APPLICATION NOTE:

SENDING THE LOGS DATA FROM AN INVERTER VIA EMAIL

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APPLICATION NOTE

Date	Version	Changes
15/12/2016	1.00	First issue

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.

IN NO CASE MAY SENECA OR ITS SUPPLIERS BE HELD LIABLE FOR ANY LOSS OF DATA, INCOME OR PROFIT DUE TO INDIRECT, CONSEQUENTIAL OR INCIDENTAL CAUSES (INCLUDING NEGLIGENCE) DERIVING FROM OR CONNECTED WITH THE USE OR INABILITY TO USE Z-GPRS3, Z-UMTS AND Z-LOGGER3, EVEN IF SENECA WAS INFORMED ABOUT THESE POSSIBLE DAMAGES.

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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 to make a simple configuration in Seal, so that the RTU acquires the values from an inverter every minute.

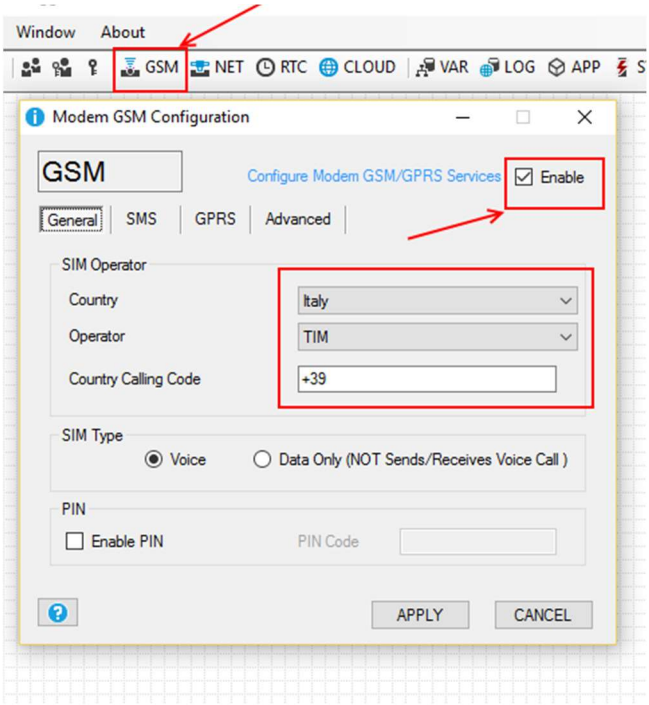
The values acquired are sent via email as cvs text files so that they can be consulted with an Excel™-type program or imported with an external tool.

The inverter is connected to the RS485 terminal of the RTU and communicates with the RTU modbus protocol.

3. SENDING LOGS WITH A 2G/3G+ CONNECTION VIA EMAIL

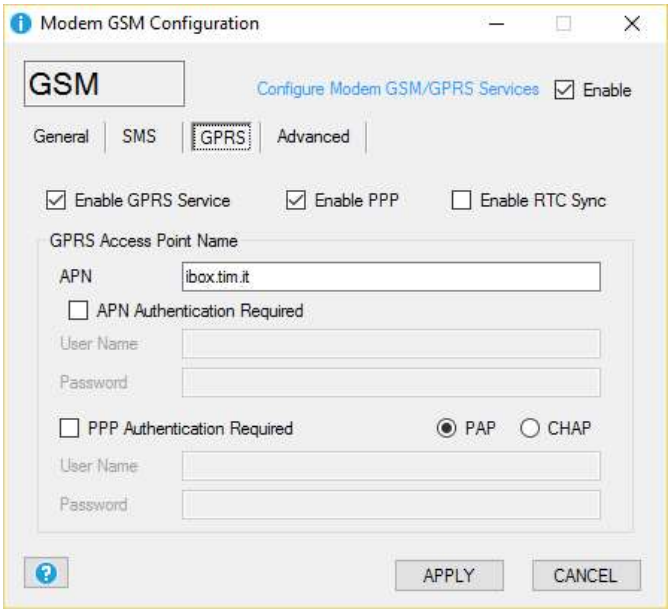
3.1. *CONFIGURATION OF THE GSM MODEM*

If you want to send logs via a 2G modem (3G+ in case of Z-UMTS), click on the GSM icon and then on "Enable", set the parameters regarding the SIM card and service provider (if necessary, enter also the PIN of the SIM card):



Now configure the internet connection via the mobile network.

