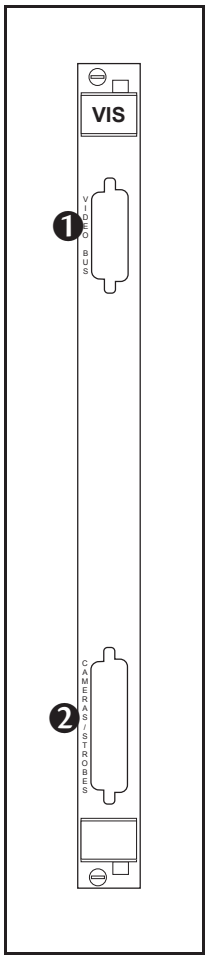
AdeptVision VME Module (VIS) 9

9.1 Introduction

The AdeptVision VME Vision Interface (VIS) module is a single-slot VME module that is a vision framegrabber for use with the AdeptVision VME product.

Refer to the *AdeptVision VME User's Guide* and the *AdeptVision Reference Guide* for complete information on installation, configuration, operation and programming your vision system.

9.2 Connections and Indicators



1. **Video Bus** connector – a 26-pin mini D-sub connector for installing one end of the Video Bus cable in AdeptVision VME systems. The other end of the cable connects to the VGB module.
2. **Camera/Strobe** connector – a 44-pin D-sub connector for either the two-camera or four-camera breakout cables.

9.3 VMEbus Address and Configuration

The VIS module will be configured as module 1, unless the system is running the Dual AdeptVision option, in which case, the second VIS module will be module 2. If you have only one VIS module installed, it will be set correctly when the controller is shipped to you.

If you install a new VIS module (as a replacement part or upgrade) or have the Dual Vision option, see the tables below for the address switch settings. The shaded cells indicate the settings that are different for each board. See Figure 9-1 for the position of the A and B settings. See Figure 9-2 for the location of SW1, SW3, and SW2 on the VIS module.

Table 9-1. Switch Settings for VIS Module 1

	1	2	3	4	5	6	7	8
SW1	A	B	B	B				
SW3	A	A	B	B	B	B	B	B
SW2	A	A	A	B	A	A	A	A

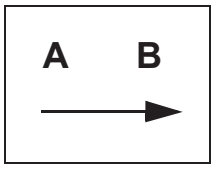


Figure 9-1. Switch Positions A and B in Relation to Arrows on SW1, SW3, and SW2

Table 9-2. Switch Settings for VIS Module 2

	1	2	3	4	5	6	7	8
SW1	A	B	A	B				
SW3	A	A	B	B	B	B	A	B
SW2	A	A	A	A	A	B	A	A

SW1-3 (3rd switch on SW1) selects either:

- B: POS_LATCH 1 and VIS_TRIGGER 1 (recommended for VIS module 1)

  or...

- A: POS_LATCH 2 and VIS_TRIGGER 2 (recommended for VIS module 2)

All other switches on SW1, SW3, and SW2 should be set as shown above.

