V is the voltage across the terminals.
I is the current through the terminals.

The efficiency, η, value is equivalent to the motor and driver overall efficiency parameter. The angular velocity that corresponds to the overall efficiency, ω_η, is equivalent to the Speed at which efficiency is measured parameter. The torque that corresponds to the overall efficiency, τ_η, is equivalent to the Torque at which efficiency is measured parameter.

There are assumptions and limitations of the Motor and Block. The first assumption is the torque demand is tracked with the time constant Tc. The second assumption is that the motor torque tracking is not affected by the motor speed fluctuations due to mechanical load.

DC-DC Converters are electronic systems designed to transform a direct current (DC) voltage into a different level of DC voltage, commonly ensuring a consistent and regulated output. An ideal DC-DC voltage converter represents a theoretical model with perfect efficiency and precision in voltage transformation. In this theoretical construct, the converter operates with 100% efficiency, converting an input DC voltage to a desired output DC voltage without any energy losses. It maintains a stable and regulated output voltage without any drop across its components, regardless of load variations or changes in input voltage. This ideal converter exhibits instantaneous response and adapts seamlessly to fluctuations in input or load, ensuring a consistent output voltage, [32].

The battery of the vehicle is a DC voltage source with an internal resistance, voltage sensor, and current sensor. The internal resistance of a DC battery serves several essential purposes within the functioning of the battery system. The internal resistance plays a role in regulating the battery's voltage output. For the simulation, the internal resistance was set to 0.05 Ω. When a load connects to the battery, this internal resistance causes a drop in voltage across the battery terminals, impacting the actual voltage available. This voltage regulation ensures that the battery delivers a consistent and stable voltage. The voltage and current sensors reflect the ideal voltage and currents by converting the voltage and current measured between two points of the circuit and displaying the signals that correspond to the measured values, [31].

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