



FlashBus[®] Spectrim

User Manual

August 2003

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FlashBus[®] Spectrim

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FlashBus® Spectrim



Introduction



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Thank you for purchasing FlashBus Spectrim, a high-performance, PCI bus-mastering video frame grabber designed to capture composite, S-Video, or RGB video in real time to system or display memory.

This chapter introduces you to the FlashBus Spectrim card's features.

About FlashBus Spectrim

FlashBus Spectrim is a high-performance, PCI bus-mastering video frame grabber designed to capture composite, S-Video, or RGB video in real time to system or display memory. Utilizing a Philips TriMedia™ Video Processor and 16MB of SDRAM memory, FlashBus Spectrim is a perfect general-purpose capture card for OEM requirements. FlashBus Spectrim also provides video output, I/O triggering, and camera integration support.

Product Features

- Bus-mastering video acquisition
- Philips TriMedia™ Video Processor
- Real-time transfer of video to system or display memory
- 16MB SDRAM frame buffer
- High-quality video scaling to arbitrarily sized windows
- Up to 4 RGB or YCbCr, 8 S-Video, and 16 composite multiplexed video inputs
- RGB, YCbCr, S-Video, and composite video output
- CCIR and square pixel capture resolution
- NTSC and PAL video formats
- Area of interest transfers to/from system and on-board memory
- Fast video input switching capability
- On-board microcontroller
- General-purpose I/O triggers
- Optically isolated trigger output for flash control
- Programmable DAC output
- RS-232 output support
- Camera integration support
- 12 volt DC switched output for camera supply
- Real-time image flip, rotate, and mirror
- Windows 98, ME, NT 4.0, 2000, and XP drivers
- Windows-based FBG video capture application
- Optional SDK with sample applications
- Compatible with IVL Vision Library

About FlashBus Spectrim Lite

FlashBus Spectrim Lite is a low-cost PCI bus-mastering video capture card that is perfect for cost-sensitive applications. Spectrim Lite also utilizes the Philips TriMedia video processor and same enhanced video digitization as the full-featured Spectrim. Spectrim Lite supports up to three composite inputs or a single S-Video input, and has a single trigger I/O for TTL or strobe interfaces.

Product Features

- Bus-mastering video acquisition
- Philips TriMedia™ Video Processor
- Real-time transfer of video to system or display memory
- 16 MB SDRAM Frame Buffer
- High-quality video scaling to arbitrarily sized windows
- Up to 3 multiplexed composite or one S-Video inputs
- CCIR and square pixel capture resolution
- NTSC and PAL video formats
- Area of interest transfers to/from system and on-board memory
- Fast video input switching capability
- General purpose I/O trigger
- Real-time image flip, rotate, and mirror
- Windows 98, ME, NT 4.0, 2000, and XP drivers
- Windows-based FBG video capture application
- Optional SDK with sample applications
- Compatible with IVL Vision Library

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Installation

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Installation consists of inserting the FlashBus Spectrim board in the computer, installing the display driver, and running a setup program from two disks. This chapter contains specific instructions for the following:

- Installing the FlashBus Spectrim board
- Installing the FlashBus Spectrim software

Also in this chapter is a listing of system requirements for running FlashBus Spectrim software.

Hardware Installation

To install FlashBus Spectrim, complete the following steps:

1. If necessary, set the jumper switches. (See Appendix A for more information.)
2. Turn off your computer and disconnect all attached equipment and the power cord. Remove the computer cover.
3. Firmly insert the FlashBus Spectrim board into an empty expansion slot inside your computer. Screw its bracket to the inside of the back of the computer.
4. Reassemble the computer. The connector should be accessible through the back of the computer.
5. Turn on the computer and begin the software installation.

Software Installation

The FlashBus Spectrim software has the following minimum system requirements:

- Intel Pentium or later computer
- 16 MB of RAM
- Microsoft Windows 95, 98, NT 4.0, 2000, XP, or ME operating system

To install the software, complete the following steps:

1. Put the FlashBus Spectrim Setup disk in a CD-ROM drive and run SETUP.EXE. You will be guided through the installation of all the software components.
2. Select a 32K, 64K, or 16M color display mode when in onscreen capture to ensure color video input display. FBG can be used to verify your board and software installation.
3. The TWAIN driver may need to be selected as the current TWAIN source using the TWAIN applet in the Windows Control Panel.
4. Add the FlashBus Spectrim LIB and INCLUDE directories to your compiler's search paths before compiling the example code or your own FlashBus Spectrim applications. Alternatively, copy the .LIB and .H files to directories already in the search paths.

