PV Smoothing Use Cases

Smoothing Decision

BASIC COURSE:
The Smoothing Algorithm uses the PI Regulator to evaluate the most recent recorded System Measurement and determines if the PWM signal should be changed. If the PWM signal needs to be modified then the Smoothing Algorithm modifies the PWM Configurations.

ALTERNATE COURSES:
System Start-Up: When the system is starting up, the Smoothing Algorithm will wait in a holding state for a specified period of time before attempting to read the most recent System Measurement.

Current/Voltage Measurement

BASIC COURSE:
The Measurement Timer (a hardware level timer) expires and the Measurement ISR is run. The Measurement ISR reads values from the Battery Current Sensor, Battery Voltage Sensor, PV Current Sensor, and PV Voltage Sensor at a regular interval. The Measurement ISR stores the recorded values in a System Measurement.

ALTERNATE COURSES:
N/A

PWM Output Update

BASIC COURSE:
The PWM Timer (a hardware level timer) expires and the PWM ISR is run. The PWM ISR takes the PWM Configuration and applies it to the PWM Module.

ALTERNATE COURSES:
System Start-Up: When the system is starting up, the PWM ISR will only reload a default PWM Configuration to the PWM Module for a specified period of time. This ensures that the DC-to-DC Converter has time to stabilize before the Smoothing Algorithm begins making changes.

PV Smoothing Use Case Diagram

Battery Voltage Sensor

Battery Current Sensor

PV Voltage Sensor

PV Current Sensor

Voltage/Current Measurement

Smoothing Decision

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PWM Output Update

DC-DC Converter