FLOATING-POINT FB LIBRARY REFERENCE MANUAL

<CONTENTS>

Reference Manual Revision History

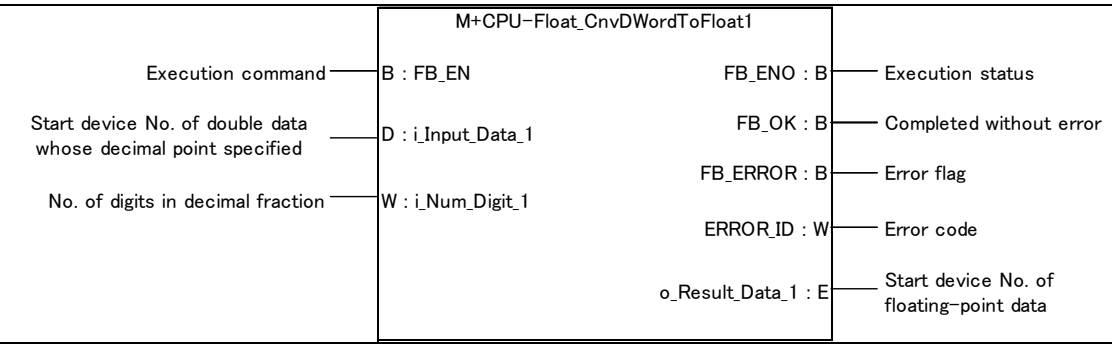
Reference Manual Number	Date	Description
FBM-M049-A	2011/03/22	First edition

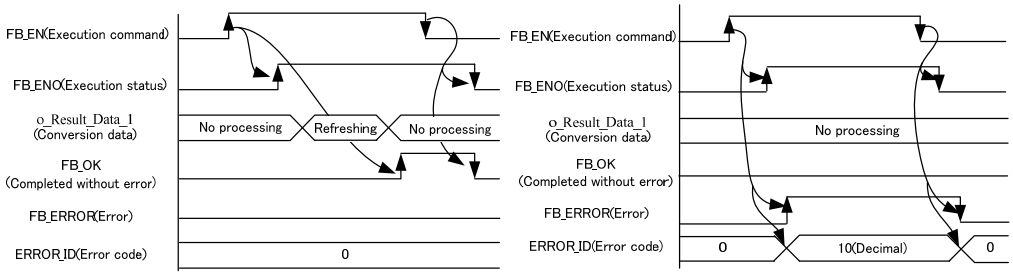
1.M+CPU-Float_CnvDWordToFloat1 (Single-precision floating-point data conversion)

FB Name

M+CPU-Float_CnvDWordToFloat1

Function Overview

Item	Description
Function overview	Converts the double data whose decimal point is specified into floating-point data.
Symbol	
Applicable hardware and software	Hardware details Q series: High performance model; Universal model L series: LCPU *Not applicable for QCPU (A mode) Compatible software: GX Works 2 Version 1.31H or later
Programming language	Ladder
Number of steps (maximum value)	For high performance model CPU: 231* *The value is the number of steps in the label program, and is therefore stated as a reference value. For details, refer to the GX Works2 Version1 Operation Manual (Simple Project).
Function description	By turning ON FB_EN (Execution command), the following conversion operations are performed. 1) The double data whose decimal point is specified is converted into floating-point data. 2) A scale conversion is performed on the data converted at 1) for the number of digits in decimal fraction. 3) When the input value is out of range, the FB_ERROR output turns ON, processing is interrupted, and the error code is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.

Item	Description
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) When the number of significant digits is 8 or more, errors can be generated in the conversion value. (2^{-128} or less)
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to Appendix - Application examples.
Timing chart	•Operation of I/O signals [When operation completes without error] [When an error occurs] 
Relevant manual	MELSEC-Q/L Programming Manual (Common Instructions)

Error codes

■Error code list

Error code	Description
10	i_Num_Digit_1 (No. of digits in decimal fraction) is not valid. Set within the range (0 to 10), and turn OFF FB_EN and then ON again.

Labels

■Input labels

Name	Label name	Data type	Setting range	Description
Execution command	FB_EN	B	ON、OFF	ON: The FB is activated. OFF: The FB is not activated.
Start device No. of double data whose decimal point specified	i_Input_Data_1	D	Specify the device that stores the data, or specify the following constant. "-2147483648~2147483647"	Set the start device number that stores the double data to be converted. Use 2 words of area.
No. of digits in decimal fraction	i_Num_Digit_1	W	0~10	Set the number of digits in decimal fraction.

■Output labels

Name	Label name	Data type	Initial value	Description
Execution status	FB_ENO	B	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	B	OFF	When ON, it indicates that the processing is completed.
Error flag	FB_ERROR	B	OFF	When ON, it indicates that an error has occurred.
Error code	ERROR_ID	W	0	FB error code output.
Start device No. of floating-point data	o_Result_Data_1	E	0	Store the result of conversion into floating-point data. Use 2 words of area.

Processing description

1) The input double data whose decimal point specified is converted into floating-point data.

2) A scale conversion is performed on the data converted at 1).

Result=Data converted at 1)/10^n

n=Number of digits in decimal fraction

3) The converted floating-point data is stored in the specified start device number of floating-point data.

Double data	No. of digits in decimal fraction	Completed without error	Error flag	Error code	Floating-point data
999	0	ON	OFF	0	999
999	1	ON	OFF	0	99.9
999	2	ON	OFF	0	9.99
999	3	ON	OFF	0	0.999
999	4	ON	OFF	0	0.0999

Version Upgrade History

Version	Date	Description
1.00A	2011/03/22	First edition

Note

This chapter includes information related to the M+CPU-Float_CnvDWordToFloat1 function block.

It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.

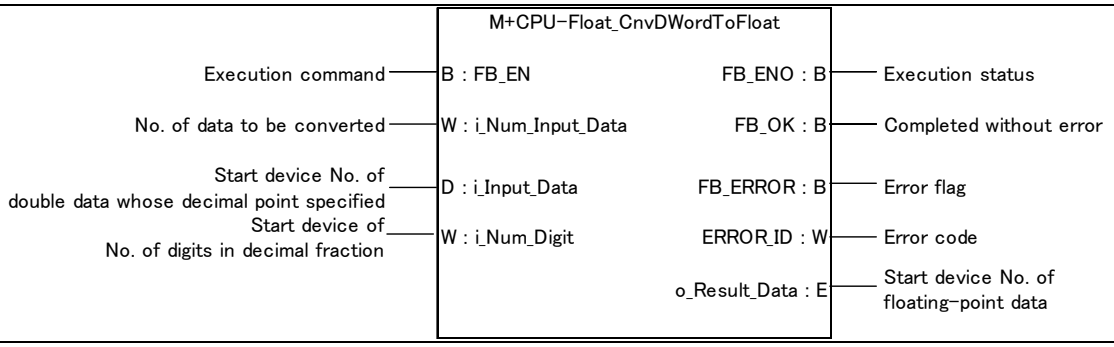
Before using any Mitsubishi products, please read all the relevant manuals.

