# MISRA-C Compliance Report for StopWatch Project

Project: StopWatch

Date: 28/8/2023

## 1. Introduction

The MISRA-C Compliance Report provides an overview of the warnings encountered during the development of the StopWatch project. The purpose of this report is to identify the warnings, categorize them based on MISRA-C rules, and suggest possible solutions to address these warnings.

## 2. Summary of Warnings

A total of 58 MISRA-C warnings were encountered in the StopWatch project. These warnings are categorized based on the specific MISRA-C rule violated.

- Rule 1.1: Ensure strict ANSI C mode (-ps) is enabled - 1 warnings

- Rule 6.3: Typedefs that indicate size and signedness should be used in place of the basic numerical types - 8 warnings

- Rule 10.1: The value of an expression of integer type shall not be implicitly converted to a different underlying type - 31 warnings

- Rule 10.3: The value of a complex expression of integer type shall only be cast to a type of the same signedness that is no wider than the underlying type of the expression - 1 warnings

- Rule 11.3: A cast should not be performed between a pointer type and an integral type - 4 warnings

 Rule 12.1: Limited dependence should be placed on C's operator precedence rules in expressions - 2 warnings

- Rule 12.5: The operands of a logical && or || shall be primary-expressions - 2 warnings

- Rule 12.7: Bitwise operators shall not be applied to operands whose underlying type is signed - 4 warnings

- Rule 16.9: A function identifier shall only be used with either a preceding &, or with a parenthesized parameter list - 1 warnings

- Rule 19.7: A function should be used in preference to a function-like macro - 5 warnings

