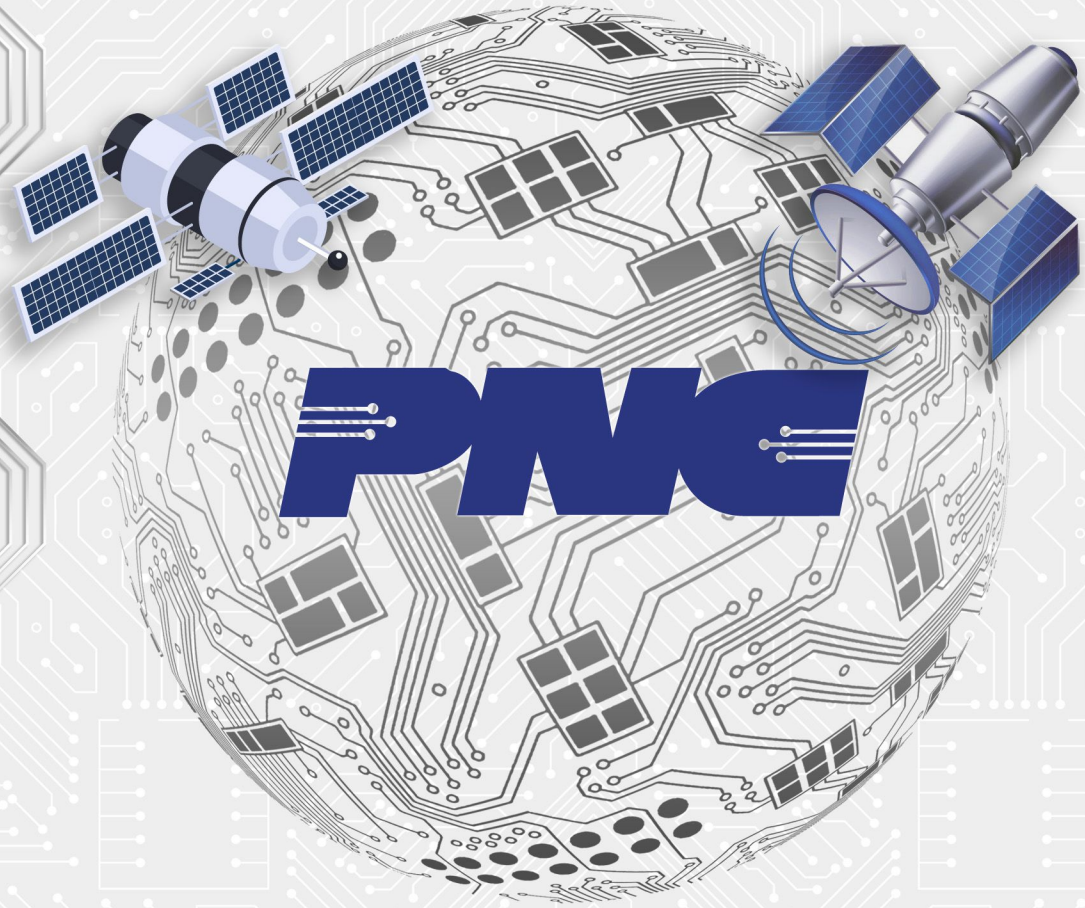
RIGID, FLEX & RIGI-FLEX PRINTED CIRCUIT BOARDS

DESIGN • MANUFACTURING • ASSEMBLY



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WELCOME

RESPONSIVENESS

COMMITMENT TO QUALITY

CONTINUOUS IMPROVEMENTS

ON-TIME DELIVERY

Welcome and thank you for your interest in PNC Inc.

PNC has been manufacturing printed circuit boards for the last half-century. Over that period, we have made considerable investments in expanding our design, bare board, flex, rigi-flex and assembly divisions. As a result, we are now capable of providing a full suite of PCB-related solutions to our customers. Our total concept process allows us to go from concept to prototype in an expedited, seamless fashion by eliminating the need for multiple vendors.

PNC's manufacturing model has been developed over the years to accommodate both quick-turn prototyping and large-scale production in order to save our customers time, money and the hassle of having to deal with multiple vendors in different locations.