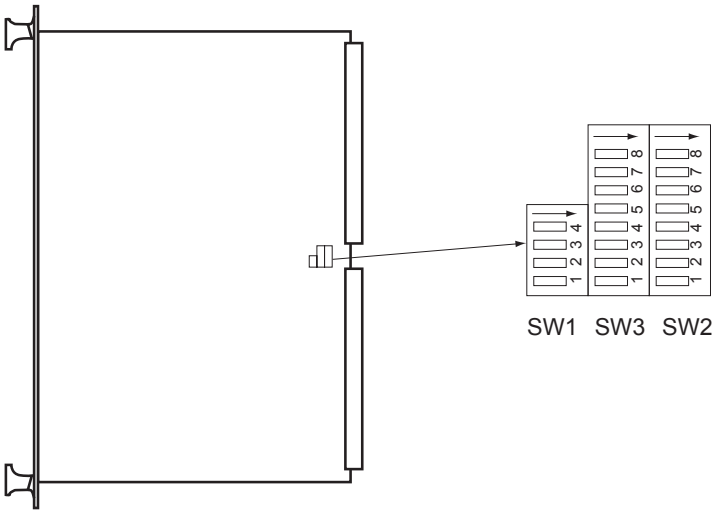


Figure 9-2. Switch Locations on VIS Module

9.4 Camera Compatibility

Compatible cameras can be purchased from Adept. See the *AdeptVision VME User's Guide* for a list of other cameras that can be used with the AdeptVision VME product. If you have a camera that is not on that list, the following information presents some guidelines for camera compatibility with AdeptVision VME (minimum requirements):

- RS-170 camera video output (US-style monochrome, 30Hz frame rate [60Hz field rate], 525 lines, interlaced)
- External Hd and Vd sync signals (inputs to camera)[1]
- Connector: Hirose HR10-10S-12P
- Pinout: typical Sony/Panasonic etc. (See Table 9-3 for pinout) – not Pulnix standard pinout.

You can use these guidelines to rule out cameras – if they do not meet all the above, you cannot expect to plug in and work. If they do meet all the above – there is a good chance they will work.

The pixel resolution of the Adept frame store is 640x480; we suggest the camera should be at least about 500 x 480. More is normally better, if the camera, lens, etc., are good quality. The actual number of pixels does not affect compatibility, because the interface is via the RS-170-standard video-link.

[1] For interfacing cameras without external sync, contact Adept Customer Service.

9.5 Installing Video Bus Coupling

The Video Bus coupling (VTV) (see Figure 9-5) transfers data between the VIS module and the VGB module. These two modules must be installed next to each other in the controller chassis. (Earlier versions of the coupling were constructed with a cable, instead of a molded unit. Both versions perform the same function.)

1. Make sure the controller On/Off switch is turned off.
2. Verify that the VIS and VGB modules are installed side-by-side in the controller.
3. Plug the coupling into the Video Bus connectors on the VIS and VGB modules.

9.6 Camera Breakout Cables

Adept offers two versions of camera breakout cables, a two-camera version and a four-camera version. They both connect to the Camera connector on the front of the module. With the four-camera model there is support for two strobe connections. The breakout cables are intended to route the signals away from the chassis — they do not connect directly to the camera. To connect to the cameras, you must use an additional cable. Adept offers a 10-meter Adept MV camera cable for this purpose.

See Tables 9-3 to 9-8 for pin and signal information.

Two-Camera Breakout Cable

This cable has a 44-pin D-sub connector on one end and it breaks out to two 12-pin Hirose-style camera connectors on the other end. The length of the cable is 1.8 meters (70”).

The VIS module supplies 12 VDC power for cameras through this cable. The current rating is 500 mA maximum per camera, with a combined maximum of 1 A.

