



FASTFRAME-CB

FASTFRAME-CB CARDBUS USER'S AND REFERENCE MANUAL

30002-02502

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OTHER ALACRON MANUALS

Alacron manuals cover all aspects of FastSeries hardware and software installation and operation. Call Alacron at 603-891-2750 and ask for the appropriate manuals from the list below if they did not come in your FastSeries shipment.

30002-00169 ALRT Runtime Software Programmer's Guide & Reference

30002-00183 Camera Integration User's Manual

30002-00395 FastMotion Library

30002-00396 FastMotion Lite User's Manual

SYSTEM REQUIREMENTS

Windows XP, or Linux (2.4/2.6 kernel) operating system.

Minimum 256MB PC memory installed.

Acrobat Reader Software

The operating temperature range of the FastFrame-CB Cardbus boards is 0° Celsius to 40° Celsius. There is an industrial grade card with - 10° Celsius to 70°

A card bus slot with at least 1W (3.3V at 0.3 amps) of available power on one card bus slot.

A computer which supports shared memory through the use of the /burnmemory boot option on Windows XP, or the IOMEM=XXXM boot command on Linux, is required to use the Fast Motion program.

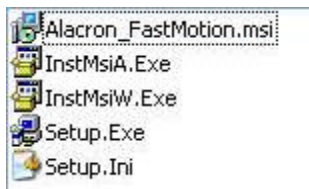
Some computers / laptops are designed to be compatible with the OEM versions of the various software and hardware elements provided by the manufacture, but the design has unexpected features which do not allow installation of the FF-CB or it's software. Should you have a problem making the FF-CB operate in your laptop please contact Alacron for assistance.

It is the responsibility of the installer of the FF-CB to determine if it is compatible with the computer or laptop.

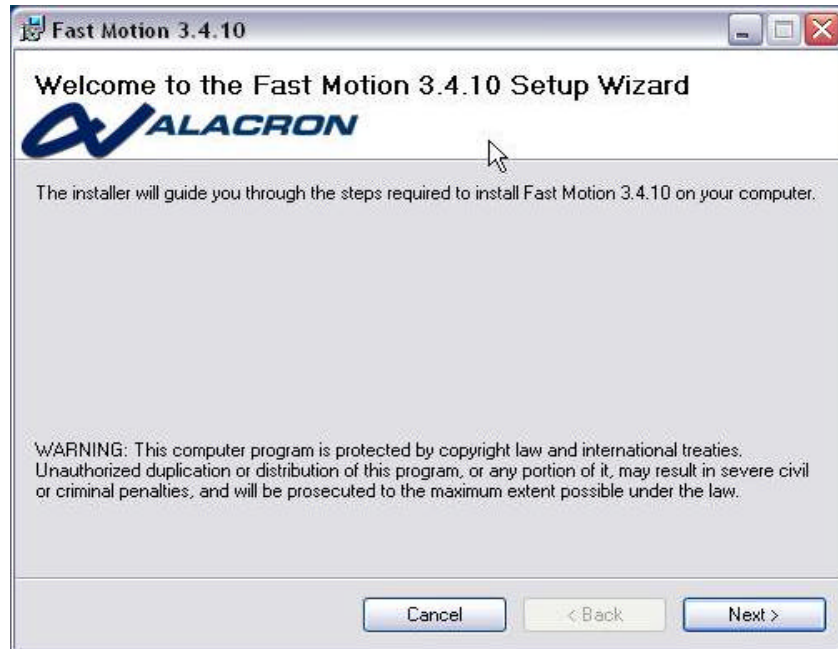
SOFTWARE INSTALLATION

WARNING: Do not install the FF-CB in your computer unless the software has already been installed. If you do install it before the software be sure to cancel out of the New Hardware Wizard. It is important you DO NOT answer OK as it will complicate installing the software, and getting the FF-CB operational.

Included with the FF-CB is a CD with the FastMotion software install on it. This software will allow you to capture and save images with the FF-CB. The installation uses the Microsoft installer, which may need to be installed on your computer. You must use the Setup.EXE for your installation file. If the installation is started with 'setup.exe' the installer will be installed if needed. Look for a directory containing:



After the installer is installed, you will see the follow screen:



Press "Next" to proceed.