We focus on creating solutions that are on the cutting edge of technology by working side-by-side with visionary engineers in the RF, microwave, space exploration and military/defense industries.

One of PNC's sister companies, Flextron, located in Wood Dale, Ill, was founded in 2005 specializing in higher volume production assembly needs for the Aero Space, Medical and the consumer electronic industries. Assembly capabilities include SMT, Thru-hole and Mixed technology builds whether rigid, flex, rigi-flex, along with box builds.

We believe in supporting a low Total Cost of Ownership (TCO) model delivering high quality products right, the first time, using our technology, resources, and our team's extensive technical knowledge. For more than a decade we have excelled in technological expertise, developing and implementing innovative processes, and providing exceptional quality.

Another sister company of PNC is, Accurate Engineering Inc. (AEI) in Sun Valley, CA, was established in the mid-eighties as a manufacturer of flex and rigi-flex printed circuit boards with military and commercial applications. Having a presence on the West and East coasts, helps us provide our customers with the best solutions and the quickest lead times for any time-sensitive projects.

To affirm our belief in constant improvement, we provide follow-up services as well. In order to abide by our philosophy of constant improvement, we feel that it is necessary to continue to receive feedback from our customers long after their product has gone to market. Accompanied with strict adherence to industry-established standards, these practices have allowed us to grow into the largest PCB provider in our region.
Thank You,

Sam Sangani
President

PRODUCTS & SERVICES

- ***PCB Design***
- ***PCB Fabrication: Rigid – Flex - Rigi-Flex***
- ***PCB Assembly***
- ***Final Box Build Assembly***
- ***New Product Development***
- ***Patented ACCUFRAME® SMT Stencils***
- ***Cable and Wire Harness/Assembly***
- ***Inventory System***

Circuit & PCB Design

PNC Inc. offers a full array of electronic circuit and PCB design services. Taking a customer's concept, idea, schematic or re-engineering requirements and turning it into a prototype within a few days is only possible due to our total concept process. We can also guide and assist our customers through each phase of design to facilitate a seamless transition into their target market. We understand that cost efficiency and the latest technology are both very important and do our best to incorporate them into the designs we create. For more information, visit our website www.pnconline.com or reach out to us at info@pnconline.com.

Circuit Design

Capabilities & Tools:

- Analog, Digital and Mixed Circuits
- Sensor Signal Conditioning, A/D
- 8-bit to 32-bit Microcontrollers; SDRAM, DDR
- Embedded OS and Device Drivers
- PCIe, USB, Wi-Fi, Bluetooth, RS-232, LCD, A/V

Design Tools:

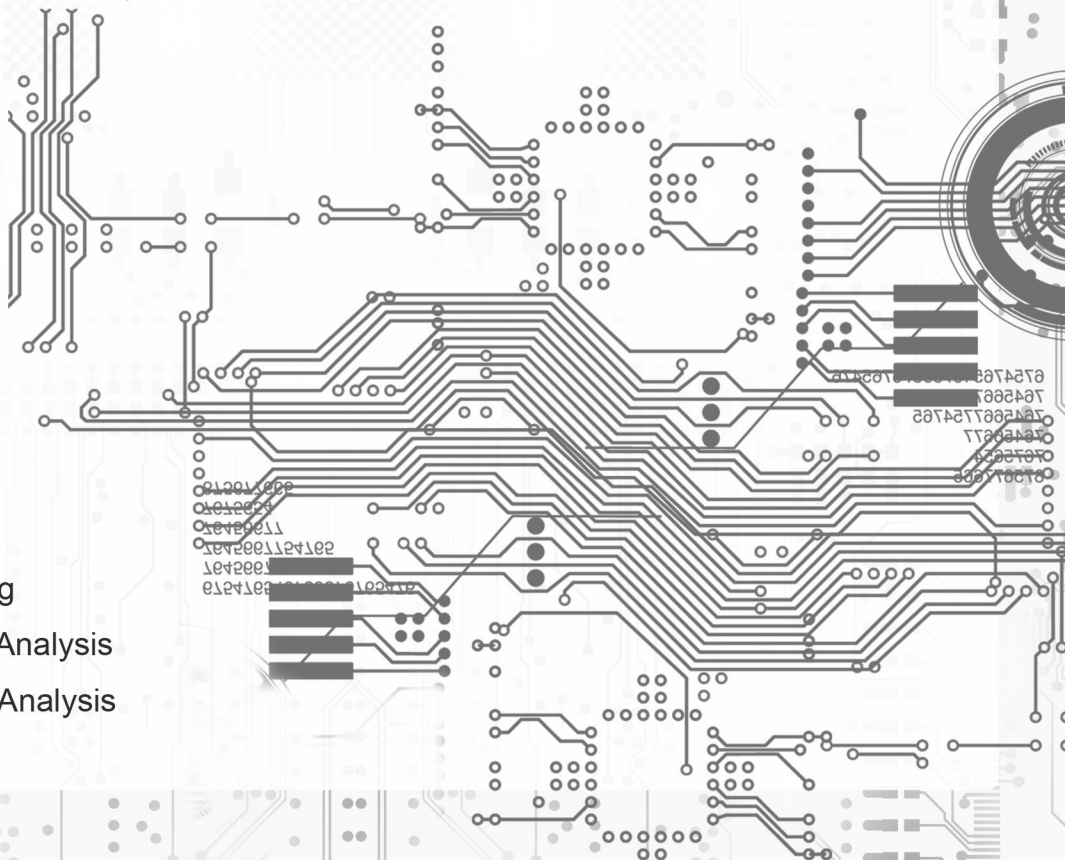
- OrCAD Capture and PSPICE
- PADS Hyperlynx and MATLAB

Deliverables:

- Schematics
- Customized Software
- Optimized BOM
- User Manuals

Simulations:

- Component Selection/Sizing
- Signal and Power Integrity Analysis
- Reliability and Worst-Case Analysis
- Impedance Matching



PCB DESIGN

PNC Inc. offers high power, RF, microwave, flex, rigi-flex and rigid PCB design services. We are well-versed in EMI, crosstalk, bypass and decoupling technologies, complex fan-out methods and minimizing inductance and loop areas. Our product designs include battery-operated hand-held devices, high power motor controls and drives, graphical user interface, high-precision test and measurement devices, wireless devices for remote monitoring systems, power supplies, LED lighting and audio/video processors to name a few.

Our design staff is also very experienced in software development when no packaged software can provide the solution you need. We have successfully contributed to application development on a large variety of platforms at various companies.

Capabilities & Tools:

- Double-Sided and Multilayer Designs
- High Speed/High Density/Fine Pitch
- Software Testing
- Component sizing
- Finite Element Analysis
- Parasitic component effects
- Power Integrity analysis
- Noise reduction
- MEMS and signal conditioning
- BLDC, PMAC-PMSM, & AC motors
- DC-DC Converter, MOSFET and IGBT
- Wireless 802.11 and 802.15.4
- LNA and Power Amplifiers
- Radial Layouts and Non-Standard Geometries
- High Power Rigid, Flex and Rigi-Flex Circuits
- Circuit optimization & Worst-Case analysis
- Component Selection
- Reliability analysis
- Signal Integrity analysis
- EMI analysis
- Impedance matching
- EMI filters and SMPS power supply designs
- High speed precision amplifiers, A/D, D/A
- Inverters
- 900MHz to 5.8GHz transceivers
- VCO, Mixers, and couplers

Design Tools:

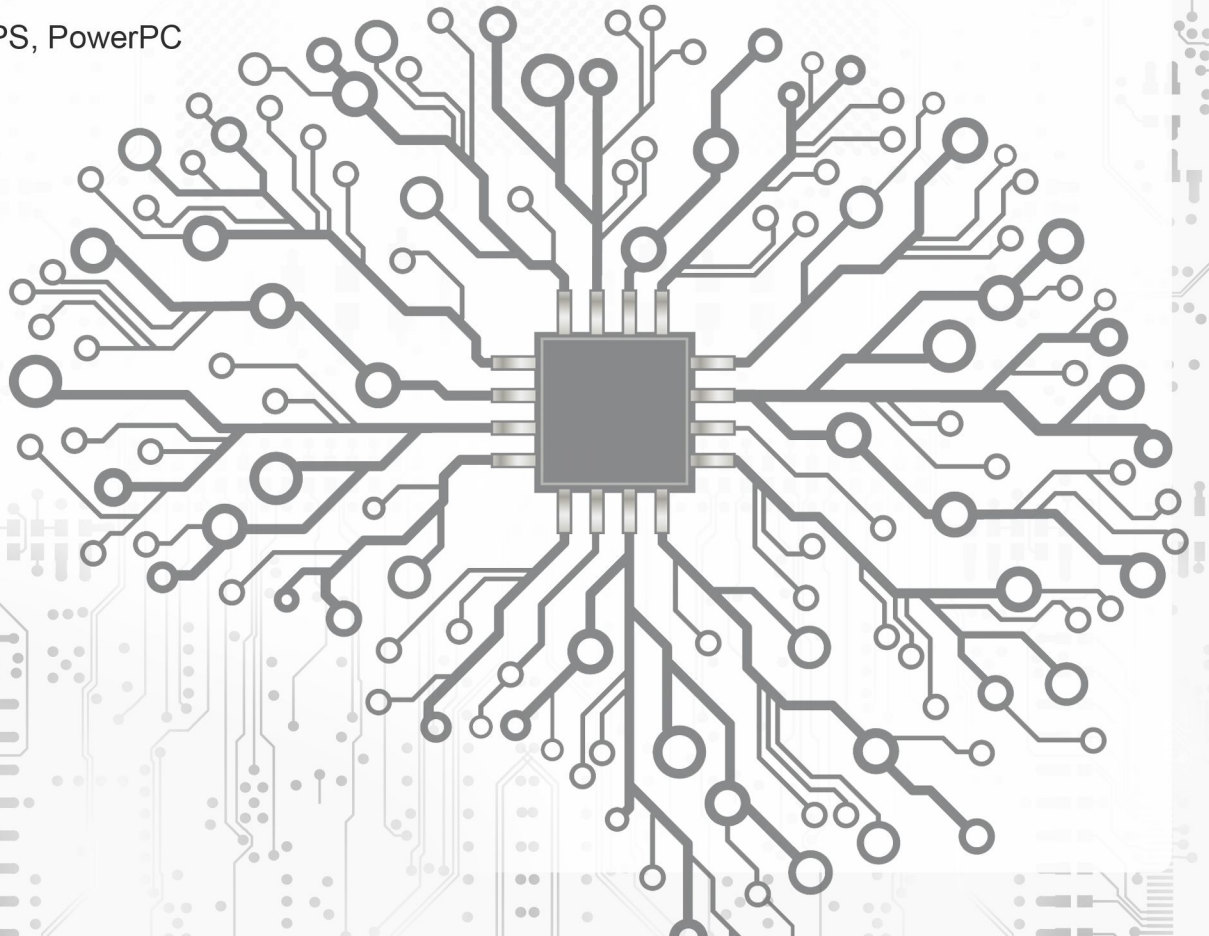
- Cadence Allegro v16
- OrCAD PCB
- PADS v9
- OrCAD Capture v16.3
- Designer v16.3

Deliverables:

- Gerber
- Assembly
- Formal Drawings on Customer Format
- Drill
- Fabrication
- Database Services

Embedded Software Capabilities:

- C, C++, VHDL, and Verilog
- Board support packages (BSP)
- Operating systems porting
- Applications Development
- SDRAM, DDR, SRAM, NAND memory
- AVR and PIC
- Cortex-M3/M4
- 8 to 32-bit uC and processors
  - ARM7/9/11, MIPS, PowerPC
  - Cortex-M3/M4
  - AVR
  - PIC
  - 8051, STM8
- Embedded Linux, WinCE, FreeRTOS
- Device drivers
- Protocol stacks porting/development
- Graphical User Interface (GUI)
- TFT, STN, EPD LCD
- 8051 andSTM8
- FPGA, CPLD



PCB FABRICATION

Manufacturing Capacity

We offer 24-hour prototypes and high-volume production in our Nutley, NJ and Sun Valley, CA facilities. Manufacturing includes single-sided and multi-layer constructions using an array of base materials. Upon request, our global partners are an option based on lead times and pricing requirements.

