

METAL SHARK



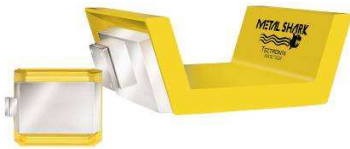
T E C T R O N I X S Y S T E M S I N C .

Unit 9, 18812 - 96th Avenue, Surrey, BC Canada V4N 3R1

SHARK OnePlus FPS

FILTERED POWER SYSTEM 1004AG-SE

Technical Manual (English)



SHARK OnePlus Series Filtered PowerSystem (FPS)**User Instruction Manual**

Customer Name: -

Location: -

Date in Service d/m/y: -

We would like to take this opportunity to thank you for purchasing your Uninterruptable Power System (FPS) from Tectronix. The confidence you have placed in our product is sincerely appreciated and we will endeavour to provide the best service and support possible.

Please take the time to read this User Manual completely as this provides you with the expertise and safety knowledge necessary to install and adjust the system according to your requirements. If you have any problems in the set up and operation of your system, the Tectronix team are available to assist you.

Tectronix Systems inc.
Unit 9 18812 - 96th Ave
Surrey , British Columbia
Canada, V4N 3R1

Telephone: (001) 604 607-6028
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E-mail: service@metal-shark.com

Equipment Information Label

1. IMPORTANT SAFETY INSTRUCTIONS



1.1. SAVE THESE INSTRUCTIONS

- Please read and save these instructions. This manual contains important instructions for the SHARK OnePlus Filtered Power System (FPS). Follow these instructions during the unpacking, installation and maintenance of the SHARK FPS. If you have a problem with the unit, please refer to this manual before calling Tectronix Systems Inc..
- This manual contains all needed information for operating the SHARK OnePlus® FPS and is directed to the Mill Operators and Technicians.
- At no time is any page to be removed from this manual. If this manual or any pages become lost, you should request a new manual immediately
- This documentation is not subject to change control by Tectronix Systems Inc.. The manufacturer reserves the right to make changes to this documentation. All rights reserved.
- Tectronix Systems Inc. gives no implicit guarantees regarding standard qualities or suitability for a certain application.

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3. Introduction

- Thank you for selecting this Filtered Power System (FPS). Tectronix's SHARK OnePlus FPS offers the most reliable protection from the harmful effects of electrical line disturbances for your computing and communications equipment. Tectronix's ISO 9001 certification represents our commitment to building world-class products. We take pride in every unit that leaves our manufacturing facility.

3.1. Registering your Shark FPS

- Your Tectronix SHARK OnePlus is registered at our manufacturing plant. Your warranty will start on the date of receiving this system.

Model: SHARK OnePlus1004AG-SE FPS
Manufacturer: **TECTRONIX SYSTEMS INC.**
Address: UNIT9 – 18812 96th Ave.
Surrey BC Canada V4N 3R1
Print Date of this Manual: February 2009.

4. Technical Support

- Tectronix Systems Inc offers 24-hour technical support.
- To contact Tectronix Technical Services:
 - North America: (604) 607-6028
 - email: service@metal-shark.com
- Please check with Tectronix Technical Services before attempting to repair or return any Shark product. If any Shark FPS needs repair or replacement, Tectronix Technical Services will issue a Return Material Authorization (RMA) number along with instructions on how to return the FPS.

5. Declarations

5.1. FCC Compliance

- *ATTENTION: Changes or modifications to this unit not expressly approved by the party responsible or in FCC compliance could void the user's authority to operate the equipment.*



This equipment was tested and complies with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the FPS is operating in a commercial environment. The FPS generates, uses, and can radiate radio frequency energy. If installation and use is not in accordance with the instruction manual, it may cause harmful interference to radio communications.

- *ATTENTION: Operation of this equipment in a residential area may cause harmful radio communications interference. The user is responsible for correcting the interference.*

6. Safety



6.1. Warning

- *This equipment services power from more than one source. The output receptacles may have voltage even when the unit is unplugged.*
- *Dangerous voltages are present within this unit! There are no user-serviceable parts inside. Any repairs or modifications by the user may result in out-of-warranty repair charges, unsafe electrical conditions, or violation of electrical code*
- *FPSs present a different safety issue than most electrical equipment because unplugging the FPS puts it into backup mode. Unplugging the FPS does not remove the electrical charge. To ensure that the FPS is off, turn the power switch OFF before unplugging the FPS from the wall outlet.*



6.2. Caution

- *This unit is intended to be used in a system that has a grounded neutral conductor.*
- *Operating this equipment without proper grounding may present a risk of electrical shock.*
- *Do not use AC adaptors with only two conductors to connect the input line cord to the wall socket as this will not connect the earth ground to the equipment*
- *Do not remove the cover. All repairs should be done by qualified service personnel. Voltages inside the FPS may be lethal. Internal components are powered even when the FPS is turned OFF. Even with the battery disconnected and the unit unplugged, energy is stored in high voltage capacitors and represents a severe shock hazard*
- *The maximum ambient operating temperature is 33°C. The unit is intended for installation in a controlled environment (temperature controlled, indoor area, free of conductive contaminants*