You will see the software license. When you have read the agreement, you will need to push the "Agree" radio button and press next, or exit the installer.

The next page allows you to choose the location that the software is installed to, and to choose whether the program menu entries should be in the "All Users" area or only in your program menu. Make your choices and press next.

You will be asked to confirm that you want to install the software, when you press next the software will be installed.

At this point you have the software installed, but you have not installed the drivers for the FF-CB. Install the FF-CB into your computer's Card-bus slot. This should activate the new hardware wizard. You should see the page shown below.



Click the “No, not this time” as no updates are available from the internet. Press “Next” to proceed to the next page.

This page allows you to install the driver manually or automatically. Select the top option “Install software automatically (Recommended)”.



You will be asked to agree to install an unsigned driver which indicates that the driver has been tested by Microsoft. This driver has not been tested and digitally signed by Microsoft, so “continue anyway”.

This system install will copy the driver and other files to your driver directory and your system directory. At this point the driver should be installed. If it indicates a problem with the hardware re-boot your computer without removing the FF-CB.

If you successfully install the driver then you are ready to connect your data source and start grabbing images with FastMotion. The operation of FastMotion is explained in the manual 30002-00396 FASTMOTION LITE USER’S MANUAL.

When you select camera control files, select only the files that have the FFCB prefix, like: FFCB_NTSC/PAL.

FASTFRAME-CB INSTALLATION

The FF-CB uses the industry standard format called the Type-I card bus form factor. This means the FF-CB uses one slot in your computer, and is 5 mm thick.

You can install the FF-CB at any time, with the power on or off, AFTER you have installed the software. The card is installed with the ‘ALACRON / FastFrame-CB’ in large letters visible. The end of the card with the two rows of small holes for nearly the full width of the card goes into the computer. The metal D shaped connector will end up sticking out of the side of your computer.

When you install the card into your computer you may hear a double tone, indicating that the driver was found and installed.

Should you wish to remove the FF-CB from your computer, you should exit all the programs that might be using the board, and then click on the small icon in your icon tray at the bottom right of the screen, and select "safely remove the Alacron FastFrame Cardbus". The system will advise you if it is safe to remove it. If the system says "try again later", be sure you have exited all the programs that might be using the board. If that does not work, then power down your computer and remove the FF-CB.

CONNECTING CABLES TO THE FASTFRAME CARDBUS

If you intend to use the FF-CB for collecting image data, you will need to install a cable on the metal D shaped connector on one end of the card. Note that the connector has a tapered shape, the narrow part on the bottom. If you examine the shiny end of the cable you will see a similar shape. Install the connector on the cable so the flat side of the shiny connector is facing you, making sure that the D parts of the two connectors are aligned correctly. NOTE it is possible to connect the cable upside down if you push it hard enough, it will not damage the FF-CB (beyond the damage it does to the cable and the connector), but the cable will not work correctly.

Top – wide part of the D connector



Bottom – Narrow part of the D connector

You might find it easier to install the cable when the FF-CB is removed from the computer. It is a good idea to screw in the provided connector retaining screws so the cable does not separate from the FF-CB. Disconnecting the cable with the power turn on could damage the FF-CB or the device it is connected to.

It is important to not pull on the cable while you are using the FF-CB as it may come out of your computer, possibly crashing you computer, which could damage files on your disk drive. Some computers have a positive locking scheme for holding the board in the slot, this may work if the mechanism does not hit the LEDs at the sides of the board.

After you have connected the cable to the FF-CB you can connect it to your data source. Note: Most cameras should be powered off, as well as FF-CB, while connecting cables you should removed the FF-CB from your computer.

FASTFRAME-CB CARDBUS FEATURES

The Alacron FastFrame-CB Cardbus is for original equipment manufacturers and end users who anticipate a demand for diverse I/O requirements and high bandwidth. Available in Analog, Digital and Camera Link configurations, the FastFrame-CB Cardbus with the Philips NXP1302 microprocessor provides for complex image and digital signal processing.

- ? PCIMCA Form-Factor.
- ? On-board PNX1302 90MHz processor or higher with 16MB of SDRAM...
- ? Capable of over 360-800 MFLOPS of computational power.
- ? 32-bit 33MHz Cardbus interface.

