Converting character string to 16-bit binary data

VAL(P)(_U)

FX5S	FX5UJ	FX5U	FX5UC

These instructions convert the character string in the device numbers specified by (s) and later to 16-bit binary data, and store the number of digits in the device specified by (d1) and the binary data in the device specified by (d2).

Ladder diagram	Structured text	
  (s) (d1) (d2)	ENO:=VAL(EN,s,d1,d2); ENO:=VALP(EN,s,d1,d2);	ENO:=VAL_U(EN,s,d1,d2); ENO:=VALP_U(EN,s,d1,d2);

FBD/LD
EN   ENO s   d1   d2

Setting data

■Descriptions, ranges, and data types

Operand		Description	Range	Data type	Data type (label)
(s)		Character string to be converted to binary data, or head device for storing the character string.	—	Character string	ANYSTRING_SINGLE
(d1)	VAL(P)	Head device for storing the number of digits of the binary data after conversion	—	16-bit signed binary	ANY16_S_ARRAY (Number of elements: 2)
	VAL(P)_U			16-bit unsigned binary	ANY16_U_ARRAY (Number of elements: 2)
(d2)	VAL(P)	Head device for storing the binary data after conversion	—	16-bit signed binary	ANY16_S
	VAL(P)_U			16-bit unsigned binary	ANY16_U
EN		Execution condition	—	Bit	BOOL
ENO		Execution result	—	Bit	BOOL

■Applicable devices

| Operand	Bit	Word			Double word		Indirect specification	Constant			Others
	X, Y, M, L, SM, F, B, SB, S	T, ST, C, D, W, SD, SW, R	U□\G□	Z	LC	LZ		K, H	E	$	
(s)	—	○*1	—	—	—	—	○	—	—	○	—
(d1)	○	○	—	—	—	—	○	—	—	—	—
(d2)	○	○	○	○	—	—	○	—	—	—	—

*1 T, ST, and C cannot be used.

Processing details

- These instructions convert the character string in the device numbers specified by (s) and later to 16-bit binary data, and store the number of digits in the device specified by (d1) and the binary data in the device specified by (d2). When converting a character string into binary data, the data from the device number specified by (s) to a device number storing "00H" is handled as a character string.

- The total number of digits stored in (d1) is the total number of characters (including the sign and decimal point) representing the numeric value. The number of digits in the decimal part stored in (d1)+1 is the number of characters representing the decimal part after 2EH (.). The 16-bit binary data stored in (d2) is binary value converted from a character string with the decimal point ignored.
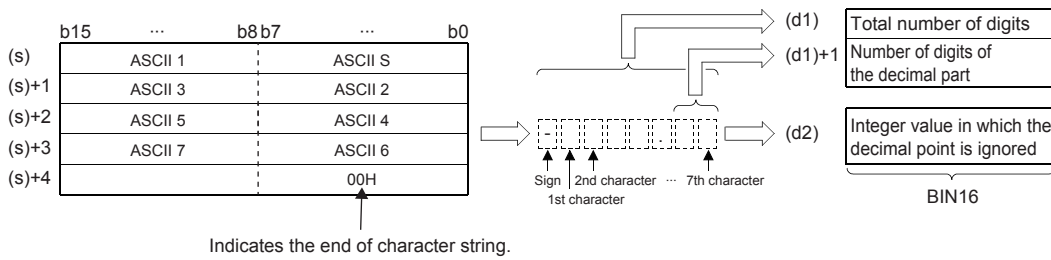

Ex.

When the character string "-123.45" (signed) is specified by (s) and later
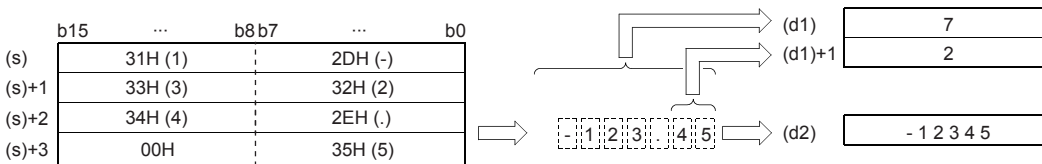
- The total number of characters of the character string specified by (s) is 2 to 8 characters.