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FBG Application

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The FBG application controls all functions of FlashBus Spectrim under Windows. FBG offers live video in a resizable window and in a variety of video input types and standards. FBG can also control flash video grabs, save images to several file formats, and adjust a variety video parameters.

The following information is included in this chapter:

- Configuring the video window
- Configuring video captures
- Adjusting video and image quality

The chapter is organized according to menu items available at the top of the FBG window.

File and Edit

The FBG file and edit menus contain standard Windows options. Following are the notable options on the File menu (see Figure 1):

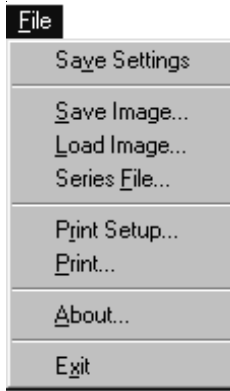


Figure 1

The File menu contains standard Windows saving and printing options.

- **Save Settings**—saves the current FBG configuration for the next time you open the application. To return FBG to default values, click Reset on each appropriate panel (as described in the following sections) and choose Save Settings again.
- **Save Image...**—saves an image in BMP, TGA, JPEG, or TIFF file format.
- **Load Image...**—retrieves saved images for viewing on the FBG window.
- **Series File...**—saves a series of images. First, enable a series capture (as described in the next section). Then choose Series File..., type a filename, and the series capture begins. Files are given the name you entered, appended with numbers that increase by one as the series progresses. See the “Advanced Configuration” section of the next section for more about file series.

Tools

The Tools menu contains two important choices pertaining to the FBG video window, remote video captures, image series captures, and more.

Configuration

Choosing Configuration... on the Tools menu opens the Configure panel (see Figure 2), which contains the following options:

- **Scale Video**—resizes live video to fit within the FBG window. If you do not select this, only a portion of the video appears in the window.
- **Keep Aspect**—maintains the video's proportion even if the window is resized. If you do not select this, the video is squeezed horizontally or vertically to fit in the window.
- **Field Rep**—eliminates uneven flash illumination on images. Live video consists of two rapidly alternating fields—one that displays video on odd-numbered lines and one that displays video on even-numbered lines. With a flash grab, one field is often illuminated more than the other. When you select Field Rep, the even field is copied over the odd field to even out the flash illumination.
- **One Field**—resizes video to less than or equal to 240 lines. This is small enough that only one field is required.
- **Offscreen**—transfers video to the system memory first and then to the VGA display memory.
- **X Center**—adjusts the horizontal position of the video in the view screen to cover any black lines on the right or left sides.
- **Y Center**—adjusts the vertical position of the video in the view screen to cover any black lines on the top or bottom.
- **JPEG Q**—changes the size of files that you save as JPEGs. Increasing the value creates higher-quality JPEGs but requires greater storage space.
- **Source**—changes the camera displayed on the video screen. The camera inputs are labeled 0–15, with 1 being the default.

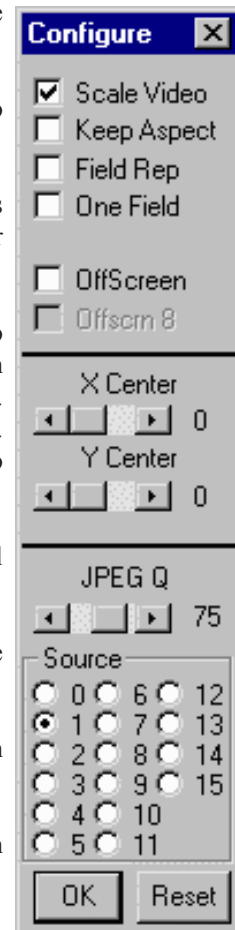


Figure 2

The Configure panel controls the size and field aspects of the FBG video screen.

Advanced Configuration

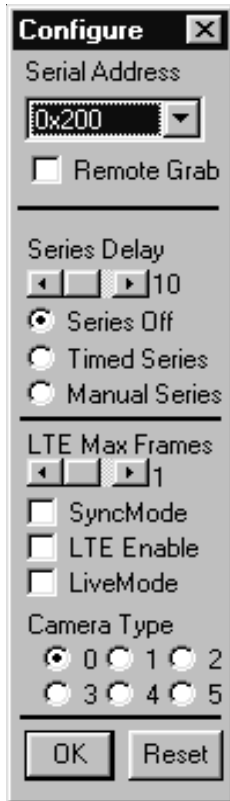


Figure 3

The advanced Configure panel controls series captures and long-term exposures.

