

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:=BANDP_U(EN,s1,s2,s3,d); |
| FBD/LD | |
| | |

Setting data

■Descriptions, ranges, and data types

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| Operand | Description | | | Range | | Data type | | Data type (label) | |
|---------|---|--|--|------------------|--|------------------------|--|-------------------|--|
| (s1) | Lower limit value of the dead band (no-output band) | | | -32768 to +32767 | | 16-bit signed binary | | ANY16_S | |
| | BAND(P)_U | | | 0 to 65535 | | 16-bit unsigned binary | | ANY16_U | |
| (s2) | Upper limit value of the dead band (no-output band) | | | -32768 to +32767 | | 16-bit signed binary | | ANY16_S | |
| | BAND(P)_U | | | 0 to 65535 | | 16-bit unsigned binary | | ANY16_U | |
| (s3) | Input value controlled by the dead band | | | -32768 to +32767 | | 16-bit signed binary | | ANY16_S | |
| | BAND(P)_U | | | 0 to 65535 | | 16-bit unsigned binary | | ANY16_U | |
| (d) | Head device number for storing the output value controlled by the dead band | | | — | | 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 | |

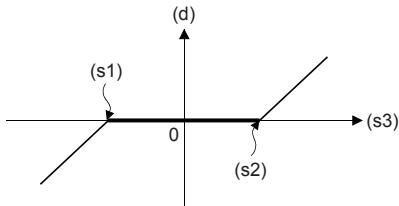
■Applicable devices

| 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 | | 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 = 8000H-000AH = 7FFFH = 32758

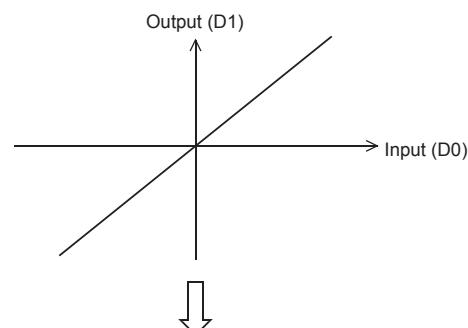
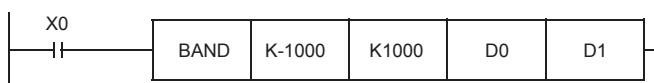
- When the output value to be stored in the device specified by (d) is a 16-bit unsigned binary value and the operation result exceeds the range of 0 to 65535, the output value is calculated as follows.

Ex.

When (s1) is 100 and (s3) is 50: Output value = 50-100 = 0032H-0064H = FFCEH = 65486

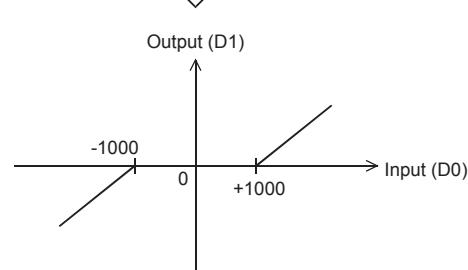
Program example

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 ≤ D0 ≤ +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). |