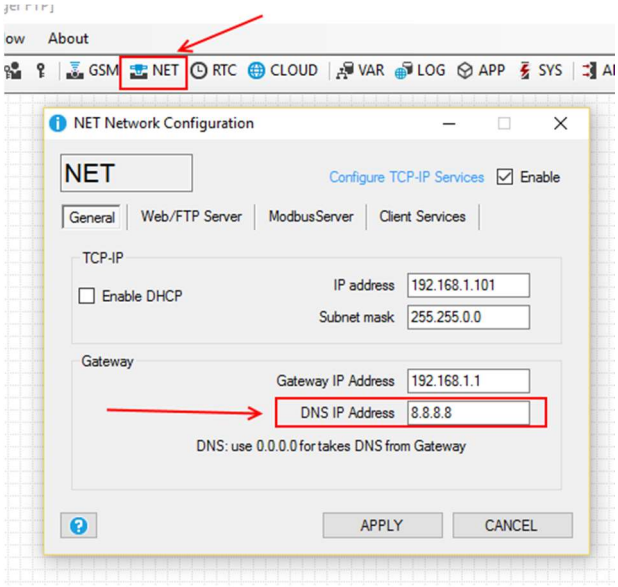
Enable the PPP connection and GPRS services to have an "always on" connection (always active):



Enter the APN (in this case public), shown in the phone contract (in this case ibox.tim.it), and then the PAP authentication (check the correct parameters with the phone operator).

3.2. *CONFIGURING THE ETHERNET PORT*

Now configure the gateway common to the ethernet peripheral:

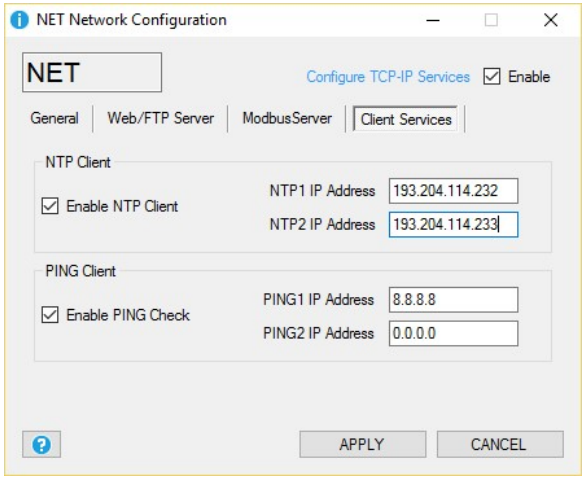


Set the ethernet port and DNS as per the figure.

ATTENTION!

If the APN in the contract is not public, the SIM card cannot access the internet. For this reason, a reachable DNS must be entered (therefore not 8.8.8.8).

Configure the client services:



First of all, set the NTP servers (Network Time Protocol) to maintain date/time synchronization.

ATTENTION!

If the APN in the contract is not public, the SIM card cannot access the internet. For this reason, it is necessary to enter a NTP server reachable inside the network (the set addresses are in the internet and must therefore be modified).

Set also a PING check that is an IP address used by the RTU to verify that the internet connection is active, for instance set the same server as the previously set DNS (8.8.8.8).

ATTENTION!

If the APN in the contract is not public, the SIM card cannot access the internet. For this reason, enter a reachable address on which to give the PING (for instance an internal Gateway).

