
SmartFusion2 MSS
Real Time Counter (RTC) Configuration
User Guide



Table of Contents

- Introduction 3
- 1 Configuration Options..... 4
- A Product Support 6
 - Customer Service 6
 - Customer Technical Support Center 6
 - Technical Support 6
 - Website 6
 - Contacting the Customer Technical Support Center 6
 - ITAR Technical Support 7

Introduction

The real-time counter (RTC) system has two main modes of operation:

- Real-time Calendar: Counts seconds, minutes, hours, days, week, months, and years
- Binary Counter.

In the Calendar mode, the RTC counts seconds, minutes, hours, days, month, years, weekdays, and weeks. In Binary mode, the RTC consecutively counts from 0 all the way to 2^{43} . In both modes, the alarm event generation logic simply compares the content of the Alarm Register with that of RTC; when they are equal, the RTC_MATCH output is asserted.

For details, refer to the [SmartFusion2 SoC and IGLOO2 FPGA Fabric User Guide](#).

The values entered in the configurator will be exported into the programming files for programming of the flash bits that control this functionality. The flash bits are loaded in the system registers at power up (or when the DEVRST_N external pad is asserted/de-asserted).

1 – Configuration Options

Clock Source - Select the clock that drives the RTC system (RTCCLK) (Figure 1-1).

- External 32KHz RTC Crystal Oscillator
- External Main Oscillator - Crystal (32KHz - 20MHz)
- External Main Oscillator - Ceramic Resonator (0.5MHz - 4MHz)
- External Main Oscillator - RC Network (32KHz - 4MHz)
- On-chip 1-MHz RC Oscillator
- On-chip 25/50-MHz RC Oscillator (50MHz in 1.2v part and 25MHz in a 1.0v part)

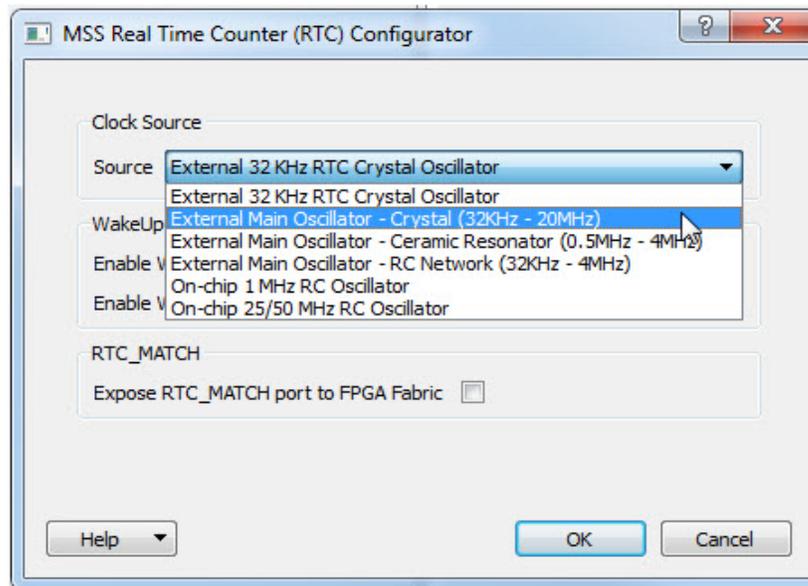


Figure 1-1 • RTC Clock Source Configuration

WakeUp Interrupt - The RTC_WAKEUP_CR in the SYSREG block provides masking for the RTC_WAKEUP interrupt to the FPGA fabric and the Cortex-M3 microcontroller (Figure 1-2). You can select which interrupt to enable using this configurator.

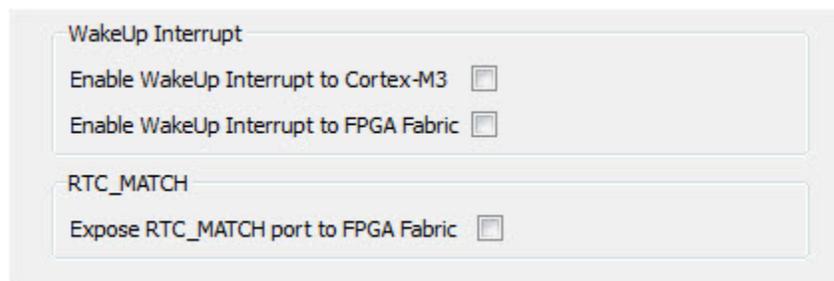


Figure 1-2 • WakeUp Interrupt Configuration

RTC_MATCH - RTC_MATCH status bit and output is asserted whenever the Alarm system is enabled and a match occurs (Figure 1-3). In Calendar mode, it is asserted for a 1 second period whilst the alarm condition is valid. The output is synchronous to the rising edge of the RTCCLK. You can expose the RTC_MATCH output signal to drive the FPGA fabric by checking the checkbox. The RTC_MATCH signal is then available to be used in the design.