- ? Input/Output via 68-pin VHDCI connector.
- ? Analog option supports PAL, SECAM, NTSC and S-Video
- ? 4 input multiplexer provided by Philips SAA7111A Enhanced Video Input Processor
- ? Digital option supports 16 differential digital inputs, 8 differential input / outputs.
- ? Camera link option supports Base Camera link, up to 80 Mbytes per second.
- ? Camera link serial interface with DLL
- ? Analog, Digital, and Camera link options are mutually exclusive, factory configured.

INTRODUCTION TO FASTFRAME-CB CARDBUS

Alacron's FastFrame-CB Cardbus (FF-CB) product breaks new ground in PC cards. It provides a frame grabber interface with on board processor, with 16MB of memory, which can be programed by the user. This brings commercial co-processor technology performance to Laptop computers.

The FastFrame-CB Cardbus has been configured with a Philips Nexperia PNX1302-series 200 MHz microprocessor. The processor is operated at 90 MHz to reduce the power consumed to a point acceptable to typical laptop computers.

Alacron's FastFrame-Cardbus is available with three factory configuration options: Analog, Digital, and Camera Link. These options can not be mixed due to space and signal limitations.

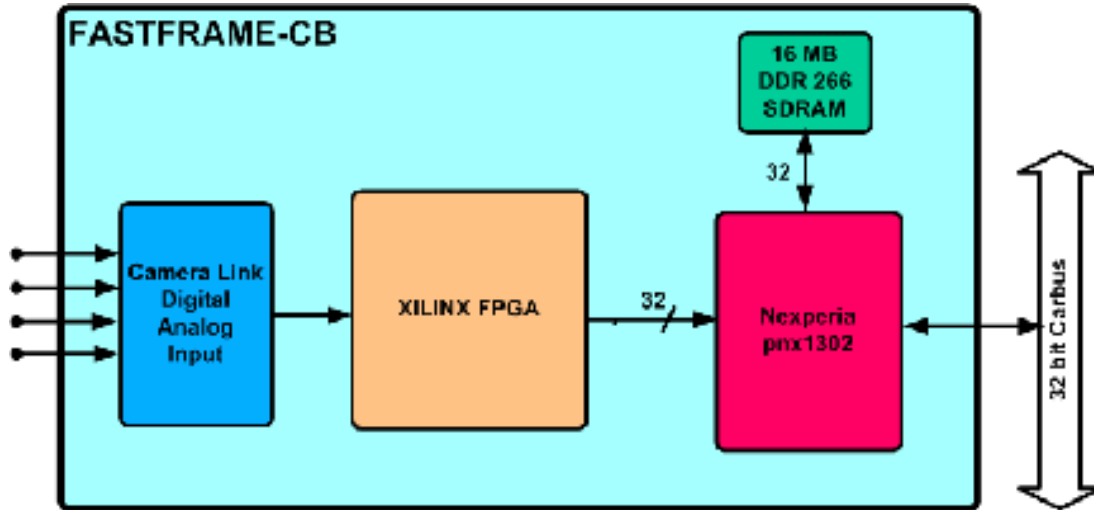
Shown below is a picture of the FF-CB . The left hand connector is a 68 pin VHDCI input connector. The right hand connector plugs into a PCMCIA slot which supports the Card-Bus standard. The Card-Bus is almost identical to 33 MHz PCI bus.

The input connector at the left is a 68-Pin VHDCI connector. This connector has been selected to provide for all the options supported by the FF-CB . Alacron provides cables to allow the connection to this connector. Pin-outs and cable drawings are in the Appendix of this document.



A block diagram of the FF-CB is shown below. Depending on the option ordered the inputs can be Analog, Digital or Camera Link. The inputs pass through a FPGA which is configured by software, to the PNX1302 processor. The PNX1302 provides for the processing of the input data and its transfer to the host memory. The FF-CB supports both bus master and bus slave accesses. As a bus master the board can transfer at up to 90 MB/sec into host memory (DMA). The processor is connected to a 16 MB SDRAM which provides up to 360 MB/sec access rates (@ 90MHz).

The FF-CB contains a 1K bit EEPROM which provides for configuring the PNX1302 processor on power on. All other features of the FF-CB are controlled by the processor. The FPGA (Xilinx XC2S30VQ100) is programmed by the processor. This allows the FPGA to be configured to the application.



