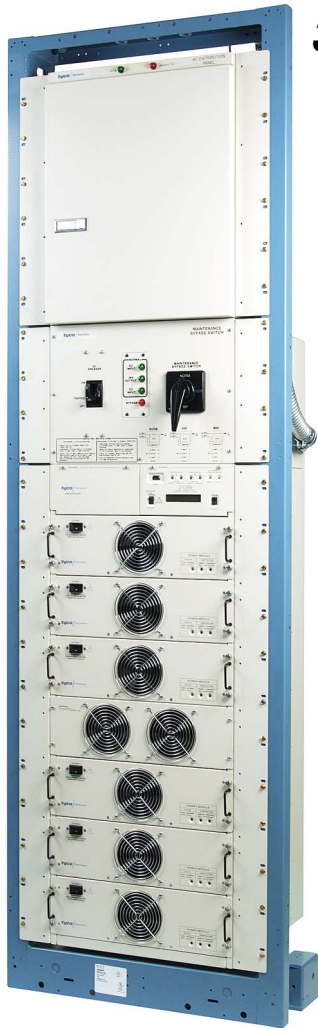


ALPHATRAN™ Inverter System

3.5 kVA - 21 kVA Scalable N+1 Inverter



The Next Generation in AC Telecom Power

Lineage Power's Alphatran N+1 scalable DC to AC inverter is the latest state of the art inverter line designed to become the industry standard for critical AC power for the world's leading telecom companies.

The Alphatran scalable 3.5 kVA inverter power modules can be stacked in an N+1 redundant configuration for optimum reliability up to 17.5kVA. This modular scalability makes the Alphatran ideal for most applications where future power growth is anticipated. All modules are packaged into a "hot swap" receiver cabinet allowing rapid and safe exchange of any component without interruption to the critical load.

Advanced Specifications

- Compliant to NEBS/Telecom industry standards.
- True Modular Scalability: 3.5 kVA - 21 kVA (3.5 kVA modules). Add modules as your system grows.
- Parallel for N+1 redundancy or capacity.
- Safe hot-swap technology.
- Unparalleled reliability. No single points of failure.
- Full front accessibility.
- Ultra low profile: 21 kVA in 24 U with static switch.
- Clean DC input < 30 dBrc
- Precision output voltage regulation: <1% line and load
- Integrated static bypass for added reliability
- LCD status display module
- SNMP / Web-based monitoring (future offering)
- Universal voltage and frequency (User selectable via laptop computer. Computer not supplied.)
- International agency certifications (UL, CE, TUV)

System Overview and Components

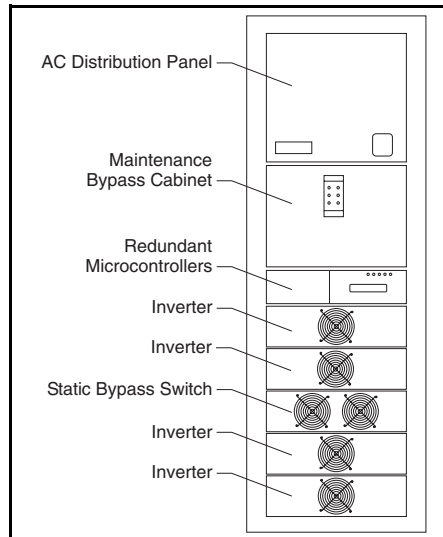
System Operation

The Inverter plant receives 48 VDC from a DC power plant of battery bank and converts the output to precision regulated AC power (user selectable voltage and frequency). In the event that the DC is not available or out of tolerance due to a discharged battery, or the inverters are not

able to maintain the critical load, the system will automatically transfer to the static transfer switch and disconnect from the DC source. The static transfer switch (standard) will make a seamlessly, uninterrupted transfer from the critical load to an alternate AC power source where the inverter power was synchronized to (utility power or another protected AC source). The availability of the Alphatran N+1 on-line mode with a backup source present is greater than 99.9999%.

AC Distribution Panel

The AC distribution panel accommodates 20 (7 KVA system) or 24 (14 and 21 KVA systems) single pole circuit breaker positions and is available in 120 and 240 Vac versions.



