



## CTAN007: TrueIDE Mode Operation of Cactus Technologies' Flash Memory Cards

Covered Products: PC Cards, Compact Flash Cards

### 1. Introduction

Both PC Card and Compact Flash standards define a mode in which the card can operate as though it is a hard disk drive. This is called TrueIDE mode operation. For this mode, the pins of the card interface are redefined to match the signal usage in the ATA Specification. The following sections of this appnote show the modified pin mappings and example schematics of adapter circuits for both PC Cards and CF Cards.

### 2. TrueIDE Mode for PC Cards

The following table shows the pin mapping for PC Cards in various modes.

Pin no.	PC Card Memory Mode	PC Card I/O Mode	TrueIDE Mode
1	GND	GND	GND
2	D3	D3	D3
3	D4	D4	D4
4	D5	D5	D5
5	D6	D6	D6
6	D7	D7	D7
7	CE1#	CE1#	CS0#
8	A10	A10	---

Pin no.	PC Card Memory Mode	PC Card I/O Mode	TrueIDE Mode
9	OE#	OE#	GND
10	---	---	---
11	A9	A9	---
12	A8	A8	---
13	---	---	---
14	---	---	---
15	WE#	WE#	---
16	Rdv/Bsv	IREQ	INTRQ
17	VCC	VCC	VCC
18	VPP	VPP	VPP
19	---	---	---
20	---	---	---
21	---	---	---
22	A7	A7	---
23	A6	A6	---
24	A5	A5	---
25	A4	A4	---
26	A3	A3	---
27	A2	A2	A2
28	A1	A1	A1
29	A0	A0	A0
30	D0	D0	D0
31	D1	D1	D1
32	D2	D2	D2
33	WP	IOIS16#	IOCS16#
34	GND	GND	GND
35	GND	GND	GND
36	CD1#	CD1#	GND
37	D11	D11	D11
38	D12	D12	D12
39	D13	D13	D13
40	D14	D14	D14
41	D15	D15	D15
42	CE2#	CE2#	CS1#
43	VS1#	VS1#	---
44	IORD#	IORD#	IORD#
45	IOWR#	IOWR#	IOWR#
46	---	---	---
47	---	---	---
48	---	---	---
49	---	---	---

Pin no.	PC Card Memory Mode	PC Card I/O Mode	TrueIDE Mode
50	---	---	---
51	VCC	VCC	VCC
52	VPP	VPP	VPP
53	---	---	---
54	---	---	---
55	---	---	---
56	CSEL#	CSEL#	CSEL#
57	VS2#	VS2#	---
58	RESET	RESET	RESET#
59	WAIT#	WAIT#	IORDY
60	INPACK#	INPACK#	DMARQ
61	REG#	REG#	DMACK#
62	BVD2	SPKR#	DASP#
63	BVD1	STSCHG#	PDIAG#
64	D8	D8	D8
65	D9	D9	D9
66	D10	D10	D10
67	CD2#	CD2#	GND
68	GND	GND	GND

*Table 1. PC Card Pin Assignment*

Note: The host should take care to make sure that unused pins (e.g. A10-A3) on the PC Card interface while in TrueIDE mode are not left floating.

The next page shows a sample schematic of how to connect the pins from a PC Card socket to the 40-pin ATA connector on a typical host motherboard so that the PC Card can be use in TrueIDE mode.



### 3. TrueIDE Mode for CompactFlash Cards

The following table shows the pin mapping for CF Cards in TrueIDE mode.

