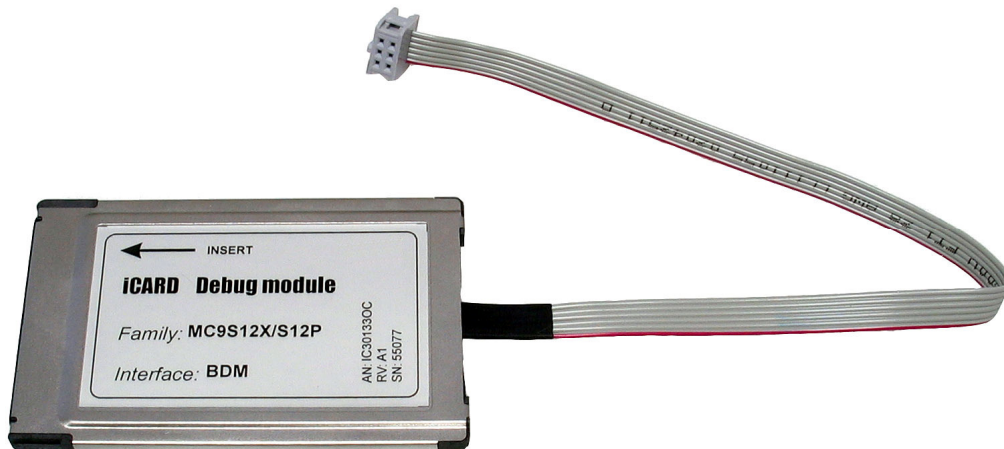


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## Hardware Reference

# MC9S12X/ S12P / S12G family iCARD Debug module

Ordering code	IC301330C-1
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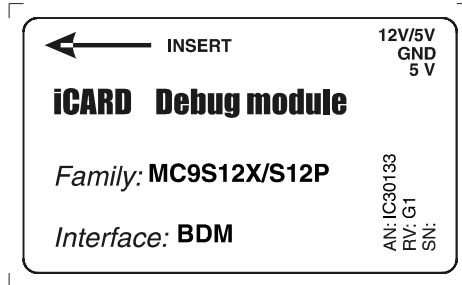
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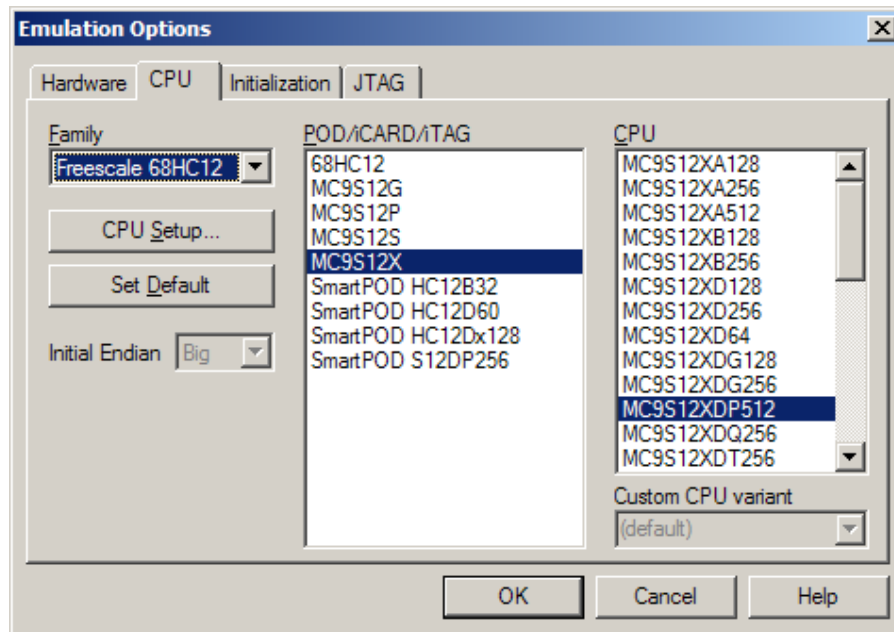
<b>Ordering code</b>	<b>IC30133OC-1</b>
<b>Dimensions (WxLxH, mm)</b>	<b>54x84x5</b>



Supported CPU families
68HC12
MC9S12
MC9S12X + XGATE
MC9S12P
MC9S12G
MC9S12S

**Note: License for MC9S12G family (IC30121-S12G) is included with this iCard.**

Note that when debugging the 68HC12 or MC9S12 families, 68HC12 iCARD must be selected in winIDEA. When MC9S12X + XGATE is debugged, MC9S12X iCARD must be selected. When debugging the MC9S12P family, MC9S12P iCARD must be selected and when debugging the MC9S12G family, MC9S12G iCARD must be selected.



