

Gemini 2 & 4 Video Link Expander User Guide

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1 Introduction

Gemini-4 allows extra cameras to be easily sent over an existing video surveillance link without the need of any modification. Gemini operates by multiplexing up to 4 video inputs together into one video stream suitable for transmission over a coax, fibre-optic or RF/microwave link. At the receive site, the Gemini decoder splits the multiplexed stream back into separate outputs ready to be viewed on individual monitors, or a combination of scaled pictures on one monitor, as required. See Figure 1: Gemini Application Diagram.

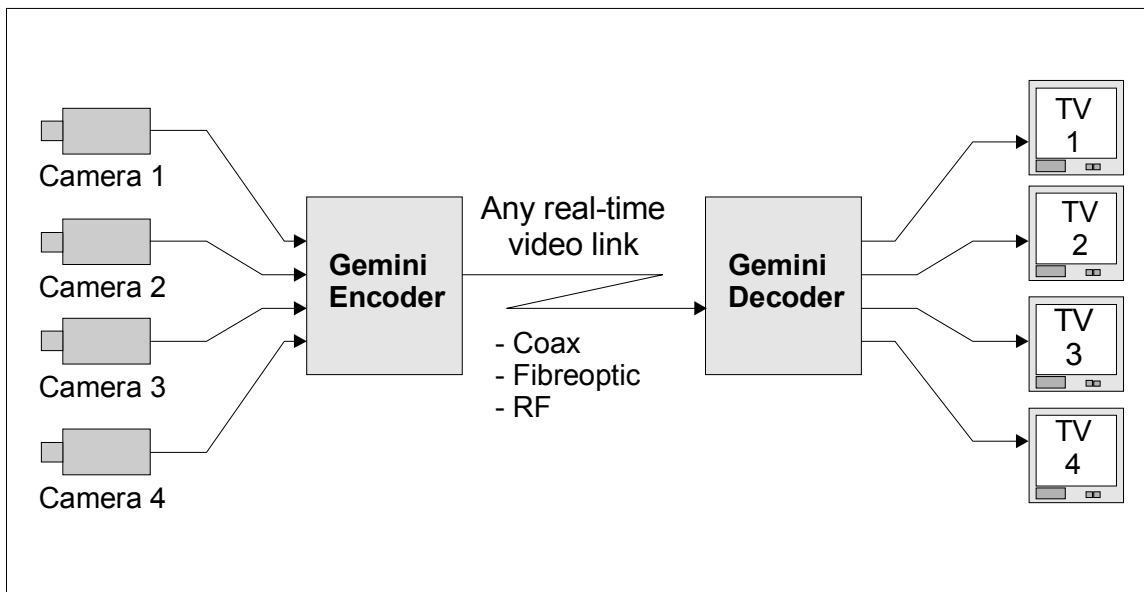


Figure 1: Gemini Application Diagram.

Gemini provides the fastest possible picture update rates by using video field multiplexing. The picture update rate per channel is dependant upon the number of active inputs to the encoder and the video standard used. Please refer to Table 1 below showing details of Gemini's update rates:

Number of Inputs	PAL Picture Update Rate (Pictures per Second)	NTSC Picture Update Rate (Pictures per Second)
1	50	60
2	25 / 25	30 / 30
3	25 / 12.5 / 12.5	30 / 15 / 15
4	12.5 / 12.5 / 12.5 / 12.5	15 / 15 / 15 / 15

Table 1: Gemini Picture Update Rates

2 Quick Start Guide

The Gemini system is supplied as an encoder / decoder pair with DC power leads. The following describes the basic installation:

- 2.1 Ensure the units are configured for the correct video standard (PAL or NTSC). A “PAL” or “NTSC” label on the side of the unit indicates the configuration.
- 2.2 Ensure the encoder’s and decoder’s mode control switches are both set to “0” as shown in Figure 2.
- 2.3 Connect 7 to 32 V DC power source to the encoder and decoder to units using Lemo cable assembly provided, as shown in Figure 2. As a guide the encoder requires approximately 300 mA, the decoder 400 mA, at 12 Volts DC.

