Preliminary

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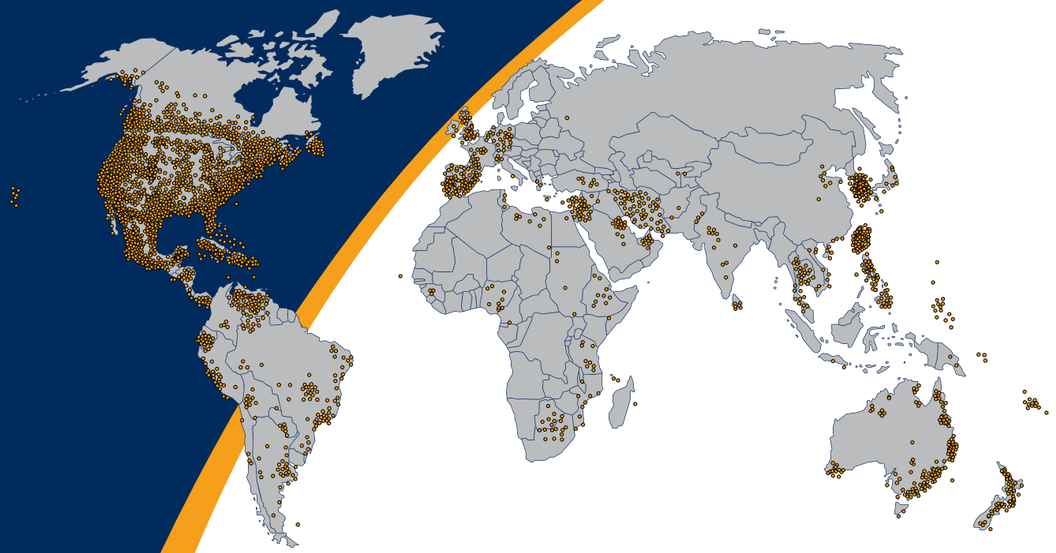
• Nautel Customers



ABOUT NAUTEL

Nautel designers and engineers have the experience to support our products, old or new. Our customer service staff is available 24 hours a day, 7 days a week to answer your questions and provide experienced technical support. We provide extensive training and on-site support for all our products along with extended warranties and a ready supply of parts that can be shipped at a moment's notice.

Nautel products include extensive documentation, manuals and schematics to guide you through everything from installation to troubleshooting. We build value into every piece of equipment that leaves our facilities; in terms of technical features, innovation and cost effectiveness, Nautel is always one step ahead of the pack.

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Specifications subject to change.

NS Series Power Amplifier

High Power Low Frequency Amplifier Technology

NSSeries

High Power Low Frequency Amplifier Technology

ADVANCED, FLEXIBLE, AFFORDABLE

Nautel's new NS Series low frequency amplifiers are robust, solid state systems designed specifically for sonar applications in difficult industrial and military environments. Nautel has over 40 years of experience with solid state amplifier design. Many of these original units remain on the air today. Nautel amplifiers are built to operate in the harshest environments with units installed in over 177 countries and in all of the worlds oceans.

ROBUST DESIGN AND EASY MAINTENANCE

The systems are designed and tested to specific MIL-STD environmental and shake and vibration conditions.Control group monitors all subsystems, enabling remote maintenance and troubleshooting activities.

HIGH OPERATING EFFICIENCY

Efficient, full bridge Class D (switched mode) amplifiers operate at near 96% efficiency which are capable of operating into high reactive loads. Interleaved Pulse Duration Modulation (IPDM) virtually eliminating high frequency distortions characteristic of single phase systems while extending frequency range capability and reducing the size and weight of high power filter components.

SOPHISTICATED REMOTE CONTROL AND MONITORING

The NS Series display functionality is available through IP via a web-interfaced PC or through SNMP (Simple Network Management Protocol). Users can access status, controls, alarms, logs and reports.

NX-LINK REMOTE CONTROL INTERFACE

GROUNDING, EMI SHIELDING AND SAFETY

The NS Series of amplifiers are designed and tested to specific MIL-SPEC standards for EMI conditions. The amplifiers are well marked for appropriate safety considerations for users at all input and output locations.

