

NVISION Ethernet Protocol

General Protocol Format And General Messages

**NP0018-00
Rev B**

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1. Introduction

This document specifies the format and delivery mechanisms for the NVISION Ethernet Protocol [NVEP].

2. References

2.1 Specifications and Standards

IEEE 802.3

2.2 Other Protocol Documents

NP0015 – NVISION Protocol – Shared Definitions

3. Document Conventions

Decimal numbers are expressed with no radix. Hexadecimal numbers are prefixed with a radix of “0x” as in the “C” programming language.

The absolute size of a protocol data field is specified with brackets as follows: [32] will indicate 32 bits, etc.

Message formats are described in a simplified BNF as follows:

$\{X\}^+ = X$ repeats 1 to n times.

$\{X\}^* = X$ repeats 0 to n times.

$\{X\}^0 = X$ occurs 0 or 1 time.

$\{X\} = X$ occurs 1 time.

$\{X\}^n = X$ occurs n times

$\{X | Y\} =$ either X or Y occurs.

4. Overview

4.1 Physical and Datalink layers

This protocol assumes an Ethernet network in compliance with IEEE 802.3.

4.2 Network layer

Devices may have a static IP address and subnet mask or may use DHCP to get this information.

4.3 Transport layer

This protocol supports either TCP/IP connection oriented sockets or UDP connectionless communications. See the device specific documentation to see what method a particular device supports.

4.4 Session layer

None, other than that maintained by the IP stack.

4.5 Presentation layer

All data is packaged in network byte order. All atomic data in this protocol is 32 bits in length, simplifying the conversions to and from host and network byte orders.

4.6 Maximum message size

Maximum supported message size including header is 8192 Bytes. Max data size is 8176 Bytes.

5. Protocol Message Structure

5.1 NVEP Header format

Protocol headers are composed of the following fields:

32 bit Protocol ID.
32 bit Sequence number, which will be copied into the response.
32 bit byte count
32 bit Protocol Command.

5.2 Protocol ID

The assignment of NVEP protocol IDs are listed below:

- 0x0000000C – Router Control Protocol
- 0x0000000E – NV9000 Control Protocol
- 0x00000010 – Master Control Protocol
- 0x00000012 – Machine Control Protocol
- 0x00000013 – NV7512 Quad Mixer Protocol

5.3 Byte Count

Each header is followed by 0 to 8176 bytes of data. The byte count is the number of bytes in the data packet, including the header.

5.4 Protocol Command

For commands:

- The highest order bit of the Command word in the header is never set.
- The command value of 0x00000000 is never used.

For responses:

- The highest order bit of the Command word in the header is always set.
- The command value of 0x80000000 is always an error response. Each message has the potential to generate an error.

6. Commonly Used Types

6.1 Status Flags

Status Flags are the Extended Status values defined in the document NP0015.

6.2 System Status Flag

Values and Meanings:

0x0000	Unknown
0x0001	Present
0x0002	Missing
0xFFFF	Does not apply

6.3 Temperature Status

Values and Meanings:

0x00	Unknown
0x01	Ok
0x02	Minor Alarm
0x03	Major Alarm

6.4 Power Supply Data

{Power Supply Data} =
 {[32] System Status Flag - Power supply present }
 {[32] Power Supply Temperature}

7. Parameters

7.1 Parameter Type ID

The values allowed for Parameter Type ID varies based on the product.

RESERVED VALUES:

0x0100 - 0x01FF Generic Parameter Type IDs (apply to more than one product).

0x1000 - 0x10FF Master Control Parameter Type IDs.

0x2000 - 0x20FF Router Parameter Type IDs.

0x3000 - 0x30FF NV7512 Quad Mixer Parameter Type IDs

Note: see specific product documentation for details.

7.2 Parameter ID

The values allowed for Parameter ID varies based on the product.

7.3 Generic Parameter Data Format

Parameter Format:

{[32] Parameter ID}

{[32] Parameter Data Count = m}

{Parameter Data}^m

The Data Count includes contains the number of 32-bit words in the Parameter Data.

8. Protocol Command Messages

8.1 0x0000 0002 Set Parameters Command

This message sets parameters for a Parameter Type.

8.1.1 Message Format.

{NVEP Header}
{[32] Parameter Type ID}
{[32] Number Of Parameters = n}
{Parameters}ⁿ

Parameters values and meanings:

This data varies based on the product and the type of parameters requested.

