

Dead band control of 16-bit binary data

BAND(P)(_U)

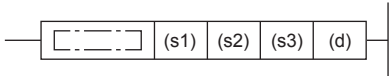
FX5S

FX5UJ

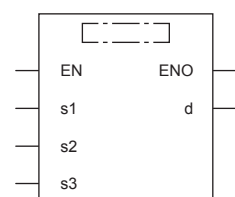
FX5U

FX5UC

These instructions control the output value to be stored in the device specified by (d) by checking the input value (16-bit binary data) in the device specified by (s3) with the upper and lower limit values of the dead band specified by (s1) and (s2).

Ladder diagram	Structured text	
	ENO:=BAND(EN,s1,s2,s3,d); ENO:=BANDP(EN,s1,s2,s3,d);	ENO:=BAND_U(EN,s1,s2,s3,d); ENO:=BANDP_U(EN,s1,s2,s3,d);

FBD/LD



Setting data

■Descriptions, ranges, and data types

Operand	Description	Range	Data type	Data type (label)
(s1)	BAND(P)	-32768 to +32767	16-bit signed binary	ANY16_S
	BAND(P)_U	0 to 65535	16-bit unsigned binary	ANY16_U
(s2)	BAND(P)	-32768 to +32767	16-bit signed binary	ANY16_S
	BAND(P)_U	0 to 65535	16-bit unsigned binary	ANY16_U
(s3)	BAND(P)	-32768 to +32767	16-bit signed binary	ANY16_S
	BAND(P)_U	0 to 65535	16-bit unsigned binary	ANY16_U
(d)	BAND(P)	—	16-bit signed binary	ANY16_S
	BAND(P)_U	—	16-bit unsigned binary	ANY16_U
EN	Execution condition	—	Bit	BOOL
ENO	Execution result	—	Bit	BOOL

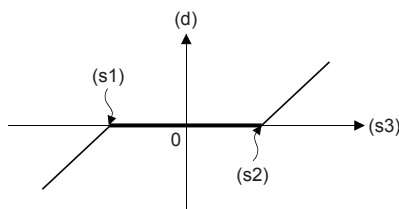
■Applicable devices

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	\$	
(s1)	○	○	○	○	—	—	○	○	—	—	—
(s2)	○	○	○	○	—	—	○	○	—	—	—
(s3)	○	○	○	○	—	—	○	○	—	—	—
(d)	○	○	○	○	—	—	○	—	—	—	—

Processing details

- These instructions control the output value to be stored in the device specified by (d) by checking the input value (16-bit binary data) in the device specified by (s3) with the upper and lower limit values of the dead band specified by (s1) and (s2). The output value is controlled as follows.

Condition	Output value
Lower limit value of the dead band (s1) > Input value (s3)	Input value (s3) - Lower limit value of the dead band (s1)
Upper limit value of the dead band (s2) < Input value (s3)	Input value (s3) - Upper limit value of the dead band (s2)
Lower limit value of the dead band (s1) ≤ Input value (s3) ≤ Upper limit value of the dead band (s2)	0



- When the output value to be stored in the device specified by (d) is a 16-bit signed binary value and the operation result exceeds the range of -32768 to 32767, the output value is calculated as follows.

Ex.

When (s1) is 10 and (s3) is -32768: Output value = $-32768 - 10 = 8000\text{H} - 000\text{AH} = 7\text{FFFH} = 32758$

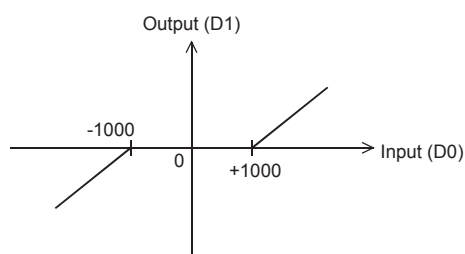
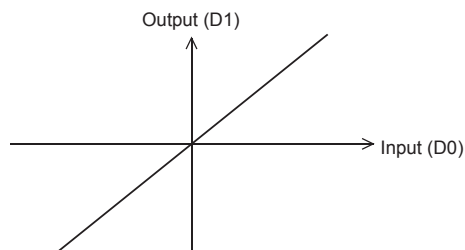
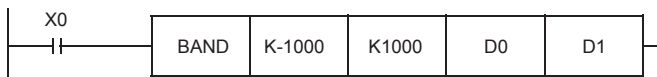
- When the output value to be stored in the device specified by (d) is a 16-bit unsigned binary value and the operation result exceeds the range of 0 to 65535, the output value is calculated as follows.

Ex.

When (s1) is 100 and (s3) is 50: Output value = $50 - 100 = 0032\text{H} - 0064\text{H} = \text{FFCEH} = 65486$

Program example

In the program example shown below, the data of D0 is controlled by the dead band of the limit values “-1000” to “+1000”, and the controlled value is output to D1 when X0 is set to ON.



Operation

- In the case of “ $D0 < -1000$ ”, “ $D0 - (-1000)$ ” is output to D1.
- In the case of “ $-1000 \leq D0 \leq +1000$ ”, “0” is output to D1.
- In the case of “ $+1000 < D0$ ”, “ $D0 - 1000$ ” is output to D1.

Operation error

Error code (SD0/SD8067)	Description
3405H	The lower limit value specified by (s1) is greater than the upper limit value specified by (s2).