Our 60,000 sq. ft., full-service PCB solution-provider at our headquarters in New Jersey is capable of manufacturing over 2,000 sq. ft. of panels per day. Within this facility, our manufacturing processes are continuously upgraded with new equipment to allow us to stay current with the newest technologies.

Production Capabilities (Rigid, Flex and Rigid-Flex)

- Layers: 1-40
- Smallest Trace/Space: 3/3 mils
- Smallest Pad Size: 3 mils
- Min. Aspect Ratio: 12:1
- Board Thickness: 20-250 mils
- Minimum 0.4 mm BGA Pitch
- LDI Solder Mask Registration
- Plated Edges/Castellation's
- Multiple Plating
- Impedance Tolerance: 5%
- Impedance Control
- Cavity Boards
- Heatsinking
- LDI Inner/Outer Layer Imaging
- High Copper Weight
- Via Fill conductive/non-conductive
- Control Depth Routing
- Minimum Solder Mask Between Pads: 2.5 mils
- Min. Core Thickness: 2 mils (without copper) 5 mils (with copper)
- Smallest Drill Size: 3 mils (Mechanical) 3 mils (Laser)
- Smallest Finished Hole Size: 2 mils (Mechanical) 2 mils (Laser)
- Vias: Blind, Buried, In Pad, Via fill
- Largest Panel Size:

  22" x 26" (Double-sided) 18" x 24" (Multi-layer)

- Materials:

  FR-4 (Low Tg, or High Tg, UL Approved)
  Polyimide
  Halogen-free
  Nelco
  High Frequency
  Megtron 6
  Rogers Ceramic & Duroid
  Taconic
  Arlon/Arlon Flex
  Panasonic

- **Metal Core:**
  - Aluminum Core 6061
  - Aluminum Core 5052
  - Copper Core
  - Copper-Invar-Copper
- **Hybrids:**
  - Metal-Backed Rogers Duroid
  - Metal-Backed FR-4
  - Metal-Backed Rogers Ceramics
- **Surface Treatments:**
  - HASL (lead or lead-free)
  - ENIG
  - OSP
  - ENEPIG
  - Immersion Tin
  - Flash Gold
  - Gold Finger Plating
  - Immersion Silver
  - Hard Gold
- **Scoring:**
  - V-Score
  - Jump Score
  - Countersink
  - Counter-bore
  - Milling
  - Beveling
- **Solder Mask**
  - Green
  - Blue
  - Black
  - White
  - Red
  - Yellow
  - Orange
  - Custom Colors
- **Technical Assistance**
- **Order and Track Online**
- **Rigid-Flex & Flex:**
  - Sculpted Fingers
  - Impedance Control
  - Dynamic Flexing
  - Fine Lines
  - Cavity Boards
  - Wire Bondable
  - Strip lines
  - Micro Strip lines
  - Cryo-Stable (as low as -200C Liquid Nitrogen/Rigid-Flex)
  - Cryo-Stable (as low as -273C Liquid Nitrogen/Flex)

PCB ASSEMBLY

Contract Manufacturing and More

Our contract manufacturing capabilities include multiple High Speed SMT lines, through-hole and mixed technology lines. Quantities range from small-number prototypes to large production orders. We serve the military/defense, medical, automotive, industrial and consumer sectors. Since we design and fabricate boards in the same facility, we are able to turn concepts into prototypes in as little as 24 hours. Other services include functional testing, programming, inspection, and rework.

The PNC Inc. quality system ensures that our employees are IPC-A-610 and IPC-J-STD Class III-qualified. All SMT areas are ITAR-restricted for military standards. We are ESD compliant to ANSI/ESD S20.20.

