



Question:

- ES910 and ES830: Use NVRAM with Simulink (via INTECRIO)
- How to save Simulink variable values into non-volatile memory of ES910 or ES830 (or ES1135) so that these values are still there when powered off and can be loaded back when powered on
- Non volatile RAM for Simulink models
- How to store some data over key-cycles with a Simulink model



Answer:

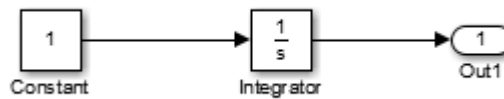
Short Answer

- Modify your Simulink model, and then use **INTECRIO** to add an "ASCET NVRAM container module" that provides store and restore processes for NVRAM access (see instructions below)

More Detailed Answer

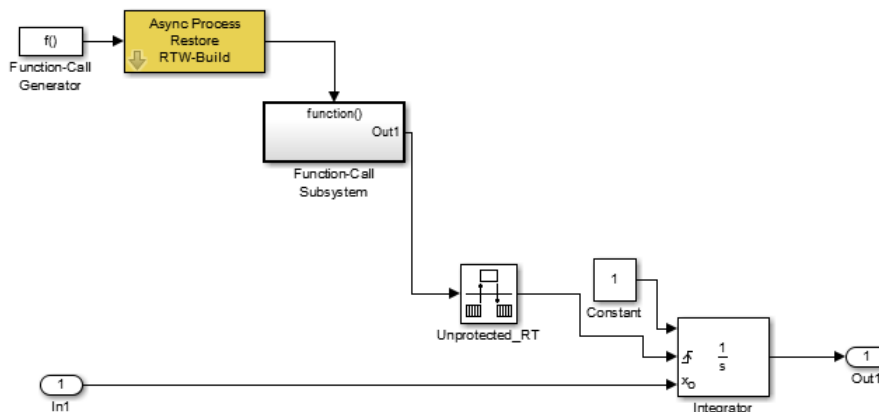
The Simulink Model

- The Simulink model needs two additional ports:
 - **In** port: to read in the initialization value from the NVRAM container module
 - **Out** port: to transfer the data periodically to the NVRAM container module
- Additionally, there is an initialization process needed to initialize the Simulink model with the restored values
- And the model has to be changed to apply the initialization value
- Example:
 - A simple integrator block like this...



(Attachment `integrator_without_nv_ram.mdl`)

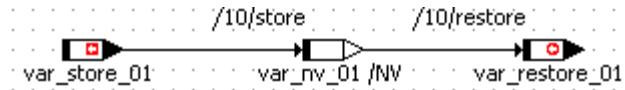
- ...becomes this:



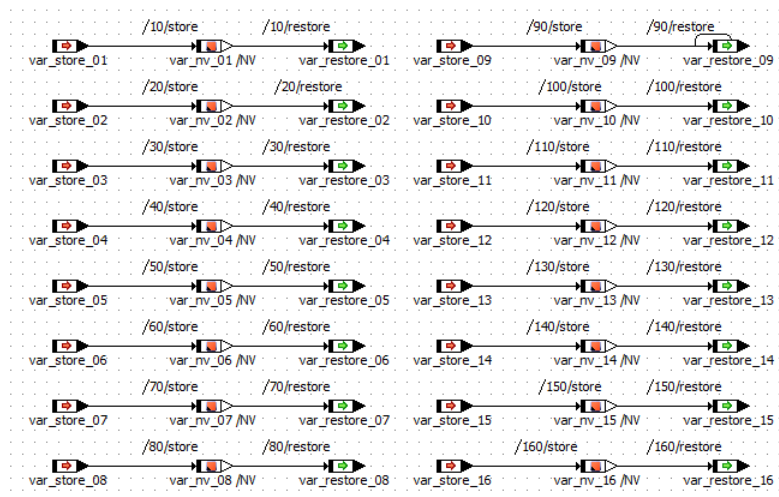
(Attachment `integrator_with_nv_ram.mdl` and `integrator_with_nv_ram.six`)

The ASCET NVRAM Container Module

- An ASCET module can use the NV RAM feature
 - This ASCET module can be imported into Simulink model (as SIX file in INTECRIO)
 - So we create an ASCET module which serves as vehicle to store data to NV RAM
 - We call this module **ASCET NVRAM Container Module**
- A simple model for 1 value would look like:



- There is 1 variable stored in NVRAM ("**var_nv_01**")
- In addition, the model contains 2 processes:
 - **Store**: should be called periodically to save the data into NV RAM
 - **Restore**: should be called on initialization of the model to recover data
- Example ASCET NVRAM container module for 16 values:

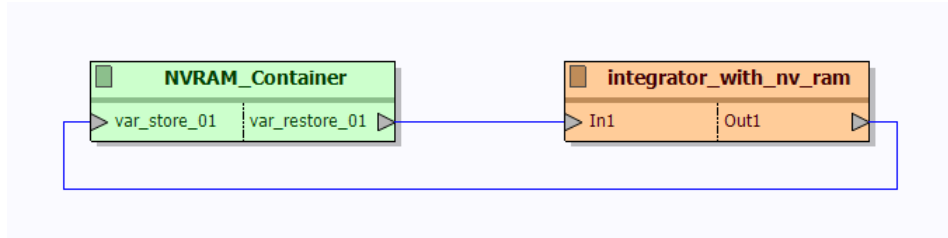


(Attachment **ASCET_NVRAM_16.exp**, **ASCET_NVRAM_16.six** and **baseTypes-asd.xml**)

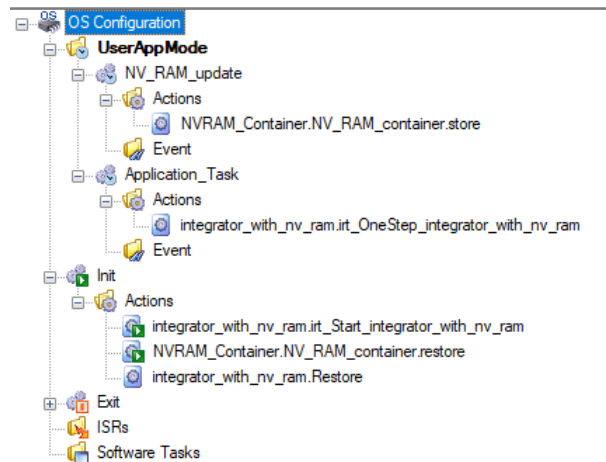
- Example ASCET NVRAM container module for 128 values: Attachment **ASCET_NVRAM_128.six**

Combining The Modules In INTECRIO

- The data transfer in the INTECRIO software system looks pretty simple:
 - **NVRAM_Container** is the ASCET NVRAM Container module
 - **integrator_with_nv_ram** is our Simulink example model



- For a correct reinitialization the processes have to be assigned in the OS settings:



- Example INTECRIO workspace attached as file **test_Simulink_NVRAM.ioz**



Additional information:

- This article applies to:
 - ASCET V6.x
 - ES1135
 - ES830
 - ES910
 - INTECRIO



In case of further questions:

Please feel free to contact our Support Center, if you have further questions.

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