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IC-PCI™

Installation Guide

47-G60002-01

Rev 01
January 1998

CORECO IMAGING

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IC-PCI Installation Guide

47-G60002-01

Revised January 1998

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EU Declaration of Conformity

Imaging Technology, Inc., 55 Middlesex Turnpike, Bedford, Massachusetts 01730 USA
tel: 617–275–2700 fax: 617–275–9590

We, the manufacturer, declare, under our sole responsibility, that the products identified in this declaration,

IC–PCI	IM–PCI	IMA	IMS	
CMC–PCI	CMC–VME	DMPC	DPX	FBV–PCI
AM–CLR	AM–DIG	AM–FA	AM–MTD	AM–VS
CM–ALU	CM–BC	CM–BC	CM–CLU	CM–GEO
CM–HF	CM–IPI	CM–MEM	CM–MMP	CM–PA

and to which this declaration relates, are in conformity with the protection requirements of Council Directive 89/336/EEC as amended by 92/31/EEC and 93/68/EEC on the approximation of the laws of the Member States relating to **Electromagnetic Compatibility**.

Attestation is provided according to article 10 (2) of the Directive by a **Technical Construction File**.

Technical File Number: 41–4768 Issue: 2 Dated: 26 November 1996

The following standards are referenced in the file:

EN55011:1991	Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio–frequency equipment	EC1000–4–2:1995	Electrostatic discharge immunity test
		EC1000–4–3:1995	Radiated, RF, EM field immunity test
		EC1000–4–4:1995	Electrical fast transient/burst immunity test
EN55022:1994	Limits and methods of measurement of radio disturbance characteristics of information technology equipment	EC1000–4–5:1995	Surge immunity test
		EC1000–4–6:1994	Conducted immunity test
EN60601–1–2:1993	Medical electrical equipment	EC1000–4–11:1994	Voltage Variation, Dips, and Interruptions
EN50082–1:1991	Generic Immunity Standard	ENV50141:1993	Conducted RF Immunity

A Technical Report/Certificate has been issued in accordance with Part V (Reg 50) of the UK Regulations (SI 1992 No. 2372) by a UK appointed Competent Body, namely,

Interference Technology International Limited
41–42 Shrivenham Hundred Business Park
Shrivenham, Swindon, Wilts. SN6 8TZ
England, UK

Certificate number: C372IMT1.DWS Dated: 2 December 1996

We also declare that Low Voltage Directive 73/23/EEC does not apply to the above listed products since operating voltage levels are all below 75 volts DC.

The Authorized Signatory to this declaration, on behalf of the manufacturer, is identified below:



Signed:
Name: Ernest G. Henrichon, Jr.
Title: VP of Engineering
Location: Bedford, Massachusetts, USA
Date: December 5, 1996

The Responsible Person, based within the EC, is identified below:

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INTRODUCTION

This document leads you through installing the IC-PCI hardware and software. By following the steps outlined, you can perform basic image capture functions. For more advanced applications, consult the software manuals and hardware reference manuals.

This installation guide covers:

- Configuring the IC-PCI board
- Configuring the AM-VS, AM-DIG, and AM-FA (the AM-CLR does not have configuration switches)
- Installing the IC-PCI board in the host computer
- Connecting cameras
- Installing the ITEX™ library

Please Note

The IC-VS is an IC-PCI mother board with an AM-VS acquisition module

The IC-DIG is an IC-PCI mother board with an AM-DIG acquisition module

The IC-FA is an IC-PCI mother board with an AM-FA acquisition module

The IC-COMP is an IC-PCI mother board with an AM-STD-COMP acquisition module

The IC-RGB is an IC-PCI mother board with an AM-STD-RGB acquisition module

If you experience difficulty or have a failure, call the dealer or representative. If you purchased the IC-PCI directly from Imaging Technology Incorporated, call the Customer Response Center at (617) 275-2700, or the electronic answering system at (617) 275-9500. Please fill out the “Customer Response Form” at the end of this guide before calling.

EMC/EMI Precautions

This product has been tested and found to comply with the FCC limits for a class A device. The intended use of this product is in a commercial, industrial work environment. Operation of this product within a domestic environment may cause radio interference, in which case the user may be required to take adequate measures.

This product has been tested and found to comply with the European Community Directive for EMC, 89/336/EEC. In order to maintain compliance with the EMC Directive this product must be installed in an EEC EMC compliant chassis that has a CE marking. Additionally, all cables used to connect the computer and peripherals must be shielded, grounded and securely fastened.

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In This Shipment

You need the following items (in this shipment) to complete the instructions in this guide:

1. IC-PCI image capture board
2. Acquisition module (AM; already installed on the IC-PCI if ordered together)
3. Break-out cables (at least one) illustrated in Figure 22 (page 15) used with AM-VS, AM-FA, or AM-CLR; not used with AM-DIG or AM-MTD.
4. Camera Adapter cables (at least one) illustrated in Figures 24 (page 16) and Figure 25 (page 21) that connect to break-out cable, or directly to IC-PCI with AM-DIG.
5. One CD-ROM containing ITEX object code and on–line documentation

What You Need

These items are necessary to complete the instructions in this guide:

1. Host computer: PCI bus computer
2. Operating system: DOS 6.2 or later
3. Windows 3.1 or Windows for Workgroups 3.1.1,
   Windows NT 4.0, or Windows 95
4. Text editor
5. Compilers under Windows 3.1 or 3.1.1:
   WATCOM C/C++ v10 32-bit library,
   or, Visual C++ 1.52
   Compilers under Windows NT and Windows 95:
   Microsoft Visual C++ v5.x, Visual Basic 5.x
6. Camera: RS-170 mono, RS-170 RGB, CCIR mono, CCIR RGB, NTSC, PAL
7. Monitor: VGA, multisync, or multiscan (attached to host computer)

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Installation Procedure

Perform the following steps in order. Each step is discussed fully in this document, beginning on the page noted.

Please read the license agreement and fill out the software registration card.

Part 1. Hardware Configurations (page 5) — 30 minutes.

1. Check the Acquisition Module (page 6).
2. Install the IC-PCI board (page 14).
3. Connect the camera and monitor cables (page 14).

Part 2. ITEX Library Installation (page 23) — 30 minutes

Windows 3.1, Windows for Workgroups 3.1.1 Win16

1. Copy the media (page 23).
2. Edit your system environment (page 25).

Windows NT 4.0, Windows 95 Win32

1. Install the device driver for Windows 95 (page 29).
2. Copy the media (page 29).
3. Edit your system environment (page 31).
4. Run the Configurator (page 33).

Part 3. Hardware Configuration Files (page 35).

1. Edit the configuration file (page 36).
2. Edit the ASCII text file in DOS (page 36) then convert it into binary (page 36), or use the Configurator utility.

The installation is complete at this point.

Part 4. Building an Example Application (page 37).

Building with ITEXprep Win16

1. Create a Makefile for “examples\icpapps” (page 37).
2. Compile the Application (page 37).
3. Run the Application (page 38).

Building with Developer Studio Win32

1. Build an Example (page 39).

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NOTES

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PART 1
HARDWARE CONFIGURATIONS

Static electricity can damage boards. Take the following precautions when handling MVC products:

- Keep all circuit boards in the antistatic packaging until you are ready to install them
- Wear a grounding wrist strap, or touch a grounded surface before removing the board from its package. This discharges any static electricity that may have built up in your body.
- Handle all circuit boards by the edges or connectors and avoid touching any components.

CAUTION *Failure to follow these precautions can cause severe equipment damage.*

Figure 1 illustrates the IC-PCI board, with an Acquisiton Module (AM) installed.

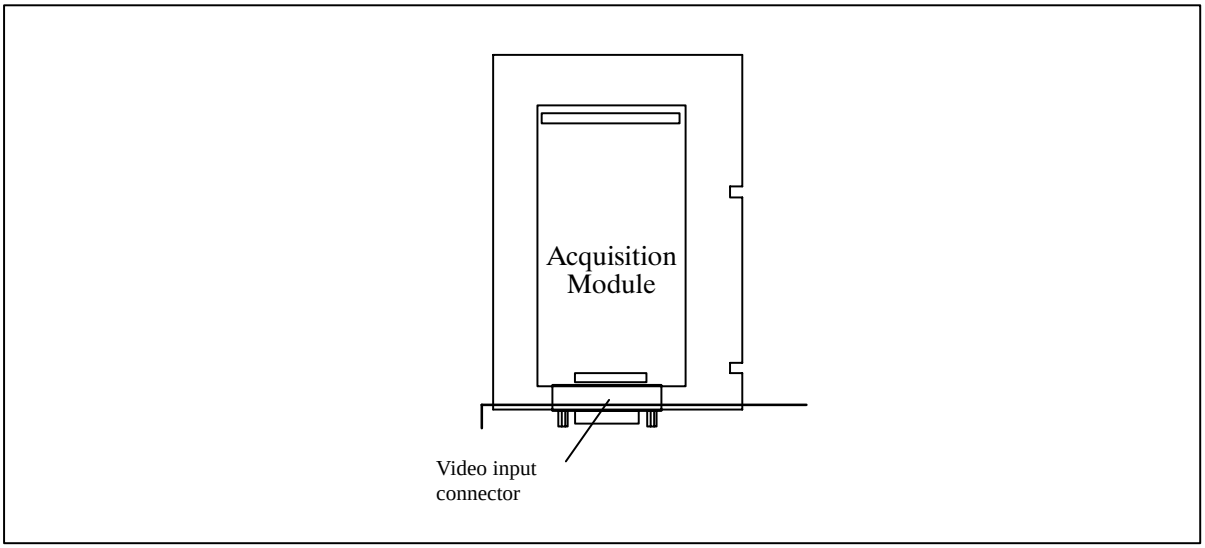


Figure 1. IC-PCI Board

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STEP 1. Check the Acquisition Module

If you do not have an acquisition module, skip forward to Step 2 on page 14. Other wise, proceed as directed below:

- AM-CLR module, refer to section 1.1.
- AM-VS module, refer to section 1.2 on page 6.
- AM-DIG module, refer to section 1.3 on page 11.
- AM-FA module, refer to section 1.4 on page 12.

1.1 AM-CLR Color Acquisition Module

There are no configuration switches or jumpers on the AM-CLR. All options are software programmable.

CAUTION *Do not tamper with the adjustable components (resistors and capacitors) on the AM-CLR board.*

1.2 AM-VS Variable-Scan Acquisition Module

This section configures the AM-VS module. Figure 2 illustrates the location of the configuration switches on the AM-VS.

