



Z-Wave Alliance Certification Overview

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			Sec 2.6.2	Added Market Cert Instructions
			Sec 2.6	New Cert Process image
			Sec 2.5	Certification tool update to include CTT Exclude form revision 1-8 for Z-Wave Plus products for re-certification
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	20210920	BRO	Sec 2.4.2 Sec 3.1.5	Review only re-certification, noted as free of charge Z-Wave Plus v2 GW DT fee reduced to \$6000 Replacing "Slave" with "End Device"
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	20220308	BRO	All Sec. 2.6.3 Sec. 1.4 Sec. 2.6.2 Sec. 2.4.2, 2.4.3, 4	Removed indications of Z-Wave Plus program still active for new cert certification exception: allowing WG consent, removed BoD approval step Replace preference of documentation list with Specification reference Remove REFERENCES section Added relaxed QR code and DSK requirement if Learn Mode is not supported Included sec. 2.4.3 and 4 into sec. 2.4.2
	20221011	BRO	Sec. 2.4.2 Sec. 3.1.4	Cost of adding ZW LR Adding ZW LR in limited product modification
	20230221	BRO	Sec. 2.4.2 All All Sec. 3.1.6	Change in fees Renaming "SDK" to "Protocol (SDK)" Integrating process descriptions for the Protocol Certification Program Changing requirement for Protocol SDK upgrade

Table of Contents

1.1	Overview	4
1.2	Purpose	4
1.3	Audience and Prerequisites	4
1.4	Specification reference	4
1.5	Terms Used in the Z-Wave Certification Programs	5
2	GENERAL REQUIREMENTS	6
2.1	Types of Products	7
2.2	Review/Testing Requirements	8
2.3	Certification Fees	9
2.3.1	Types of Certifications for Z-Wave consumer products	9
2.3.2	Types of Certifications for Z-Wave Protocol products	10
2.3.3	Certification Fees & Payment	11
2.4	Z-Wave Certification & Development Tools	12
2.4.1	Certification Portal	12
2.4.2	Certification Forms	12
2.4.3	Compliance Test Tool (CTT)	12
2.4.4	Z-Wave End Device Emulator (EDE)	13
2.4.5	Z-Wave Test System (ZTS)	13
2.5	Steps in the Z-Wave Certification Process	14
2.5.1	Technical Certification	15
2.5.2	Market Certification	19
2.5.3	Exception to comply with in-force specifications	21
2.6	Z-Wave Certification Number Formats	21
2.7	Certification Contact Information	22
2.8	Test Partners	22
3	Z-WAVE CERTIFICATION MAINTENANCE	23
3.1	Changes and Modifications of Z-Wave Certified consumer Products	23
3.1.1	“Different Products” with regard to Z-Wave Certification	23
3.1.2	Non-technical Product Modifications	24
3.1.3	Technical Changes that do not Affect Z-Wave Network Behavior	25
3.1.4	Limited Product Modifications and Product Modifications	26
3.1.5	Frequency-Only changes	26
3.1.6	Change in Protocol (SDK) used in consumer products	27
3.1.7	Any Other Product Modification	27
3.2	Modifications of Updatable Products	28
3.3	Changes and Modifications of Z-Wave Certified Protocol products	29
3.4	Updates required due to compliance issues being discovered after certification	29
3.5	Grandfathering of Existing Products	29
3.6	Revocation of Certifications	29

1.1 Overview

This document covers the Z-Wave Product Certification Program for 500, 700 & 800 series, and the Z-Wave Protocol Certification Program for Silicon and Stack products.

1.2 Purpose

The purpose of this document is to clarify the certification process and to instruct product developers and Silicon and Stack vendors how to certify their individual Z-Wave enabled products.

1.3 Audience and Prerequisites

The audience of this document is primarily Z-Wave product and/or protocol (SDK) developers. Furthermore, this document is used by the Z-Wave Alliance, authorized Verification Test Partners and others who are part of the Z-Wave Certification process.

Z-Wave Alliance' Licensing agreements require that developers certify their Z-Wave products prior to selling them or market them as being Z-Wave compliant. The proper use of logos is also required by the licensing agreements. Specifications, and additional information regarding certification can be downloaded from the Z-Wave Alliance member site after registering. The Z-Wave Alliance Trademark and Distribution License (TDL) MUST be accepted to certify products and software utilizing Z-Wave technology. Acceptance of the TDL is done on the web-based Certification Portal as part of a Product or Protocol certification submission.

1.4 Specification reference

Z-Wave Specifications is the basis of Z-Wave Certification. Specifications are developed and maintained by Z-Wave Alliance Technical Working Groups, such as the Application Working Group (AWG), Core Stack Working Group (CSWG), Security Working Group (SWG), Open Source Working Group (OSWG), Product Certification & Ecosystem Working Group (PCWG).

Every test and technical requirement presented in the Certification Form and the Compliance Test Tool (CTT) can be directly referenced to the in-force specification package available here

<https://z-wavealliance.org/z-wave-specifications/>

1.5 Terms Used in the Z-Wave Certification Programs

This document describes mandatory and optional aspects of the required compliance of a product to the Z-Wave Plus and Z-Wave Plus v2 standards.

The words “SHALL” and “MUST” specify aspects that are mandatory for compliance. Equally, “MUST NOT” must be adhered to for compliance. Products that are in violation of any such statement are **not** Z-Wave compliant.

The words “MAY” “COULD”, and “MAY NOT” leave the choice to the implementer. “RECOMMENDED” also leaves the choice formally to the developer but provides additional guidance. Future versions of Z-Wave MAY make aspects that are recommended at this time mandatory.

