Blackbox Test

The “Blackbox test” verification is focused on testing “[functionalities and performance](../1)%20Requirements/3.%20SWRA_20190621.docx)”, and at the highest level verify that the “[conventions](../1)%20Requirements/3.%20SWRA_20190621.docx)” are met, as well as sub requirements of such.

This document is defined as such:

1.- Testing conventions.

2.- Testing and verifying functionalities and performance.

Contents

[TC001 2](#_Toc21774908)

[TC002 3](#_Toc21774909)

[TC003 4](#_Toc21774910)

[TC004 5](#_Toc21774911)

[TC005 6](#_Toc21774912)

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| Test Case ID | TC001 |
| SW | Version: V1.0 |
| Test Case Summary | Verify that power voltage supply is from 9 to 12 Volts DC. |
| Related Requirement | [SRS-Power input -001](../1)%20Requirements/3.%20SWRA_20190621.docx) |
| Prerequisites | 1. DC power source. 2. Input- output connection to speed controller. |
| Test Procedure | 1. Modify the power source to provide power in the defined denominations (Volts). 2. Set the power source to the different number of Volts defined in the quantities. 3. Verify that digital multimeter displays the real measurements of the source. |
| Test Data | 1. Denominations: Volts 2. Quantities: 9, 10, 11, 12 |
| Expected Result | 1. Readout of the specific voltage according to the different quantities is met. |
| Actual Result | 1. If the specified quantity is valid, the result is as expected. 2. If the specified quantity is invalid, nothing happens; the expected message is not displayed |
| Status | Pass |
| Remarks | This is a “Conventions” test case. |
| Created By | Jesus Ramirez |
| Date of Creation | 11/10/19 |
| Executed By | Algemiro Gil |
| Date of Execution | 11/10/19 |
| Test Environment | * Manual Test. |

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| Test Case ID | TC002 |
| SW | Version: V1.0 |
| Test Case Summary | Verify that the frequency work load is set in the f = 100 Hz to f = 1 KHz, range. |
| Related Requirement | [SRS-Work load frequency range-002](../1)%20Requirements/3.%20SWRA_20190621.docx) |
| Prerequisites | 1. Configuration for frequency work load is set to 100 Hz. 2. Input- output connection to the Oscilloscope are available. 3. Output pin 46 is defined as signal outlet. |
| Test Procedure | 1. Turn on the oscilloscope and calibrate to read frequency. 2. Ensure, electric board is powered and configured to generate signal. 3. Verify that digital signal is generated in the specific frequency and read by the oscilloscope. |
| Test Data | 1. Denominations: Hertz 2. Quantities: 100 Hz |
| Expected Result | 1. Readout of the specific Frequency according to the quantities is met. |
| Actual Result | 1. If the specified quantity is valid, the result is as expected. 2. If the specified quantity is invalid, nothing happens; the expected message is not displayed |
| Status | Pass |
| Remarks | This is a “Conventions” test case. |
| Created By | Jesus Ramirez |
| Date of Creation | 11/10/19 |
| Executed By | Algemiro Gil |
| Date of Execution | 11/10/19 |
| Test Environment | * Manual Test. |

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| Test Case ID | TC003 |
| SW | Version: V1.0 |
| Test Case Summary | Verify that PWM duty cycle shall be defined after working frequency, from 0 – 100 range. |
| Related Requirement | [SRS-PWM Duty Cycle-003](../1)%20Requirements/3.%20SWRA_20190621.docx) |
| Prerequisites | 1. Configuration for frequency work load is set to 100 Hz. 2. Output is sent to display. |
| Test Procedure | 1. Direct display of the duty cycle is visible in LCD display. |
| Test Data | 1. Denominations: % 2. Quantities: 0 - 100 |
| Expected Result | 1. Readout of the specific cycle according to the quantities is met. |
| Actual Result | 1. If the specified quantity is valid, the result is as expected. 2. If the specified quantity is invalid, nothing happens; the expected message is not displayed |
| Status | Pass |
| Remarks | This is a “Conventions” test case. |
| Created By | Jesus Ramirez |
| Date of Creation | 11/10/19 |
| Executed By | Algemiro Gil |
| Date of Execution | 11/10/19 |
| Test Environment | * Manual Test. |

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| Test Case ID | TC004 |
| SW | Version: V1.0 |
| Test Case Summary | Verify that the set point is defined within the range 0 to 3240 RPM. |
| Related Requirement | [SRS-Set point (Speed)-004](../1)%20Requirements/3.%20SWRA_20190621.docx) |
| Prerequisites | 1. Configuration for frequency work load is set to 100 Hz. 2. PWM has been tested. |
| Test Procedure | 1. Verify on LCD that rpm quantity is displayed. |
| Test Data | 1. Denominations: RPMs 2. Quantities: 0 – 3240 rpm |
| Expected Result | 1. Readout of the specific rpm according to the quantities is met. |
| Actual Result | 1. If the specified quantity is valid, the result is as expected. 2. If the specified quantity is invalid, nothing happens; the expected message is not displayed |
| Status | Pass |
| Remarks | This is a “Conventions” test case. |
| Created By | Jesus Ramirez |
| Date of Creation | 11/10/19 |
| Executed By | Algemiro Gil |
| Date of Execution | 11/10/19 |
| Test Environment | * Manual Test. |

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| Test Case ID | TC005 |
| SW | Version: V1.0 |
| Test Case Summary | Verify that the LCD shall display the motor speed, set point and duty cycle percentage. |
| Related Requirement | [SRS-Display behaviour-005](../1)%20Requirements/3.%20SWRA_20190621.docx) |
| Prerequisites | 1. Ensure that previous requirements are met: [SRS-Power input -001](file:///C:\Users\jesus\Documents\GitHub\Proyecto_Integrador\ESTRUCTURA%20DEL%20PROYECTO\1)%20Requirements\3.%20SWRA_20190621.docx) [SRS-Work load frequency range-002](file:///C:\Users\jesus\Documents\GitHub\Proyecto_Integrador\ESTRUCTURA%20DEL%20PROYECTO\1)%20Requirements\3.%20SWRA_20190621.docx) [SRS-PWM Duty Cycle-003](file:///C:\Users\jesus\Documents\GitHub\Proyecto_Integrador\ESTRUCTURA%20DEL%20PROYECTO\1)%20Requirements\3.%20SWRA_20190621.docx) [SRS-Set point (Speed)-004](file:///C:\Users\jesus\Documents\GitHub\Proyecto_Integrador\ESTRUCTURA%20DEL%20PROYECTO\1)%20Requirements\3.%20SWRA_20190621.docx) 2. Ensure the LCD display is on. |
| Test Procedure | 1. Verify on LCD that Duty cycle, Setpoint and Speed is displayed. |
| Test Data | 1. Denominations: %, RPM, RPM, State 2. Quantities: 0-100, 0 – 3240, 0 – 3240, READY/RUNNING/HOLD |
| Expected Result | 1. Readout of the specific quantities according to the quantities is met. |
| Actual Result | 1. If the specified quantity is valid, the result is as expected. 2. If the specified quantity is invalid, nothing happens; the expected message is not displayed. |
| Status | Pass |
| Remarks | This is a “Conventions” test case. |
| Created By | Jesus Ramirez |
| Date of Creation | 11/10/19 |
| Executed By | Algemiro Gil |
| Date of Execution | 11/10/19 |
| Test Environment | * Manual Test. |