CAUTION *Do not tamper with the adjustable resistor on the AM-VS board.*

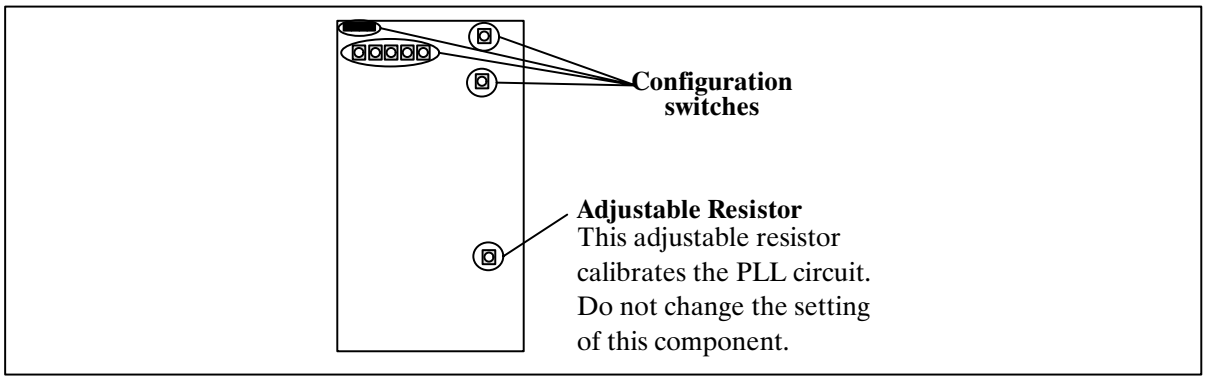


Figure 2. AM-VS Board

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Composite Video input: If your camera supplies synchronization on the video signal (one BNC connector) use the factory default. Figure 3 illustrates this configuration. *All four camera inputs accept monochrome composite video.*

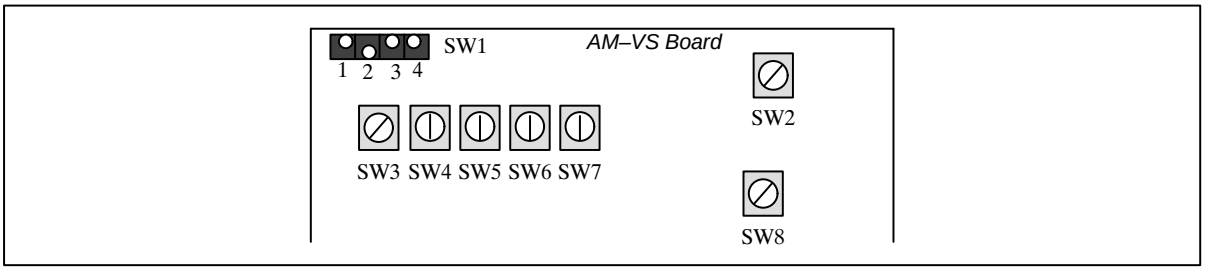


Figure 3. RS-170 or CCIR Composite Video Input

Composite Sync input: If your camera supplies a separate composite synchronization (two BNC connectors; video and synchronization) change the position of switches SW6 and SW8, as illustrated in Figure 4. *Only CAM0 accepts separate sync inputs.*

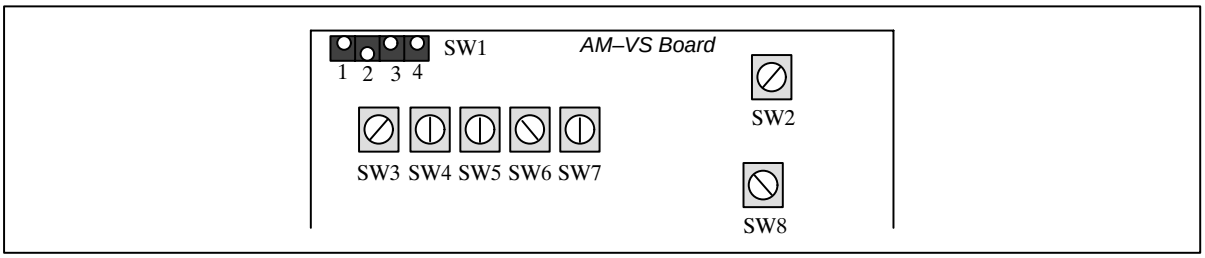


Figure 4. RS-170 or CCIR Separate Composite Sync Input

NOTE *The AM-VS does not support separate horizontal and vertical input signals (three BNC connectors; video, horizontal, and vertical).*

Composite Sync Output: If your camera requires a composite sync input, configure the AM-VS to output composite sync, as illustrated in Figure 5. This configuration allows the camera to synchronize (gen-lock) to the AM-VS timing. *All four camera inputs supply composite sync to the camera.*

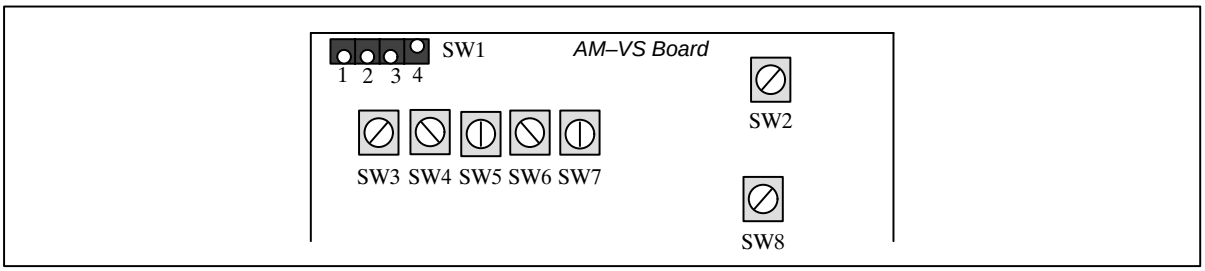


Figure 5. Composite RS-170 or CCIR Sync Output

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Horizontal and Vertical Sync Output: If your camera requires separate horizontal and vertical sync inputs, configure the AM-VS to output separated sync signals, as illustrated in Figure 6. This configuration allows the camera to synchronize (gen-lock) to the AM-VS timing. *All four camera inputs supply separate syncs to the camera.*

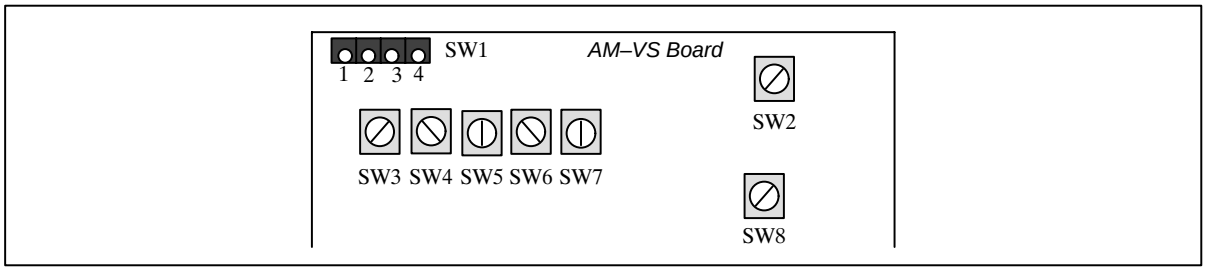


Figure 6. Horizontal and Vertical Sync Output

XC7500: The Sony XC7500 Progressive Scan camera requires separate horizontal and vertical sync. Figure 6 illustrates this configuration. All four camera inputs supply separate syncs to the camera. The AM-VS incorporates a special XC7500 timebase to drive this camera.

CV-M10BX: The Protec/Costar CV-M10BX Progressive Scan camera requires separate horizontal and vertical sync. The AM-VS Frame Reset signal is the camera's trigger input signal. Figure 7 illustrates this configuration. Only the CAM0 and CAM1 connectors support this signal.

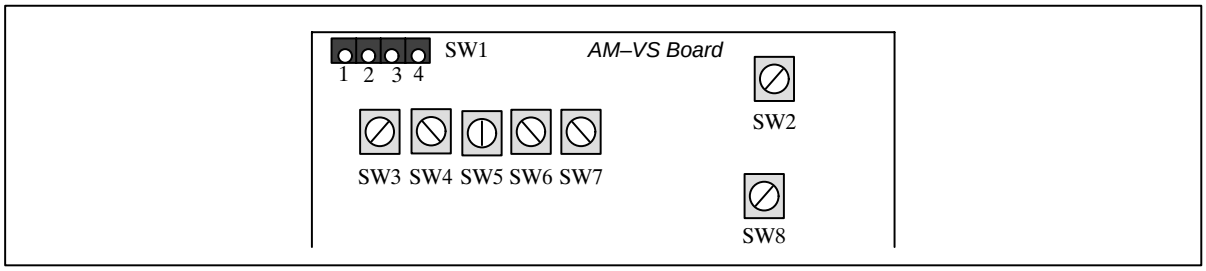


Figure 7. CV-M10BX Configuration

Use the AM-VS XC7500 timebase to drive the CV-M10BX camera. The CM-M10BX camera can be connected to the CAM0 or CAM1 camera ports, using the CVM10-6 cable.

Non-Standard or Variable Scan Cameras

Cameras that do not adhere to the standards for broadcast signals are supported in "variable-scan" modes. The AM-VS accepts single-ended or differential timing signals from area scan and line scan devices.

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Area Scan TTL Timing: Figure 8 illustrates the AM-VS configuration for an area scan camera with single-ended TTL timing signals for: line enable (LEN), frame enable (FEN), and pixel clock (VSCLOCK). *CAM0 and CAM1 support variable-scan. CAM2 and CAM3 support monochrome composite video (RS-170 and CCIR).*

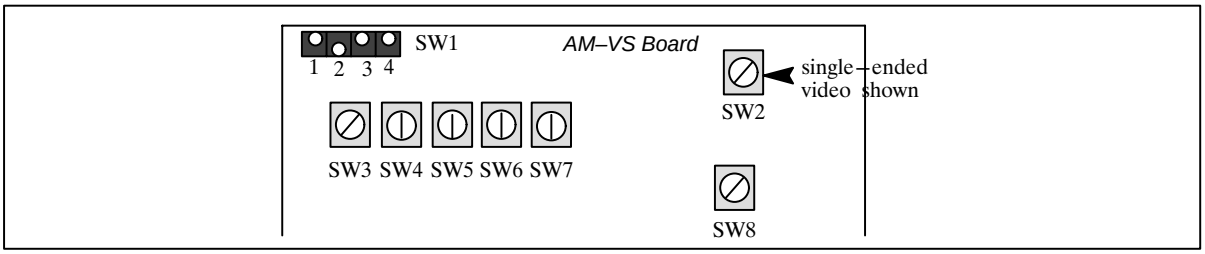


Figure 8. Single-Ended TTL Timing

Area Scan Differential Timing: Figure 9 illustrates the AM-VS configuration for an area scan camera with differential RS-422 timing signals for: line enable (LEN), frame enable (FEN), and pixel clock (VSCLOCK). *CAM0 and CAM1 together create one differential variable-scan timing input. CAM2 and CAM3 support monochrome composite video* (*RS-170 and CCIR).*

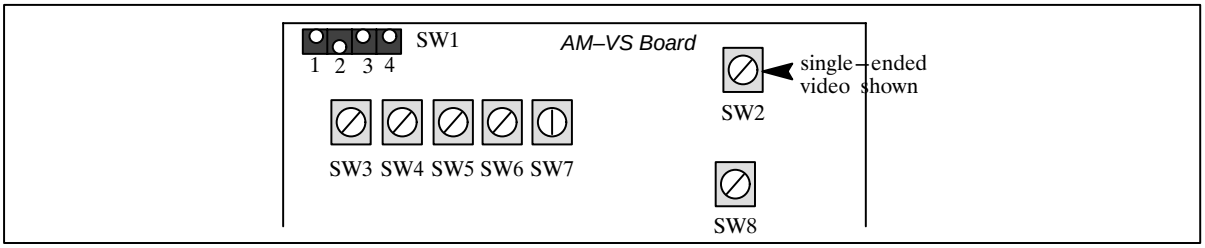


Figure 9. Differential Timing

Line Scan TTL Timing: Figure 10 illustrates the AM-VS configuration for a line scan camera or sensor with single-ended timing signals for: line enable (LEN) and pixel clock (VSCLOCK). *CAM0 and CAM1 support variable-scan. CAM2 and CAM3 support monochrome composite video* (RS-170 and CCIR).