Throughout the Z-Wave Certification Programs, the following terms are used:

Interoperability	Interoperability is the successful interworking of multiple products of various types from multiple manufacturers. These products MAY be based on multiple versions of Z-Wave. Interoperability always describes the interworking of two or more products, while Compliance relates to the conformity to the Z-Wave standard.
Z-Wave Compliance	Adherence to the Z-Wave standards is mandatory. The term “conformance” is used equivalently to the term “compliance”
Z-Wave Certification	Process of testing and verifying compliance to Z-Wave standards.
Self-certification	Developers conduct testing to verify compliance to the Z-Wave standards before submitting the product for certification.
Verification	Confirmation of the Self-certification tests and compliance to the Z-Wave standards by the independent test partner.
Certification Fees	Fees paid by the developer/product owner to the test partner for their services. These cover the costs for administration, review, and verification testing by the test houses.
Case owner	The general definition of the person responsible for submitting a product for certification and used equivalently to the term “developer”

2 GENERAL REQUIREMENTS

Any product that appears as being Z-Wave compliant MUST be certified. This includes software applications.

- Membership in the Z-Wave Alliance is required to certify products to the Z-Wave standards. More information on <https://z-wavealliance.org/join/>
- If your company is already a Z-Wave Alliance member, go to <https://sdomembers.z-wavealliance.org/user/register> to register for a user account on the Certification Portal.
- Only when a product has passed certification and a certification number has been issued, the product owner may sell and market the product as being Z-Wave compliant.
 - Selling and/or marketing non-compliant and/or non-certified products is in direct violation of the Z-Wave licensing agreements and will be referred to the Z-Wave Alliance' Board of Directors for legal action.
- Z-Wave Certification consists of two distinct parts, Technical Certification and Market Certification. Both are required in Product certification, and both must pass their individual reviews.
 - Technical Certification covers implementation and compliance to the Z-Wave standards and technical specifications.
 - Market Certification cover the correct usage of brand and logo and the correct terminology in user manuals, etc.

Protocol and sample application certifications only require the product to pass the technical part.

- New consumer products based on the 500, 700 & 800 series chipset MUST be Z-Wave Plus v2 certified.
- 800 series consumer products MUST be based upon a certified Protocol (SDK) version while 500 and 700 series consumer products may be based upon earlier non-certified Protocol (SDK) versions.
- Recertifications of existing products can be based on an active Protocol (SDK), unless specifically prohibited. Review only recertifications can be based on an active or obsolete Protocol (SDK), unless specifically prohibited.
- Certifications MUST be maintained. Any change to a certified product is subject to the maintenance requirements identified in Section 3 of this document. Failure to maintain Product or Protocol certifications will result in the revocation of the already achieved certification.
- The Z-Wave Certification Programs & Tools are updated twice a year in Q2 and Q4. Every update is announced in the Certification Portal and on the Z-Wave Alliance Certification Overview page <https://z-wavealliance.org/certification-overview/>

The certification process is designed to help developers ensure that Z-Wave has been correctly and robustly implemented and that the product will interoperate with other certified Z-Wave products from the same and other vendors, for the same and other applications.

The certification process is in its core a “self-certification” process. The case owner is responsible for ensuring that products are certified and remain certified during the product life cycle. This document defines the steps to follow and describes the detailed specification points that MUST be implemented as a minimum.

2.1 Types of Products

General Products:

Products combining the Z-Wave hardware interface and the software/application to provide full Z-Wave functionality. The Z-Wave hardware interface can be either integrated or a separate add-on module designed specifically for use with the product and sold with it. Examples include but are not limited to:

- Self-contained products like light switches, thermostats & door locks.
- Static controllers, bridges, gateways, or security panels with integrated Z-Wave CHiPs/modules and either integrated or cloud based UI software. The final end-user interface **MUST** be verified as compliant to the applicable Z-Wave standards.
- Static controllers, bridges, gateways, or security panels relying on a separate Z-Wave hardware product like a USB stick for the RF functionality and interface to the Serial API. The Z-Wave hardware product can already be certified, or it can be certified as part of the General Product. If it is certified as part of the product, then it cannot be sold separately. These products can have either integrated or cloud based UI software. The final end-user interface **MUST** be verified as compliant with the applicable Z-Wave standards.

Software Application:

This is a software program that is designed to access a separate Z-Wave certified hardware interface/platform and provides the UI for control of the Z-Wave network products. It **MUST** be capable of working with any certified hardware product that utilizes the same hardware interface and OS. All software applications are considered updatable products.

- Older software certified to the Classic Z-Wave standards **MAY** be used with hardware products certified to either Classic Z-Wave, Z-Wave Plus or Z-Wave Plus v2 standards.
- Software certified to the Z-Wave Plus standards **MUST** be used with Z-Wave Plus or Z-wave Plus v2 certified hardware products for full functionality.
- Software applications based on a Z-Wave protocol (SDK) **MUST** be certified to the appropriate Z-Wave standards.
- The final end-user interface **MUST** be verified as compliant with the applicable Z-Wave standards.

Hardware Platform:

This type of product utilizes a standard interface like USB or Serial to provide RF functionality and a Z-Wave hardware interface via the standard Z-Wave Serial API. Although it can be sold as a stand-alone product like a USB stick, it cannot be shipped and/or sold with uncertified software.

- USB-HID and proprietary interfaces cannot be certified as hardware platforms.
- Hardware platforms **MUST NOT** provide any functionalities other than the RF and interface to the Serial API.

Protocol (SDK) product:

A protocol stack based upon a chipset type, made available for consumer product development and certification.

- A Z-Wave Protocol product MUST comply with the standards provided by the Z-Wave Alliance Open Source Working Group.
- Protocol (SDK) products utilizing 800 series chipset and newer MUST pass certification in order to be selectable for Product certification.

2.2 Review/Testing Requirements

General Products

- Document review and inspection
- Review of Market Certification data
- Hardware / Software testing
- Controllers:
 - The end user interface MUST be tested and verified compliant.
 - Network management functions MUST be made available to the end user if the end user owns the product.

