Tech Note: NJ/NX Series CPUs
Shutdown Methodology In the Event of a Power Loss

NX701
NJ501
NJ301
NJ101
S8BA
S8VK
In many control systems, the need for a method of properly shutting down the controller on a power loss is needed in order to manage various ‘engines’ of the NJ/NX CPU’s.

This paper will demonstrate the proper way to manage a power loss to the NJ501-1340 SECS/GEM controller. Similar routines can be used for SQL & Robotics CPU’s.

Per the NJ501-1340 CPU User’s Manual W528:

“If you turn OFF the power supply to the CPU Unit while the GEM Services are in operation, the GEM Setting data, GEM Service logs, or spool data may be corrupted. To prevent corruption, you must Always end the GEM Services before you turn OFF the power supply to the CPU Unit.”

Since there is no power-down subroutine or service flags available in an NJ/NX controller, an affordable and viable solution is to use the S8BA Uninterruptable power supply.

Figure 1 below illustrates a complete system configuration for accomplishing a managed shutdown process.

The S8BA UPS includes discrete I/O (blue cable above) which can be connected to the NJ I/O. In Figure 4, detailed connections are shown to an EtherCAT NX coupler Input and output modules. CJ modules mounted directly to the CPU would function just as well (NPN Input and Contact Output are preferred).

Since the current S8BA product line is DC to DC battery backup (AC to DC in the future), a standard S8VK Power supply and NJ-PD3001 will also be required as shown in Figure 2.
Wire the output of the S8VK to the input of the S8BA, then, Output of S8BA to the NJ PD3001. Daisy-chain the DC power to the NX Coupler A shown below.
Figure 4 – detailed view of NX I/O wiring (Blue, Orange/White, Green)

Figure 5 – Pin-Out diagram of S8BW-C02 contact I/O cable of S8BA
Create a project in Sysmac Studio, go on-line with the NJ system. Under EtherCAT, right-click on the CPU and choose Merge and Compare. This should show the NX node configuration. Click apply settings.

Open the I/O Map and type in the variable as shown below

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Figure 6 – Sysmac Studio I/O Map
Create the program below.

When power is lost to the S8BA, it will go to battery mode and turn ON its BU signal.

If the GEM Service is running, this will in turn execute the GEM Service Shutdown command to properly stop the service.

When the service shutdown command is executed and the service is actually stopped, it turns ON the internal status bit \_GEM\_ServiceStatus.Shutdown flag.

This will turn ON the NJ output which instructs the S8BA to shutdown and turn off the battery which powers down the entire system properly.

**SQL CPU’s have similar system variables and procedures:**

![Diagram of SQL CPU program to properly shutdown](image)
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