

DUAL CONVERSION TRAFFIC LIGHT UPS SYSTEMS



Door Mount UPS
(Patent Pending)



Shelf Mount UPS
(Patent Pending)

DESCRIPTION: The Always “On”™ NDM (door mount) and NSM (shelf mount) Series UPS’s are dual conversion on-line UPS systems provided in slim, light weight door mount and shelf mount configurations. The NDM and NSM Series allows the user to mount the UPS system in a space limited situation. The dimensions of this compact system are 9” x 15” x 3.5”, while the NSM units measure 11.4” x 15.8” x 4.4”. The included mounts allow the user to install the NDM and NSM system directly to a door, wall or confined enclosure with ease, with the batteries located separately up to six feet away.

APPLICATIONS: Our door mount and shelf mount on-line UPS’s are ideal for traffic cabinets, panel mounting, specialized equipment, LAN file servers, personal computers, networks and workstations, Automatic Teller Machines, telecommunications equipment, laboratory and medical equipment, test equipment, POS equipment, robotics, PLC’s, security and emergency systems, military & government applications and other standard computerized equipment.

ADVANCED FEATURES: Features include utility input power factor correction, self-diagnosis, an LCD display, a static bypass, smart power source monitoring and battery management, noise and lightning/surge protection, spike and transient protection, cold start/auto restart, auto frequency detection and an intelligent communications interface. SNMP and AS-400 adapters are available for network management.

COMPLETE PROTECTION: NDM and NSM Series UPS’s are designed with comprehensive spike, transient and surge protection, which prevents destructive hardware damage and extends system life. The high end EMI/RFI filtering design prevents electrical common and normal mode noise from affecting controller or computer operation, data or files, including when the UPS is operating in Bypass Mode. There is no transfer time to back-up and the load will never see a fluctuation.

OPERATING VOLTAGES AND FREQUENCIES: The NDM and NSM Series UPS’s are designed to function at wide voltage variations and frequency variations. This wide input range requires less battery usage under normal operations, extending the battery life substantially. The automatic frequency sensing function will synchronize the input and output frequencies. This makes the NDM and NSM Series ideal for connecting to a dirty generator, as it will also clean up the power.

AUTO RESTART: This user selectable feature allow NDM and NSM Series UPS’s to restart automatically when the utility becomes available, provided the UPS has been shutdown due to an extended blackout.

SELF-DIAGNOSIS AND INFORMATION INDICATORS: Each NDM and NSM Series UPS is equipped with a microprocessor that performs monthly self-diagnosis and battery load tests. Key diagnostic features include a monthly battery test algorithm and a system performance check.

CHARGING CURRENT WITH LOW RIPPLE AND LOW HARMONICS: A control circuit is used to provide a strict sine wave with low ripple and low harmonic distortion from the charging circuit. This reduces the conducted electro-magnetic interference to other loads sharing the same distribution panel with your UPS.

SMART POWER SOURCE MONITORING AND BATTERY MANAGEMENT: Via microprocessor-based electronics, NDM and NSM Series UPS’s produce a strict true sine wave output regardless of the input. They also control the on-battery and low battery shutdown, which prevents full discharge, thereby extending the battery performance and battery life.

INTELLIGENT COMMUNICATION INTERFACE: Each NDM and NSM Series UPS is equipped with RS232 and dry contact interface ports, for which we provide various powerful management software programs. For the more complex network environment, we support SIMPLE NETWORK MANAGEMENT PROTOCOL (SNMP), AS400 and others. Optional timed contacts are available.

REMOTE SHUTDOWN AND EMERGENCY STOP: Features include remote shutdown via communication port and emergency stop via communication port, as well as an optional additional connector or push button.

OPTIONAL EXTENDED RUNTIMES: To meet your back-up time requirements, we offer increased back-up time by simply adding additional hot pluggable battery cabinet(s).