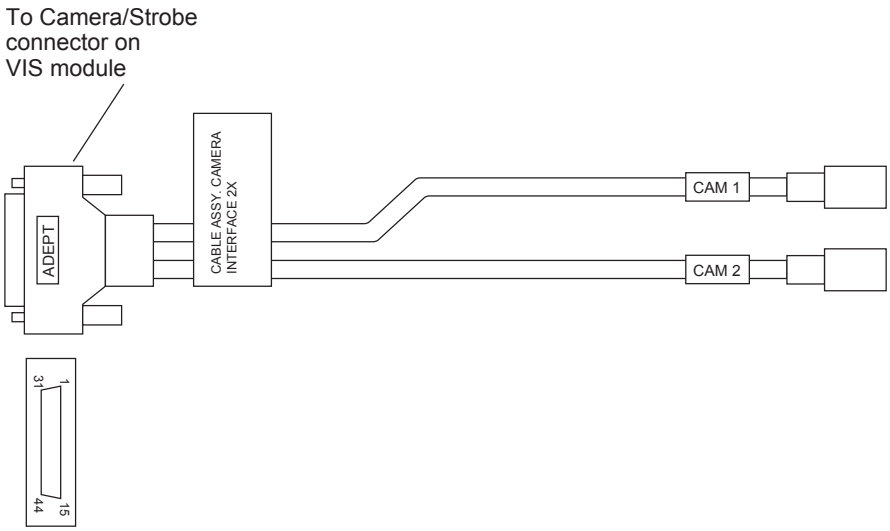
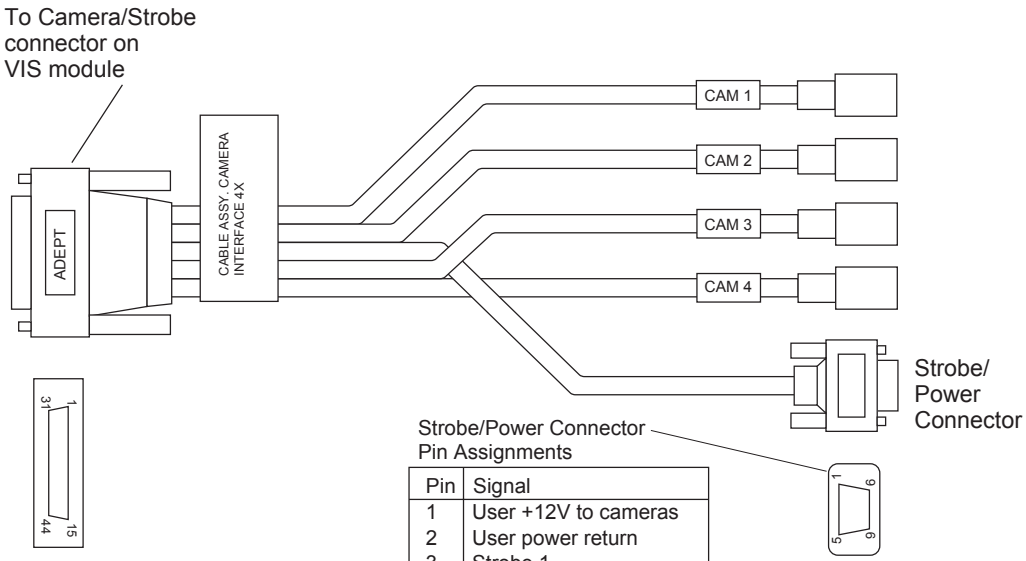


Figure 9-3. Two-Camera Breakout Cable

Four-Camera Breakout Cable

This cable has a 44-pin D-sub connector on one end and it breaks out to four 12-pin Hirose-style camera connectors and one 9-pin D-sub connector on the other end. The length of the cable is 1.8 meters (70").

Due to the current limitation of the VMEbus specification, the VIS module cannot supply enough current to operate all four cameras from the four-camera cable. You must supply the external power to operate the cameras when using this cable. This power must be routed through the 9-pin D-sub connector; see the drawing below and Table 9-4 for pin information.



Strobe/Power Connector Pin Assignments

Pin	Signal
1	User +12V to cameras
2	User power return
3	Strobe 1
4	Strobe return
5	Strobe 2
6	Reserved
7	Reserved
8	Reserved
9	Shield (chassis ground)

Figure 9-4. Four-Camera Breakout Cable

10-Meter Adept MV Camera Cables

The 10-meter Adept MV Camera cables have a male Hirose connector on one end and a female Hirose connector on the other end. These cables are intended to go between the breakout cables and the connectors on the cameras. Each camera requires one of these cables (or an equivalent).

9.7 Installing Camera Cables

Refer to the *AdeptVision VME User's Guide* for information on mounting cameras and strobes in your system. Figure 9-5 shows the installation of a typical four-camera breakout cable and the associated hardware.

CAUTION: Turn off the controller before installing or removing a camera or cable. Failure to do this may damage the VIS module.

