

# Power Solutions for Traffic & Intelligent Transportation Systems

TOTAL POWER SOLUTIONS BY ALPHA TECHNOLOGIES LTD.

The image shows the exterior of an Alpha Technologies building. The building is a modern, multi-story structure with a large glass facade and a prominent blue and white logo on the upper level. The logo consists of the word "alpha" in a stylized, lowercase font with a circular element around it, and the word "TECHNOLOGIES" in a bold, uppercase font below it. The building is set against a clear blue sky, and there is some greenery in the foreground.

## ALPHA TECHNOLOGIES LTD.

With 4 decades of industry leadership in POWER, Alpha Technologies has established itself as the preeminent total power solutions provider and one stop source for AC, DC, hybrid and renewable powering solutions for the Telecom, Cable TV, Traffic, ITS, Industrial and Alternative Energy industries. Alpha's products are the trusted power behind large switching and data centers, mobile cell sites, broadband networks, traffic and security systems, DAS networks, and many more. Our intimate knowledge of our customers allows us to understand powering problems better than other providers of power, and to quickly design/deliver solutions specifically tailored to solve your powering challenges. With multiple options for standardized and custom system design, Alpha has the ability to provide the ideal solution for virtually any application.

### THE ALPHA GROUP

The Alpha Group represents an alliance of companies who share a common philosophy – to create world class powering solutions. Collectively, Alpha Group members develop and manufacture AC, DC and renewable power conversion, protection and standby products. Applications for these products include Cable TV, Telecom, Commercial, Industrial and Distributed Generation for a worldwide customer base. In addition to these core specialties, Alpha Group companies provide a complete range of installation and maintenance services. Members of The Alpha Group include Alpha Technologies Ltd., Alpha Technologies Inc., Alpha Energy, Alpha Industrial Power, Altair Advanced Industries Inc., Alpha Technologies S.A., OutBack Power Technologies Inc., Alpha Technologies Europe Ltd., Alpha Technologies GmbH, Alpha Innovations Brasil, Alphatec Ltd., Alphatec Baltic, Alpha Mexico Network Power S.A. de C.V., NaviSemi Technologies Pvt. Ltd. and Alpha Technologies Turkey Enerji Ltd. Sti.





<b>Uninterruptible Power Supplies (UPS) Solutions</b>	
Power Solutions for Traffic & ITS .....	4
Alpha FXM UPS Family .....	5
FXM 350 .....	6
FXM 650 .....	7
FXM 1100 .....	8
FXM 2000 .....	9
FXM 1100 QC .....	10
FXM/Mini Remote Communications .....	11
Remote Monitoring Capability .....	12
<b>Alpha Transfer Switches</b>	
Universal Automatic Transfer Switch .....	13
Universal Generator Transfer Switch .....	13
Alpha Maintenance Bypass Switch .....	13
Alpha Transfer Switch Configurations .....	14
<b>AMPS HP2</b>	
AMPS Topology .....	16
AMPS HP2 .....	18
Alpha Inverter Module 2500 .....	20
<b>Alpha Enclosure Solutions</b>	
Alpha Traffic Mini BBS .....	22
Powernode Systems .....	24
SE48-1616 .....	25
SE48-2216 .....	26
SE48-1909 .....	27
<b>Battery Solutions</b>	
AlphaCell GXL .....	29
AlphaCell Gold HP .....	30
AlphaCell XTV .....	31
Remote Battery Monitoring System Plus .....	32
Battery Heater Mats .....	33
Battery Accessories .....	34
<b>AlphaGen DC Generator System .....</b>	<b>35</b>
<b>ITS Solutions .....</b>	<b>37</b>
<b>Services &amp; Support .....</b>	<b>38</b>
<b>Contact Us .....</b>	<b>39</b>
<b>UPS/BBS Selection Guide .....</b>	<b>40</b>

# POWER SOLUTIONS FOR TRAFFIC & INTELLIGENT TRANSPORTATION SYSTEMS

Power disturbances that impact traffic signals and Intelligent Transportation Systems (ITS) not only create potentially dangerous conditions for transportation users, but also often result in immediate gridlock and congestion on arterials and outlying intersections - impacting air quality, noise levels and transit times. Year to year, traffic control system failure accounts for an immeasurable number of automobile accidents, personal injury/fatalities and insurance claims. While this is no surprise to those familiar with the challenges of transportation, many may be unaware that strategically deployed and reliable backup power can minimize or even neutralize the root cause of many of these problems.

With 15 years of experience in the Traffic market, Alpha continues to be the leader in providing back up power and power conditioning for traffic signalized intersections and ITS. To date, the majority of the States in America have standardized on Alpha UPS's for their applications, resulting in Alpha systems already backing up over 50,000 traffic intersections and ITS installations, as well as many other traffic markets around the world.

The ITS promises the benefit of providing real-time information access to operators of traffic management centers and end users, enabling them to make smarter, more efficient use of transportation networks. Without backup power, loss of these interfaces and critical communication devices

(such as detectors, surveillance tools and wireless communications) may pose significant safety and security risks for the user and operator. The moment when communications are needed the most is often the time when there is an unexpected local power loss or interruption.

For over 40 years, Alpha's line of rugged outdoor uninterruptible power supplies (UPS) and backup power solutions have been designed by outdoor power experts to meet the stringent requirements like those in the traffic industry, reliably performing in frigid temperatures, searing desert heat, snow & salt and other environmentally harsh conditions.

By implementing battery backup/UPS solutions into your traffic networks, there is the potential to:

- Condition and regulate incoming commercial power ensuring sensitive control equipment works efficiently and experiences less damage
- Save lives and eliminate severe accidents due to power outages
- Sustain power to operating systems and controller electronics until utility power is restored
- Extend the life cycle and lower repair cost up to 70% of all protected traffic electronic equipment
- Maintain traffic flow and intersection safety
- Reduce expenses by eliminating ghost service call-outs or expensive after hours calls

## ALPHA OFFERS PROVEN SOLUTIONS TO FIT ANY TRAFFIC AND ITS APPLICATION

- Outdoor and indoor UPS power modules with Ethernet/SNMP remote monitoring and communication capabilities with the highest Mean Time to Failure Rate (MTBF)
- A wide range of weather-hardened, secure enclosures that permit flexible configuration and customization to meet specific requirements
- Automatic transfer and failsafe bypass switches that allow safe switching from utility to emergency power
- Paralleled battery configurations, stationary and portable gas-powered generators for extended run times at remote & critical locations
- Advanced GEL-cell and AGM batteries featuring superior working life and reliability, and one of the longest battery warranties available
- Remote battery testing and diagnosis that drastically lowers maintenance time and cost.
- AlphaGuard™ battery management technology to balance and optimize battery performance
- Battery heater mats to optimize battery performance in cold climates

## ALPHA FXM UPS FAMILY

Alpha's FXM family of uninterruptible power supplies (UPS) is designed to provide clean, reliable backup power for Traffic applications. Featuring an automatic voltage regulation (AVR), each FXM UPS provides power stability in varied power conditions as well as the ability to switch to emergency backup power without interrupting power to the intersection. Choose the Alpha FXM 350 and 650 for ITS, the FXM 1100 for standard signalized intersections or the Alpha FXM 2000 for larger intersections or railway crossings with multiple turn lights and other additional power requirements.

The factory installed Ethernet/SNMP card allows communication with the UPS remotely through any web browser and is capable of notifying up to four different email addresses. Outgoing notifications can be customized with selectable severity levels and triggered by events, faults and/or alarms.

For optimal control and performance of your UPS system, the Ethernet/SNMP card is powered by the UPS batteries' DC voltage, eliminating the need for an external power source.

Each FXM power level is available in either 120V or 230V variants, both with auto frequency detection (60Hz/50Hz). Alpha is approved by multiple States within the US, including California Department of Transportation (Caltrans), Texas and many others.

Other smart features of the FXM family include:

- During periods of surge or sag in the line voltage, a wider-range automatic voltage regulation means less dependence on batteries thus lengthening battery life
- Independently programmable user inputs and dry contact relays allow controlling and tracking of key functions
- Event and alarm logging with time and date stamping simplifies and accelerates troubleshooting
- A wide operating temperature range of -40 to 74°C (-40 to 165°F)<sup>1</sup> is suitable for extreme operating environments
- Control and power connection panels can be rotated for viewing in horizontal or vertical mounting orientations<sup>2</sup>
- Temperature compensated battery charging protects batteries from over-charging at extreme temperatures, extending the life of the battery

1. Power module only. Output power derates after 55°C (122°F) for FXM 350, 650 and 1100 and after 50°C (122°F) for FXM 2000 (120Vac), 55°C (230Vac).  
2. The LCD panel on the FXM 350, 650 cannot be rotated.



# FXM 350

## RUGGED UPS MODULE

- › 350W/VA UPS module designed to operate in extreme environments; providing maximum flexibility while ensuring critical loads remain protected and running during power outages and other power disturbances
- › Unsurpassed flexibility with dual 120Vac and 24Vac outputs
- › Wide range Automatic Voltage Regulation (AVR) lengthens battery life by providing protection without transferring to backup mode during voltage surge or sag
- › Local and remote monitoring and control via USB port and Ethernet SNMP interface
- › Temperature compensated battery charging protects batteries from overcharging at extreme temperatures, extending the life of the battery
- › Independently programmable control and report dry contacts allow monitoring and controlling of key functions

Consult your Alpha representative for P/N configurations

### ELECTRICAL

Model	120Vac	230Vac	
<b>Battery String Voltage</b>	48Vdc or 24Vdc	24Vdc	
<b>Nominal Voltage</b>	120Vac	230Vac	
<b>Frequency</b>	60/50Hz ±5% (auto-detection)		
<b>Input</b>	Voltage range (w/o transferring to battery mode)	88 to 152Vac	151 to 282Vac
	Current:	FXM350-24: 5.3A FXM350-48: 5.7A	2.7A
	Waveform	Pure sinewave	Pure sinewave
<b>Output</b>	Nominal voltage	Dual 120Vac, 24Vac	230Vac, 24Vac
	Voltage regulation at nominal input	±10% on line mode, ±2% on inverter mode	
	Power at 55°C	350W/VA Total	350W/VA Total
	24Vac:	260W/VA (max)	260W/VA (max)
120Vac:	350W/VA (max)	350W/VA (max)	
<b>Frequency</b>	Output frequency = Input frequency		

### MECHANICAL

**Mounting:**..... 19" or 23" rack with the addition of ears for rack mounting

**Dimensions:**

mm:..... 88.14H x 342W x 198D

inches: ..... 3.5H x 13.46W x 7.8D

**Weight:** ..... 8.62kg (19lbs)

### ENVIRONMENTAL

**Operating Temp Range\*:** -40 to 74°C (-40 to 165°F)

**Humidity:** ..... Up to 95% (non condensing)

**Altitude (m/ft):** ..... Up to 3700 (12,000)\*\*

**Audible Noise @ 25°C:** ..... 45dBA @ 1 meter (39in)

**MTBF (hours):** ..... 150K + as per Telcordia SR-332, 100% duty cycle, full load

**BTU/Hr:** ..... Normal mode 9W/30.7BTU/hr  
Backup mode 110W/675 BTU/hr

### PERFORMANCE

**Typical Output Voltage THD:** ... <3% (resistive load)



**Typical Efficiency:** ..... >96% (resistive load)

**Typical Transfer Time:** ..... <5ms


**Load Crest Factor:** ..... 3:1 (load dependent)

### POWER CONNECTOR OPTIONS

#### 120Vac Model

	Input	Output
<b>Standard</b>	 Terminal Block	 Terminal Block

#### 230Vac Model

<b>Standard</b>	 Terminal Block	 Terminal Block
-----------------	--	--

### AGENCY COMPLIANCE

**Electrical Safety:** UL1778, CSA C22.2 No. 107.3, EN60950-1

**Marks:**  

**EMI:** CFR47, Part 15 Subpart B, Class A; CES-003, Class A; ENG2040-2

\*Derates after 55°C (131°F)

\*\*Derates 2°C per 300m (1000ft) above 1400m (4500ft)

\*\*\*CE applies to 230Vac version only



# FXM 650

## RUGGED UPS MODULE

- 650W/VA UPS module designed to operate in extreme environments and provide maximum flexibility while ensuring critical loads remain protected and running during outages and other power disturbances
- Wide range Automatic Voltage Regulation (AVR) lengthens battery life by providing protection without transferring to backup mode during voltage surge or sag
- Independently programmable control and report dry contacts allow monitoring and controlling of key functions
- Temperature compensated battery charging protects batteries from overcharging or undercharging at extreme temperatures, extending the life of the battery
- Local and remote monitoring and control via RS232 port and Ethernet SNMP interface

Consult your Alpha representative for P/N configurations

### ELECTRICAL

Model	120Vac	230Vac
Battery String Voltage	24Vdc or 48Vdc	24Vdc
Nominal Voltage	120Vac	230Vac
Frequency	60/50Hz ±5% (auto-detection)	
Input	Voltage range	85 to 175Vac
	Current	8.7A (@ nominal voltage and max battery charging current)
	Waveform	Pure sinewave
	Nominal voltage	120Vac
Output	Voltage regulation at nominal input	±10% on line mode, ±2% on inverter mode
	Power at 55°C	650W/VA
	Charge current	10A max
Frequency	Output frequency = Input frequency	

### MECHANICAL

#### Dimensions:

mm: .....88H x 432W x 229D  
 inches: .....3.47H x 17W x 9D

Weight: .....11kg (25lbs)

### ENVIRONMENTAL



**Operating Temp Range\*:** -40 to 74°C (-40 to 165°F)  
**Humidity:** .....Up to 95% (non condensing)  
**Altitude(m/ft):** .....Up to 3700 (12,000)\*\*  
**Audible Noise @ 25°C:** .....45dBa @ 1 meter (39in)  
**MTBF (hours):** .....150K + as per Telcordia  
 SR-332, 100% duty cycle, full load  
**BTU/Hr:** .....Normal mode 9W/30.71 BTU/hr  
 Backup mode FXM 650-48: 143W/488 BTU/hr  
 Backup mode FXM 650-24: 217W/740 BTU/hr