3.3. *CLOCK CONFIGURATION*

Set the configuration of the clock and calendar with icon 

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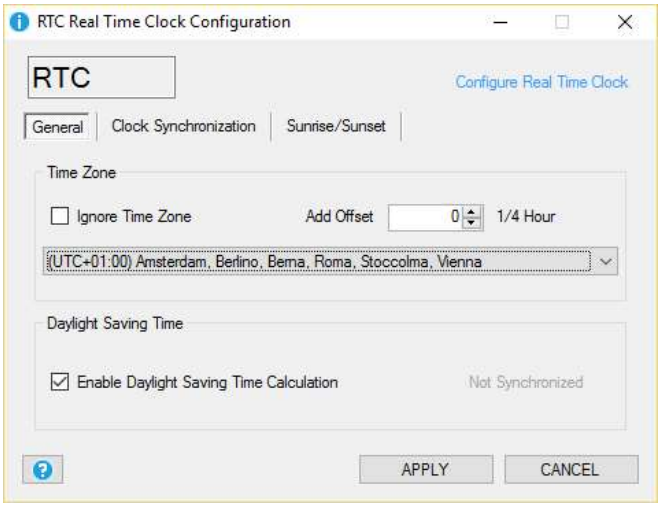
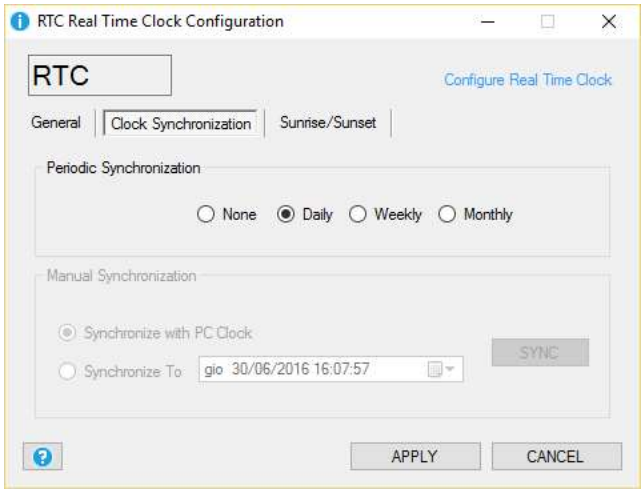
First of all, configure the time zone and set the automatic move to summer time (Daylight Saving Time):



Set date-time synchronization to once a day (Daily):

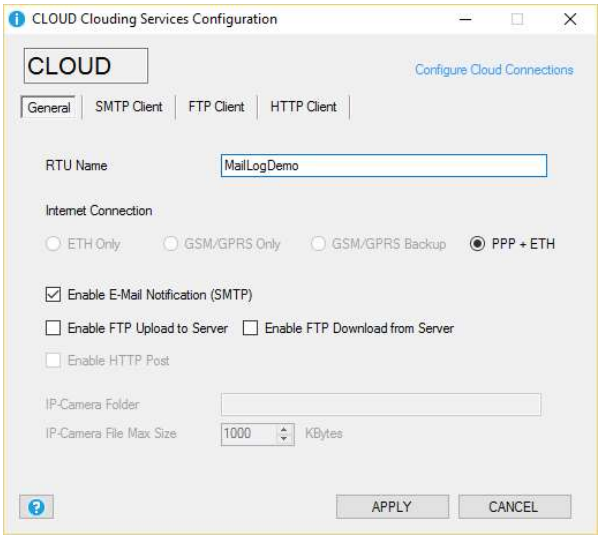


Now select how to send the log files: via EMAIL or via FTP, you cannot select both options.

3.4. *FILE SEND CONFIGURATION ON SMTP SERVER (EMAIL)*

Click on icon CLOUD.

To send the log files vis FTP, it is first necessary to define the name of the RTU (it will be the first part of the sent csv file) and tick sending the files to a Mail server (SMTP):

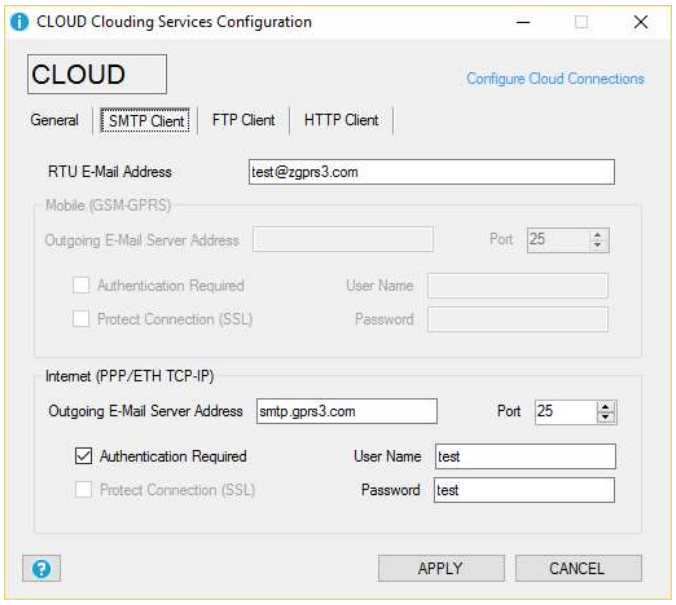


the files will be recognizable in the attachment because they will be:

FTPLogDemo_20160704123345.csv

Set up the account connecting to the SMTP server.

First of all set the EMAIL address of the RTU or the sender address (in the example test@zgprs3.com), the SMTP server, username and password to access the email.



ATTENTION!

SETTING A PPP (ALWAYS ON) CONNECTION, THE RTU CAN SEND EMAILS TO THE SMTP SERVER ONLY IF THEY ARE NOT SSL ENCRYPTED (FOR INSTANCE YOU CANNOT USE THE GMAIL SERVER).

PUBLIC UNENCRYPTED SMTP SERVERS ARE REALLY FEW. USE A COMPANY SMTP SERVER OR INSTALL ONE (FOR INSTANCE HMAIL SERVER FOR WINDOWS). FOR THE INSTALLATION OF HMAIL SERVER, REFER TO THE STEP BY STEP GUIDE.

ATTENTION!

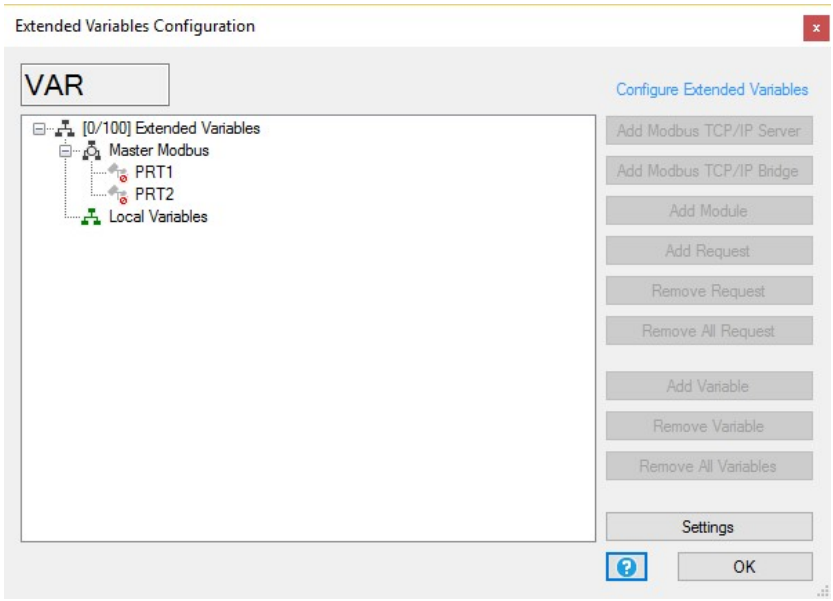
IT IS POSSIBLE TO SEND EMAILS WITH SSL BY DISABLING THE PPP CONNECTION, REFER TO THE RELATIVE APPLICATION NOTE.

ATTENTION!

SENECA ADVISES NOT TO SEND LOG FILES USING PUBLIC SERVERS BECAUSE THE RTU CAN BE CONSIDERED A SPAMMER AND THE SERVER ACCESS CAN GET BLOCKED.

3.5. *CONFIGURING THE EXTENDED VARIABLES (ON RTU MODBUS) OF THE INVERTER*

Now it is possible to define which variables to add to those already available on the RTU, to do this, click icon VAR :



It is possible to extend the variables on board the RTUs using a serial connection with the Modbus RTU protocol or via ethernet with the Modbus TCP-IP protocol (up to a maximum of 100 extended variables).

