

IPARB

Arbitrary Waveform Generator

Description

Hardware-in-the-loop simulation often requires the generation of specific waveforms to replicate signals that would exist in real applications. For example, an engine controller may require the pulse from the magnetic pick-up transducer that detects the passage of the magnetic spot on the flywheel. A simulated engine determines the pulse timing, but the interface must generate the actual signal to the controller. The replication of the actual transducer signal is required, including changes in the pulse characteristics with RPM.

The IPARB was developed to respond to the need for special as well as standard waveshape generation. The IPARB generates a waveform by sweeping through a 65,536 word memory bank. The output is processed through a 12-bit D/A converter and then further passed through a gain and offset amplifier. The memory bank may be subdivided into two, four, or eight banks, allowing multiple waveforms to be stored. Program selection (external to the IPARB) of the memory bank, gain, and offset provide a highly capable arbitrary function generator.

In addition to the analog waveform output, the sequence of 16-bit words from the memory that form the basis of the waveform are also available. Thus the IPARB may also serve as a memory-driven digital pattern generator. In combined operation, the four bits not required for analog signal generation are available as synchronized digital signals, conveniently representing tone wheel teeth, etc.

Software Support

The IPARB is supported by a library of ADvantageDE routines that facilitate the generation of the memory data values, loading of the data, and run-time control. Included is the ability to start, stop, run continuously, or operate on a triggered (one-shot) basis.

Features

- Arbitrary waveform output as a function of time
- Software-controlled frequency, gain, and offset
- 64K word memory divisible into eight memory banks for changing waveforms during a real-time simulation run
- No run-time load on primary computing resources
- Industry-standard IP module form factor, single site
- Direct digital outputs available

Specifications

Sampling rate range: 0 to 10 megasample/sec
 Sampling rate resolution: 0.0149 Hz
 Sampling rate accuracy: 0.01%

Waveform Memory

Memory size: 65,536 words
 Number of memory banks: 1, 2, 4, or 8

Analog Voltage Output

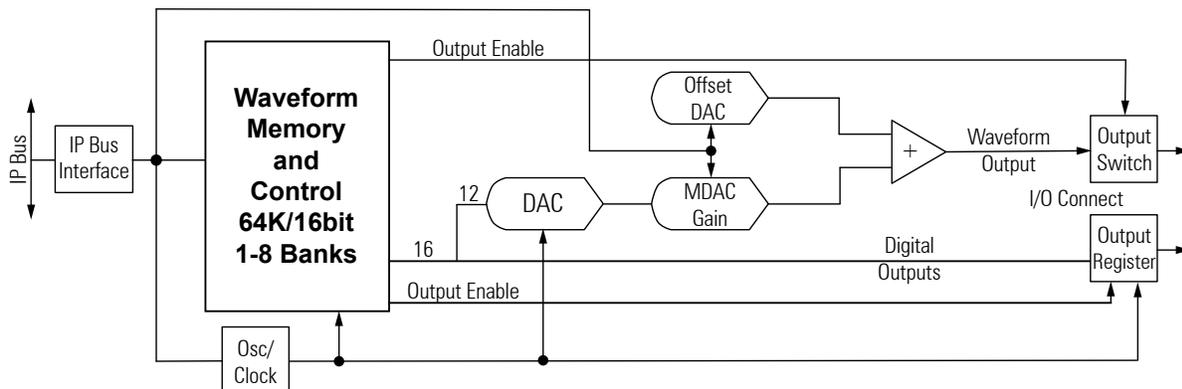
Waveform voltage range: +/- 10 volts
 Offset voltage range: +/- 5 volts
 Gain range: 0 to 1.0
 Minimum load: 500 ohms

Digital Outputs

Number of bits (parallel): 16
 Voltage range: TTL-compatible voltages, 24mA source/sink

Mechanical/Electrical

IP Module, Single site, Type 1



High-Performance Real-Time Simulation