### PERFORMANCE

**Typical Output Voltage THD:**... <3% (resistive load)  
**Typical Efficiency:** ..... >98% (resistive load)  
**Typical Transfer Time:** ..... <5ms  
**Load Crest Factor:** ..... 3:1 (load dependent)

### POWER CONNECTOR OPTIONS

#### 120Vac Model

	Input	Output
Standard	 Terminal Block	 Terminal Block

#### 230Vac Model

Standard	 Terminal Block	 Terminal Block
----------	--	--

### AGENCY COMPLIANCE

**Electrical Safety:** UL1778, CSA 22.2 No 107.3-03, ENG2040-1

**Marks:**  

**EMI:** CFR47, Part 15 Subpart B, Class A; CES-003 Class A; ENG 2040-2

\*Derates after 55°C

\*\*Derates 2°C per 300m (1000ft) above 1400m (4500ft)

\*\*CE applies to 230Vac version only



# FXM 1100



## RUGGED UPS MODULE

- 1100W/VA UPS module designed to operate in extreme environments and provide maximum flexibility while ensuring critical loads remain protected and running during outages and other power disturbances
- Wide range Automatic Voltage Regulation (AVR) lengthens battery life by providing protection without transferring to backup mode during voltage surge or sag
- Independently programmable control and report dry contacts allow monitoring and controlling of key functions
- Temperature compensated battery charging protects batteries from overcharging or undercharging at extreme temperatures, extending the life of the battery
- Local and remote monitoring and control via RS232 port and Ethernet SNMP interface
- UPS panels can be rotated, improving usability and viewing convenience

Consult your Alpha representative for P/N

### ELECTRICAL

Model	120Vac	230Vac
Battery String Voltage	48Vdc	48Vdc
Nominal Voltage	120Vac	230Vac
Frequency	60/50Hz ±5% (auto-detection)	
Input	Voltage range	85 to 175Vac
	Current	15.5A (@ nominal voltage and max battery charging current)
	Waveform	Pure sinewave
Output	Nominal voltage	120Vac
	Voltage regulation at nominal input	±10% on line mode, ±2% on inverter mode
	Power at 55°C	1100W/VA
Frequency	Output frequency = Input frequency	

### MECHANICAL

#### Dimensions:

mm:.....133H x 394W x 222D  
inches: .....5.22H x 15.5W x 8.75D

Weight: .....16kg (35lbs)

### ENVIRONMENTAL

**Operating Temp Range\*:** -40 to 74°C (-40 to 165°F)

**Humidity:** .....Up to 95% (non condensing)

**Altitude(m/ft):**.....Up to 3700 (12,000)\*\*

**Audible Noise @ 25°C:** .....45dBa @ 1 meter (39in)

**MTBF (hours):**.....150K + as per Telcordia

**BTU/Hr:** .....SR-332, 100% duty cycle ,full load  
Normal mode 22W/75 BTU/hr  
Backup mode 242W/825.75 BTU/hr

### PERFORMANCE

**Typical Output Voltage THD:**... <3% (resistive load)

**Typical Efficiency:**..... >98% (resistive load)

**Typical Transfer Time:**..... <5ms

**Load Crest Factor:**..... 3:1 (load dependent)

### POWER CONNECTOR OPTIONS

#### 120Vac Model

	Input	Output
Standard	Terminal Block	Terminal Block
Optional	Terminal Block	Terminal Block + Dual 5-15R
	IEC**	IEC**

#### 230Vac Model

Standard	Terminal Block	Terminal Block
----------	----------------	----------------

\*\*FXM models with IEC connectors come with 4 lines LCD display instead of the traditional 2 lines display. Only available in Kit 0380009-003

### AGENCY COMPLIANCE\*\*\*

**Electrical Safety:** UL1778, CSA 22.2 No 107.3; EN62040-1

**Marks:**

**EMC:** CFR47, Part 15 Subpart B, Class A; CES-003 Class A; EN62040-2

\*Derates after 55°C

\*\*Derates 2°C per 300m (1000ft) above 1400m (4500ft)

\*\*\*Compliance only applies to units with standard input and output connectors.

Contact us for compliance information on models with optional power connectors

\*\*\*\*CE applies to 230Vac version only

# FXM 2000



## RUGGED UPS MODULE

- 2000W/VA UPS module designed to operate in extreme environments and provide maximum flexibility while ensuring critical loads remain protected and running during outages and other power disturbances
- Wide range Automatic Voltage Regulation (AVR) lengthens battery life by providing protection without transferring to backup mode during voltage surge or sag
- Independently programmable control and report dry contacts allow monitoring and controlling of key functions
- Temperature compensated battery charging protects batteries from overcharging or undercharging at extreme temperatures, extending the life of the battery
- Local and remote monitoring and control via RS232 port and Ethernet SNMP interface
- UPS panels can be rotated, improving usability and viewing convenience

Consult your Alpha representative for P/N configurations

### ELECTRICAL

Model	120Vac	230Vac
Battery String Voltage	48Vdc	48Vdc
Nominal Voltage	120Vac	230Vac
Frequency	60/50Hz ±5% (auto-detection)	
Input	Voltage range	85 to 152Vac
	Current	20A (@ nominal voltage and max battery charging current)
	Waveform	Pure sinewave
Output	Nominal voltage	120Vac
	Voltage regulation at nominal input	±10% on line mode, ±2% on inverter mode
	Power at 55°C	2000W/VA
Frequency	Output frequency = Input frequency	

### MECHANICAL

#### Dimensions:

mm: ..... 133H x 394W x 222D  
 inches: ..... 5.22H x 15.5W x 8.75D

Weight: ..... 16kg (35lbs)

### ENVIRONMENTAL



**Operating Temp Range\*:** -40 to 74°C (-40 to 165°F)  
**Humidity:** ..... Up to 95% (non condensing)  
**Altitude(m/ft):** ..... Up to 3700 (12,000)\*\*  
**Audible Noise @ 25°C:** ..... 45dBA @ 1 meter (39in)  
**MTBF (hours):** ..... 150K + as per Telcordia SR-332, 100% duty cycle ,full load  
**BTU/Hr:** ..... Normal mode 41W/140 BTU/hr  
 Backup mode 439W/1498 BTU/hr

### PERFORMANCE


**Typical Output Voltage THD:** .... <3% (resistive load)  
**Typical Efficiency:** ..... >98% (resistive load)  
**Typical Transfer Time:** ..... <5ms  
**Load Crest Factor:** ..... 3:1 (load dependent)

### POWER CONNECTOR OPTIONS

#### 120Vac Model

	Input	Output
Standard	 Terminal Block	 Terminal Block

#### 230Vac Model

Standard	 Terminal Block	 Terminal Block
----------	--	--

### AGENCY COMPLIANCE

**Electrical Safety:** UL1778, CSA 22.2 No 107.3; EN62040-1

**Marks:**  

**EMC:** CFR47, Part 15 Subpart B, Class A; CES-003 Class A; EN62040-2

\*120Vac module derates after 50°C (122°F). 230Vac module derates after 55°C (131°F)

\*\*Derates 2°C per 300m (1000ft) above 1400m (4500ft)

\*\*\*CE applies to 230Vac version only



# FXM 1100 QC

## FXM 1100 4 LINE DISPLAY & QUICK CONNECT IEC PLUGS/RECEPTACLE

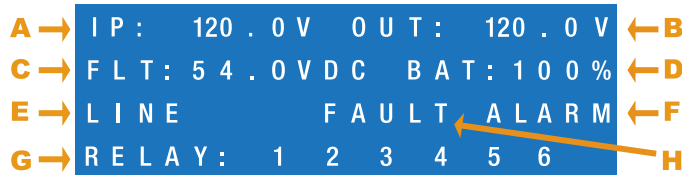
The FXM 1100 QC UPS has all the benefits of the standard FXM UPS plus:

- Caltrans approved, TEES 2009
- 4 lines LCD display
- Resettable output circuit breaker
- Input/Output, with quick disconnects and locking device

Consult your Alpha representative for P/N configurations

### DISPLAY

The LCD control panel provides "at a glance" monitoring. This panel when used along with the CANCEL, SCROLL and SELECT buttons, allows you to program, make measurements, and troubleshoot the Alpha FXM.



### LCD Screen

- A. IP: Input voltage reading
- B. OUT: Output voltage reading
- C. FLT: Battery voltage when not charging  
CHR: Battery voltage when charging
- D. BAT: Battery capacity (0-100%)
- E. Present operating mode (Line mode shown)
- F. Text "ALARM" flashes if alarm triggered
- G. RELAY: Energized relays numbers
- H. Text "FAULT" flashes if fault triggered

### ELECTRICAL

#### 120Vac Model

**Battery String Voltage:** ..48Vdc

**Nominal Voltage:**.....120Vac

**Nominal Frequency:** .....Auto-sensing

#### Input:

Current:.....15.5A (@ nominal voltage and max battery charging current)

Voltage:.....85 to 175Vac

#### Output:

Voltage Regulation

at nominal input:.....±10% on line mode, ±2% on inverter mode

Power at 55°C:.....1100W/VA

### MECHANICAL

#### Dimensions:

mm:.....133H x 394W x 222D

inches: .....5.22H x 15.5W x 8.75D

**Weight:** .....16kg (35lbs)

### ENVIRONMENTAL

**Operating Temp Range\*:** -40 to 74°C (-40 to 165°F)

**Humidity:** .....Up to 95% (non condensing)

**Altitude(m/ft):**.....Up to 3700 (12,000)\*\*

**Audible Noise @ 25°C:** ....45dBa @ 1 meter (39in)

**MTBF (hours):**.....150K + as per Telcordia

SR-332, 100% duty cycle ,full load

**BTU/Hr:** .....Normal mode 22W/75 BTU/hr

Backup mode 242W/825.75 BTU/hr

### PERFORMANCE

**Typical Output Voltage THD:** <3% (resistive load)



**Typical Efficiency:**.....>98% (resistive load)

**Typical Transfer Time:**.....<5ms

**Load Crest Factor:**.....3:1 (load dependent)

### POWER CONNECTOR OPTIONS

#### 120Vac Model

Input	Output
IEC* 	IEC* 

\*FXM models with IEC connectors come with 4 lines LCD display instead of the traditional 2 lines display

# FXM/MINI REMOTE COMMUNICATIONS

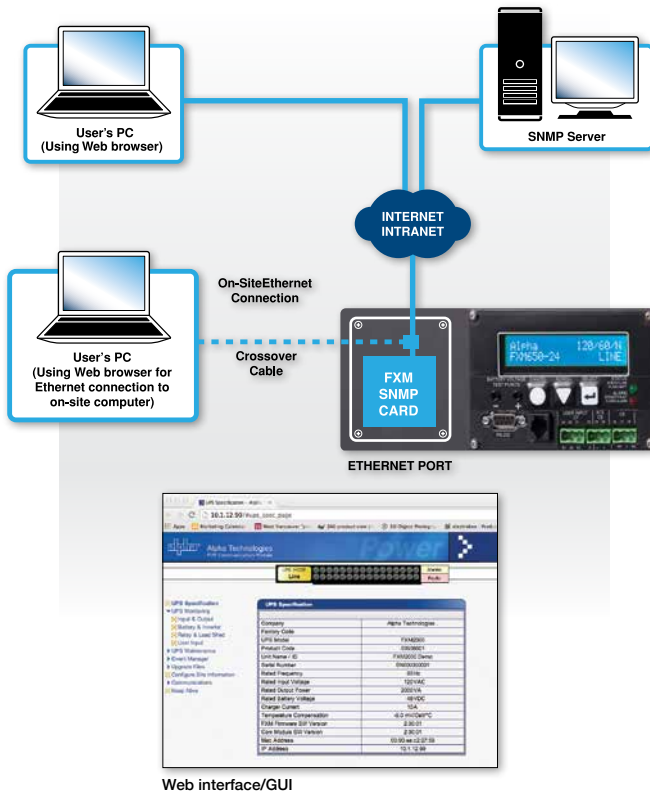


## ETHERNET/SNMP (SIMPLE NETWORK MANAGEMENT PROTOCOL) CARD

For greater effectiveness, control and communication over your UPS system, the Ethernet/SNMP card is factory installed and allows for communication with the Alpha UPS remotely through a web based interface. The Ethernet/SNMP card is powered by the UPS batteries eliminating the need for an external power source. The communication card is capable of providing notifications to four different email addresses. Outgoing notifications can be customized with selectable severity levels and triggered by events, faults and/or alarms.

## ADVANTAGES OF USING SIMPLE NETWORK MANAGEMENT PROTOCOL

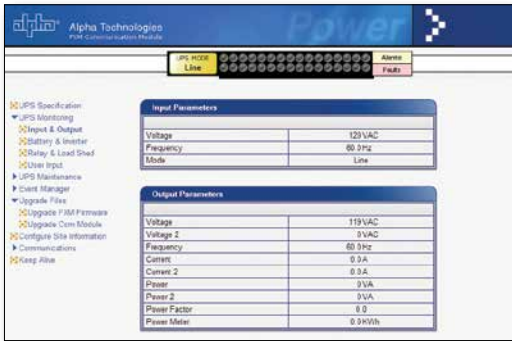
- SNMP allows an administrator to easily and simultaneously manage key remote devices from different vendors using the same tools and interface, lessening the need for truck rolls to sites that require constant monitoring
- SNMP offers long-term reporting capabilities, allowing monitoring for network trends over time and to take remedial action
- Triggered notifications such as e-mail can be used to alert administrators of alarms or system updates
- The ability to update firmware remotely and monitor another device and reset it (by cycling its power) if it does not respond to a query
- The Traffic Management Center (TMC) can communicate remotely with each UPS at all intersections



The card provides a web based graphical user interface (GUI) designed to help Alpha FXM/Mini UPS users monitor, control and set various parameters. With a computer and a crossover RJ-45 cable, users are able to see UPS parameters, relay configurations, events and warnings through a web browser. It is an excellent maintenance and troubleshooting tool that updates information every 5 seconds and logs 200 events with time and date stamp. The UPS event log can be saved remotely via a web page.

