DeviceNet™ Conformance Test Policy

1 PURPOSE OF THE DOCUMENT

Define and establish ODVA's policies for ensuring conformance with the DeviceNet Specifications. In doing so, this document:

1.1 Describes the goal of conformance testing, how it is accomplished and the application of the certification mark,

1.2 Defines when products need to be tested/retested,

1.3 Defines how products are tested,

1.4 Defines what can be claimed in product advertising regarding conformance,

1.5 Defines impact of specification revisions on conformance testing,

1.6 Describes the conformance test and appeal processes,

1.7 Recognizes and defines the requirements of Embedded Technologies,

1.8 Defines the policy and procedure for removal of the rights that have been granted by ODVA to a vendor to use ODVA's trademarks, service marks and certification marks in that vendor's publications.

2 SCOPE/APPLICATION

In accordance with the DeviceNet Terms of Usage that are accepted by each vendor in order to design and manufacture DeviceNet products, this policy, its procedures and guidelines apply to all marketed products based on the DeviceNet Specifications.

The ODVA DeviceNet Conformance SIG (hereinafter "Conformance SIG") is responsible for the implementation of this policy.

3 DEFINITIONS

3.1 DeviceNet Conformance Tested Products – products that have a valid Declaration of Conformity issued by ODVA.

3.2 Family Approval – A conformance evaluation for a group of similar products from an individual vendor that are determined to be DeviceNet Conformance Tested Products by submitting a representative number of the candidate products for testing at an authorized ODVA Test Service Provider. The policy section establishes the criteria and scope of testing for valid candidate products.

3.3 Embedded Technology – A product that is not intended to be an end product itself, but is intended to be incorporated into a second product from the same or another vendor to enable it to communicate over the DeviceNet network.

3.4 EDS File –Electronic Data Sheet file formatted in accordance with the DeviceNet Specification.

3.5 TSP – An ODVA Conformance Test Service Provider, either operated by ODVA or officially authorized by ODVA to perform DeviceNet conformance testing on behalf of ODVA as described herein.

3.6 Netlist – documentation describing the interconnection of all components on a printed circuit board.

4 ASSOCIATED MATERIAL

4.1 Statement of Conformance blank form

4.2 “DeviceNet Conformance Tested” certification word mark and certification logo mark (see Appendix C)

4.3 DeviceNet Terms of Usage

4.4 Declaration of Conformity

5 CONFORMANCE TESTING

5.1 ODVA authorizes, conducts and regulates DeviceNet conformance testing. The goal of conformance testing is to promote and facilitate interoperability among devices from multiple vendors.

5.1.1 The Conformance SIG shall continuously improve the DeviceNet Conformance Tests with the ultimate goal of 100% coverage of the DeviceNet Specifications.

5.1.2 Products shall be tested against the Current Version of the DeviceNet Conformance Tests except as specifically allowed for elsewhere in this document.

5.1.3 New Releases of the DeviceNet Conformance Tests shall not become the Current Version used by the TSP until 30 days after the release date. During this 30-day period, a Vendor may request testing with the New Release.

5.1.4 Products are tested against a published device profile. Implementation claims are made in the Statement of Conformance.

5.2 A TSP is authorized to evaluate the following:

5.2.1 Behavior and conformance of a product to the DeviceNet Specifications using protocol, EDS, physical and interoperability tests. In addition, if the device is a network power supply, the TSP is authorized to perform the network power supply test.

5.2.2 A TSP is authorized to take certain actions as necessary if a product appears to achieve compliance with the tests, but demonstrates some behavior that interferes with the nominal operation of an otherwise conforming DeviceNet network.

5.3 Test data and failed test verdicts are confidential between the vendor, the TSP and ODVA world headquarters with the exception that problems detected during system testing not readily attributable to a single device may be reported to multiple vendors.

5.4 ‘No Code/No Stamp’ Policy – Products using a publicly defined device type are not eligible for conformance testing until the device type is covered by a released ODVA test.

5.5 ODVA’s “DeviceNet Conformance Tested” certification word mark and certification logo mark are registered trademarks of ODVA and protected by international law, the authorized use of which indicates that a product has passed conformance testing at a TSP and that its vendor has been issued an official Declaration of Conformity from ODVA. The DeviceNet Conformance Tested certification marks are to be applied in the following manner:

5.5.1 The certification word mark and certification logo mark are to be placed on a product, its literature and/or advertising only after the vendor has received an official Declaration of Conformity from ODVA that the product has successfully passed conformance testing. When the certification mark is used on product literature or advertising with multiple DeviceNet Products, it shall be clear which product(s) have passed conformance testing.