Choosing Advanced Configuration... on the Tools menu opens another Configure panel (see Figure 3), which contains the following options:

- **Serial address**—not used with FlashBus Spectrim.
- **Remote Grab**—allows you to use a remote trigger for a flash grab with a compatible cable.
- **Series Delay**—sets the delay between each capture in a series. For example, setting this to 10 causes FBG to capture every ten seconds. Under the Series Delay setting are the following options:
 - **Series Off**—disables the Series Delay (default).
 - **Timed Series**—enables the Series Delay.
 - **Manual Series**—allows you to capture an irregular frequency of frames as part of a series.
- **LTE Max Frames**—captures the indicated number of frames in a single long-term exposure. See the “Application Notes” chapter for more information about long-term exposure.
 - **SyncMode**—required for certain LTE cameras (such as the Sony DXC950 and 970).
 - **LTE Enable**—enables the long-term exposure. You must change the Camera Type before you click LTE Enable.
 - **LiveMode**—not used with FlashBus Spectrim.
- **Camera Type**—change to 3 when using a long-term exposure camera. You must select 3 before choosing LTE Enable (see the “Application Notes” chapter for camera type information).

Setup

The Setup menu contains three choices for configuring video and image capture adjustments.

Limit Window

Clicking on Limit Window limits the size of the video to a maximum of 640×480 in NTSC or 760×570 in PAL.

Video Setup

Clicking on Video... opens the Video Setup panel (see Figure 4), which contains the following settings for live video in FBG:

- **Brightness**—changes the brightness of the live video.
- **Contrast**—changes the contrast of the live video.
- **Saturation**—changes the saturation of the live video. This is valid only for composite and S-Video input.
- **Hue**—changes the hue of the live video. This is valid only for composite and S-Video input.
- **Sharpness**—changes the sharpness of the live video. This is valid only for composite video input.
- **Auto Iris**—changes the iris voltage level (for auto-iris cameras only). This can also be controlled on the Grab Setup panel.
- **Standard**—allows you to select either the NTSC (default) or PAL video standard. NTSC is used in the Western Hemisphere, Japan, South Korea, The Philippines, and Taiwan. PAL is used almost everywhere else.
- **Input Type**—allows you to select the type of video input—RGB, composite, S-Video, or YUV—depending on the type of camera (consult the camera's documentation).



Figure 4

The Video Setup panel controls the appearance of live video and the video input type and standard.

Effects

Clicking on Effects displays a menu that allows you to rotate the video image clockwise (CW Rotation) or counterclockwise (CCW Rotation).

Grab Setup



Clicking on Grab... opens the Grab Setup panel (see Figure 5), which contains the following settings for flash grabs and grabbed images:

- **Brightness**—changes the brightness of a captured frame.
- **Contrast**—changes the contrast of a captured frame.
- **Field Delay**—indicates the number of fields to wait between a flash and a capture. This number is typically anywhere from 0 to 3.
- **Line**—indicates the number of lines to wait between a flash and a capture. This rarely needs to be changed from the default of 0.
- **Auto Iris**—changes the iris voltage level (for auto-iris cameras only). This can also be controlled on the Video Setup panel.
- **Align**—indicates which field should be grabbed first. Any (default) is usually sufficient, although Even or Odd is better when using a flash grab (try both Even and Odd to determine which one is correct for the situation).
- **Type**—indicates the type of camera and flash unit used (consult the camera's documentation).

Figure 5

The Grab Setup panel controls the appearance of captured images and flash parameters.

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Appendix



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Specifications and Jumpers

FlashBus Spectrim Technical Specifications

Video Inputs

- 4 RGB or YCrCb component inputs
- 8 S-Video color inputs
- 16 composite or monochrome inputs
- 25-pin input connector
- Video expansion header

Video Digitization

- NTSC M, NTSC N, NTSC 4.43, NTSC-Japan, SECAM, PAL BGDHI, PAL N, and PAL M format support
- ITU-601 digitization
- Software programmable control of offset, gain, hue, and saturation
- EEPROM for storing configuration and calibration settings

Video Acquisition

- Philips TriMedia video processor
- Smooth interpolated scaling to randomly sized windows
- Bus-mastering video transfers to system or display memory
- Hardware overlay of graphics over video
- RGB 32/24/16/15/8 and YUV 4:2:2 pixel formats
- Area of interest transfers to and from on-board and system memory
- 16 MB SDRAM frame buffer
- Fast image switching of camera inputs up to 20 images/sec
- Real-time image flip, mirror, or rotate

Video Output

- Composite, S-Video, and component video output
- Output video can be from video input with overlay, region of interest, or system memory