PCBA Capabilities

Surface Mount Technology (SMT)

We utilize state of the art automated SMT equipment to produce the high-quality products our customers expect. The accuracy and versatility of our SMT lines gives us the flexibility to assemble a wide variety of components with high level of placement accuracy, solder joint integrity and quality is consistently achieved. With two modern SMT lines, we are fully equipped to undertake PCB batches from prototype and low to high quantities.

- Components as small as 0201 package size
- Package types: QFPs, uBGAs, and BGAs
- Two-sided assembly for rigid and flex and rigi-flex PCBs
- Ability to do IPC-A-610 Class 1, 2 and 3
- RoHS and Leaded assembly

Thru Hole Technology

Traditional leaded through hole components can be either flow soldered or fitted by our dedicated, highly skilled assembly team. Whether need a couple of TH components hand placed, or 100% of your PCBs, our TH process is capable of doing the job. Our highly certified staff utilizes manual TH stations or our custom slide lines to assemble larger volumes.

- Highly Skilled Staff IPC J-Std-001 trained and certified
- Manual Through Hole Assembly
- Custom Slide line for larger volume
- Press fit connectors
- Wave soldering
- Select solder machine for Lead and Lead-free (RoHS) products

Mixed Technology

We have a team of experts, who are self-driven, and motivated to manufacture quality and highly efficient printed circuit board assemblies using mixed technology. Our vast experience has given us a good understanding, and knowledge of the PCB assemblies, and services.

Chemistries

Our Nano Jet Inline cleaning system is capable of both water and aqueous chemical cleaning applications. Nano Jet's directed flow drying technology complements the machine's outstanding cleaning capability by efficiently forcing water out of tight spaces and not allowing evaporation to leave behind harmful residues and produces the cleanliness our customers require.

Box Build Assembly

PNC helps customers get their products to market faster with full turnkey assembly and product integration with the quality our customers require. We work closely with our clients to understand the unique requirements of the end application to optimize the user experience. We provide a wide variety of services to get your product launched including:

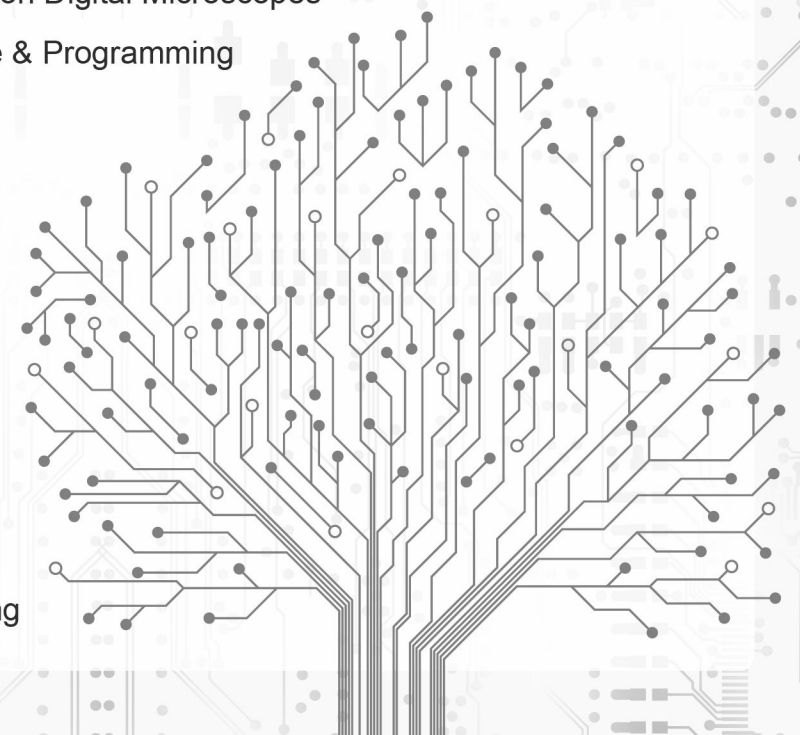
- Plastic enclosures
- Mechanical assemblies
- Kitting, labelling and packaging of finished product with all components and documentation
- Direct ship to distributors or end customers

