

Certificate

Certificate
UL-US-2447973

Issue date
2024-12-06

Expiration date
2029-12-06

Report Reference
E545021_20241206_Descriptio
nFS



This is to acknowledge that

Sonatus Inc

330 Gibraltar Dr Sunnyvale, CA 94089
United States

has had

Automator Safety Interlock - ASI-102-CODE v1.0.0

evaluated and meets the requirements of the standard(s)

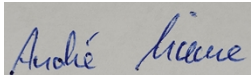
**ISO 26262-2:2018; ISO 26262-6:2018; ISO 26262-8:2018; ISO
26262-9:2018**

General Conditions and Notes

- 1)This certificate (in accordance with UL's Functional Safety Certificate Scheme) does not imply that UL has issued product-marking based safety certification (such as Listing, Recognition, or Classification) nor will the referenced report authorize the use of product safety certification marks or other references to UL on these products.
- 2)This certificate only covers the product version that is listed in the report reference. Any changes applied to the certified product are not covered by this Certificate.

Certification Program Owner:

André Thieme



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FUNCTIONAL SAFETY CERTIFICATE OF COMPLIANCE

Automator Safety Interlock - ASI-102-CODE v1.0.0

HW Version Identification:	SW Version Identification:
n/a	ASI-102-CODE v1.0.0 - Commit HASH: efa93515aa6c5916e45ca9a50dc329875f677aef

The certified module provides the following safety ratings:

Safety Function/Goal	Maximum Safety Rating	SPFM (%)	LFM (%)	PMHF
SNT_ASI-ASR-103	ASIL D	--	--	--
SNT_ASI-ASR-114	ASIL D	--	--	--
SNT_ASI-ASR-113	ASIL D	--	--	--
SNT_ASI-ASR-112	ASIL D	--	--	--
SNT_ASI-ASR-110	ASIL D	--	--	--
SNT_ASI-ASR-111	ASIL D	--	--	--
SNT_ASI-ASR-109	ASIL D	--	--	--
SNT_ASI-ASR-108	ASIL D	--	--	--
SNT_ASI-ASR-104	ASIL D	--	--	--
SNT_ASI-ASR-105	ASIL D	--	--	--
SNT_ASI-ASR-106	ASIL D	--	--	--
SNT_ASI-ASR-107	ASIL D	--	--	--

SNT_ASI-ASR-103 The Automator Safety Interlock shall restrict action requests to only those defined in the pre-approved list before transmitting them to the vehicle.

SNT_ASI-ASR-114 The Automator Safety Interlock shall ensure continuous communication integrity between the requestor and target vehicle controllers (ECUs).

SNT_ASI-ASR-113 The Automator Safety Interlock shall enter a predefined safe state within the Fault Tolerant Time Interval (FTTI) if communication integrity is compromised.

SNT_ASI-ASR-112 The Automator Safety Interlock shall enter a predefined safe state within the Fault Tolerant Time Interval (FTTI) if unauthorized action requests are detected, to prevent unintended actions.

SNT_ASI-ASR-110 The Automator Safety Interlock shall only allow requests to be transmitted when the vehicle is in an authorized mode.

SNT_ASI-ASR-111 The Automator Safety Interlock shall ensure that requested actions don't interfere with commands issued directly by the driver (e.g. unable to deactivate windshield wipers if still requested by the driver via windshield wiper switch in "on" state).

SNT_ASI-ASR-109 The Automator Safety Interlock shall manage its communication load to remain within the capacity of the vehicle's communication bus.

SNT_ASI-ASR-108 The Automator Safety Interlock shall transmit messages with a priority equal to or lower than other critical ECU controllers (e.g. wiper controller, seat controller, vehicle computer, host system).

SNT_ASI-ASR-104 The Automator Safety Interlock shall issue commands only when internal quality and rationality checks are confirmed.

SNT_ASI-ASR-105 The Automator Safety Interlock shall ensure that transmitted data or commands accurately reflect the input data or commands requested.

SNT_ASI-ASR-106 The Automator Safety Interlock shall perform calibration updates ONLY when the vehicle is in an authorized mode.

SNT_ASI-ASR-107 The Automator Safety Interlock shall ensure that ONLY correct and intended calibration parameters are written to the ECU during the calibration process.

Conditions of Safe Use of the Certified Product:

- 1) The product must be installed, operated, and maintained as specified in:

Document Identifier	Revision	Issue Date	Title
ASI-101-SCR	Rev A	2024-11-27	Sonatus Automator Safety Interlock Safety Case Report
ASI-101-SM	Rev A	2024-11-27	Sonatus Automator Safety Interlock Safety Manual

- 2) The manufacturer of the certified product shall keep record of the failure analysis for all returned products.



FUNCTIONAL SAFETY CERTIFICATE OF COMPLIANCE

Certificate Revision Records

Issue Date	Revised Date	Report Reference No	Summary of Change Records
2024-12-06	2024-12-05	E545021_00000000_DescriptionFS	Initial Report

Additional Information:

- The Automator Safety Interlock is collaboratively designed and implemented by Sonatus and LHP Engineering.

- The Automator Safety Interlock (ASI) software component is developed as a Safety Element out of Context (SEooC) according to the definition in ISO 26262-10:2018.

- The qualification of the software tools used in this project has been performed according to clause 11.4.6 in ISO 26262-8:2018, except for the tool: GNU Compiler Collection (GCC), version: 12.2, for which the qualification is assumed to be within the integrator's responsibility.

Including further sites:

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United States