Figure 1-3 • RTC_MATCH Configuration

A – Product Support

Microsemi SoC Products Group backs its products with various support services, including Customer Service, Customer Technical Support Center, a website, electronic mail, and worldwide sales offices. This appendix contains information about contacting Microsemi SoC Products Group and using these support services.

Customer Service

Contact Customer Service for non-technical product support, such as product pricing, product upgrades, update information, order status, and authorization.

From North America, call **800.262.1060**

From the rest of the world, call **650.318.4460**

Fax, from anywhere in the world, **650.318.8044**

Customer Technical Support Center

Microsemi SoC Products Group staffs its Customer Technical Support Center with highly skilled engineers who can help answer your hardware, software, and design questions about Microsemi SoC Products. The Customer Technical Support Center spends a great deal of time creating application notes, answers to common design cycle questions, documentation of known issues, and various FAQs. So, before you contact us, please visit our online resources. It is very likely we have already answered your questions.

Technical Support

For Microsemi SoC Products Support, visit <http://www.microsemi.com/products/fpga-soc/design-support/fpga-soc-support>.

Website

You can browse a variety of technical and non-technical information on the Microsemi SoC Products Group [home page](http://www.microsemi.com/soc), at www.microsemi.com/soc.

Contacting the Customer Technical Support Center

Highly skilled engineers staff the Technical Support Center. The Technical Support Center can be contacted by email or through the Microsemi SoC Products Group website.

Email

You can communicate your technical questions to our email address and receive answers back by email, fax, or phone. Also, if you have design problems, you can email your design files to receive assistance. We constantly monitor the email account throughout the day. When sending your request to us, please be sure to include your full name, company name, and your contact information for efficient processing of your request.

The technical support email address is soc_tech@microsemi.com.

My Cases

Microsemi SoC Products Group customers may submit and track technical cases online by going to [My Cases](#).

Outside the U.S.

Customers needing assistance outside the US time zones can either contact technical support via email (soc_tech@microsemi.com) or contact a local sales office.

Visit [About Us](#) for sales office listings and corporate contacts.

Sales office listings can be found at www.microsemi.com/soc/company/contact/default.aspx.

ITAR Technical Support

For technical support on RH and RT FPGAs that are regulated by International Traffic in Arms Regulations (ITAR), contact us via soc_tech_itar@microsemi.com. Alternatively, within My Cases, select **Yes** in the ITAR drop-down list. For a complete list of ITAR-regulated Microsemi FPGAs, visit the ITAR web page.



Microsemi Corporate Headquarters
One Enterprise, Aliso Viejo,
CA 92656 USA

Within the USA: +1 (800) 713-4113
Outside the USA: +1 (949) 380-6100
Sales: +1 (949) 380-6136
Fax: +1 (949) 215-4996

E-mail: sales.support@microsemi.com

©2016 Microsemi Corporation. All rights reserved. Microsemi and the Microsemi logo are trademarks of Microsemi Corporation. All other trademarks and service marks are the property of their respective owners.

About Microsemi

Microsemi Corporation (Nasdaq: MSCC) offers a comprehensive portfolio of semiconductor and system solutions for communications, defense & security, aerospace and industrial markets. Products include high-performance and radiation-hardened analog mixed-signal integrated circuits, FPGAs, SoCs and ASICs; power management products; timing and synchronization devices and precise time solutions, setting the world's standard for time; voice processing devices; RF solutions; discrete components; Enterprise Storage and Communication solutions, security technologies and scalable anti-tamper products; Ethernet solutions; Power-over-Ethernet ICs and midspans; as well as custom design capabilities and services. Microsemi is headquartered in Aliso Viejo, Calif. and has approximately 4,800 employees globally. Learn more at www.microsemi.com.

Microsemi makes no warranty, representation, or guarantee regarding the information contained herein or the suitability of its products and services for any particular purpose, nor does Microsemi assume any liability whatsoever arising out of the application or use of any product or circuit. The products sold hereunder and any other products sold by Microsemi have been subject to limited testing and should not be used in conjunction with mission-critical equipment or applications. Any performance specifications are believed to be reliable but are not verified, and Buyer must conduct and complete all performance and other testing of the products, alone and together with, or installed in, any end-products. Buyer shall not rely on any data and performance specifications or parameters provided by Microsemi. It is the Buyer's responsibility to independently determine suitability of any products and to test and verify the same. The information provided by Microsemi hereunder is provided "as is, where is" and with all faults, and the entire risk associated with such information is entirely with the Buyer. Microsemi does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other IP rights, whether with regard to such information itself or anything described by such information. Information provided in this document is proprietary to Microsemi, and Microsemi reserves the right to make any changes to the information in this document or to any products and services at any time without notice.