I/O Control

- Optically isolated output trigger for flash interface
- 1 general purpose input trigger
- 2 general purpose output triggers

External Control

On-board microcontroller
RS-232 control
Camera exposure control
Programmable DAC output (0V-10V)
12-volt DC output for camera power supply (fused at 1 amp)

Software Developers Kit

Windows 98, ME, NT 4.0, 2000, and XP DLLs
Video for Windows drivers
DirectDraw support
DirectShow support
Visual Basic support
TWAIN support
Sample applications with source code
Windows-based FBG capture application

Video Cables

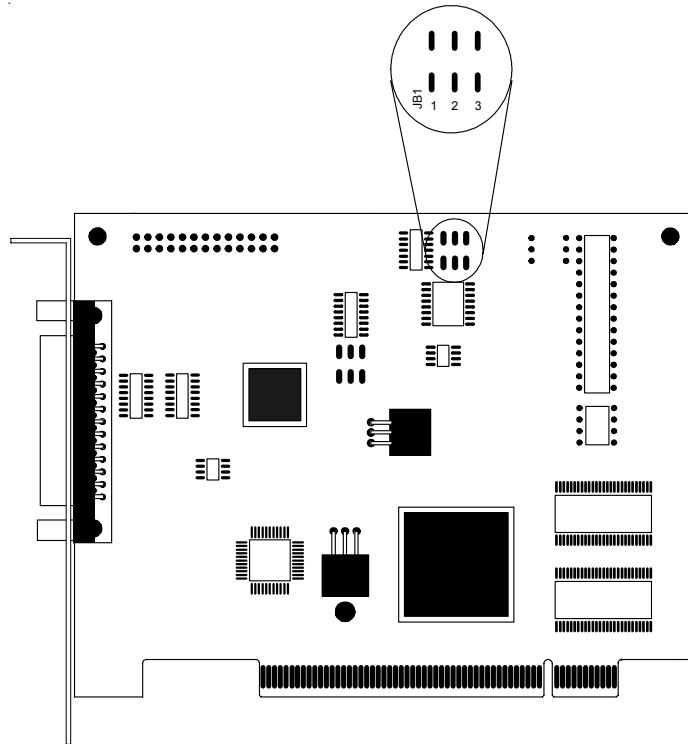
Composite, S-Video, and component input and output cables available
Custom cables and connector

Physical and Environmental

Board Size: 4.2" × 5.375"
Power Consumption: 8.2 W
FCC and CE approved

FlashBus Spectrim Jumper Settings

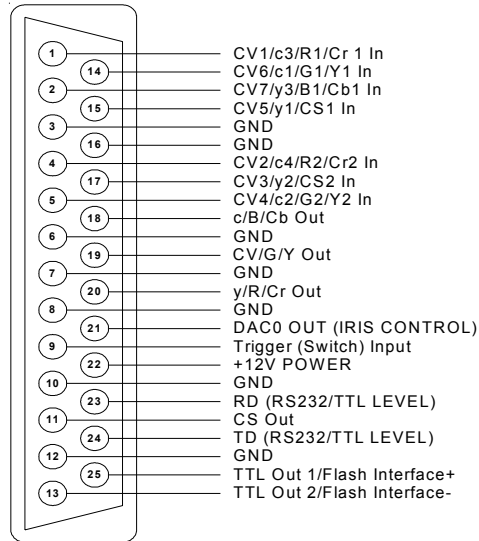
FlashBus Spectrim contains jumpers as indicated in the following diagram. The functions of the jumper settings are described in the table.



Purpose	JP1	JP2	JP3
Contact Closure	Open	Closed	Open
Primary TTL Out	Closed	Open	Open
Secondary TTL Out	Open	Open	Closed
Primary and secondary TTL Out	Closed	Open	Closed

FlashBus Spectrim DB-25 I/O Connector Pinout

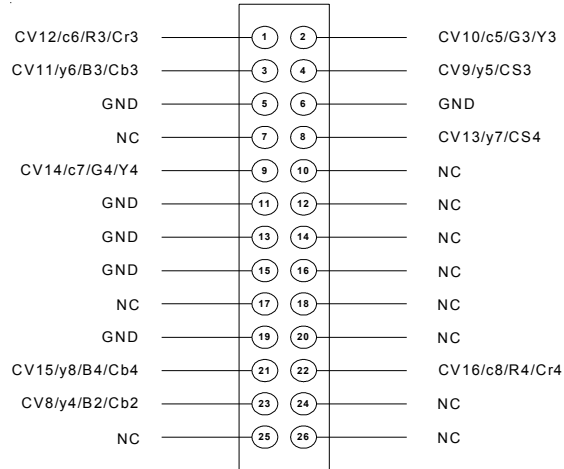
The FlashBus Spectrim board contains a DB-25 I/O connector on its bracket. The following diagram shows the pinout of the connector.