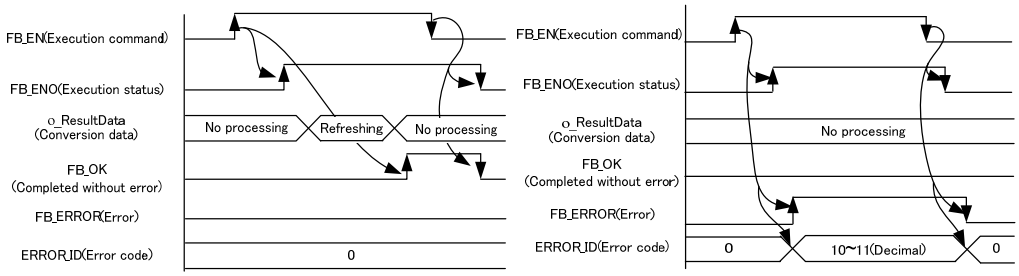
2.M+CPU-Float_CnvDWordToFloat (Multiple single-precision floating-point data batch conversion)

FB Name

M+CPU-Float_CnvDWordToFloat

Function Overview

Item	Description
Function overview	Converts the double data whose decimal point is specified into floating-point data. n points of data are converted simultaneously.
Symbol	
Applicable hardware and software	Hardware details Q series: High performance model; Universal model L series: LCPU *Not applicable for QCPU (A mode) Compatible software: GX Works 2 Version 1.31H or later
Programming language	Ladder
Number of steps (maximum value)	For high performance model CPU: 384* *The value is the number of steps in the label program, and is therefore stated as a reference value. For details, refer to the GX Works2 Version1 Operation Manual (Simple Project).

Item	Description
Function description	By turning ON FB_EN (Execution command), the following conversion operations are performed. 1) The double data whose decimal point is specified is converted into floating-point data. 2) A scale conversion is performed on the data converted at 1) for the number of digits in decimal fraction. 3) When the input value is out of range, the FB_ERROR output turns ON, processing is interrupted, and the error code is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) This FB uses index registers Z9, Z8, and Z7. Please do not use these index registers in an interrupt program. 4) When the number of significant digits is 8 or more, errors can be generated in the conversion value.
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to Appendix - Application examples.
Timing chart	•Operation of I/O signals [When operation completes without error] [When an error occurs] 
Relevant manual	MELSEC-Q/L Programming Manual (Common Instructions)

Error codes

■Error code list

Error codes	Description
10	i_Num_Digit_1 (No. of digits in decimal fraction) is not valid. Set within the range (0 to 10), and turn OFF FB_EN and then ON again.
11	i_Num_Input_Data (No. of data to be converted) is not valid. Set within the range (1 to 10), and turn OFF FB_EN and then ON again.

Labels

■Input labels

Name	Label name	Data type	Setting range	Description
Execution command	FB_EN	B	ON、OFF	ON: The FB is activated. OFF: The FB is not activated.
No. of data to be converted	i_Num_Input_Data	W	1~10	Set the number of data to be converted.
Start device No. of double data whose decimal point specified	i_Input_Data	D	Valid device range	Set the start device number that stores the double data to be converted. Use 2 words of area per data.
Start device of No. of digits in decimal fraction	i_Num_Digit	W	Valid device range The value stored in the device is “0 to 10”.	Set the start device number that stores the number of digits in decimal fraction. User one word area per data, and set a value between 0 and 10.

■Output labels

Name	Label name	Data type	Initial value	Description
Execution status	FB_ENO	B	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	B	OFF	When ON, it indicates that the processing is completed.
Error flag	FB_ERROR	B	OFF	When ON, it indicates that an error has occurred.
Error code	ERROR_ID	W	0	FB error code output.
Start device No. of floating-point data	o_Result_Data	E	0	Store the result of conversion into floating-point data. Use 2 words of area per data.

Processing description

1) The input double data whose decimal point is specified is converted into floating-point data.

2) A scale conversion is performed on the data converted at 1).

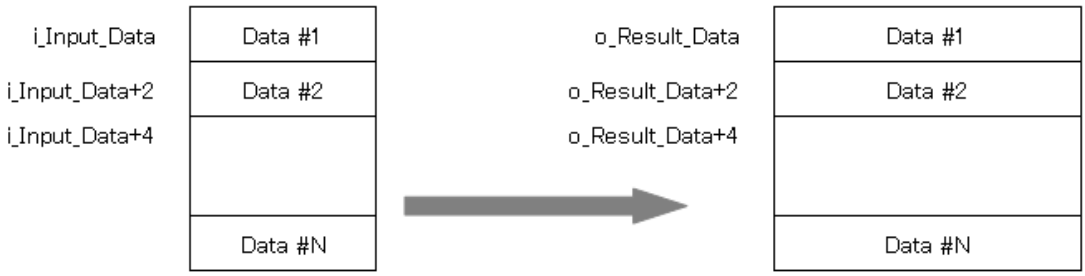
Result=Data converted at 1)/10^n

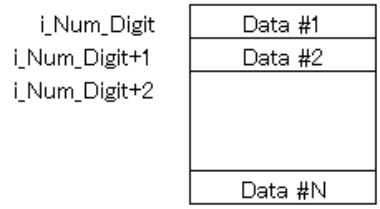
n= Number of digits in decimal fraction

3) The floating-point data converted at 2) is stored in devices starting from the start device number of floating-point data in order.

Double data	No. of digits in decimal fraction	Completed without error	Error flag	Error code	Floating-point data
999	0	ON	OFF	0	999
999	1	ON	OFF	0	99.9
999	2	ON	OFF	0	9.99
999	3	ON	OFF	0	0.999
999	4	ON	OFF	0	0.0999

The processing above is repeated by the number of data to be converted.





Version Upgrade History

Version	Date	Description
1.00A	2011/03/22	First edition

Note

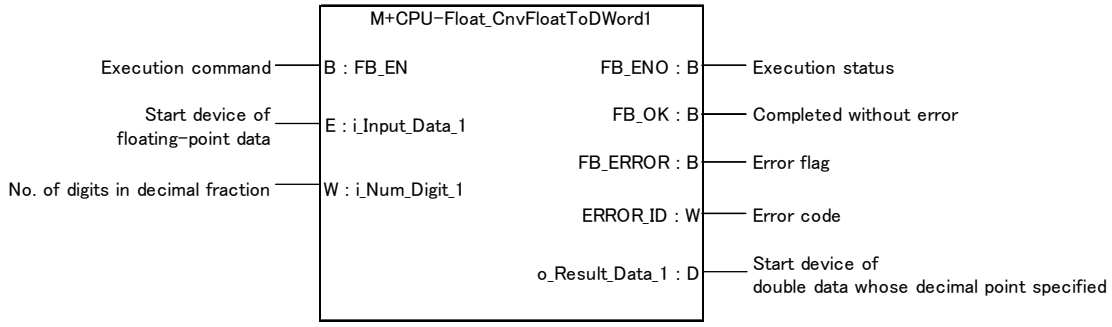
This chapter includes information related to the M+CPU-Float_CnvDWordToFloat function block.
It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.
Before using any Mitsubishi products, please read all the relevant manuals.