Software Applications

- Document review and inspection
- Review of Market Certification data
- Software testing (with certified hardware)
- Controller Software:
 - The end user interface MUST be tested and verified compliant.
 - Network management functions MUST be made available to the end user.

Hardware Platform

- Hardware testing (with certified application software or Z-Wave Alliance' PC Controller software)
- Review of Market Certification data

Protocol Products

- Full or One-Region Software testing based on the test specifications from the Z-Wave Alliance Core Stack Working Group
- Test log review

2.3 Certification Fees

2.3.1 Types of Certifications for Z-Wave consumer products

New/Full Certifications

Includes documentation review and technical testing.

- Form and document review – Verification that end user instructions include required information and meet certification requirements. Verify that if needed, special instructions required for testing the product has been provided. Quick test to verify DUT's NIF matches information in certification form.
- Tests performed include but are not limited to network management (inclusion, exclusion, replication, rediscovery, etc.), Product/Role Type, Command Class, CTT (Compliance Test Tool) and RF tests according to the certification form.

Recertifications

Tests performed depend on changes being made. Random spot checks of other functionalities are also performed.

For any recertification applies, that the case is based upon the same form revision as the original product.

- Limited Product Modification may include:
 - Changes in up to 4 Standard Command Classes
 - Changes in 1 Advanced Command Class
 - Derivative Software for additional Controllers (Same Z-Wave code and functionality, different hardware)
 - Derivative Software for mobile products (Software for IOS, Android etc. Must access & control Z-Wave network through primary certified application)
 - Change to firmware in a hardware product.
- Review Only, a technical or non-technical product modification that do not affect network performance, Z-Wave functionality and/or Z-Wave behavior may include:
 - Brand
 - Product Name and/or number
 - GUI/Software (cosmetic or not involving Z-Wave functionality)
 - Update of underlying FW (not including Z-Wave Chip FW 0)
 - Frequency change
 - Exchanging 500 series chip version SD3502 with SD3503 and vice versa.
 - Protocol (SDK) update

2.3.2 Types of Certifications for Z-Wave Protocol products

New Certifications

- Form review
- Testing of the Z-Wave protocol stack to ensure that the implementation is in conformance with the test specifications from the Core Stack Working Group.

Recertifications

For any recertification applies, that the case is based upon the same form revision as the original product.

Recertifications are **only applicable for Z-Wave Alliance Source Code updates.**

2.3.3 Certification Fees & Payment

Fees for New Certifications and Recertifications are settled with the selected test partner as pre-payment. The Z-Wave Alliance will charge the case owner for fees related to Review Only recertifications once the case has passed initial review.

The certification fees listed are guideline prices in **USD**. The test partner may accept other currencies based on the exchange rate in effect at the time of submission.

All taxes, money transfer fees, currency exchange fees and shipment costs are paid by the case owner.

A one-time re-test during Ad hoc phase is Included in the fee for new certification.

Additional re-testing or other product related service fees are agreed with the test partner directly. It is however essential to note that if “Test Partner A” is assisting in product development, another test partners **MUST** be used for the official verification.

Line Item	Product Type	New Certification	Re-Certification	Review Only
1	End Product	\$3600	\$1950	\$450
2	Controllers (Any Product or Role Type except Z-Wave Plus v2 Gateway	\$6600	\$3950	\$450
3	Z-Wave Plus v2 Gateway Product Type	\$6600	\$4950	\$450
4	Hardware Product	\$1600	\$1450	\$450
5	Silicon / Stack Product Type <ul style="list-style-type: none"> • Full Test Suite • One Region Test Suite 	\$39600 \$27600	NA	\$450 \$450
	Additional fee			
6	LibS2 test for Controllers not based upon Z/IP or Unify	\$4000	\$2000	
7	Long Range, adding to already certified product or including in new certification.	\$1000	\$500	

2.4 Z-Wave Certification & Development Tools

2.4.1 Certification Portal

Z-Wave Certification utilize an online web-based certification form for compliance testing/verification in the Z-Wave Alliance Certification Portal. Access to the Certification Portal <https://certification.z-wavealliance.org> requires Z-Wave Alliance membership and user registration. Referring to section 2.1 for further information.

As of July 2021, the Z-Wave Alliance Certification Portal replaced the old Portal. The old Portal will remain open for re-certifications under the following URL: <https://z-wavecertification.z-wavealliance.org>. Original user accounts apply.

2.4.2 Certification Forms

Z-Wave is an evolving technology and the certification forms in the Portal are updated twice a year to accommodate Z-Wave Specifications. The developer MUST use the latest version of the appropriate form when submitting a new product for certification.

Only the most current form will be available on the Portal when creating new cases, however a 60-day grace period from the release of a new form revision, will allow submission in the older form. The Portal will issue a warning to the user if the form they are using is outdated and no longer accepted.

Important: For Z-Wave Plus program products based upon form revision 1-8 (all included), it is not possible to conduct a review only re-certification. Any change to such a product must be re-tested in accordance with the latest form requirements.

The majority of form changes are to clarify requirements, simplify the form or add/update Command Class Specifications and/or Role and Product Type Specifications. The Portal provides a basic revision record in the wiki, but directions to the relevant Command Class, Role Type and Product Type specification documents.

2.4.3 Compliance Test Tool (CTT)

Using the Compliance Test Tool, also referred to as the CTT, is mandatory in the self-certification phase. The CTT offers an 80% coverage of automated tests required, based upon the information provided in the form.

Passing all tests in the CTT is not a guarantee that the product will pass certification but an indication that the product at least will pass the same tests when verified by the test house.

The CTT is updated together with the certification forms and is accessible from the Portal.