Maintenance Bypass Cabinet

Safely and seamlessly transfers the output to an alternate AC source (utility power or protected AC power from another inverter or UPS system) allowing the inverter to be shut down or removed without interrupting power to the critical loads. The maintenance bypass assembly is factory wired to the inverter module when ordered as a system.

Dual Independent Microcontroller Modules

If the primary microcontroller module is ever compromised the secondary module continues to provide uninterrupted performance.

Redundant 3.5 kVA “Hot Swappable”

Inverter Modules

Permits power modules to go off line and be quickly replaced while keeping the load on inverter power.

Integrated Electronic Static Transfer Switch

Provides six sigma reliability by rapidly transferring the load to an alternate AC power source if DC power to the inverters is not available.

Rack Mount Receiver Cabinet with Rapid Change Connector System

Swap components on-line safely and rapidly with no wiring connections and without risking system performance.

Telecom Grade Filtering

The Alphatran is equipped with a high grade noise filter system limiting ripple current on the battery to well under required levels, as well as ensuring that radiated and conducted EMI are kept to safe levels.

System Features

Digital Calibration and Self Diagnostics

Any drift in settings is immediately self corrected, eliminating maintenance and calibration requirements.

Field Replaceable Fan Assemblies

Fans can be swapped easily without system downtime.

Open Frame Relay Rack

All components are mounted on an industry standard 26-inch width open frame relay rack with the entire inverter plant certified for zone 4 seismic installations.

Web Based Monitoring (future offering)

The Alphatran monitoring system provides inverter, maintenance bypass and AC distribution status and alarms over a closed network or via the

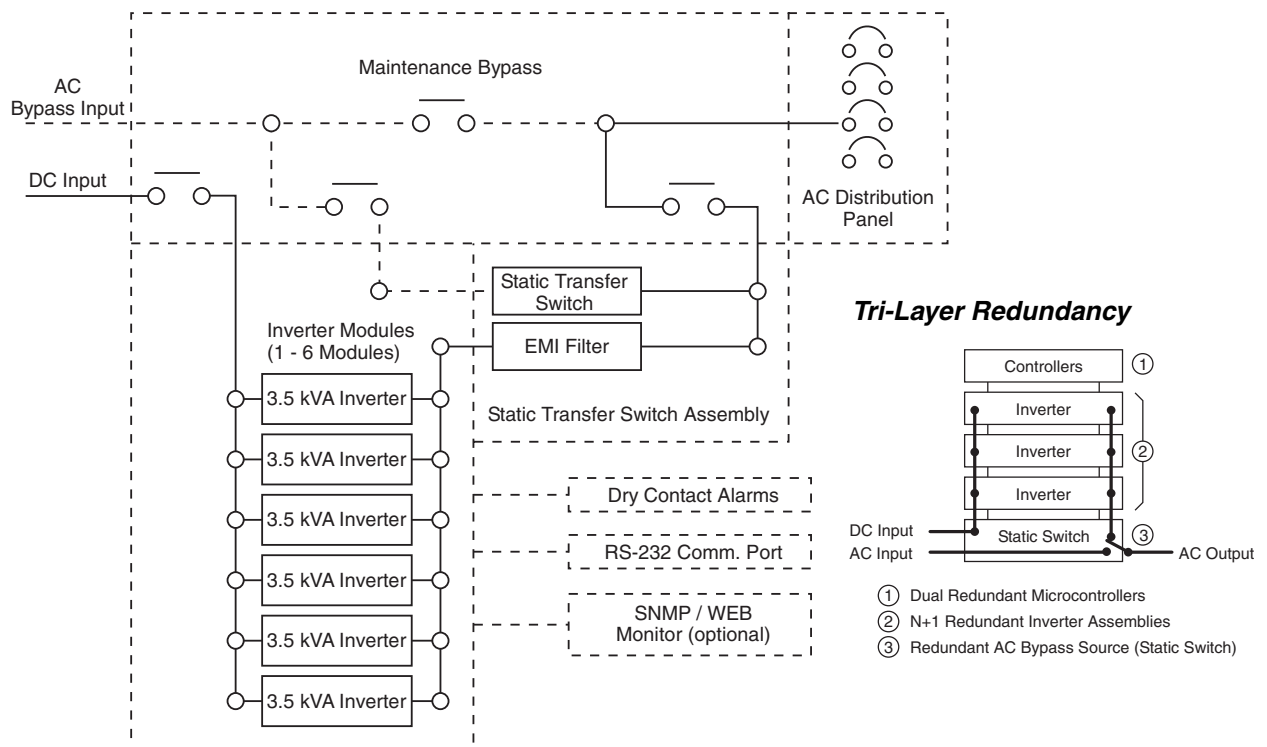
Internet serving up web pages that can be viewed with a standard browser or via SNMP or dial-up access. Accessories include environmental monitoring modules and auxiliary inputs to monitor other devices such as leak detection system, room security or any other dry contact status points.