When using the four-camera breakout cable, you must provide 12 VDC power at sufficient current for the type and quantity of cameras you are using. See the documentation supplied with your cameras for information on current requirements.

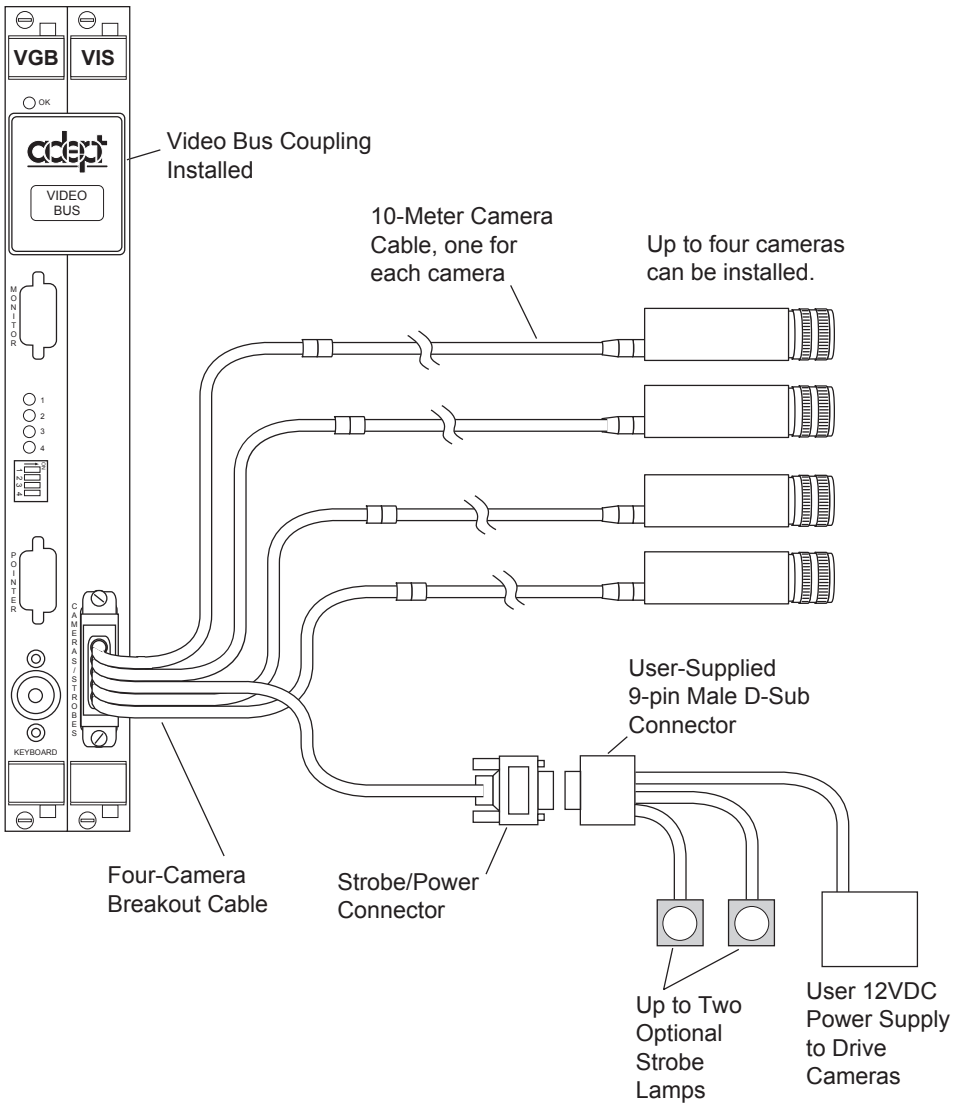


Figure 9-5. Camera Cable Installation Drawing

9.8 Camera Cable Pin and Signal Information

This section provides the pin and signal information for the connectors and cables associated with the AdeptVision VME product.