PCI Block Diagram

SOFTWARE SUPPORT

The FF-CB supports two modes of operation: Slave Mode and Co-processor mode.

In Slave Mode the end user does not have to program the on board processor but can use the capture program supplied with the FF-CB (Fast Motion), or from you own application using the DLL based software API (FastMotion Library). In this mode the FF-CB is used much like a non-processor based board.

In co-processor mode the end user can program the PNX1302 processor as well as the host processor. For this mode of operation Alacron provides ALRT (Alacron, Runtime), and re-sells the Philips NDK which contains the tools needed to write programs for the PNX1302 (compiler, linker, libraries, etc.). In addition ALRT contains basic image processing tools which are optimized for the PNX1302. Please consult with Alacron for price information.

INPUT/OUTPUT FORMATS

The FF-CB is configured for your particular application(s) to support one of the input types listed below, although special applications requiring a mix of these inputs may be supported after consultation with the Alacron engineering staff.

ANALOG CVBS OR Y/C

The FF-CB uses a Philips SAA7111A decoder for interfacing PAL / SECAM and NTSC signals. In addition S-Video is supported (so called Y-C). The FF-CB supports capture from one source at a time, but provides up to four inputs. The SAA7111 provides a 4 way multiplexer; the input channel can be selected by software. The SAA7111A is configured by I²C from the PNX1302. The I²C signals (SCL, SDA) are available on the 68-pin VHDCI

connector. Alacron sells the necessary cable, 88000-00330. Please consult Alacron Sales for price of the cable.

Connector Pair	Connector Pin	Function
Pair6+	8	Vid1
Pair6-	42	Vid 1 rtn
Pair7+	9	Vid 2
Pair7-	43	Vid 2 rtn
Pair8+	10	Vid 3
Pair8-	44	Vid 3 rtn
Pair9+	11	Vid 4
Pair9-	45	Vid 4 rtn

If you refer the SAA7111A data sheet you can determine the various modes that are supported by the FF-CB. The following digital signals are connected to the FPGA. Should you wish to support a different mode on the SAA7111A please contract Alacron for assistance.

Internal Bus	SAA7111A Signal
FE_Dat0	SAA7111A_D0
FE_Dat1	SAA7111A_D1
FE_Dat2	SAA7111A_D2
FE_Dat3	SAA7111A_D3
FE_Dat4	SAA7111A_D4
FE_Dat5	SAA7111A_D5
FE_Dat6	SAA7111A_D6
FE_Dat7	SAA7111A_D7
FE_Dat8	SAA7111A_EVIP_ODD
FE_Dat9	SAA7111A_CREF
FE_Dat10	SAA7111A_HREF
FE_Dat11	SAA7111A_VREF
FE_Dat12	SAA7111A_D8
FE_Dat13	SAA7111A_D9
FE_Dat14	SAA7111A_D10
FE_Dat15	SAA7111A_D11
FE_Dat16	SAA7111A_D12
FE_Dat17	SAA7111A_D13
FE_Dat18	SAA7111A_D14
FE_Dat19	SAA7111A_D15
EVIP_LLC	SAA7111A_LCC

Some analog camera applications require triggers and HD/VD outputs. This can be done with a custom cable and FPGA.

DIGITAL LVDS (RS-644)

The FF-CB provides up to 16 pairs of input and 8 pairs of input/output signals. The inputs and output share the same connector pairs. The internal I/O bus, called the FE bus, supports 28 signals and one clock routes the signals to the FPGA. Possible options for mixing drivers and receivers are shown in the table below.

FE Bus	Direction	ChipID	Connector Pair
FE_DAT0	Input	U6	Pair01
FE_DAT1	Input	U6	Pair02
FE_DAT2	Input	U6	Pair03
FE_DAT3	Input	U6	Pair04
FE_DAT4	Input	U7	Pair05
FE_DAT5	Input	U7	Pair06
FE_DAT6	Input	U7	Pair07
FE_DAT7	Input	U7	Pair08
FE_DAT8	Input	U8	Pair09
FE_DAT9	Input	U8	Pair10
FE_DAT10	Input	U8	Pair11
FE_DAT11	Input	U8	Pair12
FE_DAT12	Input	U9	Pair13*
FE_DAT13	Input	U9	Pair14*
FE_DAT14	Input	U9	Pair15*
FE_DAT15	Input	U9	Pair16*
FE_DAT16	Input	U10	Pair17
FE_DAT17	Input	U10	Pair18
FE_DAT18	Input	U10	Pair20
FE_DAT19	Output	U15	Pair20
FE_DAT20	Output	U15	Pair21
FE_DAT21	Output	U15	Pair22
FE_DAT22	Output	U15	Pair23
FE_DAT23	Output	U14	Pair13
FE_DAT24	Output	U14	Pair14
FE_DAT25	Output	U14	Pair15
FE_DAT26	Output	U14	Pair16
FE_DAT27	Tri-state	U14	
FE_CK	Input	U10	Pair19