2.4.4 Z-Wave End Device Emulator (EDE)

A Windows .Net application for Z-Wave Controller development which allows user to emulate Z-Wave end devices and create a fully functioning network. The EDE is designed to be used during product development and is not a required part of the certification. The EDE can be downloaded from here <https://sdomembers.z-wavealliance.org/document/dl/1833>

2.4.5 Z-Wave Test System (ZTS)

The ZTS is still under development but to the extent possible the ZTS MUST be used in verification and self-certification of Z-Wave Protocol (SDK) <https://github.com/Z-Wave-Alliance/z-wave-test-system>. For self-certification access to the OSWG Z-Wave-Test-System GitHub repository is required. User request must be forwarded to administration@z-wavealliance.org

2.5 Steps in the Z-Wave Certification Process

Below is a view of the different steps in the technical certification as well as in the market certification part. For consumer products both parts MUST pass their individual reviews for the product to pass certification. For Protocol products and sample applications the Market Certification part do not apply, but any use of the Z-Wave name, logo, brand, or badge MUST be in accordance with the requirements.

Upon successful completion of the process, an official Z-Wave Certification Number is issued through the Portal, with notification to the case owner.

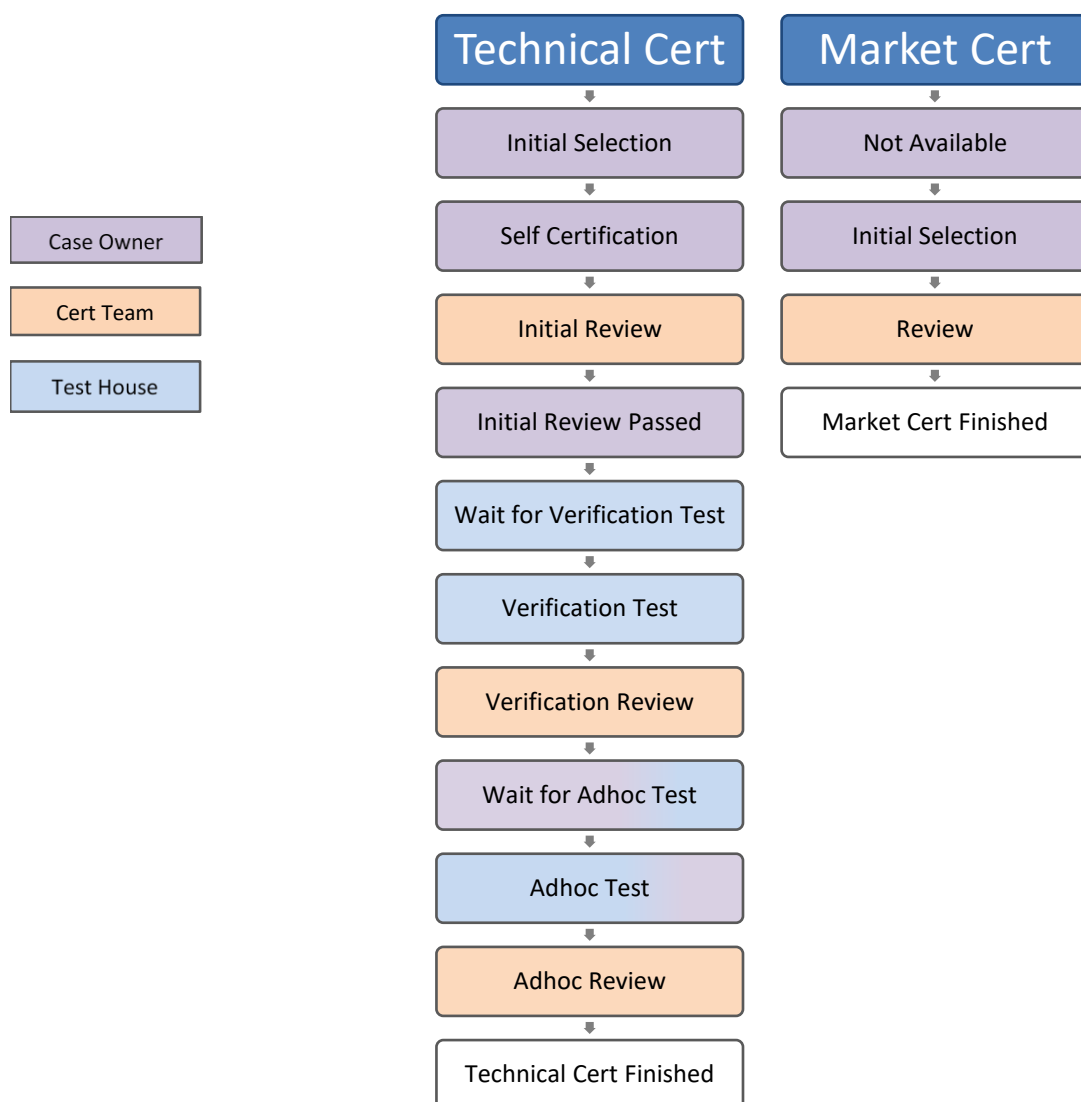


Figure 1, Steps in the Z-Wave Certification Process

2.5.1 Technical Certification

1. The owner creates a case in the Certification Portal by filling in the certification form. Most form items provide a direct reference to the specification requirement, for detailed explanation (e.g., RT:06.110003.1 or DT:00.11.0026.1)
 - Case owner decides which CHIP will be used and the desired Z-Wave functionalities of the product during the definition stage of product development. Depending on this direction, the next step is to choose which Product & Role Types and Command Classes are to be implemented. The Z-Wave Technical Certification Form should be used in this step to help identify protocol implementation requirements as well as record detailed aspects of the targeted Z-Wave compliance.
 - Case owners certifying for the first time will need to have a Manufacturer's ID number assigned. This can be requested by submitting a pull request in the GitHub repository https://github.com/Z-Wave-Alliance/zwave_xml/blob/main/zw_manufacturers.xml The ID will be published within the Z-Wave developers' community.
2. The case owner conducts the Self-certification and submits the Certification Form for Initial Review
 - As part of the Self-certification, the case owner conducts tests to confirm functionality and compliance to Z-Wave specifications. Tests shall be conducted for all aspects of the implementation where compliance is claimed in the Certification Form. Z-Wave testing guidelines are provided in the Compliance Test Tool (CTT) that MUST be used in Command Class related tests, and in the Z-Wave Test System for Protocol products to test the implementation of the MAC and Network layers.
 - The latest version of the appropriate certification form MUST be used when submitting a new product for certification.
 - Only the latest version of the online form will be available on the Certification Portal for new products.
 - Prior to submission for review, the developer MUST read and accept the Trademark and Distribution License as specified on the online Portal.
 - Certifications are issued to the company submitting the online Z-Wave Certification Form.
 - Z-Wave Certification submissions are done online at the end of the self-certification phase. Each variation of a product MUST be certified separately. The type of certification required depends on the differences between the products. Refer to Section 3 for details.

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3. The certification system automatically assigns a case number to the product when submitted.
 - This case number is used to track the product through the entire testing and certification process. All communications regarding this product **MUST** reference this case number in the subject line of the email message.
 - Prior to submission, all cases are labeled “Pre-Cert”.
 4. The Z-Wave Certification Team conducts the Initial Review of the Certification form. The system automatically notifies the case owner and the selected test house when a form has passed Initial Review. The case owner can then start communicating with the test house regarding payment of the fees and sample/documentation submissions.
 - If the Initial Review fails, the developer is automatically notified by the system that the online form needs to be corrected/updated and then re-submitted.
 5. A product enters Wait for Verification when everything has been received by the test house. This includes payment, samples, and product instructions/documentation. The number of products in this queue varies and information regarding queue length can only be provided when the test house has received everything.
