Data Sheet
February 2003

tyco / Electronics

ALPHATRAN™ Inverter System

3.5 kVA - 21 kVA Scalable N+1 Inverter

The Next Generation in AC Telecom Power

Tyco'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.

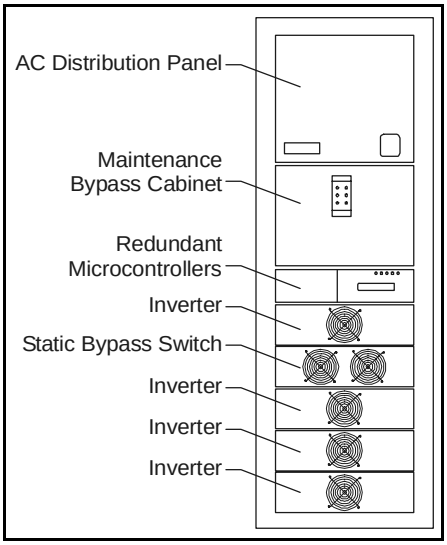
Advanced Specifications

- 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 dBrnc
- 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)

Power Systems

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 single pole circuit breakers and is available in 120 and 240 Vac versions. 10 x two-pole circuit breakers can be used if distribution alarm monitoring is required.

Maintenance Bypass Cabinet

Safely and seamless 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 can be mounted on an industry standard 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.

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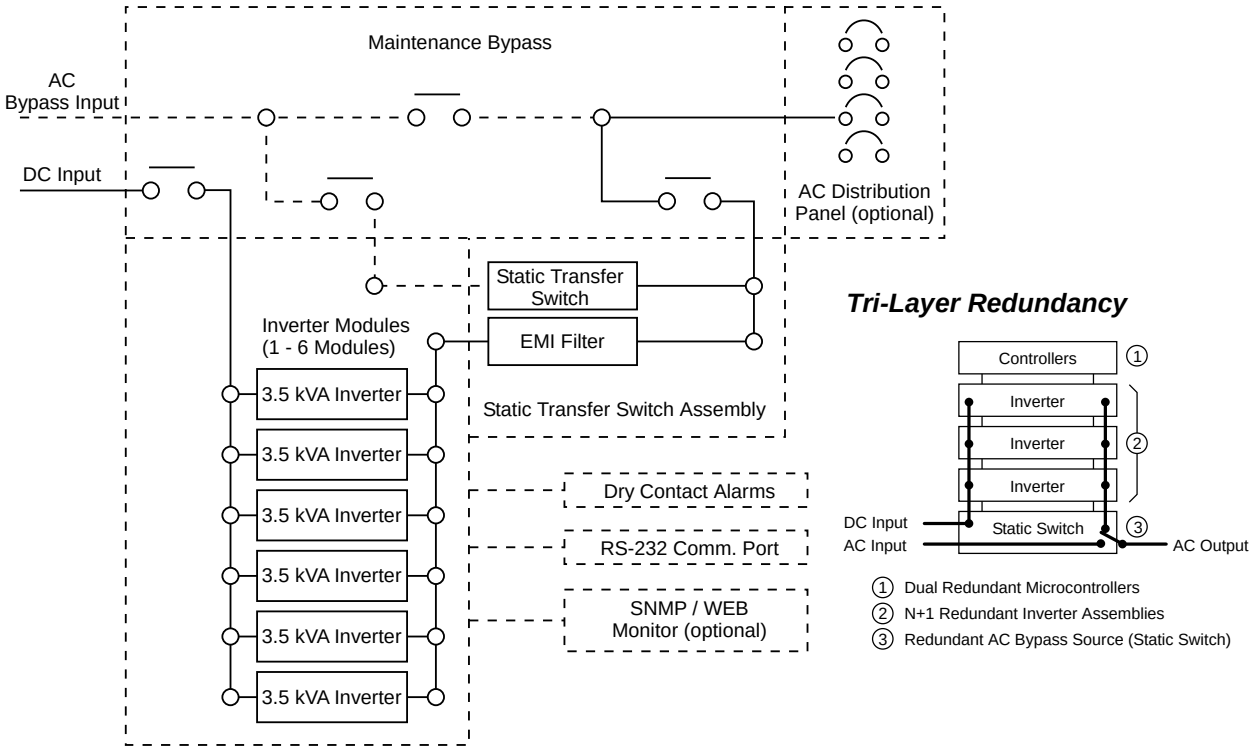
System Block Diagram



Alphatran Technical Specifications

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 dBrnc
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	25-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)	Approx. System Weight (lbs)	Max BTU	Sugg. DC Breaker (A)	AC Input Breaker (A at 115 Vac)
21.0	7.0	3.5/3.0	1 (1/2)	3.5/3.0	88	26	114	1807	125	30
21.0	7.0	7.0/6.0	2 (1/2)	7.0/6.0	176	52	182	3614	250	60
31.5	14.0	7.0/6.0	2 (2/4)	7.0/6.0	176	52	182	3614	250	60
31.5	14.0	10.5/9.0	3 (2/4)	10.5/9.0	265	78	241	5421	375	100
31.5	14.0	14.0/ 12.0	4 (2/4)	14.0/ 12.0	353	104	299	7227	500	125
42.0	21.0	10.5/9.0	3 (3/6)	10.5/ 12.0	265	78	241	5421	375	100
42.0	21.0	14.0/ 12.0	4 (3/6)	14.0/ 12.0	353	104	299	7227	500	125
42.0	21.0	17.5/ 15.0	5 (3/6)	17.5/ 15.0	441	130	357	9034	650	150
42.0	21.0	21.0/ 18.0	6 (3/6)	21.0/ 18.0	529	157	418	10,84 1	750	200

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

Ordering Information

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

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 2 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

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	407247337
25A Single Pole	407247386
30A Single Pole	407247394
15A Double Pole	407250034
20A Double Pole	407250042
25A Double Pole	407250059
30A Double Pole	407250067
40A Double Pole	407250083
50A Double Pole	407250109
70A Double Pole	408519631
100A Double Pole	408519601
125A Double Pole	408519627

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February 2003
DS03-004 Rev 2