Configuring the External Access Feature in the EMUL166 and EMULST10 Emulators.   *Application Note # 100*

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EXTERNAL ACCESS - EMUL166-PC and EMULST10-PC   *VERSION 1.0*

This option is found under the Config, Emulator menu in the Hdw Config tab and in the Miscellaneous window. This option passes information to the emulator monitor code and only indirectly controls CPU registers. This option is applicable only to the Nohau EMUL166 and EMULST10 emulator families. This note is concerned with the Infineon C166 and ST Microelectronics ST10 families.

If the EA pin (External Access) is set high at the CPU reset, the CPU starts fetching code from the internal ROM area. The ROMEN bit (Internal ROM Enable) in the SYSCON register is set high. BUSACT0 (Bus Active Control) in the BUSCON register is cleared which disables the external bus. Port 0 is available for use as general purpose I/O and not address and data information.

If the processor reads or writes the external bus at this time, the Illegal External Bus Access Flag (ILLBUS) is set and the program jumps to address 0028h. The intended external access will then not occur. This situation will happen when the emulator monitor code tries to initialize the breakpoint and mapping memory that is inside the emulator during emulator initialization. In this situation, since the breakpoint and mapping memory is accessed via the external memory bus, a ILLBUS will occur.

This check box essentially asks permission to clear the breakpoint and mapping memory table during the emulator initialization period by using Port 0 to access this memory. You should be aware of any issues this may cause with any target hardware connected to Port 0. This is the essence of the issue here. Activity on Port 0 caused by the emulator initialization period could upset some target applications and this fact must be taken into account by the designer.

If your application uses only internal ROM space and Port 0 is used as I/O and having activity on Port 0 will cause problems with your hardware, the External Memory check box must not be selected. Port 0 will not be used to initialize the breakpoint and mapping memory. These two emulator RAM spaces are not used. Only software breakpoints are used because the ROM space of the microcontroller is synthesized with RAM, not ROM. Since there is no external memory by definition, the mapping function is redundant.

Some applications use both internal ROM space and external memory. In this case, Port 0 will not be available for I/O but will be used for address and data buses. The External Memory box must be checked to activate the external bus and to initialize the breakpoint and mapping memory.

If the External Mode of the microcontroller is selected with EA held low at reset, the setting of this emulator option has no practical effect and can be ignored. This is the default setting for stand-alone operation.