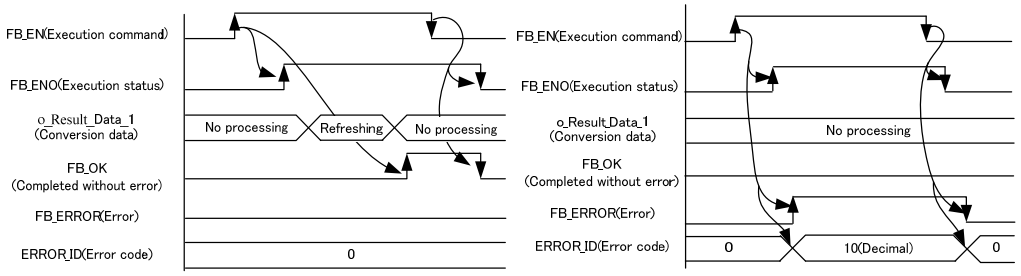
3.M+CPU-Float_CnvFloatToDWord1 (Double data conversion)

FB Name

M+CPU-Float_CnvFloatToDWord1

Function Overview

Item	Description
Function overview	Converts floating-point data into double data whose decimal point is specified.
Symbol	
Applicable hardware and software	Hardware details Q series: High performance model; Universal model L series: LCPU *Not applicable for QCPU (A mode) Compatible software: GX Works 2 Version 1.31H or later
Programming language	Ladder
Number of steps (maximum value)	For high performance model CPU: 225* *The value is the number of steps in the label program, and is therefore stated as a reference value. For details, refer to the GX Works2 Version1 Operation Manual (Simple Project).
Function description	By turning ON FB_EN (Execution command), the following conversion operations are performed. 1) The data type of the floating-point data for the number of digits in decimal fraction is converted. 2) The data converted at 1) is set in the double data whose decimal point specified. 3) When the input value is out of range, the FB_ERROR output turns ON, processing is interrupted, and the error code is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.

Item	Description
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program.
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to Appendix - Application examples.
Timing chart	•Operation of I/O signals [When operation completes without error] [When an error occurs] 
Relevant manual	MELSEC-Q/L Programming Manual (Common Instructions)

Error codes

■Error code list

Error code	Description
10	i_Num_Digit_1 (No. of digits in decimal fraction) is not valid. Set within the range (0 to 10), and turn OFF FB_EN and then ON again.

Labels

■Input labels

Name	Label name	Data type	Setting range	Description
Execution command	FB_EN	B	ON、OFF	ON: The FB is activated. OFF: The FB is not activated.
Start device No. of floating-point data	i_Input_Data_1	E	Valid device range	Set the start device number that stores floating-point data to be converted. Use 2 words of area.
No. of digits in decimal fraction	i_Num_Digit_1	W	0~10	Set the number of digits in decimal fraction 0=floating-point data*1 1= floating-point data*10 2= floating-point data*100

■Output labels

Name	Label name	Data type	Initial value	Description
Execution status	FB_ENO	B	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	B	OFF	When ON, it indicates that the processing is completed.
Error flag	FB_ERROR	B	OFF	When ON, it indicates that an error has occurred.
Error code	ERROR_ID	W	0	FB error code output.
Start device No. of double data whose decimal point specified	o_Result_Data_1	D	0	Store the result of conversion into double data whose decimal point specified. Use 2 words of area.

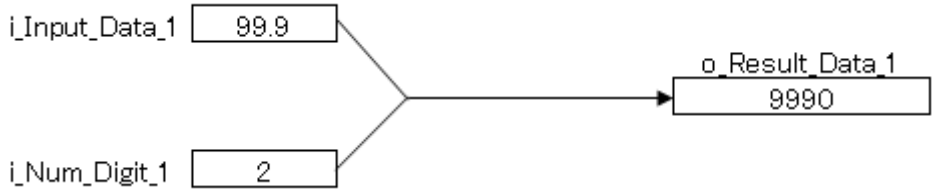
Processing description

1) A scale conversion is performed on the input floating-point data. After conversion, the first digit after the decimal point of the real number is rounded off.

   Result=Floating-point data*10^n

   n=Number of digits in decimal fraction

2) The data converted at 1) is stored in the double data whose decimal point specified.



Floating-point data	No. of digits in decimal fraction	Completed without error	Error flag	Error code	Double data
99.9	0	ON	OFF	0	100
99.9	1	ON	OFF	0	999
99.9	2	ON	OFF	0	9990
99.9	3	ON	OFF	0	99900
99.9	4	ON	OFF	0	999000
99.9	7	ON	OFF	0	999000000

Version Upgrade History

Version	Date	Description
1.00A	2011/03/22	First edition

Note

This chapter includes information related to the M+CPU-Float_CnvFloatToDWord1 function block.

It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.

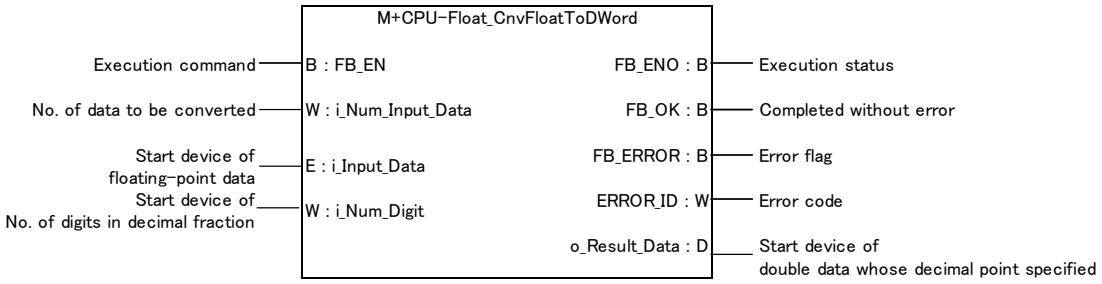
Before using any Mitsubishi products, please read all the relevant manuals.

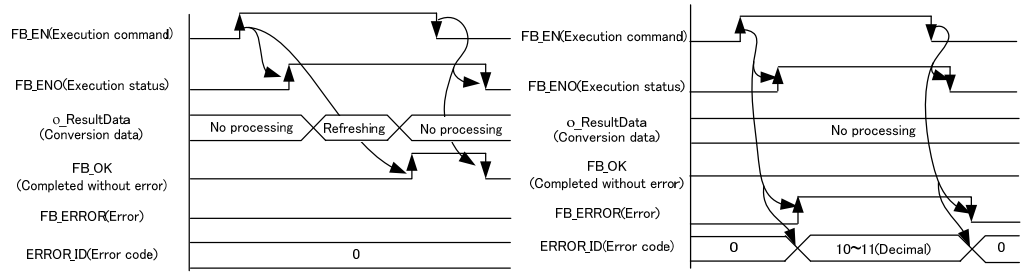
4.M+CPU-Float_CnvFloatToDWord (Multiple double data batch conversion)

FB Name

M+CPU-Float_CnvFloatToDWord

Function Overview

Item	Description
Function overview	Converts the floating-point data into the double data whose decimal point is specified. n points of data are converted simultaneously.
Symbol	
Applicable hardware and software	Hardware details Q series: High performance model; Universal model L series: LCPU *Not applicable for QCPU (A mode) Compatible software: GX Works 2 Version 1.31H or later
Programming language	Ladder
Number of steps (maximum value)	For high performance model CPU: 376* *The value is the number of steps in the label program, and is therefore stated as a reference value. For details, refer to the GX Works2 Version1 Operation Manual (Simple Project).
Function description	By turning ON FB_EN (Execution command), the following conversion operations are performed. 1) The data type of the floating-point data for the number of digits in decimal fraction is converted. 2) The converted data is set in the double data whose decimal point is specified. 3) When the input value is out of range, the FB_ERROR output turns ON, processing is interrupted, and the error code is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.

Item	Description
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) This FB uses index registers Z9, Z8, and Z7. Please do not use these index registers in an interrupt program.
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to Appendix - Application examples.
Timing chart	•Operation of I/O signals [When operation completes without error] [When an error occurs] 
Relevant manual	MELSEC-Q/L Programming Manual (Common Instructions)

Error codes

■Error code list

Error code	Description
10	i_Num_Digit_1 (No. of digits in decimal fraction) is not valid. Set within the range (0 to 10), and turn OFF FB_EN and then ON again.
11	i_Num_Input_Data (No. of data to be converted) is not valid. Set within the range (1 to 10), and turn OFF FB_EN and then ON again.