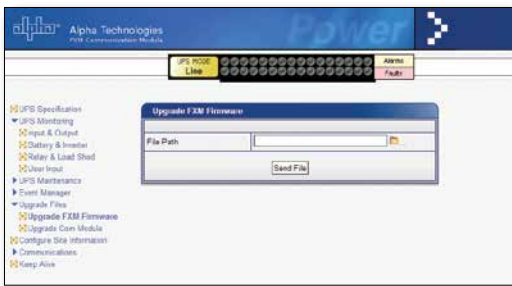
Get real-time notification of every alarm and fault that occurs so you can respond proactively. Easy to customize, it allows you to set your own notification preferences and receive it on any PC, smartphone or a tablet that can receive email.

# REMOTE MONITORING CAPABILITY



## REMOTE STATUS AND MONITORING

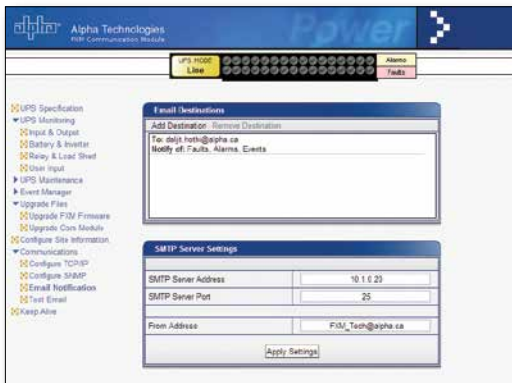
FXM input/output and battery parameters can be viewed as well various setting can be updated remotely. Dry contact configuration can be viewed or changed based on site or user requirements.



## FIRMWARE UPDATES

Both FXM firmware and SNMP card software can be upgraded remotely via web page\*. Costly truck rolls can be avoided and new feature can be implemented with ease.

\*Units with blue LCD. Older units has to be upgraded locally once to implement this feature.



## EMAIL NOTIFICATION

User can set up automatic email notification for status change, events or faults to remotely manage sites and to respond in a timely manner proactively.

# ALPHA TRANSFER SWITCHES

## OUTDOOR SOLUTIONS



Automatic Transfer Switch

### UNIVERSAL AUTOMATIC TRANSFER SWITCH 120V/30A 230V/16A

Alpha's Universal Automatic Transfer Switch is designed as a three stage bypass switch that allows for the UPS to be bypassed and still maintain the ability to keep batteries fully charged.

It acts as a fail-safe device by switching the critical load to the utility line should a fault occur in the UPS. The UATS ensures that clean power is always provided to the critical load, ensuring that your mission-critical equipment always remains running in the event of an outage. This transfer switch also includes a standard manual bypass switch which eliminates costly equipment downtime while servicing the UPS or replacing the batteries.

**Dimensions:** mm: 81H x 135W x 152D  
inches: 3.25H x 5.3W x 6.0D

**Mounting options:** Wall, shelf or single side rack mount



Automatic Generator Transfer Switch

### UNIVERSAL GENERATOR TRANSFER SWITCH 120V/30A 230V/16A

Alpha's Universal Automatic Generator Transfer Switch automatically transfers the input to the UPS from the utility line to a portable AC generator.

The UGTS allows the generator to recharge the batteries and ensure your mission - critical equipment remains in operation during extended power outages. For manually connecting or disconnecting a generator, a standard switch is included.

**Dimensions:** mm: 81H x 135W x 152D  
inches: 3.25H x 5.3W x 6.0D

**Mounting options:** Wall, shelf or single side rack mount



Alpha Maintenance Bypass Switch

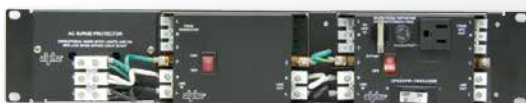
### ALPHA MAINTENANCE BYPASS SWITCH 120V 230V OPTION NOT AVAILABLE

Alpha's Maintenance Bypass Switch allows the user to manually bypass the UPS system to safely perform service or routine maintenance.

When working in conjunction with the Alpha U-ATS, the manual-only maintenance bypass switch can be installed into the traffic controller cabinet, allowing for the complete UPS system to be bypassed for safe emergency replacement.

**Dimensions:** mm: 117H x 120.6W x 165D  
inches: 4.6H x 4.75W x 6.5D

**Mounting options:** Wall, 4 point shelf mount or single side rack mount



Rack Mount Options

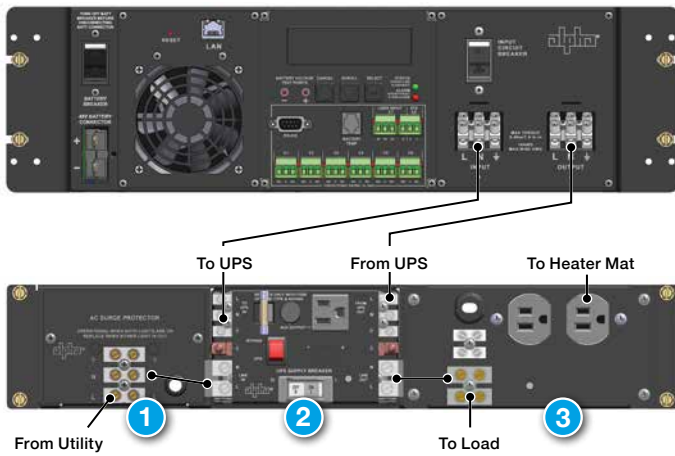
### OTHER MOUNTING OPTIONS RACK MOUNT KIT 2RU – 19 OR 23"

Can be configured with U-ATS, U-GTS, surge option and/or receptacle plate for heating mats.

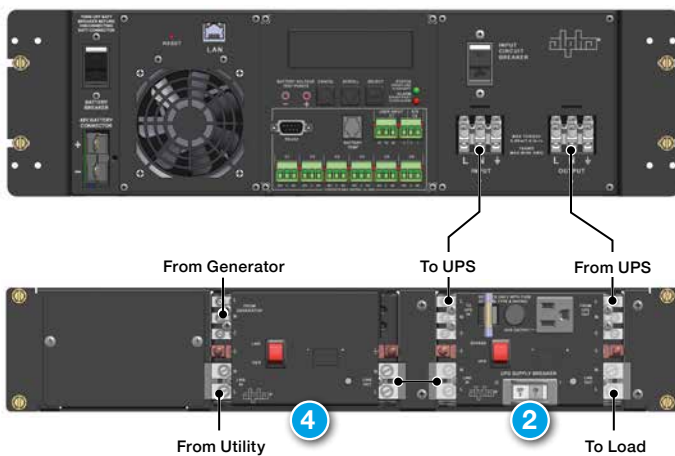
# ALPHA TRANSFER SWITCHES

## CONFIGURATIONS

### OPTION 1



### OPTION 2



19" rack mount shelf option is offered in few different configurations based on application. In option 1 is preconfigured with surge aristor, UATS and receptacle plate assembly. In option 2 assembly comes preconfigured with UGTS and a UATS.

Other configurations are available. Consult your Alpha representative for P/N

#### 1 SURGE ASSEMBLY

The Surge Assembly comes with a UL listed Type 1 Surge Protection Device suitable for use on:

- Surge Entrance
- Distribution panels
- Point of use application

#### 2 UNIVERSAL AUTOMATIC TRANSFER SWITCH

The UATS ensures continuous operation of your systems either with conditioned line power, battery backup power or power direct from the line should the UPS require maintenance.

#### 3 RECEPTACLE PLATE

The receptacle plate provides connection point for UPS backed up customer load, internal enclosure AC lamp and convenience receptacle for non-critical loads like battery heater mats.

#### 4 UGTS

The Universal Automatic Generator Transfer Switch (UGTS) automatically transfers the input to the UPS from the utility line to a portable AC generator. The UGTS allows the generator to recharge the batteries and power your systems during extended power outages.



## AMPS HP2

AMPS HP2 is a revolutionary high performance technology that combines the high reliability of a telecom-grade inverter system with a highly efficient UPS with best in class leading craft access. AMPS is a new tool in the delivery of battery backed AC power. It enables telcos to supply highly reliable video and data delivery as part of triple play service. It offers data centers a more reliable means of powering mission-critical servers and routers. And the same system delivers either single or 3-phase AC power.

The core of the AMPS HP2 system is the Alpha Inverter Module (AIM). Unlike a conventional inverter that transforms a DC input into an AC output, or a traditional UPS that delivers an AC output from an AC input, the AIM accepts both AC and DC inputs. This innovative approach is the key reason the AMPS HP2 system is more reliable than a UPS, more efficient than an inverter.



# AMPS TOPOLOGY

AMPS HP2 is a revolutionary high performance technology that combines a highly reliable inverter system with a highly efficient UPS with best in class craft access. AMPS is a new tool in the delivery of battery backed AC power. It enables telcos to supply highly reliable video and data delivery as part of triple play service. It offers data centers a more reliable means of powering mission-critical servers and routers. And the same system delivers either single or 3-phase AC power.

The core of the AMPS HP2 system is the Alpha Inverter Module (AIM). Unlike a conventional inverter that transforms a DC input into an AC output, or a traditional UPS that delivers an AC output from an AC input, the AIM accepts both AC and DC inputs. This innovative approach is the key reason the AMPS HP2 system is more reliable than a UPS, more efficient than an inverter.

## THE TECHNOLOGY BEHIND THE AMPS HP2 SYSTEM OFFERS TREMENDOUS BENEFITS TO THE USER

**AMPS HP2 delivers fully conditioned, line-regulated telecom-grade AC power with up to 94% system efficiency.**

**In the event of an AC outage, there is zero transfer time with AMPS HP2.**

**AMPS HP2 is more reliable than devices that rely on a static transfer switch (STS) for protection.**

In both AC UPS and Telecom grade inverter system topologies, the STS becomes the “single point of failure”, because if it fails to bypass DC when there is a battery failure, critical loads might get dropped. With AMPS HP2, commercial AC is normally responsible for powering the load, and the 400Vdc bus is always present, so there is no need for an STS.

**AMPS HP2 can include N+1 redundancy.**

The modularity of the system lends itself to redundant operation. AMPS HP2 systems can also be configured for N+N redundancy within a single rack system yielding significant floor space savings for revenue generating equipment.

**AMPS HP2 is scalable.**

Even with traditional modular inverter and UPS systems, a STS must be sized at the time of installation thus limiting future expansion. AMPS HP2 can grow with the addition of AIM modules and/or modular rectifiers.

**AMPS HP2 is safe for technicians.**

With AMPS HP2, technicians are only exposed to 120Vac and 48Vdc, both prevalent and conventional voltages. On the other hand, UPS systems using elevated voltages to achieve higher system efficiencies expose technicians to unsafe voltages, and even though the AIM modules do produce a 400Vdc bus, that voltage is internal to the inverter module and not accessible by the technician.

**AMPS HP2 uses conventional 48Vdc power and batteries.**

By using 48Vdc, AMPS HP2 avoids the expense of high voltage batteries and the expensive service contracts needed to maintain them. Indoor 48Vdc batteries in headend often have a 10 to 20 year design life, available spare capacity can be used to support AC loads.

**AMPS HP2 only requires enough rectifiers to charge the batteries used during an AC outage.**

Unlike conventional Inverters, AMPS HP2 only requires incoming DC to provide the AC output when the utility AC is out of service. So rather than sizing the rectifiers as if the inverter is another DC load, the rectifiers can be sized only for the amount of time prescribed for recharging the batteries.

**AMPS HP2 can be configured for either single phase, two pole/split phase or 3-phase AC output power.**

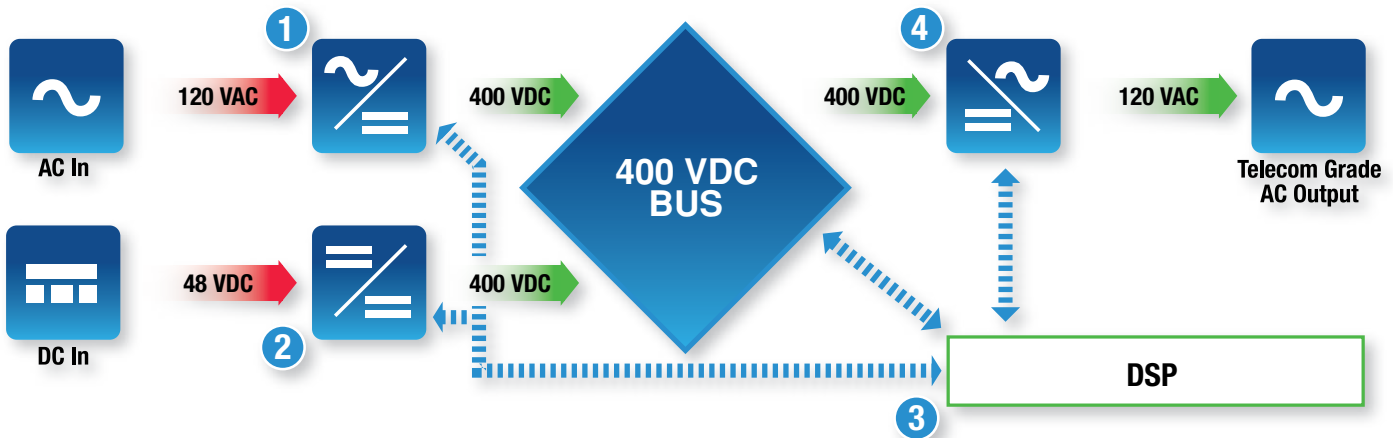
**AMPS HP2 is designed to handle dynamic load surges.**

AIM modules can operate continuously at 110% of rated output, as well as provide short term overload compatibility of up to 150% capacity for 5 seconds.