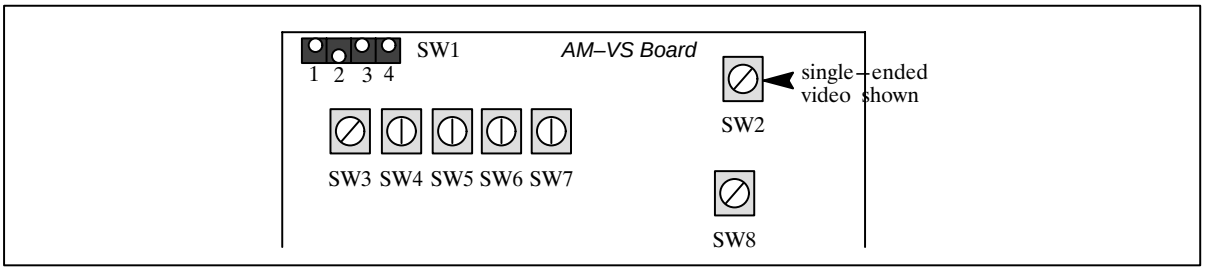


Figure 10. Line Scan TTL Timing

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Line Scan Differential Timing: Figure 11 illustrates the AM-VS configuration for a line scan camera or sensor with differential timing signals for: line enable (LEN) and pixel clock (VSCLOCK). *CAM0 and CAM1 together create one differential variable-scan timing input. CAM2 and CAM3 support monochrome composite video* (RS-170 and CCIR).

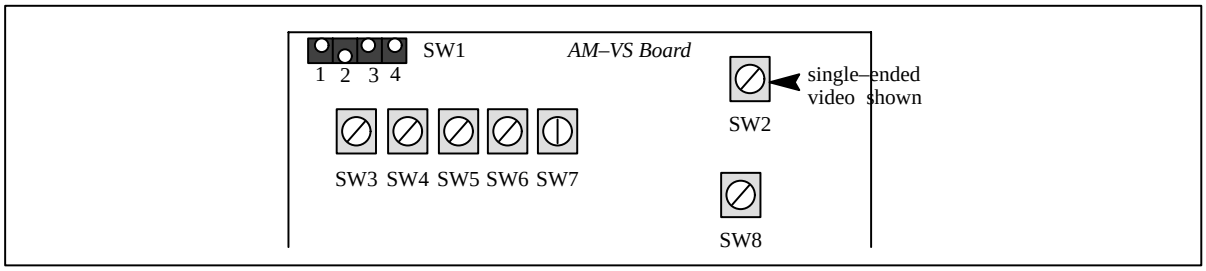


Figure 11. Differential Line Scan Timing

Dalsa Camera: Figure 12 illustrates the AM-VS configuration for a Dalsa area scan or line scan camera. The Dalsa cameras have differential line enable (LEN), frame enable (FEN), and pixel clock (VSCLOCK). The Dalsa configuration also supports a negative voltage video signal on CAM0-C; if the CAM0-B input is grounded, the amplifier inverts the signal. CAM0 and CAM1 together create one differential variable-scan timing input. *CAM2 and CAM3 support monochrome composite video (RS-170 and CCIR).*

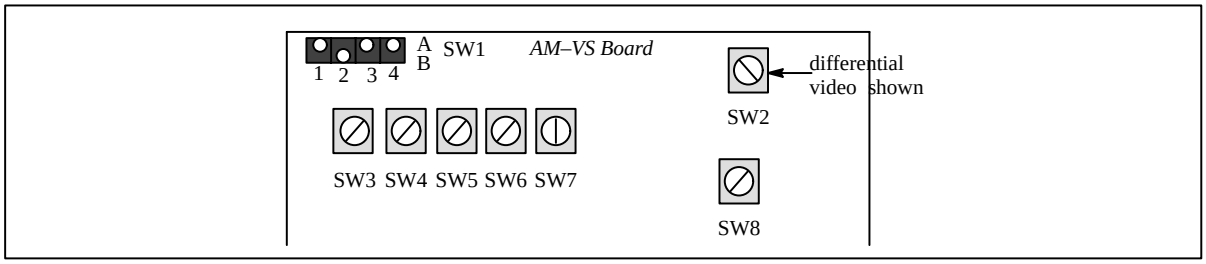


Figure 12. Dalsa Camera Configuration

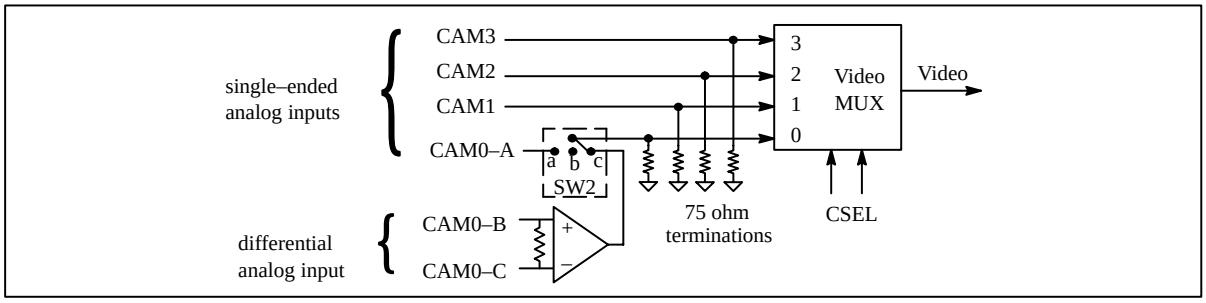


Figure 13. Differential Video Input

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1.3 AM-DIG Digital Acquisition Module

This section configures the AM-DIG module. If you do not have an acquisition module, skip forward to Step 2 on page 14.

The two switches on the AM-DIG configure the timing inputs to accept either RS422 or TTL timing signals from the digital camera. Figure 14 shows the location of these switches on the AM-DIG. These switches only affect the timing inputs. The data inputs are configured at the factory according to the model ordered, and cannot be changed.

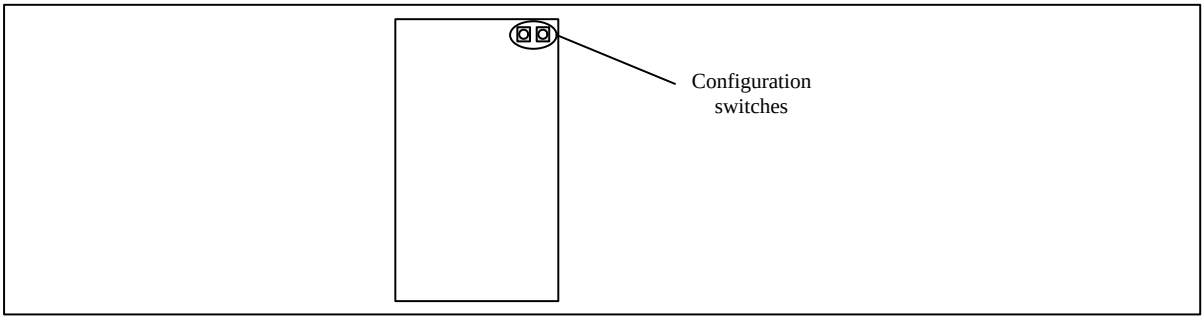


Figure 14. AM-DIG Board Switch Location

Differential Timing input: Figure 15 illustrates the AM-DIG configured to receive RS422 differential timing signals from the camera.

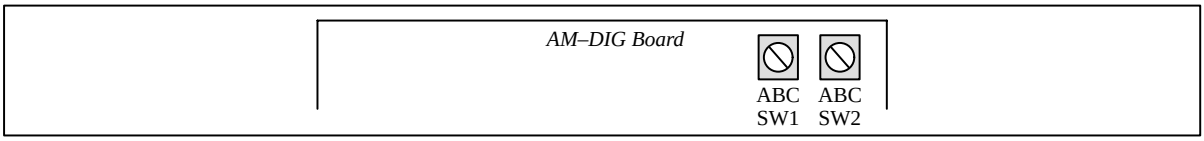


Figure 15. AM-DIG Differential Timing Inputs

TTL Timing inputs: Figure 16 illustrates the AM-DIG configured to receive TTL timing signals from the camera.

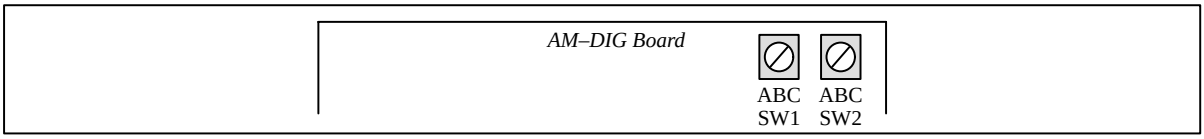


Figure 16. AM-DIG Single-Ended Timing Inputs

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1.4 AM-FA Fast Analog Acquisition Module

This section configures the AM-FA module. Figure 17 illustrates the location of the configuration switches on the AM-FA.

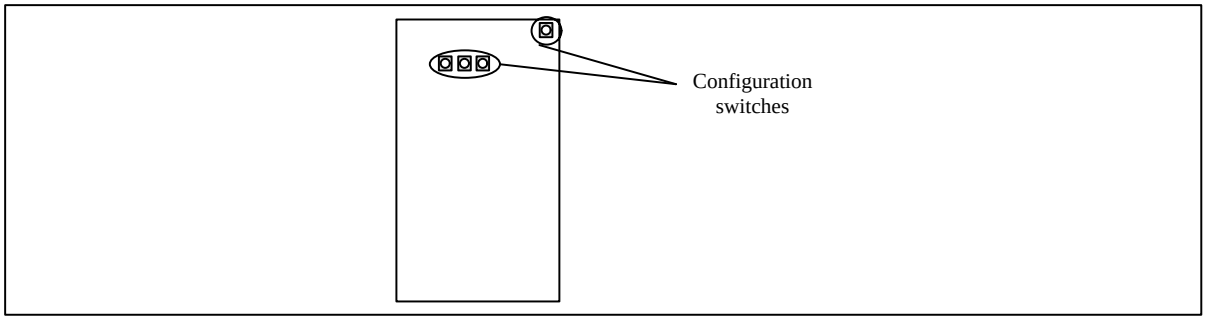


Figure 17. AM-FA Board Switch Location

Timing Inputs: Two switches on the AM-FA configure the timing inputs to accept either RS422 or TTL timing signals from the camera. These switches only affect the timing inputs.

Differential Timing inputs: Figure 18 illustrates the AM-DIG configured to receive RS422 differential timing signals from the camera.

