



ANSI E1.54 – 2021
ESTA Standard for Color Communication in
Entertainment Lighting

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Extraordinary legacy gift: Ken Vannice

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Interest category codes:

CP = custom-market producer DE = designer
DR = dealer rental company G = general interest
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1 Scope

This standard specifies the color space to be utilized when communicating color between lighting controllers and color-changing luminaires. The method is generic and is neither manufacturer-specific nor color technology-specific. It facilitates communication of chromaticity only.

2 Requirements (normative)

2.1 ESTA Standard Color Space

2.1.1 Color Space

The Color Space shall be CIE 1931 x,y. (Reference: <http://www.cvrl.org/database/text/ccs/cccie31.htm>)

2.2 Communication of Color

2.2.1 Communication of x,y Coordinates

The required method of communicating chromaticity in this standard is by using CIE 1931 x,y color coordinates. If Color Matching Functions (CMF) are used to derive the x,y values, then the 1931 2-degree CMF shall be used.

2.2.1.1 DMX512 16-bit

If DMX512 (ANSI E1.11) is used as the communication system, then CIE 1931 x,y color coordinates shall be sent as linearly scaled values where 100% in the communication system shall be interpreted as 0.85 for x, and 0.85 for y.

It is recommended that 16-bit values for both x and y are utilized with the following command mapping:

x = 0: command value = 0

x = 0.85: transmitted value for x = FFFFh

y = 0: command value = 0

y = 0.85: transmitted value for y = FFFFh

Values should be sent as two consecutive DMX512 channels with the most significant byte first.

2.2.1.2 DMX512 8-bit

If DMX512 (ANSI E1.11) is used as the communication system, then CIE 1931 x,y color coordinates shall be sent as linearly scaled values where 100% in the communication system shall be interpreted as 0.85 for x, and 0.85 for y.

8-bit values are allowed but are discouraged. If 8-bit values are used, then they should utilize the following command mapping:

x = 0: command value = 0

x = 0.85: transmitted value for x = FFh

y = 0: command value = 0

y = 0.85: transmitted value for y = FFh

2.3.3 Requirements for a Transmitter

For a data transmitter such as a lighting controller to be compliant with this standard, it must be capable of sending x,y coordinates as defined in 2.2.1.

2.3.3.1 Requirements for a Transmitter via DMX512

For a data transmitter communicating via DMX512 (ANSI E1.11), such as a lighting controller, to be compliant with this standard, it must be capable of sending both 16-bit x,y coordinates as defined in 2.2.1.1 and 8-bit x,y coordinates as defined in 2.2.1.2

2.3.4 Requirements for a Receiver

For a data receiver such as a luminaire to be compliant with this standard, it must be capable of receiving x,y coordinates as defined in 2.2.1.

2.3.4.1 Requirements for a Receiver via DMX512

For a data receiver communicating via DMX512 (ANSI E1.11), such as a luminaire, to be compliant with this standard, it must be capable of receiving either 16-bit x,y coordinates as defined in 2.2.1.1 or 8-bit x,y coordinates as defined in 2.2.1.2