

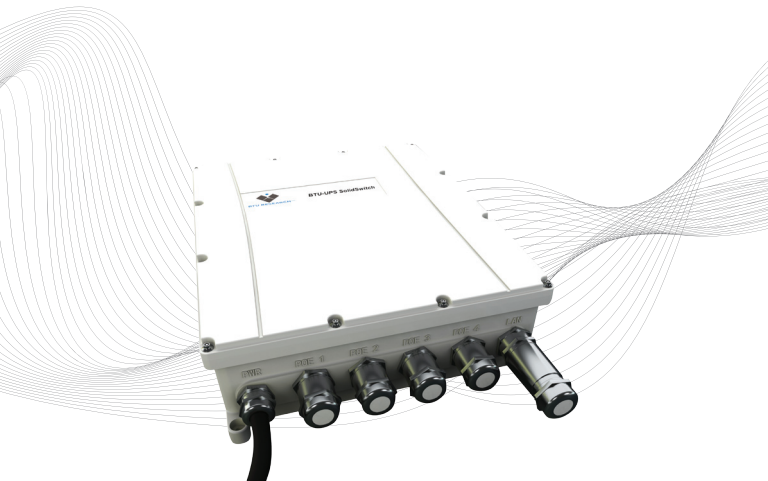


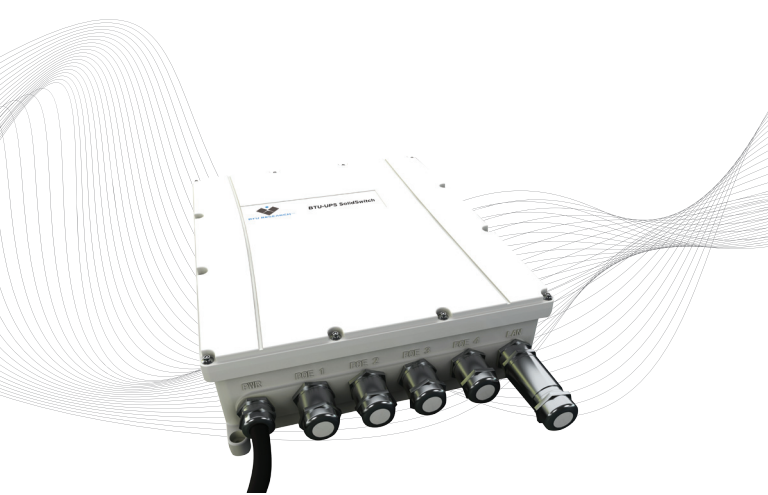
**BTU RESEARCH™**

## INSTALLATION AND OPERATING INSTRUCTIONS

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### **BTU UPS SOLIDSWITCH**





## TABLE OF CONTENTS

<b>SAFETY</b> .....	<b>3</b>
<b>1.1 HIGH VOLTAGE</b> .....	<b>3</b>
<b>1.2 LITHIUM BATTERIES</b> .....	<b>3</b>
<b>1.3 AUDIENCE</b> .....	<b>3</b>
<b>BRIEF DESCRIPTION OF UNIT</b> .....	<b>4</b>
<b>SECURITY FEATURES</b> .....	<b>4</b>
<b>MECHANICAL VIEW</b> .....	<b>5</b>
<b>3.1 MECHANICAL INSTALLATION</b> .....	<b>6</b>
<b>3.2 ELECTRICAL INSTALLATION</b> .....	<b>7</b>
<b>UNIT CONFIGURATION</b> .....	<b>8</b>
<b>TROUBLESHOOTING</b> .....	<b>10</b>
<b>HARD REBOOT OF SOLIDSWITCH</b> .....	<b>10</b>
<b>SPECIFICATIONS</b> .....	<b>11</b>
<b>TECHNICAL SUPPORT</b> .....	<b>11</b>

## SAFETY

### 1.1 HIGH VOLTAGE

Under no circumstances should the unit be opened except by trained, qualified personnel, after AC power has been disconnected and residual internal voltages have been allowed to decay. Potentially lethal voltages exist within the unit when it is connected to AC power.

The plug on the power cord is used as a disconnect device. If the plug on the power cord is used, the outlet shall be installed near the unit and shall be readily accessible. If the unit is permanently installed without the plug, a readily accessible disconnect device shall be used.

A GFCI (Ground Fault Circuit Interrupter) meeting local electrical codes should be used in all areas that may be subject to moisture.

Whereas over voltage and transient protection is provided within the unit, certain outdoor installations may require additional protection where the mains supply can experience abnormal variations, or be influenced by factors such as lightning strikes.

### 1.2 LITHIUM BATTERIES

Lithium-ion battery pack handling, maintenance and replacement should be made only by trained, qualified personnel. Improper handling can result in injury to personnel, or damage to the unit to render it unusable.