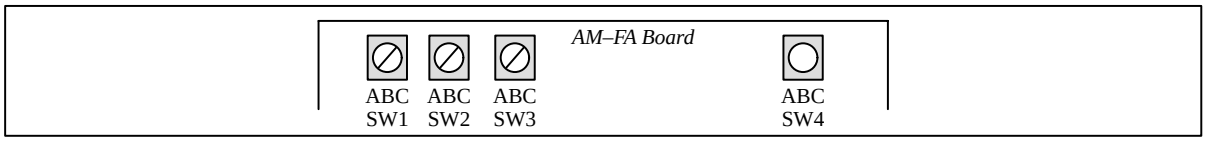


Figure 18. AM-FA Differential Timing Inputs

TTL Timing inputs: Figure 19 illustrates the AM-DIG configured to receive TTL timing signals from the camera. *This is the factory default.*

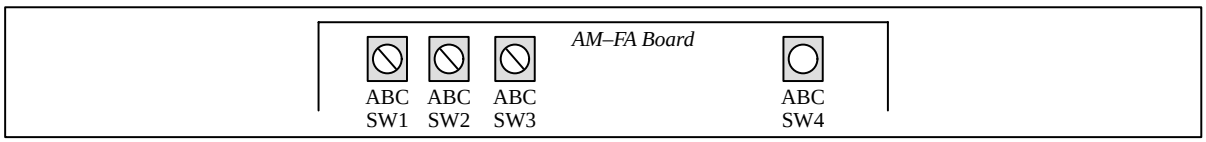


Figure 19. AM-FA Single-Ended Timing Inputs

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CAM0 Differential Video: Figure 20 illustrates the AM-FA configuration for differential video signal on CAM0-B and CAM0-C. This same configuration can be used for a negative video signal (Dalsa analog camera). If the CAM0-B input is grounded, the amplifier inverts the signal on CAM0-C. *CAM-1, CAM2 and CAM3 support only positive single-ended video.*

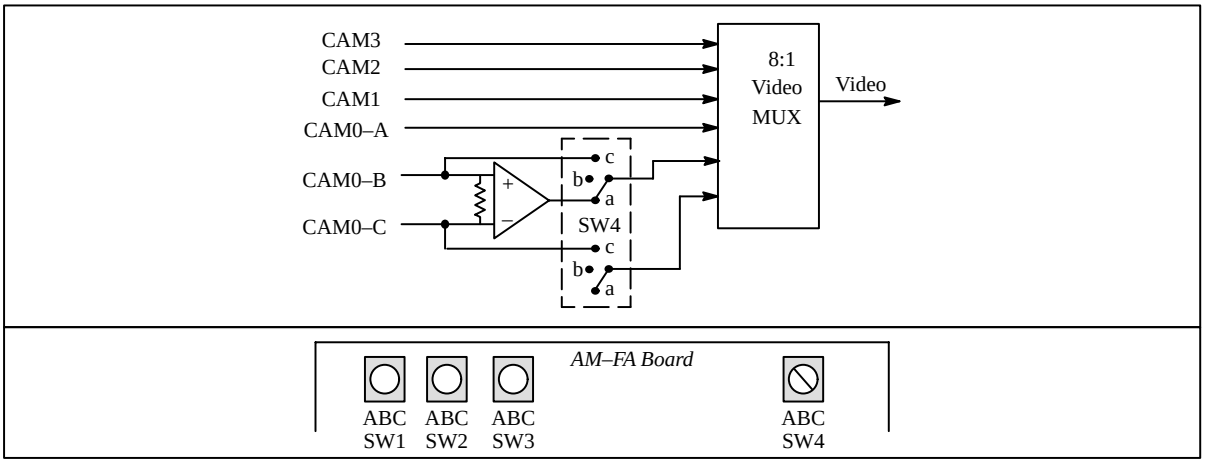


Figure 20. AM-FA Differential Video on CAM0

CAM0 Single Ended Video: Normally, CAM0-A, CAM0-B, and CAM0-C are used for single ended positive video inputs. Figure 21 illustrates the AM-FA configuration for positive video signals on CAM0-A,B,C. *This is the factory default.*

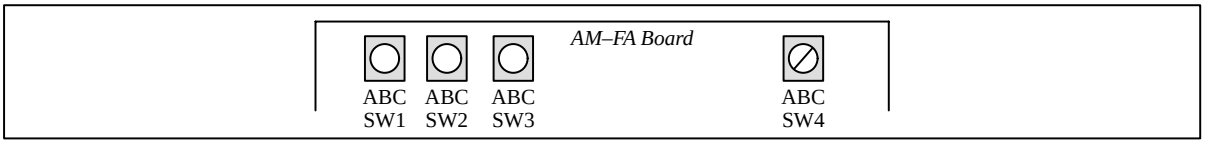


Figure 21. AM-FA Positive Single-ended Video on CAM0

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STEP 2. Install the IC-PCI Board

Static electricity can damage boards. Take the following precautions when handling MVC products:

- Keep all circuit boards in the antistatic packaging until you are ready to install them
- Wear a grounding wrist strap, or touch a grounded surface before removing the board from its package. This discharges any static electricity that may have built up in your body.
- Handle all circuit boards by the edges or connectors and avoid touching any components.

CAUTION *Failure to follow these precautions can cause severe equipment damage.*

The IC-PCI mother board plugs directly into a PCI-bus computer. Follow these directions to install boards in a host computer.

1. Turn off (and unplug) the computer and any attached devices.
2. Select a PCI-bus slot on the PC motherboard. Hold the IC-PCI board by the edges; avoid touching the components or connectors.
3. Press the board firmly into the motherboard. Make sure the connections are solid.
4. Connect all video cables (covered in Step 3) before connecting any power cables.

STEP 3. Connect the Camera Cables

The IC-PCI has one 44-pin connector on the end-bracket for video input and cameras.

Video input cables for the IC-PCI fall into two categories: break-out cables and adapter cables. The break-out cables separate the 44-pin input connector into four 15-pin camera connectors and one 9-pin miscellaneous signal connector. The AM-CLR, AM-VS, and AM-FA use the break-out cables. The AM-DIG does not use the break-out cables.

NOTE *Secure all cable screws to ensure adequate sheilding. All cables used to connect the computer and peripherals must be shielded, grounded, and securely fastened.*

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Breakout Cables

Three different versions of the break-out cables used with the AM-CLR, AM-VS, and AM-FA support one, two, and four cameras.

a. One camera cable: (labeled 4606-1)

b. Two camera cable: (labeled 4606-2)

c. Four camera cable: (labeled 4606-4)

NOTE *NTSC, PAL, or SVHS on AM-CL need the* four *camera cable.*

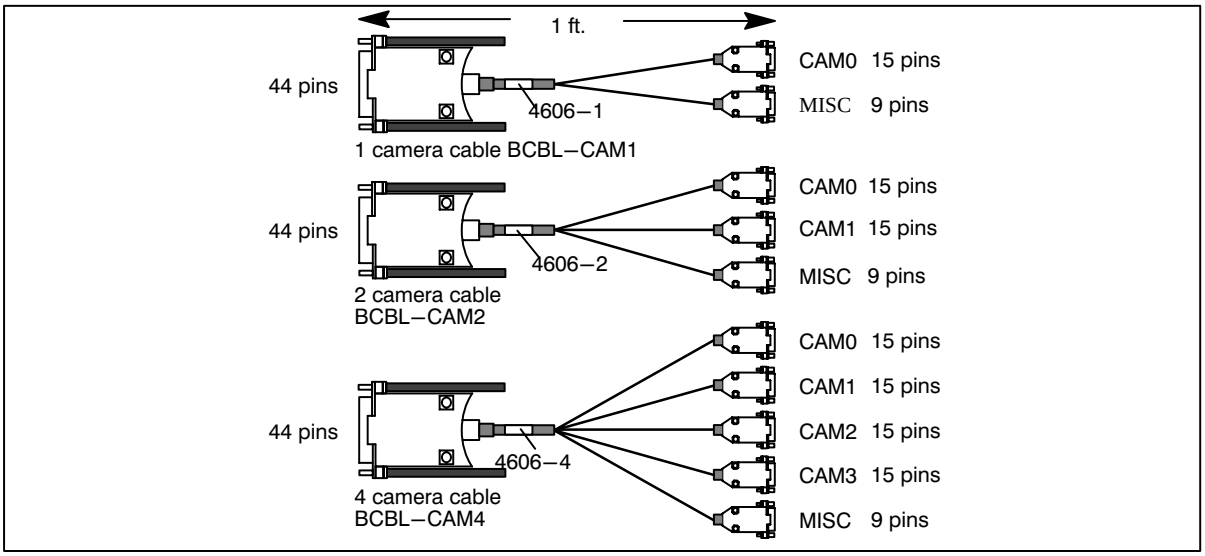


Figure 22. Break-Out Cables

The ACBL-MISC cable connects to the 9-pin MISC connector.

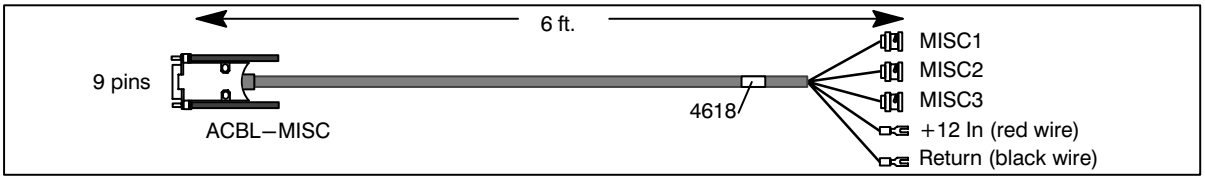


Figure 23. MISC. Cable

CAUTION *To avoid equipment damage, turn off power before connecting or disconnecting cameras or cables.*

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Adapter Cables

Adapter cables (Figure 24) connect cameras to 15-pin connectors on the break-out cables. Other adapter cables may be available. See the applicable AM hardware reference manual for Cable pin-outs.

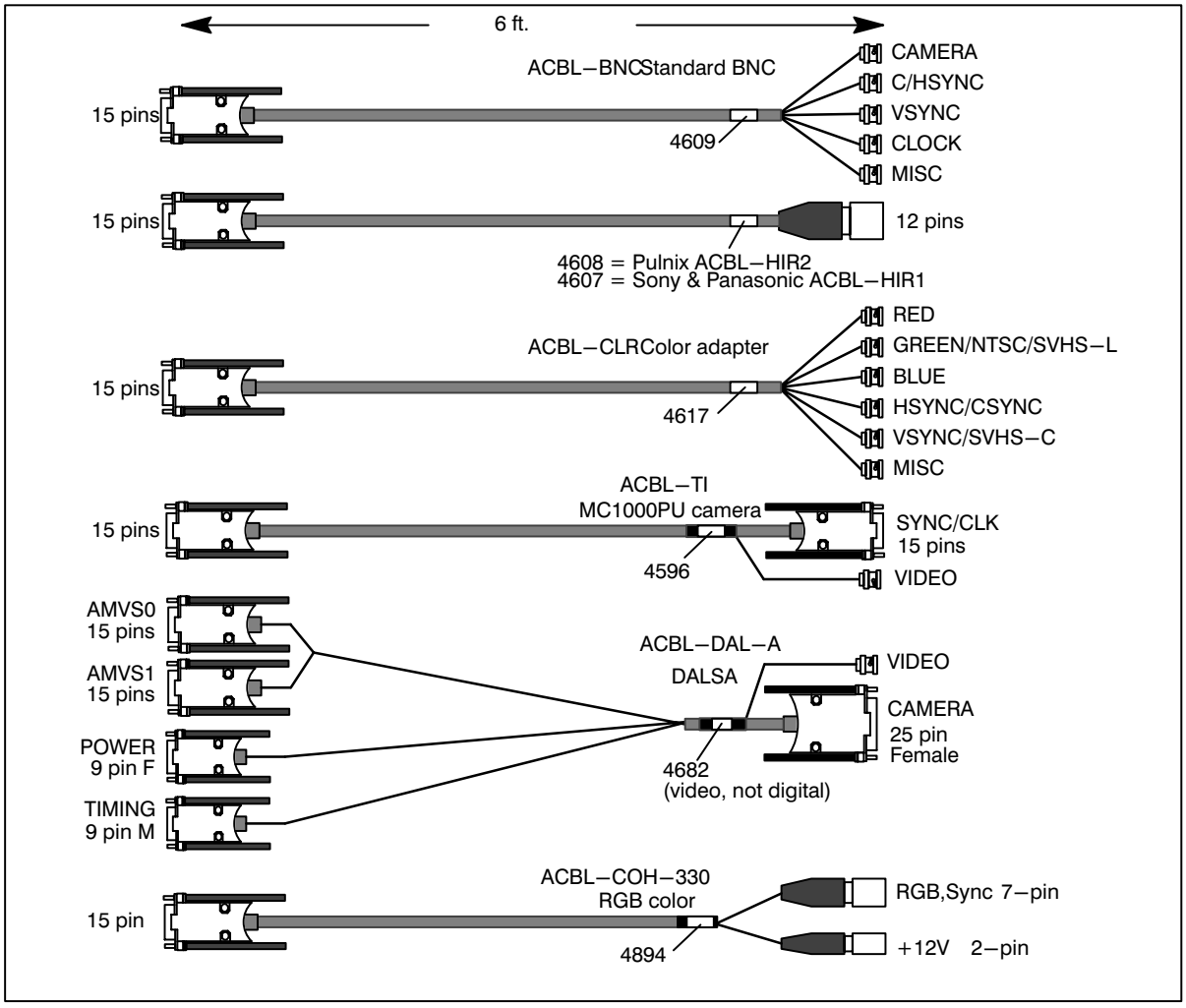


Figure 24. Camera Adapter Cables

CAUTION *To avoid equipment damage, turn off power before connecting or disconnecting cameras or cables.*

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3.1 Camera Connections: AM-CLR, AM-FA, AM-STD-COMP

The three break-out cables support the following configurations when used with the AM-CLR:

a. One camera: (labeled 4606-1) CAM0: RGB color or monochrome, RS-170 or CCIR

b. Two camera: (labeled 4606-2) CAM0: RGB color or monochrome, RS-170 or CCIR; CAM1: monochrome or RGB color, RS-170 or CCIR

c. Four camera: (labeled 4606-4) CAM0: RGB color or monochrome, RS-170 or CCIR; CAM1: RGB color or monochrome, RS-170 or CCIR; CAM2: NTSC, PAL, or SVHS; CAM3: monochrome, RS-170 or CCIR

Table 1 gives information on the various adapter cables used with the AM-CLR and which break-out connectors support the different camera types. Other cameras may be supported. Other cables may be available.