For LVDS Camera applications the FF-CB supports 16 bits inputs, clock (FE_CK), line valid (LVAL), and frame valid (FVAL). Four outputs are provided for triggers (Pair20, 21, 22, 23). If the LVDS camera uses 12 bits or less, an addition four outputs can be used (Pair13, 14, 15, 16).

FE_DAT27 can tri-state the outputs on Pair13, 14, 15, and 16, which allows these pairs to be used for bi-directional signaling.

Alacron sells the necessary cable, 88000-00329. Please consult Alacron sales for the price of the cable.

NOTE: Some configurations are fixed when the FF-CB is built (removing chips, cutting pins etc.). When you contact Alacron, provide which configuration you want.

CAMERA LINK

The FF-CB board supports up to the Base Camera Link configuration. The channel link installed is compatible with 85 MHz clock rate, but the PNX1302 can support 80 MHz, therefore the limit on the input clock rate is 80 MHz. When the camera link option is

installed, there are no additional I/O signals. Should you need additional signals please contact Alacron.

Internal Signal	Direction	Connector Pair
X0	Input	Pair1
X1	Input	Pair2
X2	Input	Pair3
XCLK	Input	Pair4
X3	Input	Pair5
SERTC	Output	Pair6
SERTF	Input	Pair7
CC1	Output	Pair8
CC2	Output	Pair9
CC3	Output	Pair10
CC4	Output	Pair11

The Camera-Link interface supports 24 bits of data, and four bits of control, as well as the bi-directional serial communications interface and CC1 through CC4 signals. Termination for all Camera-Link signals is provided on board.

Alacron sells a special Camera-Link cable, 88000-00328 to be used only with the FastFrame-CB Cardbus. It connects to a standard 26-pin 3M MDR connector.

Please consult Alacron sales for the price of the cable.

POWER DISSIPATION

The FF-CB will dissipate power approximately as shown below:

Version	+3.3V Power
90MHz	1W
178MHz	3W
Idle	0.08 W

The actual power dissipation depends on the program that is running. The table contains the typical values obtained when the FF-CB is operating and transmitting high speed video (80MB/sec) to the host memory. Idle power is significant.

The 178MHz operation is not achievable in a laptop application without significant modification of the laptop power to the card bus slot, AND provisions for removing the heat from the card bus cavity. The FF-CB can be operated outside a laptop environment, at higher data rates and processing rates. Please contact Alacron should you have an application which requires higher clock speed operation.

FASTFRAME-CB CARDBUS CABLES

The cables from the list below are needed for the FF-CB depending on the version of the board you require. Please contact Alacron Sales for cable pricing.

If you need additional cables, contact Alacron Sales or Technical Support.

Alacron Part Number	Cable Use
88000-00330	Analog Input Cable
88000-00329	Digital-In Adapter Cable
88000-00328	Camera-Link Cable

JTAG

The JTAG connection to the PNX1302 are connected to the VHDCI connector. This allows debugging support with the debugger in the Philips NDK (Software development kit).

PC

The I2C data and clock are connected to the PN1302, the SAA7111A (if present), and to the VHDC connector.

CLOCK SCHEME

The FF-CB s design takes advantage of the high data rates possible with the PN1302 processor, while enabling tight control of the timing on high-speed buses. The clocks are selected and generated through the FPGAs.