7. THEORY OF OPERATIONS

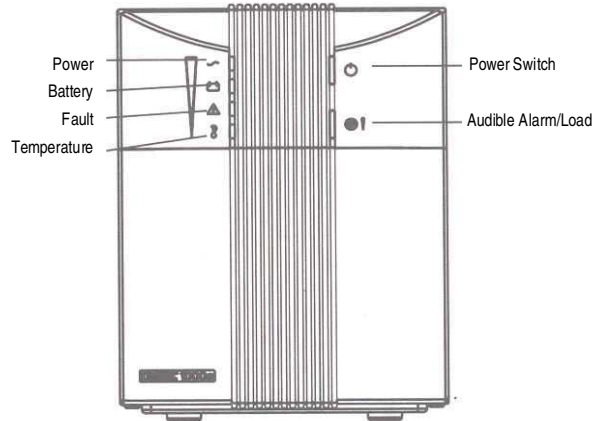
7.1. AC Power Mode

- The SHARK OnePlus FPS has two operating modes: Conditioned AC Power and Battery Backup.
- When utility AC power is present and within the correct voltage range, the FPS provides fully conditioned power:
 - Electronic equipment is protected from harmful transient voltage spikes and other electrical noise.
 - FPS detector circuits continuously monitor the utility power for blackout, low voltage, and over voltage events
 -
- The buck and boost feature will compensate for a wide range of voltage variations without depleting the batteries

7.2. Battery Backup Mode

- In an extreme over- or under-voltage situation, the detector circuits determine that utility AC power is no longer in an appropriate voltage range. The FPS switches to battery to supply continuous power.
- While in backup mode, detector circuits monitor the return of utility AC power. The FPS synchronizes with the utility's frequency when utility AC power is available. The equipment is supplied continuous power even when running in battery backup mode
- If the battery becomes exhausted while maintaining the load, battery backup terminates and the FPS output turns off. A low battery warning is sounded and transmitted via the communications port approximately two minutes prior to termination of battery backup. The FPS monitors the line and provides output when utility power is restored to normal operating range.

Fig. 1: Shark OnePlus FPS Front View



7.3. Output Overload Protection

- During normal operation, electronic output overload protection is active. If the output is loaded to more than 110% of the FPS rating, battery power to the FPS is not available. If the output is loaded to more than 125% of the FPS rating, the audible alarm will sound continuously and the FPS will shut down in 4 seconds if the load is not reduced. To reset, turn the FPS OFF, remove some of the load, then turn the FPS ON.

7.4. Input Protector

- A grossly overloaded FPS trips the rear panel circuit breaker. To reset the circuit breaker, push the button in.
 - If the circuit breaker trips repeatedly following reset, unplug the equipment from the FPS output receptacles and reset the circuit breaker once again.
 - If operation appears to be normal, check the total equipment load. Add your equipment to the FPS.
 - Output one device at a time. Check the front panel display after each device is powered ON.
 - If the circuit breaker trips with nothing plugged into the output receptacles, there may be an internal problem with the FPS. Call Tectronix Technical Services for assistance (refer to page 4-8).

8. SETUP AND INSTALLATION

8.1. Inspection and Unpacking

- Before shipment, this product was tested, inspected and found to be free of mechanical and electrical defects. Upon receipt of your FPS, carefully examine the packing containers for any sign of physical damage. Notify the carrier immediately if damage is present. After inspecting, carefully unpack the FPS. Retain the packaging materials for reuse or dispose of the materials properly, see Return Procedure on page 30. Once unpacked, inspect and test the unit for hidden damage that may have occurred in transit. *If damage is evident, contact Tectronix Technical Services..*

8.2. Installation

- When selecting a location for your FPS Cabinet, be sure that the unit is near a properly wired AC electrical outlet and is easily accessible for all other connections (the loads and/or optional communications cable). Leave at least 2 inches of clearance on each side of the FPS cabinet for proper ventilation.



- **CAUTION:** Do not cover or install the FPS cabinet in a confined or enclosed space.
- Keep the outside of the FPS Cabinet Clean by wiping off any dust or dirt accumulation.
- For optimal battery life, keep the FPS Cabinet at an ambient temperature of 25°C (77°F).

8.3. Long Term Storage

- Improper long-term FPS storage may damage the FPS battery and invalidate the battery warranty.
- Unplugging a FPS from its AC utility power source for an extended period of time results in lost battery charge. Restoration of charge to maximum capacity requires 24 - 48 hours.
- To keep the battery enclosure fully charged and to maximize the life of the battery, plug the FPS into an outlet while it is in storage. If the FPS is stored without power access, plug it into a power source for 24 hours at least once every 4 - 6 months.



- **ATTENTION:** If the storage temperature is greater than 30°C (86°F) plug the FPS into a power source for 24 hours every 2 to 3 months.



- **ATTENTION:** The FPS should not be stored at temperatures below -15°C (+5° F)

8.4. Ventilation

- The SHARK FPS requires a minimum of 2 inches (50 mm) of clearance on all sides for ventilation.

8.5. Grounding the Unit

- To eliminate shock hazard, connect the unit to a properly grounded AC receptacle.
- Before applying power, verify that the available line voltage matches the voltage listed on the rear-panel label. (For GS compliance: The power distribution system for all models is type TN.)




- **CAUTION:** Interruption of the protective grounding conductor or disconnection of the protective earth terminal presents a potential shock hazard that could result in personal injury and damage to the equipment.

NOTE: When connecting the FPS, make sure that the receptacle has power available and is not controlled by a remote switch.

8.6. Connections

- Before beginning, shut down and unplug the equipment to be protected. DO NOT make any connections or attempt to use any of the equipment until all the following connection instructions have been reviewed and completed.



- **CAUTION:** Do not  attach laser printers to the FPS. A laser printer periodically draws significantly more power during use and may overload the FPS.

