

ACS IDE to CF Adapter

Module

User's Manual

Monday, May 05, 2003



On The Cutting Edge of Technological Evolution

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Introduction

Thank you for purchasing the ACS IDE to CF Adapter Module. This device provides low-cost interfacing of Compact Flash Association CF Cards with IDE / ATA equipped computers.

Features:

The ACS IDE to CF Adapter Module provides the following hardware resources:

- CF Standard Type 1 Card 50 pin Connector
- Four different models:
 - Original IDE Standard 40 pin 0.1" Male Ribbon Connector (non-SFF)
 - IDE Standard 40 pin 0.1" Male Ribbon Connector (non-SFF)
 - IDE 40 pin 0.1" Female Connector (non-SFF)
 - SFF IDE Standard 44 pin 0.079" Male Ribbon Connector (SFF)
- Drive Select Jumpers
- CF Card Power Control
- Card Powered Indicator
- Card Accessed Indicator

Installation

The ACS IDE to CF Adapter module may be mounted with screws through the appropriate mounting holes. Note that the plated mounting hole marked 'MT1' is connected to the Ground on the module. Please refer to the board outlines at the end of this manual for mounting dimensions. The newer models are designed for ease of installation with redesigned form factors, mounting holes and additional jumpers.

The module connects to the host PC in the same way that a hard drive is connected - using an IDE cable on both SFF and non-SFF male connector models, and powered via a disk drive power cable on non-SFF models. There is also a new model that is designed to plug directly into the IDE connector on the motherboard.

Be careful to observe the pin numbers and connector orientations that are marked on the board legend. On development systems, it is recommended that the module be installed as the only device on the Secondary IDE channel. On target embedded systems, it is recommended that the module be installed as the only or Master device on the Primary IDE channel.

IDE Connector

The IDE connector supports PC compatible signals that allow the ACS IDE to CF Adapter Module to be connected to widely available PC compatible motherboards. The IDE connector pin-out follows:

Pin #	SFF Pin #	Name	Notes
1	1	RESET-	
2	2	GND	
3	3	D7	
4	4	D8	
5	5	D6	
6	6	D9	
7	7	D5	
8	8	D10	
9	9	D4	
10	10	D11	
11	11	D3	
12	12	D12	
13	13	D2	
14	14	D13	
15	15	D1	
16	16	D14	
17	17	D0	
18	18	D15	
19	19	GND	
20	20	KEY	
21	21	DMARQ-	NOT USED
22	22	GND	
23	23	IOWR-	
24	24	GND	
25	25	IORD-	
26	26	GND	
27	27	IORDY	
28	28	CSEL-	MAY BE FORCED LOW VIA JB1
29	29	DMACK-	NOT USED
30	30	GND	
31	31	IRQ	
32	32	IOCS16-	
33	33	A1	
34	34	PDIAG	
35	35	A0	
36	36	A2	
37	37	CE1-	LIGHTS RED LED WHEN ACTIVE WITH IORD- or IOWR-
38	38	CE2-	LIGHTS RED LED WHEN ACTIVE WITH IORD- or IOWR-
39	39	DASP	
40	40	GND	
N/A	41	+5v Logic	
N/A	42	+5v Motor	
N/A	43	GND	
N/A	44	0=ATA	

CF Connector

The CF Adapter Card connector provides CF compatible signals. The CF connector pin-out follows:

Pin #	Name	Notes
1	GND	
2	D3	
3	D4	
4	D5	
5	D6	
6	D7	
7	CE1-	LIGHTS RED LED WHEN ACTIVE
8	A10	GROUND
9	OE-	GROUND
10	A9	GROUND
11	A8	GROUND
12	A7	GROUND
13	VCC	+5VDC
14	A6	GROUND
15	A5	GROUND
16	A4	GROUND
17	A3	GROUND
18	A2	
19	A1	
20	A0	
21	D0	
22	D1	
23	D2	
24	IOIS16-	
25	CD2-	LIGHTS GREEN LED WHEN ASSERTED WITH CD1
26	CD1-	LIGHTS GREEN LED WHEN ASSERTED WITH CD2
27	D11	
28	D12	
29	D13	
30	D14	
31	D15	
32	CE2-	
33	VS1-	NO CONNECTION
34	IORD-	
35	IOWR-	
36	WE-	TIED TO +5V
37	IREQ-	
38	VCC	+5VDC ONLY
39	CSEL-	MAY BE FORCED LOW VIA JB1
40	VS2-	NO CONNECTION
41	RESET-	
42	IORDY	
43	INPACK-	NO CONNECTION
44	REG-	TIED TO +5V
45	DASP	
46	PDIAG	
47	D8	
48	D9	
49	D10	
50	GND	

Power Connector

All ACS IDE to CFA Adapters only require +5vdc. They are designed to use industry standard power cabling.

The ACS-CF-IDEtoCFA 40 PIN FEMALE Rt. Angle model plugs directly into the Host PC motherboard and requires a floppy drive style power connector.

The **ACS-CF-IDEtoCFA 40 PIN IDE MALE** is designed to be mounted in a drive bay and has a standard 5 ¼" power connector as part of the IDE connector.

The **ACS-CF-IDEtoCFA 44 PIN SFF IDE MALE** is designed to connect to a 2.5" hard drive IDE chain and obtains its power via the extended signals on extra four pins of the IDE interface.

Drive Select Jumpers

Jumper JB1 allows the original ACS IDE<->CF Adapter (revision #2) module to be connected standalone or as the Master in a Master/Slave IDE string. When installed, JB1 forces the IDE CSEL- line active low indicating that there are no other devices on the IDE channel. This is the proper setting when the IDE to CF Adapter is the only device on the IDE channel.

The **ACS-CF-IDEtoCFA 40 PIN FEMALE Rt. Angle** model has no drive configuration jumpers as it is designed to plug directly into the Host PC's motherboard and be the only device on the IDE chain.

The **ACS-CF-IDEtoCFA 40 PIN IDE MALE** is designed to be mounted in a drive bay and has Master (MS), Slave (SL) and Cable-Select (CS) jumpers as part of the IDE connector.

The **ACS-CF-IDEtoCFA 44 PIN SFF IDE MALE** is designed to connect to a 2.5" hard drive IDE interface and has a jumper block for selecting Master (MS), Slave(SL) and Cable-Select (CS) operation. The ATA jumper grounds the same named signal on the extended IDE connector, and may or may not be required for correct operation with your Host PC.

Indicators

All ACS IDE to CF Adapter Modules have two LED indicators to provide operating feedback to the user. The Green LED is illuminated whenever the CF card is fully inserted and subsequently has power applied. The Red LED briefly illuminates whenever the CF card is being accessed by the host PC.

Operation

All ACS IDE to CF Adapter modules have circuitry to detect proper CF card insertion and apply power only when the card is fully installed. This is indicated by the illumination of the Green LED. However, the circuitry in the Host PC is not designed for removable IDE device operation while power is applied.

To avoid damage to the Host PC and/or CF Card, it is strongly recommended that CF cards are only installed or removed when the power to the system is OFF.

The BIOS in most host PCs are able to recognize the CF cards using the 'Auto' detection feature. Some early BIOS do not support this capability and may require the manual entry of the Cylinders, Heads and Sectors values as for a 'User' defined hard drive. These values are available from the CF card manufacturer or may be obtained via the BIOS IDE detection screen on another host PC.

Once correctly identified to the Host PC BIOS, the CF cards behave exactly like a PC hard drive. They may be FDISKed, FORMATted and made bootable just like their larger, rotating counterparts.

REMEMBER!!! The CF card has a limited number of write cycles!!!
Performing an OS Plug and Play setup or configuring a swap or page file on the CF card will rapidly exhaust its usable life.