The on-board clock-generator chip (Cypress CY22392) generates the following clocks:

Clock Signal	Frequency	Used by:
VID_CLK	81 MHz	To FPGA general purpose
CPU_CLK	47.666MHz, Selectable	PN1302
EVIP_CLK	24.576MHz	SAA7111A's

Table 6 – Clock Signals

The PN1302 contains two phase locked loops (PLL) which use the CPU_CLK as a reference. The memory clock speed can be set to direct (PLL bypass), 2 times the CPU_CLK, or 3 times the CPU_CLK. The second PLL in the PN1302 provides the clock to the DSP core. PLL can be set to direct (PLL bypass), same frequency as the input with the PLL enabled, two, 3/2, 4/3, or 5/4 times the memory clock speed. The absolute maximum clock speeds supported by the grade of PN1302 installed is 200MHz, memory and CPU clock frequency.

INTERRUPTS

The FF-CB uses the INTA output of the PN1302 which is directly connected to CINT on the Carbus.

FASTFRAME-CB CONNECTOR PIN-OUT

The pin-out of the FF-CB 68-pin VHDCI connector has the pin-out show in the table below.

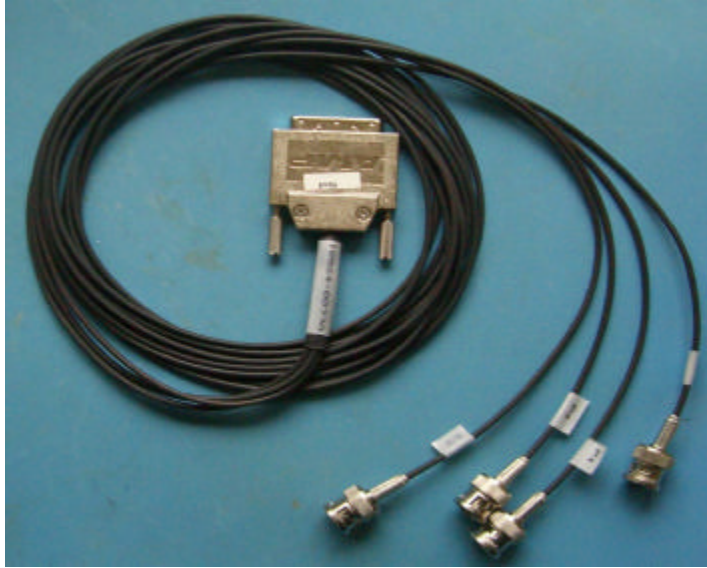
Pin	Signal	Multifunction	Pin	Signal
1	Ground		35	Ground
2	PAIR1+	X0+/-	36	PAIR1-
3	PAIR2+	X1+/-	37	PAIR2-
4	PAIR3+	X2+/-	38	PAIR3-
5	PAIR4+	XCK+/-	39	PAIR4-
6	PAIR5+	X3+/-	40	PAIR5-
7	Ground		41	Ground
8	PAIR6+	SERTC+/-	42	PAIR6-
9	PAIR7+	SERTFC+/-	43	PAIR7-

10	PAIR8+	CC1+/- VID1+/-	44	PAIR8-
11	PAIR9+	CC2+/- VID2+/-	45	PAIR9-
12	PAIR10+	CC3+/- VID3+/-	46	PAIR10-
13	Ground	CC4+/- VID4+/-	47	Ground
14	PAIR11+		48	PAIR11-
15	PAIR12+		49	PAIR12-
16	PAIR13+		50	PAIR13-
17	PAIR14+		51	PAIR14-
18	PAIR15+		52	PAIR15-
19	Ground		53	Ground
20	PAIR16+		54	PAIR16-
21	PAIR17+		55	PAIR17-
22	PAIR18+		56	PAIR18-
23	PAIR19+		57	PAIR19-
24	PAIR20+		58	PAIR20-
25	Ground		59	Ground
26	PAIR21+		60	PAIR21-
27	PAIR22+		61	PAIR22-
28	PAIR23+		62	PAIR23-
29	Ground		63	Ground
30	TM_SDA	2.7K pull-up	64	TM_SCL
31	TR_EEPROM_WE*	2.7K pull-up	65	Ground
32	DEBUG_TRST*	5K PU / 5K PD	66	DEBUG_TCK
33	DEBUG_TMS	5K PU / 5K PU	67	DEBUG_TDI
34	DEBUG_TDO		68	Ground

CABLES

ANALOG CABLE

The picture below is of the Analog cable. The shiny end in the middle of the picture plugs into the FF-CB and the other ends connect to your video sources. The connectors are BNC connectors which will plug directly into most analog cameras.