## 3. Detailed Warnings

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| #1376-D (MISRA-C:2004 1.1/R) Ensure strict ANSI C mode (-ps) is enabled GPIO\_interface.h    /StopWatch/MCAL/GPIO    line 17 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if it is not a conversion to a wider integer type of the same signedness  main.c  /StopWatch  line 52 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if it is not a conversion to a wider integer type of the same signedness  main.c  /StopWatch  line 53 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if it is not a conversion to a wider integer type of the same signedness  main.c  /StopWatch  line 54 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if it is not a conversion to a wider integer type of the same signedness  main.c  /StopWatch  line 60 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if it is not a conversion to a wider integer type of the same signedness  main.c  /StopWatch  line 63 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if it is not a conversion to a wider integer type of the same signedness  main.c  /StopWatch  line 72 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if it is not a conversion to a wider integer type of the same signedness  main.c  /StopWatch  line 79 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if it is not a conversion to a wider integer type of the same signedness  main.c  /StopWatch  line 81 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if it is not a conversion to a wider integer type of the same signedness  main.c  /StopWatch  line 82 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if it is not a conversion to a wider integer type of the same signedness  main.c  /StopWatch  line 84 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if it is not a conversion to a wider integer type of the same signedness  main.c  /StopWatch  line 85 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if it is not a conversion to a wider integer type of the same signedness  main.c  /StopWatch  line 95 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if it is not a conversion to a wider integer type of the same signedness  main.c  /StopWatch  line 96 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if it is not a conversion to a wider integer type of the same signedness  main.c  /StopWatch  line 98 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if it is not a conversion to a wider integer type of the same signedness  main.c  /StopWatch  line 99 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if it is not a conversion to a wider integer type of the same signedness  main.c  /StopWatch  line 106    C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if it is not a conversion to a wider integer type of the same signedness  main.c  /StopWatch  line 107    C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if it is not a conversion to a wider integer type of the same signedness  main.c  /StopWatch  line 109    C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if it is not a conversion to a wider integer type of the same signedness  main.c  /StopWatch  line 110    C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if it is not a conversion to a wider integer type of the same signedness  main.c  /StopWatch  line 117    C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if the expression is complex  main.c  /StopWatch  line 79 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if the expression is complex  main.c  /StopWatch  line 82 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if the expression is complex  main.c  /StopWatch  line 96 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if the expression is complex  main.c  /StopWatch  line 107    C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if the expression is not constant and is a function argument  main.c  /StopWatch  line 55 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if the expression is not constant and is a function argument  main.c  /StopWatch  line 56 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if the expression is not constant and is a function argument  main.c  /StopWatch  line 59 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if the expression is not constant and is a function argument  main.c  /StopWatch  line 83 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if the expression is not constant and is a function argument  main.c  /StopWatch  line 84 C/C++ Problem |
| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if the expression is not constant and is a function argument  main.c  /StopWatch  line 85 C/C++ Problem |
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| #1393-D (MISRA-C:2004 10.1/R) The value of an expression of integer type shall not be implicitly converted to a different underlying type if the expression is not constant and is a function argument  main.c  /StopWatch  line 116    C/C++ Problem |
| #1395-D (MISRA-C:2004 10.3/R) The value of a complex expression of integer type shall only be cast to a type of the same signedness that is no wider than the underlying type of the expression main.c  /StopWatch  line 84 C/C++ Problem |
| #1395-D (MISRA-C:2004 10.3/R) The value of a complex expression of integer type shall only be cast to a type of the same signedness that is no wider than the underlying type of the expression main.c  /StopWatch  line 85 C/C++ Problem |
| #1400-D (MISRA-C:2004 11.3/A) A cast should not be performed between a pointer type and an integral type    main.c  /StopWatch  line 52 C/C++ Problem |
| #1400-D (MISRA-C:2004 11.3/A) A cast should not be performed between a pointer type and an integral type    main.c  /StopWatch  line 60 C/C++ Problem |
| #1400-D (MISRA-C:2004 11.3/A) A cast should not be performed between a pointer type and an integral type    main.c  /StopWatch  line 63 C/C++ Problem |
| #1400-D (MISRA-C:2004 11.3/A) A cast should not be performed between a pointer type and an integral type    main.c  /StopWatch  line 72 C/C++ Problem |
| #1405-D (MISRA-C:2004 12.5/R) The operands of a logical && or || shall be primary-expressions   main.c  /StopWatch  line 81 C/C++ Problem |
| #1405-D (MISRA-C:2004 12.5/R) The operands of a logical && or || shall be primary-expressions   main.c  /StopWatch  line 95 C/C++ Problem |
| #1406-D (MISRA-C:2004 12.7/R) Bitwise operators shall not be applied to operands whose underlying type is signed    main.c  /StopWatch  line 52 C/C++ Problem |
| #1406-D (MISRA-C:2004 12.7/R) Bitwise operators shall not be applied to operands whose underlying type is signed    main.c  /StopWatch  line 60 C/C++ Problem |
| #1406-D (MISRA-C:2004 12.7/R) Bitwise operators shall not be applied to operands whose underlying type is signed    main.c  /StopWatch  line 63 C/C++ Problem |
| #1406-D (MISRA-C:2004 12.7/R) Bitwise operators shall not be applied to operands whose underlying type is signed    main.c  /StopWatch  line 72 C/C++ Problem |
| #1422-D (MISRA-C:2004 16.9/R) A function identifier shall only be used with either a preceding &, or with a parenthesised parameter list, which may be empty (function "updateTime")    main.c  /StopWatch  line 59 C/C++ Problem |
| #1428-D (MISRA-C:2004 19.7/A) A function should be used in preference to a function-like macro  STD\_TYPES.h /StopWatch/LIB  line 17 C/C++ Problem |
| #1428-D (MISRA-C:2004 19.7/A) A function should be used in preference to a function-like macro  STD\_TYPES.h /StopWatch/LIB  line 18 C/C++ Problem |
| #1428-D (MISRA-C:2004 19.7/A) A function should be used in preference to a function-like macro  STD\_TYPES.h /StopWatch/LIB  line 19 C/C++ Problem |
| #1428-D (MISRA-C:2004 19.7/A) A function should be used in preference to a function-like macro  STD\_TYPES.h /StopWatch/LIB  line 20 C/C++ Problem |
| #1428-D (MISRA-C:2004 19.7/A) A function should be used in preference to a function-like macro  STD\_TYPES.h /StopWatch/LIB  line 37 C/C++ Problem |
| #1437-D (MISRA-C:2004 20.2/R) The names of standard library macros, objects and functions shall not be reused ("time")  main.c  /StopWatch  line 17 C/C++ Problem |
| #1459-D (MISRA-C:2004 12.1/A) Limited dependence should be placed on C's operator precedence rules in expressions   main.c  /StopWatch  line 81 C/C++ Problem |
| #1459-D (MISRA-C:2004 12.1/A) Limited dependence should be placed on C's operator precedence rules in expressions   main.c  /StopWatch  line 95 C/C++ Problem |
| #1498-D (MISRA-C:2004 6.3/A) typedefs that indicate size and signedness should be used in place of the basic numerical types    main.c  /StopWatch  line 52 C/C++ Problem |
| #1498-D (MISRA-C:2004 6.3/A) typedefs that indicate size and signedness should be used in place of the basic numerical types    main.c  /StopWatch  line 60 C/C++ Problem |
| #1498-D (MISRA-C:2004 6.3/A) typedefs that indicate size and signedness should be used in place of the basic numerical types    main.c  /StopWatch  line 63 C/C++ Problem |
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This report provides an overview of the MISRA-C warnings encountered in the StopWatch project. It categorizes the warnings based on specific MISRA-C rules and provides insights into addressing these warnings to ensure compliance with the MISRA-C coding standards.

For more detailed information about each warning and its suggested solution, please refer to the "Detailed Warnings" section of this report.