

Provide Intermediate Rung Output

OUTPUT S8

DESCRIPTION

The OUTPUT function is provided to simplify user programming and to improve execution time. It is entered as a Special Function but does not involve the same overhead.

Execution time is similar to that of a simpler instruction, e.g. coil, contact, AND.

The OUTPUT Special Function provides an intermediate rung output in the middle of a rung, placing this output in a data table location specified with the following VALUE instruction.

On controllers that have floating point facilities, it works in exactly the same way. However, in this case, the table location specified with the VALUE depends on the type of rung input to the OUTPUT. It must be:

- in a floating point table if the rung input is a floating point number, or:
- in an integer table if the rung input is integer

FEATURES

- Allows monitoring of intermediate rung values without dividing one rung into two separate rungs
- Aids debugging of user program
- Simple to use
- No possibility of run-time fault conditions

SPECIFICATION

Control language:-

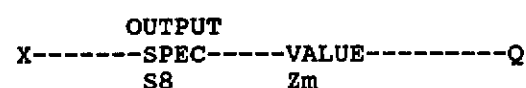


Table 1 Program rung data

Sym	Location	Use	Range
X	Rung Input	Result from previous element in rung	Any value
Zm	Value location	Data table location where X is to be stored	Any write-enabled table usable by Special Functions
Q	Rung Output	Input to subsequent computation	Same value as X

Q and X always have the same value and are also of the same type. That is, if X is an integer, so is Q; if X is floating point, then so is Q.

Further, the table specified by Zm must be of the same type as Q and X. That is, if X is floating point, then Zm must specify a Q-table location: if X is integer, then Zm can specify any integer table such as G-table, W-table, B-table, D-table, etc. Any Q table location must have a number that is even or zero, e.g. Q6, Q0, Q58, etc.

For serial link data, however, you can use K-table with OUTPUT for either integer or floating point values.

APPLICATION NOTES

1. Monitoring Intermediate Values

By including OUTPUTs you can monitor intermediate values in a rung that would not otherwise be accessible.

For instance, when you use ADDs and SUBs in a calculation, the result of either of these operations is not monitorable unless you directly output the result and terminate the rung.

For instance, if you have a 3-term control using PIDABS, you could have a rung such as:

SETPT	M/VAL	PIDABS		CNTRL
<AND>	<SUB>	SPEC	VALUE	<OUT>
W230	W314	S34	W1050	W451

With this rung, the problem is that you cannot directly monitor the error between the setpoint (SETPT) and the measured value (M/VAL). To get round the problem, you could split the rung into two

SETPT	M/VAL			ERROR
<AND>	<SUB>			<OUT>
W230	W314			W1200
ERROR	PIDABS			CNTRL
<AND>	SPEC	VALUE		<OUT>
W1200	S34	W1050		W541

However, you cannot then monitor the output of the PIDABS at the same time as the setpoint. On the other hand, you could do this by adding an OUTPUT before the PIDABS as below:

SETPT	M/VAL	OUTPUT		PIDABS		CNTRL
<AND>	<SUB>	SPEC	VALUE	SPEC	VALUE	<OUT>
W230	W314	S8	W1200	S34	W1050	W541

2. Use as a Commissioning Aid

While commissioning your plant, you can edit in OUTPUT Special Functions to examine the intermediate state of a rung. Once the plant has been commissioned, you can then delete the OUTPUT and VALUE from the program.



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