Trouble Shooting

The ACS IDE to CF Adapter module has circuitry to detect proper CF card insertion and apply power only when the card is fully installed. This is indicated by illumination of the Green LED. The Red LED indicates CF card access. If the BIOS hangs on power up, try the following:

1. Turn power off to the computer in which the CF adapter is being installed
2. Install the CF adapter on the Primary IDE cable/chain
3. Make sure the Master jumper is installed on the CF adapter
4. Insert your CF card into the CF adapter
5. Power up the computer
6. Set the CMOS to auto type the Primary Master IDE device
7. Save the CMOS settings and reboot
8. See if the BIOS correctly reads the Cylinder, Heads, Sectors from the CF card.
9. If it can't read the Cylinders, Heads, Sectors, make sure the following happened during power up:
 - a. The Green LED turned on when power was applied to the computer
 - b. The Red LED turned on or flashed when the bios was trying to determine its size

If step "a" doesn't happen, check for power to the CF adapter via the disk drive connector on non-SFF adapters.

If step "a" & "b" happened, but the BIOS still cannot determine the Cylinders, Heads, and Sectors, try a different CF card

If step "a" & "b" happened, and the BIOS determined the Cylinders, Heads, and Sectors, but the computer will not boot, check the following:

1. Make sure the CF Card is setup as a hard disk, not a floppy. Some manufactures ship the cards formatted as floppies. Use fdisk to display and or create a partition on the CF card, then format the partition. If you have a choice, format the partition using FAT, or FAT16. Some motherboards will not boot FAT32.
2. Make sure the partition is active
3. Try using a different brand of CF card. Some BIOS's need a delay after resetting the hard drive to identify it. CF cards with SST controllers have a built in delay, to sometimes better mimic a mechanical hard drive.
4. Some older BIOS's just will not boot from a CF card, due to its speed. Check the motherboard manufacture for a newer BIOS.

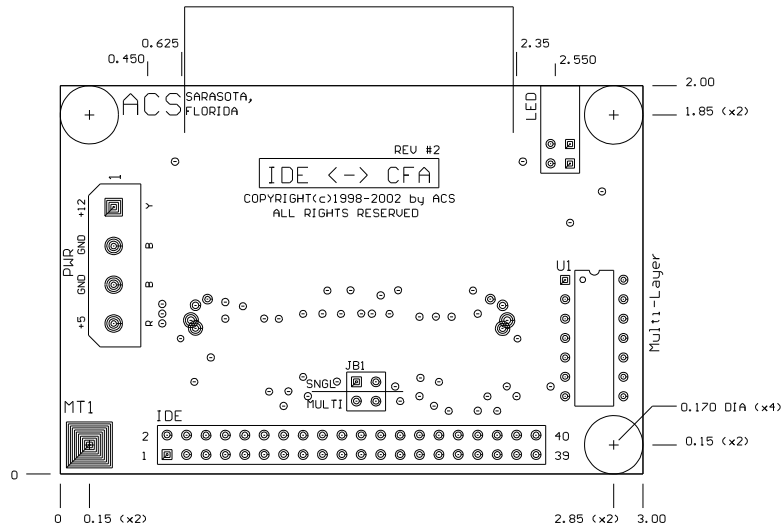
It is possible to have a defective ACS IDE to CF Adapter, but more likely to have a bad CF card(s), or incompatible BIOS. If the Green LED flickers when the Red access LED turns on, then the ACS IDE to CF Adapter CF Card power switching section is bad, and the adapter needs to be returned for repair.

Since Compact Flash cards are consumer price driven, Compact Flash card manufactures use any CF controller they can buy the cheapest. Just because you're buy brand "X" compact flash card, doesn't mean you're getting the same CF controller every time. It can change from day to day, hour to hour, week to week, lot to lot.