Built to Meet Industry Standards

The Alphatran inverter is designed to meet the stringent regulatory qualifications demanded by telecommunications facilities. As well as meeting all major safety standards (including CE and UL), it is one of the only inverters designed to meet Network Equipment Building System (NEBS) standards - the industry benchmark for product quality and reliability.

UL is a registered trademark of Underwriters Laboratories, Inc.

System Block Diagram



Alphatran Technical Specifications

Parameter	Description
Input Voltage	-48 Vdc (40 - 60 Vdc operational range)
Output Voltage	100, 110, 115, 120, 200, 220, 230, 240 Vac (selectable via external PC configuration software)
Output Frequency	50 or 60 Hz +/- 0.02% (selectable via external PC configuration software)
Output Waveform	High resolution PWM sine wave
Inverter Technology	IGBT PWM
Load/Line Voltage Regulation	Less than +/- 1%
Static Switch Transfer Time	Less than 3 ms
Efficiency	88% typical (on-line mode) to 97% typical (off-line eco mode)
Transient Response	5% deviation with 1 ms recovery from zero to full load
Overload Capability	120% of continuous rated VA/watts at 20°C
Short Circuit Current (SCC)	300% for more than 4 cycles
Audible Noise	Less than 50 dBA
EMI Emission	Less than 30 dBrc
Total Harmonic Distortion	Less than 1% for linear loads, less than 3% for crest factor loads up to 3:1
Monitoring	LCD with true RMS metering, LED status display, dry contacts, RS-232, optional SNMP / Web server
Calibration	Digitally controlled / automatic
Operating Temperature	0 to +55°C (-40 to +75°C shipping)
Operating Humidity	0 to 90% relative, without condensation
Operating Altitude	Less than 10,000 feet without derating
Agency Approvals	UL/CSA 60950 (listed) and European Standard EN60950, CE, TUV, FCC class A certified
Installation	26-inch rack, floor mounted
Finish	RAL 902 off white

Receiver System Height ¹ (inches)	Receiver Cabinet Capacity (kVA)	Inverter Capacity (kVA/KW)	Number of Inverters (min/max)	Power (kVA/KW)	DC Input (A max)	Output (A at 115 Vac)	Output (A at 240 Vac)	Approx. System Weight (lb)	Max BTU	Sugg. DC Breaker (A)	AC Input Breaker (A at 115 Vac)	AC Input Breaker (A at 240 Vac)
21.0	7.0	3.5/3.0	1 (1/2)	3.5/3.0	88	29	14.5	114	1807	200	80	40
21.0	7.0	7.0/6.0	2 (1/2)	7.0/6.0	176	58	29	182	3614	200	80	40
31.5	14.0	7.0/6.0	2 (2/4)	7.0/6.0	176	58	29	182	3614	400	150	80
31.5	14.0	10.5/9.0	3 (2/4)	10.5/9.0	265	87	43.5	241	5421	400	150	80
31.5	14.0	14.0/12.0	4 (2/4)	14.0/12.0	353	116	58	299	7227	400	150	80
42.0	21.0	10.5/9.0	3 (3/6)	10.5/12.0	265	87	43.5	241	5421	600	225	125
42.0	21.0	14.0/12.0	4 (3/6)	14.0/12.0	353	116	58	299	7227	600	225	125
42.0	21.0	17.5/15.0	5 (3/6)	17.5/15.0	441	145	72.5	357	9034	600	225	125
42.0	21.0	21.0/18.0	6 (3/6)	21.0/18.0	529	174	87	418	10,841	600	225	125