- Table 9-3 describes the Hirose connector that is used for all cameras on both the two- and four-camera breakout cables.
- Table 9-4 describes the Strobe and Power connector on the four-camera breakout cable.
- Table 9-5 describes the 10-meter camera cable.
- Table 9-6 describes signal information between the 44-pin connector and the camera connectors for the two-camera breakout cable.
- Table 9-7 describes signal information between the 44-pin connector and the camera and strobe/power connectors for the four-camera breakout cable. The table is organized by camera number.
- Table 9-8 contains information similar to Table 9-7, only it is organized numerically by the 44-pin connector.

Table 9-3. Breakout Cable Camera Connector Pin Assignments

Pin	Function	Notes
1	Power return	
2	+12V power	to camera
3	Shield (video)	
4	Video	from camera
5	Shield(Hd)	
6	Hd (horizontal drive)	to camera
7	Vd (vertical drive)	to camera
8	Shield(Clock)	to camera (camera 1 & 2 only)
9	Clock	to camera (camera 1 & 2 only)
10	not connected	
11	not connected	
12	Shield (Vd)	
12-Pin Hirose Female Jack, HR10A-10J-12S		
This connector will normally be connected to the camera via the optional 10-Meter Adept MV Camera Cable. For special applications, this connector will mate with a Hirose Male Plug HR10A-10P-12P (user supplied) or similar.		

Table 9-4. Breakout Cable Strobe and Power Connector Pin Assignments

Pin	Function	Notes
1	User +12 V dc to cameras	
2	User power return	
3	Strobe 1	
4	Strobe return	
5	Strobe 2	
6	Reserved	(do not use)
7	Reserved	(do not use)
8	Reserved	(do not use)
9	Shield (chassis ground)	
9-Pin D-Sub female Receptacle		
Note: this connector will mate with a 9-pin D-Sub male plug (user-supplied). The two-camera breakout cable does not include this connector.		

Table 9-5. Adept 10-Meter Camera Cable Pin Assignments

Pin # at controller end (male)	Function	Notes	Wire Color (typical)	Pin # at camera end, (female)
1	Power return		gray	1
2	+12V power	to camera	yellow	2
3	Shield (video)		red-shield	3
4	Video	from camera	red-signal	4
5	Shield(Hd)		orange-shield	5
6	Hd (horizontal drive)	to camera	orange-signal	6
7	Vd (vertical drive)	to camera	black -signal	7
8	Shield (Clock)	to camera (cam. 1 & 2 only)	white-shield	8
9	Pixel clock	to camera (cam. 1 & 2 only)	white-signal	9
10	used	reserved	brown	10
11	used	reserved	blue	11
12	Shield (Vd)		black-shield	12

- Connector at controller end: 12-Pin Hirose Male, HR10A-10P-12P, with ground terminal lug (shield).
- Connector at camera end: 12-Pin Hirose Female, HR10A-10P-12S.
- Cable specifications: 12 conductors - including 4 coax pairs, 4 discrete conductors, and overall shield. At each end the shield is clamped to connector body.

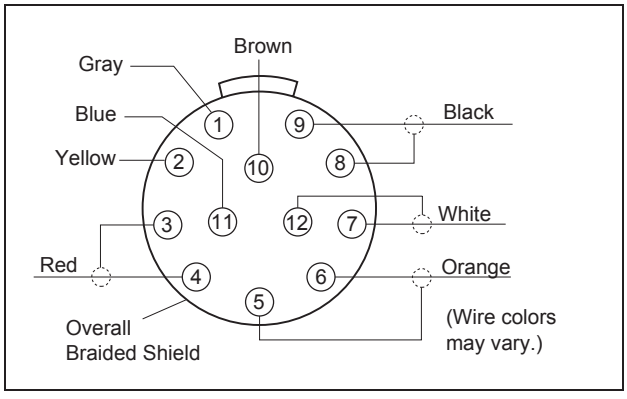


Figure 9-6. Pin Locations for Camera Cable Connector (12-Pin Hirose Male)