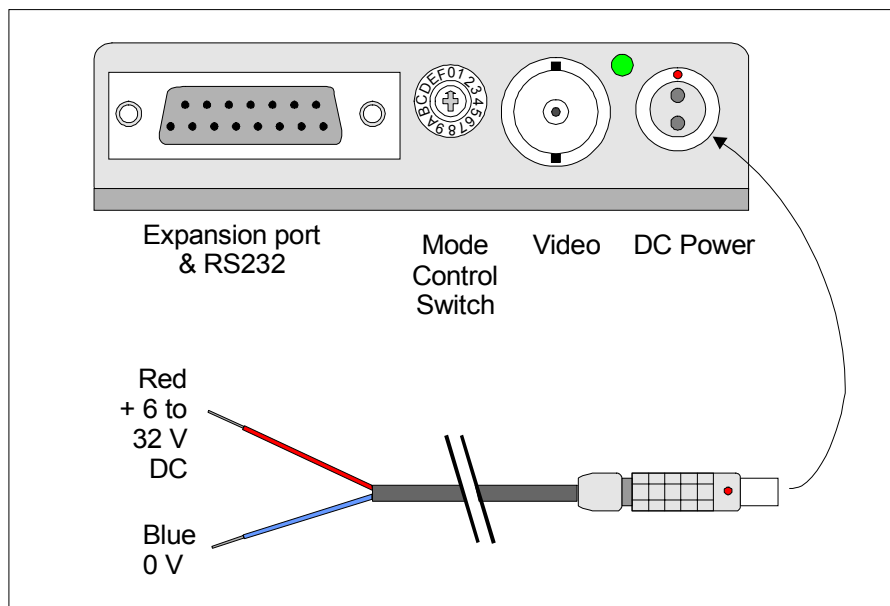


Figure 2: Gemini Interfaces / User Control

- 2.4 Connect up to 4 video sources (cameras) to the encoder’s video inputs. Any combination of input channels may be used. All video connections are nominally 1 V pp with 75 Ω terminations.
- 2.5 Connect the encoder’s video output to the real-time video link (see Figure 1).
- 2.6 Connect the output of the video link to the decoder’s input (see Figure 1).
- 2.7 Connect the number of video monitors required to the Gemini decoder’s outputs (see Figure 1).

6 Decoder Picture-in-Picture Modes

The mode switch on the side of the unit selects the decoder's picture-in-picture modes with the following function:-

Mode	Output 1	Output 2	Output 3	Output 4
0. Normal De-mux mode	1	2	3	4
1. Switch Cameras	2	3	4	1
2. Switch Cameras	3	4	1	2
3. Switch Cameras	4	1	2	3
4. Side by side without scaling	1-Left 1/2 2-Right 1/2	3-Left 1/2 4-Right 1/2		
5. Side by side with scaling	1-Squashed 2-Squashed	3-Squashed 4-Squashed		
6. A above B without scaling	1- Top 1/2 2- Bot 1/2	3- Top 1/2 4- Bot 1/2		
7. A above B with scaling	1- Squashed 2- Squashed	3- Squashed 4- Squashed		
8. Two way PIP mode 1	2 1	4 3		
9. Two way PIP mode 2	1 2	3 4		
A. Two way PIP mode 3	1 2	3 4		
B. Two way PIP mode 4	2 1	4 3		
C. 3 way PIP	1 2 3	2 1 3		
D. 4 way PIP	1 2 3 4	2 1 3 4		
E. Quad	1 2 3 4	2 1 4 3		
F. Full Picture cycle	1>2>3>4	3>4>1>2		

Table 3: Decoder Picture In picture modes.

7 Encoder Modes

In normal operation, mode 0, the encoder automatically configures itself to share the available update rate over the number of cameras actually connected. However, there are a number of manual modes that allow for a fixed number of cameras (which helps reduce encoder power consumption) together with the possibility to allocate a priority update rate to camera 1. Please refer to Table 4 below:

Mode Switch Position	Description	Picture Rate Per Second PAL (NTSC)			
		Input 1	Input 2	Input 3	Input 4
0	Auto (Default)	Auto	Auto	Auto	Auto
1	Cam 1 only	50 (60)	-	-	-
2	Cam 1 & 2 only	25 (30)	25 (30)	-	-
3	Cam 1,2 & 3 only	25 (30)	12.5 (15)	12.5 (15)	-
4	Cam 1,2,3,4	12.5 (15)	12.5 (15)	12.5 (15)	12.5 (15)
5	Cam 1 3 x Priority	25 (30)	8.5 (10.2)	8.5 (10.2)	8.5 (10.2)
6	Cam 1 9 x Priority	37.5 (45)	4 (4.8)	4 (4.8)	4 (4.8)
7	Do Not Use	- -	- -	- -	- -
8	Cam 1 47 x Priority	47 (56.4)	1 (1.2)	1 (1.2)	1 (1.2)
9	Cam 1 96 x Priority	48 (57.6)	0.5 (0.6)	0.5 (0.6)	0.5 (0.6)
A	Do Not Use	- -	- -	- -	- -

Table 4: Gemini Encoder Update Rates Pictures Per Second for PAL Video
NTSC update rates are show in brackets.

In most applications it is expected that the Gemini encoder will be used in conjunction with a corresponding decoder. However, there are applications where a single picture-in-picture display of the inputs will suffice, and in this instance, the encoder may be configured to operate stand-alone. The picture-in-picture modes are as follows:

Mode	Description
B	Input 1 with an insert of input 2
C	Input 1 above input 2
D	Input 1 beside input 2
E	All 4 inputs, quad screen
F	2 second cycle through each input

Table 5: Encoder Picture In Picture modes

Note: The decoder is not compatible with the encoder's picture-in-picture modes.