5.5.2 There is no time limit on the validity of the DeviceNet Conformance Tested certification word mark or certification logo mark. Note that this does not relieve the vendor of its on-going responsibility to adhere to the DeviceNet Terms of Usage Agreement and/or to meet the DeviceNet Specifications.

5.5.3 The right to continue to apply the DeviceNet Conformance Tested certification word mark or certification logo mark is subject to the following conditions.

5.5.3.1 All ODVA fees are paid in full.

5.5.3.2 The vendor continues to adhere to the DeviceNet Terms of Usage Agreement including maintaining its Vendor ID and at least one uninterrupted subscription to the DeviceNet specifications

5.5.3.3 Following modifications to a product, the product has passed conformance testing at a TSP or meets the requirements described in Appendix D. Note: Substitution of a product component with equivalent specification from an alternate source is not considered a modification and thus does not require the product to be retested: the intention is to allow use of second sources for components that are drop-in replacements.

5.5.4 The right to use the DeviceNet Conformance Tested certification word mark and certification logo mark may be revoked upon notice by ODVA of nonconformance or failure to meet any of the conditions defined in section 5.5.3.

5.6 Passing the test at a TSP does not relieve the vendor of responsibility for conformance to the DeviceNet Specifications.

5.7 Specification revisions impact conformance testing in the following manner:

ODVA maintains a “List of Exceptions” (see Appendix ‘A’), which identifies feature/function differences between specification revisions where the revised behavior is mandatory. If a product “fails” due to an item on the “list of exceptions”, the vendor will have the option to be listed against the most recent version of the conformance test for which the old behavior was acceptable.

5.8 A product vendor may appeal a test result according to the process described in Section 9 of this policy.

5.9 If any party other than ODVA identifies non-conformance in a DeviceNet product, ODVA expects the identifying party to contact the vendor(s) directly for discussion and resolution. If a resolution cannot be reached in a timely manner, then the affected party may contact ODVA.

5.10 All vendors must execute ODVA’s DeviceNet Terms of Usage agreement that requires vendors to agree to certain terms in order to obtain a unique Vendor ID.

5.11 The vendor will terminate the use of the DeviceNet name and trademark, the DeviceNet Conformance Tested certification marks, as well as any other trademarks, service marks or certification marks owned or controlled by ODVA, upon demand by ODVA for any one of the following reasons:

5.11.1 Failure to provide ODVA upon request a product for testing at one of its TSPs.

5.11.2 Failure to stop shipping a DeviceNet product upon written notice from ODVA that the product is non-conforming.

5.11.3 Failure of the vendor to continue to meet the requirements of its signed DeviceNet Terms of Usage Agreement.

6 POLICY REGARDING FAMILY APPROVAL

Family approval addresses the situation where a vendor has a family of products derived from a common implementation, and complete conformance testing of each family member is redundant. A complete list of product family members must be submitted at the time of testing. Additional family members not included in the initial submission are subject to the normal testing procedure. Two variations of family approval exist:

6.1 Where all product family members share an identical DeviceNet physical layer implementation and identical firmware/software (with the exception of identity object instance attributes 3 and 7), the entire family of products may be validated based on complete testing two representative (but not identical) products from the family.

6.2 Where all product family members share identical firmware/software (with the exception of identity object instance attributes 3 and 7) but have different DeviceNet physical layer implementations, the entire family of products may be validated based on protocol testing two representative products from the family and physical layer and interoperability testing on each physical layer variant.

7 POLICY REGARDING EMBEDDED TECHNOLOGY

7.1 Embedded Technology may be submitted to ODVA for testing to attain the classification of DeviceNet Conformance Tested Embedded Technology.

7.2 Embedded Technologies and derivative products shall comply with standard Conformance Policy, except as noted below.

7.2.1 Embedded Technology products shall remain at a TSP of ODVA's own choosing after successful completion of the testing. As soon as possible after the release of new ODVA DeviceNet Conformance Tests, the embedded technology device shall be retested by this TSP.

7.2.2 If, during retesting, instances of non-conformance are identified, such instances are recorded and distributed to all TSPs by ODVA. These records are active for the following intervals:

- 24 months from the ODVA DeviceNet Conformance Test Release Date for Embedded Technologies not readily updated as part of the normal manufacturing process (for example, software in mask ROM, ASIC's etc.).
- 12 months from the ODVA DeviceNet Conformance Test Release Date for Embedded Technologies readily updated as part of the normal manufacturing process (for example, software in Flash ROM, EPROM, EEPROM, diskettes etc.).

7.2.3 Products derived from Embedded Technologies are tested against the Current Version of the ODVA DeviceNet Conformance Tests. Instances of non-conformance in active records for the Conformance Tested Embedded Technology as described in section 7.2.2 shall be waived, and the product will be listed as having passed the most recent version of the Conformance Test for which the Embedded Technology had no instances of non-conformance.

