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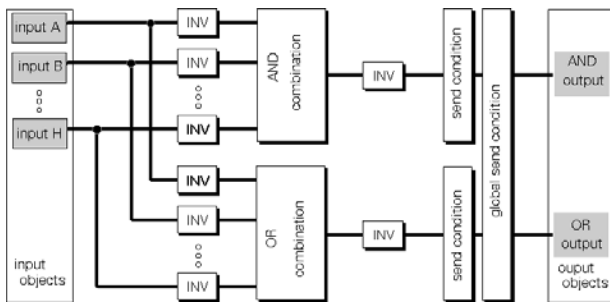
Devices Employing the Program

Product family: Controller
Product type: Controller
Manufacturer: Siemens

Name: Logic module N301
Order-no.:   5WG1 301-1AB01

Application Description

This application allows you to combine up to 8 inputs via a logic AND operation and an OR operation. The results are passed on to separate outputs (AND, OR).

Furthermore, the inputs and outputs of the AND and OR gates can be inverted individually.
The outputs can be assigned sending conditions (output filters) that rule the sending of telegrams via that output. By inverting all inputs and the output, the OR gate can be converted to an AND gate and vice versa. Thus, it is possible to realize 2 separate AND or OR gate with 4 inputs each with a single logic module.

Communication Objects

Product		Program	Order number
	no. Function	Object name	Type
Logic module N 301		11 CO AND-8/2 720101	5WG1 301-1AB01
	0 Inputs	A	1 Bit
	1 Inputs	B	1 Bit
	2 Inputs	C	1 Bit
	3 Inputs	D	1 Bit
	4 Inputs	E	1 Bit
	5 Inputs	F	1 Bit
	6 Inputs	G	1 Bit
	7 Inputs	H	1 Bit
	8 Outputs	AND	1 Bit
	9 Outputs	OR	1 Bit

Note:

The order of the entries may vary from the above due to individual customization of the table.

Obj	Function	Object name	Type	Flag
0	Inputs	A	1-Bit	CWTU
Via this object's group addresses input A's switching telegrams are received. The logic operation that is to be used on this input can be selected in the parameter list. The input also can be used to both gates or none at all.				
1	Inputs	B	1-Bit	CWTU
Via this object's group addresses input B's switching telegrams are received. The logic operation that is to be used on this input can be selected in the parameter list. The input also can be used to both gates or none at all.				
2	Inputs	C	1-Bit	CWTU
Via this object's group addresses input C's switching telegrams are received. The logic operation that is to be used on this input can be selected in the parameter list. The input also can be used to both gates or none at all.				
3	Inputs	D	1-Bit	CWTU
Via this object's group addresses input D's switching telegrams are received. The logic operation that is to be used on this input can be selected in the parameter list. The input also can be used to both gates or none at all.				
4	Inputs	E	1-Bit	CWTU
Via this object's group addresses input E's switching telegrams are received. The logic operation that is to be used on this input can be selected in the parameter list. The input also can be used to both gates or none at all.				
5	Inputs	F	1-Bit	CWTU
Via this object's group addresses input F's switching telegrams are received. The logic operation that is to be used on this input can be selected in the parameter list. The input also can be used to both gates or none at all.				
6	Inputs	G	1-Bit	CWTU
Via this object's group addresses input G's switching telegrams are received. The logic operation that is to be used on this input can be selected in the parameter list. The input also can be used to both gates or none at all.				
7	Inputs	H	1-Bit	CWTU
Via this object's group addresses input H's switching telegrams are received. The logic operation that is to be used on this input can be selected in the parameter list. The input also can be used to both gates or none at all.				
8	Outputs	AND	1-Bit	CRTU
Via this object's group address the result of the logic AND operation are sent. A parameter is provided to ruling whether telegrams are sent only on an object state of logic "1", logic "0" or both.				

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Obj	Function	Object name	Type	Flag
9	Outputs	OR	1-Bit	CRTU

Via this object's group address the result of the logic AND operation are sent. A parameter is provided to ruling whether telegrams are sent only on an object state of logic "1", logic "0" or both.