Labels

■Input labels

Name	Label name	Data type	Setting range	Description
Execution command	FB_EN	B	ON、OFF	ON: The FB is activated. OFF: The FB is not activated.
No. of data to be converted	i_Num_Input_Data	W	1~10	Set the number of data to be converted.
Start device No. of floating-point data	i_Input_Data	E	Valid device range	Set the start device number that stores floating-point data to be converted. Use 2 words of area per data.
Start device of No. of digits in decimal fraction	i_Num_Digit	W	Valid device range The value stored in the devices is “0 to 10”.	Set the start device number that stores the number of digits in decimal fraction. User one word area per data, and set a value between 0 and 10.

■Output labels

Name	Label name	Data type	Initial value	Description
Execution status	FB_ENO	B	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	B	OFF	When ON, it indicates that the processing is completed.
Error flag	FB_ERROR	B	OFF	When ON, it indicates that an error has occurred.
Error code	ERROR_ID	W	0	FB error code output.
Start device No. of double data whose decimal point specified	o_Result_Data	D	0	Return the result of conversion from floating-point data into double data. Use 2 words of area per data.

Processing description

1) The data type of the input floating-point data is converted. After conversion, the first digit after the decimal point of the real number is rounded off.

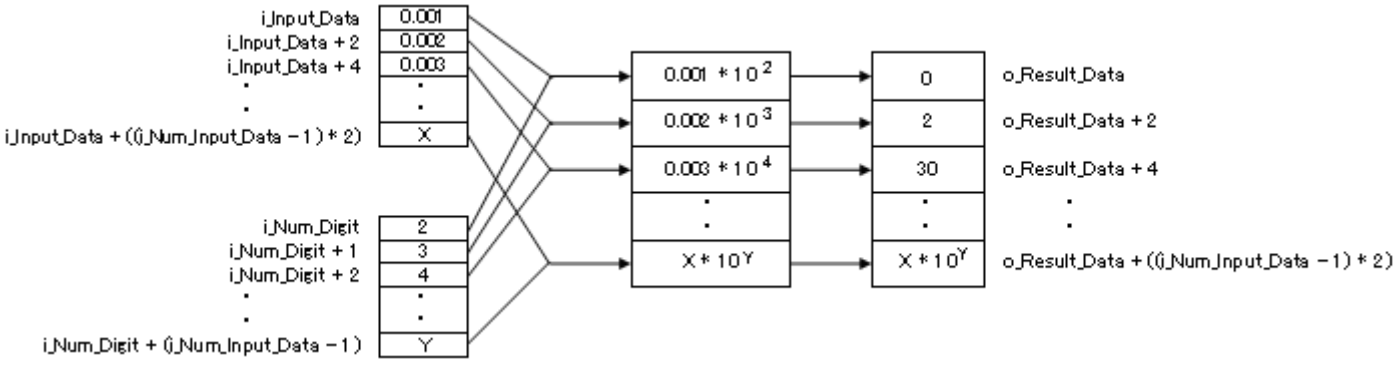
   Result=Floating-point data*10n

   n=Number of digits in decimal fraction

2) The result converted at 1) is stored in the start device number of double data whose decimal point specified in order.

Floating-point data	No. of digits in decimal fraction	Completed without error	Error flag	Error code	Double data
99.9	0	ON	OFF	0	100
99.9	1	ON	OFF	0	999
99.9	2	ON	OFF	0	9990
99.9	3	ON	OFF	0	99900
99.9	4	ON	OFF	0	999000
99.9	7	ON	OFF	0	999000000

The processing above is repeated by the number of data to be converted.



Version Upgrade History

Version	Date	Description
1.00A	2011/03/22	First edition

Note

This chapter includes information related to the M+CPU-Float_CnvFloatToDWord function block.

It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.

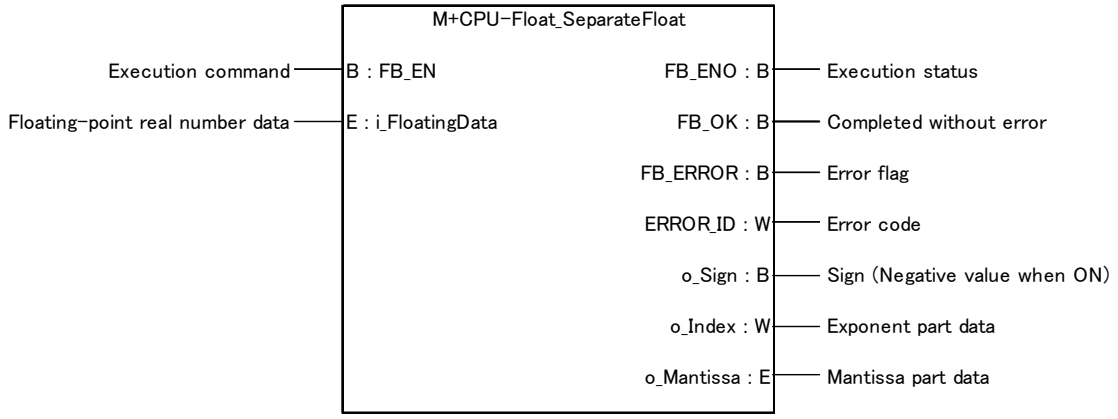
Before using any Mitsubishi products, please read all the relevant manuals.

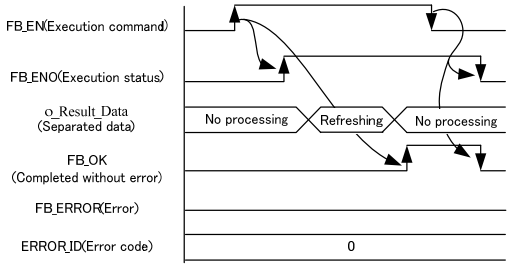
5.M+CPU-Float_SeparateFloat (Dissociate floating-point real number into mantissa and exponent part)

FB Name

M+CPU-Float_SeparateFloat

Function Overview

Item	Description
Function overview	Dissociates the floating-point real number data into mantissa part and exponent part.
Symbol	
Applicable hardware and software	Hardware details Q series: High performance model; Universal model L series: LCPU *Not applicable for QCPU (A mode) Compatible software: GX Works 2 Version 1.31H or later
Programming language	Ladder
Number of steps (maximum value)	For high performance model CPU: 243* *The value is the number of steps in the label program, and is therefore stated as a reference value. For details, refer to the GX Works2 Version1 Operation Manual (Simple Project).
Function description	By turning ON FB_EN (Execution command), the floating-point real number data is dissociated into mantissa and exponent part. The floating-point data is dissociated into 32-bit integer data (23-bit data) mantissa part, 16-bit integer data (8-bit data) exponent part, and sign (1 bit data: negative value when ON), and they are stored in each output label.

Item	Description
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program.
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to Appendix - Application examples.
Timing chart	•Operation of I/O signals 
Relevant manual	MELSEC-Q/L Programming Manual (Common Instructions)

Error codes

■Error code list

Error code	Description
None	None

Labels

■Input labels

Name	Label name	Data type	Setting range	Description
Execution command	FB_EN	B	ON、OFF	ON: The FB is activated. OFF: The FB is not activated.
Floating-point real number data	i_FloatingData	E	2-126 ~ 2128	Set the floating-point real number data to be converted.

