APPLICATION NOTE:

MATHEMATICAL CALCULATIONS WITH SEAL

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APPLICATION NOTE

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ATTENTION!

Contact your telephone provider for information on GSM and GPRS service costs. It is best to quantify log and SMS costs before setting up and installing Z-GPRS3, Z-UMTS, Z-LOGGER3.

The use of Z-GPRS3 and Z-UMTS is in data roaming mode (for example, abroad with an Italian SIM card) may generate unexpected costs. Contact your telephone provider for further information.

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ATTENTION!

-Contact your telephone service provider for GSM and GPRS service costs especially when using Z-GPRS3 or Z-UMTS with a sim card issued by a country other than the one in which it is used (international roaming).

-It is best to estimate telephone costs before setting up Z-GPRS3 and Z-UMTS.

-The cost of each SMS is set by the telephone service provider.

-GPRS send/receive costs can be tied to Kbytes sent/received, a monthly ceiling included in a package or GPRS connection time. Contact your telephone service provider for further information.

-Check the data quantity sent via GPRS and SMS before using Z-GPRS3 and Z-UMTS.

Please remember that mobile phone service providers consider the entire communication that permits file transmission as data traffic (and therefore data transmission overhead, the number of connection attempts, etc. must also be included in the count) and not just the dimensions of each 2G/3G transaction.

1. PRELIMINARY INFORMATION ON SEAL

Further information about SEAL can be found in the SEAL Quick Guide and the SEAL online help; further information on Z-GPRS3, Z-UMTS and Z-LOGGER3 can be found in the user manual.

The sample setting refers to Z-GPRS3 but it is the same for the other RTUs.

2. PURPOSE OF THE GUIDE

The purpose of this guide is showing to show how it is possible to do mathematical calculations in the SEAL environment.

Every variable in SEAL can be logged and then sent to a remote server (see other application notes).

In the example, the radius of a circle is defined, the program will calculate the circumference and the area of the circle with that radius.

If the area exceeds an alarm value, digital output 1 is closed.

If the circumference exceeds an alarm value, digital output 2 is closed.

It is possible to change the values of the radius and of the alarm thresholds writing the variables via Modbus TCP-IP, Modbus RTU, SMS or from a web page.

If the RTU is connected to a server in http post (for instance the "Cloudbox" Seneca product), it is possible to change the values also from the Scada page.

3. MATHEMATICAL CALCULATIONS IN SEAL

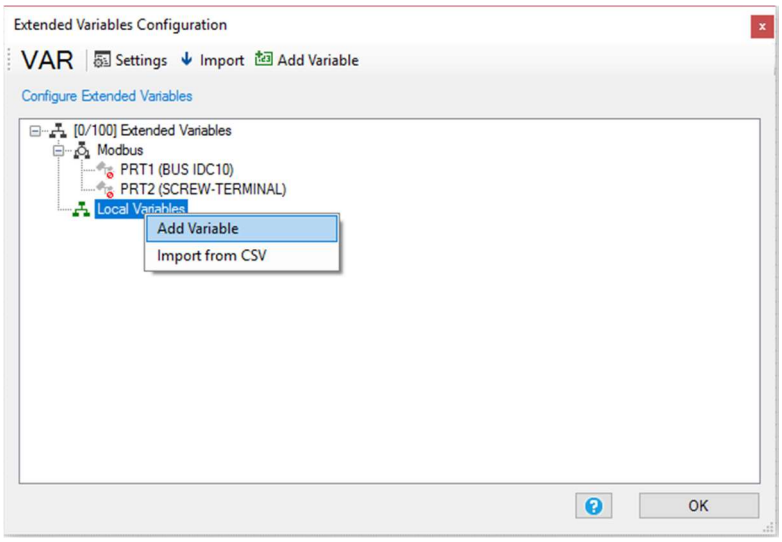
Via SEAL, it is possible to make mathematical calculations creating support variables.

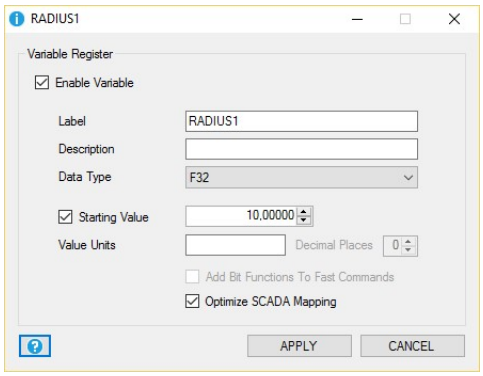
For instance, it is possible to calculate the area and circumference of a circle passing the value of the radius.