Maximum number of group addresses: 12
Maximum number of assignments: 15

Parameters

AND Inputs

Parameters	Settings
Input A	**not connected** direct inverted
Input B	**not connected** direct inverted
Input C	**not connected** direct inverted
Input D	**not connected** direct inverted
Input E	**not connected** direct inverted
Input F	**not connected** direct inverted
Input G	**not connected** direct inverted
Input H	**not connected** direct inverted

Each of these parameter rules whether the corresponding output object is to be used to the AND gate.
"not connected": The respective input object is not used to the AND operation.
"direct": The respective input object is used to the AND opera-

tion and the input is not inverted by the logic gate. A "1" telegram is forwarded as a logic "1"to the respective logic input of the AND gate and a "0" telegram is forwarded as a logic "0"
"inverted": The respective input object is used to the AND operation and the input of the logic gate is inverted. A "1" telegram is forwarded as a logic "0"to the respective logic input of the AND gate and a "0" telegram is forwarded as a logic "1"

AND Output:

Parameters	Settings
Invert AND output	**No** Yes

This parameter rules whether the result of the logical AND operation is inverted before forwarding it to object "Output AND".
"No": The result of the AND operation is not inverted to passing it on to the output object. A logic "1" at the output of the AND gate is sent as a "1" telegram according to the specified send condition and a logical "0" as a "0" telegram
"Yes": The result of the AND operation is inverted to passing it on to the output object. A logic "1" at the output of the AND gate is sent as a "0" telegram according to the specified send condition and a logical "0" as a "1" telegram

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OR inputs:

Parameters	Settings
Input A	**not connected** direct inverted
Input B	**not connected** direct inverted
Input C	**not connected** direct inverted
Input D	**not connected** direct inverted
Input E	**not connected** direct inverted
Input F	**not connected** direct inverted
Input G	**not connected** direct inverted
Input H	**not connected** direct inverted
Each of these parameter rules whether the corresponding output object is to be used to the OR gate. "not connected": The respective input object is not used to the OR operation. "direct": The respective input object is used to the OR operation and the input is not inverted by the logic gate. A "1" telegram is forwarded as a logic "1"to the respective logic input of the OR gate and a "0" telegram is forwarded as a logic "0" "inverted": The respective input object is used to the OR operation and the input of the logic gate is inverted. A "1" telegram is forwarded as a logic "0"to the respective logic input of the AND gate and a "0" telegram is forwarded as a logic "1"	

OR Output:

Parameters	Settings
Invert OR output	**No** Yes
This parameter rules whether the result of the logical OR operation is inverted before forwarding it to object "Output OR". "No": The result of the OR operation is not inverted to passing it on to the output object. A logic "1" at the output of the OR gate is sent as a "1" telegram according to the specified send condition and a logical "0" as a "0" telegram "Yes": The result of the OR operation is inverted to passing it on to the output object. A logic "1" at the output of the AND gate is sent as a "0" telegram according to the specified send condition and a logical "0" as a "1" telegram	

Outputs:

Parameters	Settings
Used outputs	**AND and OR** only AND only OR
A logic operation that is not used must be disabled. The communication object of an enabled output must be assigned an address. Otherwise the logic module might malfunction. "AND and OR ": Both logic operations are used and therefore both output objects must be assigned a group address. "only AND ": Only the AND operation is used. The parameter settings to the OR operation are ignored. It is not necessary to assign group addresses to "Outputs OR". "only OR ": Only the OR operation is used. The parameter settings to the AND operation are ignored. It is not necessary to assign group addresses to "Outputs AND".	
Send condition for both outputs	**only on changes at output** on each reception
This parameter rules when the results of logic operations is to be sent. "only on changes at output": The used outputs only send when the result of the AND or OR is changed by receiving a new input edge, either from "0" to "1" or from "1" to "0" and the send condition is not set otherwise. "on each reception ": The used outputs send every time an input is received provided the send condition is not set otherwise. Here it does not matter whether the input object is used with the logic operation of this output. This setting must not be chosen when assigning a group address to the output of a logic operation that points to an input as the sending of an output would be immediately received at that input which would in turn produce another telegram and so on, resulting in a continuous circle of telegrams at maximum frequency.	

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Parameters	Settings
Send condition for AND output	**none** only on 1 at output only on 0 at output
This parameter defines the state of the AND output object required to sending telegrams: "none": According to the "sending conditions to both outputs" parameter the object "AND output" sends telegrams to every result of the logic operation. "only on 1 at output ": according to the "sending conditions to both outputs" parameter the object "AND output" sends telegrams only when the result of the logic operation is "1". "only on 0 at output ": according to the "sending conditions to both outputs" parameter the object "AND output" sends telegrams only when the result of the logic operation is "0".	
Send condition for OR output	**none** only by 1 on output only by 0 on output
This parameter defines the state of the OR output object required to sending telegrams: "none": According to the "sending conditions to both outputs" parameter the object "OR output" sends telegrams to every result of the logic operation. "only on 1 at output": according to the "sending conditions to both outputs" parameter the object "OR output" sends telegrams only when the result of the logic operation is a "1". "only on 0 at output": according to the "sending conditions to both outputs" parameter the object "OR output" sends telegrams only when the result of the logic operation is a "0".	