

Typical Application

- Avionics waveform generation
- SDR instrumentation
- Medical/industrial RF drivers
- Lab prototyping

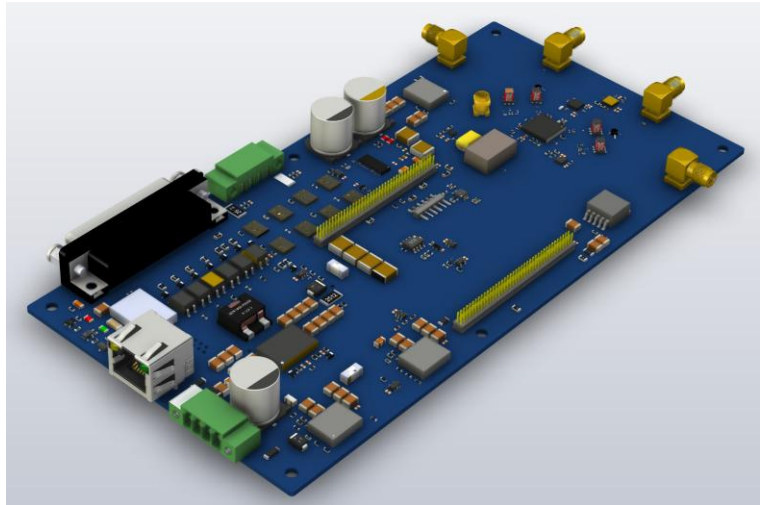
Product Features

- Wideband RF Coverage: 325 MHz to 3800 MHz.
- Multi-Channel Support: 2 TX and 2 RX complex (I/Q) channels;
- Instantaneous Bandwidth: Up to 20 MHz per channel.
- Synchronized Receive: Dual RX channels operate in phase coherence for accurate calibration and RF level measurement.
- Independent TX/RX LO Control
- Baseband Processing: Xilinx Zynq SoC with FPGA design implementing 4 DMA channels (2 TX, 2 RX).
- Agile Operation: Supports pulse-mode transmission and real-time waveform agility.
- Automatic Level Control: Constant I/Q sample-based RF generation with fine-tune ALC adjustments.
- Motor Control Subsystem: TI DRV8711 for pump drive, RPM feedback via optical encoder, and interlock safety sensor.
- Power Input: 28 - 36 V DC source with on-board conversion to 24 V for motor and regulated logic rails.
- FPGA Interface: High-density LVDS data lanes and control signals for seamless SoC integration.

Product Description

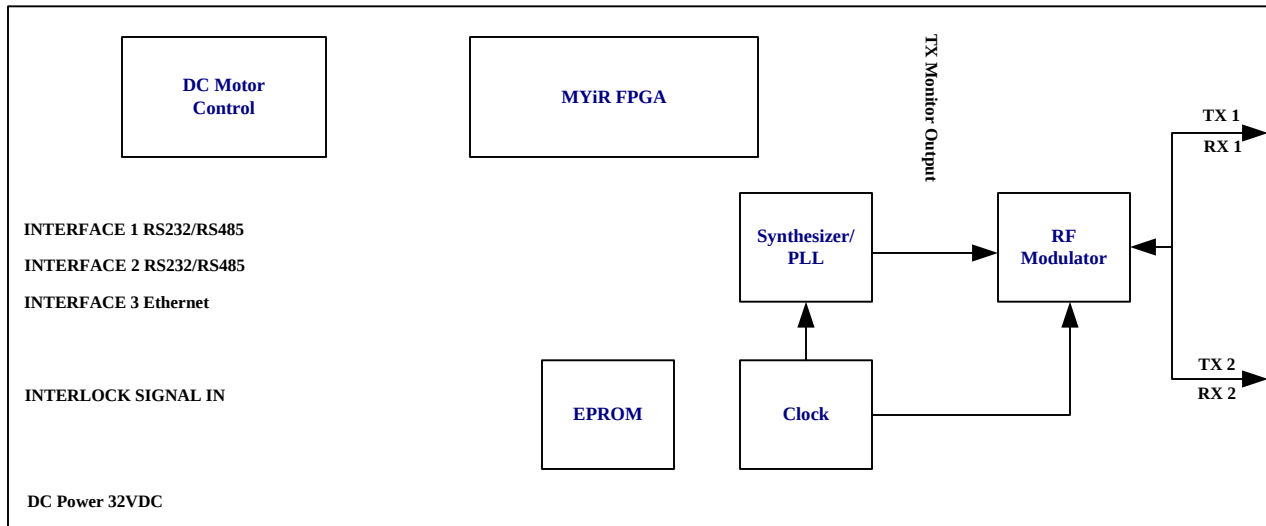
The PWG3800 is a programmable digital and RF platform designed for generating and capturing complex waveforms. It provides control, monitoring, and signal synthesis for medical and industrial RF generator systems. This PCA integrates an AD9363-based transceiver front-end, an RF synthesizer ADF4356, low-speed precision data converters, dual RS-485/RS-232 interfaces, non-volatile memory, and FPGA/SoC expansion banks.

The board operates from a single 28-36 V DC input, internally generating regulated rails for sensitive analog, RF, and digital domains. With programmable filtering, attenuators, and extensive synchronization/control options, the PWG acts as the control and communication backbone of the generator system, supplying regulated rails, digital I/O, and supervisory functions.



Programmable Waveform Generator

Block Diagram



Specification

RF Performance (TX / RX Paths)

Parameter	Typ
Operating band RX/TX path	325 – 3800 MHz
TX output level	+8 dBm
TX flatness across band	±1.5 dB
Harmonics at 0 dBm out	–45 dBc
Spurious (non-harmonic)	–60 dBc
RX noise figure	2.5 dB
RF I/O return loss	13 dB

Baseband & Digital

Parameter	Typ
Channel bandwidth	0.2 - 20 MHz
Converters	12-bit ADC/DAC
Sample rate	61.44 MSPS
TX EVM	3%
Gain control range	89.75 dB
Gain control step	0.25 dB

Local Oscillator & Clocking

Parameter	Typ
Reference oscillator frequency	80.000 MHz
XO frequency stability	±10 ppm
XO RMS jitter (12 kHz–20 MHz)	0.5 ps
PLL output frequency	0.035 - 6.8 GHz
PLL output power	0 to +5 dBm
Phase noise @ 100 kHz offset	–115 dBc/Hz
Integrated RMS jitter	0.3 ps

Power

Parameter	Typ
Primary input voltage	28 - 36 V
Local rails available	1.8 / 3.3 / 4.0 / 5.0 / 12.0 V
Total board power	10–16 W

Sync & Control I/O

Interface	Levels
Ethernet	Standard
RS-232 / RS-485	Standard
SPI / I ² C	3.3 V