 - Everything required to enter the test queue **MUST** be received by the test house within **60 days** of the initial review. Failure to meet this requirement will result in the case being closed. The case owner will have to re-submit a new case if this occurs.
 - Products having to be resubmitted **MUST** be compliant with the specifications in place at the time of re-submission and utilize the latest version of the certification form.
 - Two test samples of a submitted product are required. Samples submitted to the test partner are not returned to the case owner. These are retained by the test partner for reference in case of issues and for use during interoperability testing.

6. The Z-Wave Test Partner conducts the Verification Tests.

- The Verification Tests cover all aspects of Z-Wave compliance as defined in the specification documents, the certification form and the CTT or the Z-Wave Test System. Depending on the type of product this MAY include but is not limited to the examples listed below.
 - Use of the proper software libraries for the intended market.
 - General compliance requirements like use of a certified protocol (SDK), selected Product Class or Product & Role Type is appropriate for the intended application/use of the product, implementation of all mandatory Command Classes for the product being submitted and tolerance toward unexpected frame lengths.
 - Verification of the programmed values in the Manufacturer Specific CC, Version CC, Z-Wave Plus Info CC and NVR flash page.
 - Common product requirements like Node Information Frame format, use of Explorer Frames, Inclusion/Exclusion into/from existing networks, use of Normal Power Mode and Network Wide Inclusion.
 - Specific requirements based on the applicable Product Class or Product & Role Type. These are listed in the applicable specification document.
 - Controllers are tested to verify their ability to include all certified products, the ability to be included into existing networks, network management functionality, and that a minimum level of control as defined in the specifications is provided for all products regardless of brand/manufacturer. The end-user interface MUST be submitted and verified as compliant.
 - All implemented Command Classes MUST provide appropriate and correct functionality.
 - Supported Command Classes MUST implement all commands in the CC.
 - Mandatory Command Class control is identified in the Command Class Control Specification [10].
 - End user documentation is reviewed to ensure all mandatory requirements are met. The certification form is also reviewed to ensure all implemented functionalities are correctly identified.
 - If questions arise during the Verification Test, the Test Partner will contact the case owner directly.
 - Depending on the number of products already in queue, the goal is to start testing within two weeks of the product entering “Wait for Verification” -phase. The actual testing time will then depend on the type of product, its complexity and if prepared through self-certification & testing.
 - Automatic notifications of testing completed are sent to the Certification Team.

7. The Z-Wave Certification Team reviews the Verification Test results.

- If the product passes all the tests, a certification number will be issued, providing that the corresponding Market certification if the product type requires, has also passed.
- If the product fails due to a few minor issues*, the case owner will be notified that it is going into Ad Hoc review and the case owner will be granted **30 days** to work directly with the test partner to fix the issues and pass the tests. The case owner is not allowed to change functionality of the product during Ad Hoc.
 - Ad Hoc is NOT an approval to produce or sell the product while issues are being resolved.
 - Ad Hoc testing includes one re-submission to fix the issues identified in the test report. Additional charges may apply if more than one re-submission is required to fix all issues. Please refer to section 2.4.2 Certification Fees
 - Failure to resolve the issues within this time frame will result in the case being closed without certification. Case owner can only re-submit the product by starting the process over, providing new documentation and settling the corresponding fees for new certification.
- Case owner will be notified if the product fails due to major issues. Case owner can only re-submit the product by starting the process over, providing new documentation and settling the corresponding fees for new certification. Parameters for minor and major issues are defined below.
 - Five (5) document issues count as one (1) command class/protocol issue:
 - Minor Issues: Technical issues in up to 5 command classes/protocol items
 - Major issues: Technical issues in 6 or more command classes/protocol items
- Not passing the Market Certification part if the product type requires, is considered a certification failure. Case owner can only re-submit the product by starting the process over, providing new documentation and settling the corresponding fees for new certification.