Always “On”™ UPS Systems Inc., #100 - 150 Campion Road, Kelowna, BC Canada V1X 7S8

DOOR MOUNT ON-LINE UPS

NDM-SERIES	MODEL NO.	GES-102NDM	GES-152NDM
GENERAL	Maximum Capacity	1000VA/700W	1500VA/1050W
	UPC Order Code	825433 30218	825433 30317
INPUT	Nominal Voltage	120VAC (OPTIONAL 220VAC AVAILABLE)	
	Voltage Range	60VAC/40% Load, 70VAC/70% Load, 80VAC - 144VAC/100% Load	
	Bypass Voltage	+/-10%, +10/-15%, +15/-20% (User Selectable)	
	Phase	Single Phase (L-N-G)	
	Frequency	50 or 60Hz Auto Sensing	
	Frequency Window	45-65Hz (+/-2%, +/-5%, +/-7% - User Selectable)	
	Synchronization Window	+/- 3Hz	
	Power Factor	0.97	
OUTPUT	Output Voltage	100/110/115/120/127VAC (User Selectable)	
	Voltage Regulation	+/- 2%	
	Frequency Regulation	+/- 0.25Hz (Battery or Free Run Mode)	
	Voltage Distortion - THD	<3% Linear Load, <5% Non-linear Load	
	Transient Response	4% (100% Load Change)	
	Overload Capacity	125% for 1 min. / 150% for 10 sec.	
	Maximum Output Current @ 120VAC	8.2A	12.4A
	Crest Factor	3:1	
	Efficiency	>83%	
Transfer Time	Zero		
BATTERY (External)	Battery Type	Sealed Lead Acid, Maintenance Free - Hot Swappable Cabinet/String	
	Battery String	3	
	DC Voltage in String	36VDC	
	Recharge Time	Depends on External Batteries	
	Advanced Battery Management	Auto Self-test, Temperature Compensated 3-Stage Charging, Load Dependent Discharge	
	Extended Runtime	Battery Banks and Strings Available	
PROTECTION	Output Short	YES	
	Abnormal Voltage	YES	
	Abnormal Frequency	YES	
	I/O Noise Protection	Common & Normal Noise Suppression	
INTERFACE	I/O Spike and Transient	YES	
	Display	LCD / LED - Status, Readings and Setup Parameters	
	Audible Alarms	On Battery, Low Battery, Overload, Fault	
	Communications	RS232 / Dry Contact / (Optional: USB, SNMP, AS400)	
ENVIRONMENT	Emergency Power OFF	YES - Via Normally Closed Contact	
	Operating Temperature	-30 to 60 °C (-22 to 140 °F) (Extended range available [-40 to 74 °C])	
	Humidity	0 - 95% (Non-condensing)	
CONFORMANCE	Audible Noise	<40 dBA at 1 Meter	
	Safety	UL 1778, CE	
PHYSICAL DATA	EMI/RFI	FCC Part 15	
	W x D x H mm (in.)	230 x 380 x 90 (9" x 15" x 3.5")	
	Weight in kg (lbs.)	6.0 (13.2)	7.5 (16.5)

Specifications are subject to change without notice to reflect upgrades and improvement in technology.

OTHER VOLTAGES AND CONFIGURATIONS ARE AVAILABLE; FOR ORDER CODES, CONSULT MANUFACTURER.

AN EXTERNAL WRAP-AROUND BYPASS MODULE IS AVAILABLE FOR ALL MODELS, PERMITTING UPS MAINTENANCE WITHOUT POWER INTERRUPTION TO THE LOAD.



FOR ALWAYS "ON"™ UPC ORDER CODES, VISIT WWW.ALWAYSON.COM.

