APPLICATION NOTE

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Rev. 1

Comparison of the CR9032 and CR9031 CPU Modules for CR9000(X) Systems

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Comparison of the CR9032 and CR9031 CPU Modules for CR9000(X) Systems

This application note provides several charts that allow you to easily compare the CR9032 CPU Module (used in the CR9000X) with the CR9031 CPU Module (used in the CR9000). These CPU modules are what differentiates the CR9000X from the CR9000. The CR9000X replaced the CR9000 in August 2004. The CR9032 provides the CR9000X with superior capabilities over the CR9000. An existing CR9000 can be converted to a CR9000X by simply replacing the CR9031 module with a CR9032.

Processor

Characteristic	CR9031	CR9032
Type	INMOS T805 transputer	Hitachi SH-4 microprocessor
Clock Speed	20 MHz	180 MHz (see note)
Memory Cache	none	32 kbyte RAM
Program Name Extension	*.CR9	*.C9X

Note: *The CR9032 can achieve Higher Speed with Memory Cache and SDRAM, which results in a processing speed that is 25 times faster than the CR9031.*

Memory

Characteristic	CR9031	CR9032
RAM Storage	2 Mbyte SRAM	128 Mbyte SDRAM
Flash	2 Mbyte	2 Mbyte (see note 1)
Program Storage	128 kbyte Flash	128 kbyte Flash
PC Card Expansion Port	requires CR9080 module	built-in single slot (see note 2)
Card Format File System	16-bit	16-bit or FAT 32

Notes:
(1) This memory is reserved for both the operating system and program storage.

(2) The CR9032's card slot supports up to 2 Gigabyte cards.

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Communication Ports

Port Type	CR9031	CR9032
TLink	built-in (see note 1)	N/A
10/100 BaseT EtherNet	requires NL105 module	built-in
RS-232 9-pin serial	requires TL925 Interface	built-in
Parallel	requires PLA100 Interface	N/A
CS I/O 9-pin serial	requires CR9080 module	built-in (see note 2)
SDM Control	requires CR9080 module	built-in (see note 2)

Notes:
(1) The CR9031 requires expensive peripherals to interface with a computer.

(2) SDM Devices must use the SDM ports for communications when using the CR9032.

Peripheral Compatibility

Peripheral	CR9031	CR9032
AM25T	standard	reformatted instruction
SDM-AO4	not supported	standard
SDM-CD16AC	not supported	standard
SDM-CD16D	not supported	standard
SDM-CAN	requires CR9080 module	standard
SDM-CVO4	not supported	standard
SDM-INT8	requires CR9080 module	standard
SDM-SIO4	requires CR9080 module	standard
SDM-SW8A	not supported	standard
DSP4	requires CR9080 module	standard
CSAT 3	requires CR9080 module	standard

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PC-Card LED Indicator Status

LED Color	CR9031	CR9032
Red	corrupt card present	accessing the card
Dark (not lit)	card not detected, can safely remove card	card not detected or formatted card with errors
Yellow	not used	corrupt card, or no card with CardOut used in program
Green	card present and correctly formatted	safely remove card
Orange	accessing the card	not used

Instruction Set

The CR9031 and CR9032 have similar instruction sets, and many existing CR9000 programs will function properly without modifications. The CR9032 includes additional instructions that support capabilities not provided in the CR9031. Also, some of the CR9031's instructions have been modified or removed, and programs containing those instructions will need to be revised.

New Instructions

Instruction	CR9031	CR9032
ACOS	not supported	arc-cosine function
AO4	not supported	supports the SDM-AO4 or SDM-CVO4
ASIN	not supported	arc-sine function
ATN2	not supported	arc-tangent function
CalFile	not supported	stores calibration constants
CardOut	was PamOut	writes data to PCMCIA cards
CD16AC	not supported	supports the SDM-CD16AC or SDM-CD16D
CosH	not supported	hyperbolic cosine function
CS7500	not supported	supports the LI7500
IMP	not supported	logical implication function
LOG10	not supported	log base 10 function
SinH	not supported	hyperbolic sine function
SW8A	not supported	supports the SDM-SW8A
TanH	not supported	hyperbolic tangent function
WindVector	not supported	wind vector function

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Modified or Removed Instructions

Existing CR9000 programs that include one or more of the following instructions will need to be revised if the CR9000 is upgraded to a CR9000X (i.e., the CR9031 module replaced with the CR9032).

Instruction	CR9031	CR9032
AM25T	old format	easier to use format
BurstTrigger	burst mode supported	burst mode not supported (see Scan)
Delay	old format	option to select measurement or processing delay added
FlashOut	write to Flash	storing data files to Flash is not supported
Low Priority	supported	removed
MemoryTest	supported	removed
Outlink	supported	removed
PamOut	old format	replaced with CardOut Instruction
Scan	format change	supports buffer mode instead of burst mode
RunDLDFile	old format	options changed to support PCMCIA cards
WaitlinkTrig	supported	removed

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