# AIM INTERNAL POWER ARCHITECTURE

## How does it work

- 1 Each AIM accepts an input from an AC source, typically via AC mains (i.e., commercial utility AC) or an AC generator. It rectifies this 120Vac input into a 400Vdc output for delivery to a common bus. The high output DC voltage enables the unit to achieve a very high efficiency.
- 2 Each AIM unit also accepts a DC input, either from external battery plants or other energy storage and generation devices such as fuel cells and DC generators. The 48Vdc input is converted to a 400Vdc output for delivery to the common bus. Again, because of the high voltage DC output, the efficiency of the system is very high.
- 3 An onboard Digital Signal Processor actively monitors both module inputs and controls which one (or how much of each one) is to be delivered to the 400Vdc bus. The selection process is based on the following:
  - If commercial AC is available, the DSP selects the rectified 400Vdc
  - If commercial AC is unavailable, the DSP selects the converted 400Vdc
  - If commercial AC is partially unavailable, as in the case of a brown-out condition, the DSP augments the rectified output with converted output power.
  - DC or AC input priority may also be manually configured, as well as automatically triggered remotely to accommodate advanced energy management such as utility peak shaving.
- 4 The 400Vdc bus is then inverted into 120Vac to power the equipment.



AMPS HP2 COMPARISON VS TRADITIONAL INVERTERS/UPS'S

Features	Inverter	UPS	AMPS HP2
Filtered AC output	●	●	★
High efficiency design	●	★	★
Utilize low voltage, telecom batteries	★	○	★
Eliminates need for STS	●	●	★
Additional rectification ONLY for charging	●	●	★
Modularity/Scalability	★	●	★
Centralized AC & DC control and monitoring	○	★	★
Compatibility with existing DC plants	★	○	★
★= Fully compliant   ●= Partially or sometimes compliant   ○= Not compliant			

# AMPS HP2

## MODULAR INVERTER SYSTEM



- Innovative, inverter system for critical facilities and Telecom applications
- Single, dual and three phase configurations with up to 75kVA/60kW capacity
- 'HP' technology engineered to deliver high efficiency, high system reliability and low total cost of ownership
- 94% efficiency, 15 year design life and module MTBF (Mean Time Between Failures) greater than 200,000 hours results for class-leading TCO (Total Cost of Ownership)
- Intelligent system controller with integrated SNMP for local and remote management of AC power modules, optional rectifier modules, batteries and other peripherals
- Small footprint system in a single 19" box bay rack, freeing up valuable rack and floor space
- Optional 2.4kW rectifier modules convert the AMPS into a modular, standalone, high-reliability UPS

Introducing the AMPS HP2, Alpha's high performance AC power system offering Telecom grade reliability, 94% efficiency and high power density. The AMPS HP2 features hot swappable 2.5kVA/ 2.0kW inverter modules and optional 2.4kW rectifier modules that are the building blocks of a highly reliable inverter system utilizing -48Vdc battery bus. Each inverter module can utilize either AC or DC sources or both, eliminating the need for a static transfer switch. Transfer between sources is 100% seamless.

Alpha's CXC-HP controller with it's integrated Ethernet/SNMP interface monitors and manages the complete system through a web based GUI and local LCD touch screen. The controller also features email notification via TCP/IP, user definable alarms and data logging, flexible battery management features, and smart peripheral monitoring features.

The AMPS HP2 meets your current and future power needs by allowing you to purchase only the power modules you currently need while having ultimate flexibility to scale up or down, depending on future power needs. Best in class craft access and user friendly connections make the system easy to install, easy to service and easy to upgrade. Furthermore, Alpha's warranty and comprehensive support network for ordering spare modules make AMPS HP2 a smart and dependable investment decision.

## STANDARD FEATURES

- System controller with integrated SNMP communications
- AC input & output breaker
- Integrated maintenance bypass switch
- Transient voltage surge suppressor (TVSS)

Model	AMPS HP2 1-10	AMPS HP2 2-20	AMPS HP2 3-30	AMPS HP2 2-40	AMPS HP2 3-75
<b>System P/N</b>	<b>0260083-010 w/o Cntrl option (-110)</b>	<b>0260083-020 w/o Cntrl option (-120)</b>	<b>0260083-030 w/o Cntrl option (-130)</b>	<b>0260081-001/003*** (Inverter version) 0260081-002/004**** (UPS version)</b>	<b>0260080-001/003*** (Inverter version) 0260080-002/004**** (UPS version)</b>

## ELECTRICAL

<b>Inverter System Max Capacity</b>	10kVA/8kW	20kVA/16kW	30kVA/24kW	40kVA/32kW	75kVA/60kW* or 68kVA/54kW (N+1)
<b>System AC Input Voltage</b>	120Vac Single Phase (2 Wire +G)	120/208Vac 2-Pole (Or) 120/240Vac Split Phase (3 Wire+G)	120/208Vac 3 Phase (4 Wire+ G)	120/208Vac 2-Pole (Or) 120/240Vac Split Phase (3 Wire+G)	120/208Vac 3 Phase (4 Wire+ G)
<b>Inverter Input AC Breaker</b>	100A, 1-Pole	100A, 2-Pole	100A, 3-Pole	200A, 2-Pole	250A, 3-Pole
<b>Inverter Efficiency</b>	94%	94%	94%	94%	94%
<b>Inverter Module Output</b>	2.5kVA/2.0kW	2.5kVA/2.0kW	2.5kVA/2.0kW	2.5kVA/2.0kW	2.5kVA/2.0kW
<b>Inverter Positions</b>	Up to 4 modules	Up to 8 modules	Up to 12 modules	Up to 16 modules	Up to 30 modules
<b>Rectifier System Max Capacity</b>				14.4kW	14.4kW
<b>Rectifier Input AC Breaker</b>				1x 100A Breakers (UPS Version)	1x 60A Breaker (UPS Version)
<b>System DC Input Voltage</b>	-48Vdc	-48Vdc	-48Vdc	-48Vdc	-48Vdc
<b>Rectifier Efficiency</b>				+96%	+96%
<b>Rectifier Module Output</b>				2.4kW	2.4kW
<b>Rectifier Positions</b>				Up to 6 modules	Up to 6 modules

## MECHANICAL

<b>System Dimensions</b>	15.75H x 19W x 23.6D	19.25H x 19W x 23.6D	22.75H x 19W x 23.6D	83.4H x 24W x 28D	83.4H x 24W x 28D
<b>Mounting Configuration</b>	19 or 23" Rack Mountable Front or Mid Mount			Preinstalled in Box Bay	
<b>DC Input Connections</b>	4x 3/8" on 1" Centers per polarity	4x 3/8" on 1" Centers per polarity	4x 3/8" on 1" Centers per polarity	4x 3/8" on 1" Centers per polarity**	4x 3/8" on 1" Centers per polarity**
<b>System Weight</b>	112lbs	128lbs	144lbs	600lbs	700lbs
<b>Inverter Module Weight</b>	11lbs	11lbs	11lbs	11lbs	11lbs
<b>Rectifier Module Weight</b>				3.9lbs	3.9lbs
<b>Controller</b>	CXC-HP	CXC-HP	CXC-HP	CXC-HP	CXC-HP

## ENVIRONMENTAL

<b>Temperature</b>	Operating (full load): -20 to 40°C (-4 to 104°F) Storage: -40 to 70°C (-40 to 158°F)
<b>Relative Humidity</b>	Up to 95%, non-condensing
<b>Operating Altitude</b>	Up to 1500m (4900ft) above sea level
<b>Thermal Dissipation per 2.5kVA/2kW AIM module</b>	437 BTU/hr in AC to AC mode; 758 BTU/hr in DC to AC mode

## AGENCY COMPLIANCE

<b>Safety</b>	UL1778 (5th Ed); CSA C22.2 No. 107.3-14 UPS General Safety
<b>EMC</b>	FCC CFR47 Part 15 Class A; ICES-003

\*Consult factory for P/N \*\*8 total with back to back termination \*\*\*001/002: Top feed AC/DC \*\*\*\*003/004: Top feed AC, Bottom feed DC

# ALPHA INVERTER MODULE 2500



## FOR INSTALLATION IN AMPS80 HP2 SYSTEMS

- Offers 94% efficiency and Telecom-grade reliability
- Hot swappable 2.5kVA/2kW AC power module allows optimal scalability and flexibility
- No single point of failure due to system static switch, as each module has DSP controlled static switch functionality
- Up to 4 high power density modules per inverter shelf
- Up to 30 modules per 75kVA AMPS80 HP2 system

P/N: 014-201-20

### ELECTRICAL

#### AC Output:

Power rating:	2500VA/2000W
Waveform:	Pure sine wave
Efficiency:	94% AC-to-AC mode
Power factor:	0.8
Transfer time:	Zero transfer time
Nominal voltage:	120Vac
Voltage accuracy:	±2%
Frequency:	60Hz (same as input frequency)
Frequency accuracy:	0.03%
THD (resistive load):	<1.5%
Transient load recovery time:	0.4 ms
Soft start time:	20s
Max crest factor at nominal power:	3.5
Short circuit overload capacity:	10 x In for 20msec (AC-to-AC mode)
Short term overload capacity:	150% for 5 seconds
Permanent overload capacity:	110%
MTBF:	>230,000hrs

#### AC Input:

Nominal AC voltage:	120Vac
AC voltage range:	90 - 140Vac
Input power factor:	>99%
Synchronization range:	57 - 63Hz

#### DC Input:

Nominal DC voltage:	48Vdc
Maximum DC voltage range (max):	40 - 60Vdc (user adjustable)
Voltage ripple:	<2mV/<38 dbnrc

### MECHANICAL

#### Dimensions:

mm:	88.9H x 102W x 435D
inches:	3.5H x 4W x 17.13D

**Weight:** 5kg (11lbs)

### ENVIRONMENTAL

#### Temperature:

Operating:	-20 to 40°C (-4 to 104°F)
Storage:	-40 to 70°C (-40 to 158°F)

**Relative Humidity:** Up to 95%, non-condensing

**Operating Altitude:** Up to 1500m (4900ft) above sea level

**Heat Dissipation:** 437BTU per hour in AC-to-AC mode;  
758BTU per hour in DC-to-AC mode

### AGENCY COMPLIANCE

**Safety:** UL 60950

**Immunity:** EN 61000-4

**Emissions:** EN 55022 (Class A)

**RoHS:** Compliant

## ALPHA ENCLOSURE SOLUTIONS

Alpha offers a complete line up of NEMA 3R traffic enclosures, both in aluminum and stainless steel, that are designed and tested to meet the highest industry operating standards. Each enclosure maintains a clean and dry environment ensuring an extended life and enhanced reliability of the power electronics and batteries. Alpha enclosures provide application flexibility with a variety of mounting options, choice of enclosure color, thermal management solutions, security level, generator connectivity, heaters and many other options and features. When an Alpha outdoor enclosure is combined with either an FXM Outdoor AC UPS or Cordex DC power system and AlphaCell batteries, the result is an optimally designed, highly-reliable and efficient outdoor power system that provides easy installation and long term operation.

Alpha Traffic Mini BBS (Battery Backup System) is a rugged enclosure made of 0.125" aluminum and designed to easily accommodate an Alpha uninterruptible power supply, Universal Automatic Transfer Switch and up to four AlphaCell™ 100XTV or two 195/220 GXL batteries.

Alpha's Powernode (PN) Series enclosures offer flexibility and modular expandability for Broadband powering applications. Supporting centralized or distributed powering architectures, PN Series enclosures accommodate multiple power supplies, battery strings and/or natural gas or propane generators.

SE48-1616 is one of the most popular traffic enclosures sold today. It is designed to accommodate an FXM UPS module, transfer switches and four (4) AlphaCell 220 GXL batteries (BCI Group 31). Thermostat controlled fan and louvered vents ensure reliable operation of the system in high temperature environments. SE48-1616 is available in multiple colors to meet DOT requirements for the state, county or the city.

SE48-2216 design is based on the popular SE48-1616 enclosure but with one main difference being width. The SE48-2216 is designed to accommodate a FXM UPS module, transfer switches and four (4) AlphaCell 220 GXL batteries (BCI Group 31), with additional room for other components. Thermostat controlled fan and louvered vents ensure reliable operation of the system in high temperature environments.

SE48-1909 is a battery only enclosure designed to hold four (4) AlphaCell 220 GXL batteries (BCI Group 31). The SE48-1909 is a cost-effective method of adding 48Vdc standby capacity to any existing ground mount enclosure where there is no room inside the existing traffic enclosure for the batteries.