Always "On"™ UPS Systems Inc., #100 - 150 Campion Road, Kelowna, BC Canada V1X 7S8

SHELF MOUNT ON-LINE UPS

NSM SERIES	MODEL NO.	GES-102NSM	GES-152NSM
GENERAL	Maximum Capacity	1000VA/700W	1500VA/1050W
	UPC Order Code	825433 30223	825433 30224
INPUT	Nominal Voltage	120VAC (OPTIONAL 220VAC AVAILABLE)	
	Voltage Range	60VAC/40% Load, 70VAC/70% Load, 80VAC - 144VAC/100% Load	
	Bypass Voltage	+/-10%, +10/-15%, +15/-20% (User Selectable)	
	Phase	Single Phase (L-N-G)	
	Frequency	50 or 60Hz Auto Sensing	
	Frequency Window	45-65Hz (+/-2%, +/-5%, +/-7% - User Selectable)	
	Synchronization Window	+/- 3Hz	
	Power Factor	0.97	
OUTPUT	Output Voltage	100/110/115/120/127VAC (User Selectable)	
	Voltage Regulation	+/- 2%	
	Frequency Regulation	+/- 0.25Hz (Battery or Free Run Mode)	
	Voltage Distortion - THD	<3% Linear Load, <5% Non-linear Load	
	Transient Response	4% (100% Load Change)	
	Overload Capacity	125% for 1 min. / 150% for 10 sec.	
	Maximum Output Current @ 120VAC	8.2A	12.4A
	Crest Factor	3:1	
	Efficiency	>83%	
	Transfer Time	Zero	
BATTERY (External)	Battery Type	Sealed Lead Acid, Maintenance Free - Hot Swappable Cabinet/String	
	Battery String	3	
	DC Voltage in String	36VDC	
	Recharge Time	Depends on External Batteries	
	Advanced Battery Management	Auto Self-test, Temperature Compensated 3-Stage Charging, Load Dependent Discharge	
	Extended Runtime	Battery Banks and Strings Available	
PROTECTION	Output Short	YES	
	Abnormal Voltage	YES	
	Abnormal Frequency	YES	
	I/O Noise Protection	Common & Normal Noise Suppression	
	I/O Spike and Transient	YES	
INTERFACE	Display	LCD / LED - Status, Readings and Setup Parameters	
	Audible Alarms	On Battery, Low Battery, Overload, Fault	
	Communications	RS232 / Dry Contact / (Optional: USB, SNMP, AS400)	
	Emergency Power OFF	YES - Via Normally Closed Contact	
ENVIRONMENT	Operating Temperature	-40°C to 74°C	
	Humidity	0 - 95% (Non-condensing)	
	Audible Noise	<40 dBA at 1 Meter	
CONFORMANCE	Safety	UL 1778, CE	
	EMI/RFI	FCC Part 15	
PHYSICAL DATA	W x D x H mm (in.)	289 x 401 x 109 (11.4" x 15.8" x 4.4")	
	Weight in kg (lbs.)	7.7 (17.0)	7.7 (17.0)

OTHER VOLTAGES AND CONFIGURATIONS ARE AVAILABLE; FOR ORDER CODES, CONSULT MANUFACTURER.

FOR ALWAYS "ON"™ UPC ORDER CODES, VISIT WWW.ALWAYSON.COM.

Always "On"™ UPS Systems Inc., #100 - 150 Campion Road, Kelowna, BC Canada V1X 7S8

LINE INTERACTIVE TRAFFIC UPS SYSTEM

TLP Series (TRUE SINE WAVE)



Patent Pending

**Traffic Standard:
CALTRANS and Illinois DOT**

This innovative product combines Always "On"[™] UPS Systems Inc. cutting edge technology and Always "On"[™]'s high quality uninterruptible power supplies. Dark intersections due to power loss become a thing of the past.

The Traffic Light Protector (TLP) Series UPS is designed to take full advantage of the new energy efficient LED traffic signals. The Always "On"[™] TLP Series UPS system provides continuous power conditioning, true sine wave output, Automatic Voltage Regulation, Common and Normal Mode Noise protection, surge and spike suppression, and High End Line Interactive technology to carry you through those tough periods due to power glitches, extreme weather or natural disasters. Take advantage of the user programmable status contacts and the on-system data logger for comprehensive system monitoring and energy management.

STANDARD FEATURES:

SMART BOOST AND BUCK LINE CONDITIONING:

Transformer based built in line conditioning provides stable voltage when the utility supply fluctuates.

LIGHTNING, NOISE, SPIKE AND TRANSIENT PROTECTION:

Lightning and surge protection, common mode and normal mode noise protection - low pass series filters

on the input and output.