2.5.2 Market Certification

The Market Certification part is mainly focusing on the correct use of Z-Wave logo, marks, and badges and whether these are correctly used in the product manuals and correctly presented on the products and its packaging.

1. Product Information and Brand

This step is where submitters will input descriptions for their products. These should be concise and include information about how the product functions as a Z-Wave product. Submitters are also required to submit proof of their brand on the product being considered for certification. These photos must be an image showing the product itself – not a mockup – with the brand on the product.

2. Product Image

The product submitter must provide a photo of the product against a white background. This will be publicly available and listed on the Z-Wave Alliance product catalog.

3. Manuals

The product submitter must submit manuals and any relevant documentation for review. These manuals must be readable in English even if the final product will not be sold in English-speaking markets. The intent of this section is so that Z-Wave Alliance may be sure that product documentation explicitly outlines the following requirements:

- Z-Wave trademark is acknowledged and used correctly: **Z-Wave™**
- Interoperability of Z-Wave products is acknowledged.
- SmartStart, if supported, is described appropriately, and spelled correctly.
- The S2 DSK information is available on the product per requirements established in specifications, as well as available on product packaging if required and applicable.
- Association Groups and Command Classes are detailed in the product documentation to allow ease of reference to installers and customers.

4. Z-Wave Marks

In this step, submitters must provide documentation that Z-Wave Plus or Z-Wave Long Range badges, and Z-Wave logos are applied correctly to their products and their products' packaging. For the most up-to-date versions of the badge, please visit this page:

<https://sdomembers.z-wavealliance.org/wg/Members/home/certification-resources>

Z-Wave badges must fit the minimum size requirement of 13mm x 11mm and MUST be applied to the products and packaging. The Z-Wave Alliance requires photos of the final product and the final package. If a physical version of your product will not be available for review by the time it is submitted for certification review, you may submit digital mockups showing the Z-Wave badge or Security S2 markings.

NOTE: Out of date badges will NOT be accepted. Z-Wave Alliance Members MUST use the most up-to-date badges on their products. Any misuse of Z-Wave logos in the promotion of uncertified products will be referred to Z-Wave Alliance' Board of Directors for legal action.

The Z-Wave badge on the packaging requirement may be waived if the product is to be **directly installed by the Manufacturer or Brand's direct service organization**. The Z-Wave badge will be required to be placed on the package if the product and packaging will be sent to distributors or resellers, channel partners, or where sales may take place through online, retail, or wholesale means.

Please refer to the Badge Usage Policy and Z-Wave Logo Guidelines at the link above for full details on the badge and logo requirements as they relate to your products and your marketing collateral.

5. Security 2/SmartStart Markings

All products supporting SmartStart must provide a representation of the DSK (whether the full DSK or a QR Code and PIN combination) on the product. If the product's size precludes using the full DSK, the QR Code and PIN combination may be used **as long as** the full DSK is printed on the product's packaging or as an insert in the product's packaging. For full requirements of the S2 Security markings, please refer to the relevant document in the link above.

Please note that the DSK or QR Code must be shown on the product itself. Digital inserts or product renders are not allowed and will be rejected.

If the product does not support Learn Mode, then DSK labeling does not apply. If the product does not support to be included in a network using SmartStart inclusion, then QR labeling does not apply.

6. Legacy products

The Market cert process for legacy products created in the old Portal is different from current system. Please visit <https://marketcert.z-wavealliance.org/help/help.html> for further information or contact certadmin@z-wavealliance.org

2.5.3 Exception to comply with in-force specifications.

Any Z-Wave product that is submitted for certification MUST comply with the in-force specifications.

Exceptions to comply with in-force specific requirements can only be granted if the relevant Z-Wave Alliance Working Group approves to modify or remove a requirement with the next specification update.

Developer can initiate a discussion with the relevant working group and if approved within the group an exception form can then be requested from the Certification Team certadmin@z-wavealliance.org

The exception form must include the list of individual certification form items that are affected, and a link that verifies the working group change approval (e.g., GitHub pull request approval or approved comment on Causeway).

2.6 Z-Wave Certification Number Formats

A Z-Wave certification number is assigned to each certified product. The purpose of certification number is to allow that each Z-Wave certified product type can be identified and tracked in the market. A new number is assigned whenever a product is recertified.

With the exception of ZC06 the number format is: ZC 2-digit version/-/2-digit year/2-digit month/4-digit number e.g., ZC12-20031521 for Product Certifications

For Protocol Certifications the number format is: ZPC 2-digit version/-/2-digit year/2-digit month/4-digit

Listed are all Z-Wave certification programs ever used and its related certification number formats. The year entered below are just to indicate the original launch of the specific program. The numbers marked in red, are no longer issued.

QFN Certification	Classic Certification	Z-Wave Plus Cert	Z-Wave Plus v2	Protocol Certification
<i>ZC09-13xxxxxx</i>	<i>ZC06-xxxxxx</i>	ZC10-17xxxxxx	ZC12-19xxxxxx	ZPC01-23xxxxxx
	<i>ZC08-13xxxxxx</i>	ZC13-21xxxxxx	ZC14-21xxxxxx	

2.7 Certification Contact Information

Questions regarding Z-Wave certification, the content or interpretations of this Certification document can be directed to the Certification Team or Certification Program Manager by email to: certadmin@z-wavealliance.org

Questions related to Z-Wave development can be addressed to any of the Z-Wave Alliance technical working groups in Causeway <https://sdomembers.z-wavealliance.org/>

- Application Working Group
- Core Stack Working Group
- Security Working Group
- Open Source Working Group
- Product Certification & Ecosystem Working Group