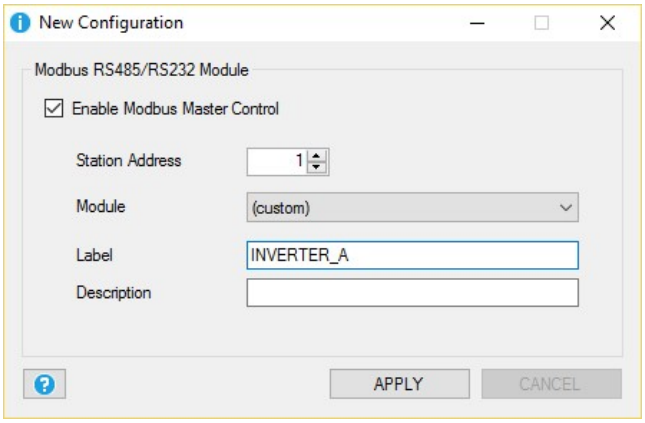
Further information on Modbus protocol is available from:

http://modbus.org/specs.php

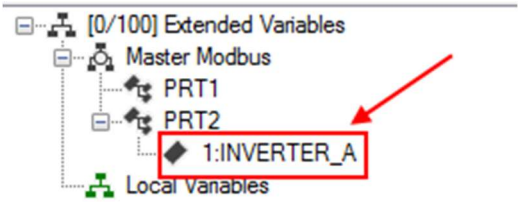
As an example, configure the reading of 3 modbus variables of an inverter connected to RS485 port number 1:

Add a new slave module to the RS485 terminal port (PRT2):

Click on Add Module:



Enter station address 1 and click on APPLY:



Now the inverter is connected to the PRT2 port.

Now enter the addresses of the variables to log, from the inverter documentation you can get the addresses of the 3 string streams:

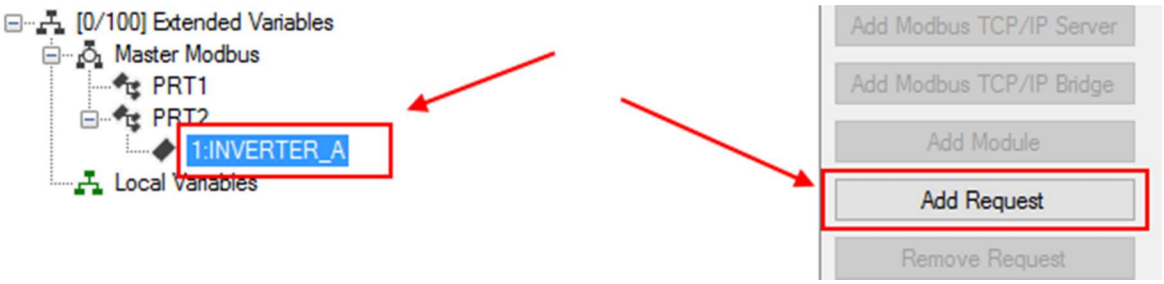
ADR (DEC)	Description/Number code	CNT (WORD)	Type	Format	Access
30057	Serial number [Serial Number]	2	U32	RAW	RO
30241	Operating state [Mode]: 309 = Operation 455 = Warning 1392 = Error 1470 = Disturbance	2	U32	ENUM	RO
30245	SMU ID [SSMId]	2	U32	FIX0	RO
31793	String current of string 1 of a SMU/SMID (A) [CurCh1]	2	S32	FIX3	RO
31795	String current of string 2 of a SMU/SMID (A) [CurCh2]	2	S32	FIX3	RO
31797	String current of string 3 of a SMU/SMID (A) [CurCh3]	2	S32	FIX3	RO

Unfortunately, there is no unique numbering in the modbus, so it is necessary to understand if the modbus 30001 register is 0-offset or 1-offset.