#### CAUTION

**RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE**

**DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS**

#### ATTENTION

**RISQUE D'EXPLOSION SI LA BATTERIE EST REMPLACÉE PAR UN TYPE INCORRECT**

**ELIMINER LES BATTERIES USAGÉES CONFORMÉMENT AUX INSTRUCTIONS**

### 1.3 AUDIENCE

This manual is prepared for persons familiar with enclosure installations in an outdoor environment, electronic circuitry and the codes and regulations specifying the requirements of the particular installation.

## BRIEF DESCRIPTION OF UNIT

The **SolidSwitch** is a versatile multifunctional device for outdoor or indoor use, to power and communicate with PoE devices over a network. It has 4 PoE output ports, each of which will provide up to 60W, up to the total rated output power of the particular unit.

A fifth port provides connection to the network via an SFP module, which can accept interfaces to a variety of network hardware depending on user requirements. Any of the other ports can also be used for the network connection if needed, but access is via an RJ45 connector only.

All ports support up to 1Gbps Ethernet speeds.

The unit runs normally from a universal AC input from 85 to 264V. This is used to maintain the included Lithium-ion batteries and run the PoE loads when AC power is present. Up to 1400WH of rechargeable Lithium-ion battery storage is available inside the unit. Should AC power fail, the batteries will seamlessly assume the PoE loads.

All ports provide access to the on-board network, power and battery management system. A web browser is required to interface with this system.

The unit has been tested to IEC60529, level IP68 ingress protection standards, and at extended temperatures, making it suitable for outdoor applications. Internal heat dissipating parts are thermally connected to the aluminum housing, and no fans are required.

## SECURITY FEATURES

The **Layer 3 SolidSwitch** employs all encryption methods used to comply with FIPS Standards.

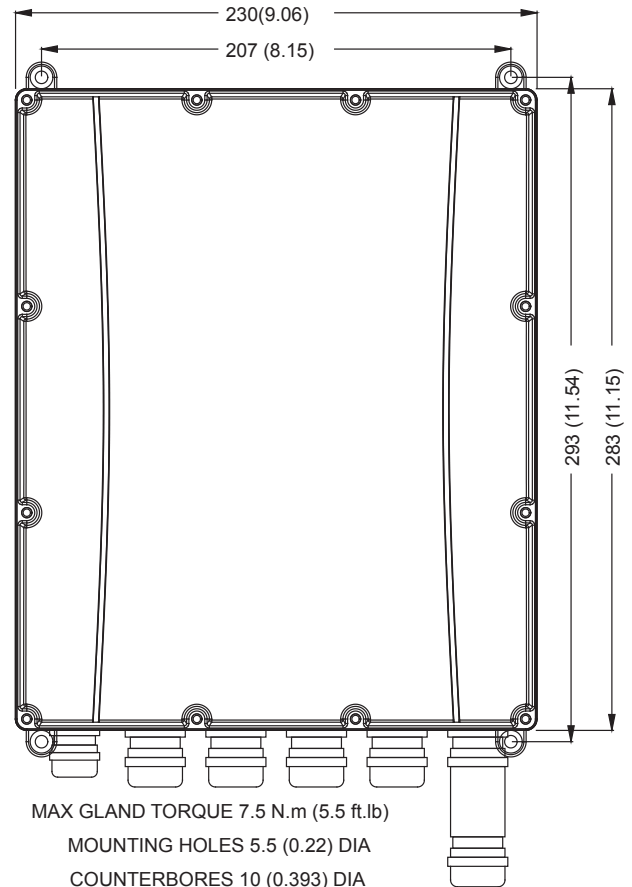
### Network Security

- SNMP v3 With 128/256-bit encryption
- VLAN Ingress Tagging (port by port)
- VLAN Access Restriction (port by port)
- 802.1x

### Device Management

- HTTP interface over HTTPS
- SSH@ Command Line Interface
- Local
- Radius
- TACACA+

## MECHANICAL VIEW



### 3.1 MECHANICAL INSTALLATION

The unit may be mounted on any convenient flat surfaces including concrete, wood, brick, etc. using 4 screws through the mounting holes. Pole mounting is made easy with an optional pole mounting kit. The suggested orientation of the unit is with the glands facing downward to easily facilitate bringing power to the unit and for connecting to POE and LAN ports.

**Earth ground screw must be connected to Earth ground in all types of installations.**

When installing on a brick surface the use of lag screws is recommended. Orientate the **SolidSwitch** so that none of the lag screws are located on the mortar.

When installing on a concrete wall, concrete block, cement block, foundation block or concrete masonry unit (CMU) ensure the appropriate anchor is selected for the weight of the unit.

The **UPS SolidSwitch** is an outdoor device and is not recommended for installation on drywall.