# ALPHA TRAFFIC MINI BBS



## ALPHA TRAFFIC MINI BATTERY BACKUP SYSTEMS

- Consolidated battery backup system (BBS) designed to power ATC, NEMA M, P & 336 (or similar style) traffic controller cabinets
- Ideal solution for space constraint applications providing >4 hours of battery runtime\*
- Self-contained UPS, factory wired, tested and ready to install, reducing installation time and cost\*\*
- Alpha's "No Worries" 5 Year Warranty full replacement with AlphaCell™ 100XTV batteries
- Compact, integrated 350W or 1000W battery backup system, utilizing the same design and similar features of the highly successful and reliable FXM series UPS

NOMINAL SPECIFICATIONS			
Model	Traffic Mini 350 BBS	Traffic Mini 1000 BBS	
P/N	0170021-040	0170021-010	
<b>ELECTRICAL</b>			
System Input Voltage	120Vac	120Vac	
Input Current Rating***	5.3A	14A	
Input Frequency	50/60Hz ±5% (Autosense)	50/60Hz ±5% (Autosense)	
AVR Range	88-152Vac	85-169Vac	
System DC Voltage	24Vdc	48Vdc	
Max Charge Current	6A DC	10A DC	
System Output Voltage	120Vac	120Vac	
Output Power@ 50°C	350W	1000W	
Output Frequency (Hz)	Output frequency = Input frequency	Output frequency = Input frequency	
Output Voltage Regulation at nominal input	±10% Line Mode ±2% Inverter Mode	±10% Line Mode ±2% Inverter Mode	
Output Waveform	Pure Sine Wave	Pure Sine Wave	
<b>MECHANICAL</b>			
Dimensions	in	34H x 16W x 12D	34H x 16W x 12D
	mm	864H x 406W x 305D	864H x 406W x 305D
Weight (w/o batteries)		65 lbs (29.5 kg)	55 lbs (25 kg)
Construction	Aluminum, 5052-H32 (High strength corrosion resistance)		
Finish	Natural Aluminum	Natural Aluminum	
Cable Entrance	Bottom or Rear	Bottom or Rear	
Mounting	Side mount, Optional - wall, pole or pedestal kit available		
Access	Removable bottom shelf for easy wiring access		
AC Input Connections AWG	Terminal blocks #14 to #6 AWG (2.08 to 13.3mm <sup>2</sup> )	Terminal blocks #14 to #6 AWG (2.08 to 13.3mm <sup>2</sup> )	
AC Output Connections AWG	Terminal blocks #14 to #6 AWG (2.08 to 13.3mm <sup>2</sup> )	Terminal blocks #14 to #6 AWG (2.08 to 13.3mm <sup>2</sup> )	
Dry Contact AWG	Terminal blocks #26 to #12 AWG (0.2 to 2.5mm <sup>2</sup> )	Terminal blocks #26 to #12 AWG (0.2 to 2.5mm <sup>2</sup> )	

Model	Traffic Mini 350 BBS	Traffic Mini 1000 BBS
P/N	0170021-040	0170021-010
<b>COMMUNICATION INTERFACE</b>		
Display	2 x 20 backlit alpha-numeric LCD	2 x 20 backlit alpha-numeric LCD
Ports	USB-B: Local Communication RJ45: Remote Communication RJ11: Battery Temperature Compensation	RS232: Local Communication RJ45: Remote Communication RJ11: Battery Temperature Compensation
Indicators	Green & Red LED's Solid Green: Line Mode Flashing Green: Inverter Mode Flashing Red: Alarm Solid Red: Fault	Green & Red LED's Solid Green: Line Mode Flashing Green: Inverter Mode Flashing Red: Alarm Solid Red: Fault
Dry Contact	2 x Programmable NO/NC (250Vac, 1A), 2 x user inputs	5 x Programmable NO/NC (250Vac, 1A), 1 x 48Vdc/500mA, 3 x user inputs, 1 x ATS
<b>ENVIRONMENTAL</b>		
Temperature	Operating: -40 to 74°C (-4 to 165°F)**** Storage: -40 to 75°C (-40 to 167°F)	Operating: -40 to 74°C (-4 to 165°F)**** Storage: -40 to 75°C (-40 to 167°F)
Relative Humidity	Up to 95%, non-condensing	Up to 95%, non-condensing
Altitude	Operating: Up to 2000m (6562ft) above sea level	Operating: Up to 2000m (6562ft) above sea level
<b>PERFORMANCE</b>		
Typical Output Voltage THD	<3% (resistive load)	<3% (resistive load)
Typical Efficiency*****	96%	92%
Load Crest Factor	3:1 (load dependent)	3:1 (load dependent)
<b>AGENCY COMPLIANCE</b>		
Electrical Safety	UL1778, CSA 22.2 No 107.3, UL 60950-1, CSA-C22.2 60950-1	
Marks		
EMC	CFR47, Part 15 Subpart B, Class A; CES-003 Class A	
NEMA	3R	3R
<b>STANDARD SYSTEM CONFIGURATION</b>		
<ul style="list-style-type: none"> <li>• 0.125" Thick Natural Aluminum Enclosure</li> <li>• Universal Automatic Transfer Switch</li> <li>• Document Holder</li> <li>• Tamper Switch</li> <li>• 350 or 1000W UPS Module</li> <li>• Battery Cable Kit - ¼" Ring Lug</li> <li>• Door Filter</li> <li>• ADD AlphaCell Batteries - 4 x 100 XTV (Mini 1000 BBS) or 2 x 220 GXL (Mini 350 BBS)</li> </ul>		
<b>OPTIONAL ACCESSORIES</b>		
<ul style="list-style-type: none"> <li style="width: 25%;">• Remote Battery Monitoring System</li> <li style="width: 25%;">• Battery Heater Mats</li> <li style="width: 25%;">• Mounting Brackets - Pole or Wall</li> <li style="width: 25%;">• Pedestal Mounting Kit</li> </ul>		

\*Runtime calculated with 450W resistive load with 4 x AlphaCell 100XTV at 25°C

\*\*Excluding batteries

\*\*\*@ nominal input voltage and maximum battery charging current

\*\*\*\*Power module only. Output power derates above 50°C

\*\*\*\*\*Efficiency is measured at an ambient temperature of 25°C, full resistive condition and nominal line and battery voltage



# POWERNODE SYSTEMS



## TRAFFIC BBS ENCLOSURE

- › Configurable to support centralized or distributed powering architectures
- › Compatible with AlphaGen™ systems or multiple battery strings for extended runtime solutions
- › Standard or low profile designs
- › Agency certified to meet applicable industry standards
- › High security options

The PN-3 enclosure can accommodate a maximum combination of three equipment or battery trays.

<p><b>Single PN-3</b> 1 Power Supply 2 Battery Strings</p>	
<p><b>Dual PN-3</b> 2 Power Supplies 4 Battery Strings</p>	
<p><b>PN-3/CE-3X2</b> 2 Power Supplies 1 Battery String AlphaGen™ Generator</p>	

### SPECIFICATIONS

**Dimensions:**  
 mm:.....660W x 1118H x 610D  
 inches: .....26W x 44H x 24D  
**Weight:** .....52kg (115lbs) trays not included  
**Power Supply Capacity:** Up to three power supplies  
**Color:**.....Seafoam Green, optional colors available  
**Standard Features:**.....Removable/Lockable doors  
**Finish:**.....Durable powder coat  
**Material:**.....Aluminum

The PN-4 enclosure can accommodate a maximum combination of four trays. A maximum of either three power modules or three battery trays can be installed.

<p><b>Single PN-4</b> 2 Power Supply 2 Battery Strings</p>	
<p><b>Dual PN-4</b> 3 Power Supplies 4 Battery Strings</p>	
<p><b>PN-4/CE-9X2</b> 2 Power Supplies 3 Battery String AlphaGen™ Generator</p>	

### SPECIFICATIONS

**Dimensions:**  
 mm:.....660W x 1320H x 610D  
 inches: .....26W x 52H x 24D  
**Weight:** .....66kg (145lbs) trays not included  
**Power Supply Capacity:** Up to three power supplies  
**Color:**.....Seafoam Green, (optional colors available)  
**Standard Features:**.....Removable/Lockable doors  
**Finish:**.....Durable powder coat  
**Material:**.....Aluminum

# SE48-1616



## 48" OUTDOOR TRAFFIC BBS ENCLOSURE

- › Traffic grade aluminum enclosure protects battery backup power systems (BBS) from outdoor elements
- › Various mounting options (including pole-mount) provide a flexible solution for traffic applications
- › Large sun shield reduces solar heat load inside the cabinet
- › Thermostat controlled fan and louvered vents ensure reliable operation in high temperatures
- › 180° stainless steel piano hinged door with two locking open positions makes internal component installation and maintenance easy and convenient
- › Three-point latching mechanism with Corbin Type 2 lock (or optional Best lock) for maximum security

Consult your Alpha representative for P/N configurations

### MECHANICAL

#### Dimensions:

mm: ..... 1220H x 419W x 419D

inches: ..... 48H x 16.5W x 16.5D

**Weight:** ..... 34kg (75lbs)

**Construction:** ..... High strength corrosion resistant aluminum

**Finish:** ..... Natural aluminum

**Equipment Space:** ..... 8RU space (without generator inlet) with two (2) battery shelves

**Equipment Rails:** ..... EIA standard 19" (vertical)

**Cable Entrance:** ..... Bottom of enclosure: 1 x 76mm (3") dia. knock-out

### HARDWARE

**Hinge Type:** ..... Stainless steel piano hinge

**Door Prop:** ..... Aluminum rod, 2 locking open positions

**Handle:** ..... Stainless steel handle with padlock fitting for extended life and improved look

**Door Latch:** ..... 3 point latch with integrated Corbin Type 2 lock (or optional Best lock) for maximum security

### HVAC

**Cooling:** ..... Thermostat controlled 48Vdc fan, 100 cfm or better, ON at 49°C (120°F) Off at 32°C (89°F)

**Ventilation:** ..... Door installed louvers

### ENVIRONMENTAL

#### Temperature:

Operating: ..... -40 to 46°C (-40 to 115°F)

Storage: ..... -40 to 85°C (-40 to 185°F)

### INSTALLATION

**Access:** ..... Removable bottom shelf for easy wiring access

### MAINTENANCE

**Door Installed Louver:** ... Equipped with washable filter

**Other:** ..... Bug screen protected top vent

### ENCLOSURE OPTIONS

**Mounting:** ..... Side mount (standard) - designed to mount to the side of most traffic enclosure cabinets  
Ground mount kit (optional)  
Pole mount kit (optional)

### SYSTEM SPECIFICATIONS (AS SHOWN)

- 2 Battery shelf with 4x AlphaCell 220GXL batteries
- FXM1100 UPS
- Universal automatic transfer switch
- Universal generator transfer switch

#### System Options

- Generator support: locking generator access door and L5-30 F1 plug
- Tamper switch
- Tilt switch
- AlphaGuard™ battery balancer
- Door activated interior light
- Battery heater mats
- "On Battery" indicator light

### AGENCY COMPLIANCE

**CSA/UL, CE:** UL50E/C22.2 No.94

**NEMA Rating:** 3R

# SE48-2216



## 48" GENERAL PURPOSE OUTDOOR TRAFFIC ENCLOSURE

- Traffic grade aluminum enclosure protects battery backup power systems (BBS) from outdoor elements
- Various mounting options (including pole-mount) provide a flexible solution for traffic applications
- Large sun shield reduces solar heat load inside the cabinet
- Thermostat controlled fan and louvered vents ensure reliable operation in high temperatures
- 180° stainless steel piano hinged door with two locking open positions makes internal component installation and maintenance easy and convenient
- Three-point latching mechanism with Corbin Type 2 lock (or optional Best lock) for maximum security

Consult your Alpha representative for P/N configurations

### MECHANICAL

#### Dimensions:

mm: ..... 1220H x 559W x 419D

inches: ..... 48H x 22W x 16.5D

**Weight:** ..... 41kg (90.3lbs)

**Construction:** ..... High strength corrosion resistant aluminum

**Finish:** ..... Natural aluminum

**Equipment Space:** ..... 11RU space (without generator inlet) with two (2) battery shelves

**Equipment Rails:** ..... EIA standard 19" (vertical)

**Cable Entrance:** ..... Bottom of enclosure: 1 x 76mm (3") dia. knock-out

### HARDWARE

**Hinge Type:** ..... Stainless steel piano hinge

**Door Prop:** ..... Aluminum rod, 2 locking open positions

**Handle:** ..... Stainless steel handle with padlock fitting for extended life and improved look

**Door Latch:** ..... 3 point latch with integrated Corbin Type 2 lock (or optional Best lock) for maximum security

### HVAC

**Cooling:** ..... Thermostat controlled 48Vdc fan, 100 cfm or better, ON at 49°C (120°F) Off at 32°C (89°F)

**Ventilation:** ..... Door installed louvers

### ENVIRONMENTAL

#### Temperature:

Operating: ..... -40 to 46°C (-40 to 115°F)

Storage: ..... -40 to 85°C (-40 to 185°F)

### INSTALLATION

**Access:** ..... Removable bottom shelf for easy wiring access

### MAINTENANCE

**Door Installed Louver:** ... Equipped with washable filter

**Other:** ..... Bug screen protected top vent

### ENCLOSURE OPTIONS

**Mounting:** ..... Side mount (standard) - designed to mount to the side of most traffic enclosure cabinets  
Ground mount kit (optional)  
Pole mount kit (optional)

### AGENCY COMPLIANCE

**NEMA Rating:** 3R



# SE48-1909

(FORMERLY BSM4)



## BATTERY SIDE MODULE FOR EXISTING ENCLOSURES

- Traffic grade aluminum enclosure protects batteries from outdoor elements
- Cost-effective method of adding 48Vdc standby capacity to any existing ground mount enclosure
- Engineered to minimize temperature differential between batteries
- Available in natural aluminum finish

Consult your Alpha representative for P/N configurations

### MECHANICAL

#### Dimensions:

mm: ..... 1220H x 495W x 222D  
 inches: ..... 48H x 19.5W x 8.75D

**Weight:** ..... 17.3kg (38lbs)

**Construction:** ..... 0.125" High strength aluminum

**Finish:** ..... Natural aluminum

**Equipment Space:** ..... Accommodates 4xAlphaCell 220GXL  
 (Case 31) batteries

### HARDWARE

**Door Latch:** ..... Corbin lock for maximum security

### HVAC

**Ventilation:** ..... Louvered vents on front door

### INSTALLATION

**Access:** ..... Lift-off front door provides easy wiring access

### AGENCY COMPLIANCE

**NEMA Rating:** 3R



## BATTERY SOLUTIONS

Alpha offers a comprehensive line of AlphaCell™ batteries in many formats specifically designed for demanding indoor and outdoor Telecom, Cable, Traffic, Enterprise and Renewable Energy applications. In addition, we provide remote battery monitoring systems to help extend the life of the battery string and minimize maintenance costs.

AlphaCell batteries come in GEL, AGM, and pure lead varieties, in front and top terminal formats to support multiple applications. Excellent heat displacement characteristics have shown Alpha's GEL cell batteries to exhibit superior working life and reliability. AlphaCell™ GXL, HP and XTV batteries come with a full replacement, non-prorated warranty and provide years of expected life and trouble-free performance. Choosing Alpha battery technology means 100% out-of-box capacity, reliable performance in harsh operating conditions, longer service life, and reduced maintenance.