Table 1. Camera Adapter Cables for AM-CLR, AM-FA, AM-STD-COMP

Camera Type	Adapter Cable	Break-Out Connectors
mono RS-170/CCIR BNCs	ACBL-BNC (4609), or ACBL-CLR (4617)	CAM3 (0, 1 also)[1,2]
mono RS-170/CCIR 12-pin [3]	ACBL-HIR2 (4608)	CAM3 (0, 1 also)[1]
RGB RS-170/CCIR	ACBL-CLR (4617)	CAM0, 1
NTSC	ACBL-BNC, -CLR	CAM2
PAL	ACBL-BNC, -CLR	CAM2
SVHS [4] BNCs	ACBL-BNC, -CLR	CAM2
SVHS 4-pin mini DIN	ACBL-SVHS (4619)	CAM2
COHU Color 7 & 2-pin [3]	ACBL-COH-330 (4894)	CAM0, 1

1. CAM3 is dedicated to monochrome. CAM0 and CAM1 are wired for RGB, but may also be used for monochrome input.

2. Use the “green” BNC for monochrome.

3. Cables 4608 and 4893 supply power to the camera. Always turn off power before connecting and disconnecting the camera, to avoid damage to the board and camera.

4. Connect Chroma output signal to VSYNC connector.

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3.1.1 Camera Connections: AM-VS,AM-FA, AM-STD

The three break-out cables support the following configurations when used with the AM-VS and AM-FA:

a. One camera: (labeled 4606-1) CAM0: RS-170, CCIR, or single-ended variable-scan

b. Two camera: (labeled 4606-2) CAM0: RS-170, CCIR, or single-ended variable-scan; CAM1: RS-170, CCIR, or single-ended variable-scan; CAM0 and CAM1 together: one differential variable-scan camera

c. Four camera: (labeled 4606-4) CAM0: RS-170, CCIR, or single-ended variable-scan; CAM1: RS-170, CCIR, or single-ended variable-scan; CAM0 and CAM1 together: one differential variable-scan camera; CAM2: RS-170 or CCIR camera; CAM3: RS-170 or CCIR camera

All four cameras can supply composite video to the AM-VS, but only camera 0 can supply separate composite sync (CSYNC). The AM-VS and AM-FA can drive any of all four cameras with either composite sync output (CSYNC) or separate horizontal and vertical sync output (HSYNC, VSYNC). The AM-VS and AM-FA can only supply a clock to connectors CAM0 and CAM1.

Table 2 (page 19) provides information about the various adapter cables used with the AM-VS and AM-FA, and which break-out connectors support the different camera types. Other cameras may be supported. Other cables may be available. CAM0 and CAM1 on the AM-FA can use the color cables to support three monochrome cameras.

CAUTION *Always turn off power before connecting and disconnecting cameras, break-out cables, and adapter cables. Damage can result from connecting and disconnecting cables or cameras while power is on.*

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Table 2. Camera Adapter Cables for AM-VS, AM-FA, AM-STD

Camera Type	Adapter Cable	Break-Out Connectors
RS-170/CCIR monochrome (camera supplying sync on video)	ACBL-BNC (4609)	CAM0,1,2,3
RS-170/CCIR monochrome (camera supplying separate composite sync)	ACBL-BNC (4609)	CAM0
RS-170/CCIR monochrome (AM-VS supplying sync to camera)	ACBL-BNC (4609)	CAM0,1,2,3
Sony, Panasonic (mono) 12-pin [1]	ACBL-HIR1 (4607), or	CAM0,1,2,3
	ACBL-BNC (4609)	CAM0,1,2,3
Pulnix (mono) 12-pin [1]	ACBL-HIR2 (4608) or ACBL-BNC (4609)	CAM0,1,2,3 CAM0,1,2,3
Sony XC7500 (AM-VS only)	ACBL-HIR1 (4607)	CAM0,1,2,3
Costar/Protec CV-M10C/E (AM-VS only)	CBVM10-6 (4771)	CAM0,1
Non-standard camera [2] (TTL single-ended timing)	ACBL-BNC (4609)	CAM0,1
Non-standard camera [2] (RS422 differential timing) (Hamamatsu [4])	two ACBL-BNC (or custom cable)	CAM0 & CAM1 [3]
DALSA [3,4] analog	ACBL-DAL-A (4682)	CAM0 & CAM1 [3]
Kodak MEGAPLUS [4]	ACBL-KOD-A (4685)	CAM0 & CAM1 [3]
Cidtec TN2250 and TN3710 two 25-pin connectors	ACBL-CID (4726)	CAM0,1

1. Cables 4607 and 4608 supply power to the camera. Always turn off power before connecting and disconnecting the camera, to avoid damage to the board and camera.

2. Line scan or area scan.

3. CAM0 supports video input and the positive timing signals. CAM1 supports the negative timing signals

4. Using the camera's video signal output, not digital output.

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3.1.2 Camera Connections with AM-DIG

The break-out cables are not used with the AM-DIG. The AM-DIG adapter cables plug directly into the 44-pin video connector on the IC-PCI.

Table 3 lists the adapter cables currently available for the AM-DIG. A few cables are illustrated in Figure 25. Other cameras may be supported. Other cables may be available.

NOTE *Always turn off power before connecting or disconnecting cables, to avoid damage to the camera or the AM.*

Table 3. Camera Adapter Cables for AM-DIG

Camera Type	**Cable**	**Camera Connectors**
Kodak 8-bit MEGAPLUS™	ACBL-KOD-D14 (4700)	37-pin female
Kodak10-bit MEGAPLUS™	ACBL-KOD-D16 (4729)	68-pin male
Hamamatsu C4742	ACBL-HAM (4701)	37-pin female
Xillix MicroImager 1400	ACBL-XIL (4702)	50-pin female
Dalsa CL-C*x* family	ACBL-DAL-D (4703)	25-pin female, BNC, 9-pin female, ribbon(2)
Cohu 4110	ACBL-COH (4705)	44-pin female
DVC-10	ACBL-DVC-D (4727)	37-pin male
Dalsa CL-C*x* family RGB	ACBL-DAL (4728)	25-pin female, BNC, 9-pin female, ribbon(3)
Roche Progres 3012 12-bit	ACBL-ROCHE-PROGRES (4734)	50-pin female 3-row
Kodak i Series 8-bit	ACBL-KOD-I8 (4752)	68-pin male, 9-pin female
Kodak i Series 10-bit	ACBL-KOD-I10 (4738)	68-pin male, 9-pin female
Dalsa CTE1-*x*	ACBL-DAL-CTE1 (4733)	ribbon(3)
Amber Proview, Amber 4128	ACBL-AMBER-PRO/4128 (4753)	40-pin female ribbon
Amber Radience	ACBL-AMBER-RAD	40-pin female ribbon
Pulnix 9700	*order from Pulnix*; *cable #* 30-DG-02-ITI	

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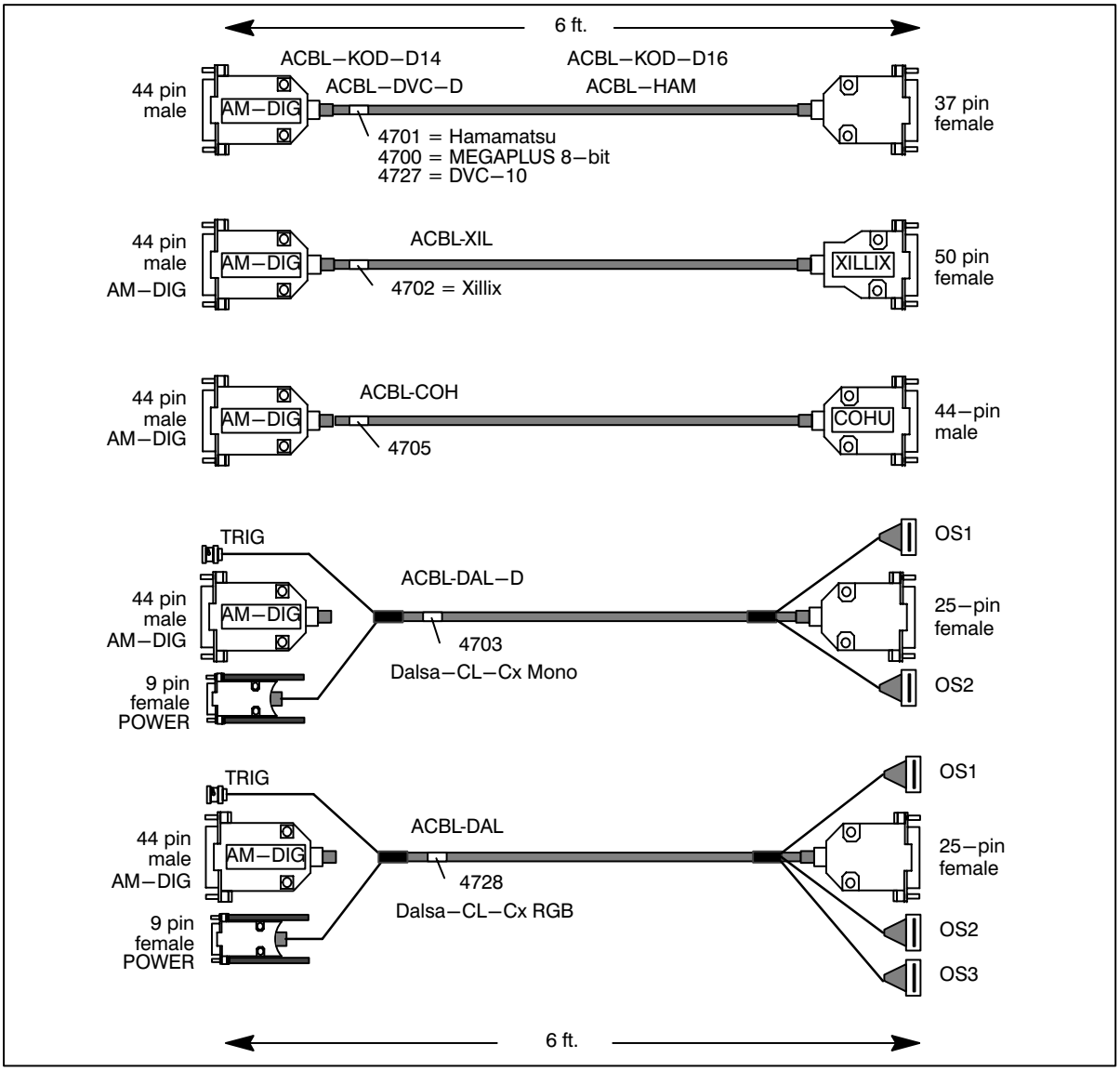


Figure 25. AM-DIG Camera Adapter Cables

If you experience difficulty or have a failure, call the dealer or sales representative. If you purchased the IC-PCI directly from Imaging Technology Incorporated, call the Customer Response Center at (781) 275-2700, or the electronic answering system at (781) 275-9500. Please fill out the “Customer Response Form” at the end of this guide before calling.