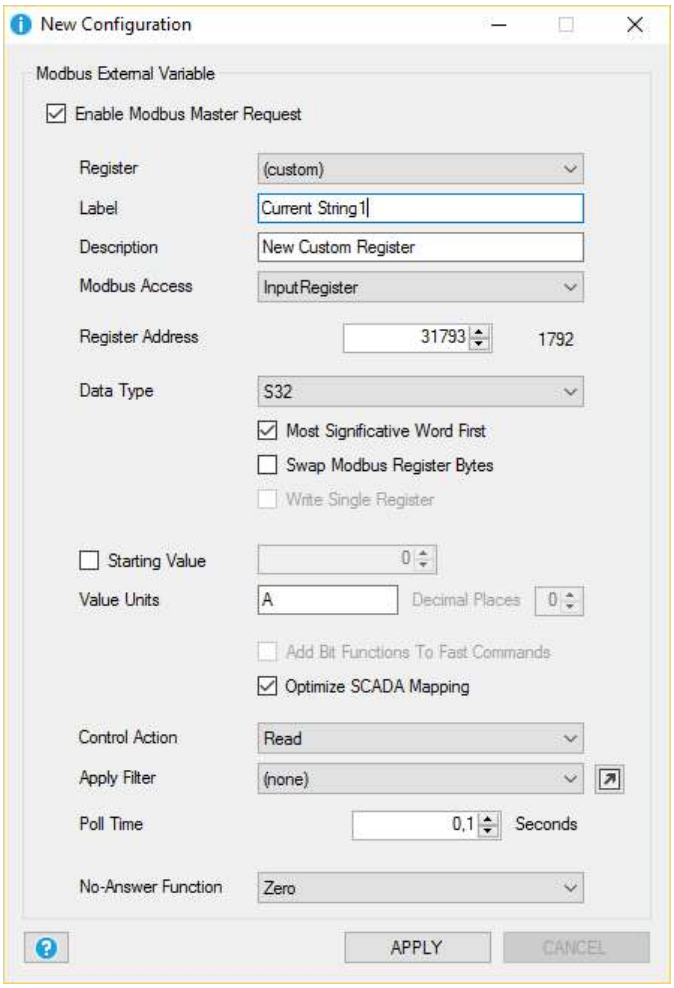
Reading the documentation, you can see that the first available register is 30001 and therefore 0-offset:

ADR (DEC)	Description/Number code	CNT (WORD)	Type	Format	Access
30001	Version number of the SMA Modbus profile	2	U32	RAW	RO

Enter the addresses you are interested in by selecting the inverter and clicking on Add Request:



At this point, enter the first variable filling the details according to the inverter documentation, address 31793 (register offset 1792), 2 consecutive modbus registers (32 bit) and Signed 32 data type (integer with 32-bit sign):



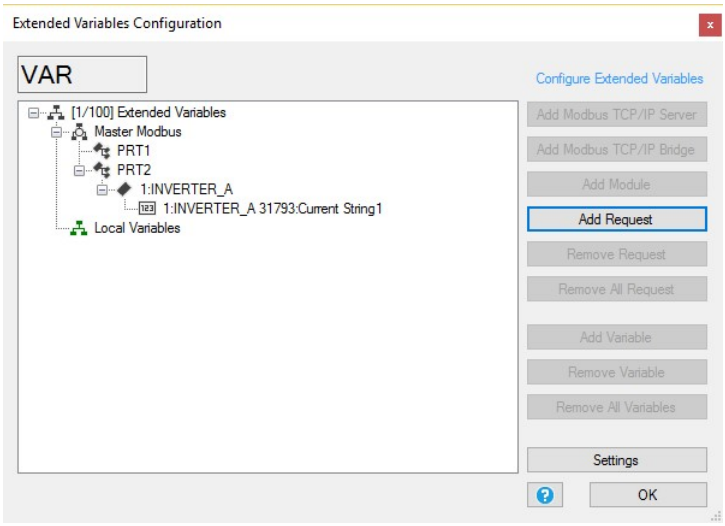
Please note how it has been flagged that the most significant part of the register is in the first register:

REGISTER 31793 MOST SIGNIFICANT PART

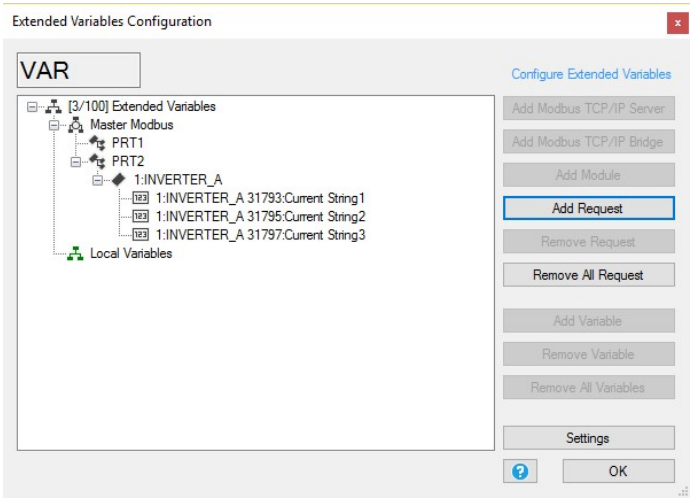
REGISTER 31794 LEAST SIGNIFICANT PART

The name of the variable (tag) that it will have in the datalogger is "Current String1"

Confirm and you have added the new register:



Add the other 2 variables the same way:

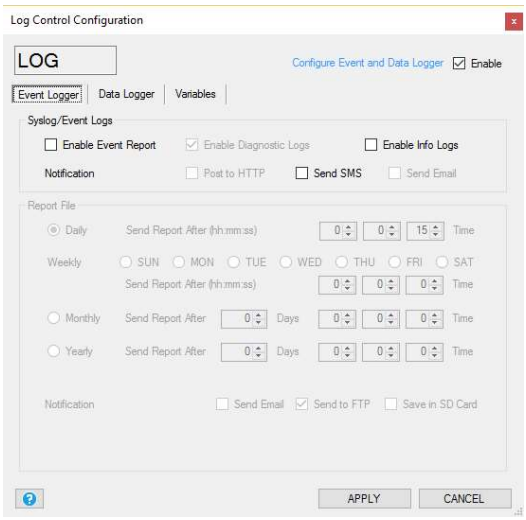


Extended variables are finished.

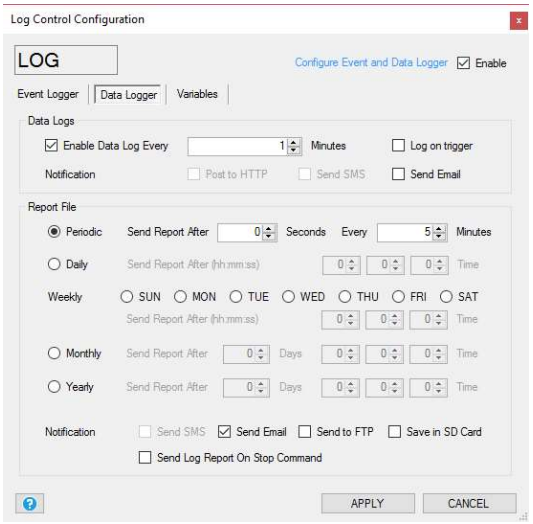
3.6. *LOGGER SETUP*

Now define the logger parameters clicking on icon LOG :

Only data are to be logged, so the event log DOES NOT need to be configured:



Otherwise, configure the Data Logger:

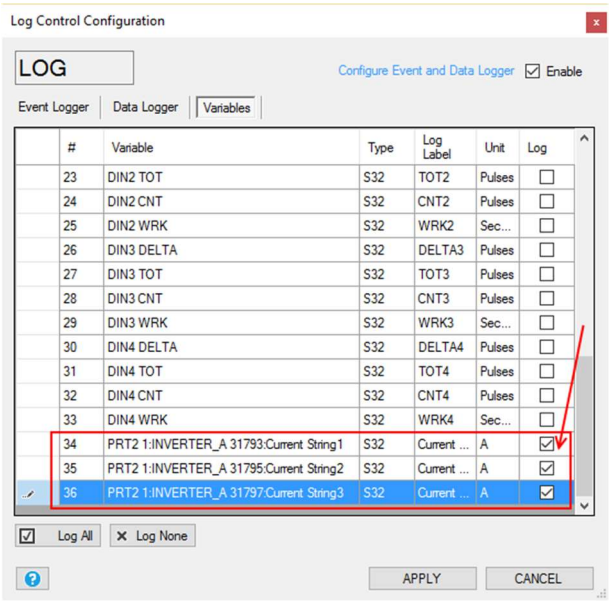


Acquire variables every 1 minute and send the Notification file with the report every 5 minutes.

