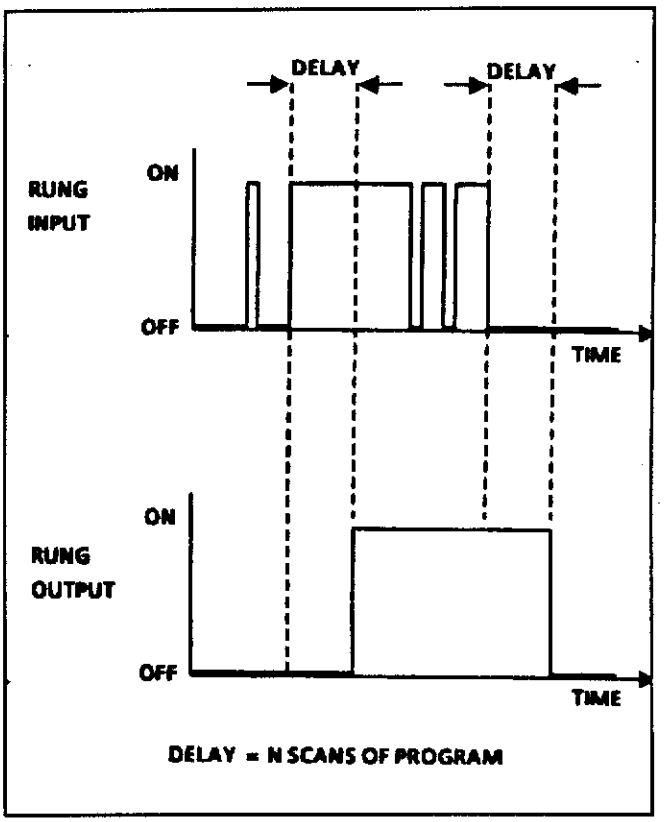
CEGELEC
INDUSTRIAL CONTROLS

Debounce Functions for Logic Input Signal — DBOUNCE S0

DESCRIPTION

The DBOUNCE function may be used to condition a logic input signal which is prone to transient or spurious operation.

It provides a means of ignoring transient changes of signal state until the signal has remained static for a chosen number of scans of the user program.



FEATURES

- Symmetrical switch ON and switch OFF action
- Provision for initialisation

SPECIFICATION

Control language:-

```
        DBOUNCE
X-------SPEC--------VALUE-------Q
        S0            Zm
```

Table 1 Program rung data

Sym	Location	Use	Range
X	Rung Input	'Bouncy' input signal	OFF (zero) or ON (non zero)
Q	Rung Output	'Smoothed' version of input signal	OFF (zero) or ON (-1)
Zm	Value location	Start of parameter list (5 locations)	Any write enabled table usable by special functions

Table 2 Value data

Sym	Location	Use	Range
F	Zm	Fault code and flags	See Table 3.
N*	Zm + 1	User chosen number of scans for which input must be steady.	0 to +32767 Typically 4 to 50
C	Zm + 2	Current count of consecutive scans with input state different from output state.	0 to N
Q'	Zm + 3	Previous output state	OFF (zero) or ON (-1)
M*	Zm + 4	Mode control input	OFF (zero) to hold output to OFF ON (non-zero typically -1) to enable

* data set up by user

Table 3 Fault conditions

Conditions	Result	Code in Zm	
		Numeric Value	States ON
Programming error. No VALUE after SPEC	Q = 0 (OFF)	-	-
Programming error. Invalid VALUE location: a) Number instead of address b) Zm in write protected memory c) Zm in table not usable by special functions d) Zm + 4 beyond end of data tables memory area.	Q = 0 (OFF)	-	-
Invalid number os scans: N<0	Q = Q' = 0 C = 0	5	0 & 2
Mode control input OFF: M = 0	Q = Q' = 0 C = 0	9	0 & 3

APPLICATION NOTES

1. Initialisation

For most applications the mode control facility is not required and the mode control input can be preset ON (typically M = -1) so that DBOUNCE operates continuously.

Typical applications of the mode control input are:

a) To hold the scan count to zero (C = 0) until some initial conditions defined by the user are satisfied.

b) To force the output to OFF, avoiding the delay due to DBOUNCE action.

2. Very Bouncy Signals

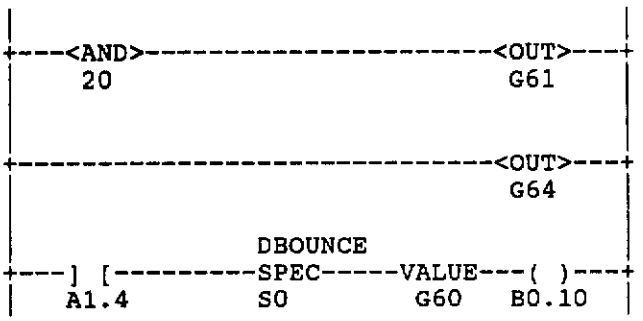
The DBOUNCE function is intended to obtain a single transition for an input which tends to chatter as it reaches the changeover point. It is not suitable for a signal which chatters continuously, because the criterion of N consecutive scans in the same state will be satisfied only if the signal eventually settles firmly in one state or the other.

3. Example

a) Requirements

A switch (input A1.4) detects the presence of material on a conveyor. The granular nature of the material leads to multiple transitions of the switch at the ends of a batch of material. A signal (output B0.10) is required to give a definite material present/absent indication.

b) Program rung



c) Value data

G60 Fault code and flags
G61 No. of scans (set to 20 by user)
G62 Current scan count
G63 Previous output
G64 Mode control (set to -1 by user)

d) Remarks

This example illustrates the use of program rungs to set up 'value' data. For controllers which include functions LOCATE (S20) and MOVE (T20), the same effect may be obtained by entering the data in the preset table and copying to a working value table on start up. The MOVE function data sheet shows a typical program using the P and W tables for this purpose. If the controller has a write enabled preset table, then the preset table itself can be used for the value location.

For a typical program repetition interval of 100ms, the counting of 20 scans would introduce an effective delay of 2 seconds.

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