Table 9-6. Two-Camera Breakout Cable Pin Assignments

From:	Pin	To:	Pin	Function
VIS	8	CAM1	1	Power return
VIS	7	CAM1	2	+12V power
VIS	12	CAM1	3	Shield(video)
VIS	42	CAM1	4	Video
VIS	38	CAM1	5	Shield(Hd)
VIS	36	CAM1	6	Hd (horizontal drive)
VIS	37	CAM1	7	Vd (vertical drive)
VIS	38	CAM1	8	Shield(Clock)
VIS	22	CAM1	9	Clock
--	--	CAM1	10	not connected
--	--	CAM1	11	not connected
VIS	38	CAM1	12	Shield(Vd)
VIS	6	CAM2	1	Power return
VIS	5	CAM2	2	+12V power
VIS	43	CAM2	3	Shield(video)
VIS	29	CAM2	4	Video
VIS	35	CAM2	5	Shield(Hd)
VIS	34	CAM2	6	Hd (horizontal drive)
VIS	19	CAM2	7	Vd (vertical drive)
VIS	35	CAM2	8	Shield(Clock)
VIS	20	CAM2	9	Clock
--	--	CAM2	10	not connected
--	--	CAM2	11	not connected
VIS	35	CAM2	12	Shield(Vd)

Note that the Clock output to cameras 1 and 2 may be enabled by a switch on the VIS board, if required.

Also note that this cable provides 12V dc (fused 1A max) to the cameras from the Adept controller. The fuse is not user-replaceable. **If the total current required by the two cameras exceeds 1A, this cable should not be used.**

Table 9-7. Four-Camera Breakout Cable Pin Assignments (sorted by destination)

From:	Pin	To:	Pin	Function
Str/Pwr	2	CAM1	1	Power return
Str/Pwr	1	CAM1	2	+12V power
VIS	12	CAM1	3	Shield(video)
VIS	42	CAM1	4	Video
VIS	38	CAM1	5	Shield(Hd)
VIS	36	CAM1	6	Hd (horizontal drive)
VIS	37	CAM1	7	Vd (vertical drive)
VIS	38	CAM1	8	Shield(Clock)
VIS	22	CAM1	9	Clock
--	--	CAM1	10	not connected
--	--	CAM1	11	not connected
VIS	38	CAM1	12	Shield(Vd)
Str/Pwr	2	CAM2	1	Power return
Str/Pwr	1	CAM2	2	+12V power
VIS	43	CAM2	3	Shield(video)
VIS	29	CAM2	4	Video
VIS	35	CAM2	5	Shield(Hd)
VIS	34	CAM2	6	Hd (horizontal drive)
VIS	19	CAM2	7	Vd (vertical drive)
VIS	35	CAM2	8	Shield(Clock)
VIS	20	CAM2	9	Clock
--	--	CAM2	10	not connected
--	--	CAM2	11	not connected
VIS	35	CAM2	12	Shield(Vd)
Str/Pwr	2	CAM3	1	Power return
Str/Pwr	1	CAM3	2	+12V power
VIS	14	CAM3	3	Shield(video)
VIS	44	CAM3	4	Video
VIS	33	CAM3	5	Shield(Hd)
VIS	32	CAM3	6	Hd (horizontal drive)
VIS	18	CAM3	7	Vd (vertical drive)
--	--	CAM3	8	not connected
--	--	CAM3	9	not connected
--	--	CAM3	10	not connected
--	--	CAM3	11	not connected
VIS	33	CAM3	12	Shield(Vd)

Table 9-7. Four-Camera Breakout Cable Pin Assignments (sorted by destination)