Note
y and c are for S-Video
Y is for YUV

FlashBus Spectrim Video Expansion Connector

The FlashBus Spectrim video expansion connector allows you to expand to 4 RGB, 8 S-Video, or 16 composite video inputs when used with the DB-25 connector. The following diagram shows the pinout of the connector.



Note
y and c are for S-Video
Y is for YUV

FlashBus Spectrim Lite Technical Specifications

Bus Format

PCI 2.2 Compliant
Universal slot

Video Inputs

3 Composite inputs
1 S-Video input
BNC or S-Video connector

Video Digitization

NTSC M, NTSC N, NTSC 4.43, NTSC-Japan, SECAM, PAL BGDHI, PAL N, and PAL M format support
ITU-601 digitization
Software programmable control of offset, gain, hue, and saturation
EEPROM for storing configuration and calibration settings

Video Acquisition

Philips TriMedia video processor
Smooth interpolated scaling to randomly sized windows
Bus-mastering video transfers to system or display memory
Hardware overlay of graphics over video
RGB 32/24/16/15/8 and YUV 4:2:2 pixel formats
Area of interest transfers to and from on-board and system memory
16 MB SDRAM frame buffer
Fast image switching of camera inputs up to 20 images/sec
Real-time image flip, mirror, or rotate

I/O Control

Optically isolated output trigger for flash interface
1 general purpose input trigger
1 general purpose output trigger

Software Developers Kit

Windows 98, ME, NT 4.0, 2000, and XP DLLs
Video for Windows drivers
DirectX support
Visual Basic support
TWAIN support
Sample applications with source code
Windows-based FBG capture application

(continued)

Video Cables

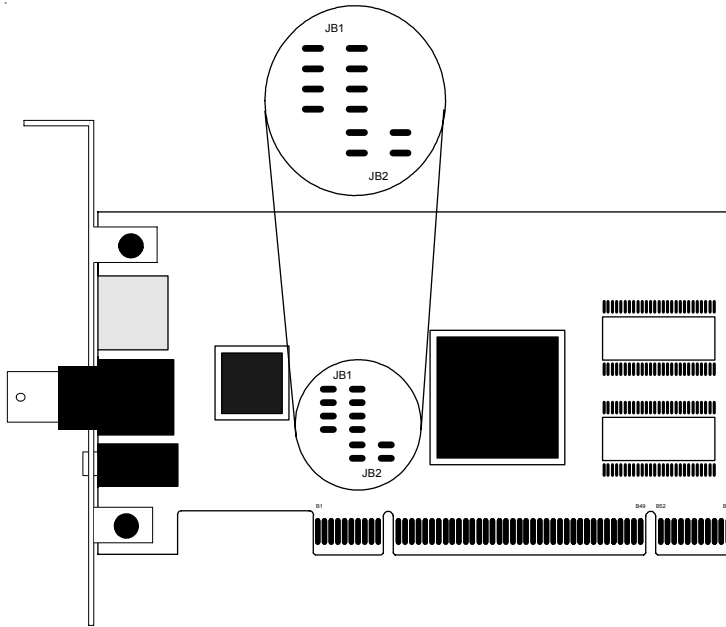
Composite, S-Video, and component input and output cables available
Custom cables and connector pinouts available upon request

Physical and Environmental

Small form factor—2.5" × 4.721"
Low power consumption: 4W
FCC and CE approved

FlashBus Spectrim Lite Jumper Settings

FlashBus Spectrim Lite contains jumpers as indicated in the following diagram. The functions of the jumper settings are described in the table.

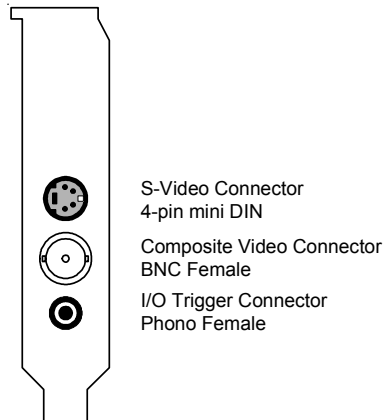


Switch	JB1-1	JB1-2	JB1-3	JB1-4
Switch Closure	Open	Closed	Closed	Open
TTL I/O	Closed	Open	Open	Closed

PCI Signaling Level*	JB2-1	JB2-2
3.3V	Closed	Open
5.0V	Open	Closed

FlashBus Spectrim Lite Connector

The FlashBus Spectrim Lite PC bracket is equipped with three standard connectors. The composite video input consists of a BNC female, and the S-Video input is a four-pin female mini DIN. The following diagram shows the connectors on the bracket.



