

Engine Synchronous signals capture

The module supports the ability to count the number of degrees between the TDC of the compression stroke of a cylinder and the specified edge of its corresponding **EST** and **Injector** signals, and the duration of the spark or injection pulses.

The twelve Engine Spark Timing (**EST1:12**) and twelve Injector (**INJ1:12**) signals are sampled by the FPGA module in order to detect the time occurrence of the rising and falling edges of these signals. The transitions detected are then analyzed by the CPU model which derives the start angle and duration of the pulses, taking into account the specified engine speed and the actual engine position. The values obtained are displayed in the main window of the **RPG Module Run-Time Panel**.

For each cylinder, a window of detection of the EST and INJ pulses is defined. The start and end angle values of these windows are configurable across the 720 degrees range, via the LabView Configuration panel of the RPG (**EST** and **Injection** tabs).

Electrical characteristics

Voltage range

- The EST and INJ inputs are Battery voltage tolerant. They operate with a threshold voltage around 2.5 volts with hysteresis to prevent oscillation. When the input is above 3.5 volts it is considered asserted (high) and when it is below 3.5 volts it is considered de-asserted (low).
- The input impedance is >100K ohms

Rails

- Support for power rail selection was implemented on RPG card revision 2.1.
- The possible rail values are IGN1, ECU5V, an External bias signal or GND. There is one external bias voltage for the 12 EST signals (**EST_BIAS_VOLT**), and one for the 12 INJ signals (**INJ_BIAS_VOLT**). The rail selection is performed via the **EST** and **Injection** tabs of the RPG LabView configuration panel.



