Performance Controls, Inc. (PCI) designs and manufacturers some of the most sophisticated power amplifiers in the world. We specialize in amplifiers characterized by high precision, high power, wide bandwidth, and ruggedized construction.

PCI's expertise is applied in three areas: motor drives and servo amplifiers, MRI gradient amplifiers, and custom amplifiers.

You can select from one of our standard products, have a product customized, or work with us to develop a custom solution that exactly matches your application's requirements.

With over 300 man-years of innovative design experience, more than 30 patents and a culture of customer collaboration, PCI is the perfect partner to meet your specialized amplifier requirements.
Motor Drives and Servo Amplifiers

PCI’s motor drives and servo amplifiers are used in a variety of demanding applications. These range from critical gas control valves in power generation, automated guided vehicle drive systems, mission-critical antenna positioning systems, voice coil driven vibration test systems, oil and gas downhole motor control, and many others.

When you have a motor drive requirement that’s beyond the ordinary, contact PCI.

Diverse Motor Types and Power Ratings
Our motor controllers power a wide range of motor types: brushed DC, brushless DC, AC induction, linear and others.

From fractional horsepower to 5 HP and above, PCI is able to provide a drive for you.

Drives are available which operate from bus voltage supplies ranging from 24VDC to 300 VDC.

Digital Architecture
Since 1988 our motor drives have been fully digital, enabling performance optimization and superior flexibility in setup, operation and maintenance.

Proprietary PWM modulation techniques contribute to quiet operation, highly responsive control in torque and velocity modes and efficient use of supply voltage.

PCI’s robust health monitor logs faults, warnings, and alarms to support fast and efficient field troubleshooting and problem remediation.

Ruggedized Design
Many of PCI’s servo amplifiers are used in harsh vibration, temperature and humidity environments. We’ve designed and produced amplifiers for on-road vehicles, off-road vehicles (including military), mission-critical antenna systems, and oil and gas downhole tooling.

Command and Feedback Options
Input command options include +/-10V analog, RS485, CAN and others, based on the application. Depending on the requirements, drives accept feedback from encoders, Halls sensors, and resolvers. Some amplifiers can be run in master/slave mode.

Voice Coil Motor Drives
Beyond rotary motors, PCI has rack-mounted amplifiers for voice coil motors. These amplifiers are well suited for high performance shock and vibration test systems.

Specialized Solutions Since 1980
For years PCI has solved tough motor drive challenges for its customers. Our capabilities include:

- Engineering support: We can customize our servo amplifiers to better match your needs. We can also design fully custom amplifiers to your exact specifications.
- Full range of certifications: We provide UL, CE, IEC, ATEX and other certifications.
- Scalable OEM production volumes: We can efficiently manufacture in low to medium volumes (50 to 500) and in high volumes.
PCI designs and manufactures high-precision pulse width modulated gradient amplifiers for MRI (magnetic resonance imaging) systems. MRI gradient amplifiers provide power to generate the variable (gradient) magnetic field component important in the MRI process.

High power, excellent stability, wide bandwidth and low noise levels are critical to achieving clear MRI images and are characteristic of all PCI gradient amplifiers.

Our gradient amplifiers can be found in health care centers around the world. With a wide range of power levels available, PCI’s gradient amplifiers power MRI systems rated from 0.2T to 7T (Tesla).

3-Axis Gradient Amplifier Systems

PCI’s cabinet-based, 3-axis gradient amplifiers are among the highest performance and most powerful in the industry.

The foundation of their superb performance is their 100% digital control architecture, called D-SERIES™. Built on a long history of PCI innovations, D-SERIES™ offers a digital fiber interface, power optimization tools, advanced diagnostics, interactive communications, and many other features which improve image quality and increase MRI system availability.

Our amplifier power ratings constantly increase to meet the evolving demands of MRI system designs. Currently, our 3-axis gradient amplifiers are available in output ratings from 800 VDC at 700 Apk, to 2100 VDC at 900 Apk, per axis.

1-Axis Gradient Amplifiers

Our rack-mounted, 1-axis gradient amplifiers are widely considered as a “work horse” in the MRI world. Well over 10,000 are in use today, a testament to their reliability and proven performance.

Utilizing a hybrid digital and analog control architecture, PCI’s 1-axis amplifiers include digital tuning and set-up, diagnostic tools, programmable protection for loads, and more.

These amplifiers are available in 150 VDC and 300 VDC versions.

Shim Amplifiers

PCI’s dual-channel shim amplifiers are used to improve the homogeneity of the magnetic field by shaping (shimming) the magnetic field within the MRI system’s scan volume.

RF Panel Filters

Our RF penetration panel filters attenuate high frequency noise from either gradient amplifier outputs or shim amplifier outputs as their signals pass into the MRI magnet room, thus contributing to clear, artifact-free images.

A Legacy of Innovation

PCI’s gradient amplifiers have a rich history since 1990 of engineering innovation, evidenced by more than 30 awarded patents in the amplifier discipline.
Custom Amplifiers for Demanding Applications

PCI’s core product is the passion, creativity and skill of our engineering professionals. This passion often manifests itself in designing custom amplifiers for specific applications.

Why PCI?
We’re often able to do what others can’t or won’t do in terms of performance, features, volume, and schedule. PCI engineers will work with you as partners to ensure your unique goals are achieved.

If needed, PCI will develop new amplifier technology to meet your performance requirements. PCI’s many amplifier patents attest to our ability to innovate.

Example: High Power, 3 Phase Pulse Amplifier
Our customer’s linear motor required an exceptional amplifier to simulate high accelerations measured in crash events. PCI’s delivered solution included:

- Three amplifiers, each outputting 1600 A and 400 V for up to 100 ms.
- Total harmonic distortion less than 1% at 200 Hz.
- Bandwidth exceeding 1.7 kHz at 45 deg phase angle.
- Noise level better than -80 db.

Example: Radar Antenna Servo Amplifier
The US government’s Federal Aviation Administration (FAA) required ultra-reliable motor drives for positioning the antennas in the nationwide Terminal Doppler Weather Radar (TDWR) system. The FAA selected PCI to deliver drive systems with:

- Four drives per antenna: two elevation and two azimuth.
- Custom power supply.
- Integrated chassis to house power supply and motor drives.
- Anti-backlash control mode.
- 24/7 operational reliability.

Example: Patient Handling Motion System
A medical device OEM required higher reliability, lower-cost motion controls for their patient handling system. PCI delivered:

- Seven axes of motion control.
- Integration of servo amplifiers, power supplies, controls, signal conditioning.
- Savings of more than 40% compared to the previous motion control system.