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| Project | **Standard for Actuator Interface for Cyber and Physical World**  <https://sagroups.ieee.org/2888.2/ **>** |
| Title | **Data Formats for Character Display Actuator** |
| DCN | **2888-22-0014-02-0002** |
| Date Submitted | **Feb 16, 2022** |
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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!"  }  } |