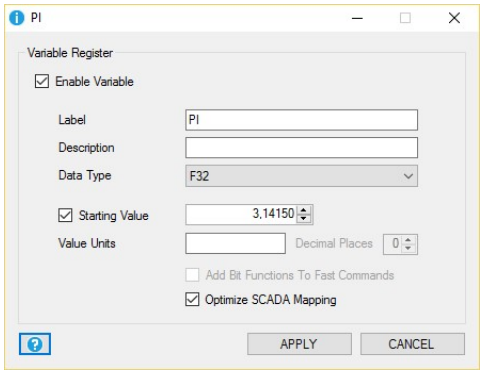
First of all, define some local extended variables to be used for the calculations, give a starting value to the variable because it will serve to define constants such as the pi.

Click on icon 

:

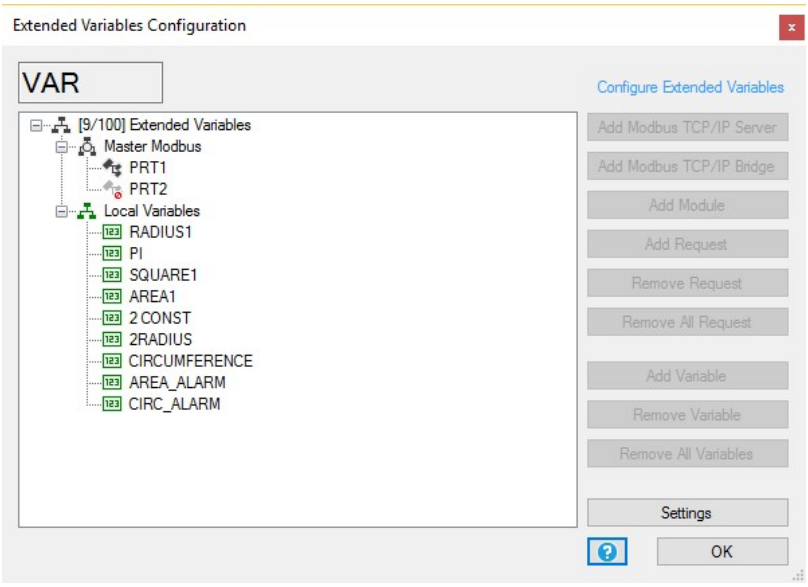




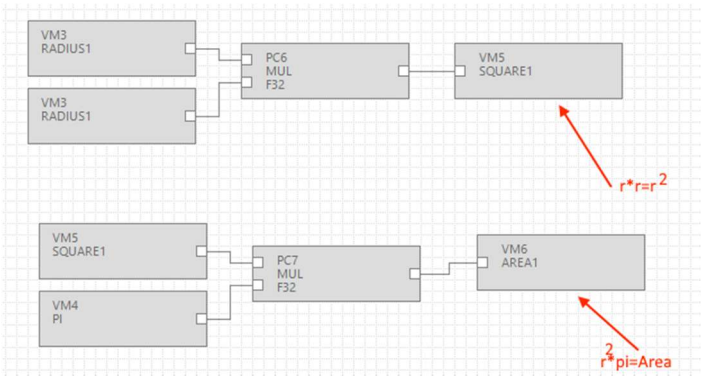


Etc…

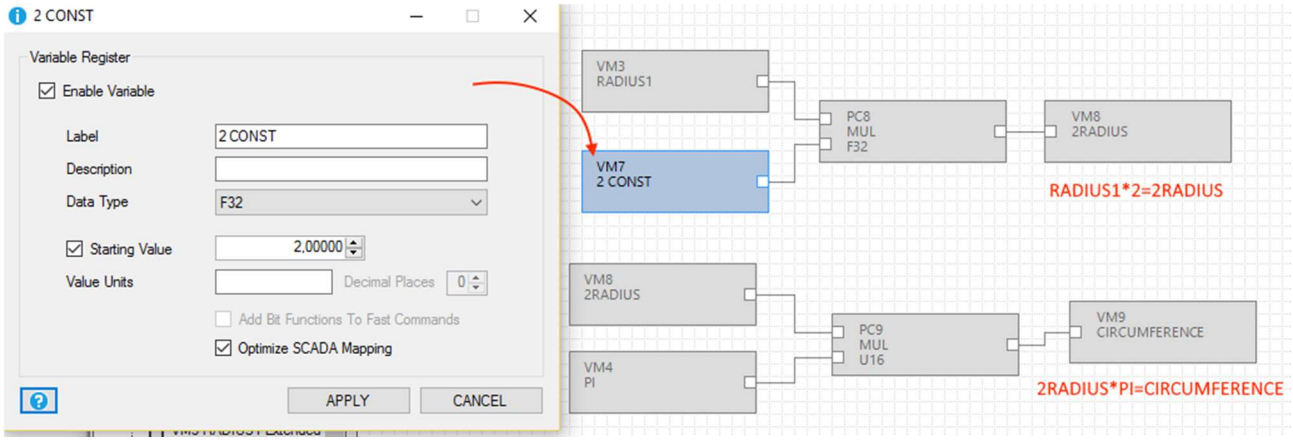
The complete list is as follows:



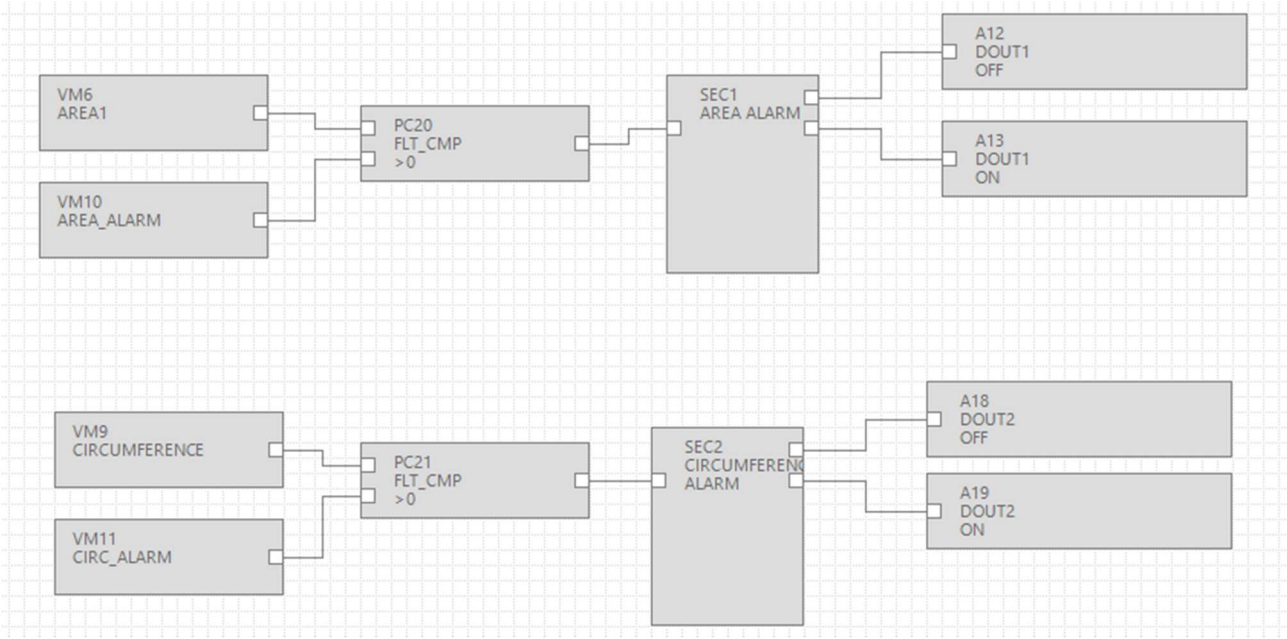
Calculate the circle area and copy it to the "AREA1" variable:



Calculate the circumference defining the constant with value 2:



An alarm can now be generated if the area or circumference exceed an alarm value:



To change the alarm and radius values, it is possible to act via Modbus TCP-IP on the following registers:

Output Messages

#	Level	Facility	Message
449	Debug	Element	PC9 var.prm.5.w.1 = 0x0001
450	Debug	Element	PC9 var.prm.5.w.2 = 0x0001
451	Notice	Build	Slave Address RADIUS1:RADIUS1.F32.LSW Mapped to 41003
452	Notice	Build	Slave Address RADIUS1:RADIUS1.F32.MSW Mapped to 41004
453	Notice	Build	Slave Address PI:PI.F32.LSW Mapped to 41005
454	Notice	Build	Slave Address PI:PI.F32.MSW Mapped to 41006
455	Notice	Build	Slave Address SQUARE1:SQUARE1 Mapped to 41007
456	Notice	Build	Slave Address AREA1:AREA1 Mapped to 41009
457	Notice	Build	Slave Address 2 CONST:2 CONST.F32.LSW Mapped to 41011
458	Notice	Build	Slave Address 2 CONST:2 CONST.F32.MSW Mapped to 41012
459	Notice	Build	Slave Address 2RADIUS:2RADIUS Mapped to 41013
460	Notice	Build	Slave Address CIRCUMFERENCE:CIRCUMFERENCE Mapped to 41014
461	Notice	Build	Slave Address AREA_ALARM:AREA_ALARM.F32.LSW Mapped to 41016
462	Notice	Build	Slave Address AREA_ALARM:AREA_ALARM.F32.MSW Mapped to 41017
463	Notice	Build	Slave Address CIRC_ALARM:CIRC_ALARM.F32.LSW Mapped to 41018
464	Notice	Build	Slave Address CIRC_ALARM:CIRC_ALARM.F32.MSW Mapped to 41019
465	Notice	Build	Slave Address FLT_CMP DELAY_ON.U16 Mapped to 41203

It is easy to act on the values of the variables entering the variable value directly onto the webpage in SD card.

Entering on a browser:

http://192.168.1.101/index.html

The values of the variables can be read and modified directly in the webserver generating the alarms.