- In the character string specified by (s), the number of characters that form the decimal part is 0 to 5 characters. However, be sure to specify "Total number of digits - 3" or below.

- The range of the character string of the numeric value that can be converted to a binary value is -32768 to +32767 for a signed value with the decimal point ignored, and 0 to 65535 for an unsigned value. A character string of a numeric value excluding the sign and decimal point can be specified only within the range of 30H to 39H. (Value with the decimal point ignored ... "-12345.6" becomes "-123456".)

- When representing a positive numeric value, 20H is set in the sign, and when representing a negative numeric value, 2DH is set.

- 2EH is set in the decimal point.

- When "20H (space)" or "30H (0)" exists between the sign and the first non-zero number in a character string specified by (s), "20H" or "30H" is ignored during conversion to a binary value.
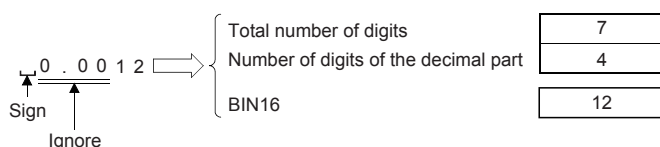
Ex.

When "20H" exists between the sign and the first non-zero number (a signed value is specified)
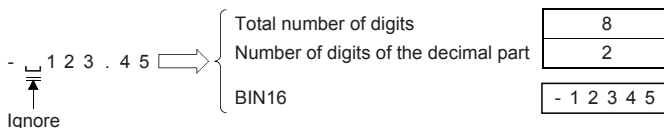
Ex.

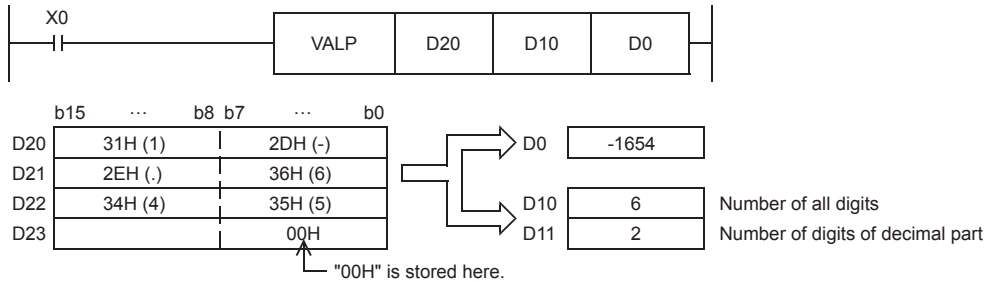When "30H" exists between the sign and the first non-zero number

- Do not set 2EH(.) to the last character of (s). (Example: 1234.)

Precautions

• Store signed data, "space (20H)" or "- (2DH)" only in the 1st byte (low-order 8 bits of the head device set in (s)). Only the ASCII data "0 (30H)" to "9 (39H)", "space (20H)" and "decimal point (2EH)" can be stored from the 2nd byte to the "00H" at the end of the character string in (s). If "- (2DH)" is stored in the 2nd byte or later, an operation error occurs.

Program example

In the program below, the character string data stored in D20 to D22 is regarded as an integer value. This value is converted into a binary value, and stored in D0 when X0 is set to ON.

Operation error

Error code (SD0/SD8067)	Description
2820H	The device specified by (d1) exceeds the corresponding device range.
	When "00H" is not set in the corresponding device range after the device specified in (s).
3401H	The number of characters of the character string specified by (s) is other than 2 to 8 characters.
	The number of characters of the decimal part of the character string specified by (s) is other than 0 to 5 characters.
	The relationship between the total number of characters specified by (s) and the number of characters of the decimal part is other than that described below. Total number of characters - 3≥Number of characters in the decimal part
	When the VAL(P) instruction is used, an ASCII code other than "20H" and "2DH" is set as a sign.
	When the VAL(P)_U instruction is used, an ASCII code other than "20H" is set as a sign.
	An ASCII code other than 30H to 39H, and 2EH (decimal point) is set in the digits of each number
	Two or more decimal points are set.
	The converted binary value exceeds the range that can be converted by each instruction. Signed operation: -32768 to +32767, unsigned operation: 0 to 65535