



**FRTC**  
**Release Note**



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## **1 About This Document**

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This document includes release information. Chapter 2 contains release information, release content and instructions how to use release. Chapter 3 contains release history.

## 2 General

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### 2.1 Release Information

Product	FRTC
Release	1.5.1
Date	2.2.2016

**Table 1. Release information**

### 2.2 Release Content

Module/Document/Part	Version	Notes
FRTC IP	1.5.1	Full version of FRTC IP Revision ID: 3 (readable from register IP_CORE_ID) Device ID: 0x90 (readable from register IP_CORE_ID)
FRTC User Manual	1.6	

**Table 2. Release content**

Note: In order to use all latest features related FRS reference design QSYS wrapper version number must be also 1.5.

### 2.3 Installation, Compilation and Configuration

Component can be used from Altera QSYS. Use of other external signals is described in IP manual.

### 3 Release History

Date	Revision	Description and changes
2.2.2016	1.5.1	Changes: <ul style="list-style-type: none"> <li>Improved internal implementation for better <math>f_{\max}</math>.</li> </ul>
5.10.2015	1.5	Changes: <ul style="list-style-type: none"> <li>Added DEFAULT_STEP_NS and DEFAULT_STEP_SNS generics</li> <li>Fixed SUBNSEC_WIDTH to support values 0 and 16</li> <li>Fixed time adjustment issue where nanosecond adjustment had different timing comparing to second adjustment</li> <li>Improved internal implementation for better <math>f_{\max}</math>: nanosecond time adjustment is not summed to nanosecond step anymore, so software must do the summing instead (for accurate 100 ns forward step, the time adjustment should be 100 ns + current nanosecond step)</li> </ul>
19.12.2014	1.4.1	Changes: <ul style="list-style-type: none"> <li>License updated</li> </ul>
6.5.2014	1.4	Changes: <ul style="list-style-type: none"> <li>Improved IP timing performance</li> </ul>
9.12.2013	1.3	Changes: <ul style="list-style-type: none"> <li>Opencore license updated</li> </ul>
15.5.2013	1.2	Changes: <ul style="list-style-type: none"> <li>Improved frequency adjust accuracy</li> </ul>
24.10.2012	1.1	Changes: <ul style="list-style-type: none"> <li>1PPS available</li> </ul>
8.8.2011	1.0	Initial full release

**Table 3. Release History**