1. Wire the SHARK FPS into a properly grounded AC electrical circuit. (LINE IN)
2. Wire the equipment to be protected into the FPS. (LOAD) Refer to Page13-27

Junction Box connections

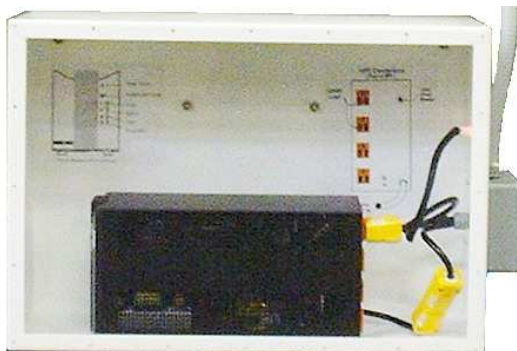
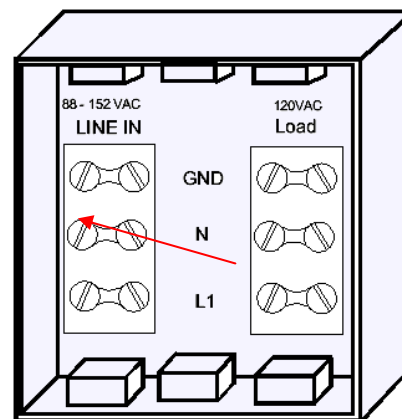



fig. 2: Typical FPS Installation



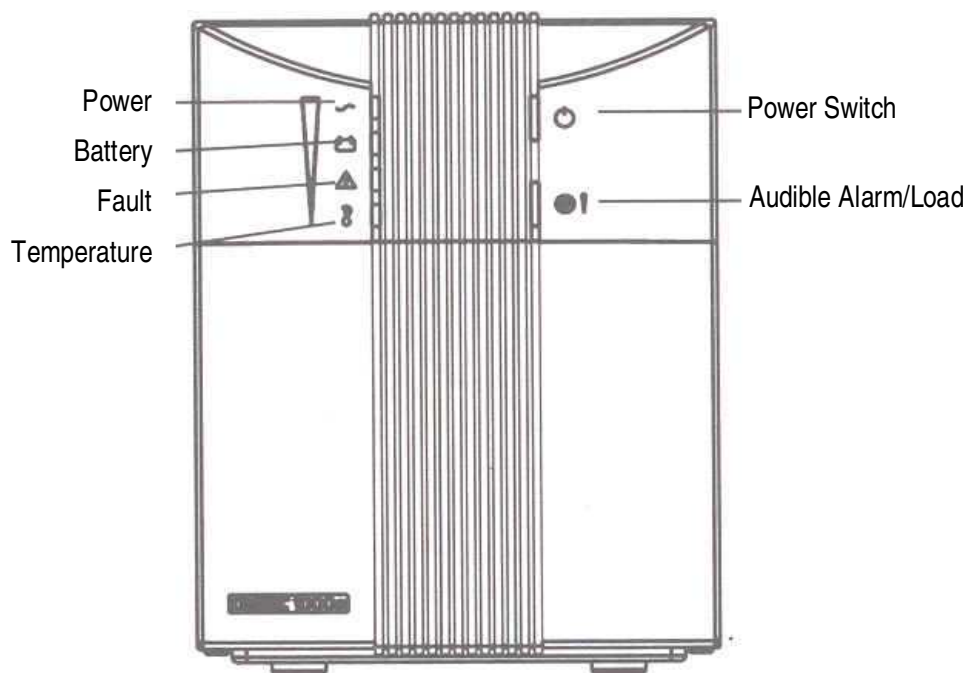
3. Press the power switch  on the front panel of the FPS for 2 seconds to turn the unit ON.

- The SHARK performs a self-test when it is first plugged in and turned on. After the self-test the unit enters Normal-mode. If the alarm sounds or the FPS alarm indicator stays on, see Table 4, "System Code Status" on page 11-23.

- **NOTE:** The batteries charge to 90% capacity in approximately 3 to 6 hours. However, it is recommended that the batteries charge for 6 to 24 hours after installation or after long-term storage. If long term storage is necessary, the batteries should be charged every 6 months by plugging the FPS into a power outlet for 24 hours

8.7. SHARK Front Panel


- The SHARK front panel lights indicate status of the unit and potential power problems. For alarm codes and indicators, see System Code Status Chart on page



8.8. Power Switch

- With the FPS connected to a properly wired AC input power source, press the power switch (⏻) on the front panel for 2 seconds. Power is supplied to the output connectors.
- Turn OFF the FPS by pressing the power switch (⏻) for 2 seconds. This turns the power to the output connectors "OFF." The internal charger will continue to charge and maintain the battery as long as the line cord is connected to a live input AC power source.

8.9. Self Test

- FPS performs a self-test when it is first turned ON. A green LED indicates normal AC output. The three LEDs on the front panel will indicate the status. A blinking yellow LED shows the battery is being charged. The FPS will continuously monitor the condition of the battery. If the battery cannot be charged, is disconnected or takes too long to charge, a code is represented in the LED Display
- *NOTE: The System Code Status Chart on the back of the FPS (and on page 27 of this manual) provides a quick reference for interpretation of the system status LEDs*
- To initiate a self-test, press and hold the  button for five seconds. If the FPS finds a problem, an LED indicates where the problem is. For more about the LED indicator lights, see Troubleshooting on page 28.
- *NOTE: Be sure the batteries are fully charged and the FPS is not in Battery-mode before initiating the self-test*

9. Indicators and Alarms

9.1.1. Battery Mode

If the AC input power source to the FPS rises too high, too low or fails, the FPS will switch to the internal inverter to deliver power to the outlet receptacles from the batteries. The LEDs will indicate that the FPS is on battery (see System Code Status Chart on page 27). An audible alarm will also sound every minute.