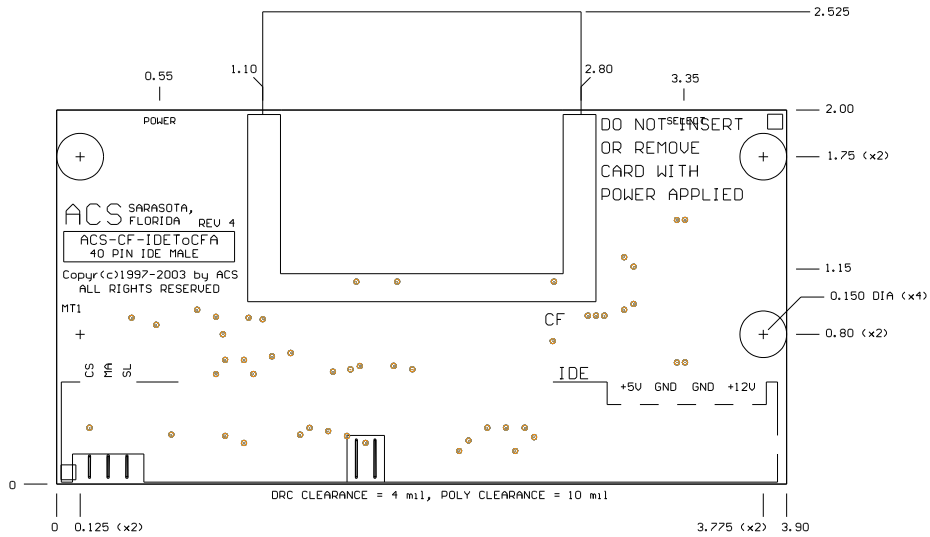
Because of these unknowns with the compact flash cards, we test each ACS IDE to CF Adapter twice, once after the manufacturing process, and again before it ships.

IDE to CF Module Layouts

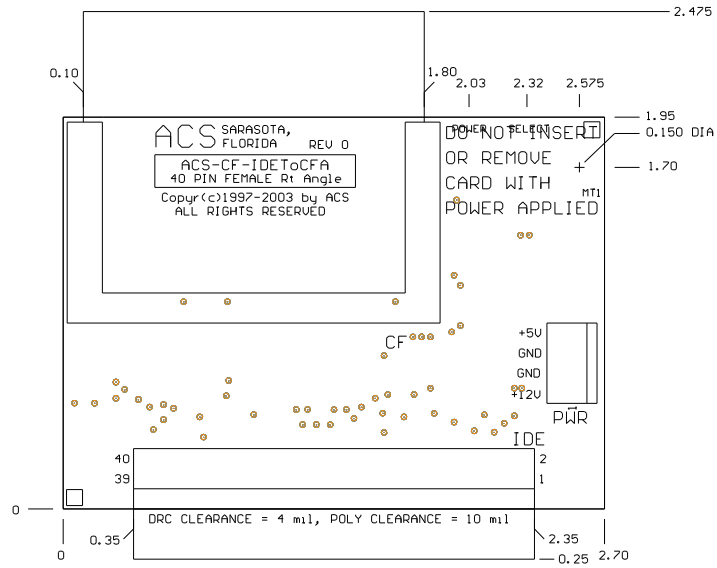
Original ACS IDE <-> CFA (Rev #2)