FlashBus® Spectrim



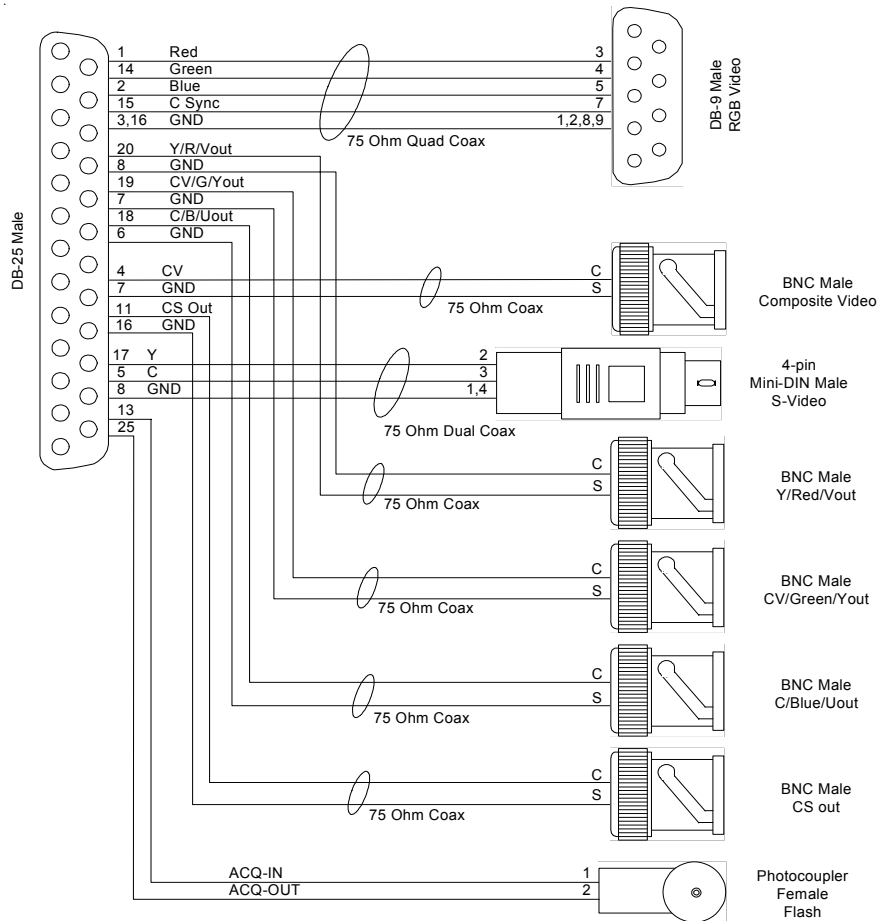
Appendix

B

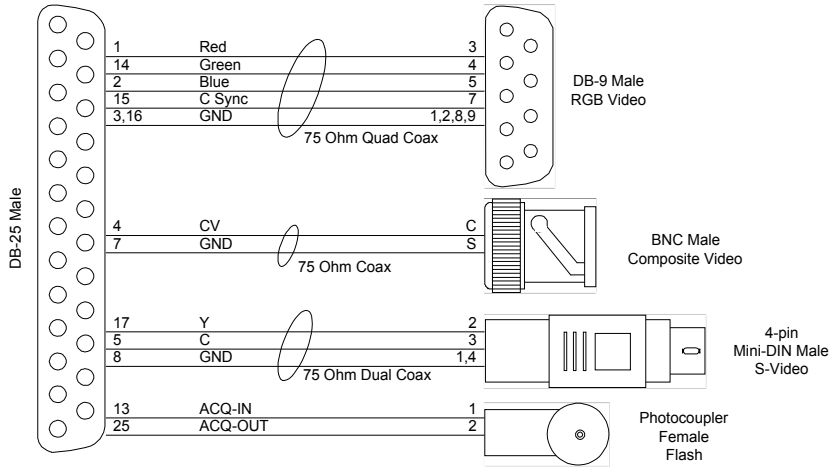
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 **Cables**