9.1.2. Low Battery

When the battery voltage falls to a predetermined level, the audible alarm will sound continuously and the green and yellow LEDs will blink. If the FPS continues to operate in this mode for two minutes or more, the FPS will shutdown and remove power from the output receptacles. When AC power returns, the FPS will return to on-line operation and the batteries will automatically recharge.

9.1.3. Overload

If the load on the FPS exceeds its capacity, the red and green LEDs will blink. If the audible alarm sounds once every minute, FPS will no longer transfer to battery backup until some of the load is removed. If the FPS is heavily overloaded, the audible alarm will sound continuously and will shut down in 4 seconds. The input circuit breaker may also trip. To reset the breaker, turn off the FPS (press the FPS power switch and hold for 5 seconds) remove the load and push the breaker back into its housing.

9.1.4. Battery Replacement

If the FPS has determined that the battery is no longer functional, the green and red LEDs will be on continuously and the yellow LED will flash. The audible alarm will sound every five seconds. See Battery Considerations on page 23 for more information regarding battery replacement

9.1.5. Indicator Lights

- The front of the FPS has four indicator lights: green, yellow, red, and green (See Table 4, "System Code Status Chart," on page 27 for details).

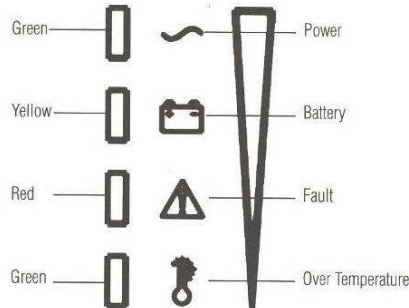



fig. 4: Front Panel Indicator Lights

- The front panel indicator lights serve four functions
 - To indicate status of the FPS, whether operating normally or in fault condition. See System Code Status Chart on page 27 for details.
 - To indicate % of load connected to the FPS the FPS must be on AC power, not on battery. To determine % load, . Press and hold the  button until the indication lights illuminate, indicating load % as follows

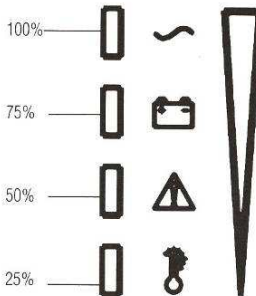



fig. 5: Percentage of Load or Percentage of Remaining Runtime Indicators

- To determine % of remaining runtime, the FPS must be on battery, not on AC power. Press and hold the  button until the indication lights illuminate.
- See fig. 5 for determining % of remaining runtime.
- To indicate over temperature, When illuminated, the unit has exceeded safe operating temperatures. See Table 5, "Troubleshooting," on page 28

9.2. Long term shut down

When the input power to the FPS is interrupted or removed for extended time (over 1 hour), manually shut down the FPS by removing the cabinet front cover and press the power switch (⏻) on the front panel of the FPS for 2 seconds to turn the unit OFF



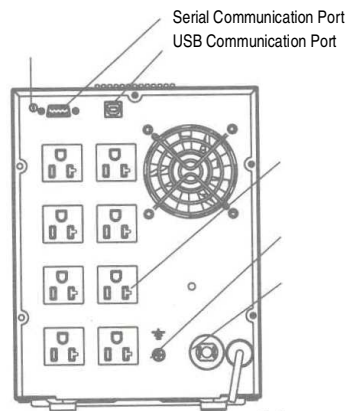
Caution do not Power up the FPS for 30 min after a full Mill power up. Wait until the mill power is stabilized to minimize the Stress to the FPS and The Metal-Shark Metal Detector.

9.2.1. Mill shut down

It is recommended that a dedicated circuit be installed and is never turned off even during mill shut down. This will enable the FPS to Maintain its protective qualities.

10. Communications

- With a communications cable and MopFPS® Express installed, MopFPS Express can exchange data with the FPS. This power management software polls the FPS for detailed information on the status of the power environment. If a power emergency occurs, the software initiates an orderly shutdown of the equipment. The interface ports will send On Battery and Low Battery signals to the host computer. The interface ports will also accept a shutdown inverter signal to conserve battery life



10.1. Installing MopFPS® Express

- To establish communications between the FPS and a computer:
 1. Connect the computer to the FPS communications port using the supplied USB communications cable.

NOTE: If a serial connection is required, contact the factory to purchase optional serial cable (SHARK part number CA-2BJOS-03).

NOTE: RS232 and USB communications ports cannot be used simultaneously.

2. Insert the supplied MopFPS software CD into the computer's CD-ROM drive
3. Once the CD is inserted into the drive, an installation wizard will appear. Follow the installation instructions from the wizard
4. Once MopFPS Express is installed and launched, the User Manual can be accessed by clicking on the Help button. If further assistance is needed, contact Tectronix Technical Service at (604)607-6028 or email: service@metal-shark.com.