INTELLIGENT COMMUNICATIONS INTERFACE:

Dry contact and/or RS-232 interface port act as the communication link between the traffic system, remote computer and the UPS. User programmable settings log events for future review and reporting.

COLD START:

Allows UPS to start-up from battery when AC is not present.

TEMPERATURE COMPENSATED CHARGE:

10 A temperature-compensated charging maximizes battery life, stops charging $\geq 50^{\circ}\text{C}$. Also features remote battery temperature monitoring.

AUTO RESTART:

This feature allows the UPS to restart automatically after it has been shut down due to an extended blackout.

LINE INTERACTIVE TRAFFIC UPS SYSTEM

TLP SERIES	MODEL	GES-152TLP *	GES-202TLP *
GENERAL	UPC Order Code	825433 22304	825433 22450
	Capacity	1.5 kVA / 1 kW	2 kVA / 1.5 kW
	Technology	Line Interactive Transformer Based AVR	
INPUT	Rated Voltage	120 VAC (nominal) **	
	Voltage Range	90 - 150 VAC	90 - 150 VAC (User programmable)
	Phase	Single Phase (L-N-G)	
	Frequency Window	60 Hz +/- 3 Hz	
OUTPUT	Output Voltage	120 VAC	
	Current	6.52 A	17 A
	Transfer Time	< 3-5 ms (typical)	
	Output Waveform	True Sine Wave	
	Power Factor	0.75	
	Protection	Overcurrent, Short-Circuit, Overload and Noise	
BATTERIES	Type	Maintenance Free Sealed Lead Acid	
	Typical Backup Time	Depends on Requirements	
	Recharge Time	< 2- 4 Hours to 90% (Depends on Batteries)	
	Protection	Fused	
	Additional Battery Cabinet	Available	
INTERFACE	Communication	RS-232 / Dry Contact (6 Relays) - Programmable	
	LCD Display	Online, Buck, Boost, On Battery, Low Battery, Overload, Standby, Self Test	
	Control	External Wrap-Around Bypass Control / PTS Control / Cabinet Fan Control	
	Audible Alarm Condition	No	
ENVIRONMENT	Audible Noise	<40 dBA to 1 meter	
	Temperature	-40°C to 74°C	
	Relative Humidity	< 95% non-condensing	
PHYSICAL DATA	L x W x H in cm. (in.)	43.2 x 22.9 x 13.3 (17" x 9" x 5.25")	43.2 x 26.7 x 13.3 (17" x 10.5" x 5.25") 3U
	Weight	15 kgs (33 lbs)	19.5 kgs (43 lbs)
STANDARDS	Safety Compliance	UL 1778 (cUL / UL) CSA 107.1 [EN 60950 / EN 50091-1, CE]	
	EMI/RFI Compliance	FCC Class A	
	Testing Standards	IEEE C62.41 Category A [IEC 1000-4-5 / IEEE C62.41]	
	Traffic Standards	CALTRANS & Illinois DOT	

Specifications subject to change without notice to reflect upgrades and improvement in technology.

*Other Models and ratings available, consult manufacturer.

**Other voltages available

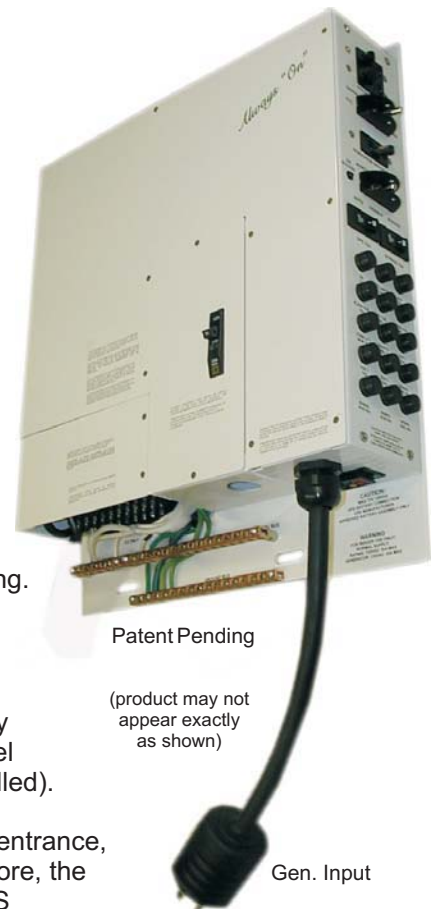


Patent Pending

TRAFFIC LIGHT POWER DISTRIBUTION ASSEMBLY (PDA)