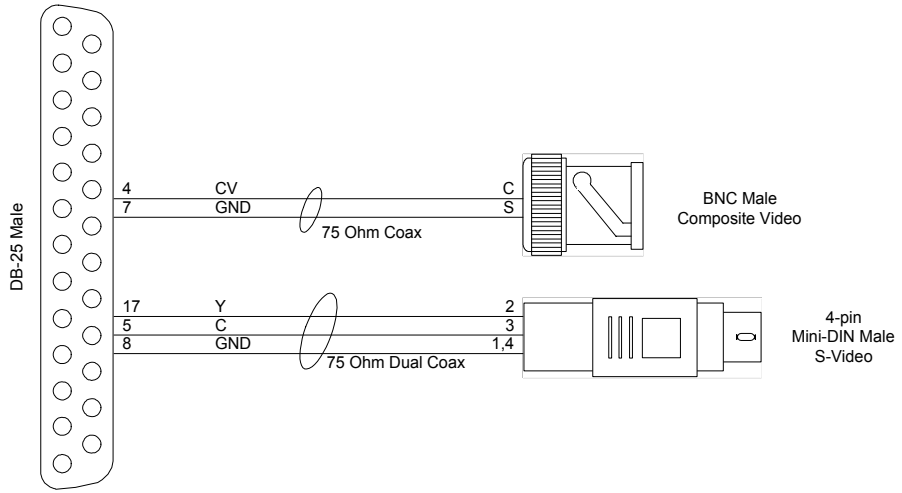
Expanded Cable with Video Output and Composite Sync—#3613



Expanded Cable—#3610

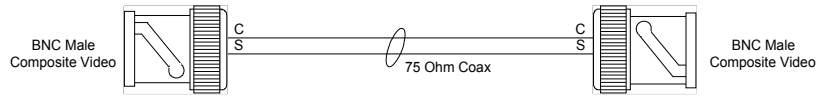


Basic Cable—#3620

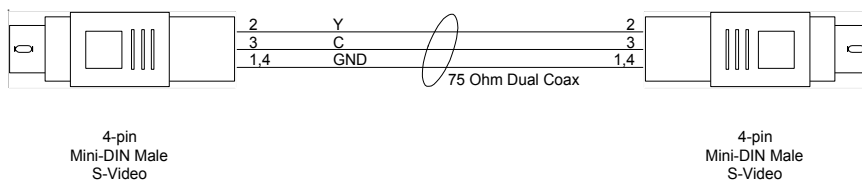


Composite Video Cable—#3651 and #3654

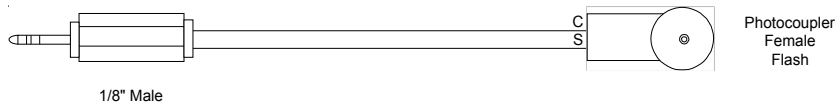
This cable is sold in lengths of 6 feet (#3651) and 12 feet (#3654).



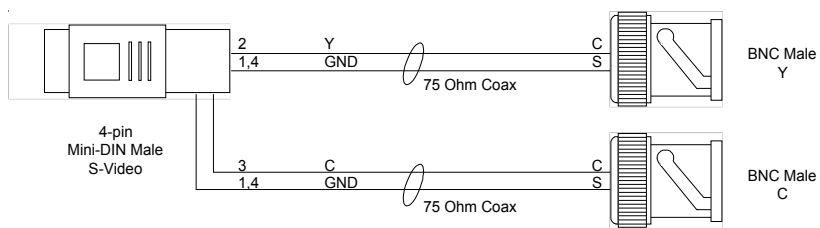
S-Video Cable—#3652



Flash Sync Cable—#3653



S-Video to Dual BNC Adapter Cable—#3655



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Appendix

C

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**Tech Support
and Warranty**

Technical Support

Integral Technologies is committed to providing you with superior technical and engineering support. When you need help with your FlashBus Spectrim hardware, please have the following information available:

- A complete description of the problem, including error messages and instructions for re-creating the error.
- Your computer configuration, including brand, processor, speed, and memory.
- Peripheral equipment you use with FlashBus Spectrim, including cameras, cables, and so on.
- Environment (Windows 95/98/ME/NT/2000/XP).
- Compiler brand and version.
- Sample code whenever possible and applicable.