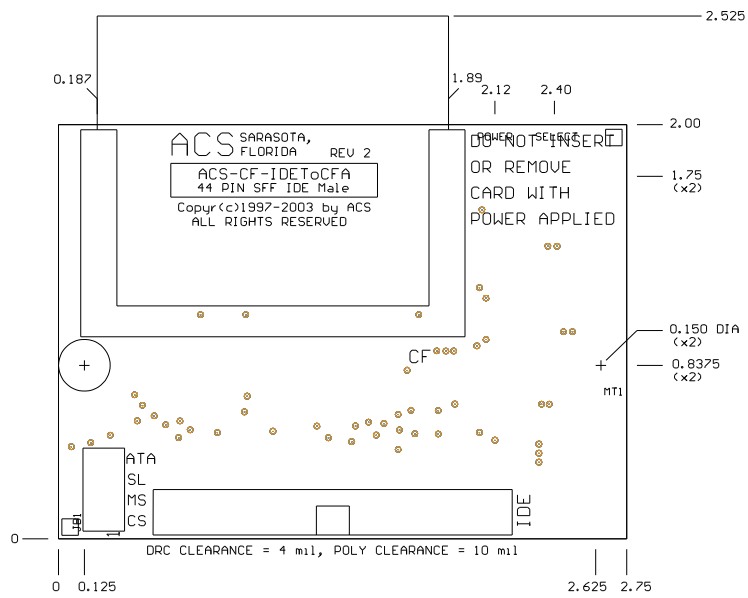
ACS-CF-IDEtoCFA 40 PIN IDE MALE

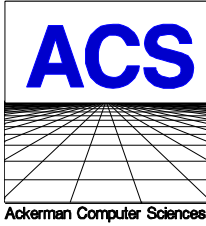


ACS-CF-IDEtoCFA 40 PIN FEMALE Rt. Angle



ACS-CF-IDEtoCFA 44 PIN SFF IDE Male





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Engineering Bulletin

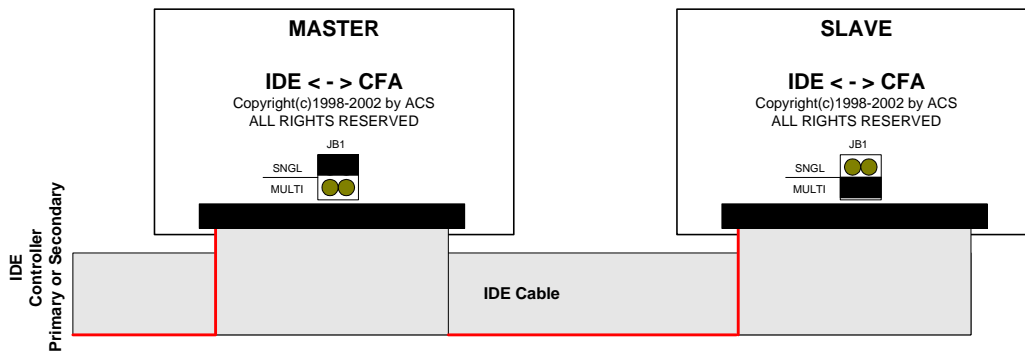
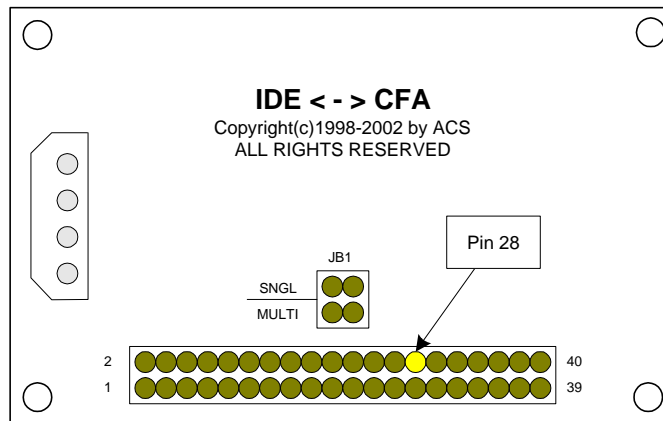
DATE: 5/5/03

PRODUCT: ACS IDE to CFA Adaptor **Revision #2 Only**

TITLE: Master / Slave Operation

Normally, the ACS IDE to CFA Adaptor revision #2 must be the only device on an IDE Primary or Secondary chain. By making a small modification, two ACS IDE to CFA revision #2 Adaptors, master and slave, may be used on an IDE Primary or Secondary chain.

IDE connector Pin 28 on the ACS IDE to CFA revision #2 adaptor is the CSEL- signal. By **removing or cutting this pin** on both adaptors, then jumpering one ACS IDE to CFA adaptor as Master (jumper installed on SNGL) and jumpering the other IDE to CFA adaptor as Slave (jumper installed on MULTI) two ACS IDE to CFA adaptors can coexist as master/slave on the same IDE chain.



One caveat - the select LEDs on both adaptors will light whenever either drive on the chain is selected.