PDA Features:

- Intended for use in traffic cabinets rated -40°C to +74°C.
- Meets NEMATS-2 specifications.
- Optional main service entrance with 30A, 10kAIR breaker (22kAIR optional).
- State of the art TVSS and EMI module.
- Slim minimum footprint PDA.
- Traffic Rated Mercury Contactor.
- Quick, no fuss battery and UPS connectors.
- Automatic UPS sensing Bypass Module option.
- Generator transfer switch and connection option.
- Conveniently accessed branch protection of magnetic circuit breakers and fusing.



Patent Pending

(product may not appear exactly as shown)

Gen. Input

This Power Distribution Assembly (PDA) was designed as a “UPS ready” power supply and circuit distribution system for traffic cabinets. Intended for use with LED retrofitted intersections, this power supply allows for easy connection of a UPS to the power supply and allows the UPS to be a detachable unit that may be added or removed from the panel at any time, without interruption of service to the traffic cabinet (when optional ATS installed).

The panel is intended to be a power distribution panel with an optional main service entrance, along with more refined secondary protection for sensitive control circuits. Furthermore, the unit may be equipped with special features, such as a generator transfer switch, UPS power backup and conditioning, TVSS power conditioning and filtering or a wrap-around bypass for servicing the UPS or allowing the PDA to be “UPS ready”.

The main features of the PDA are the optional main service entrance, the serviceable TVSS module and the easy to access branch protection, all in a slim minimum footprint PDA. The TVSS module offers high protection that surpasses other similar products. Furthermore, the TVSS module offers power line conditioning to the traffic cabinet’s sensitive equipment, regardless if a UPS is installed.

As extra features, an automatic UPS sensing Bypass Module may be added to the PDA to allow for easy installation of a UPS or servicing of a UPS at any time without service interruption to the traffic cabinet. Also, there is a generator transfer switch option that allows the user to easily and safely connect a 20A, 120VAC generator to power the PDA and traffic cabinet at the flip of a switch. Optional service entrance breaker.

	VOLTAGE	PHASES / POLES	CURRENT RATING	OTHER
Utility (AC) Service	120VAC	1 phase	30A	-
Main Breaker	120VAC	1 pole	30A	10kA Interrupt (22kA optional)
Generator Connection	120VAC	1 phase	20A	10kA Interrupt (22kA optional)
Generator Transfer Switch	120VAC	DPDT	30A	10kA Interrupt (22kA optional)
Automatic Maintenance Bypass	120VAC	-	15A	10kA Interrupt (22kA optional)
UPS AC Connection	120VAC	1 phase	15A	-
UPS DC & Battery Connection	72VDC Max	-	-	1500 Watts Max
Temperature Rating	-40°C to +74°C, non-condensing, sea level)			

BOOST CHARGER MODULE

Provides rapid charging for larger battery banks to gain quicker recharge times, allowing you to be ready for the next outage that much faster. The charger module supplements the UPS charger. Designed for use to complement Always "On"™ traffic UPS components.

Features:

- Intended for use in traffic cabinets rated -40°C to +74°C.
- Light, compact, corrosion resistant enclosure.
- Easy to connect battery cables and UPS cables.
- Hardwired AC terminal block.
- Little to no maintenance.
- Pilot light to indicate power.
- Mounting tabs for installing.



