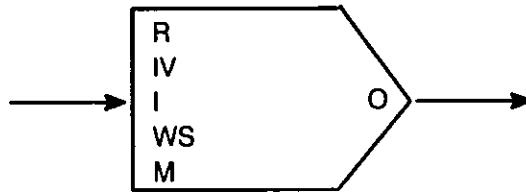


21.0 PULSE MULTIPLIER

This function can be used in AutoMax Control Block tasks and UDC Control Block tasks.



Function

If WORD_SIZE > 0 (Relative mode), then

If RESET@ = TRUE then

ERROR = 0

Rem (n-1) = 0

Error = sign extended (Error masked with (16-WORD_SIZE))

else if TRUE to FALSE transition on RESET@ then

Input (n-1) = INITIAL VALUE

Error = INPUT - Input (n-1)

Error = sign extended (Error masked with (16-WORD_SIZE))

else (RESET@ = all other conditions)

if (FIRST PASS) then

INPUT (n-1) = INPUT

Error = INPUT - INPUT (n-1)

Error = sign extended (Error masked with (16-WORD_SIZE))

else (Absolute mode) then

If RESET@ = TRUE then

Error = 0

Rem (n-1) = 0

else (RESET@ = all other conditions)

Error = INPUT

(Calculate OUTPUT and Remainder (n-1) for both modes)

Ans (real) = ((Error * MULTIPLIER) / 32768) + Rem (n-1))

OUTPUT = INT (Ans)

Rem (n-1) = Ans - OUTPUT

Program Statement

```
CALL PULSE_MULT(INPUT = input%,  
  RESET = reset@,  
  WORD_SIZE = nnn,  
  INITIAL_VALUE = initial_value%,  
  MULTIPLIER = multiplier%,  
  OUTPUT = output%)
```

&
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Inputs

R (RESET) =

BOOLEAN multiplier reset. The default for this parameter is FALSE. If TRUE, OUTPUT is held to zero and all internal registers are set to zero. If TRUE to FALSE transition, the INPUT(n-1) term will be obtained from INITIAL_VALUE [not applicable when used in absolute mode (WORD_SIZE = 0)]. If FALSE, the block will function normally.

IV (INITIAL_VALUE) =

INTEGER preset of INPUT (n-1). The default for this parameter is zero. On the TRUE to FALSE transition of RESET, INITIAL_VALUE is used as INPUT (n-1) when computing relative counts/scan. INITIAL_VALUE must be right-justified within the 16-bit word regardless of the WORD_SIZE value.

I (INPUT) =

INTEGER signal input. This parameter must be specified. It must be specified as a variable name only (literal value not accepted).

WS (WORD_SIZE) =

INTEGER word size of input (in bits). Specifies the number of significant bits in INPUT beginning with bit 0 (right-justified). The default for this parameter is zero. If specified, it must be entered explicitly as a numeric literal between 0 and 16, inclusive. If WORD_SIZE equals 0, INPUT must be in counts/scan (absolute mode). If WORD_SIZE does not equal 0, INPUT must be right-justified and a relative counts/scan value is computed as [(INPUT - INPUT(n-1))].

M (MULTIPLIER) =

INTEGER multiplier ratio. The default for this parameter is 32768, giving an overall gain of 1.0. This parameter divided by 32768 controls the ratio of input to output counts.

Outputs

O (OUTPUT) =

INTEGER signal output. This parameter must be specified.

Notes

1. Not programming (defaulting) the MULTIPLIER parameter is the only way of achieving a gain equal to 1. If programmed, the nearest value to 1.0 that the overall gain can achieve is $32767 : 32768$, or 0.9999695.
2. The intended use of this block is to provide an interface from a frequency input module, such as the resolver feedback, to the digital system. It also provides a means to scale position information properly without losing any information from one scan to the next. This is accomplished by saving the remainder after the divide operation and adding it during the next scan calculations.