PIN #	Signal Name	Function	Position
1	Low batt	Low battery simulated contact; 20 mA, 30 VDC contact rating Closes when low	Out
2	RxD	Receive from external device and shut down input	In
3	TxD	Transmit to external device	Out
4	-	No connection	-
5	GND	Signal common	-
6	AC fail	AC fail, simulated contact, open on fail; 20 mA, 20 VDC contact rating	Out
7	-	No connection	-
8	-	No connection	-
9	AC fail	AC Fail, simulated contact, close on fail; 20 mA, 30 VDC contact rating	Out

Table 1. Pin Signals for RS232 Port

11. Features and Specifications

- Your SHARK OnePlus FPS features full output isolation and power conditioning with Virtual Kelvin Ground® output filtering. This provides the highest level of protection from power line disturbances available
- SHARK's ONEGROUND is a standard feature on all SHARK OnePlus FPSs. The patented technology diverts transient errant current from flowing through ground circuit leads of datacom cables-minimizing the effect of ground potential shifts that can effect the performance of interconnected systems.

NOTE: In order to maintain the full performance benefits of this technology, equipment connected to the SHARK OnePlus FPS should NOT externally re-bond the grounding connector to building structural steel or a common conductor between the FPS and the equipment it is powering

- a. Five-year warranty on power control systems
- b. Two-year warranty on batteries - True sine wave output
- c. Site wiring fault indicator shows lack of ground connection or line and neutral reversed.
- d. Intelligent battery management system includes:
 - Battery condition monitoring and status alerts
 - Low battery indication
 - User-replaceable battery
 - Battery charge indication
 - Buck and boost low/high line voltage compensation without battery depletion
 - Controlled inverter shutdown if battery is depleted

SHARK OnePlus® UPS

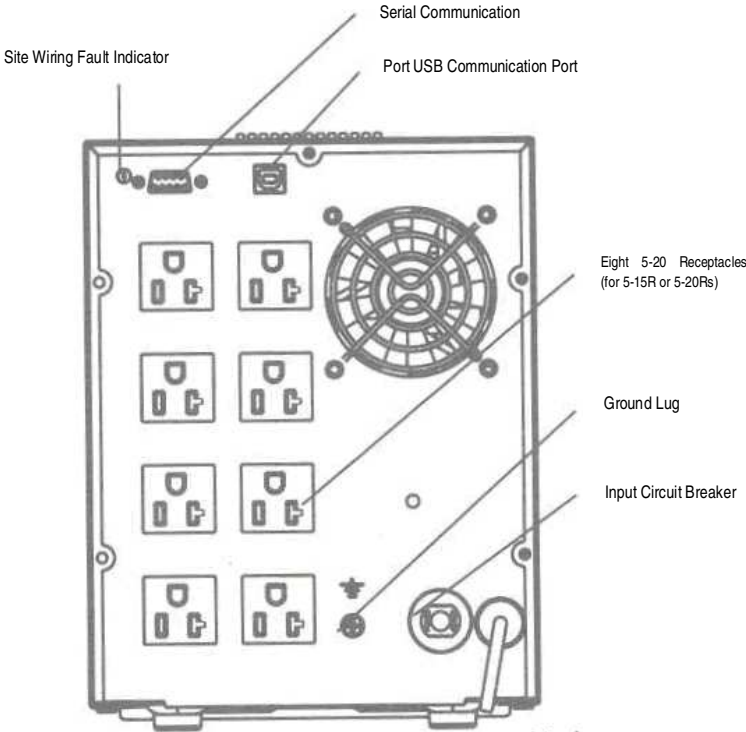


Fig 8 250VA Shark OnePlus FPS Back Panel

11.1. Specifications and Characteristics

Table 2. Physical/Electrical Specifications and Performance Characteristics

Specification and Characteristics	OnePlus250	OnePlus400	OnePlus600	OnePlus1000
Part Number	ONE254AG-SE	ONE404AG-SE	ONE604AG-SE	ONE1004AG-SE
Maximum Load VA/W	250/167	400/268	600/402	1000/670
Rated Power Factor	FPS .67			
Crest Factor	<3			
Nominal Input Voltage	120VAC			
Low Limit for On-line Operation	89 VAC			
High Limit for On-line Operation	152VAC			
Frequency Limits (on-line)	60Hz +/-5%			
Input Connection	6' attached line cord with 5-15P plug			
Input Over Current Protection	resettable circuit breaker			
Buck and Boost	maintains output voltage between 101 and 132 VAC while input voltage varies between 89 and 152 VAC			
Nominal Output Voltage (on battery)	120VAC			
On Battery Waveshape	sine-wave			
On Battery Frequency	60Hz +/-1%			
Transfer Time	6mS, typical			
Output Connection	(4) 5-15R	(4) 5-15R	(8)5-15R	(8) 5-20R (T*)
Battery Type	maintenance free, spill proof, sealed lead-acid			
Typical Battery Life	2 - 4 years, depends on number of discharges and ambient temperature			
Typical Battery Recharge Time (90% Recovery)	3-6 hours after full discharge to cut off			
Communications	basic signaling			
Interface Connector	USB and RS232 communications ports			
Input Signal - static	inverter shut down [pin 2 (+) to pin 5 (common)] (+3 to +27 VDC shuts down inverter)			
Output Signals - stimulated relay	on battery (pin 9 N.O. pin 6 N.C.), pin 5 (common) Low battery (pin 1 N.O.)			
Maximum Collector Voltage	25 VDC			
Maximum Collector Current	25 mADC			
Operating Temperature*	0 to +40° C (32 to 104° F)			
Storage Temperature**	-15 to 45° C (+5 to 113° F)			
Relative Humidity	0 to 95%, non-condensing			

