



TA Document 1999019

AV/C Command for Device Diagnostics 1.0

April 18, 2000

Sponsored by:
1394 Trade Association

Approved for Release by:
1394 Trade Association Board of Directors.

Abstract:

This specification defines a common unit command that requests that an audio/video device execute its built-in diagnostics and report the results to the requestor. This document does not specify what functionality the device should test or how the diagnostics should be performed. This command makes use of the Function Control Protocol (FCP) defined by IEC-61883, Digital Interface for Consumer Electronic Audio/Video Equipment, for the transport of audio/video command requests and responses.

Keywords:

AV/C, Diagnostics, Self-test.

Copyright © 1996-2000 by the 1394 Trade Association.
Regency Plaza Suite 350, 2350 Mission College Blvd., Santa Clara, CA 95054, USA
<http://www.1394TA.org>
All rights reserved.

Permission is granted to members of the 1394 Trade Association to reproduce this document for their own use or the use of other 1394 Trade Association members only, provided this notice is included. All other rights reserved. Duplication for sale, or for commercial or for-profit use is strictly prohibited without the prior written consent of the 1394 Trade Association.

1394 Trade Association Specifications are developed within Working Groups of the 1394 Trade Association, a non-profit industry association devoted to the promotion of and growth of the market for IEEE 1394-compliant products. Participants in working groups serve voluntarily and without compensation from the Trade Association. Most participants represent member organizations of the 1394 Trade Association. The specifications developed within the working groups represent a consensus of the expertise represented by the participants.

Use of a 1394 Trade Association Specification is wholly voluntary. The existence of a 1394 Trade Association Specification is not meant to imply that there are not other ways to produce, test, measure, purchase, market or provide other goods and services related to the scope of the 1394 Trade Association Specification. Furthermore, the viewpoint expressed at the time a specification is approved and issued is subject to change brought about through developments in the state of the art and comments received from users of the specification. Users are cautioned to check to determine that they have the latest revision of any 1394 Trade Association Specification.

Comments for revision of 1394 Trade Association Specifications are welcome from any interested party, regardless of membership affiliation with the 1394 Trade Association. Suggestions for changes in documents should be in the form of a proposed change of text, together with appropriate supporting comments.

Interpretations: Occasionally, questions may arise about the meaning of specifications in relationship to specific applications. When the need for interpretations is brought to the attention of the 1394 Trade Association, the Association will initiate action to prepare appropriate responses.

Comments on specifications and requests for interpretations should be addressed to:

Editor, 1394 Trade Association
Regency Plaza Suite 350
2350 Mission College Blvd.
Santa Clara, Calif. 95054, USA

1394 Trade Association Specifications are adopted by the 1394 Trade Association without regard to patents which may exist on articles, materials or processes or to other proprietary intellectual property which may exist within a specification. Adoption of a specification by the 1394 Trade Association does not assume any liability to any patent owner or any obligation whatsoever to those parties who rely on the specification documents. Readers of this document are advised to make an independent determination regarding the existence of intellectual property rights, which may be infringed by conformance to this specification.

Table of Contents

- 1. Overview 0
 - 1.1 Scope..... 0
- 2. References..... 0
- 3. Definitions..... 0
 - 3.1 Keywords and Definitions..... 0
 - 3.2 Acronyms and Abbreviations 0
- 4. Command for Device Diagnostics 0
 - 4.1 SELF-TEST Command..... 0
 - 4.2 Simple Diagnostics 0
 - 4.3 Vendor_dependent Diagnostics 0

List of Figures

Figure 4.1 – SELF-TEST command frame0
Figure 4.2 – SELF-TEST response frame.....0
Figure 4.3 – SELF-TEST Simple Diagnostics command frame0
Figure 4.4 – SELF-TEST Simple Diagnostic response frame.....0
Figure 4.5 – SELF-TEST Vendor_dependent command frame0
Figure 4.6 – SELF-TEST Vendor_dependent response frame.....0

List of Tables

Table 4.1 – Device diagnostics command summary 0
Table 4.2 – Definition of response_format field..... 0

1. Overview

1.1 Scope

This document specifies an AV/C common unit control command for requesting that a device execute its built-in diagnostics. The results are reported back to the requestor in the response. The requestor can vary the format of the response, but it will minimally include a simple pass/fail indicator.

