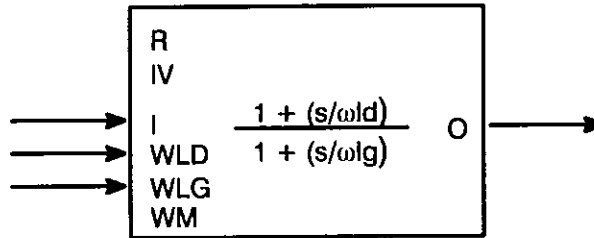


# 44.0 LEAD/LAG

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



## Function

$$\text{LAPLACE TRANSFER FUNCTION} = \frac{1 + (s/\omega d)}{1 + (s/\omega l g)}$$

## Program Statement

```
CALL LEAD_LAG(INPUT = input%,                                &
               WLD = wld,                                     &
               WLG = wlg,                                     &
               WM = nnn.n,                                    &
               INITIAL_VALUE = initial_value%,               &
               RESET = reset@,                                &
               OUTPUT = output%)                              &
```

## Inputs

R (RESET) =

BOOLEAN device reset. The default for this parameter is FALSE. When this parameter is TRUE, OUTPUT will be held at INITIAL\_VALUE.

IV (INITIAL\_VALUE) =

INTEGER initial value. The default for this parameter is zero.

I (INPUT) =

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

WLD ( $\omega d$ ) =

REAL lead frequency in radians/second. This parameter must be specified. You must include a decimal point in the actual value.

WLG ( $\omega l g$ ) =

REAL lag frequency in radians/second. This parameter must be specified. You must include a decimal point in the actual value.

WM ( $\omega_m$ ) =

REAL mapping frequency in radians/second. If specified, this parameter must be entered explicitly as a real literal. The default value for this parameter is  $\omega_s$  divided by 20 where  $\omega_s$  is the frequency in rad/sec. You must include a decimal point in the actual value.

## Outputs

O (OUTPUT) =

INTEGER signal output. This parameter must be specified.

### 44.1 LEAD\_LAG, $\omega_{ld}$ , $\omega_{lg}$ , and $\omega_m$ Limitations

$\omega_{ld}$ ,  $\omega_{lg}$ , and  $\omega_m$  are equal to or greater than 0.001.

$\omega_{ld}$ ,  $\omega_{lg}$ , and  $\omega_m$  are equal to or less than  $2\pi$  divided by  $4.5 T$ .

Low Limit = 0.001

High Limit =  $\frac{2\pi}{4.5T}$

where:

T = scan period in seconds

= number of CPU clock ticks times tick rate

LEAD\_LAG  $\omega_{ld}:\omega_{lg}$  or  $\omega_{lg}:\omega_{ld}$  ratio restrictions

maximum = 20:1

minimum = 2:1

LEAD\_LAG  $\omega_s:\omega_{ld}$  and  $\omega_s:\omega_{lg}$  ratio restrictions

minimum = 4.5:1

where:

$\omega_s$  = scan frequency in radians/second

=  $\frac{2\pi}{T}$

T = scan period in seconds

= number of CPU clock ticks times tick rate