Table 2. Physical/Electrical Specifications and Performance Characteristics

<u>Specification and Characteristics</u>	<u>OnePlus1004</u>
Operating Elevation	0 to 3,000 m (0 to 10,000 ft.)
Storage Elevation	0 to 15,000 m (0 to 50,000 ft.)
FPS Dimensions (HxWxL) in.	9.3 x 7.1 x 15.0
(HxWxL) (cm)	(23.5 x 18 x 38)
FPS Shipping Weights lbs. (kg)	63 (28.5)
Surge Voltage Withstand Capability	ANSI/IEEE C62.41 Category A&B, 6kV/200 & 500 Amp, 100kHz Ringwave
Surge Voltage Let-through	Less than 10 V normal mode (L-N), less than 0.5 V Common mode (N-G) when subjected to ANSI/IEEE C62.41 Cat. A
Normal & Common Mode Clamping Response Time	instantaneous
<small>* T-slot output connector will accept either 5-15P or 5-20P plugs ** SHARK OnePlus FPS should be operated or stored in locations where ambient temperature does not exceed 25°C (77°F) to preserve optimal battery life.</small>	

11.2. Typical Runtimes

Table 3. Typical SHARK OnePlus FPS Runtimes

<u>Part Number</u>	<u>ONE254AG-SE</u>
VA	1000
Half Load	12 min.
Full Load	59 min.
NOTE:	<i>Due to application specific conditions, your actual run time may be different</i>

12. Battery Considerations

NOTE: To obtain new batteries, contact Tectronix Technical Services at (604) 607-6028,

- SHARK OnePlus batteries are user replaceable. It is a safe procedure that is isolated from electrical hazards. The FPS and attached loads can be left powered "ON" during the procedure. If the unit is "ON," the audible alarm will sound when the battery is disconnected and the yellow and red LEDs will blink
- Although not necessary, AC power can be removed for battery replacement. Press the power switch for 2 seconds to turn the unit "OFF" AND unplug the FPS from the AC power source.

NOTE: The FPS cannot protect against power outages while the batteries are disconnected

Before replacing batteries, read all warnings below.



WARNING: Due to the presence of electrical charge batteries can present a risk of electrical shock or burn.

To minimize the risk of electrical shock:

- a. Remove watches, rings or other metal objects;
- b. Use tools with insulated handles;
- c. Do not lay tools or metal objects on the battery.



WARNING: DO NOT attempt to change battery wiring or connectors. Doing so can cause injury



WARNING: Replace batteries with the same type and quantity as previously installed in the unit.



WARNING: DO NOT disconnect the batteries if the FPS is in battery mode.

12.1. FPS Bypass

- When necessary to remove FPS from enclosure or remove FPS for service.
- **Before Proceeding** Read the safety information contained in this Manual


1. Open the enclosure and locate the power plugs.
2. Unplug the input Plug/Socket
3. Unplug the output plug and insert it into the input socket
4. Turn the FPS off by holding the power switch  down for 5 seconds



Fig 8a: Plug and socket Location (normal mode)

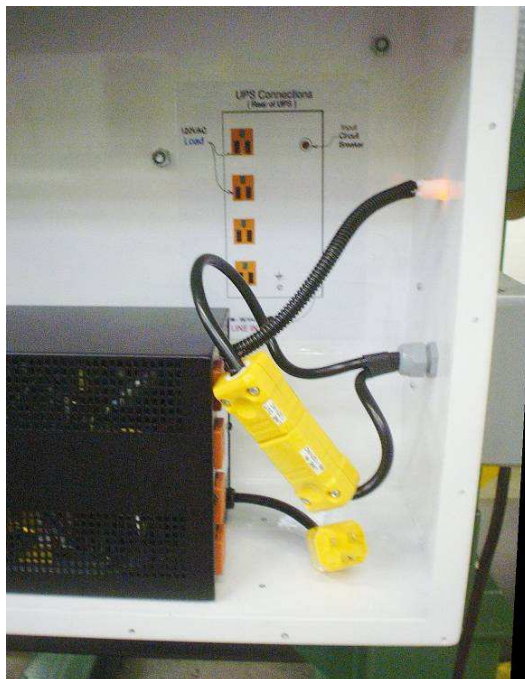


Fig 8b: Plug and Socket location (Bypass mode)

5. Verify that there are no indicator lights active on the front of the FPS. Return to step 4 until all lights are off.
6. It is now safe to remove the FPS from the enclosure.
7. On completion of service the FPS can be reinstalled by reversing the above steps

12.2. Battery Replacement Procedures

1. Remove plastic bezel from the front of the FPS by pulling the top left corner forward and sliding the front panel off (see fig. 10).

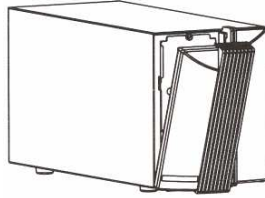


fig. 10: Removing the Front Panel

2. Remove the metal battery retention plate to access the battery by removing the coin slot screw(s) and sliding the plate up (see fig. 11).

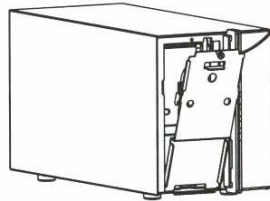


fig. 11: Removing the Metal Cover

3. Disconnect the keyed wire connector which connects the cable to the battery.
4. Carefully slide old battery out of battery chamber onto a flat, stable surface (see fig. 12).



