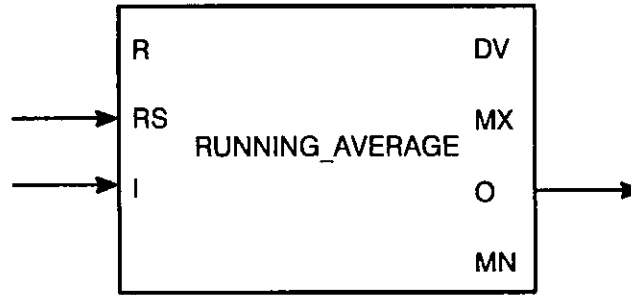


25.0 RUNNING AVERAGE

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



Function

$$\text{OUTPUT} = \frac{(\text{INPUT}(n) + \dots + \text{INPUT}(n+1))}{(\text{REQUIRED_SAMPLES})}$$

The OUTPUT is updated each scan with the average of the samples read for INPUT over the last RS scans.

Program Statement

```
CALL RUNNING_AVERAGE(REQUIRED_SAMPLES=req_sam,    &
  RESET=reset@,                                    &
  INPUT=input%,                                     &
  DATA_VALID=data_valid@,                         &
  MAX_VALUE=max_value%, MIN_VALUE=min_value%,     &
  OUTPUT=output%)
```

Inputs

RS (REQUIRED_SAMPLES) =

Required number of samples to average, type INTEGER. This parameter must be entered explicitly as a numeric literal. The value entered for REQUIRED_SAMPLES can range from 1 to 32767. See note 1 for details.

R (RESET) =

Reset input, type BOOLEAN. This is an optional parameter. The default is FALSE. When this input is true, the following occur: the internal storage areas are initialized, OUTPUT is set to zero, VALID_DATA is set FALSE, MAX_VALUE is set to -32768, and MIN_VALUE is set to 32767.

I (INPUT) =

Signal input, type INTEGER. This parameter must be specified as a numeric symbol only (literal value not accepted).

Outputs

DV (DATA_VALID) =

Data valid output, type BOOLEAN. This is an optional parameter. DATA_VALID is set TRUE after a minimum of RS samples have been read since RESET went FALSE. When RESET is TRUE, DATA_VALID is set FALSE.

MX (MAX_VALUE) =

Maximum value output, type INTEGER. This is an optional parameter. This parameter outputs the maximum value sampled for INPUT since RESET went FALSE. When RESET is TRUE, MAX_VALUE is set to -32768.

MN (MIN_VALUE) =

Minimum value output, type INTEGER. This is an optional parameter. This parameter outputs the minimum value sampled for INPUT since RESET went FALSE. When RESET is TRUE, MIN_VALUE is set to 32767.

O (OUTPUT) =

Data output, type INTEGER. This parameter must be specified. OUTPUT is updated each scan with the average of the RS samples read for INPUT over the last RS scan. When RESET is TRUE, OUTPUT is set to a value of zero.

Notes

1. The RUNNING_AVERAGE block creates an internal data storage area that is used to store the last RS samples read for INPUT. The size of the internal data storage area in bytes is equal to two times the required number of samples. If the size of the internal data storage area exceeds 32767 bytes, a compilation error will occur. In addition, since the internal data storage area is local to the control block task, its size is further limited by the maximum size of the total data storage area that the task can allocate for all the local variables.