CAMERA LINK CABLE

The picture below is of the camera link cable. The connector at the left connects to the FF-CB and the one at the right connects to a base camera link connector on a digital camera.



DIGITAL CABLE

The picture below shows the digital adapter cable. It provides copies of nearly all of the signals on the FF-CB, but with an easier to use connector (62-miniD with three rows of pins).



The mate to the 62 pin D (at the left) is a Male 62 pin mini D connector such as Digikey part number A2079-ND, or AMP part number 748367-1. The wiring of this cable is shown in the table below.

:

VHDCI PIN	Parallel SIG-t	62-PIN-D PIN	Function <-+ PAIR - ->	VHDI PIN	Parallel SIG-b	62-PIN-D PIN
1	GND		GND	35	GND	
2	PAIR01P	4	TAP1_D0	36	PAIR01N	25
3	PAIR02P	5	TAP1_D1	37	PAIR02N	26

4	PAIR03P	6	TAP1_D2	38	PAIR03N	27
5	PAIR04P	7	TAP1_D3	39	PAIR04N	28
6	PAIR05P	8	TAP1_D4	40	PAIR05N	29
7	GND		GND	41	GND	
8	PAIR06P	9	TAP1_D5	42	PAIR06N	30
9	PAIR07P	10	TAP1_D6	43	PAIR07N	31
10	PAIR08P	11	TAP1_D7	44	PAIR08N	32
11	PAIR09P	58	TAP2_D0	45	PAIR09N	57
12	PAIR10P	60	TAP2_D1	46	PAIR10N	59
13	GND	43	GND	47	GND	
14	PAIR11P	62	TAP2_D2	48	PAIR11N	61
15	PAIR12P	21	TAP2_D3	49	PAIR12N	42
16	PAIR13P	20	TAP2_D4	50	PAIR13N	41
17	PAIR14P	19	TAP2_D5	51	PAIR14N	40
18	PAIR15P	56	TAP2_LVAL	52	PAIR15N	55
19	GND	46	GND	53	GND	
20	PAIR16P	54	TAP2_FVAL	54	PAIR16N	53
21	PAIR17P	1	TAP1_LVAL	55	PAIR17N	22
22	PAIR18P	2	TAP1_FVAL	56	PAIR18N	23
23	PAIR19P	3	TAP1_PXCK	57	PAIR19N	24
24	PAIR20P	47	GPOUT1	58	PAIR20N	48
25	GND		GND	59	GND	
26	PAIR21P	13	STROBE1	60	PAIR21N	34
27	PAIR22P	14	STROBE2	61	PAIR22N	35
28	PAIR23P	15	MASTER_CK1	62	PAIR23N	36
29	GND		GND	63	GND	
30	TM_SDA	16		64	TM_SCL	37
31	TRI_PWE	44		65	GND	45
32	~TRST	49		66	TCK	50
33	TMS	12		67	TDI	33
34	GND		GND	68	GND	

TROUBLESHOOTING

There are several things you can try before you call Alacron Technical Support for help.

- _____ Make sure the computer is plugged in. Make sure the power source is on.
- _____ Go back over the hardware installation to make sure you didn't miss a page or a section.
- _____ Go back over the software installation to make sure you have installed all necessary software.
- _____ Run the Installation User Test to verify correct installation of both hardware and software.
- _____ Run the user-diagnostics test for your main board to make sure it's working properly.
- _____ Insert the Alacron CD-ROM and check the various Release Notes to see if there is any information relevant to the problem you are experiencing.

The release notes are available in the directory: **\usr\alacron\alinfo**

- _____ Compile and run the example programs found in the directory:
\usr\alacron\src\examples
- _____ Find the appropriate section of the Programmer's Guide & Reference or the Library User's Manual for the particular library and problem you are experiencing. Go back over the steps in the guide.
- _____ Check the programming examples supplied with the runtime software to see if you are using the software according to the examples.
- _____ Review the return status from functions and any input arguments.
- _____ Simplify the program as much as possible until you can isolate the problem. Turning off any operations not directly related may help isolate the problem.
- _____ Finally, first **save your original work**. Then remove any extraneous code that doesn't directly contribute to the problem or failure.