8 Operation With Viewlock II Video Encryption System.

If a secured transmission link is required, it is possible to scramble the Gemini output using Ovation Systems' Viewlock II video encryption system as shown in Figure 3. It is not possible to use a configuration where the video input to the Gemini encoder is scrambled.

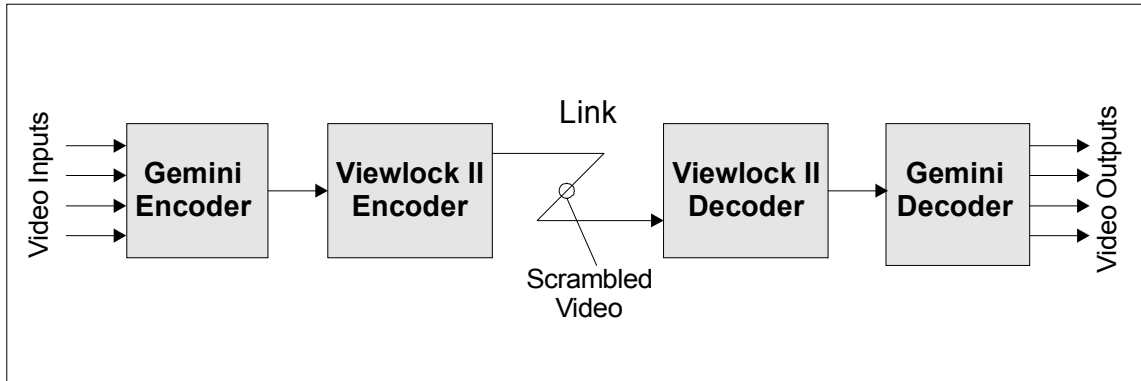


Figure 3: Gemini and Viewlock II video scrambling configuration

Important: In PAL operation, the standard Viewlock II configuration is not interoperable with the Gemini-2/4 system. This is caused by the two systems using the same video line to transmit synchronising data. The solution is to change the Viewlock II's data line by using the VL2-Talk PC configuration software and serial programming cable.

For Gemini-4 users, the software and cable are available free of charge by contacting Ovation Systems. Install the VL2-Talk software, as described in the accompanying user guide, and then click the "Set For Gemini" button on the "Data Line" tab. Ensure this procedure is repeated for all Viewlock II encoders / decoders.

NB: In NTSC operation, Viewlock II and Gemini-4 are compatible and do not require any change to the standard configuration.

9 Operation with VCRs

It is possible to record the multiplexed output of the Gemini-4 encoder on a standard VCR and decode the playback to 4 separate outputs using a Gemini-4 decoder. However, the system will only operate with real-time recordings and is not compatible with any time-lapse modes.

Note: Gemini-4 is unlikely to be compatible with any digital hard-disk video recorders due to the compression and digitisation techniques employed removing the Gemini synchronisation data.

10 Trouble Shooting

If problems are encountered, initially check the system installation by the following procedure:

- 10.1 Check that both Gemini units are set for the correct video standard (PAL or NTSC), indicated by a small label on the side of the unit.
- 10.2 Check the DC supply to the Gemini units is within 7 to 32 Volts DC. The PSU's should have a smoothed output and be capable of providing at least 0.5 amps.
- 10.3 **Whilst powered**, set the encoder and decoder control switches to "0". This will ensure that both units are in a known and compatible state.
- 10.4 If practicable, connect the output of the encoder directly to the decoder's input using a BNC cable, to ensure the link is not causing the problem.
- 10.5 Check the encoder's and decoder's LED's are flashing in the expected sequence for the number of cameras connected to the encoder. See Section 3 on page 4 regarding the LED function.

If problems persist, check for the following symptoms:

1. **One or more output channels have intermittent or no colour.**

This is usually caused by Gemini being unable to fully lock to the incoming video signal due to off frequency video syncs or colour burst. This type of problem is often attributed to camera set-up or performance. Please check the following:

- a) For successful Gemini-4 operation it is vital that the master input (the lowest input number to the encoder used) adheres strictly to the PAL or NTSC standard. Try changing / swapping cameras into the encoder so a different camera is used as the master channel.
- b) Some cameras have the option external synchronisation which, if selected, causes their syncs to be off frequency. This function is often controlled by a camera DIP switch marked "Int / Ext" which should be set for **internal operation**. For further information, please refer to camera's user guide.

2. **The system operates OK with a direct BNC cable connection between the encoder and decoder, but shows a "No Master" message when operated over a link.**

This indicates the decoder is unable to lock-on to the incoming video. Probable causes are incorrect video level (possibly double termination) or video sync distortion introduced by the link. If available, check the video level and distortion to the input of the decoder using an oscilloscope.