Inspection & Testing

- 3D Solder Paste Inspection
- 3D AOI Inspection
- X-Ray Inspection
- 100% Visual Inspection - High Magnification Digital Microscopes
- Functional Testing with custom test fixture & Programming

Value-added Services

- Sheet Metal/Plastic Enclosures
- Configuration
- Conformal Coating
- Cable/Wire Harness and Assembly
- BGA Rework
- ICT Test
- Potting Services
- Burn In, Temperature and Humidity Cycling



Part Procurement

- Full Turnkey
- Full Consignment
- Partial Consignment

Environmental controlled Part Storage

To comply with Moisture sensitive components, PNC utilizes a dry cabinet storage system. The humidity is controlled at 2-5% at a temperature of 22-25 C (71.6-77 F). All MSL level parts are stored either by Customer job number or by PNC's MRP part indemnification numbering system.

De-Panel V-score and routing

Depending on the design of Panel array, PNC has 2 methods of de-panelization. V-scored panels are de-panelized using a pizza style cutting blade which cleanly separates the array. When panel arrays are tab routed, PNC uses a router to remove the tab flush with the PCBA and eliminates manual sanding of partial tabs.

Continuous Investment

Through countless economic cycles in the industry, PNC Inc. has steadily grown in terms of quality, technology and service. We abide by three key philosophies to maintain this growth:

Equipment, People and Processes:

- Multi-million in capital investments, equipment and facilities upgrades.
- All employees trained with a focus on leadership techniques and certifications

Focus on Financial Stability:

- Never Unprofitable in 50 years
- Average Growth: 15%
- Projected Growth: 25%

Unwavering Commitment to our Customers:

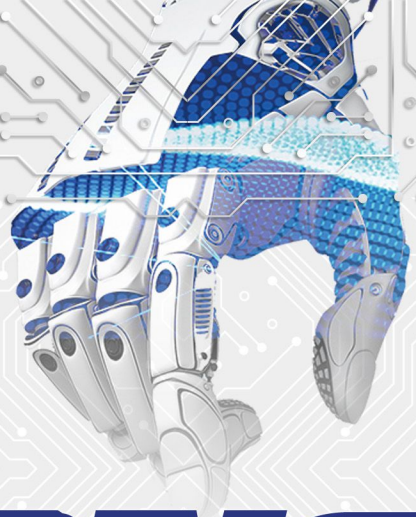
- 99% On-time Delivery
- 1% Scrap Rate
- Continuous Improvement of New Technologies and Services

Certifications & Compliances

- AS9100D
- ISO 9001:2015
- UL Approved
- IPC-A-600
- Small Business
- ITAR
- Disadvantaged Business Enterprise
- Minority Business Enterprise
- J-STD-001
- JPL Approved
- MIL-PRF-31032
- MIL-P-50884 Type IV (Flex)
- MIL-PRF-55110 Type 3 (GF & GI)
- ESD ANSI/ESD S20.20

Clientele

MAROTTA
N-VISION OPTICS
bliley technologies
CANFIELD
Avionic Instruments LLC
Marshall RADIO TELEMETRY
EMBEDTEK
EATON
TRIAD RF SYSTEMS
McIntosh
Georgia Tech
HARRIS
AstroNova
BOSE
U.S. NAVAL RESEARCH LABORATORY
DRS Technologies A Finmeccanica Company
NASA
JPL Jet Propulsion Laboratory California Institute of Technology
BAE SYSTEMS INSPIRED WORK
LOCKHEED MARTIN
NORTHROP GRUMMAN
apple
HUBBELL
PICATINNY ARSENAL
BERKELEY LAB LAWRENCE BERKELEY NATIONAL LABORATORY
U.S.ARMY
SIEMENS
L3
EMERSON
UBER
COOPER Wheelock
MIRION TECHNOLOGIES
AMETEK PROGRAMMABLE POWER
ORION A Phoenix Mecano Company
PitneyBowes
TAIT
AEROTECH
compunetix
Raytheon
VT Miltope A company of VT Systems
AKTINA MEDICAL
PPI Performance Precision Integrity TimeZero
COMUS International
Marshall RADIO TELEMETRY



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