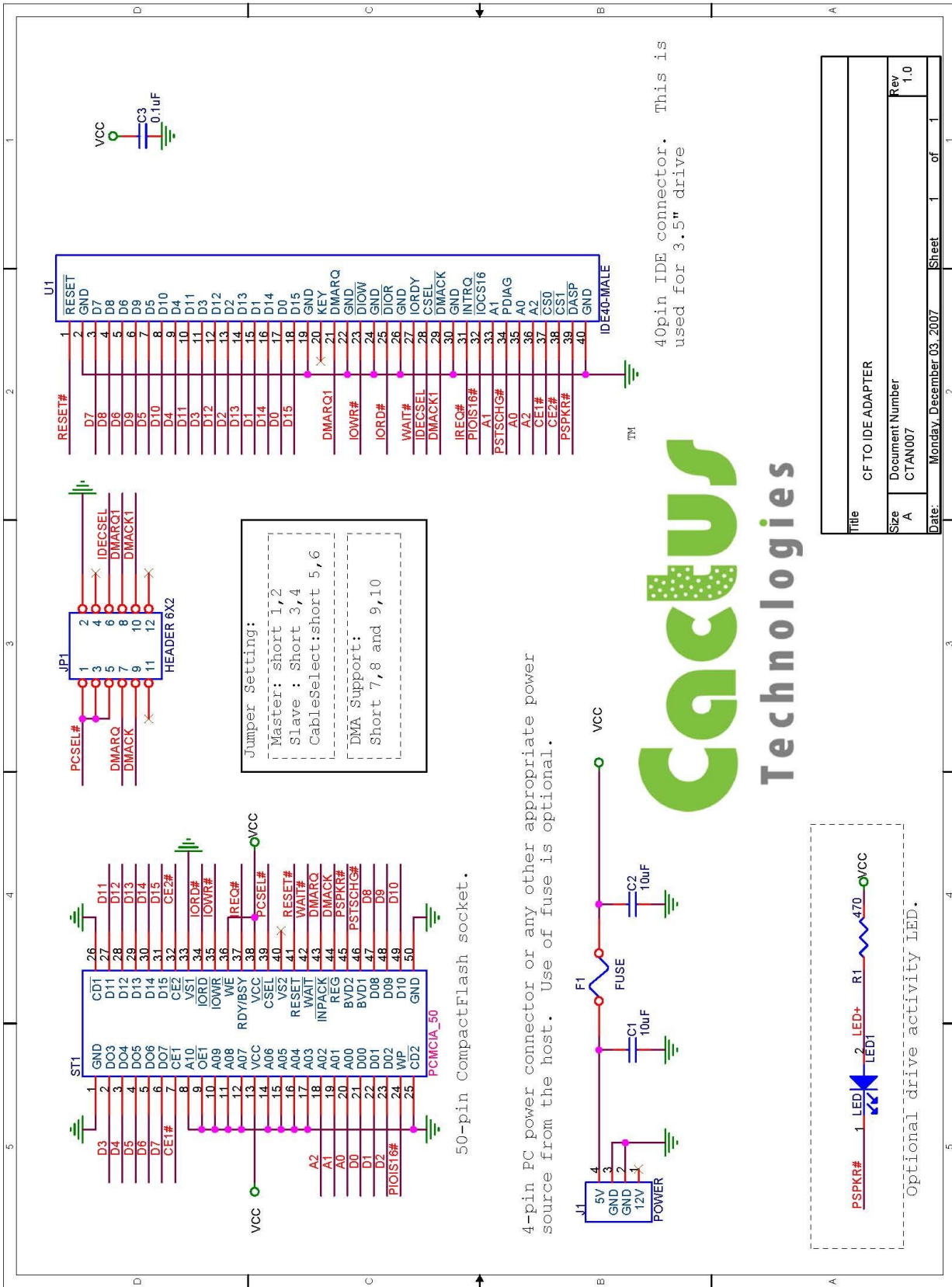
Pin no.	Memory Mode	I/O Mode	TrueIDE Mode
1	GND	GND	GND
2	D3	D3	D3
3	D4	D4	D4
4	D5	D5	D5
5	D6	D6	D6
6	D7	D7	D7
7	CE1#	CE1#	CS0#
8	A10	A10	---
9	OE#	OE#	GND
10	A9	A9	---
11	A8	A8	---
12	A7	A7	---
13	VCC	VCC	VCC
14	A6	A6	---
15	A5	A5	---
16	A4	A4	---
17	A3	A3	---
18	A2	A2	A2
19	A1	A1	A1
20	A0	A0	A0
21	D0	D0	D0
22	D1	D1	D1
23	D2	D2	D2
24	WP	IOIS16#	IOCS16#
25	CD2#	CD2#	---
26	CD1#	CD1#	---
27	D11	D11	D11
28	D12	D12	D12
29	D13	D13	D13
30	D14	D14	D14
31	D15	D15	D15
32	CE2#	CE2#	CS1#
33	VS1#	VS1#	---
34	IORD#	IORD#	IORD#
35	IOWR#	IOWR#	IOWR#

Pin no.	Memory Mode	I/O Mode	TrueIDE Mode
36	WE#	WE#	---
37	Rdv/Bsv	IREQ	INTRQ
38	VCC	VCC	VCC
39	CSEL#	CSEL#	CSEL#
40	VS2#	VS2#	---
41	RESET	RESET	RESET#
42	WAIT#	WAIT#	IORDY
43	INPACK#	INPACK#	DMARQ
44	REG#	REG#	DMACK#
45	BVD2	SPKR#	DASP#
46	BVD2	STSCHG#	PDIAG#
47	D8	D8	D8
48	D9	D9	D9
49	D10	D10	D10
50	GND	GND	GND

Table 2. CF Card Pin Assignment

Note: The host should take care to make sure that unused pins (e.g. A10-A3) on the PC Card interface while in TrueIDE mode are not left floating.

The next page shows a sample schematic of how to connect the pins from a CF Card socket to the 40-pin ATA connector on a typical host motherboard so that the CF Card can be used in TrueIDE mode.



Title		CF TO IDE ADAPTER
Size	Document Number	Rev
A	CTAN007	1.0
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## 4. Version History

<i>Version</i>	<i>Date</i>	<i>Change</i>
1.00	December 2, 2007	Initial Version
1.01	December 4, 2007	Added DMA signals at CF card table
1.02	June 3, 2008	Minor edits