Application note

Number	20
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Author	H. Bruhn
Subject	How to use General Purpose Chip Select on DIMM-PC´s
Related Products	DIMM-PC/386-B, DIMM-PC/386-I, DIMMPC/486-I, DIM-PC/586-I

Date	Edited by	Alteration to previous document revision
30.09.98	H. Bruhn	Initial release
17.09.00	G.Vogl	Add info to DIMM-PC/486/586 and function-table 74LS138
23.04.02	D. Gunter	English proofreading
23.08.02	H. Bruhn	Changed to Kontron style

1. Basic information

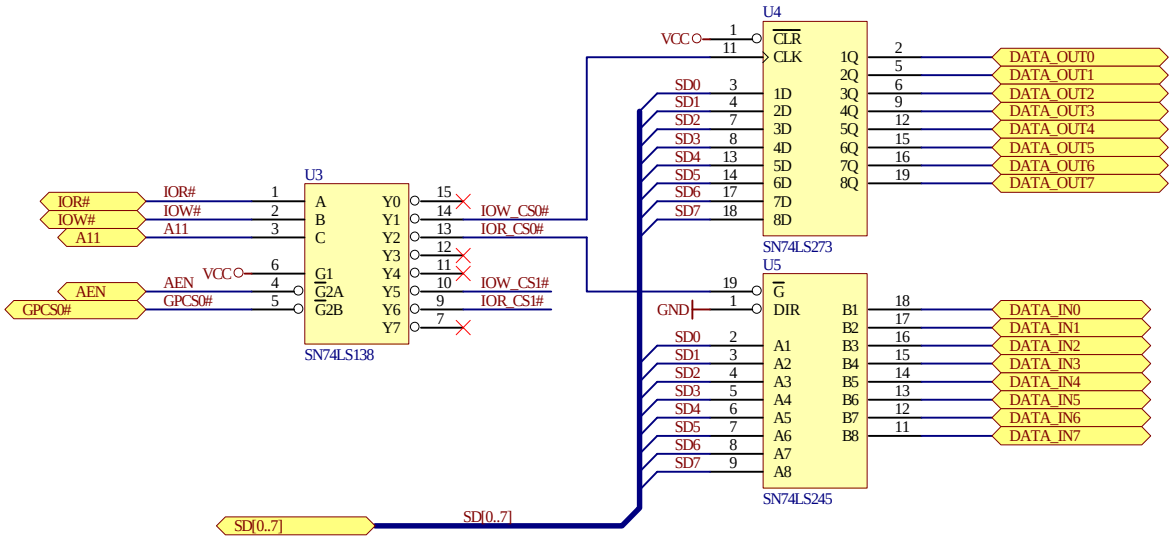
The Kontron DIMM-PC has been designed for embedded applications that have to be controlled by a PC-architecture with a minimum use of space. In many cases it is necessary to address additional peripheral devices offboard the DIMM-PC. This can be a very hard job to do. Kontron has found an easier solution to control additional peripheral hardware with a special signal of the DIMM-PC bus. Every Kontron DIMM-PC offers an onboard generated low active General Purpose Chip Select (refered to as /GPCS) which is connected to Pin 76 of DIMM-PC-bus and is made available for external peripherals.

2. Selecting I/O-port address of GPCS

The I/O-port address of GPCS can be changed in the BIOS. Enter the BIOS-setup using the <DEL> key and choose “Advanced“ in the Setup-Window. Use cursor keys to scroll through the options until the section “---Special Options---“ is shown. One entry is “GPCS address“. Possible settings are 110h, 220h, 330h and disabled. The address decode of GPCS is only a 10 bit address, which allows several GPCS signals to be decoded in the full address range by using address lines A11 to A19 for decoding.
Note: If the adress lines A10 to A19 are not decoded, the GPCS port is mirrored every 400hex (with 330h this results in mirroring at 730h, B30h, etc.).

3. Application example

3.1 DIMM-PC/386-I



The schematics above shows one possible solution for using the GPCS signal in a customer application. It's opposite to the normal circuitry on an ISA-Bus so there is one advantage. No address decoder is necessary because it is already integrated in the DIMM-PC.