Boost Charger Module with Door Mount UPS & UPS Status Module



Charger Module

TRAFFIC CABINET LINE FILTER

TRANSIENT VOLTAGE SURGE SUPPRESSION SPECIFICATIONS AC POWER LINE FILTER CONDITIONING

The Always "On"™ TLF120L60A traffic line filter is an advanced traffic cabinet AC Service surge protector. The Always "On"™ TLF120L60A filtering surge protector absorbs power line noise and switching transients that other suppressors and RFI filters pass through. If random time-base, memory loss, or other problems are affecting some of your intersections, this state-of-the-art protector can be of great benefit when properly installed.

This filter is compact and features 6 modes of operation instead of the industry standard of 2 modes of operation. It also features a grounding connection not featured by competitors' products with both serial and parallel filtration. A status indicator indicates the parallel filtration status. The status indicator is used as a "health check" of the parallel filter.

The TLF120L60A traffic line filter is configured for series-parallel surge, EMI and transient filtering. It is a state-of-the-art, high current filter based upon proven Always "On"™ products and provides high performance for its size. The TLF120L60A provides series filtering to the line. The filter is intended for the harsh operating environment of a traffic cabinet. The filter may be operated in the temperature range of -40°C to +74°C.



Patent Pending

Traffic Filter	MODEL NO.	TLF120L60A
INPUT	Nominal Voltage	120 VAC
	Frequency Range	45 – 65 Hz
	Phase Configuration	Single Phase 2 Wire (Line and Neutral)
OUTPUT	Output Voltage	120 VAC
	Current	60 Amperes
	Load Current Surge Rating	64 kA Surge Current
PROTECTION	Transient Suppression	275 V Maximum Clamping Voltage
	Noise Attenuation	Nominal 60 dB, Mil-Standard-220A@100kHz
ENVIRONMENT	Operating Temperature	-40°C to +74°C
	Humidity	0 to 90% non-condensing
CONFORMANCE	Safety	CSA
	Warranty	5 years
PHYSICAL DATA	Enclosure	Flange Mount (4" x 4" x 2.4")
	Weight	2 lbs.

OTHER VOLTAGES AND CONFIGURATIONS ARE AVAILABLE; FOR ORDER CODES, CONSULT MANUFACTURER.

STATUS CONTACT MODULE

To provide UPS operational status via contacts to the traffic controller. There are 3 main signals. They are Battery Low, Utility failed/On Inverter, and Timer expired. The timer contact gives one the flexibility to operate the signal heads in flash mode after a set period in backup mode. This feature is given to extend runtime of the UPS in backup mode and keep the intersection lit as long as possible.

The timer relay can have many different delays for different times of the day and days of the week. Briefly explained, the module has 14 different programmable time delays. One of the 14 timers can be assigned to a half hour interval in a week schedule. There are 336 half hour intervals that make up the week. For example, timer A is set to 1.5 hours and is programmed into 10:30 am during a Wednesday. If a power outage occurs during the period of 10:30 to 10:59 am during a Wednesday, a timer contact will close after 1.5 hours of continuous back up.

The advantage of the schedule is immediately apparent when one considers that an outage late night Sunday may not affect a large volume of traffic. It may not seem necessary to operate full colour signals and use up all the battery-stored energy. Remember, it takes time to recharge batteries. Thus, if the signals are operated with a duty cycle then that means there will be likely more energy left over for Monday morning when there is a large volume of traffic.

Features:

- Intended for use in traffic cabinets rated -40°C to $+74^{\circ}\text{C}$.
- Easily connects to the UPS.
- Robust 120VAC, 8A Form C contacts.
- Light, compact, corrosion resistant enclosure.
- Easy to use and program through user interface.
- Logs and timestamps power events.
- Low battery status.
- Utility fail/On inverter status.
- Multi timer relay.
- Weekly schedule of programmable half hour intervals.
- 14 programmable time delays.
- Accurate real-time clock.



Status Module
(Patent Pending)



Typical Displays

FOR ALWAYS "ON"™ UPC ORDER CODES, VISIT WWW.ALWAYSON.COM.

Always "On"™ UPS Systems Inc., #100 - 150 Campion Road, Kelowna, BC Canada V1X 7S8