7.2.4 A product derived from an updated embedded technology that has passed the conformance test at an ODVA approved test facility may be self retested if the non-embedded technology portion of the derived product meets the requirements documented in Appendix D. Otherwise the product must be retested at a TSP.

8 CONFORMANCE TESTING PROCEDURE

8.1 Purchase and maintain a current subscription to the ODVA DeviceNet Protocol Conformance Test Software.

8.2 Test product in house as necessary.

8.3 Create the electronic input file (.stc file) for use in the Conformance Test using the ODVA DeviceNet Protocol Conformance Test Software.

8.4 Contact ODVA world headquarters to order product testing. ODVA will verify that the vendor has a valid Vendor ID and has an active subscription to the DeviceNet Specifications. When both of these have been confirmed, ODVA will schedule the testing with the vendor and the TSP.

8.5 For testing, the vendor must provide:

8.5.1 A correct electronic input file (.stc file) for the product created with ODVA's DeviceNet Protocol Conformance Test Software.

8.5.2 Any configuration tools/documentation needed to configure and use the product on the network, including an EDS file consistent with the .stc file referenced in 8.5.1.

8.5.3 A representative to accompany the product, especially on its first visit to the TSP, to help in setting up and configuring the device for operation. If the vendor chooses not to assist in person, then at a minimum the vendor must submit the device pre-configured and "ready to go" once powered-up. Specific instructions must be supplied that clearly show all necessary electrical connections to make the device function on the network.

8.5.4 Any auxiliary (non-network) power supplies or fixtures needed to setup/connect/configure the product.

8.5.5 All necessary equipment for testing. No vendor shall be allowed to install hardware or software on a Test PC located at the TSP for any reason.

8.5.6 Delivery of the candidate product to the test location.

8.6 The conformance test on the candidate product will be conducted with the Current Version of the ODVA Conformance Tests.

8.7 The TSP will perform the conformance tests and evaluate the candidate product.

8.8 A candidate product shall receive a passing verdict if it has no errors except for the conditions stated in sections 5.7 and the TSP has not identified behavior that interferes with the nominal operation of an otherwise conforming DeviceNet network as described in section 5.2.2.

8.8.1 Upon completion of the test, the vendor will be notified by the TSP that the test has been completed and that the product has received a passing verdict; the test data will be provided to the vendor by the TSP.

8.8.2 ODVA world headquarters will be notified by the TSP that the test has been completed and that the product has received a passing verdict; a copy of the test data will be sent to ODVA world headquarters by the TSP with this notice.

8.8.3 An official Declaration of Conformity shall be issued to the vendor by ODVA world headquarters, at which time the product may be marked as DeviceNet Conformance Tested.

8.9 A candidate product shall receive a failing verdict if it has errors other than the conditions stated in sections 5.7 and/or the TSP has identified behavior that interferes with the nominal operation of an otherwise conforming DeviceNet network as described in section 5.2.2.

8.9.1 Upon completion of the test, the vendor will be notified by the TSP that the test has been completed and that the product has received a failing verdict; the test data will be provided to the vendor by the TSP.

8.9.2 ODVA world headquarters will be notified by the TSP that the test has been completed and that the product has received a failing verdict; a copy of the test data will be sent to ODVA world headquarters by the TSP with this notice for quality control purposes.

8.9.3 The submitter may appeal the TSP's verdict according to the process described in Section 9.

9 PROCESS FOR HANDLING APPEALS OF FAILED CONFORMANCE VERDICTS:

9.1 Appeals must be submitted to ODVA world headquarters who will forward them to the Conformance SIG. An appeal must include the rationale for reversing the verdict.

9.2 The Conformance SIG will evaluate the appeal.

9.2.1 The Conformance SIG may determine that the original verdict is correct. If so, then they will inform the TSP and ODVA world headquarters; ODVA world headquarters will inform the product vendor.

9.2.2 The Conformance SIG may determine that the test is in error. If so, they will take the necessary steps to correct the test.

9.2.3 The Conformance SIG may believe that a Specification Enhancement (hereinafter "SE") is necessary. If so, then they will refer the appeal to the ODVA Technical Review Board (hereinafter "TRB."). If the TRB concurs that a SE is appropriate, the product vendor shall generate and sponsor the SE prior to verdict reversal.

9.3 The product vendor may accept the Conformance SIG's decision or appeal to the TRB.

9.4 The TRB will resolve the issue within 60 days. Its decision is final.

10 PROCESS FOR REMOVAL OF VENDOR ID.

In any case where ODVA has the right to require the vendor to cease use of the DeviceNet Conformance Tested certification word and certification logo marks, the DeviceNet trademark or any other trademarks, service marks or certification marks owned or controlled by ODVA, it shall also have the right, in its sole discretion, to terminate all rights and privileges associated with any vendor identification number or numbers (collectively, the “Vendor ID”) previously assigned:

10.1 ODVA may remove the Vendor ID from all public postings (ODVA Web Site, catalog, or other) ten (10) days after sending written notification.