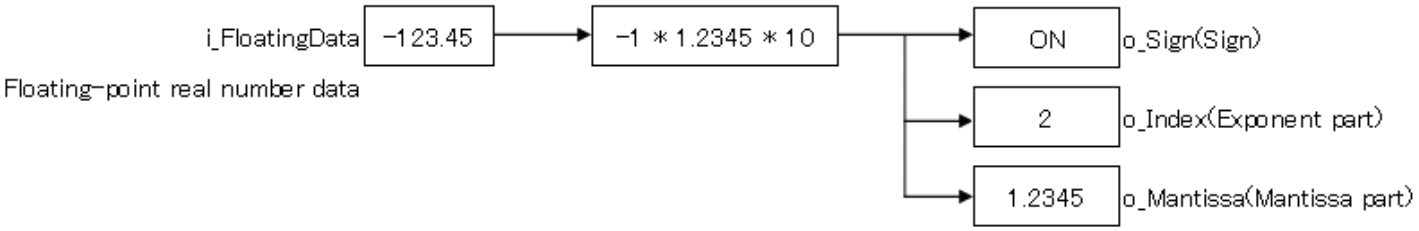
■Output labels

Name	Label name	Data type	Initial value	Description
Execution status	FB_ENO	B	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	B	OFF	When ON, it indicates that the processing is completed.
Error flag	FB_ERROR	B	OFF	When ON, it indicates that an error has occurred.
Error code	ERROR_ID	W	0	FB error code output.
Floating-point data sign	o_Sign	B	OFF	OFF: Positive value (+) ON: Negative value (-)
Floating-point data exponent part	o_Index	W	0	Store the exponent part of the floating-point data.
Floating-point data mantissa part	o_Mantissa	E	0	Store the mantissa part of the floating-point data.

Processing description

1) The floating-point real number data is dissociated into sign, mantissa part and exponent part.

2) The dissociated sign, mantissa part and exponent part are stored in each output label.



Version Upgrade History

Version	Date	Description
1.00A	2011/03/22	First edition

Note

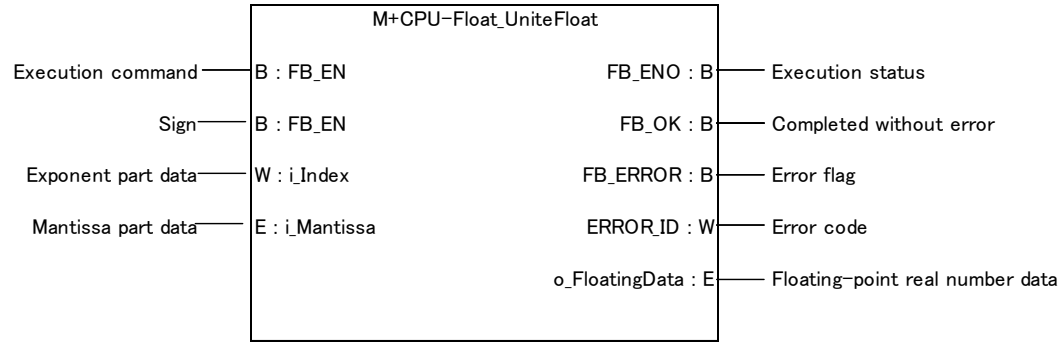
This chapter includes information related to the M+CPU-Float_SeparateFloat function block.
It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.
Before using any Mitsubishi products, please read all the relevant manuals.

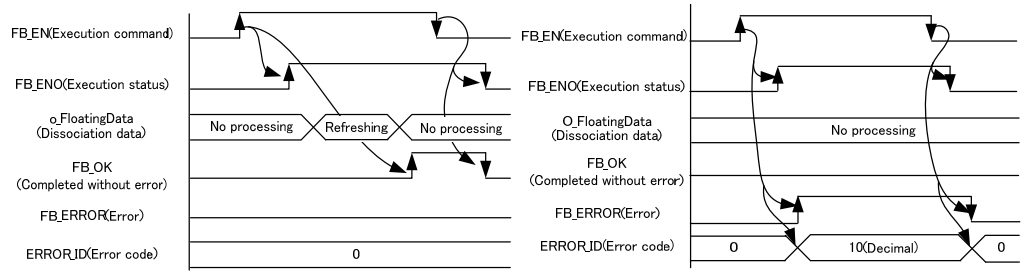
6.M+CPU-Float_UniteFloat (Convert sign, mantissa and exponent part into floating-point real number)

FB Name

M+CPU-Float_UniteFloat

Function Overview

Item	Description
Function overview	Converts the sign, mantissa and exponent part into floating-point real number.
Symbol	
Applicable hardware and software	Hardware details Q series: High performance model; Universal model L series: LCPU *Not applicable for QCPU (A mode) Compatible software: GX Works 2 Version 1.31H or later
Programming language	Ladder
Number of steps (maximum value)	For high performance model CPU: 226* *The value is the number of steps in the label program, and is therefore stated as a reference value. For details, refer to the GX Works2 Version1 Operation Manual (Simple Project).
Function description	By turning ON (Execution command), the sign, mantissa and exponent part data are converted into floating-point real number data. The floating-point real number data is outputted based on the 32-bit integer data (23-bit data) mantissa part, 16-bit integer data (8-bit data) exponent part, and sign (1 bit data: negative value when ON).
Compiling method	Macro type

Item	Description
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) When the input value is out of range, the FB_ERROR output turns ON, processing is interrupted, and the error code is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to Appendix - Application examples.
Timing chart	•Operation of I/O signals [When operation completes without error] [When an error occurs] 
Relevant manual	MELSEC-Q/L Programming Manual (Common Instructions)

Error codes

■Error code list

Error code	Description
10	i_Index (Floating-point data exponent part) is not valid.

Labels

■Input labels

Name	Label name	Data type	Setting range	Description
Execution command	FB_EN	B	ON、OFF	ON: The FB is activated. OFF: The FB is not activated.
Floating-point data sign	i_Sign	B	ON、OFF	OFF: Positive value (+) ON: Negative value (-)
Floating-point data exponent part	i_Index	W	-38~38	Set the exponent part of the floating-point data.

Name	Label name	Data type	Setting range	Description
Floating-point data mantissa part	i_Mantissa	E	$2^{-126} \sim 2^{128}$	Set the mantissa part of the floating-point data.

■Output labels

Name	Label name	Data type	Initial value	Description
Execution status	FB_ENO	B	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	B	OFF	When ON, it indicates that the processing is completed.
Error flag	FB_ERROR	B	OFF	When ON, it indicates that an error has occurred.
Error code	ERROR_ID	W	0	FB error code output.
Floating-point real number data	o_FloatingData	E	0	Store the converted floating-point real number data.

Version Upgrade History

Version	Date	Description
1.00A	2011/03/22	First edition

Note

This chapter includes information related to the M+CPU-Float_UniteFloat function block.
It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.
Before using any Mitsubishi products, please read all the relevant manuals.