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NOTES

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PART 2
ITEX SOFTWARE INSTALLATION

In Part 2 you will install the software, verify operation, and update your PC environment.

Before You Begin

There are different instructions for different software environments. Refer to the steps and page numbers below for how to install ITEX for your system environment.

Windows 3.1, and Windows for Workgroups 3.1.1 Win16

Step 1. (page 23) Covers copying the media onto the hard drive and installing the library.

Step 2. (page 25) Covers setting up your system environment.

Windows NT, and Windows 95 Win32

Step 1. (page 29) Covers installing the Device Driver under Windows 95. The install program automatically installs and registers the driver under Windows NT.

Step 2. (page 29) Covers copying the media onto the hard drive and installing the library.

Step 3. (page 31) Covers setting up your system environment.

Step 4. (page 33) Covers running the Configurator.

Windows 3.1, 3.1.1 or DOS

STEP 1. Copy the Win16 Media

Before you start the installation, make sure that the C compiler is already installed on your system.

NOTE *Do not install this version of ITEX in the same directory used for a previous version (or another ITEX product). Back-up and delete the old version, or use a new destination. If you use a different destination, remember to make that change in all the following instructions and edits.*

1. Close or exit all applications except the Windows Program Manager. Insert the CD-ROM into the drive. This example uses drive E, but any drive is appropriate.
2. To begin the installation in Windows, bring up the Windows File Manager, click on drive E, and double click on SETUP.EXE
3. The setup program first initializes, gives some opening screens, then displays the software revision number on a “welcome” screen. Click on continue (or press enter) and the program gives you the opportunity to register the product in your name. Type in your name and company, and click on Continue (or press enter). The program then displays the “installation” menu.

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4. The default destination is “C:\ICPCI”. Click on “set location” if you wish to change the drive or name a different directory. This is referred to as the “*itexroot*” directory.
5. Select the installation options. Object is already selected. If you have ordered the source code, you may select Source too. Do not select source if you do not have the source disk. The bottom half of this screen displays the amount of disk space required. Click on “Install” to continue the installation.
6. The install program copies all files onto the hard disk, in the destination directory you specified. The display shows updating status of the installation and disk space.
7. The program asks you to decide if you want the “autoexec.bat” file automatically modified. If you do not wish the program to modify your file, you should select the second option, to save the changes in a file. Click on“OK” to continue.

Win16

8. The program reads your “config.sys” file, and either reports that it does not need to modify the file, or asks if you want the “config.sys” file modified. If you do not want the file modified, you should select the second option to save the changes in a file. Click on “OK” to continue.
9. The setup program creates a Group box in the Program Manager, and places the appropriate programs and icons in the Group. You can use the default or select a new name. Click on “OK” to use the default name. More than one Imaging Technology product can be installed in the same group box named ITEX. The scroll arrow will display the Groups already created. Select “New Group” to create a new group with a different name. Click on “OK” when done.
10. Before exiting, the program allows you to view the release notes, run the configurator, or exit the program (icons are also created for the release notes and configurator, so you can examine them later too).
11. To verify your installation by displaying an image, click on “Run the Configurator”.
12. In the Configurator menu, pull down the File menu and select New.



The option “File|New” queries the PCI bus, and creates a file that matches the MVC hardware installed. Default parameters are loaded for the hardware found. **You must select the camera.**

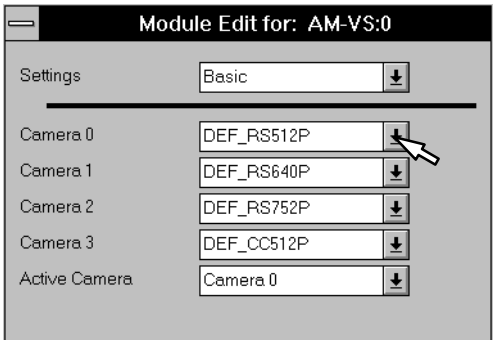
NOTE *The “MVC PCI Configurator Guide” gives detailed instructions on using the Configurator Utility. This document contains only rudimentary instructions for accomplishing the default installation.*

13. Click on the Camera or “Cam” button in the Toolbar.



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14. The configuration information for the AM appears in a pop-up Module Edit menu. Use the list buttons on the right to select from the defined cameras and select the active port (active camera).



NOTE *The top window has two selections: Basic and All. The All setting displays all the advanced settings for the Acquisition Module. If your camera is one of the many pre-defined cameras, the advanced settings will not be needed.*

15. Click on “OK” in the Module Edit menu, to accept your changes.

16. Click on Grab. A live image will be displayed on the PC display with PCIview. Win16

17. Focus and adjust your camera. Click on Snap to snap a single image and stop the continuous grab.

18. You can save the configuration file by pulling down File menu and selecting Save or Save As. Any name and directory is possible, refer to the note below on file names.

19. To exit the Configurator Utility, pull down the File menu and select “Exit”.

File Names: “15040.CNF” is the default name used by the ITEX library call itx_load_cnf() when no name is given. ITEX looks for configuration files in the current directory, then the *itexroot*\CONFIG directory. “ICPTEST.CNF” is the name used by the supplied IC-PCI examples.

The remainder of this section discusses the changes made to your system environment, and changes your may need to make. Some of these changes may have been made by the installation setup program. Review this section, then go to Part 3, page 35, for instructions on editing the hardware configuration file.

STEP 2. Edit your System Environment

NOTE *Refer to the Release Notes accompanying your diskettes for any exceptions or additions to these instructions. Some of these changes may be made by the installation program.*

2.1 Win16 Host Memory Allocator

Using the High-Level Acquisition API requires contiguous non-paged memory, that must be reserved at system boot time. Add the following line to your “autoexec.bat“ file. This example reserves 8MB for the non-paged memory pool. (A 1024 by 1024 by 8-bit image occupies 1MB.)

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Additions to “autoexec.bat” for Memory Allocation

```
itexroot\devhost\dos\bin\icpdev 8000
```

NOTE *The allocated non-paged memory will not be available to DOS/Windows or other applications as general-purpose memory. You may notice frequent swapping or system slow-down.*

2.2 Set the Win16 Run–time Environment

ITEX ships with several development utilities, which are required to build ITEX applications. You must add this tools directory “icpci\devhost\dos\bin” to your path,as shown. Win16

ITEX uses the environment variable CNF15040 to point to the configuration directory. Assuming that ITEX was installed at “c:\icpci” add the following to your “autoexec.baT” file:

Additions to “autoexec.bat” for Run-time

```
PATH=C:\ICPCI\DEVHOST\DOS\BIN;%PATH%
SET CNF15040=C:\ICPCI\CONFIG
```

When your application runs, ITEX uses the environment variable CNF15040 to locate the hardware configuration file, and the various load files for modules.

2.3 Set the Win16 Development Environment Variables

Building applications using ITEX requires that you define the environment variable ITEXROOT. In the file “autoexec.bat” set ITEXROOT to the directory where you installed ITEX, for example:

Addition to “autoexec.bat” for Development

```
SET ITEXROOT=C:\ICPCI
```

If you are using Microsoft C++ you may want to set the LIB and INCLUDE environment variables. This is not needed if you are using the ITEX build tool ITEXprep. Add the following statements to your “autoexec.bat” file:

NOTE *The indented second line should be part of the first line, not a new line!*

Optional Additions to “autoexec.bat” for Microsoft C++

```
SET INCLUDE=C:\ICPCI\COMMON\INCLUDE;
      C:\ICPCI\HOST\DOS\INCLUDE;%INCLUDE%
SET LIB=C:\ICPCI\HOST\DOS\LIB;%LIB
```


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2.4 Edit Win16 CONFIG.SYS File for MSDOS Settings

If you are using a RAMDISK to store your temporary files, it should be *at least* one Megabyte.

Source Code Customers: You should have your FILES variable in "config.sys" set to *at least* 100 or building source code will fail. You must have the 386 EMS disabled as shown (both 386 and 486 machines use the EMM386 statement):

Addition to "config.sys" for MS-DOS

```
FILES=100
DEVICE=\path\EMM386.exe NOEMS
```

Now reboot your system to make your changes to "config.sys" and "autoexec.bat" take effect.

2.5 Edit the Win16 SITE.DEF File

NOTE *If your Microsoft C compiler is installed in the Microsoft default location, you should not need to change the site.def file.*

The site configuration file contains information about the location of utilities, libraries and tools. Win16

Move to the directory "ICPCI\DEVHOST"

> **cd \icpci\devhost**

Edit the file "SITE.DEF"

> **edit site.def**

The file "site.def" looks something like this:

Example of "site.def" File

```
#ifndef Msc800Dir          /* Microsoft C v8 visual C++ v1.5 */
#define Msc800Dir c:/msvc          /* root location compiler */
#endif

#ifndef Wc10Dir                    /* Watcom 32 bit v10 */
#define Wc10Dir c:/watcom        /* root location of compiler */
#endif
```

For each definition, simply put in the directory where that product can be found. Therefore we define "Msc800Dir" to be "C:/msvc". It does not matter if you use a forward slash or a backslash to separate directories.

If you do not have a compiler or library that this file mentions, set the definition to be NOTAVAILABLE. If the build process tries to use one of the definitions, then Dmake will print out NOTAVAILABLE when it tries to use it.

NOTE *These definitions in "site.def" only tell ITEXprep and Dmake where to find include files and libraries. If you will be running any executables from these directories, such as "wcc386" or "cl", you must include those directories in your PATH environment variable.*

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2.6 Edit the Win16 PROJECT.DEF File

Win16

NOTE *You should not need to change the file project.def for the ITEX-IC for IC-PCI product.*

The file project.def tells ITEXprep which files, examples, or libraries to build. You may want to edit this file if you do not want examples to build.

Move to the directory “icpci/devhost” where the configuration files are located:

DOS > **cd \icpci\devhost**

Edit the file “project.def”

DOS > **edit project.def**

This is the project definition file, which defines what parts of ITEX you wish to build and support. About 35 lines down into the file, you should see something similar to the example.

If you only have Object code for ITEX, these definitions set up which examples will be built in “examples/icpapps”. If you have source code, these definitions define which sources you have installed.

Change the “NO” to “YES” beside each product you installed, or each project you wish to build. For example, if you want to build the examples, you must have a YES beside Buildicp and BuildExamples, and a NO beside BuildCore.

NOTE *Your YES and NO responses must be all capitals.*

This completes the software installation.

Go to Part 3, page 35, for instructions on editing the hardware configuration file.

Example of “project.def” File

```
#ifndef BuildCore
#define BuildCore       NO                  /* (VME product) */
#endif

#ifndef BuildPCI
#define BuildPCI        YES                 /* (IC-PCI board) */
#endif

#ifndef BuildCM
#define BuildCM         NO                  /* (CM library) */
#endif

#ifndef BuildPA
#define BuildPA         NO                  /* (CM-PA library) */
#endif

#ifndef BuildExamples
#define BuildExamples   YES                 /* (or NO) */
#endif
```


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Windows NT or Windows 95

STEP 1. Installing the Win32 Driver (Win95 only)

Under **Windows 95**, when you reboot your system after installing the IC-PCI board, the Plug-n-Play configuration manager detects the hardware and asks for the "manufacturer's installation diskette" or asks for the "Windows 95 Driver" for the unknown device.

