24 STANDARD BITWISE BOOLEAN FUNCTIONS

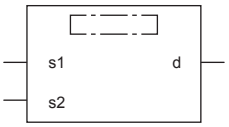
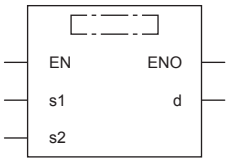
24.1 AND Operation, OR Operation, XOR Operation

AND(_E), OR(_E), XOR(_E)

FX5S FX5UJ FX5U FX5UC

- AND(_E): Outputs the logical product of input values.
- OR(_E): Outputs the logical sum of input values.
- XOR(_E): Outputs the exclusive logical sum of input values.

Ladder diagram, FBD/LD*1		Structured text*1

[Without EN/ENO]
 
	[With EN/ENO]
	 
		[Without EN/ENO]
		d:=AND(s1,s2);
		d:=OR(s1,s2);
		d:=XOR(s1,s2);
		[With EN/ENO]
		d:=AND_E(EN,ENO,s1,s2);
		d:=OR_E(EN,ENO,s1,s2);
		d:=XOR_E(EN,ENO,s1,s2);

*1 The input variable "s" can be changed in the range of 2 to 28.

Setting data

■Descriptions, types, and data types

Argument	Description	Type	Data type
EN	Execution condition (TRUE: Execution, FALSE: Stop)	Input variable	BOOL
s1(IN1) to s28(IN28)	Input	Input variable	ANY_BIT
ENO	Output status (TRUE: Normal, FALSE: Abnormal)	Output variable	BOOL
d(AND(_E) / OR(_E) / XOR(_E))	Output	Output variable	ANY_BIT

Processing details

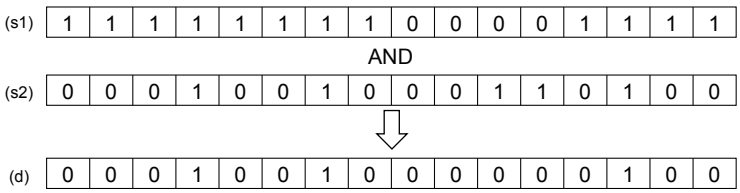
■Operation processing

1. AND(_E)

- These functions perform the logical AND on the BOOL, WORD, or DWORD type data input in (s1) to (s28) bit by bit, and output the operation result from (d) in the same data type as (s).

Ex.

When the data type is WORD

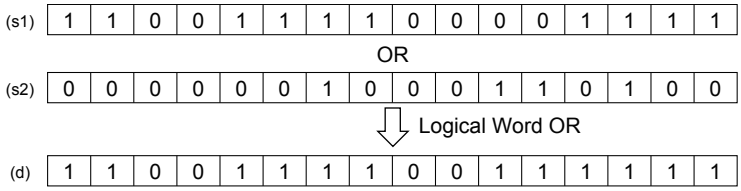


2. OR(_E)

- These functions perform the logical OR on the BOOL, WORD, or DWORD type data input in (s1) to (s28) bit by bit, and output the operation result from (d) in the same data type as (s).

Ex.

When the data type is WORD

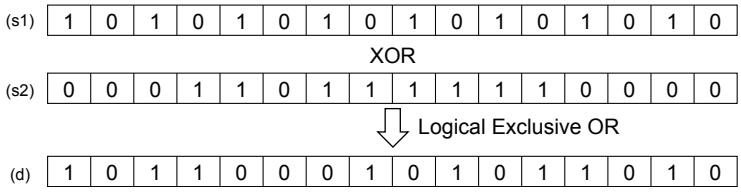


3. XOR(_E)

- These functions perform the exclusive logical OR on the BOOL, WORD, or DWORD type data input in (s1) to (s28) bit by bit, and output the operation result from (d) in the same data type as (s).

Ex.

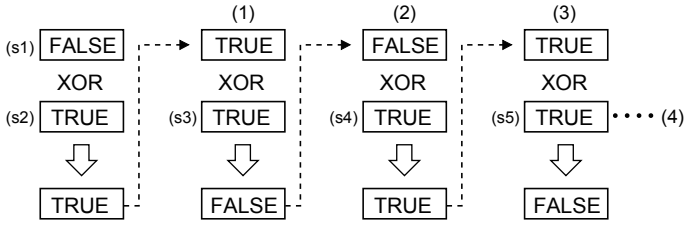
When the data type is WORD



- When three or more variables (s) exist, XOR is performed between (s1) and (s2) first, and XOR is successively performed between the result and (s3). When the expression includes (s4), XOR is performed between the result of XOR with (s3) and (s4). In this manner, XOR is repeated by the number of variables (s) in the order with (s5), (s6), and so on.

Ex.

When the data type is BOOL



(1): For 3 INs
(2): For 4 INs
(3): For 5 INs
(4): XOR is repeated by the number of variables (s).

■Operation result

1. Function without EN/ENO

The operation processing is executed. The operation output value is output from (d).

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 output 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

There is no operation error.