Appendix 1 - Application Examples

Floating-point FB application examples

System configuration

Power supply module	**CPU Module**	**Empty** (16 points)	**QY40** (Y20~Y2F)

Device list

External output (checks)

Device	FB function name	Application (ON details)
Y20	Single-precision floating-point data conversion 1	Floating-point data conversion 1 FB error
Y21	Single-precision floating-point data conversion	Floating-point data conversion FB error
Y22	Double data conversion 1	Double data conversion 1 FB error
Y23	Double data conversion	Double data conversion FB error
Y24	Dissociate floating-point real number data into mantissa and exponent part	Floating-point dissociation FB error
Y25	Convert sign, mantissa and exponent part into floating-point real number	Floating-point conversion FB error

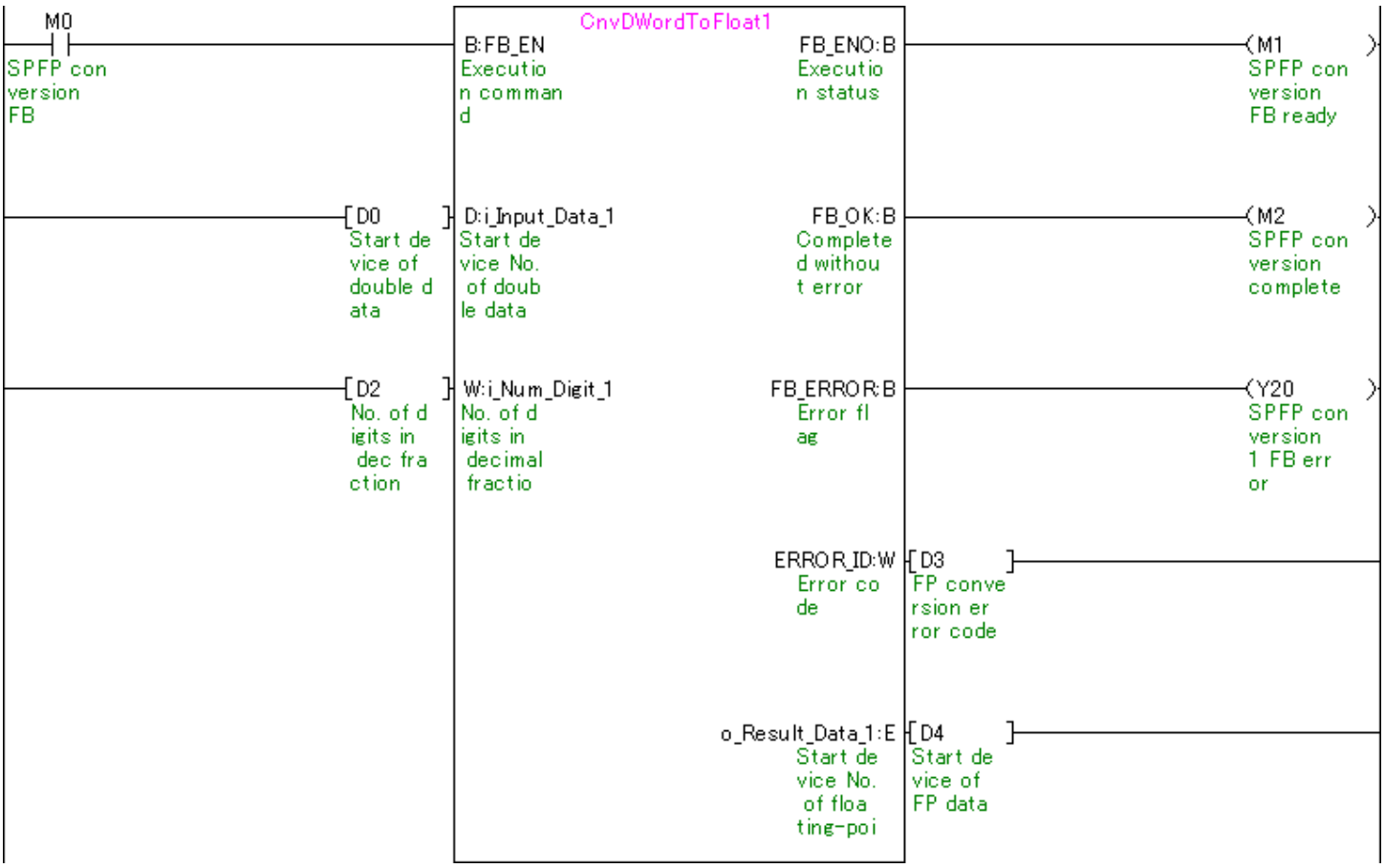
Data register

Device	FB function name	Application (ON details)
D0	Single-precision floating-point data conversion 1	Start device of double data
D2		No. of digits in decimal fraction
D3		Floating-point data conversion error code
D4		Start device of floating-point data
D6	Single-precision floating-point data conversion	No. of data to be converted
D7		Start device of double data
D27		Start device of No. of digits in decimal fraction
D37		Floating-point data conversion error code
D38		Start device of floating-point data
D58	Double data conversion 1	Start device of floating-point data
D60		No. of digits in decimal fraction
D61		Double data conversion error code
D62		Start device of double data
D64	Double data conversion	No. of data to be converted
D65		Start device of floating-point data
D85		Start device of No. of digits in decimal fraction
D95		Double data conversion error code
D96		Start device of double data
D116	Dissociate floating-point real number data into mantissa and exponent part	Conversion data
D118		Floating-point dissociation error code
D119		Floating-point data exponent part
D120		Floating-point data mantissa part
D122	Convert sign, mantissa and exponent part into floating-point real number	Floating-point data exponent part
D123		Floating-point data mantissa part
D125		Floating-point conversion error code
D126		Floating-point real number data