ALACRON TECHNICAL SUPPORT

Alacron offers technical support to any licensed user during the normal business hours of 9 a.m. to 5 p.m. EST. We offer assistance on all aspects of processor board and PMC installation and operation.

CONTACTING TECHNICAL SUPPORT

To speak with a Technical Support Representative on the telephone, call the number below and ask for Technical Support:

Telephone: **603-891-2750**

If you would rather FAX a written description of the problem, make sure you address the FAX to Technical Support and send it to:

Fax: **603-891-2745**

You can email a description of the problem to support@alacron.com

Before you can contact technical support have the following information ready:

- _____ Serial numbers and hardware revision numbers of all of your boards. This information is written on the invoice that was shipped with your products.

- _____ Also, each board has its serial number and revision number written on either in ink or in bar-code form.

- _____ The version of the ALRT, ALFAST, or FASTLIB software that you are using.

- _____ You can find this information in a file in the directory: **\\usr\alfast\alinfo**

- _____ The type and version of the host operating system, i.e., Windows 98.

- _____ Note the types and numbers of all your software revisions, daughter card libraries, the application library and the compiler

- _____ The piece of code that exhibits the problem, if applicable. If you email Alacron the piece of code, our Technical-Support team can try to reproduce the error. It is necessary, though, for all the information listed above to be included, so Technical Support can duplicate your hardware and system environment.

RETURNING PRODUCTS FOR REPAIR OR REPLACEMENT

Our first concern is that you be pleased with your Alacron products.

If, after trying everything you can do yourself, and after contacting Alacron Technical Support, you feel your hardware or software is not functioning properly, you can return the

product to Alacron for service or replacement. Service or replacement may be covered by your warranty, depending upon your warranty.

The first step is to call Alacron and request a "Return Materials Authorization" (RMA) number.

This is the number assigned both to your returning product and to all records of your communications with Technical Support. When an Alacron technician receives your returned hardware or software he will match its RMA number to the on-file information you have given us, so he can solve the problem you've cited.

When calling for an RMA number, please have the following information ready:

- _____ Serial numbers and descriptions of product(s) being shipped back
- _____ A listing including revision numbers for all software, libraries, applications, daughter cards, etc.
- _____ A clear and detailed description of the problem and when it occurs
- _____ The exact code that will cause the failure
- _____ A description of any environmental condition that can cause the problem

All of this information will be logged into the RMA report so it's there for the technician when your product arrives at Alacron.

Put boards inside their anti-static protective bags. Then pack the product(s) securely in the original shipping materials, if possible, and ship to:

Alacron Inc.
71 Spit Brook Road, Suite 200
Nashua, NH 03060
USA

Clearly mark the outside of your package:

Attention **RMA #80XXX**

Remember to include your return address and the name and number of the person who should be contacted if we have questions.

REPORTING BUGS

We at Alacron are continually improving our products to ensure the success of your projects. In addition to ongoing improvements, every Alacron product is put through extensive and varied testing. Even so, occasionally situations can come up in the fields that were not encountered during our testing at Alacron.

If you encounter a software or hardware problem or anomaly, please contact us immediately for assistance. If a fix is not available right away, often we can devise a work-around that allows you to move forward with your project while we continue to work on the problem you've encountered.

It is important that we are able to reproduce your error in an isolated test case. You can help if you create a stand-alone code module that is isolated from your application and yet clearly demonstrates the anomaly or flaw.

Describe the error that occurs with the particular code module and email the file to us at:

support@alacron.com

We will compile and run the module to track down the anomaly you've found.

If you do not have Internet access, or if it is inconvenient for you to get to access, copy the code to a disk, describe the error, and mail the disk to Technical Support at the Alacron address below.

If the code is small enough, you can also:

FAX the code module to us at **603-891-2745**

If you are faxing the code, write everything large and legibly and remember to include your description of the error.

When you are describing a software problem, include revision numbers of all associated software.

For documentation errors, photocopy the passages in question, mark on the page the number and title of the manual, and either FAX or mail the photocopy to Alacron.

Remember to include the name and telephone number of the person we should contact if we have questions.

Alacron Inc.
71 Spit Brook Road, Suite 200
Nashua, NH 03060
USA

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Fax: 603-891-2745

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