DESIGNED FOR TESTABILITY

The NS Series has BITE (Built-In Test Equipment) and BIST (Built-In Self Test) capabilities. BIST can be used to give Go / No Go conditions to the operator. Technicians can use the BITE capabilities to test the overall system and the sub-systems, potentially alleviating the need for additional test equipment and also reducing the fault finding time considerably.

REDUNDANT ARCHITECTURE

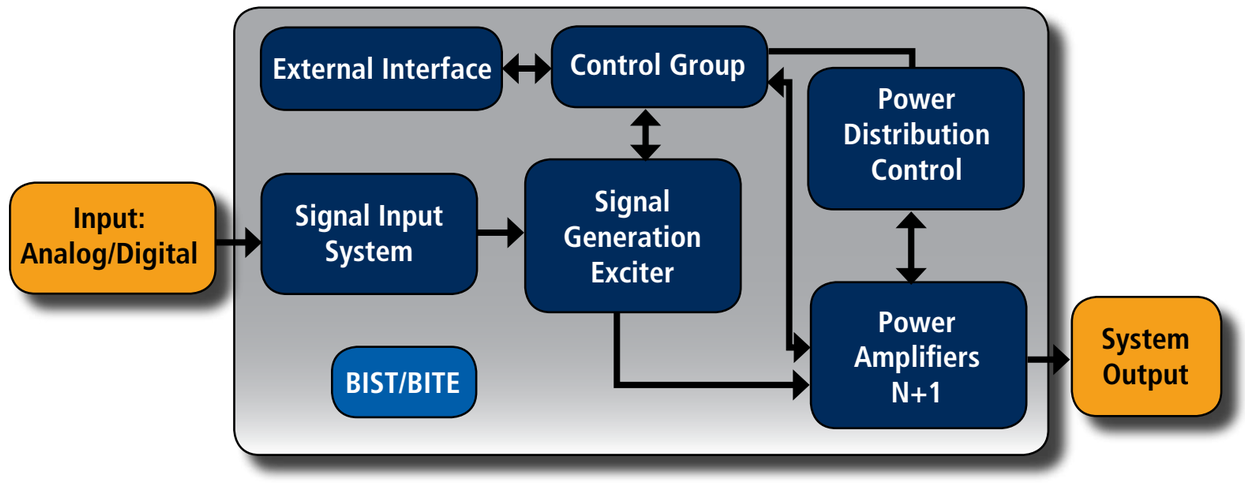
Subsystems in the NS Series amplifiers are easily swappable, making service as easy as pulling and replacing a module. The NS Series features fully parallel redundant architecture on active components assuring no single point of failure. The NS Series offers:

- Redundant Power Amplifiers
- Digital (AES3) and balanced analog audio frequency inputs
- Multiple parallel/redundant fans in each cabinet
- Redundant low voltage power supplies
- Failsafe manual and remote control
- Redundant switch mode power amplifiers
- Optional: Redundant Exciters

FAULT PROTECTION

The NS Series is designed to withstand a variety of fault conditions including but not limited to short circuit, open circuit, input signal overdrive, mains under/over voltage and overheating. All of the systems are controlled through software with control limits that can be defined for a variety of situations.

SYSTEM OVERVIEW



STATE-OF-THE-ART DIGITAL EXCITER

The digital signal generation exciter generates digital switching control waveforms for the Class D amplifiers with nanosecond precision. The system controls output power, modulation and protection while offering great flexibility for customization. Some of the benefits of the digital signal generation exciter include:

- Precise control of amplifier switching with pre-distortion linearization
- Flexible architecture which can be customized with internal signal synthesis
- Real time pre-corrections of signals in order to get very linear, low total harmonic distortion (THD) output signals.
- Digital protection algorithms smoothly limit real and reactive power when operating with mis-matched and highly reactive loads
- Advanced instrumentation features such as real time impedance (patent applied for) and spectrum analysis

OVERVIEW

- Models range from 3kW to 100kW
- High Operating Efficiency
- 200Hz to 4000Hz bandwidth
- High density power amplifiers
- Solid State Reliability
- Robust and Flexible
- Modular Serviceability
- Built-in Protection
- Shock Mount Option
- Optimal Air Cooling
- Small Footprint
- High Redundancy
- 0° C to 60° C Operating Temperature
- Designed and Tested to MIL-SPECs
- MTBF > 100,000 hours
- Power and Cost Savings
- Easy Maintenance