CAUTION: Be sure battery is supported when removed from battery chamber.

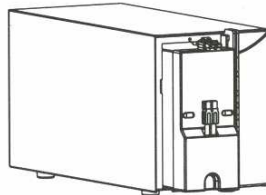





fig. 12: Removing the Battery

5. Slide the new battery into chamber.
6. Connect the cable to the battery using the keyed wire connector.

NOTE: The SHARK OnePlus battery wire connectors are keyed to assure proper installation and that the correct battery is used with the FPS.
7. Replace metal battery retention plate and lock into place with the coin slot screw.
8. Carefully snap plastic bezel into the closed position.
9. Dispose of the old battery pack according to current environmental regulations. See Battery Disposal, below, if you would like Tectronix to dispose of depleted battery. Testing New Batteries

NOTE: Once new batteries are installed it is recommended that the batteries charge 6 - 24 hours prior to testing.

- To test the batteries, press and hold the  (sound button) for five seconds. The self-test will initiate, distributing the load to the batteries and testing their performance. Once this 15-second self-test is complete, the FPS will go to Normal mode. If there is trouble with the batteries, the  (battery) indicator will flash and the  (fault) indicator will be illuminated.
- First check the battery connections and be sure the battery is fully charged. If the problem continues, contact Tectronix Technical Services. See Technical Support on page 1 for all contact information.

12.3. Battery Disposal

- Batteries contain toxic and acidic materials. Disposal method must adhere to Local/National recycling laws. Dispose of the battery in one of three ways:
 1. Return batteries prepaid to Tectronix for proper recycling using the prepaid shipping label included with your Tectronix replacement battery pack. If misplaced, contact Tectronix Technical Support for an RMA number. Mark the RMA number on the packing slip and shipping carton.
 2. Make arrangements with a local auto shop that collects automotive batteries for reprocessing.
 3. At a local Battery collection site.



CAUTION: DO NOT dispose of battery in a fire. The battery may explode. Do not open or mutilate the battery or battery enclosure. Released electrolyte is harmful to the skin and eyes and is toxic.

12.4. FPS Disposal

- Once your FPS has reached the end of its useful life and it is necessary to dispose of the unit:
 1. Remove the batteries as instructed in Battery Considerations on page 23.
 2. Dispose of the batteries as instructed in Battery Disposal above.
 3. Dispose of the unit in accordance with local/national recycling or disposal ordinances.

13. Troubleshooting

- Tectronix offers 24 hour technical support. If you have questions or problems regarding your SHARK OnePlus FPS:
 1. Refer to the Troubleshooting table on page 28 for corrective or recommended action.
 2. If you are unable to troubleshoot the problem, contact Technical Services. Refer to page 1, Technical Support for the correct telephone number in your area. Technical Services will ask you to describe the problem. They will attempt to solve the problem over the telephone or may issue a Return Material Authorization (RMA) number along with instructions on how to return the FPS if service is required.

NOTE: You will need to supply the service representative with the FPS part number and serial number. You can access these numbers on the back panel of the unit on a label located near the receptacles.

3. Always check with Tectronix Technical Services before attempting to repair or return any Shark product.



13.1. System Code Status

Table 4. System Code Status Chart

Power	Battery	Fault	Unit Status
O	O	O	OFF
●	O	O	ON/AC Present
●	☼	☼	ON AC/No Battery
●	☼	O	ON AC/Battery Charging
●	☼	●	ON AC/Replace Battery
☼	O	☼	ON AC/Overload
☼	●	O	ON Battery Power
☼	☼	O	ON Battery/Battery Low
O	O	☼	Off/Overload
O	●	●	Off/No AC - Fault
O	O	●	Off/Unit Fault
O = Off, ● = On, ☼ = Blinking			

13.2. Troubleshooting Table

Table 5. Troubleshooting

Problem	Possible Cause	Solution
FPS will not turn ON	Front Panel Switch not engaged.	Press the power switch  for 2 seconds
	FPS's input circuit breaker tripped.	Reduce the load on the FPS by unplugging the load and press the circuit breaker in on the rear panel.
	Unit not plugged in.	Plug unit into wall outlet.
	No batteries installed or defective batteries.	Check for batteries or contact Tectronix Technical Services for replacement.
FPS operates on battery even with line voltage present.	FPS's input circuit	Reduce the load on the FPS by unplugging the load and press the circuit breaker in on the rear panel.
	Breaker tripped.	
	High or low line.	Contact qualified electrician.
	Out of frequency range.	Check for FPS compatibility with power source.
Site Wiring Fault is ON.	Ground wire connection does not exist. Line and neutral wires are reversed in the line receptacle.	Contact qualified electrician. <i>(NOTE: the FPS operates while the Site Wiring Fault is ON, but may not provide rated noise and surge suppression.)</i>
Audible Alarm is sounding	See Table 4, "System Code Status Chart," on page 27 for resolutions.	To silence the alarm for an existing fault, press the  button. If the FPS status changes, the alarm will sound again. The alarm will not silence if there is a FPS fault, low battery condition, or if the battery needs to be replaced.
Fault LED is ON.	If yellow LED is blinking, the battery needs to be replaced.	Contact Tectronix for replacement. See Battery Considerations on page 23.
	If yellow LED is off or on solid, there is an internal FPS fault.	Contact Tectronix Technical Services. See Technical Support on page 1.

