

Application Note



Notes on using either the HST or RST

Reset input on F²MC16L Microcontrollers

© Fujitsu Microelectronics Europe GmbH, Microcontroller Application Group

History

	RGe	V1.0	started
28 th June 00	TKa	V1.1	New format

Warranty and Disclaimer

To the maximum extent permitted by applicable law, Fujitsu Mikroelektronik GmbH restricts its warranties and its liability for **all products delivered free of charge** (eg. software include or header files, application examples, application Notes, target boards, evaluation boards, engineering samples of IC's etc.), its performance and any consequential damages, on the use of the Product in accordance with (i) the terms of the License Agreement and the Sale and Purchase Agreement under which agreements the Product has been delivered, (ii) the technical descriptions and (iii) all accompanying written materials. In addition, to the maximum extent permitted by applicable law, Fujitsu Mikroelektronik GmbH disclaims all warranties and liabilities for the performance of the Product and any consequential damages in cases of unauthorised decompiling and/or reverse engineering and/or disassembling. **Note, all these products are intended and must only be used in an evaluation laboratory environment.**

1. Fujitsu Mikroelektronik GmbH warrants that the Product will perform substantially in accordance with the accompanying written materials for a period of 90 days form the date of receipt by the customer. Concerning the hardware components of the Product, Fujitsu Mikroelektronik GmbH warrants that the Product will be free from defects in material and workmanship under use and service as specified in the accompanying written materials for a duration of 1 year from the date of receipt by the customer.
2. Should a Product turn out to be defect, Fujitsu Mikroelektronik GmbH's entire liability and the customer's exclusive remedy shall be, at Fujitsu Mikroelektronik GmbH's sole discretion, either return of the purchase price and the license fee, or replacement of the Product or parts thereof, if the Product is returned to Fujitsu Mikroelektronik GmbH in original packing and without further defects resulting from the customer's use or the transport. However, this warranty is excluded if the defect has resulted from an accident not attributable to Fujitsu Mikroelektronik GmbH, or abuse or misapplication attributable to the customer or any other third party not relating to Fujitsu Mikroelektronik GmbH.
3. To the maximum extent permitted by applicable law Fujitsu Mikroelektronik GmbH disclaims all other warranties, whether expressed or implied, in particular, but not limited to, warranties of merchantability and fitness for a particular purpose for which the Product is not designated.
4. To the maximum extent permitted by applicable law, Fujitsu Mikroelektronik GmbH's and its suppliers' liability is restricted to intention and gross negligence.

NO LIABILITY FOR CONSEQUENTIAL DAMAGES

To the maximum extent permitted by applicable law, in no event shall Fujitsu Mikroelektronik GmbH and its suppliers be liable for any damages whatsoever (including but without limitation, consequential and/or indirect damages for personal injury, assets of substantial value, loss of profits, interruption of business operation, loss of information, or any other monetary or pecuniary loss) arising from the use of the Product.

Should one of the above stipulations be or become invalid and/or unenforceable, the remaining stipulations shall stay in full effect.

MB90670/675 is currently one of the most successful 16-bit microcontroller of the 16L Family from Fujitsu. In some designs from customers we found some reset layout, which might cause problems under certain circumstances. This article we will focus on this feature, which is related with the external bus interface and the use of the reset logic. This feature can occur with all 16-bit Microcontroller designs, that are using the external bus interface.

1. Introduction

In the past microcontroller applications in most cases used internal ROM only. Now, with code sizes getting bigger all the time, the external bus interface is used very often in designs.

In the manual you will find some information about the specification of the 'Ready' and the 'Reset' signal. If one does not fully understand the meaning of this information, one can run into problems very fast.

2. Handling of Reset and Ready

In the manual you will find 2 pins, one called RST and the other one HST. From these two pins, commonly a hardware designer will choose the RST-pin to connect to his external reset circuitry. However, in the manual one can read, that the RST-signal will only reset the microcontroller after the currently executed instruction is finished.

On the other hand the 'Ready'-signal will hold the currently executed instruction until the external device is ready. If the 'Ready'-signal will be drawn to the state 'not ready' by an external device, this causes a state, where an instruction hangs and the applied reset is not detected by the controller. Therefore, the reset sequence might not start.

This problem can be overcome very easily. In the manual you can read the functionality of the HST-pin. This hardware standby pin can bring the microcontroller into a stop mode, from which, after releasing, a power-on reset will be initiated. This does not depend on the state of the 'Ready'-signal. Therefore, only connect your reset circuitry to the HST-pin and you will not have any problem. (You can simply connect the RST-pin to Vcc).

Note, that if you do not use the 'Ready'-signal, you can also use the RST-pin to connect to your external reset-circuitry. However, we still recommend to use the HST-pin. This is due to the possibility, that a crashed program might set the Ready-Enable-bit by accident. (Watchdog will reset the system, even if not 'Ready'!)

5. Conclusion

When using the external bus interface of our 16-bit microcontroller, we recommend to connect the Hardware Standby-pin (HST) with your reset circuitry. (In this case, RST can be connected to Vcc). This will ensure that the microcontroller can be reset by your external reset circuitry, even when an external device does not provide a proper ready signal or your software crashes.