

PROGRAM RMSCalc

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VAR
VIn : SysGetAnInp; (* Voltage input *)
CaseNr : USINT; (* Program case *)
ASum : REAL; (* Acquisistion sum *)
ACtr : USINT; (* Acquisition counter *)
VMax : REAL; (* Maximum voltage (Peak value) *)
RMS : REAL; (* Root mean square value *)
Voltage : REAL; (* Voltage value *)
END_VAR

```

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1 (* ***** *)
2 (* PROGRAM "RMSCalc" *)
3 (* ***** *)
4 (* This program calculates the voltage and the RMS value of an AC analog *)
5 (* signal connected to the analog input 0 of a SlimLine compact module. *)
6 (* The CPU module acquires only the positive half wave. *)
7 (* ----- *)
8 (* Set the Fast task execution to 500 uS so at 50 Hz up to 20 values in *)
9 (* the positive half wave can be acquired. *)
10
11 IF (SysFirstLoop) THEN
12     SysSetTaskLpTime(TaskID:=ID_TASK_FAST, Time:=500);
13 END_IF;
14
15 (* Analog input acquisistion. *)
16
17 VIn.Address:=255; (* Module address *)
18 VIn.Channel:=0; (* Acquisition channel *)
19 VIn.Mode:=AD_VOLT_0_10_COMMON; (* Acquisition mode *)
20 VIn(); (* Analog input acquisistion *)
21
22 (* ----- *)
23 (* PROGRAM CASES *)
24 (* ----- *)
25 (* Manage the program cases. *)
26
27 CASE (CaseNr) OF
28
29 (* ----- *)
30 (* Wait until the voltage is greather than "0" (Zero crossing). *)
31
32 0:
33 IF (NOT(VIn.Done) OR (VIn.Value <= 0.0)) THEN RETURN; END_IF;
34 ACtr:=1; (* Acquisition counter *)
35 VMax:=VIn.Value; (* Maximum voltage (Peak value) *)
36 ASum:=(VIn.Value*VIn.Value); (* Acquisistion sum *)
37 CaseNr:=CaseNr+1; (* Program case *)
38
39 (* ----- *)
40 (* Check if the analog input is been acquired. *)
41
42 1:
43 IF NOT(VIn.Done) THEN RETURN; END_IF;
44
45 (* Memorize the maximum voltage (Peak value). *)
46
47 IF (VIn.Value > VMax) THEN

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48         VMax:=VIn.Value; (* Maximum voltage (Peak value) *)
49     END_IF;
50
51     (* Calculate the acquisition sum. *)
52
53     ACtr:=ACtr+1; (* Acquisition counter *)
54     ASum:=ASum+(VIn.Value*VIn.Value); (* Acquisition sum *)
55
56     (* Check if the voltage drop below zero (negative half-wave). Now *)
57     (* it's possible to calculate the voltage and the RMS. *)
58
59     IF (VIn.Value <= 0.0) THEN
60         Voltage:=VMax/1.4142; (* Voltage value *)
61         RMS:=SQRT(ASum/ACtr); (* Root mean square value *)
62         CaseNr:=0; (* Program case *)
63     END_IF;
64     ELSE
65         CaseNr:=0; (* Program case *)
66     END_CASE;
67
68 (* [End of file] *)
69

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