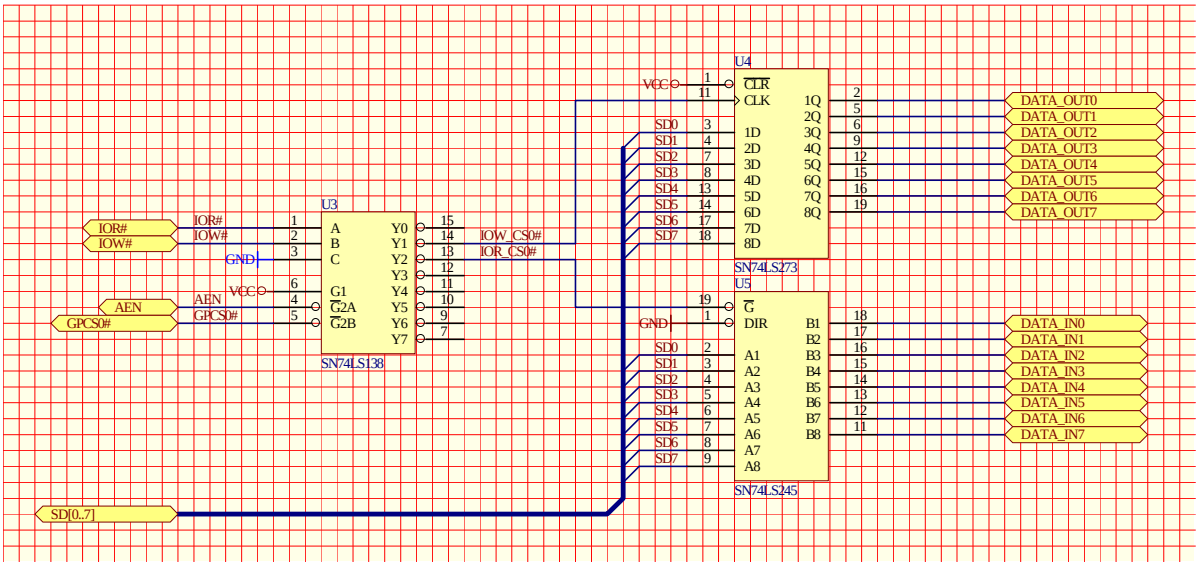
With a simple "Out" command it is possible to switch the state of any signal with the latch (U4). For example, if the GPCS is set to the address 330h in the BIOS setup, the simple command OUT 330,11 with a DOS debugger, sets the 8 output lines "DATA_OUT" to the value 11h. Keep in mind that with the above schematics the state of the lines "DATA_OUT" is not set to a defined value during the start of the system. Additional circuitry might be necessary for many applications.
The "IN" command on the programmed GPCS address will read the state of the input-lines DATA_IN[0..7] via U5.

Both directions (IN and OUT) are possible without an address decoder for one programmable I/O address.

Address line A11 is used to generate a second CS (IOW/R_CS1#) signal at Base Address plus 800h.

3.2 DIMM-PC/486/586

The DIMM-PC offers a further programmable chip select output (available over the DIMM-PC-Bus) whose output address can be adjusted in the BIOS Setup. Below you can see an example about external usage for this output signal.
The address decoder on the DIMM-PC/486 /586 works with 16 Address lines (A0-A15).



3.3 Function Table SN74LS138

CS1	CS2	CS3	A2	A1	A0	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
Vcc	AEN	GPCS	*	IOW	IOR								
X	X	H	X	X	X	H	H	H	H	H	H	H	H
X	H	X	X	X	X	H	H	H	H	H	H	H	H
L	X	X	X	X	X	H	H	H	H	H	H	H	H
H	L	L	L	L	L	L	H	H	H	H	H	H	H
H	**L**	**L**	**L**	**L**	**H**	H	**L**	H	H	H	H	H	H
H	**L**	**L**	**L**	**H**	**L**	H	H	**L**	H	H	H	H	H
H	L	L	L	H	H	H	H	H	L	H	H	H	H
H	L	L	H	L	L	H	H	H	H	L	H	H	H
H	L	L	H	L	H	H	H	H	H	H	L	H	H
H	L	L	H	H	L	H	H	H	H	H	H	L	H
H	L	L	H	H	H	H	H	H	H	H	H	H	L

* may be used for a second GPCS adress