8.1.2 Responses

0x8000 0000 Error Response.

0x8000 0002 Multiple Status Response

8.2 0x0000 0003 Get Parameters Command

This message gets parameters for a Parameter Type.

8.2.1 Message Format.

{NVEP Header}
{[32] Parameter Type ID}
{[32] Number Of Parameters = n}
{[32] Parameter ID}^m

8.2.2 Responses

0x8000 0000 Error Response.

0x8000 0003 Get Parameters Response

8.3 0x0000 0004 Get All Parameters Command

This message gets all the parameters for a Parameter Type.

8.3.1 Message Format.

{NVEP Header}
{[32] Parameter Type ID}

8.3.2 Responses

0x8000 0000 Error Response.

0x8000 0003 Get Parameters Response

8.4 0x0000 0006 Get Parameters by ID and Number Command

This message gets source status parameters.

8.4.1 Message Format.

{NVEP Header}
{[32] Parameter Type ID}
{[32] Number Of Parameter ID and Number Pairs = m}
{Parameter ID and Number} ^m

Parameter ID and Number Format:

{[32] Parameter ID}
{[32] Number}

8.4.2 Responses

0x8000 0000 Error Response.

0x8000 0003 Get Parameters Response.

8.5 0x0000 0100 through 0x0000 001FF Reserved

8.6 0x0000 5000 Get System Status Command

The system's current status is requested.

8.6.1 Message Format.

{NVEP Header}
{[32] System Format Flag}

System Format Flag values and meanings are product dependant. See product specific protocol documentation for details.

8.6.2 Responses

0x8000 0000 Error Response

0x8000 5000 [Get System Status Response](#)

9. Protocol Response Messages

9.1 0x8000 0000 Error Response

This message can be sent in response to any command.

9.1.1 Message Format

{NVEP Header}
{Originating Sequence Number}
{[32] Status Flag}

9.1.2 Applies To:

All Commands.

9.2 0x8000 0001 Command Succeeded Response

The response is used to indicate that the command was successful and there is no additional information to return.

9.2.1 Message Format

{NVEP Header}
{Originating Sequence Number}

9.2.2 Applies To:

Many commands. See the individual commands for whether they will return this response.

9.3 0x8000 0002 Multiple Status Response

The response is used to provide multiple Status flags in response to a command.

9.3.1 Message Format.

{NVEP Header}
{[32] Originating Sequence Number}
{[32] Overall Status Flag}
{[32] Number Of Status Flags = m}
{[32] Status Flags}^m

Overall Status Flag values and meanings:

0x0000 (Success): All of the Status flags are 0x0000 (Success)

0x0080 (Failure): At least one of the Status flags are is not 0x0000 (Success)

9.3.2 Applies To:

Many commands. See the individual commands for whether it will return this response.

9.4 0x8000 0003 Get Parameters Response

The response is used to provide response to a Get Parameters type of command.

9.4.1 Message Format.

{NVEP Header}
{[32] Originating Sequence Number}
{[32] Number Of Parameters = m}
{Parameters}^m

Parameters values and meanings:

- 1) If a Parameter ID is not supported, the Parameter Data returned for that Parameter ID will have Parameter Data Count = 0.
- 2) The order of the Parameters in this response may not match the order in the command message.
- 3) The Parameter Data varies based on the product and the type of parameters requested.

Applies To:

Many commands. See the individual commands for whether it will return this response.

9.5 0x8000 5000 Get System Status Response

Returns System status

9.5.1 Message Format.

{NVEP Header}
{Originating Sequence Number}
{[32] System Status Format Flag}
{System Status Data}

System Format Flag and System Status Data values and meanings are product dependant. See product specific protocol documentation for details.

10. Revision History

10.1 Revision A

- Released: May 2003

10.2 Revision B

- Released: June 2005
- Added Parameters Section
- Added the following types to the Commonly Used Types Section:
 1. System Status Flag
 2. Temperature Status
 3. Power Supply Data
- Added the following messages:
 1. 0x0000 0002 Set Parameters Command
 2. 0x0000 0003 Get Parameters Command
 3. 0x0000 0004 Get All Parameters Command
 4. 0x0000 0006 Get Parameters by ID and Number Command
 5. 0x0000 5000 Get System Status Command
 6. 0x8000 0002 Multiple Status Response
 7. 0x8000 0003 Get Parameters Response
 8. 0x8000 5000 Get System Status Response