### GENERATORS

Alpha's line of portable AC and DC generators provide extended runtime for critical loads and disaster recovery scenarios, while minimizing the amount of battery backup required at the site. Every generator system incorporates efficient, effective and reliable power technology, including: natural gas or propane powered generators, exclusive audible noise baffling, remote status monitoring features and multiple built-in safeguards to protect the system, operators, and the public.

AlphaGen™ DC generator systems are specifically designed for outside plant communication networks requiring -48Vdc power. They offer quiet operation and low profile for a discreet presence in populated areas.

**ALPHACell**  
PREMIUM GEL 220 GOLD-HP

DO NOT USE EXISTING HARDWARE. El herraje apropiado se provee con cada batería. Tamaño del herraje: 1/2" UNF x 1/2" largo. Tensión en la terminal: 12.8Vdc @ 25°C. Voltaje de carga: 13.8Vdc @ 25°C. 12 Voltios - 20 Ah capacidad nominal @ 25°C.

WARNING



**⚠ DANGER POISON**

1. NEVER OPEN BATTERY CASE  
2. NEVER INHALE BATTERY VAPORS  
3. NEVER DRINK BATTERY FLUID  
4. NEVER TOUCH BATTERY FLUID  
5. NEVER SHORT CIRCUIT BATTERY



# ALPHACELL™ GXL

## GEL TOP-TERMINAL BATTERIES

- › High-performance silver alloy for maximum life expectancy
- › Longer runtime for demanding outdoor environments
- › 100% runtime capacity out-of-box – No cycling required
- › Maintenance-free threaded inserts – No periodic retorquing
- › Available with 4 and 5 year full warranties\*
- › Wide operating temperature range

### NOMINAL SPECIFICATIONS FOR GOLD-HP

Model	220GXL	195GXL	165GXL
P/N	181-231-10	181-230-10	1810015
Warranty	4 to 5 years full replacement*		
Service Life	Extended	Extended	Extended
Battery Type	True GEL cell and silver alloy grid battery technologies with standard battery handle		
Heat Resistant	Extreme	Extreme	Extreme
Hydrogen Emission	Low	Low	Low
Capacity at 20hrs (to 1.75VPC)	109Ah	100Ah	86Ah
Typical Runtime (minutes)**	221	196	165
BCI Group Size	31	31	27
Terminals	Threaded insert ¼"- 20 UNC		
Cells Per Unit	6	6	6
Voltage Per Unit	12.8V	12.8V	12.8V
Conductance Value @ 25°C	960-1400	880-1320	800-1200
Impedance @ 60Hz (Ohms)	0.005	0.005	0.0055
Max. Discharge Current	900A	900A	800A
Short Circuit Current	2800A	2600A	2500A
10 Second Volts @ 100A	11.4	11.3	11.2

### MECHANICAL

Dimensions w/ Terminals	mm	215.4H x 340.9W x 172.7D	215.4H x 340.9W x 172.7D	204.5H x 317.8W x 173.4D
	inches	8.48H x 13.42W x 6.8D	8.48H x 13.42W x 6.8D	8.05H x 12.5W x 6.83D
Weight		33.2kg (73lbs)	28.6kg (63lbs)	30.5kg (67lbs)

### ENVIRONMENTAL

Discharge	-40 to 71°C (-40 to 160°F)	-40 to 71°C (-40 to 160°F)	-40 to 71°C (-40 to 160°F)
Charge	-23 to 60°C (-9.4 to 140°F) (w/ temperature compensation -5mV/C per °C)		
Float Charging Voltage	13.5 to 13.8Vdc average per 12V unit at 25°C (77°F)		
AC Ripple Charger	0.5% RMS or 1.5% of float charge voltage recommended for best results. Max. allowed = 4%V pk to pk		

### CURRENT DISCHARGE RATINGS TABLE IN AMPS (END VOLTAGE 1.75VPC @ 25°C/77°F)

Hours	1	2	3	4	6	8	10	12	20	24	48	72	100
220GXL	67.7	40.4	29.1	22.9	16.1	12.6	10.2	8.7	5.5	4.6	2.4	1.6	1.2
195GXL	65.1	37.4	26.8	21	14.8	11.5	9.5	8	5	4.3	2.2	1.5	1.1
165GXL	55.9	32.8	23.5	18.4	12.9	10	8.2	6.9	4.3	3.7	1.9	1.3	0.9

\* Warranty varies by country and region. Warranty valid only when used with Alpha approved power supplies, chargers and enclosures in US/Canada. 5 years warranty when purchased in conjunction with AlphaGuard. Consult your salesperson or manual for details. \*\* Runtime calculated using a 25A DC constant current load

# ALPHACELL™ GOLD HP



## GOLD-HP GELCELL BATTERIES

- › High-performance Silver Alloy for maximum life expectancy
- › Longer runtime for demanding outdoor environments
- › 100% runtime capacity out-of-box – No cycling required
- › Maintenance-free threaded inserts – No periodic retorquing
- › Available with 5 and 6 year full warranties\*
- › Wide operating temperature range

NOMINAL SPECIFICATIONS		220 GOLD-HP	195 GOLD-HP										
<b>Model</b>		<b>220 GOLD-HP</b>	<b>195 GOLD-HP</b>										
<b>P/N</b>		<b>181-233-10</b>	<b>181-232-10</b>										
<b>Warranty</b>		5 to 6 years full replacement*											
<b>Service Life</b>		Extended	Extended										
<b>Battery Type</b>		True GEL cell and silver alloy grid battery technologies with standard battery handle											
<b>Heat Resistant</b>		Extreme	Extreme										
<b>Hydrogen Emission</b>		Low	Low										
<b>Capacity at 20hrs (to 1.75VPC)</b>		109Ah	100Ah										
<b>Typical Runtime**</b>		221 mins	196 mins										
<b>BCI Group Size</b>		31	31										
<b>Terminals</b>		Threaded insert ¼ to 20 UNC											
<b>Cells Per Unit</b>		6	6										
<b>Voltage Per Unit</b>		12.8V	12.8V										
<b>Conductance Value</b>		960-1400	880-1320										
<b>Impedance @ 60Hz (Ohms)</b>		0.005	0.005										
<b>Max. Discharge Current</b>		900A	900A										
<b>Short Circuit Current</b>		2800A	2600A										
<b>10 Second Volts @ 100A</b>		11.4	11.3										
MECHANICAL													
<b>Dimensions w/ Terminals</b>	mm	215.4H x 340.9W x 172.7D	215.4H x 340.9W x 172.7D										
	inches	8.48H x 13.42W x 6.80D	8.48H x 13.42W x 6.8D										
<b>Weight</b>		33.2kg (73lbs)	30.5kg (67lbs)										
ENVIRONMENTAL													
<b>Discharge</b>		-40 to 71°C (-40 to 160°F)	-40 to 71°C (-40 to 160°F)										
<b>Charge (w/ temperature compensation)</b>		-23 to 60°C (-9.4 to 140°F) (Charger temp comp @ ±5mV/C per °C)											
<b>Float Charging Voltage</b>		13.5 to 13.8Vdc average per 12V unit at 25°C (77°F)											
<b>AC Ripple Charger</b>		0.5% RMS or 1.5% of float charge voltage recommended for best results. Max. allowed = 4%V pk to pk											
CURRENT DISCHARGE RATINGS TABLE IN AMPS (END VOLTAGE 1.75VPC @ 25°C/77°F)													
<b>Hours</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>6</b>	<b>8</b>	<b>10</b>	<b>12</b>	<b>20</b>	<b>24</b>	<b>48</b>	<b>72</b>	<b>100</b>
<b>220GXL</b>	67.7	40.4	29.1	22.9	16.1	12.6	10.2	8.7	5.45	4.6	2.4	1.6	1.2
<b>195GXL</b>	65.1	37.4	26.8	21	14.8	11.5	9.5	8	5	4.3	2.2	1.5	1.1

\*Warranty varies by country and region. Warranty valid only when used with Alpha approved power supplies, chargers and enclosures in US/Canada. 6 years warranty when purchased in conjunction with AlphaGuard. Consult your salesperson or manual for details. \*\*Runtime calculated using a 25A DC constant current load.

# ALPHACELL™ XTV



## AGM TOP-TERMINAL BATTERY

- › Extreme temperature Absorbed Glass Mat (AGM) technology
- › Significant improvement in cold temperature performance over GEL
- › Multiple models provide options for all network architectures
- › Power density gains allow more runtime from smaller sized battery
- › Extended service life for non-temperature controlled outdoor enclosures
- › Full 5-year replacement warranty\*

NOMINAL SPECIFICATIONS										
Model	100XTV	150XTV	195XTV	240XTV						
P/N	1810226	1810227	1810228	1810229						
Warranty	5-year full replacement*	5-year full replacement*	5-year full replacement*	5-year full replacement*						
Operating Temperature Range (w/Temperature Compensation)	-40 to 60°C (-40 to 140°F) (Charger temperature compensation @ ±3.3mVpc per °C)									
Storage Temperature	-10 to 40°C (14 to 104°F)	-10 to 40°C (14 to 104°F)	-10 to 40°C (14 to 104°F)	-10 to 40°C (14 to 104°F)						
Self Discharge	Battery can be stored up to 12 months at 25°C (77°F). Higher temperatures during storage will require more frequent recharge.									
Voltage Per Unit	12V	12V	12V	12V						
Float Charge Voltage	13.5 to 13.8Vdc average per 12V unit at 25°C (77°F)									
Refresh/Boost Charging Voltage	14.4 to 15.0Vdc average per 12V unit at 25°C (77°F)									
Maximum AC Ripple (Charger)	0.5% RMS or 1.5% of float recommended for best results. Maximum voltage allowed = 4% P/P									
Terminal Type	Threaded alloy insert terminal to accept M6 x 12mm bolt		Threaded alloy insert terminal to accept M6 x 20mm bolt							
Terminal Hardware Torque	13.6NM / 120in-lbs	13.6NM / 120in-lbs	13.6NM / 120in-lbs	13.6NM / 120in-lbs						
Case Sizes	22NF	24	27	31						
MECHANICAL										
Dimensions w/ Terminals	mm	207H x 228L x 138W	214H x 275L x 168W	214H x 322L x 169W	217H x 343L x 170W					
	inches	8.17H x 9.01L x 5.46W	8.44H x 10.85L x 6.65W	8.43H x 12.71L x 6.67W	8.57H x 13.50L x 6.71W					
Weight		17.7kg (39lbs)	25.4kg (56lbs)	30.5kg (67lbs)	32kg (75lbs)					
BATTERY										
Runtime Rating 25A (@ 25°C/77°F to 1.75Vpc)		100 minutes	150 minutes	195 minutes	240 minutes					
Amp Hour Capacity 20Hr Rate (@ 25°C/77°F to 1.75Vpc)		56Ah	80Ah	100Ah	112Ah					
Conductance Range Fully Charged New Battery (@ 25°C/77°F)		700 - 800	900 - 1100	1050 - 1250	1250 - 1550					
CURRENT DISCHARGE RATINGS TABLE IN AMPS (END VOLTAGE 1.75VPC @ 25°C/77°F)										
Hours	1	2	3	4	5	6	8	10	12	20
100XTV	39.4	22.1	15.8	12.4	10.3	8.7	6.7	5.4	4.6	2.8
150XTV	53.0	30.6	21.6	16.8	13.9	11.9	9.3	7.7	6.5	4.0
195XTV	65.5	37.6	26.9	21.0	17.3	14.7	11.3	9.4	7.9	5.0
230XTV	81.77	45.5	32.1	25	19.8	16.6	13	10.5	9	5.6

\*Warranty varies by country and region. Warranty valid only when used with Alpha approved power supplies, chargers and enclosures in US/Canada. Consult your salesperson or manual for details. Terminal hardware and battery handles included



# REMOTE BATTERY MONITORING SYSTEM PLUS



## REAL-TIME MEASUREMENT AND CONTROL

- › Compact, intelligent and cost effective system for determining battery condition remotely
- › Monitors each individual 12V battery via a user programmable schedule, from hourly to monthly
- › Intelligent battery balancing extends the life of the battery string and reduces maintenance costs
- › Automatic data logging function records individual battery voltage, temperature and admittance
- › Enables the scheduling and budgeting of battery replacements
- › Built-in web server allows for convenient read-only monitoring from any internet-connected computer

**48Vdc 1 String: 0370260-002**  
**48Vdc 2 Strings: 0370260-003**

### ELECTRICAL

#### Site Controller Unit:

Voltage: .....21– 59Vdc  
 Power consumption: .....7W  
 NOTE: Power is supplied from the battery bank

#### Sensors:

Voltage: ..... 12V: 8.0 – 16Vdc  
 Power consumption: ..... 12V: <10mA nominal, 0.5/6A during admittance test

### MECHANICAL

#### Site Controller Unit:

Dimensions:  
 mm: .....32H x 104.15W x 120.15D  
 inches: ..... 1.26H x 4.1W x 4.73D  
 Weight: .....0.242kg (0.53lbs)

#### Sensors (12V)

- Two-wire connection with max bolt size for terminals of 5/16 inch
- Mounted to the top of the battery with self-adhesive industrial Velcro strip
- CAT5 cable used to daisy chain from sensor to sensor
- Last sensor in the daisy chain connects to String 1 for the first battery string
- Last sensor in the daisy chain connects to String 2 for the second battery string

#### Power Harness Cable Connection

- Connects to the 48Vdc battery string + (Red) and – (Black) terminals

### ENVIRONMENTAL

**Operating Temperature:** -40 to 80°C (-40 to 176°F)

### COMMUNICATIONS

#### Site Controller Unit

- SNMP via TCP/IP & built-in web server and SMTP mail client

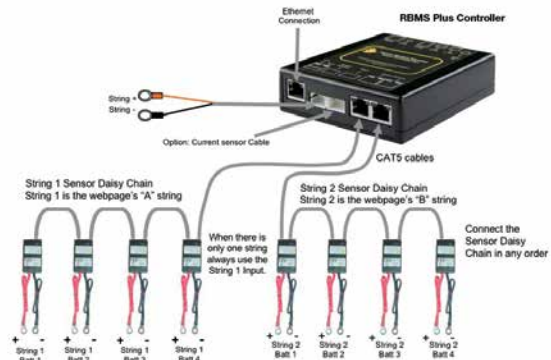
#### Site Controller Software

- Optional Lookout software provides a convenient way to monitor multiple site controllers on the network