2.8 Test Partners

Z-Wave test partner and address	Contact information	Available for
Institute of Digital Guangdong (IDG) 11/F, Block B1, Originality Building, 162 Science Avenue 510663 Guangzhou China	Pauline Lei Email: pauline@idgd.org Phone: +86020-39922015	Compliance testing of End Products based on Z-Wave Plus and Z-Wave Plus v2 standards and specifications
MK Logic GmbH Hauptmarkt 9/10 08056 Zwickau Germany	Sandy Reisinger Email: z-wave@mk-logic.de Phone: +49 (0) 375 / 39098696	Compliance testing of End Products and Controllers based on Z-Wave Plus and Z-Wave Plus v2 standards and specifications. Z-Wave Protocol Certification
Solutions for IoT, LLC 1 Burnett RD, Mendham NJ 07945 USA	Mariusz Malkowski Email: certification@solutionsforiot.com Phone: +1 908 787 4308	Compliance testing of End Products based on Z-Wave Plus and Z-Wave Plus v2 standards and specifications.
Z-Wave Alliance 3855 SW 153 rd Drive Beaverton, OR 97003 USA	Z-Wave Alliance Cert Team Email: certadmin@z-wavealliance.org Phone: +1.503.619.0851	Review only re-certifications

3 Z-WAVE CERTIFICATION MAINTENANCE

3.1 Changes and Modifications of Z-Wave Certified consumer Products

If at any time after the issuing of the Certification the developer plans to make any revisions or modifications to the product, the developer **MUST** follow the rules for Certification Maintenance described in this section.

The general rule is that any such change is considered to create a new product for which the regular Z-Wave certification process described in this document applies. A Z-Wave Certification Form **MUST** be submitted for each product affected.

Failure to maintain certifications and/or comply with the requirements identified in this section for certification maintenance will result in revocation of the original certification.

Note: For Z-Wave Plus program products based upon form revision 1-8 (all included), it is not possible to conduct a review only re-certification. Any change to such a product must be re-tested in accordance with the latest form requirements.

3.1.1 “Different Products” with regard to Z-Wave Certification

A developer **MAY** create a new product by modifying an existing certified product. Such “different products” **MUST** be certified like any other Z-Wave product.

A Z-Wave product is considered a “different product” if at least one of the following conditions applies:

- Differences in the product’s Z-Wave network and/or application behavior
- Different protocol (SDK) library used. This includes situations where for example, an EU library **MUST** be changed to a Chinese library for a 500 series product even though the base frequency is the same for both regions (868.42 MHz).
- Differences in the product’s RF performance or frequency, e.g., caused by changes to the electronics, the RF PCB layout, the antenna type / position, and/or change of subassemblies, the form and/or material of the product’s enclosure, etc.
- Different chip type
- Different product name and/or different part number
- Different manufacturer and/or brand name

Changes in the color of a product are not considered to create a different product, provided that such change does not affect the RF performance of a product (e.g., by changing the enclosure material, type of paint etc.). This is also the case if the product’s part numbers differ, provided that all color variants share a common portion of the part number.

The following categories have been established to identify various degrees of change, the conditions to qualify for each category and the corresponding certification requirements. If the conditions are not fully met, the regular Certification process **MUST** be followed.

3.1.2 Non-technical Product Modifications

Changes to product names, changes in part numbers, changes in brand names, and changes in the manufacturer name are examples of modifications that are considered non-technical in nature in the Z-Wave Certification process. While such changes also require changing the values for the Manufacturer Specific command class, they are still considered non-technical product modifications if no other changes to Z-Wave functionality are being made.

Non-technical changes are processed as Review Only re-certifications. Case owner **MUST** submit updated Certification Forms for each product and will receive the Certification Number after review and approval of the new Market Certification.

Example:

- A manufacturer currently sells a certified product under their company's brand name. They want to sell a private label version to a new customer under that customer's brand name. Product labeling, model number, packaging and at least one of the Manufacturer Specific values will be different; however, there are no other changes to the product or instructions, so this is considered a non-technical product modification. A new certification form **MUST** be submitted however, this will qualify for a review only re-certification. A Market Certification will be needed for the new product.

The certifying company is the owner of the certification. Transferring ownership to a different company applies for a new certification with full fees.

3.1.3 Technical Changes that do not Affect Z-Wave Network Behavior

In case of technical changes that do not affect Z-Wave behavior; the case owner needs to submit a new Certification Form. The form MUST contain a brief explanation on the change including a clarification why that change does not affect Z-Wave behavior.

Examples:

- Design changes are made in the AC circuitry of a certified lighting control product to comply with revised UL or CE standards and the developer changes the hardware version number of the product for tracking purposes. The product utilizes a standard Z-Wave module and based on the developer's self-testing, the design change has no effect on Z-Wave RF performance/range. There are no other changes to the product, so this is considered a technical change that does not affect network behavior. A certification form with new range test data MUST be submitted however, this will qualify for a review only re-certification as long as the range and CER is still within acceptable limits.
- A plug-in dimmer certified for the EU frequency and marketed in France is modified for sale in Germany. Product labeling, model number, packaging and at least one of the Manufacturer Specific values is changing for the new market and the only technical change to the product is the style of plug. The product utilizes a standard Z-Wave module and based on the developer's self-testing, the design change has no effect on Z-Wave RF performance/range. There are no other changes to the product, so this is considered a technical change that does not affect network behavior. A new certification form with new range test data MUST be submitted however, this will qualify for a review only re-certification if the range and CER is still within acceptable limits.
- 500 series chip version SD3502 and SD3503 carry the same IC and software. Exchanging SD3502 with SD3503 and vice versa therefore applies for a review only re-certification. Exchanging any other chip type requires full new certification.

3.1.4 Limited Product Modifications and Product Modifications

The following parameters will apply to Z-Wave Plus products based on SDKs v6.71.xx or newer, and for Z-Wave Plus v2 products.