The following pinout is valid on the target side:

2	4	6
GND	RESET	Vcc
BGND	NC	Vfp
1	3	5

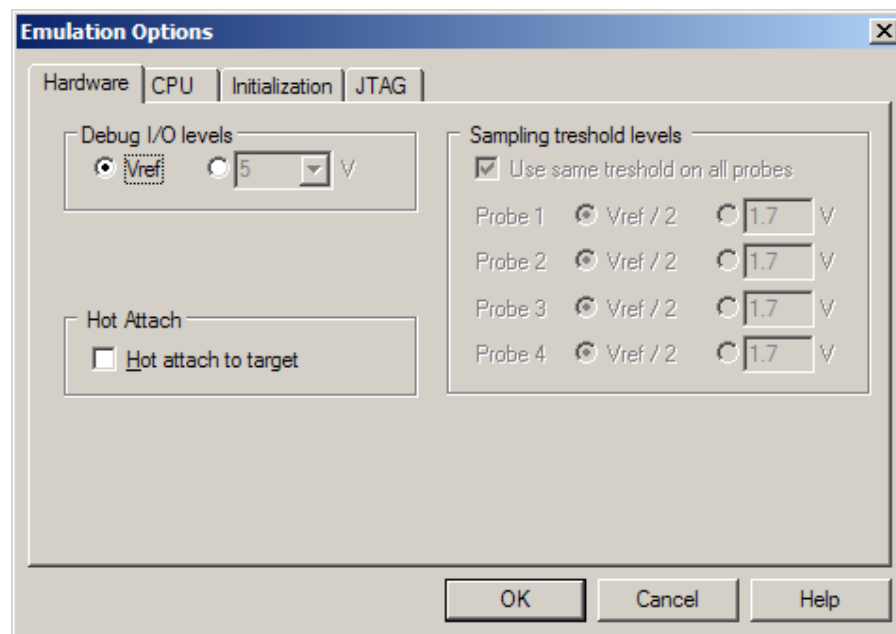
*BDM target side pinout*

Note: Vfp signal (pin 5) is valid only for old HC12 CPUs while with all HCS12 and S12X CPUs this pin must be left unconnected (NC).

This debug iCARD has all signals between the emulator and the target electrically isolated. This makes the complete development system considerably more robust and resistant to the electrical discharge, which can occur under several conditions.

With older iCARDS, where the debug signals were not electrically isolated, the most critical time was when the development system was connected to the target. At this point in time, there could be ground potential difference between the emulator and the target way over 1000V. The voltage difference is then discharged over the emulator and the target, which can destroy electronic components of the emulator and the target.

With older electrically non-isolated iCARDS, buffers driving debug signals were powered either from the emulator or from the target via the target debug connector, pin 6 (Vcc). The selection was user configurable.



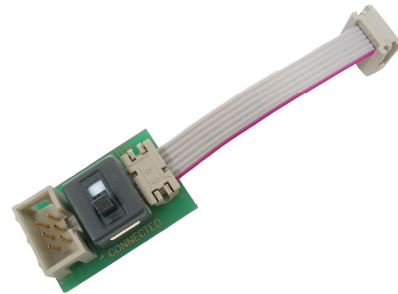
With this iCARD, buffers driving debug signals are always powered from the target via the target debug connector, pin 6. Consequentially, 'Debug I/O levels' setting in the 'Hardware/Emulation Options/Hardware' tab is irrelevant.

The user must ensure that pin 6 is always connected to the microcontroller power supply. The target must be able to provide up to 10mA (though 5mA should be enough too) of current for the iCARD buffers driving the debug signals. If the target might not be able to deliver 10mA of current, consult iSYSTEM technical support for consultation.

## Hot Attach

The development system supports Hot Attach, which allows attachment of the debugger to a running target system without affecting its operation. Refer to the belonging On-Chip Emulation Technical Notes document for more details on Hot Attach configuration and use.

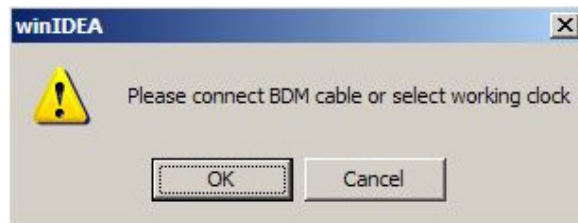
Due to the development system being electrically isolated from the target, IABDM-HOTATTACH module is required for Hot Attach operation.



### *IABDM-HOTATTACH*

It's assumed that there is a running target with no debugger connected. To hot attach:

- Check the 'Hot attach to target' option in the 'Hardware/Emulation Options/Hardware' tab.
- First, make sure that the switch on IABDM-HOTATTACH is in DISCONNECTED position and that there is no ground connection between the ic3000 HS/GT unit and the target. Next, connect one side of the IABDM-HOTATTACH to the debug iCARD and the other side to the target. Connect the debug iCARD to the ic3000 HS/GT unit and power the emulator and the target.
- Execute Download debug command. ATTACH status should be displayed in the right bottom corner.
- Select the 'Attach' debug command in the 'Debug' menu to attach to the target system. The following dialog pops up:



- Move switch on IABDM-HOTATTACH in CONNECTED position and press OK in the dialog. The debugger should now be connected to a running target and the debugger can take over the control over the CPU.

## Important Information

Note the direction in which the iCARD is inserted into the iCARD slot. The side with the label is the top side; the arrow shows the direction in which the iCARD should be inserted.

When working with this iCARD, target Vcc is always used, regardless of the WinIDEA settings. Also a fixed BDM clock is used for debug interface.

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