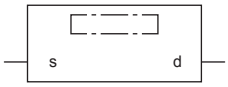
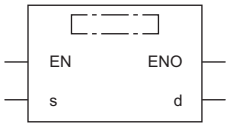
20.37 Converting REAL to STRING

REAL_TO_STRING(_E)

FX5S FX5UJ FX5U FX5UC

These functions convert REAL type data to STRING type data (exponent format).

Ladder diagram, FBD/LD		Structured text

[Without EN/ENO]
 
	[With EN/ENO]
	 
		[Without EN/ENO]
		d:=REAL_TO_STRING(s);
		[With EN/ENO]
		d:=REAL_TO_STRING_E(EN,ENO,s);

Setting data

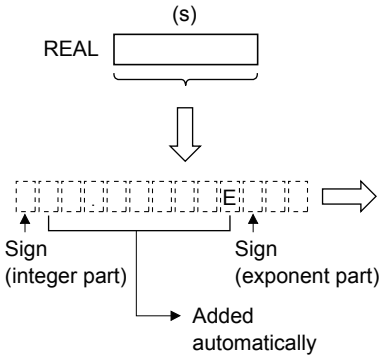
■Descriptions, types, and data types

Argument	Description	Type	Data type
EN	Execution condition (TRUE: Execution, FALSE: Stop)	Input variable	BOOL
s(IN)	Input	Input variable	REAL
ENO	Output status (TRUE: Normal, FALSE: Abnormal)	Output variable	BOOL
d(REAL_TO_STRING(_E))	Output	Output variable	STRING(13)

Processing details

■Operation processing

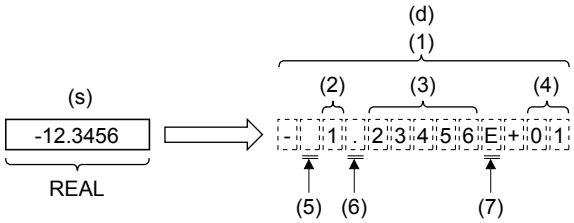
- These functions convert the REAL type data input to (s) to STRING type (exponent format) data and output from (d).



(d)

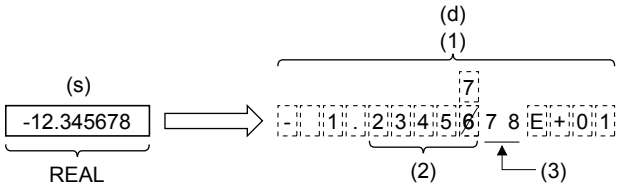
High-order byte	Low-order byte	
20H (SP)	Sign data (integer part)	+0
2EH (.)	ASCII code for integer part	+1
ASCII code for 2nd decimal place	ASCII code for 1st decimal place	+2
ASCII code for 4th decimal place	ASCII code for 3rd decimal place	+3
45H (E)	ASCII code for 5th decimal place	+4
ASCII code for tens place of exponent part	Sign data (exponent part)	+5
00H (NUL)	ASCII code for ones place of exponent part	+6

- A value input to (s) is the REAL type data value.
- The string data obtained by conversion is output from (d) as follows:
  - The number of digits is fixed respectively for the integer part, decimal part and exponent part as follows: Integer part: 1, decimal part: 5, exponent part: 2
  - "20H (space)" is stored in the 2nd byte, "2EH (.)" is stored in the 4th byte, and "45H (E)" is stored in the 10th byte automatically.



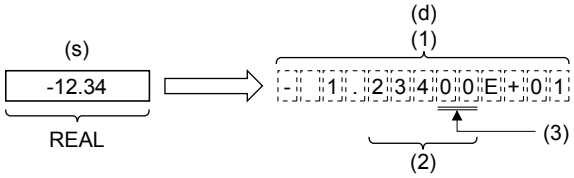
(1): Total number of digits (13 digits)
(2): Integer part (1 digit)
(3): Decimal part (5 digits)
(4): Exponent part (2 digits)
(5): "20H (SP)" is stored.
(6): "2EH (.)" is stored.
(7): "45H (E)" is stored.

- In "Sign data (integer part)", "20H (space)" is stored when the input value is positive, and "2DH (-)" is stored when the input value is negative.
- The 6th and later digits of the decimal part are rounded.



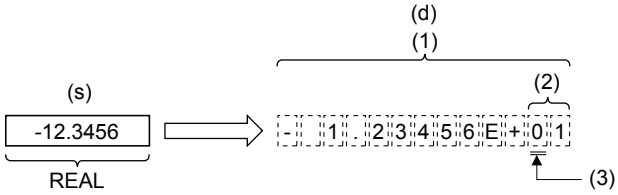
(1): Total number of digits (13 digits)
(2): Number of digits of decimal part (5)
(3): These digits are rounded off.

- "30H (0)" is stored in the decimal part when the number of significant figures is small.



(1): Total number of digits (13 digits)
(2): Number of digits of decimal part (5)
(3): "30H (0)" is stored.

- In "Sign data (exponent part)", "2BH (+)" is stored when the input value is positive, and "2DH (-)" is stored when the input value is negative.
- "30H (0)" is stored in the tens place of the exponent part when the exponent part consists of 1 digit.



(1): Total number of digits (13 digits)
(2): Number of digits of exponent part (2)
(3): "30H (0)" is stored.

- "00H" is automatically stored at the end (7th word) of the character string.

■Operation result

1. Function without EN/ENO

The following table lists the operation results.

Operation result	(d)
No operation error occurred	Operation output value
An operation error occurred	Indefinite value

2. Function with EN/ENO

The following table lists the execution conditions and operation results.

Execution condition	Operation result	
EN	ENO	(d)
TRUE (Executes operation)	TRUE (Operation error did not occur)	Operation output value
	FALSE (Operation error occurred)*1	Indefinite value
FALSE (Stops operation)	FALSE*1	Indefinite value

*1 When FALSE is output from ENO, data output from (d) is undefined. In that case, modify a program so that the data output from (d) is not used.

Operation error

Error code (SD0/SD8067)	Description
3402H	(s) is not located within the following range • 0, $2^{-126} \leq$|specified device value|$< 2^{128}$ • (s) is -0, denormalized number, NaN (not a number), or $\pm\infty$.
3406H	The whole converted character string cannot be stored in the devices from the device specified by (d) to the last device of the target device.