It is outside the scope of this document to specify the functionality that the diagnostics test or specify how to perform the tests.

2. References

The following standards contain provisions, which through reference in this document constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

- [R1] IEEE Std 1394-1995, Standard for a High Performance Serial Bus
- [R2] ISO/IEC 13123:1994, Control and Status Register (CSR) Architecture for Microcomputer Buses
- [R3] IEC-61883, Digital Interface for Consumer Electronic Audio/Video Equipment
- [R4] AV/C Digital Interface Command Set General Specification, version 3.0

3. Definitions

3.1 Keywords and Definitions

This specification uses the following keywords and terms:

3.1.1 expected: A key word used to describe the behavior of the hardware or software in the design models *assumed* by this standard. Other hardware and software design models may also be implemented.

3.1.2 may: A key word that indicates flexibility of choice with *no implied preference*.

3.1.3 shall: A key word indicating a mandatory requirement. Designers are *required* to implement all such mandatory requirements.

3.1.4 should: A key word indicating flexibility of choice with a strongly preferred alternative. Equivalent to the phrase *is recommended*.

3.1.5 byte: Eight bits of data, used as a synonym for octet.

3.1.6 CSR Architecture: A convenient abbreviation of the following reference (see clause 2): ISO/IEC 13213 : 1994 [ANSI/IEEE Std 1212, 1994 Edition], Information Technology—Microprocessor systems—Control and Status Register (CSR) Architecture for Microcomputer Buses.

3.1.7 octet: Eight bytes of data. Not to be confused with an octet, which has been commonly used to describe eight bits of data. In this document, the term byte, rather than octet, is used to describe eight bits of data.

3.1.8 pass/fail result: a diagnostic test result that indicates only whether or not the test succeeded or failed.

3.2 Acronyms and Abbreviations

This specification uses the following acronyms and abbreviations:

AV/C Audio/video control, as in the AV/C Digital Interface Command Set.

4. Command for Device Diagnostics

4.1 SELF-TEST Command

Device diagnostics is initiated through a single AV/C command, SELF-TEST. The SELF-TEST command is used to request that a device execute its built-in diagnostic self tests and report the results. This specification defines two formats for the response. Additional formats may be defined in the future. The format of the response is selected by the requestor through the *response_format* field defined below. At a minimum, all response formats include a pass/fail indicator.

It is outside the scope of this document to specify the functionality that the diagnostics test or specify how to perform the tests.

The SELF-TEST command is summarized in the table below:

Table 4.1 – Device diagnostics command summary

Opcode	Value	Support level (by ctype)			Comments
		C	S	N	
SELF-TEST	27 ₁₆	O	-	-	Perform self-test and report results

The general format of the SELF-TEST control command is as follows:

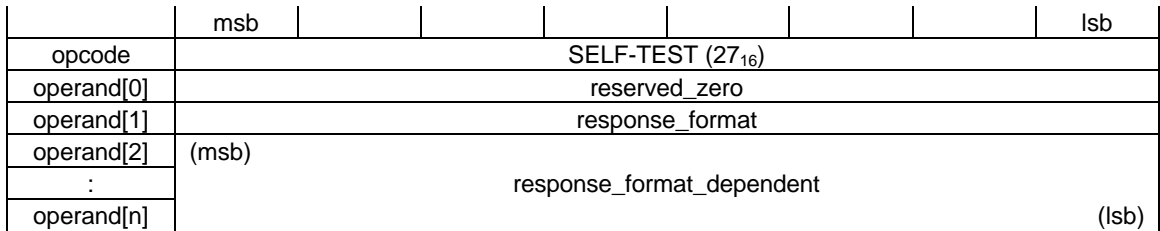


Figure 4.1 – SELF-TEST command frame

The value of the *opcode* field is 27₁₆. (Common Unit command)

The *response_format* specifies the format of the response. This field may take one of the values defined in Table 4.2.