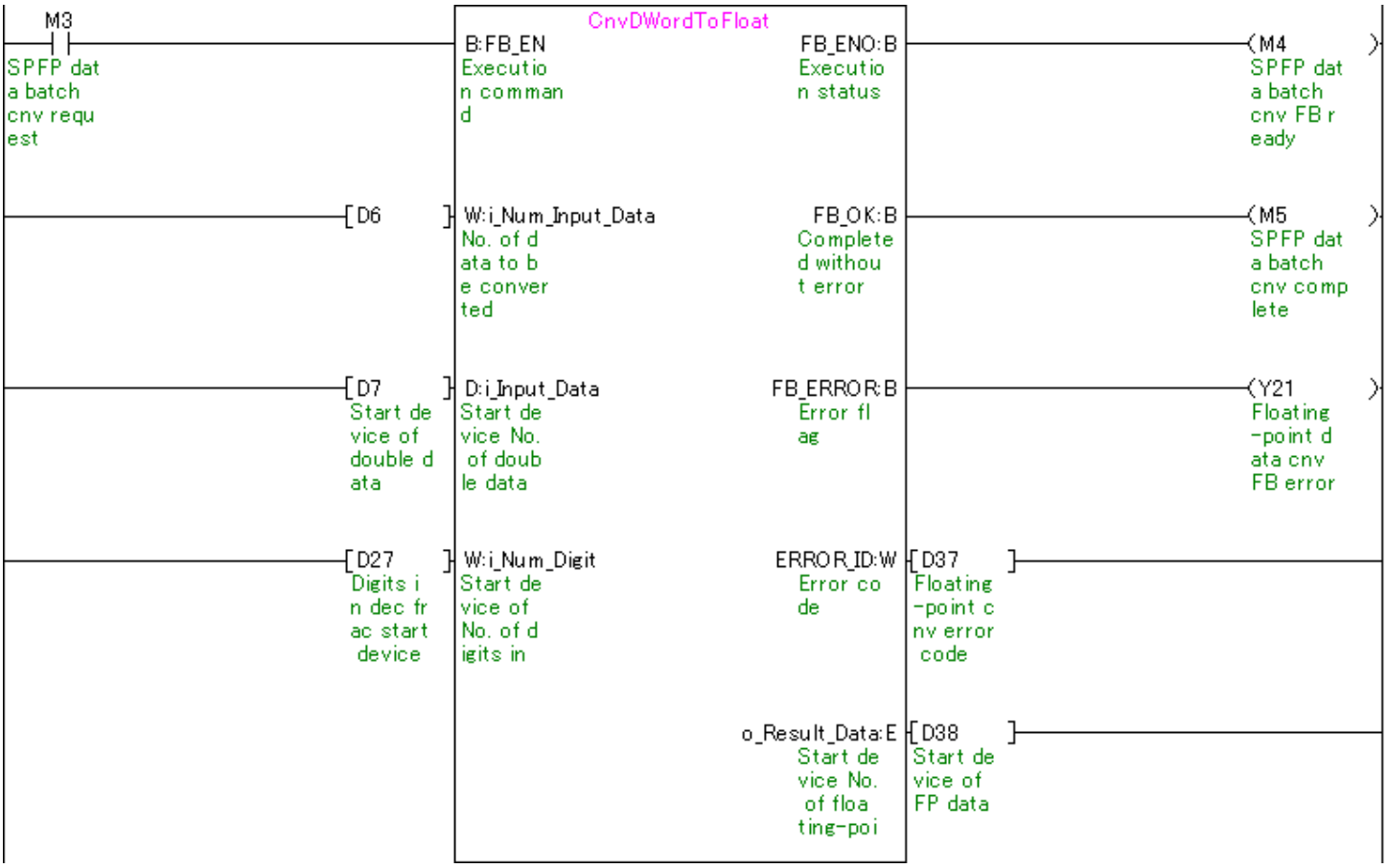
Relay

Device	FB function name	Application (ON details)
M0	Single-precision floating-point data conversion 1	Single-precision floating-point data conversion request
M1		Single-precision floating-point data conversion FB ready
M2		Single-precision floating-point data conversion complete
M3	Single-precision floating-point data conversion	Single-precision floating-point data conversion request
M4		Single-precision floating-point data conversion FB ready
M5		Single-precision floating-point data conversion complete
M6	Double data conversion 1	Double data conversion request
M7		Double data conversion FB ready
M8		Double data conversion complete
M9	Double data conversion	Double data conversion request
M10		Double data conversion FB ready
M11		Double data conversion complete
M12	Dissociate floating-point real number data into mantissa and exponent part	Floating-point dissociation request
M13		Floating-point dissociation FB ready
M14		Floating-point dissociation complete
M15		Floating-point data output
M16	Convert sign, mantissa and exponent part into floating-point real number	Floating-point real number conversion request
M17		Floating-point data sign setting
M18		Floating-point real number conversion FB ready
M19		Floating-point real number conversion complete

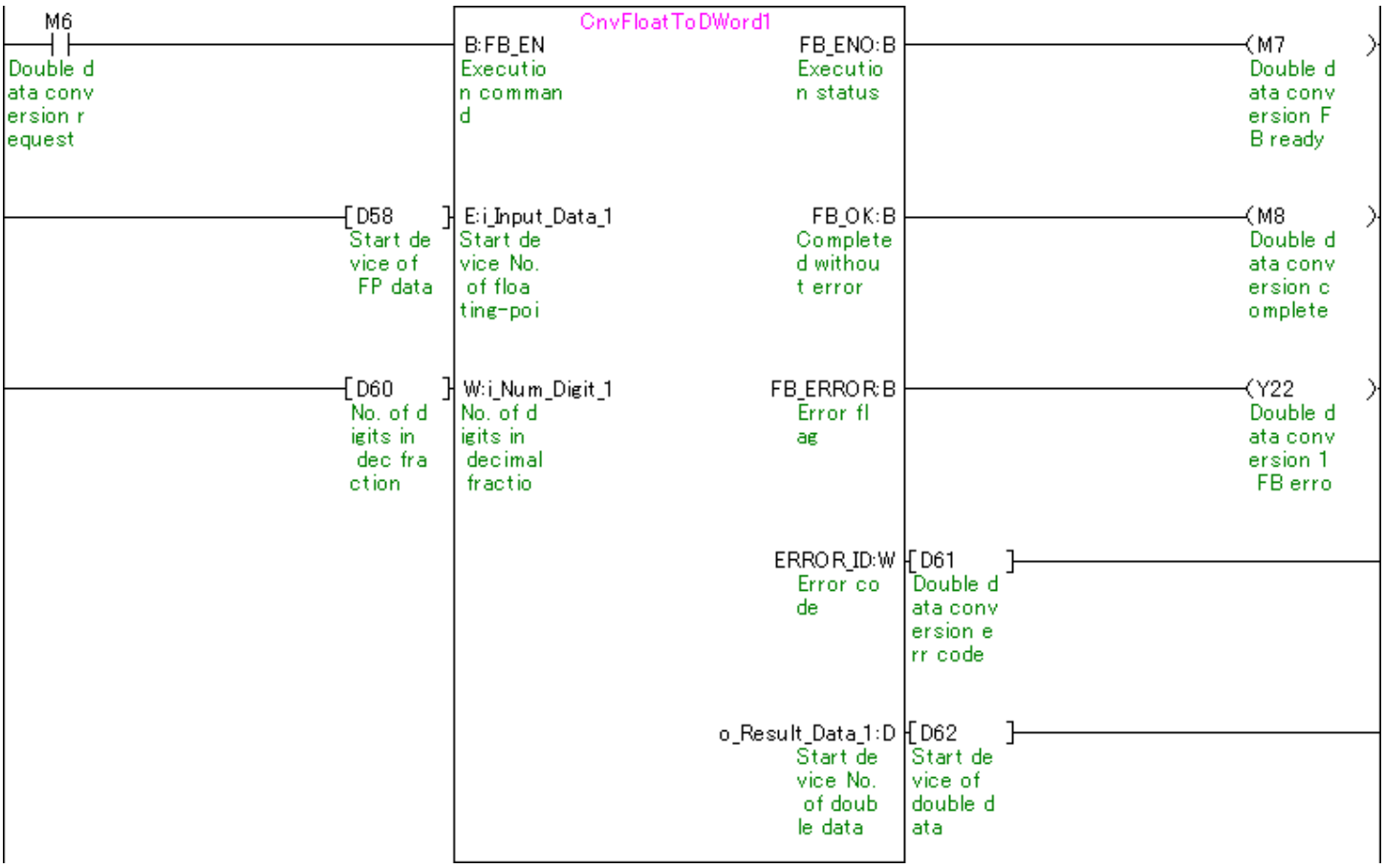
M+CPU-Float_CnvDWordToFloat1 (Single-precision floating-point data conversion)