From:	Pin	To:	Pin	Function
Str/Pwr	2	CAM4	1	Power return
Str/Pwr	1	CAM4	2	+12V power
VIS	30	CAM4	3	Shield(video)
VIS	15	CAM4	4	Video
VIS	17	CAM4	5	Shield(Hd)
VIS	16	CAM4	6	Hd (horizontal drive)
VIS	31	CAM4	7	Vd (vertical drive)
--	--	CAM4	8	not connected
--	--	CAM4	9	not connected
--	--	CAM4	10	not connected
--	--	CAM4	11	not connected
VIS	17	CAM4	12	Shield(Vd)
--	--	Str/Pwr	1	User +12 V to cameras
--	--	Str/Pwr	2	User power return
VIS	26	Str/Pwr	3	Strobe 1
VIS	11	Str/Pwr	4	Strobe return
VIS	39	Str/Pwr	5	Strobe 2
VIS	11	Str/Pwr	6	Reserved
VIS	40	Str/Pwr	7	Reserved
VIS	11	Str/Pwr	8	Reserved
VIS	--	Str/Pwr	9	Shield (chassis ground)

Note that this cable provides user-supplied 12V dc to the cameras via the Strobe and Power connector, not from the Adept controller.

Table 9-8. Four-Camera Breakout Cable Pin Assignments (sorted by origin)

From:	Pin	To:	Pin	Function
Str/Pwr	1	CAM1	2	+12V power
Str/Pwr	1	CAM2	2	+12V power
Str/Pwr	1	CAM3	2	+12V power
Str/Pwr	1	CAM4	2	+12V power
Str/Pwr	2	CAM1	1	Power return
Str/Pwr	2	CAM2	1	Power return
Str/Pwr	2	CAM3	1	Power return
Str/Pwr	2	CAM4	1	Power return
VIS	--	Str/Pwr	9	Shield (chassis ground)
VIS	11	Str/Pwr	4	Strobe return
VIS	11	Str/Pwr	6	Reserved
VIS	11	Str/Pwr	8	Reserved
VIS	12	CAM1	3	Shield(video)
VIS	14	CAM3	3	Shield(video)
VIS	15	CAM4	4	Video
VIS	16	CAM4	6	Hd (horizontal drive)
VIS	17	CAM4	5	Shield(Hd)
VIS	17	CAM4	12	Shield(Vd)
VIS	18	CAM3	7	Vd (vertical drive)
VIS	19	CAM2	7	Vd (vertical drive)
VIS	20	CAM2	9	Clock
VIS	22	CAM1	9	Clock
VIS	26	Str/Pwr	3	Strobe 1
VIS	29	CAM2	4	Video
VIS	30	CAM4	3	Shield(video)
VIS	31	CAM4	7	Vd (vertical drive)
VIS	32	CAM3	6	Hd (horizontal drive)
VIS	33	CAM3	5	Shield(Hd)
VIS	33	CAM3	12	Shield(Vd)
VIS	34	CAM2	6	Hd (horizontal drive)
VIS	35	CAM2	5	Shield(Hd)
VIS	35	CAM2	8	Shield(Clock)
VIS	35	CAM2	12	Shield(Vd)

Table 9-8. Four-Camera Breakout Cable Pin Assignments (sorted by origin)

From:	Pin	To:	Pin	Function
VIS	36	CAM1	6	Hd (horizontal drive)
VIS	37	CAM1	7	Vd (vertical drive)
VIS	38	CAM1	5	Shield(Hd)
VIS	38	CAM1	8	Shield(Clock)
VIS	38	CAM1	12	Shield(Vd)
VIS	39	Str/Pwr	5	Strobe 2
VIS	40	Str/Pwr	7	Reserved
VIS	42	CAM1	4	Video
VIS	43	CAM2	3	Shield(video)
VIS	44	CAM3	4	Video
Note that this cable provides user-supplied 12V dc to the cameras via the Strobe and Power connector, not from the Adept controller.				

9.9 VIS Module Specifications

Table 9-9. Technical Specifications[a]

Electrical Power Consumption	5 VDC at 5.0 A +12 V at 1.25 A (including 1 amp for cameras) –12 V at 0.1 A
Width	Occupies 1 backplane slot

[a] Specifications subject to change.