Table 4.2 – Definition of response_format field

Value	response_format
00 ₁₆	Simple diagnostics
01 ₁₆ - 0D ₁₆	Reserved for future specification
FE ₁₆	Vendor_dependent diagnostics
FF ₁₆	Reserved for future specification

The *response_format* value 0 specifies that this command will contain only a pass/fail indication of the test results in the response.

The *response_format* value FE₁₆ specifies that this command will include vendor-dependent diagnostics response information as well as a pass/fail indication of the test results.

The format of *response_format_dependent* field is dependent on the value of the *response_format* field. This field is not used by any of the defined response formats and is intended for future specification.

The general format of the SELF-TEST response is as follows:

	msb						lsb	
opcode	SELF-TEST (27 ₁₆)							
operand[0]	reserved_zero						pf	
operand[1]	response_format							
operand[2]	(msb)	response_format_dependent						
:								
operand[n]								(lsb)

Figure 4.2 – SELF-TEST response frame

The *response_format* and *response_format_dependent* fields are as defined above.

The *pf* (pass/fail) field indicates whether the device diagnostics were successfully in their execution. A value of 0 indicates success and a value of 1 indicates failure.

The *reserved_zero* field is reserved for future specification. When the bits in this field are defined, they must be defined such that a value of 0 for each of the bits indicates success.

4.2 Simple Diagnostics

Simple diagnostics provide only pass/fail results after executing the device diagnostics.

The command format for the simple diagnostics form of the SELF-TEST command is as follows:

	msb						lsb
opcode	SELF-TEST (27 ₁₆)						
operand[0]	reserved_zero						
operand[1]	response_format = 0 ₁₆						

Figure 4.3 – SELF-TEST Simple Diagnostics command frame

The response format for the simple diagnostics form of the SELF-TEST command is as follows:

	msb						lsb
opcode	SELF-TEST (27 ₁₆)						
operand[0]	reserved_zero						pf
operand[1]	response_format = 0 ₁₆						

Figure 4.4 – SELF-TEST Simple Diagnostic response frame

The fields are as described above.

4.3 Vendor_dependent Diagnostics

Vendor_dependent diagnostics provide additional vendor-specified results as well as pass/fail results after executing the device diagnostics.

The command format for the vendor_dependent form of the SELF-TEST command is as follows:

	msb						lsb
opcode	SELF-TEST (27 ₁₆)						
operand[0]	reserved_zero						
operand[1]	response_format = FE ₁₆						

Figure 4.5 – SELF-TEST Vendor_dependent command frame

The response format for the vendor_dependent form of the SELF-TEST command is as follows:

	msb						lsb
opcode	SELF-TEST (27 ₁₆)						
operand[0]	reserved_zero						pf
operand[1]	response_format = FE ₁₆						
operand[2]	(msb)	company_ID					(lsb)
operand[3]							
operand[4]							
operand[5]	(msb)						
operand[6]							
operand[7]							
operand[8]							
:		vendor_dependent_response_data					
operand[n]							

Figure 4.6 – SELF-TEST Vendor_dependent response frame

The *company_ID* field shall contain the 24-bit unique ID obtained from the IEEE Registration Authority Committee (RAC).

The *vendor_dependent_version_ID* field shall contain a version identifier defined by the company specified by the *company_ID* field and is used in combination with the *company_ID* field to indicate the format of the *vendor_dependent_response_data* field. This field is used to allow a single company to specify multiple formats for the *vendor_dependent_response_data* field.

The format and meaning of the *vendor_dependent_response_data* is specified by the company identified by the *company_ID* field.

The remaining fields are as described above.