14. Warranty

- Tectronix Systems Inc OnePlus FPS is warranted to be free from defects in materials and or workmanship for five years provided the equipment is installed and operated in accordance with the recommendations and instructions written in this operator's manual. This warranty is limited to repairing or replacing, at Tectronix's option, any defective component, circuit board, or module contained within the product only when it is returned with an Tectronix Return Material Authorization (RMA) number to Tectronix or to an Tectronix-designated repair facility. In all cases, the customer is responsible for shipping charges to and from Tectronix or the Tectronix-designated repair facility.

14.1. Batteries

- Certain modules or peripherals included with the product, but not manufactured by Tectronix, including but not limited to batteries or battery enclosures, are warranted for two years or the extent of the manufacturer's warranty, whichever is longer.

14.2. Limitations of Warranty

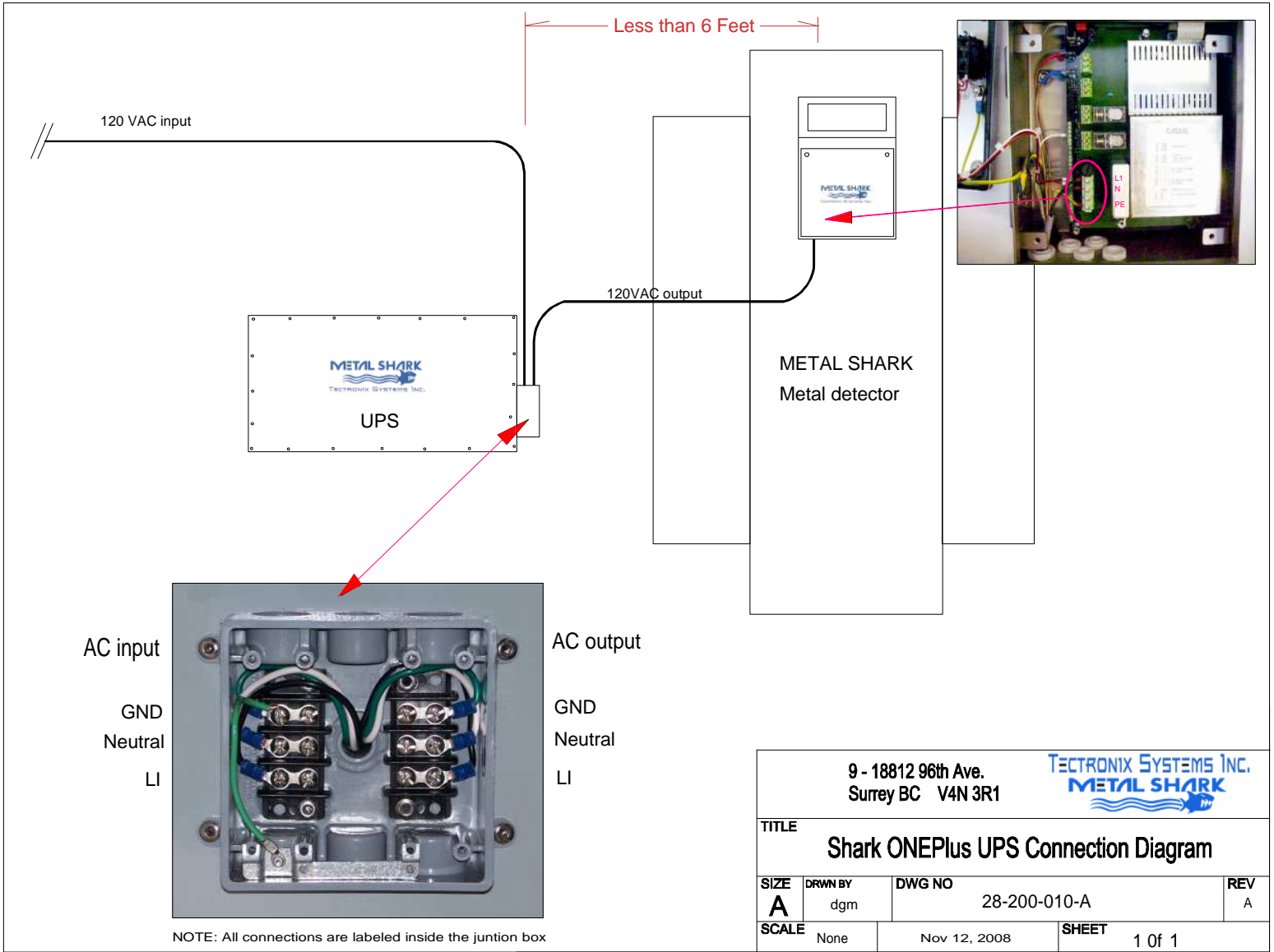
- This limited warranty does not cover any losses or damage resulting from shipment to or from the customer, or from improper installation, inappropriate environment, abuse, modifications, adjustments, or unauthorized repair.

14.3. Exclusive Remedies

- Except as set forth herein and except as to title, there are no warranties, express or implied, or any affirmations of fact or promises by Tectronix for the products, their merchantability, or fitness for any particular purpose. In no event shall Tectronix be liable for lost profits, goodwill or any other special or consequential damages.

14.4. Return Procedure

- To return a FPS, contact Tectronix Technical Support (page I) for a Return Material Authorization (RMA) number. This number must be marked on the shipping carton and packing slip of the unit returned. The customer is responsible for repair charges for damages incurred in shipment that result from inadequate or improper packing of the product.



14 FPS Connection Diagram

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Manual and operating instruction SHARK® FPS