1. System width and depth = 17.0 x 18.5 inches.

Ordering Information

Line to Neutral Power Systems

Equipped Total Capacity ¹	Comcode	Receiver Capacity (kVA)	Inverter Output (kVA)	Max. Number of Inverters (x3.5 kVA)	Inverters Included
7.0 / 3.5 kVA Inverter System	408518884	7	3.5	2	1
7.0 / 7.0 kVA Inverter System	408518892	7	7.0	2	2
14.0 / 7.0 kVA Inverter System	408518900	14	7.0	4	2
14.0 / 10.5 kVA Inverter System	408518918	14	10.5	4	3
14.0 / 14.0 kVA Inverter System	408518926	14	14.0	4	4
21.0 / 10.5 kVA Inverter System	408518934	21	10.5	6	3
21.0 / 14.0 kVA Inverter System	408518942	21	14.0	6	4
21.0 / 17.5 kVA Inverter System	408518959	21	17.5	6	5
21.0 / 21.0 kVA Inverter System	408518967	21	21.0	6	6

1. Rack-mounted system with Maintenance Bypass Switch, AC Distribution and 2nd System Controller Card

Line to Neutral Power Systems Spare Parts

Spare Parts and Spare Parts Kits	Comcode	Description
3.5 kVA Inverter Module	408518975	Inverter Module - 3.5 kVA
Level 1 Spare Parts Kit	408518983	Inverter fan, static transfer switch fan and AC fuses
Level 2 Spare Parts Kit	408518991	Spare inverter module, inverter fan, static transfer switch fan and AC fuses
Level 3 Spare Parts Kit	408519007	Inverter module, inverter fan, static transfer switch fan, controller, LCD display, AC fuses and static transfer switch PCBA
LCD Display	408519015	LCD display/control panel (spare)
Static Switch Fan Assembly	408519023	Static switch fan assembly (includes front panel plate)
Inverter Module Fan Assembly	408519031	Inverter module fan assembly, (includes front panel plate)
Maintenance Bypass Switch	408519049	Maintenance bypass switch

Line to Line Power Systems

Equipped Total Capacity ¹	Comcode	Receiver Capacity (kVA)	Inverter Output (kVA)	Max. Number of Inverters (x3.5 kVA)	Inverters Included
7.0 / 3.5 kVA Inverter System	408533888	7	3.5	2	1
7.0 / 7.0 kVA Inverter System	408533896	7	7.0	2	2
14.0 / 7.0 kVA Inverter System	408533905	14	7.0	4	2
14.0 / 10.5 kVA Inverter System	408533913	14	10.5	4	3
14.0 / 14.0 kVA Inverter System	408533921	14	14.0	4	4
21.0 / 10.5 kVA Inverter System	408533938	21	10.5	6	3
21.0 / 14.0 kVA Inverter System	408533946	21	14.0	6	4
21.0 / 17.5 kVA Inverter System	408533954	21	17.5	6	5
21.0 / 21.0 kVA Inverter System	408533962	21	21.0	6	6

1. Rack-mounted system with Maintenance Bypass Switch, AC Distribution and 2nd System Controller Card

Line to Line Power Systems Spare Parts

Spare Parts and Spare Parts Kits	Comcode	Description
Level 3 Spare Parts Kit	408533970	Includes: Level 2 spares, alarm relay card, LCD display panel, system controller, L-L static switch PCB

Ordering Information (continued)

Circuit Breakers

All circuit breakers listed do not have alarm contacts.

Circuit Breakers (10,000 AIR)	Comcode
15A Single Pole	406938688
20A Single Pole	406938696
25A Single Pole	406938704
30A Single Pole	406938712
40A Single Pole	406938738
50A Single Pole	406938753
20A Double Pole	406938779

Circuit Breakers (22,000 AIR)	Comcode
15A Single Pole	CC408634298
25A Single Pole	CC408634307
30A Single Pole	CC408634414
15A Double Pole	CC408634232
20A Double Pole	CC408634240
25A Double Pole	CC408634257
30A Double Pole	CC408634265
40A Double Pole	CC408634273
50A Double Pole	CC408633283
70A Double Pole	CC408634281
100A Double Pole	CC408634224
125A Double Pole	CC408634422

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