10.2 ODVA may make public information that the Company’s products are non-conformant through notice in ODVA publications (website, catalog, newsletter, broadcast e-mail) ninety (90) days after written notification.

10.3 ODVA agrees that it will suspend rather than withdraw Vendor ID rights from and after the time when the vendor provides ODVA with the product or products in question for testing, and all rights associated with any suspended Vendor ID will be restored promptly upon the product or products in question passing such testing requirements.

Appendix A

DeviceNet Conformance Policy List of Exceptions

Exceptions Issued September 1997

This list is provided in accordance with the ODVA DeviceNet Conformance Test Policy section 5.7 and contains the conformance exceptions approved by the ODVA Technical Review Board.

1. Specification Volume 1 revision, 1.2 to 1.3

   Setting the device baud rate over the network. Revision 1.2 required that when the baud rate was changed by a Set Attribute Single request, the device delete all Connection Objects and re-execute the Network Access State Machine. Revision 1.3 section 5-5.3; required that the modification of the Baud Rate will not take effect until the device is either physically reset (such as cycle of power or a reset switch) or by sending the Reset Service to the Identity Object. During this time the Baud Rate attribute value will not match the actual network baud rate.

2. Specification Volume 1 revision, 1.3 to 2.0

   Deferred Delete state was defined in section 5-3.4.12 and made mandatory for the Pre-Defined Master/Slave Explicit Messaging Connection Instance 1, in section 7-3.2, Table 7.5 "watchdog_timeout_action (Default = 1) Auto_Delete as described in section 5-4.3. This attribute shall be settable to Deferred Delete as described in section 5-4.3." Also, section 7-3.3 in reference to the Predefined Master/Slave Explicit Messaging Connection, "The watchdog_timeout_action attribute value of Deferred Delete shall be supported."

Appendix B

Conformance Classifications of Products that are based on the DeviceNet Specification

1. DeviceNet Conformance Tested – Product that has a valid Declaration of Conformity issued by ODVA.

2. DeviceNet Conformance Tested Embedded Technology – Embedded Technology that has a valid Declaration of Conformity issued by ODVA.

3. Non-conformant – Product has either not been issued a valid Declaration of Conformity by ODVA or has one or more known instances of non-conformance.

Appendix C

DeviceNet Conformance Test Certification Marks

The following are registered certification marks owned by ODVA.

Logo Mark

Word Mark

DeviceNet Conformance Tested ®

Appendix D

Product Exceptions Permitting Retest via Self-test

The expectation of ODVA is that all products will go through retest at the TSP. However, in some cases, vendors may retest the product themselves and not have to retest at a TSP. In order to do so, ALL of the following three conditions must be met.

1. No EDS file revisions that impact DeviceNet functionality or performance.
2. No code revisions that impact DeviceNet functionality or performance.
3. No change in product components in the path from the microprocessor executing the DeviceNet protocol stack to the network connector including printed circuit board layout.

The appropriate self test documentation shall be provided by the vendor to ODVA for approval. Upon approval, the product shall be listed at the composite test revision of the last TSP test. The ODVA tested products list shall be updated to reflect the new product revision.

Examples of Product Changes that Permit Retest via Self-test
(The following list is not exhaustive and does not include all possible examples.)

1. Revision to an EDS file that adds a help message for a parameter.
2. A derived product implementing no changes except for incorporation of an updated embedded technology that has passed the conformance test at a TSP.
3. Revision of an EDS file that adds an Assem entry for an assembly already contained in a previous version of the EDS file.
4. Revision to the product firmware that fixes a bug but adds no new DeviceNet functionality.
5. Changes to the product mounting holes.

Examples of Product Changes that Require Retest at ODVA TSP
(The following list is not exhaustive and does not include all possible examples.)

1. Replacement of microprocessor or micro-controller.
2. Replacement of transceiver.
3. Revision to an EDS file that adds access to an attribute already in the product but not previously exposed in the EDS file.
4. Product source code recompilation due to microprocessor or micro-controller change.
5. Change in product components in the path from the microprocessor executing the DeviceNet protocol stack to the network connector including printed circuit board layout.
6. Change in the product operating system.
7. A derived product implementing changes in addition to incorporation of updated embedded technology that has passed the conformance test at a TSP.
8. A derived product that incorporates embedded technology that has not passed the conformance test at a TSP.
9. The addition of a new attribute to an object.
10. Changes to the product netlist.