**Point**

The monitor function of the engineering tool can monitor real number data of CPU modules.
To represent "0" in real number data, set all numbers in each of the following range to 0.
• Single-precision real number data: b0 to b31
The setting range of real number data is as follows.
• Single precision real number data: $-2^{128}$<single precision real number data]≤$-2^{-126}$, 0, $2^{-126}$≤[single precision real number data]<$2^{128}$
Do not specify "-0" (only the most significant bit is 1) in real number data. Performing a real number operation using -0 results in an operation error.

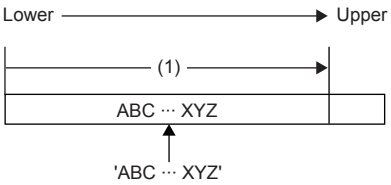
# Character string data

## Format of character string data

The following table lists the types of character string data, each of which ends with a NULL code to be handled as a character string.

| Type | Character code | Last character |
|---|---|---|
| Character string | ASCII code | NULL(00H) |
| Unicode character string | Unicode (UTF-16 (little endian)) | NULL(0000H) |

Character string data is stored in devices or an array in ascending order of device numbers or array element numbers.




(1): Character code string

## Method for expressing a character string

When a character string or a Unicode character string is specified in a program, an error may occur depending on the expressing method.
The expressing methods in the programming languages are shown below.

### ■Ladder program

| Data type | Expressing method |
|---|---|
| String | Enclose character strings with single (') or double quotation marks (''). |
| Character string [Unicode] | Enclose Unicode character strings with single (') or double quotation marks (''). |

### ■ST program

| Data type | Expressing method |
|---|---|
| String | Enclose character strings with single quotation marks ('). |
| Character string [Unicode] | Enclose Unicode character strings with double quotation marks (''). |

### ■FBD/LD program

| Data type | Expressing method |
|---|---|
| String | Enclose character strings with single quotation marks ('). |
| Character string [Unicode] | Enclose Unicode character strings with double quotation marks (''). |

## Data range

The following table summarizes the ranges of character string data.

| Type | Maximum number of character strings | Maximum number of character strings that can be handled in the program |
|---|---|---|
| Character string | 255 single-byte characters (excluding the last NULL character) | 16383 characters (excluding the last NULL character) |
| Unicode character string*1 | 255 characters (NULL at the end is not included.) | |

*1 For Unicode strings, characters in the basic multilingual plane can be used.

## Number of words required for storing data

Character string data can be stored in word devices.

The following table lists the numbers of words required for storing character string data.

| Number of character string bytes | Number of words required for storing character strings | Number of words needed for storing Unicode character string |
|---|---|---|
| 0 byte | 1 [word] | 1 [word] |
| Odd number of bytes | (Number of character string bytes+1) ÷ 2 [words] | — (Because one character is in an even byte.) |
| Even number of bytes | (Number of character string bytes÷2) +1 [words] | Number of characters + 1 [words] |

## Character string data storage location

An image of the character string data storage location is shown below.

### ■Character strings

In each character string storage image, "NULL" indicates a NULL code (00H).

| Character string to be stored | Image of storing character string data from D0 | Image of storing character string data from word type label array arrayA[0] |
|---|---|---|
| ' ' (null character string) | D0: NULL \| NULL | arrayA[0]: NULL \| NULL |
| 'ABC' | D0: B \| A<br>D1: NULL \| C | arrayA[0]: B \| A<br>arrayA[1]: NULL \| C |
| 'ABCD' | D0: B \| A<br>D1: D \| C<br>D2: NULL \| NULL | arrayA[0]: B \| A<br>arrayA[1]: D \| C<br>arrayA[2]: NULL \| NULL |

### ■Unicode character strings

In each Unicode character string storage image, "NULL" indicates the NULL code (0000H).

| Character string to be stored | Image of storing character string data from D0 | Image of storing character string data from word type label array arrayA[0] |
|---|---|---|
| " " (null character string) | D0: NULL | arrayA[0]: NULL |
| "ABCD" | D0: A<br>D1: B<br>D2: C<br>D3: D<br>D4: NULL | arrayA[0]: A<br>arrayA[1]: B<br>arrayA[2]: C<br>arrayA[3]: D<br>arrayA[4]: NULL |