ID** must be defined and the **Packetization Enabled** check box must be selected.

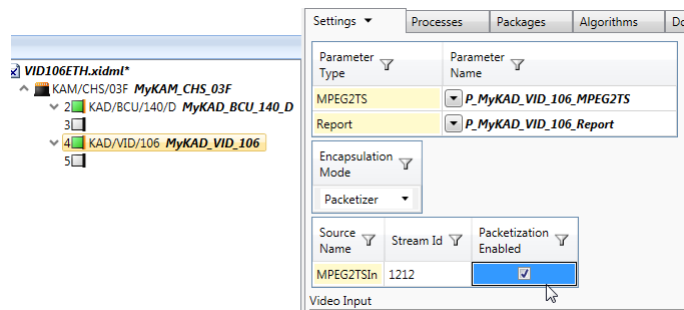


Figure 44-14: Encapsulation Mode set to Packetizer

NOTE: This mode requires an aperiodic Ethernet transmitter module such as a KAD/BCU/140.

During Verify/Program, the iNET-X block packet is automatically created by DAS Studio 3.

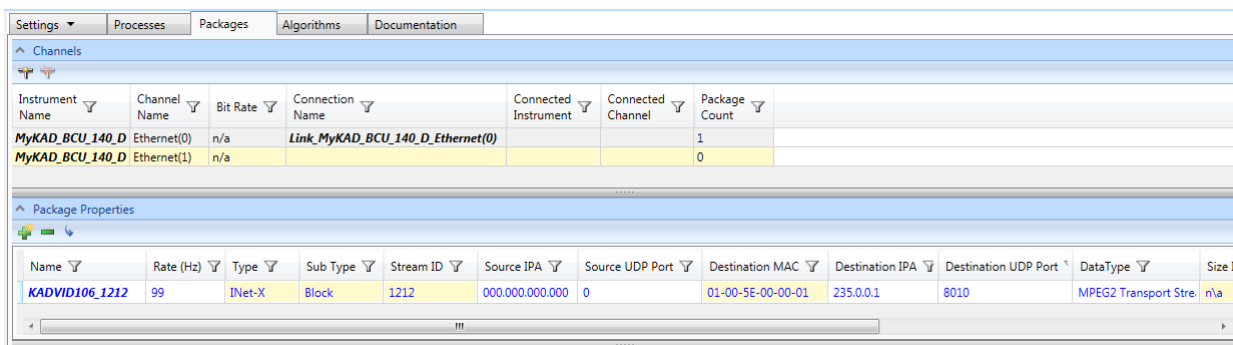


Figure 44-15: iNET-X block packet on KAD/BCU/140

44.2.3.5 Using video with a memory module

Video data can be logged to a memory module the same way as any other type of data is logged. However, two constraints apply:

- Video parameter names must follow the syntax <optional_label>VIDEO< optional_label>
- Video words must be sampled at the same rate in the memory module as in the PCM frame

Sampling video bit rate is: video sample rate × number of video words × 16.

44.3 Viewing KAD/VID/106 data

The data from the KAD/VID/106 can be viewed either in real-time (using GS Works 8) or at a later date using a memory module.

44.3.1 Using GS Works 8

Video data is treated the same as other types of Acra KAM-500 data by GS Works 8. That is, any data source such as PCM, UDP, or CompactFlash™ is supported by the KAD/VID/106. However, the ffdshow codec must be installed to view video using GS Works 8.

The KAD/VID/106 video is supported from GS Works 8.1.1. Refer to the GS Works 8 release notes. For example, in GS Works 8.1.1, audio is not available.

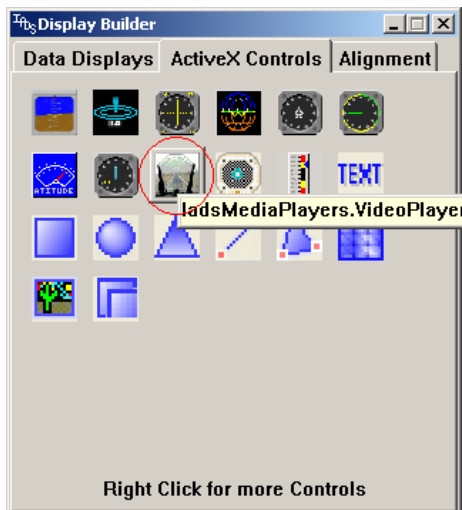
Video from the KAD/VID/106 module as displayed in the GS Works 8 video player is supported via the ffdshow_rev4513_20130525.exe video codec package. You can download ffdshow codec from source forge:

<http://sourceforge.net/projects/ffdshow>

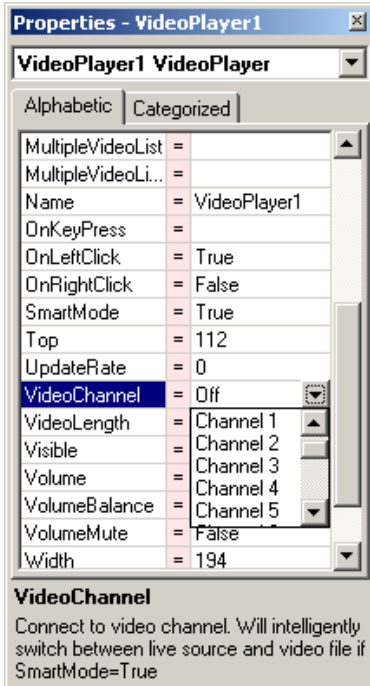
NOTE: You can only have one codec installed at a time. This means mixing KAD/VID/103 and KAD/VID/106 video in GS Works 8 is not supported.

After installing the codec, do the following to view video in GS Works 8.

1. Open GS Works 8 and follow the Start Wizard to load the data you want to view.
2. Click the **Display Builder** button on the dashboard to open the **Display Builder** window.
3. On the **Data Displays** tab, drag the **Analysis Window** icon to the desktop.
4. On the **ActiveX Controls** tab, drag the **VideoPlayer** icon to the **Analysis** window.



5. Right-click the **VideoPlayer** window and select **Properties**.
6. In the **Properties** window, scroll to the **VideoChannel** field and select the channel corresponding to the KAD/VID/106 output from the drop-down menu.



The video stream displays in the VideoPlayer.

44.3.2 Using kFlashCardXID and memory modules

As with other types of data, video data can be logged to a memory module for later viewing. Ensure that the KAD/VID/106 parameters are named <label>VIDEO<label> for correct operation.

Once the video data has been logged to the CompactFlash card, it can be extracted using kFlashCardXID. The output format must be Video (MPEG-2 Transport Stream) as shown in the following figure.

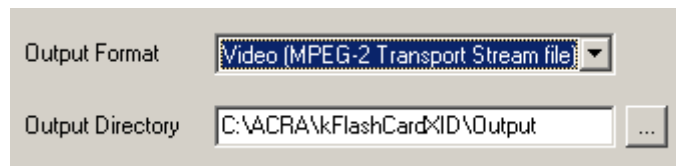


Figure 44-16: Selecting Video output format in kFlashCardXID

The video is extracted as a transport stream (<filename>.ts) file to the specified output directory. This transport stream file can then be viewed by MPEG viewing software such as VLC2.0 (<http://www.videolan.org/vlc/>).

NOTE: Contrary to the KAD/VID/103, audio is replayed by VLC because the KAD/VID/106 uses the MPEG Audio standard (AAC) in the audio stream.

44.3.3 Using UDP

An internal tool based on VLC can also be provided by Curtiss-Wright support (acra-support@curtisswright.com) to replay in real time KAD/VID/106 IENA/iNET-x placed or iNET-x packetizer video packets. Sound can also be replayed.

NOTE: This utility is an internal tool, therefore, no support is provided. When requesting this tool from Curtiss-Wright support, ask for TSD-AA-014 vlc to replay KAD/VID/106.

44.4 Troubleshooting

44.4.1 Only a black screen is displayed

If the Turn on timer overlay check box is selected on the Module Setup tab, and you see the time overlaid on a black screen, this means that the KAD/VID/106 is operating correctly, however, it is just not receiving a video stream. If the Turn on timer overlay check box is not selected, then select it now. This allows you to verify that the KAD/VID/106 is operating correctly before trying to troubleshoot video input problems.

- If camera selection is through the connector, ensure the correct pins are grounded. (See Table 44-1 on page 2.)
- If camera selection is through EEPROM, ensure that the camera is connected to the correct input. (See “Input Source” under “44.2.2.2 KSM-500 Setup tab settings” on page 4.)
- Verify the camera is working correctly.

44.4.2 GS Works 8 is in PCM lock but no video is displayed

This usually means that there is either a problem with the KAD/VID/106 video data, or destination modules.

- Ensure the correct output format is selected (PAL or NTSC). (See “Video Format” under “44.2.2.2 KSM-500 Setup tab settings” on page 4.)
- Ensure the MPEG bit-rate is adequate for the application. (See section “44.2.3 Using Video” on page 8.)
- If more than one destination module is being used in the system, ensure the KAD/VID/106 data is sampled at the same rate in each destination module. (See section “44.2.3 Using Video” on page 8.)

This page is intentionally blank