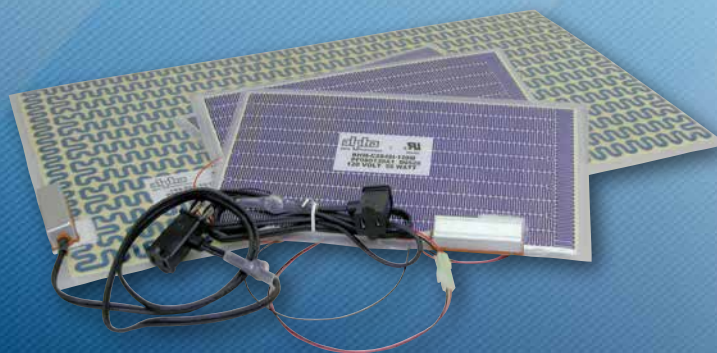
### OPTIONAL ACCESSORIES

AC Output Current Sensor	P/N: 7400583
Moisture Sensor	P/N: 7400162
120V AC wall transformer, for monitoring utility power voltage	P/N: 0180059
Two wire sensor, High Current*	P/N: 0180055
Battery cable to power RBMS Controller*	P/N: 8701040

\*Included with 0370260-002/003 kit



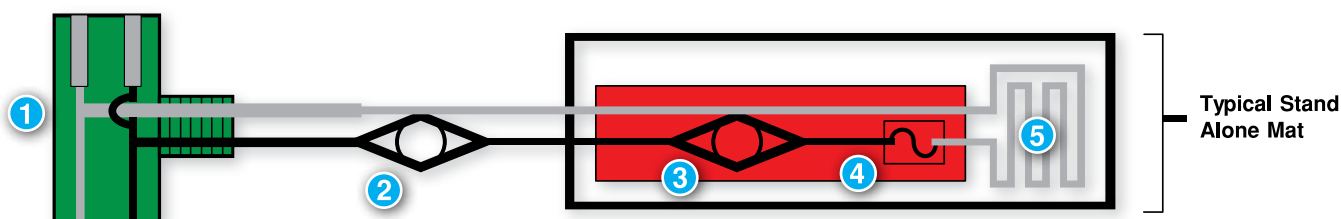
# BATTERY HEATER MATS



## EXTEND BATTERY RUNTIME IN COLD WEATHER

- › Durable polyester or silicone construction
- › Sealed on-mat electronics for maximum protection
- › On-mat thermal switch and thermal fuse for redundant safety
- › Insulated design directs heat to the batteries not the enclosure for a 30% reduction in power consumption
- › Piggyback plug standard on 120V models

### ALL MATS



The main power connector (1) on the heater mat is plugged into an AC source. In low temperature conditions the main control thermistor (2) will allow power to flow to the heater mat coil (5). The thermistor is mounted on the power cord so that it reacts to the battery temperatures and not the mat surface temperature. A secondary thermistor (3) is mounted on the mat with significantly higher temperature settings than the main thermistor (2). This thermistor keeps the mat from overheating during extended run periods. A thermal fuse (4) is a final fail safe device. The power connector (1) has an AC receptacle so that additional mats can be plugged in. Its parallel wiring keeps the failure of the first mat from affecting the operation of others in the string.

**Battery heater mats are an integral component in outdoor power solutions and need to be carefully integrated with the other system elements to ensure effective operation.**

Please contact your Alpha representative to determine the proper battery heater mat required for your outdoor power system.

#### Line Cord Thermostat:

Turn on Temperature: 5°C (41°F)  
Turn off Temperature: 15°C (59°F)

#### Mat Mounted Thermostat:

Over Temperature Off: 50°C (122°F)  
Turn Back on: 40°C (104°F)  
Thermal Fuse Rating: 85°C (185°F)

# BATTERY ACCESSORIES



AlphaGuard™ Battery Charge Management System

## ALPHAGUARD™ BATTERY CHARGE MANAGEMENT SYSTEM

### AG-CMT-4 AlphaGuard™ Charge Management SC, 48V String – including Battery interface cable

The AlphaGuard is a battery charge management system that monitors and protects your batteries for runtime optimization and longer battery life. CSA and UL approved, AlphaGuard allows you to replace single batteries rather than the whole string. It spreads charge voltage equally across batteries to maximize battery life and compensates for battery differences as they age.

*Note: For some applications, Alpha offers an extended battery warranty when AlphaGuard is used.*

Contact your Alpha representative for complete details.



Celltron Essential Battery Testing Equipment

## BATTERY TESTING EQUIPMENT

Alpha's battery testing equipment provides accurate information about the status of installed standby batteries allowing you to budget for early detection of failed or degraded batteries and for replacements with confidence.

A fast, reliable and affordable testing process.

Conductance testing, coupled with a simple utility load test, arms the operator with the quality of data necessary to know the status of installed standby batteries, allowing for detection and replacement before failure occurs and puts backup during an outage at risk.



## BATTERY SPACER CLIP

- Designed for use with most group 27 (165GXL) or 31 (3.5HP, 4.0HP, 195GXL, 220GXL) VRLA batteries
- Easy to install - clips to the top of the battery
- Increases battery life expectancy by providing critical battery spacing required for proper ventilation
- Accurately positions and secures the Remote Temperature Sensor (RTS)
- Strongly recommended for hot climates
- Designed to last over 30 years or lifetime of the equipment

# ALPHAGEN™



## DC GENERATOR SYSTEM

- › Integrated generator system lets you deploy power where you need it
- › 5.0 and 7.5kW options in either 36Vdc or 48Vdc configurations
- › Cost effective extended runtime solution for Telecom powering applications
- › Quiet operation, small size and low profile allow for easier installation in populated areas
- › Eliminates large quantities of batteries otherwise required for extended runtime
- › Designed for stand-alone or collocated powernode applications
- › Built-in safeguards to protect the system, operators and the public
- › Safe unattended operation designed to UL2200, NFPA 37, 54, 58 and 70 standards

The AlphaGen curbside generator system is specifically designed for outside plant communication networks. Every AlphaGen system incorporates industry leading power technology, including natural gas or propane powered engine generators, exclusive audible noise baffling, remote status monitoring features and durable weather resistant enclosures. Alpha offers a full line of AlphaGen systems specifically designed for easy integration with Alpha Powernodes (PN).

### PERFORMANCE/FEATURES

<b>Gas Inlet Pressure</b>	0.5 to 2 PSI inlet pressure (see note 1)
<b>Ign Charger Voltage</b>	13.5Vdc
<b>Ign Charger Current</b>	6A max
<b>Remote Interface Length</b>	75ft max Distance depends upon proper installation, de-rating and wire gauge (see note 2)
<b>Fuel System, Controls &amp; Monitoring</b>	The controls and fuel system meet applicable sections of NFPA 37, 54 and 58 for automatic unattended operation of remotely located generators. Full system control and status monitoring included.
<b>Sensors</b>	<ul style="list-style-type: none"> <li>• Gas hazard</li> <li>• Water intrusion</li> <li>• Pad shear</li> <li>• Tamper</li> </ul>

### SAFETY SHUTDOWNS

<b>All Models</b>	<ul style="list-style-type: none"> <li>• Low oil pressure</li> <li>• Low fuel pressure shutdown (propane only)</li> <li>• Water intrusion</li> <li>• Pad shear</li> <li>• Gas hazard (propane or natural gas)</li> <li>• Over temp</li> <li>• Over speed</li> <li>• Over crank</li> </ul>
<b>Optional Feature</b>	Cold start kit: Provides additional starting capability at temperatures below 17.7°C (0°F).

# ALPHAGEN™

## DC GENERATOR SYSTEM

Model	5.0kW		7.5kW			
DC output voltage	39.0V ±0.5V @ no load 36V configuration		52.0V ±0.5V @ no load 48V configuration			
	52.0V ±0.5V @ no load 48V configuration		104.0V ±0.5V @ no load 96V configuration			
DC output load regulation	0.5V		0.5V			
Output current	39.0V @ 128A max		52.0V @ 144A max			
	52.0V @ 96A max		104V @ 72A max			
Engine	398CC, Air cooled, Single OHV		624CC, Air cooled, Twin OHV			
	10.5hp (using natural gas fuel)		15hp (using natural gas fuel)			
RPM: (variable speed)	2800 to 3600RPM		2800 to 3600RPM			
<b>ACOUSTICAL NOISE</b>						
dBA 10' @ 100% rated load	68.5Ave		70.3Ave			
dBA 20' @ 100% rated load	62.5Ave		64.3Ave			
dBA 10' @ 70% rated load	66.9Ave		66.4Ave			
dBA 20' @ 70% rated load	60.9Ave		60.4Ave			
<b>DIMENSIONS</b>		<b>CE-3x</b>	<b>CE-9x</b>	<b>PN-4xL</b>	<b>PN-6x</b>	<b>w/ Optional Pedestal</b>
Height	cm	111.2	132.1	81.3	99	144
	in	44	52	32	39	57
Width	cm	66	132.1	81.3	100	
	in	26	52	32	39.25	
Depth	cm	61	61	76	61	
	in	24	24	30	24	
Weight	kg	174	187	177	174	168
	lbs	383	413	390	338	370
<b>APU FUEL CONSUMPTION</b>						
Natural gas: 1000 BTU/Ft. <sup>3</sup>	80ft <sup>3</sup> /hr		156ft <sup>3</sup> /hr			
	1.10gal/hr		1.48gal/hr			
Propane gas: 2520 BTU/Ft. <sup>3</sup>	40ft <sup>3</sup> /hr		54ft <sup>3</sup> /hr			
	4.62lbs/hr		6.24lbs/hr			
Exterior surface temperature	65°C max (149°F) (meets requirements of UL/CSA)		65°C max (149°F) (meets requirements of UL/CSA)			
<b>AGENCY COMPLIANCE</b>						

UL1778  
 UL2200  
 NFPA 37/54/58/70  
 CSA C22.2 No.107.1  
 EMC/FCC Part 15 Class A

Note: Contact Alpha Technologies for the following: 1. Low pressure 2. Remote interface length distance

# ITS SOLUTIONS

## ALPHA MICRO SECURE 100



The Alpha Micro Secure 100 is ideal for small outdoor UPS applications with loads up to 100W such as highway cameras or road signs. The UPS and batteries are enclosed in a durable outdoor NEMA 3R plastic case, which can be easily pole mounted and padlocked for security.

- Multiple voltage output configurations
- Can be wall or pole mounted
- Communication capabilities via RS-232 port or optional Ethernet/SNMP interface
- CSA/UL approved for safety
- Batteries Included

## ALPHA LINE POWERING POWER OVER COMPOSITE FIBER (PoCF)



Alpha offers an extensive assortment of line power products that are reliable, field proven options for remote network powering. Using an elevated DC voltage, power can be transmitted long distances over low gauge twisted pair copper or Power over Composite Fiber (PoCF). These converters are a great solution to power remote loads where AC utility is not available or battery maintenance is cost prohibitive. Alpha's line power converters feature built in current limiting and ground-fault protection to ensure the highest level of safety for technicians.

- Eliminate the need to have commercial power connected and metered at your ITS Network sites along the highway
- Extend the distance of your POE equipment
- Utilize existing twisted pair infrastructure or new (PoCF) communications infrastructure for power
- Support loads at distances greater than 3 Miles/5km
- Line Power, PoCF, can save thousands of dollars per site location

## ATC LOW VOLTAGE DC SOLUTIONS



As specifications are developed for the ATCC, Alpha is prepared to meet the traffic industries requirement. As varies different markets that utilize DC power as their main power source have learned over the past 75 years, picking one DC voltage is a driving force to provide simplicity, reliability, low cost and convenience. Choose your single DC voltage and Alpha will provide you with the most reliable DC power source for your signalized intersection and ITS applications. We eliminate single point failures that are seen with multiple voltage power supplies.

Alpha has over 40 years of experience providing a full suite DC power solutions for both indoor and outdoor applications. Alpha's DC products are the power behind large switching and data centers, mobile cell sites, broadband networks, and now for Traffic's new ATC Cabinets. We complement our power equipment and systems with a broad array of ruggedized DC Power Solutions for deployment in outdoor, harsh environments. Alpha's line of Cordex controllers provides sophisticated, easy-to-use control, monitoring and management of our DC power systems. With multiple options for standardized and custom system integration, Alpha has the ability to provide the ideal solution for virtually any power and site installation scenario.

Our modules convert AC to DC (rectifiers), DC to DC (converters) and DC to AC (inverters). Featuring high power density, high efficiency, and high reliability, the power conversion modules come in various shapes and sizes to match the unique needs of our customers. Many of the modules operate in high temperatures, making them ideal for harsh environments for outdoor enclosures. Cordex rectifiers range from 250W and larger, providing the utmost flexibility in power system design. Some of the building block are:

- Cordex™ 250W, 2RU, Convection cooled, 12Vdc Modular Switched Mode Rectifier with Universal 120V/208 to 240V single phase AC input
- Cordex™ 400W, 2RU, Convection cooled, 24Vdc Modular Switched Mode Rectifier with Universal 120V/208 to 240V single phase AC input
- Cordex™ 650W, 2RU, Convection cooled, 48Vdc Modular Switched Mode Rectifier with Universal 120V/208 to 240V single phase AC input

A wide assortment of breaker and fuse panels are available for distributing power to critical loads. Panels are available in various sizes and output voltages, and use industry-standard breakers and fuses.

# SERVICES & SUPPORT

## ALPHA SERVICE PLANS

### WHAT'S THE DIFFERENCE AT ALPHA?

Our distinctive service excellence at Alpha is not just having expertise or the latest high-tech equipment...but simply being as “easy to do business with” as possible, and understanding your powering challenges better than anyone else. Combining this with our innate understanding of Alpha product uniquely positions us as the most qualified supplier of services for power infrastructure in the marketplace.