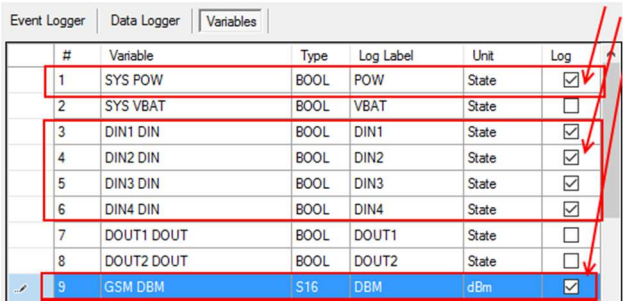
Tick the flag with Email sending.

Now you can define which variables must end up into the datalogger with the "Variables" section:

Initially, no variable is logged, so tick the 3 inverter variables:



And some variables inside the RTU, external power supply, status of the digital inputs and level of the GSM signal in dBm:

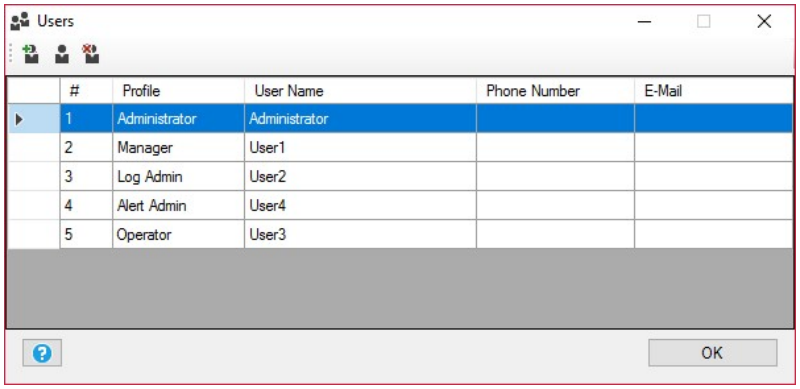


Configuration is complete.

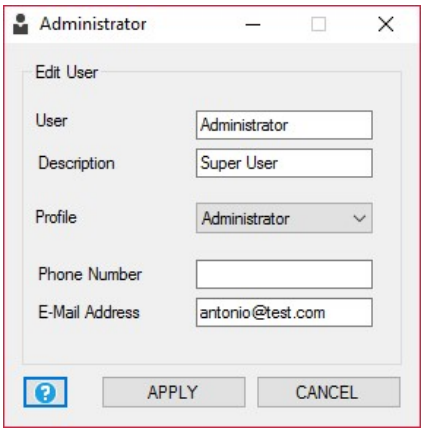
3.7. EMAIL ADDRESSEES OF THE LOG FILES

Now it is necessary to set up the addressees of the log files; this operation is possible using the address book:

Click on icon  :

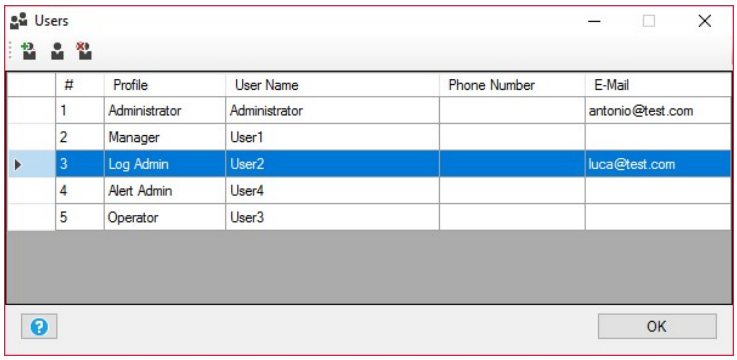


You can enter one email addressee (administrator):



Confirm with "APPLY">

Add Luca the same way, so that you have two log addressees:



With this setup, the RTU will send a log file via email every 5 minutes with the values acquired every 1 minute (a total of 5 lines on the csv file) to addressees antonio@test.com and luca@test.com.

4. COMPILING AND SENDING THE PROJECT TO THE RTU

For how to compile and send the project to the RTU, refer to the SEAL quick guide.