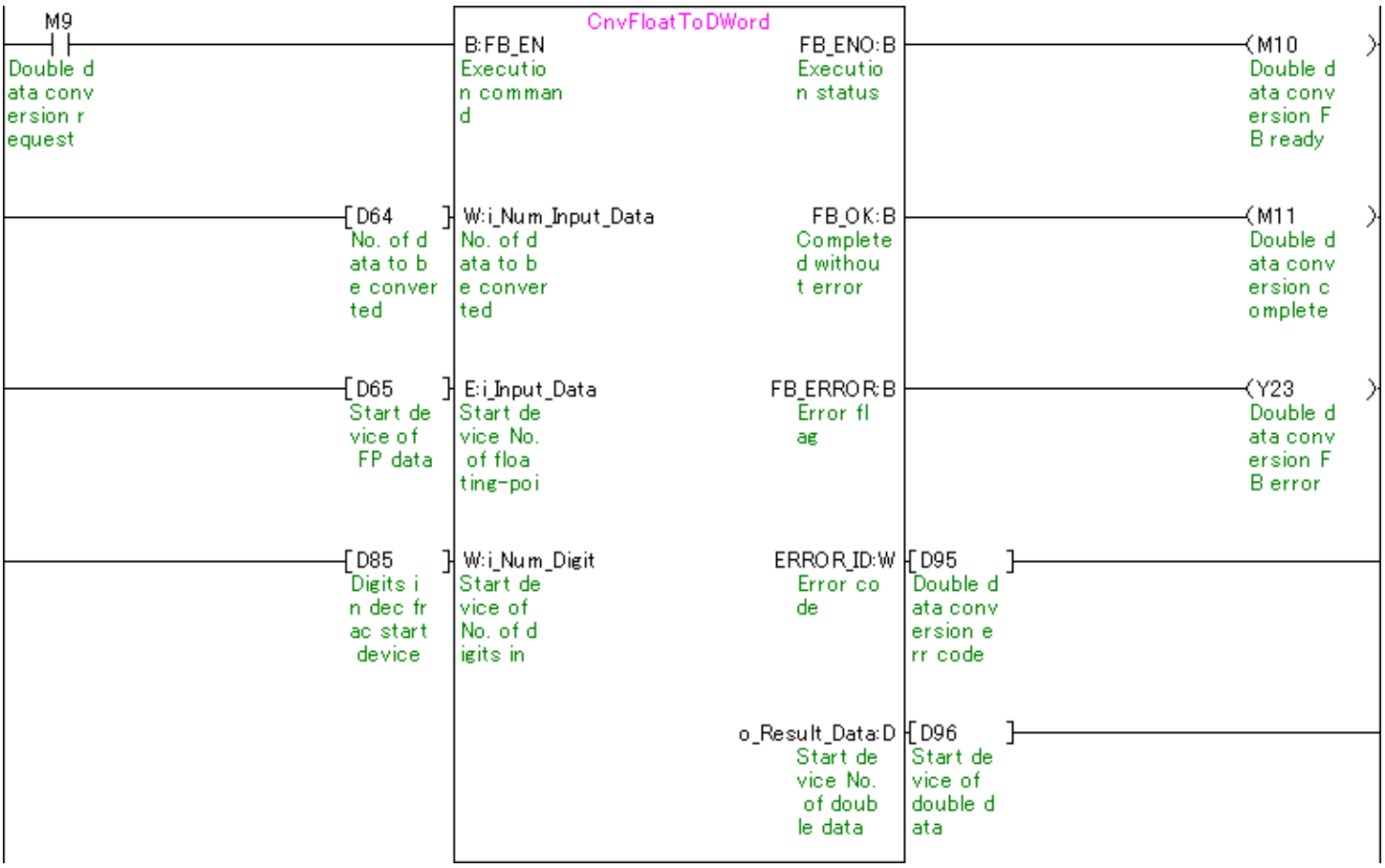
M+CPU-Float_CnvDWordToFloat (Multiple single-precision floating-point data batch conversion)



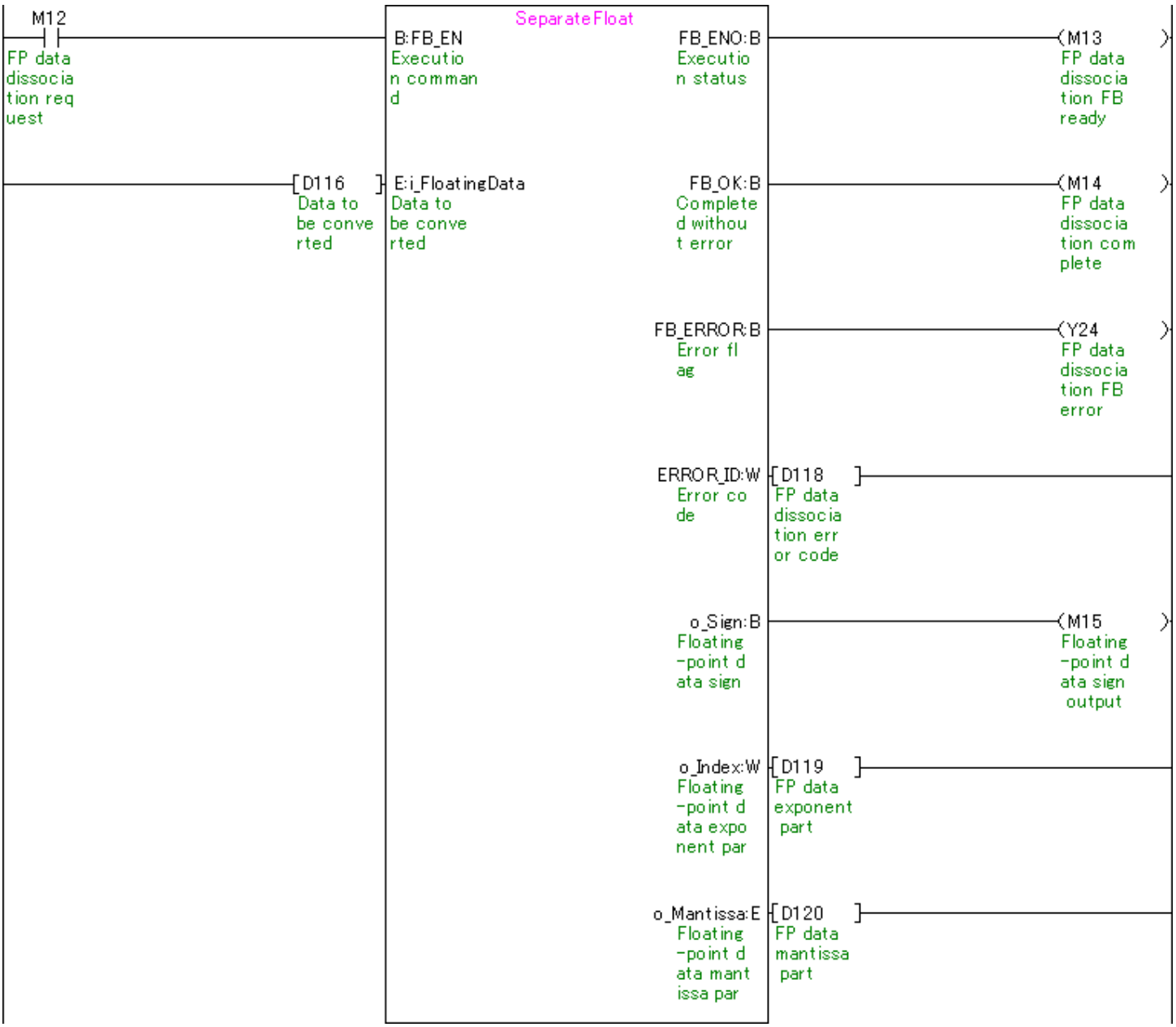
M+CPU-Float_CnvFloatToDWord1 (Double data conversion)



M+CPU-Float_CnvFloatToDWord (Multiple double data batch conversion)



M+CPU-Float_SeparateFloat (Dissociate floating-point real number data into mantissa and exponent part)



M+CPU-Float_UniteFloat (Convert sign, mantissa and exponent part into floating-point real number)