Under **Windows NT**, the install program automatically installs and registers the device driver.

1. At the first "Insert Disk" message insert the CD-ROM and allow the drive to "spin up". Click on Next. If the CD-ROM was not read, Click on "Other Locations". Type **e:** (or the appropriate drive) in the text field and click on OK. If you find the Browse option not working, do not remove and insert the CD-ROM. Cancel the Browse, use the Back key to get back to the first request, and click Next (again). The CD-ROM may be read and the path found correctly.
2. A second "Insert Disk" message appears. Do not remove and reinsert the CD-ROM. Click on OK.
3. The Copying Files menu lists the path from the *last* device driver installed; not the current installation. Click on Browse.

Win32

4. The Browse menu has the correct path for the Win32 driver "itipci.vxd". Click on OK. The configuration manager reads the device driver, then asks you to reboot the system.

NOTE *If you previously booted Windows 95 and chose not to load the device driver, you can add the driver at any time with the following instructions:*

1. Select "Control Panel" then Select "System" then select Device Manager.
2. Click on the category "Sound, Video and Game Controllers" then select "PCVision/IC-PCI Image Capture". If it is not listed there, select the category "Other" and select "unknown multimedia PCI board".
3. Click on the Driver tab, then click on "Driver File Details". Click on "Update Driver". If the CD-ROM is already installed, the IC-PCI will be recognized. Follow Steps 2 through 4 in the previous directions. If the CD-ROM was not already inserted, follow Steps 1 through 4 in the previous set of directions.

STEP 2. Copy the Win32 Media

NOTE *Do not install this version of ITEX in the same directory used for a previous version (or another ITEX product). No files will be installed if another product is in the same directory. Back-up and delete the old version, or use a new destination. If you use a different destination, remember to make that change in all the following instructions and edits.*

Under **Windows NT**, the install program automatically registers the ITEX device driver in the system registry, adds necessary variables and path to the NT user environment, and creates an uninstall file list. Installing ITEX Software under **Windows NT** requires **administrator privileges**.

1. Boot the system to Windows (NT or 95) if not already running. Insert the CD-ROM in the drive. This example uses drive E, but any drive is appropriate.
2. If auto-run is enabled, the Startup menu appears. If it does not, Click on Start (on the task bar), then click on Run. Type **e:\setup.exe** (or the appropriate drive) in the text field and click on OK.

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3. The setup program first initializes, and displays an introductory screen with options for installing software, browsing the CD contents, browsing the release notes, or exiting. Click on Install Software.
4. The software installation menu asks you to select an operating system and the software to install. Complete these choices and click on Start Install. A message box asks you to confirm your selection. Another message box may appear stating additional conditions or requirements.
5. The software displays a “welcome” screen. Click on Next (or press enter).
6. The “Software License Agreement” screen appears. Read the agreement and click on Yes.
7. Type in your name and company, and click on Next (or press enter). Both entries are required to advance to the next screen.
8. “Choose Destination Location” asks you for a destination. This is also referred to as the *itexroot* directory. The default is “c:\icpci”. Click on Browse if you wish to change the drive or name a different directory. Click on Next.
9. “Setup Type” allows you to tailor the installation by selecting the setup type: Typical, Compact, or Custom. “Typical” is recommended, because it will install all files. To install DLLs (and the driver under NT) for a run-time-only system, select “custom” and select “runtime only”. The screen describes the consequences of each choice. Click on Next to continue.
10. The setup program creates a program folder. “Select Program Folder” allows you to change the name. You can use the default or select a new name by using the list button, or typing a name. Click on Next to continue. Multiple ITEX products can be installed in the same Program Folder.
11. “Start Copying Files” menu allows you to review or change any settings before the program starts copying files. Click on next to continue, or click on Back to change your options.
12. The install program copies all files onto the hard disk, in the “destination location”. The display shows updating status of the installation and disk space. While the files are loading, a billboard appears with instructions on enabling “extension help” to access the IC-PCI help through the F1 key. Other billboards may appear highlighting product features or additions.
13. When the program is finished, “Setup Complete” asks if you wish to reboot the computer now. You must reboot the computer to complete the installation.
14. Click on View a “readme” file if you wish to review the software release notes (the file will display in Wordpad or Word after you click on finish). Click on “Finish” to exit the setup program.
15. As the system reboots, a “Service Control Manager” message may appear, indicating a driver failure if the IC-PCI hardware is not present or is not memory mapped yet. Running either the Configurator or Diagnostic will remap the board. Win32
16. Click on Start, and select Programs then select IC-PCI. Click on either IC-PCI Configurator or Diagnostic.

NOTE *A “Device Driver DLL” message may appear if this is the first time addressing your board. You must power off your computer chassis to allow this re-mapping to take effect. It has been observed that a hardware reset is not sufficient. Click on Yes and wait 30 seconds for the shutdown. Turn off your PC and then restart.*

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STEP 3. Edit your Win32 System Environment

NOTE *The memory allocator is different for Windows 95 and Windows NT. Both are covered.*

3.1 Host Memory Allocator *Windows NT*

Using the High-Level Acquisition API requires contiguous non-paged memory which must be reserved at system boot time. Use the Windows NT Registry Editor (*systemroot*\system32\REGEDT32.EXE) to modify the following key:

```
HKEY_LOCAL_MACHINE\System\ControlSet001\
  Control\SessionManager\MemoryManagement\
  NonPagedPoolSize
```

This number is set in bytes (with a decimal number). For example, enter 4000000 DEC (decimal) to allocate 4MB.

NOTE *Windows NT 4.0 requires 24 to 32MB of RAM to run well. System performance will suffer if you allocate memory to the driver and leave less than 24MB for the operating system. The allocated non-paged memory will not be available to be allocated by the operating system to other applications.*

3.2 Host Memory Allocator *Windows 95*

Using the High-Level Acquisition API requires contiguous non-paged memory, that must be reserved at system boot time. Add the following line to your “autoexec.bat“ file. This example reserves 8MB for the non-paged memory pool. (A 1024 by 1024 by 8-bit image occupies 1MB.)

Additions to “autoexec.bat” for Memory Allocation

```
itexroot\bin\itihmem 8000
```

NOTE *Windows 95 requires a minimum of 16MB to run well. System performance will suffer if you allocate memory to the driver and leave less than 16MB for the operating system. The allocated non-paged memory will not be available to other applications. You may notice they swap frequently.*

3.3 ITEX Win32 Environment Variables

NOTE *The standard setup procedure should have completed the system environment. Follow the instructions below to edit, add, or verify the settings.*

The following steps are the defaults completed by the installation program. If you move or rename the ITEX directory after the installation is completed, you must go through these same steps to correct your environment.

1. Click on Start, then click on Control Panel, and click on System. Click on the environment or “env” tab.
2. In the “System Environment variables for *user*” box add the following two lines (shown here for the default destination c:\icpci):

   CNF15040=C:\ICPCI\CONFIG

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3. Add the following to the end of the PATH statement:
   ;C:\ICPCI\BIN
4. Click on the Set button.
5. Click on the OK button.

3.4 Windows NT Device Driver

You do not need to manually install the ITEX Windows NT device driver. The default settings load the device driver at boot time so users without administrator privileges can use it. The ITEX installation stores the device driver as:

```
\Winnt\system32\drivers\mvcntp.sys
```

The following parameters can be modified to enable or disable each capability. The default values are shown. Each of these items are disabled with 0 and enabled with 1. You must have administrator privilege to modify this file.

If "Enable bootable driver" equals 1, the driver loads at boot time. If "Enable bootable driver" equals 0, the driver loads at run time.

Win32

Enable bootable driver = 1
Enable error log console = 1
Enable error message dialog box = 1
Enable trace messages = 0
Fail if driver error = 0
Fail if no hardware = 0

The following parameter changes the delay time in seconds for the shutdown message before rebooting NT after remapping an Imaging Technology board:

Shutdown time-out for EEPROM reprogramming = 0x0000001e

The default value 0x01E gives a 30 second delay.

The operation of the device driver can be changed in two ways.

a. by modifying the registry key:

```
HKEY_USERS\.DEFAULT\Software
   \Imaging Technology, Inc.
   \MVC15040 Driver DLL
```

b. by editing the file *itexroot*\config\mvcntp.ini and then loading the values into the register by typing:
   regini mvcntp.ini
   (from the *itexroot*\config directory)

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3.5 UnInstalling ITEX

ITEX can be uninstalled in Windows NT or 95 by the Add/Remove Programs utility.

1. Click on Start, then click on Settings, then click on Control Panel.
2. Click on Add/Remove Programs.
3. Select “ITEX IC-PCI for Win32” (or the ITEX product you installed).
4. On the Confirm Deletion menu click on Yes. A screen displays status or progress of the removal process.

The Add/Remove utility removes all files and DLLs installed by the ITEX Installation utility, and cleans the registery entries. Drivers are not removed. If you renamed files or created new files they are not removed. This allows you to remove the ITEX library without removing your own application code. Win32

NOTE *If you update or reinstall your C++ compiler, the link to extension help is lost. Uninstall and reinstall the IC-PCI for Win32 software to reestablish this link. This is faster than copying and editing the ICPCISW.CNT file.*

STEP 4. Run the Configurator

The Configurator utility is provided to aid you in setting up your camera configuration.

1. In the ITEX program group double-click on the IC-PCI Configurator icon.
2. In the Configurator menu, pull down the File menu and select New.



The option “File|New” queries the PCI bus, and creates a file that matches the IC-PCI and AM installed. Default parameters are loaded for the hardware found. **You must select the camera.**

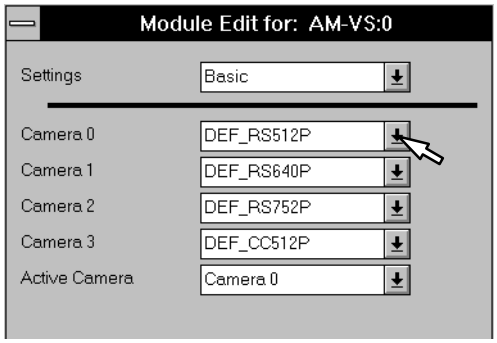
NOTE *The “MVC PCI Configurator Guide” gives detailed instructions on using the Configurator Utility. This document contains only rudimentary instructions for accomplishing the default installation.*

3. Click on the Cam button in the Toolbar.



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4. The configuration information for the AM appears in a pop-up Module Edit menu. Use the list buttons on the right to select from the defined cameras and select the active port (active camera).



NOTE *The top window has two or more selections: usually Basic and All or Advanced. The All setting displays all the advanced settings for the Acquisition Module. If your camera is one of the many pre-defined cameras, only the Basic settings are needed.*

Each port has its own camera type. Also, there is a setting for the active camera. The active camera setting is also used as the "default active camera" selection when loading the configuration file (.cfg) in your application.

It is important that the cameras be the same type when using multiple cameras and expecting fast switching times. Using two different camera types on the same system slows down the speed of switching between them.

5. Click on "OK" in the Module Edit menu, to accept your changes.
6. Click on Grab. A live image will be displayed on the PC display with PCIview. Win32
7. Focus and adjust your camera. Click on Snap to snap a single image or Freeze to stop the continuous grab.
8. You can save the configuration file by pulling down File menu and selecting Save or Save As. Any name and directory is possible, refer to the note below on file names.
9. To exit the Configurator Utility, pull down the File menu and select "Exit".

