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| Title | **Data Formats for Character Display Actuator** |
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| Re: |  |
| Abstract | This contribution proposes syntaxes, semantics, and examples for representing character display actuator information in the physical world in a standardized data format. |
| Purpose | To start a discussion on the purpose of the standard |
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# Introduction

This contribution proposes actuator command types which can control character display. It contains syntaxes, semantics, and examples for representing character display actuator information in the physical world in a standardized data format.

1. Data formats for Individual Actuators
	* 1. **Character display actuator**

**4.3.12.1 General**

This sub-clause specifies the actuator command type which can control character display.

**4.3.12.2 Syntax**

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| "characterDisplayCommandData": { "type": "object", "properties": {"displayMode": {"type": "string","enum": [ "text\_mode", "graphics\_mode"]}, "xCoordinate": { "type": "integer", "minimum": 0 }, "yCoordinate ": {"type": "integer", "minimum": 0}, "foregroundColor": { "$ref": "#/definitions/colorType" }, "backgroundColor": { "$ref": "#/definitions/colorType" }, "textSize": { "type": "string","pattern": "^[0-9]+x[0-9]+$" }, "text": { "type": "string"} }, "required": [ "xCoordinate", "yCoordinate", "text" ] }} |

**4.3.12.3 Semantics**

The semantics of the characterDisplayCommandData:

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| *Name* | *Definition* |
| characterDisplayCommandData | Provide a structure for describing a command for a character display actuator. |
| displayMode | Describes the type of display mode supported by a character display actuator, which is classified into text\_mode and graphics\_mode. Text\_mode is a display mode divided into rows and columns of boxes showing characters. The font size, foreground color, and background color for characters are fixed in text\_mode. Graphics\_mode is a display mode divided into pixels vertically and horizontally. The font size, foreground color, and background color for characters are variable in graphics\_mode. |
| xCoordinate | Describes the x-coordinate of text position on a two-dimensional screen. In text\_mode, it represents the column number of the first character in a text string. In graphics\_mode, it represents the x-coordinate of the top-left corner pixel of the first character bounding box in a text string. The minimum x-coordinate is zero. |
| yCoordinate | Describes the y-coordinate of text position on a two-dimensional screen. In text\_mode, it represents the row number of first character in a text string is displayed. In graphics\_mode, it represents the y-coordinate of the top-left corner pixel of the first character bounding box in a text string. The minimum y-coordinate is zero. |
| foregroundColor | Describes a text foreground color. If omitted, the current foreground color is used. If the type of display mode is text\_mode, it is ignored. |
| backgroundColor | Describes a text background color. If omitted, the background color is treated as a transparent color. If the type of display mode is text\_mode, it is ignored. |
| textSize | Describes the font size of text to be printed on the screen. The font size is represented into (number of horizontal pixels) × (number of vertical pixels). If omitted, the current text size is used. If the type of display mode is text\_mode, it is ignored. |
| text | Describes a text string including letters, numbers, symbols, and simple figures that can be printed on a screen. |

**4.3.12.4 Examples**

This example shows the description of the actuator command of character display with the following semantics. The character display actuator that supports "graphics\_mode" outputs the text "hello world!" with red foreground color, black background color, and text size 12x16 on the screen at (12, 5) coordinates.

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| { "commandInfoBaseAttributes": {}, "characterDisplayCommandData":{ "displayMode":"graphics\_mode", "xCoordinate":12, "yCoordinate":5, "foregroundColor":"red", "backgroundColor":"black", "textSize":"12x16", "text":"hello world!" }} |