Send the report to:

Integral Technologies

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Indianapolis, IN 46256-3336

Phone: (317) 845-9242
Fax: (317) 845-9275
Internet: support@integraltech.com
World Wide Web : <http://www.integraltech.com>

Technical Support Center Hours


Monday–Friday: 9:00 a.m.–5:00 p.m.*
Saturday–Sunday: Closed
Holidays: Closed

*Eastern Standard Time (GMT –05:00) all year

Federal Communications Commission (FCC) Radio Frequency Interference Statement

The FlashBus Spectrim video board contains incidental radio frequency-generating circuitry and, if not installed and used properly, may cause interference to radio and television reception. This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of the Federal Communications Commission (FCC) Rules. These limits are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference to radio and television reception, in which case users will be required to correct the interference at their own expense. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, users are encouraged to try to correct the interference by one or more of the following measures: Re-orient the television or radio receiving antenna, and/or relocate the FlashPoint board and the radio or TV with respect to each other. If necessary, users should consult the manufacturer or an experienced radio/television technician for additional suggestions. Users may find helpful the following booklet prepared by the Federal Communications Commission: "How to Identify and Resolve Radio-TV Interference Problems," which is available from the Government Printing Office, Washington DC, 20402 (stock # 004-000-00345-4).

CE Notice

Marking by the symbol  indicates compliance of this device to the EMC directive of the European Community. Such marking is indicative that this device meets or exceeds the following technical standards:

- EN55022: Conducted Emissions, Class B
- EN55022: Radiated Emissions, Class B
- IEC801-2: Electrostatic Discharge (ESD) 8kV Air, 4kV Contact
- IEC801-3: Radiated Immunity @3V/m, 27-1000MHZ, 80% modulated
- IEC801-4: Electrical Fast Transients (EFT) 1kV supply

Integral Technologies 1-Year Limited Warranty

What Does This Warranty Cover?

Integral Technologies (the “Company”) warrants to the Original Purchaser that the Company’s hardware is free from defects in workmanship or material under normal use and service. This warranty commences on the date of delivery of the hardware to the Original Purchaser.

What are the Company’s Obligations Under This Warranty?

During the warranty period, the Company agrees to repair or replace, at its sole option, without charge to Original Purchaser, any defective component part of the hardware. To obtain service, Original Purchaser must return the hardware to the Company in an adequate container for shipping. All defective products must be returned to the Company within thirty (30) days of failure. Products must be returned with a description of the failure and Return Merchandise Authorization (RMA) number supplied by the Company. To receive a RMA number and obtain assistance on where to deliver the hardware, call (317) 845-9242. The postage, shipping, and insurance charges incurred in shipping to the Company will be paid by Original Purchaser, and all risk for the hardware shall remain with the Original Purchaser until such time as Company takes receipt of the hardware. Upon receipt, the Company will promptly repair or replace the defective unit, and then return said unit to Original Purchaser, postage and shipping prepaid. The Company may use reconditioned or like-new parts or units, at its sole option, when repairing any hardware. Repaired products shall carry the same amount of outstanding warranty as from original purchase, or ninety (90) days, whichever is greater. Any claim under the warranty must include dated proof of purchase or invoice. In any event, the Company’s liability for defective hardware is limited to repairing or replacing the hardware.

What Does This Warranty Not Cover?

This warranty is contingent upon proper use of the hardware by Original Purchaser and does not cover: if damage is due to accident; unusual physical, electrical, or electromechanical stress; modification; neglect; misuse; failure of electric power, air conditioning, or humidity control; transportation; operation with media not approved by the Company; or tampering with or altering of the hardware.

What is the Length of the Warranty?

The warranties given herein, together with any implied warranties covering the hardware, including any warranties of merchantability or fitness for a particular purpose, are limited in duration to one year from the date of delivery to Original Purchaser. Jurisdictions vary with regard to the enforceability of warranty limitations, and you should check the provisions of your local jurisdiction to find out whether the above limitation applies to you.

What are the Limits on the Company's Liability?

The Company shall not be liable to you for loss of data, loss of profits, lost savings, special, incidental, consequential, indirect, or other similar damages arising from breach of warranty, breach of contract, negligence, or other legal action even if the Company or its agent has been advised of the possibility of such damages, or for any claim brought against you by another party. Jurisdictions vary with regard to the enforceability of provisions excluding or limiting liability for incidental or consequential damages. You should check the provisions of your local jurisdiction to find out whether the above exclusion applies to you.

This warranty allocates risks of product failure between Original Purchaser and the Company. The Company's hardware pricing reflects this allocation of risk and the limitations of liability contained in this warranty. The warranty set forth above is in lieu of all other express warranties, whether oral or written. The agents, employees, distributors, and dealers of the Company are not authorized to make modifications to this warranty, or additional warranties binding on the Company. Accordingly, additional statements such as dealer advertising or presentations, whether oral or written, do not constitute warranties by the Company and should not be relied upon.

This warranty gives you specific legal rights. You may also have other rights which vary from one jurisdiction to another.

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