File Names: "15040.CNF" is the default name used by the ITEX library call itx_load_cnf() when no name is given. ITEX looks for configuration files in the current directory, then the *itexroot*\CONFIG directory. "ICPTEST.CNF" is the name used by the supplied IC-PCI examples. The test programs look in the "current" directory.

This completes the ITEX software installation. The remainder of this section discusses the changes made to your system environment, and changes your may need to make. Review this section, then go to Part 3, page 35, for instructions on editing the hardware configuration file.

This completes the software installation.

Go to Part 3, page 35, for instructions on editing the hardware configuration file.

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PART 3
HARDWARE CONFIGURATION FILE

The configuration file tells the ITEX software what IC-PCI hardware is in your system, and how to initialize the hardware. The hardware configuration file lists all the IC-PCI boards, plug–in modules, and camera ports.

You can create a file using the Configurator utility (under Windows 3.1, NT, or 95), or by editing the ASCII text file under DOS. ITI recommends using the Comfigurator utility because it follows ITEX rules for hardware settings.

NOTE *You must create a binary configuration file. You can do this using the Configurator utility, or by editing a text file and then converting it to binary.*

Step 1 discusses the text file and editing it to match your hardware. Instructions on page 36 tell you how to create the binary file from the text file.

You can create a file that has many options unspecified, and relies upon default states built into the software, indicated in Table 4.

NOTE *When using a Dalsa CA–D4 camera with the AM–MTD and an IC–PCI motherboard, you must specify the following configuration file token:*

```
[ICP:0]
   PIXSZ_Override = 16
```

Do <u>not</u> use this token for the Dalsa CT–E1 camera.

Table 4. Software Defaults for Configuration

Module	*Defaults*
IC-PCI	4MB memory option, 32-bit addressing, interrupts disabled, bus master mode enabled.
AM-VS	port 0 = RS-170 camera 512x480, port 1 = RS-170 camera 648x480 port 2 = RS-170 camera 752x484 port 3 = CCIR 512x512 camera port 0 selected at initialization.

NOTE *The “master.txt”and “*.tok” files give all the optional parameters for all of the currently released MVC boards and modules. You may use the software defaults, or build as many options as you desire into your hardware configuration file.*

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STEP 1. Edit the Hardware Configuration File

You can create a file using the Configurator or by editing the ASCII text file.

1.1 ASCII Text File

1. Move to the directory “icpci/config” where the configuration files are located:

   > **cd \icpci\config**

2. Edit one of the sample files to match your configuration:

   > **edit icptest.txt**

3. The file shows the configuration file for a single IC-PCI with an AM-VS. This is considered the “standard” minimum configuration.

   The hash marks “#” are used to comment out lines in the text file. Most of the options are commented out, relying on the defaults indicated in Table 4 (page 35).

4. Edit the file to match your hardware and host PC environment.

1.2 Create the Binary Configuration File

After you have edited the file to match your hardware system, you must convert it to binary, using the utility “bincnf”. The syntax of this command is:

bincnf *textfilename binaryfilename*

Create the binary configuration file from “icptest.txt” by typing:

> **bincnf icptest**

This example assumes your file is called “icptest.txt”. The output is a binary file “icptest.cnf”. This the default name used by the IC-PCI examples.

Leave this file “icptest.cnf” in the “icpci/config” directory so the ITEX software can locate it with the environment variable CNF15040.

The extensions “.txt” and “.cnf” are optional. The utility will supply them if you do not.

If you do not supply an output filename, the utility uses the input text file name, deletes the extension “.txt” (if present) and adds the extension “.cnf”. The following example reads a text file named “myown.txt” and outputs a binary file named “myown.cnf”:

```
bincnf myown
```

To use a configuration file by any other name, you must supply the file name in your application program; for example:

```
...
itx_load_cnf("myown.cnf")
...
```


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PART 4
BUILDING AN EXAMPLE APPLICATION

Building with ITEXprep

NOTE *Windows NT and Windows 95 no longer support ITEXprep and Dmake. Refer to your Software Release Notes. Instructions for using Developer's Studio appear later in this section.*

This section covers using "ITEXprep" a Win16 utility that creates makefiles based on the files "site.def" and "project.def".

NOTE *Refer to the document "Building ITEX Libraries and Applications" for additional information on building your applications and building the ITEX sources.*

ITEX-IC for the is distributed with Windows DLLs. You do not need to build libraries to use the Windows DLLs. You do need to compile the examples in "icpci\examples\icpcapps". These two examples can be compiled to run in Windows, in a DOS box, or under DOS.

STEP 1. Create Makefile for "examples/icpapps"

We will create a Makefile for an ITEX directory. We will start with the directory "icpci\examples\icpapps". Start by changing to that directory. For example:

DOS > **cd \icpci\examples\icpapps** Win16

itexprep

You are prompted for which operating system you want to build ITEX for. Select "32–bit Dos Extender" for a DOS only environment. Select "Microsoft Windows" for a Windows environment. You can use a mouse, or use the arrow keys to move between choices, and press Enter to make your selection.

Next you are asked which compiler you want to use. All supported compiler choices are displayed regardless of whether you actually have that compiler installed. For the 32–bit DOS environment, select "Watcom C/C++ v10.0". For the Windows environment, select "Microsoft Visual C++ (QuickWin") to build Windows applications. Select "Microsoft Visual C++" to build the ITEX libraries and DLLs.

If everything is installed properly, ITEXprep will create a Makefile. This Makefile can only be used with Dmake, a make utility installed from the ITEX disks. The Makefile created cannot be used with NMAKE.

STEP 2. Compile the Application

1. Move to the examples directory if you are not already there by typing:
   > **cd \icpci\examples\icpapps**
2. To build all of the examples, type:
   dmake

The directory "icpci/examples/icpapps" contains a number of source code examples. If you only want to build a single example, type dmake followed by the file name. For example:

> **dmake icptest.exe**

Notice that we asked dmake to build the *executable*. We did *not* use the source name, "icptest.c".

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STEP 3. Run the Application

The example “icptest” requires an IC-PCI, an AM-VS, and the binary configuration file “icptest.cnf” to run successfully.

- To run in Windows 3.1, double-click on “icptest”.
- To run “icptest” under DOS, type:
  > **icptest**
- To run from a DOS prompt under Windows, type:
  > **icptest**

To achieve the best results for running IC-PCI programs in DOS prompts under Windows, use the PIF Editor to modify the file “dosprompt.pif”. Specify “window” mode (window/full-screen) and “Background” (background/exclusive) and “priority” of 100/50 in the “Advanced Settings”. Win16

icptest

If you type “icptest” with no parameters, the program lists the various operations it can do. You could pass one of these operations as a parameter on the DOS command line. For example, If you wanted to see the IC-PCI registers, you could type:

> **icptest reg**

In Summary

This section covered how to build the examples on the distribution media. These can be built as 32–bit DOS programs, or command line programs that run under Windows 16-bit DLLs.

You can follow these methods for developing your own applications.

ICPWIN Application

The program “ICPWIN” is provided as an illustrative example of a true Windows 3.1 application.

A makefile called ICPWIN.MAK has been provided in the directory “examples\icpwin” for building “icpwin.exe” under Microsoft C++ I.D.E.

To run ICPWIN.MAK from DOS, the file “AUTOEXEC.BAT” must correctly define the environmental variables for INCLUDE and LIB according to the instructions for Microsoft C++ (on page 26).

To run ICPWIN.MAK from MS VISUAL WORKBENCH, use the menu selections Options|Project|Compiler|Preprocessor to add the following to the include search path (if not already included):

c:\icpci\host\win\include
c:\icpci\common\include

Use the menu selections Options|Linker to add the following to the library search path (if not already included):

c:\icpci\host\win\lib\co40wp

The example program looks in the current directory for a configuration file “icptest.cnf” which you must build, either from the sample file “icptest.txt” or from your own file.

Refer to the file “readme.txt” in the directory “examples\icpwin” for additional information on making and running this example.

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Building with Developer Studio

Developer Studio is available under Windows NT and Windows 95; *not* under DOS or Windows 3.1.

STEP 1. Build an Example

These steps lead you through creating a project file and building the example ICPEXT.C. The same steps apply to building your own NT and 95 applications.

1. Open the Microsoft Visual Studio.
2. Pull down the File menu and select New.
3. Select Project Workspace. Win32
4. Select Applications (a regular application, not MFC or OLE).
5. Type a name for you application, for example type ICPEXT, then click on Create. Ignore the message “Not all files in the Workspace could be opened”. This is normal, not all files should be able to open.
6. Pull down the Insert menu and select Files Into Project.
7. Use the file menu to open directory *itexroot*\examples\icpext
8. Select all the files ending in extensions: **.c** **.h** and **.rc** Click on OK.
9. Select the FileView tab at the bottom of the Workspace files to show the included files.
10. Click on Build Settings. Click on the C/C++ tab (at the top of this menu).
11. Step 10: In the “Category” field select General**.** In the “Warning” field select or type Level 3.
12. In the “Preprocessor Definitions” field type:
    WIN32,_WINDOWS,WINNT for NT or:
    WIN32,_WINDOWS,WIN95 for ’95
    (the first two may already be there, you may only have to add**WINNT** or **WIN95**).
13. In the “Category” field select Preprocessor.
14. Click on Additional Include Directories, and add the following if they are not already there. In this instance you ***must*** use an absolute path, ***not*** *itexroot*:
    ;c:\icpci\include
15. Select the Link tab (top of the menu).
16. In the Category field select or type General. Click on the Object/library Modules field and add the following if they are not already there. In this instance you **must** use an absolute path, **not** *itexroot*:
    c:\icpci\lib\itxco10lib
17. Pull down the Build menu and select “Build pcilut.exe file”
18. Pull down the Build or Debug menu (the name may toggle between Build and Debug depending on your setup) and select “Execute pcilut”.

NOTE *The examples in icpci\examples\icpapps are console applications. If using Developer Studio, select Console Applications in step 4.*

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Example Directories Created

The following directories are created by the various MVC products:

for the IC-PCI product:

/examples/icpapps	IC-PCI examples
/examples/icpwin	IC-PCI windows 3.1 examples
/examples/icpd	IC-PCI DOS examples
/examples/icpw32s	IC-PCI Win32s examples
/examples/vb	IC-PCI declaration files for Visual Basic support
/examples/icpapps/nt	IC-PCI Win NT examples
/examples/icpapps/win95	IC-PCI Win 95 examples

for the MVC 150/40–VME product:

/examples/apps	VME examples
/examples/dmpcdemo	DM-PC overlay sample

If the CM-PA PDS library is installed:

/examples/pds	PDS examples
/examples/pdsemu	PDS emulator examples

NOTE *ITEX is developed as a multi-platform multi-environment library, and supports other operating systems and hardware buses beyond the PCI bus and Windows. As a result, your library installation may include some variables, files, and library stubs for OS9, WxWorks, UNIX, and other operating systems not applicable to the IC-PCI.*

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Customer Response Form (CRF)

If technical assistance is required, please contact the Imaging Technology Customer Response Center at (617) 275–2700. The Customer Response Center provides operational assistance without charge during the term of the warranty. Applications support and product training can also be arranged at current rates.

I.T.I. Product Type: _____ Serial # _____

Where did you purchase this product?

☐ Distributor ☐ Sales Rep. ☐ I.T.I.

Name of Distributor or Rep. _____

Are board(s) factory configured? ☐ Yes ☐ No

If no, please list jumpers that are changed _____

Camera Model: _____ Monitor Model: _____

Host Computer Manufacturer: _____

Model: _____ Host memory size: _____

Other Expansion Boards Present in Host Computer:
(please include Manufacturer, Size, Address)

Description of Symptoms: (Please be specific) _____

Diagnostic Failures _____

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