Alpha’s quality management system governs not only our products but our broad services portfolio, procedures and processes. Pooling this with our operational excellence and continuous improvement programs, we aim to achieve complete customer satisfaction by providing service of the highest standard and value.

If you have a pressing powering challenge, contact us with your specific requirements at **1.800.667.8743** (toll free North America) or email **sales@alpha.ca**. Visit Alpha online at **www.alpha.ca/service** for more information.

SERVICES					
Service	Delayed Startup Warranty	Factory Warranty	Extended Warranty	Reliability	Reliability Plus
Remote Technical Support	Postpones Factory Warranty / Extended Warranty for 6 months - 2 years	5:00 am - 5:00 pm PST Mon - Fri	5:00 am - 5:00 pm PST Mon - Fri	24x7	24x7
Advanced Replacement		60 days post purchase	90 days post purchase	120 days post purchase	180 days post purchase
Depot Repair		Included	Included	Included	Included
Freight to Customer		Included	Included	Included	Included
Install & Commissioning	Purchaseable via Quote	Purchaseable via Quote	Purchaseable via Quote	Discount Eligible	Discount Eligible
Parts	N/A	N/A	N/A	OOW Discount Eligible	OOW Discount Eligible
Preventative Maintenance	N/A	N/A	N/A	Annual PM Included	Annual PM Included
Onsite 5 Day Response	N/A	N/A	N/A	Time & Materials	Included *Priority

SERVICE UPLIFTS - A LA CARTE					
Service	Delayed Startup Warranty	Factory Warranty	Extended Warranty	Reliability	Reliability Plus
Batteries	N/A	N/A	N/A	Discount Eligible	Discount Eligible
PM - more than annual	N/A	N/A	N/A	Discount Eligible >1 year term	Discount Eligible >1 year term
Onsite Next Business Day Response	N/A	N/A	N/A	N/A	Location Dependent
Onsite 2 Business Day Response	N/A	N/A	N/A	N/A	Location Dependent
Emergency Response	N/A	N/A	N/A	N/A	Location Dependent

We offer a full range of services designed to optimize investments by protecting assets and maximizing uptime, while ensuring reliability and performance of your equipment throughout its working life.



All requests for repair are easily initiated by visiting **www.alpha.ca/rma** or calling toll free **1.888.462.7487** (North America) or **+1 (604) 436.5900** (international)

# ATL CONTACT US

## CORPORATE HEADQUARTERS

Alpha Technologies Ltd.  
7700 Riverfront Gate  
Burnaby, BC  
Canada V5J 5M4

☎ Canada/USA (Toll-Free): 1.800.667.8743  
International: 1.604.436.5900  
📠 604.436.1233  
✉ sales@alpha.ca  
🌐 www.alpha.ca

## SALES/ACCOUNT MANAGEMENT

Provides quotes and bid proposals for customer configured power systems & enclosures.

*All purchase orders must be sent via fax or email to:*

📠 604.638.8698  
✉ orders@alpha.ca  
☎ Canada/USA (Toll-Free): 1.800.667.8743  
International: 1.604.436.5900  
✉ sales@alpha.ca

## TRAFFIC/ITS APPLICATION ENGINEERS

Provides pricing and availability for configured systems and spare parts (including breakers, fuses, cables, rectifier accessories, rack accessories, etc.)

All sales inquiries – including pricing and availability – from channel partners (VARs and distributors).

*All purchase orders must be sent via fax or email to:*

📠 604.638.8698  
✉ expressorders@alpha.ca  
☎ Canada/USA (Toll-Free): 1.800.667.8743  
International: 1.604.415.7477  
✉ insidesales@alpha.ca

## CUSTOMER SERVICE

Any questions or concerns related to an order:

- Purchase orders    • Freight inquiries
- Order Status        • Order Tracking
- Order Expedites

☎ Canada/USA (Toll-Free): 1.800.667.8743  
International: 1.604.415.7474  
✉ csr@alpha.ca  
🌐 Order Tracking: [www.alpha.ca/ordertracking](http://www.alpha.ca/ordertracking)

## SERVICE & SUPPORT

Technical support requests and inquiries  
Mon- Fri, 5AM - 5PM PST for regular inquiries.  
24/7 for emergency support.

☎ North America (Toll-Free) 1.888.462.7487  
International +1.604.436.5547  
🌐 Report a problem online:  
[www.alpha.ca/report-a-problem](http://www.alpha.ca/report-a-problem)

Requests for returns, return status, warranty inquiries.

🌐 Online RMA Form: [www.alpha.ca/rma](http://www.alpha.ca/rma)

## TRAINING COURSES

DC Power Training Courses  
*Custom courses available*

☎ North America (Toll-Free) 1.888.462.7487  
International +1.604.436.5547  
✉ training@alpha.ca  
🌐 [www.alpha.ca/training](http://www.alpha.ca/training)

## ACCOUNTS RECEIVABLE

Customer invoices and payments

☎ Canada/USA (Toll-Free): 1.800.667.8743  
International: 1.604.436.5900  
✉ [accounts.receivable@alpha.ca](mailto:accounts.receivable@alpha.ca)

## REQUEST FOR INFORMATION

☎ Canada/USA (Toll-Free): 1.800.667.8743  
International: 1.604.436.5900  
🌐 [www.alpha.ca/request-information](http://www.alpha.ca/request-information)

## REQUEST FOR A QUOTE

☎ Canada/USA (Toll-Free): 1.800.667.8743  
International: 1.604.436.5900  
🌐 [www.alpha.ca/request-quotation](http://www.alpha.ca/request-quotation)

## TRACK YOUR ORDER

🌐 [www.alpha.ca/ordertracking](http://www.alpha.ca/ordertracking)  
✉ [csr@alpha.ca](mailto:csr@alpha.ca)

## REQUEST FOR SERVICE & SUPPORT

Regular Business Hours: Monday-Friday,  
6am-5pm Pacific Standard Time

☎ Canada/USA (Toll Free): 1.888.462.7487  
International: 1.604.436.5547

Outside Normal Business Hours

☎ 24/7 Emergency Technical  
Support Service: 1.888.462.7487  
🌐 [www.alpha.ca/rma](http://www.alpha.ca/rma)  
✉ [support@alpha.ca](mailto:support@alpha.ca)

## REPORT A PROBLEM

Regular Business Hours: Monday-Friday,  
6am-5pm Pacific Standard Time

☎ Canada/USA (Toll Free): 1.888.462.7487  
International: 1.604.436.5547

Outside Normal Business Hours

☎ 24/7 Emergency Technical  
Support Service: 1.888.462.7487  
🌐 [www.alpha.ca/report-a-problem](http://www.alpha.ca/report-a-problem)



# UPS/BBS SELECTION GUIDE

**Uninterruptible Power Supplies (UPS)/Battery Back-up System (BBS) selection guide for Traffic and ITS applications:** To help us design an Uninterruptible Power Supply for your traffic or ITS application, please review the following questions prior to contacting your Alpha representative.

## 1) Type of application

- Traffic intersection (all LEDs including PEDs)       Traffic intersection (partial LEDs)       Intelligent Transportation System (ITS)  
 Other: \_\_\_\_\_

## 2) Installation requirements

- New installation requiring enclosure, UPS, batteries, accessories       Retrofit existing enclosure with UPS, batteries, accessories  
 Other: \_\_\_\_\_

## 3) Enclosure mounting requirements

- Side mount to existing enclosure     Plinth     Pad     Pole     Other: \_\_\_\_\_

## 4) Commercial AC service voltage to the enclosure

- 120Vac     120/240Vac     120/208Vac     220Vac (international)     Other: \_\_\_\_\_

## 5) Operating parameters of customer equipment

Input voltage to customer equipment:     120Vac     24Vac     48Vdc     24Vdc     12Vdc

Total power requirement (Watts) \_\_\_\_\_     Calculated or  Measured

If you have loads that require different input voltages such as cameras used in ITS applications, please provide more details below.

---

NOTE: For traffic intersections, Alpha Technologies recommends that a current reading be taken at each site or at least a sample of intersections to determine the largest potential load.

## 6) Battery backup time

Backup time at full load shall be: \_\_\_\_\_ Hours \_\_\_\_\_ Min

Backup time at full load shall be: \_\_\_\_\_ Hours \_\_\_\_\_ Min then, \_\_\_\_\_ Hours \_\_\_\_\_ Min in red flash mode

## 7) Options and accessories

- |   |  |
|---|--|
| <input type="checkbox"/> Remote SNMP monitoring & management of UPS | <input type="checkbox"/> Remote SNMP monitoring & management of batteries                                  |
| <input type="checkbox"/> Battery balancer/equalizer                 | <input type="checkbox"/> AC Generator connectivity in a police style door with type II lock                |
| <input type="checkbox"/> Automatic transfer switch                  | <input type="checkbox"/> External "ON BATTERY" red light _____   |
| <input type="checkbox"/> AC surge protection                        | <input type="checkbox"/> Battery heater mats   |
| <input type="checkbox"/> Battery slider plate                       | <input type="checkbox"/> Tilt switch for emergency power off, should the enclosure be knocked off its base |

## 8) Warranty/service needs

- Extended depot warranty     Annual service maintenance contract     Delayed startup

# Power

*Your Power Solutions Partner*

VISIT US AT [WWW.ALPHA.CA](http://WWW.ALPHA.CA)

**Alpha Technologies Ltd.**  
7700 Riverfront Gate  
Burnaby, BC V5J 5M4  
Canada  
Tel: +1 604 436 5900  
Fax: +1 604 436 1233  
Toll Free: +1 800 667 8743  
[www.alpha.ca](http://www.alpha.ca)

**Alpha Technologies GmbH.**  
Hansastraße 8  
91126  
Schwabach, Germany  
Tel: +49 9122 79889 0  
Fax: +49 9122 79889 21  
[www.alpha-technologies.com](http://www.alpha-technologies.com)

**Alpha Innovations Brasil**  
Address: Rua Alvares Cabral,  
N° 338 – Diadema - SP  
09981-030  
Brazil  
Tel: +55 11 2476 0150  
[www.alpha-innovations.com.br](http://www.alpha-innovations.com.br)

**Alpha Technologies Turkey Enerji Ltd Sti**  
Altaycesme Mah. Sarigul Sok. No: 33 Umut Kent  
Sistesi A Blok D:5  
Maltepe, Istanbul  
Turkey  
Tel: +90 216 370 23 28  
Fax: +90 216 370 23 68  
[www.alpha.com.tr](http://www.alpha.com.tr)

Alpha Technologies Ltd.

member of The  Group™

**Alpha Technologies Inc.**  
3767 Alpha Way  
Bellingham, WA 98226  
United States  
Tel: +1 360 647 2360  
Fax: +1 360 671 4936  
[www.alpha.com](http://www.alpha.com)

**Alpha Technologies Europe Ltd.**  
Twyford House, Thorley  
Bishop's Stortford  
Hertfordshire, CM22 7PA  
United Kingdom  
Tel: +44 1279 501110  
Fax: +44 1279 659870  
[www.alpha-technologies.com](http://www.alpha-technologies.com)

**Alpha Innovations S.A.**  
1, Avenue Alexander Fleming  
B-1348 Ottignies, Louvain-la-Neuve  
Belgium  
Tel: +32 10 438 510  
Fax: +32 10 438 213  
[www.alpha-innovations.eu](http://www.alpha-innovations.eu)

**Alpha Mexico Network Power S.A. de C.V.**  
Calle Dakota #204, of 303, Col. Nápoles.  
México D.F. C.P.03810, México  
Tel: +55 5543 1114  
Toll Free: +01 800 0082 886  
[www.alpha-power.mx](http://www.alpha-power.mx)

**Alpha Industrial Power Inc.**  
1075 Satellite Blvd NW.  
Suite 400  
Suwanee, GA 30024  
Tel: +1 678 475 3995  
Fax: +1 678 584 9259  
[www.alpha.com](http://www.alpha.com)

**Alphatec Ltd.**  
339 St. Andrews St.  
Suite 101 Andrea Chambers  
P.O. Box 56468  
3307 Limassol, Cyprus  
Tel: +357 25 375 675  
Fax: +357 25 359 595  
[www.alpha.com](http://www.alpha.com)

**OutBack Power**  
17825 59th Ave. NE, Suite B  
Arlington, WA 98223  
United States  
Tel: +1 360 435 6030  
Fax: +1 360 435 6019  
[www.outbackpower.com](http://www.outbackpower.com)

**NavSemi Technologies Pvt Ltd.**  
Vikas Plaza, Plot No. 38/1A (4),  
Electronic City Phase 2, Hosur Road,  
Bengaluru – 560100, Karnataka, India.  
Tel: +91 80 4123 0299  
[www.navsemi.com](http://www.navsemi.com)

**Alpha Energy**  
1628 W Williams Drive  
Phoenix, AZ 85027  
United States  
Tel: +1 623 251 3000  
Fax: +1 623 249 7833  
[www.alphaenergy.us](http://www.alphaenergy.us)

**Alpha Technologies Pty Ltd.**  
Level 7  
91 Phillip Street  
Parramatta NSW 2150  
Australia  
Tel: +61 2 8599 6960  
[www.alpha.com](http://www.alpha.com)

**Alpha Tec Trading Co. Ltd.**  
Suite 1903, Tower 1,  
China Hong Kong City,  
33 Canton Road,  
Kowloon, Hong Kong  
Tel: +852 2736 8663  
Fax: +852 2199 7988  
[www.alpha.com](http://www.alpha.com)

Due to continuing product development, Alpha Technologies reserves the right to change specifications without notice.

Copyright © 2017 Alpha Technologies. All Rights Reserved. Alpha® is a registered trademark of Alpha Technologies.

AlphaGen™, AlphaCell™ and member of The Alpha Group™ is a trademark of Alpha Technologies.

048-156-00 Rev F (11/2017)