Limited product modifications are considered all changes to a certified product where the number of added, removed, or modified “Standard” command classes is up to 4 or if implementing Z-Wave Long Range capability. Product Modifications encompass all changes exceeding those allowed for Limited Product Modifications e.g., changing the protocol library type requires a full new certification. An example of this would be changing from the End Device Routing library to the End Device_Enhanced_232 library.

Each “Advanced” command class counts as 4 command classes due to the comprehensive testing that is required for verification of Z-Wave compliance. Any change besides documentation and one “Advanced” command class will require a full certification.

- “Advanced” Command Classes include Security, Multi-Channel, Multi-Channel Association, Firmware Meta Data and Multi-Command Command Classes.

Examples:

- Limited Product Modifications: Recertification.
 - Changes in up to & including four (4) Standard command classes; no other changes.
 - Adding Z-Wave Long Range without changing the SDK version used
- Product Modifications: Full certification is required.
 - Changes to one (1) Advanced command class and one (1) Standard command class

3.1.5 Frequency-Only changes

The change in operating frequency of a product – e.g., creating an EU variant from a US product – will qualify as a technical change that will not affect Z-Wave behavior, a review only re-certification if this is the only change to the product. The 700 series CHIPS & modules are universal in that with the use of an applicable SAW filter, the same CHIP/module can be used for any frequency. Due to this, all frequency-only changes including those for 500 series products are handled as review-only recertifications.

Frequency-only re-certifications will be accepted even if the SDK version used in the original product is obsolete, however the Certification Form MUST be the same as the one used when submitting the original product.

3.1.6 Change in Protocol (SDK) used in consumer products.

Upgrading the Z-Wave protocol (SDK) does require re-certification however, the level of certification required, the amount of testing needed, and the associated fees depend on the scope of the change.

- If upgrading the protocol (SDK) version from one vendor to a version from a different protocol (SDK) vendor, it will require a full new certification.
- When upgrading the protocol (SDK) version to a newer version but from the same protocol (SDK) vendor and if there are no changes to any Z-Wave functionalities or to the command classes originally selected, the change will apply for a Review Only recertification provided that the product passes a new CTT self-certification test. The complete CTT test solution must then be uploaded in the certification form file section for review.

3.1.7 Any Other Product Modification

If the conditions for the “limited product modification”, “change that does not affect Z-Wave behavior”, and the “non-technical product modification” are not met, the regular Z-Wave Certification process and full fees apply.

3.2 Modifications of Updatable Products

Many types of Z-Wave products MAY be modified relatively frequently by downloading new versions of the software or installing new firmware. Examples include Z-Wave applications that run on PCs or tablets, products that support the Firmware Update CC where the end-user can install new firmware versions, or product like static controllers, gateways, security panels or set-top boxes that can be updated either locally or automatically from a central service facility. Z-Wave products including lighting controls, door locks and thermostats can also be easily updated if the Firmware Update Meta Data Command Class is supported.

The developer MUST apply the following process for Certification and certification maintenance of updateable products and software applications:

- The developer conducts the full Z-Wave Certification process for the initial certification of the product.
- Subsequent updates are handled in the following manner:
 - Updates affecting Z-Wave functionality MUST be recertified to determine whether the changes require re-certification or full certification. Examples include but are not limited to:
 - Hardware change
 - Changes that affect the RF performance of the product
 - New major release / major revision of the product
 - Changes to the functional Z-Wave UI and/or Z-Wave functionality
 - Integration of a new major revision of the Z-Wave protocol
 - A one-page Compliance Statement [11] MAY be used to maintain an existing certification if the changes are only for underlying firmware and do not affect Z-Wave functionality. This form can be requested from Certification Team by email to certadmin@z-wavealliance.org
 - Updates that create a new/additional product (different brand, model number, etc.) MUST be submitted on the appropriate Z-Wave certification form [4] regardless of whether Z-Wave functionality is affected. Each form MUST stand alone as a comprehensive record of what is being certified.

3.3 Changes and Modifications of Z-Wave Certified Protocol products

For a period of one year protocol developer **using Z-Wave Alliance Source Code** from the Open Source Working Group (OSWG), may update a certified Z-Wave Protocol product and submit for a review only re-certification. The developer **MUST** complete a new self-certification and upload the test log in the certification form for review.

In order to secure the quality of certified Protocol products, there is a lifetime limitation of one year from first original release. This means that any update that is submitted after the one-year period **MUST** undergo full new certification, disregarding the scope of the change.

If the product is based upon a different source code than Z-Wave, then any change to the protocol will require a new certification.

Change in silicon: any change in silicon except by similarity will require a new certification. E.g., if the die is the same used in a series of SoCs, SIPs or modules, this is considered similarity.

3.4 Updates required due to compliance issues being discovered after certification.

As stated in Section 2.1, General Requirements, it is the responsibility of the developer/case owner to maintain their certifications. If compliance issues are discovered after a certification is issued when the developer/case owner **MUST** fix the problems and bring the product back into compliance. The scope of the issue(s) and required fixes will determine whether the existing certification can be maintained or if a recertification will be needed.

If a product is updated from one series to another e.g., 500 to 700 or 700 to 800, the product **MUST** be submitted as a new Z-Wave certification.

3.5 Grandfathering of Existing Products

All existing Z-Wave certifications for non-updatable products remain valid indefinitely regardless of the changes to certification criteria mentioned in this document. However, if re-certification of a product is required, the newest version of the relevant specifications and Z-Wave Certification documents **MUST** be used.

Certifications for updatable products are tied to the software/firmware version. If no changes are made, the certification will remain valid indefinitely. Please refer to Section 3.2 if changes are made.

3.6 Revocation of Certifications

Failure to fix a compliance issue **MAY** result in the product certification being revoked. Product certifications **MAY** also be revoked if it is determined that the certification was obtained based on incomplete, false, or misleading data in the certification form submitted.