### 3.2 ELECTRICAL INSTALLATION

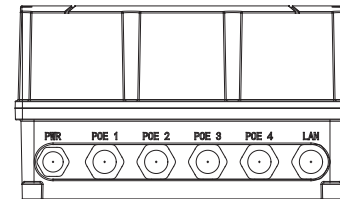
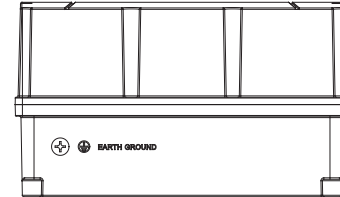
Installation should be performed to meet all relevant local Electrical Codes. The **EARTH GROUND** screw must be connected to earth ground.

The power cord comes pre-installed. To preserve the IP68 rating of the unit, cables must be rated for exterior use, and the following procedures should be followed. You will need a 24mm wrench.

1. For each port used, remove the cover, seal and seal compression fingers from the unit, and thread them in that order over the end of the cable. Attach the RJ45 plug.
2. Install the RJ45 connector, tab "down". It should click into place. Replace cover and tighten.

If Fiber is being used for the LAN connection, you may need the extender provided to accommodate the fiber termination length, which should also be installed before the fiber is terminated.

For some SFP modules, you will need to remove the base of the gland from the enclosure and replace it after the SFP module is installed. Be sure not to damage the sealing O-ring.



## UNIT CONFIGURATION

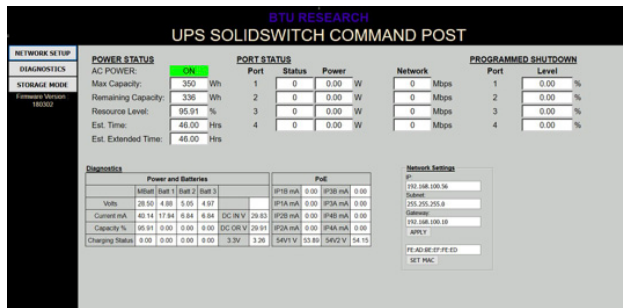
The unit is shipped and stored with the batteries de-activated. In this state, the unit can be stored for up to 3 months if kept in the temperature range -20°C and +50°C. To “wake up” the unit, plug it into an AC outlet. Once awake, the unit will stay awake until it is either put in storage mode again, or the batteries run flat without AC power. Depending on the storage capacity installed, their charge status, and any load, the batteries will be flat in anywhere between a few hours to a few weeks.

To put the unit back into storage mode, you should be connected to it with a computer. Please see later for complete details.

To configure the unit, connect a computer with a web browser to the unit.

The default IP address is 192.168.100.55

You should be rewarded with the **SolidSwitch** Command Post Screen as below.



## SIDE BUTTONS

**NETWORK SETUP** toggles display of the network settings in the main display screen. By default it does not appear. To change IP, Subnet and Gateway parameters, enter values required, and press **“APPLY”**. The new values are recorded in non-volatile memory. If the IP address is changed, the web browser must be re-started using the new address. To change the MAC address, type in the new address and press **“SET MAC”**.

**DIAGNOSTICS** toggles display of the diagnostic information on the main display screen. By default it does not appear. This display is normally only used for troubleshooting.

**STORAGE MODE** allows the user to de-activate the batteries for storage mode or shipment. To put the unit in storage mode, first disconnect the AC power. The AC POWER status should change from ON to OFF. Then press the **“STORAGE MODE”** button. Confirm that you want to put the unit into storage mode. The unit will turn off. All connected loads will be turned off. The page will stop responding. The unit is now in storage mode.

## POWER STATUS

**AC POWER** reads ON and is green when present, OFF and is red when absent.

**MAX CAPACITY** indicates the total installed battery capacity. It is in multiples of 350WH.

**REMAINING CAPACITY** when AC power is present indicates the capacity to which the batteries are currently charged. When AC power is absent, it shows the amount of capacity remaining.

**RESOURCE LEVEL** is the ratio of remaining capacity to max capacity expressed as a percentage.

**EST TIME** is the estimated battery run time while running at the current load indicated in the Port Power and Status fields.

**EST EXTENDED TIME** is the estimated battery run time when the Programmed Shutdown levels are set.

## PORT STATUS

**STATUS** is 1 if the port is providing PoE power, 0 if not. **POWER** displays the power taken by each port. **NETWORK** displays the port speed, whether the port is providing power on not.

**PROGRAMMED SHUTDOWN** allows the user to set capacity thresholds at which, during absence of AC power, each PoE port will be turned off. This enables essential services to be maintained for as long as possible in the event of a prolonged power outage.

## TROUBLESHOOTING

As this is an outdoor rated unit, there are no LED indicators to indicate operating status.

Standard procedures like "check connections" are not listed.

SYMPTOM	POSSIBLE CAUSE	COMMENTS
<b>Will not power any load</b>	No AC power and flat batteries	The unit goes into storage mode. It will recover when AC power is restored but the batteries will need to charge.
<b>Some loads will not power</b>	Over power budget	<b>SolidSwitch</b> rigidly enforces its designed power budget to protect itself and its loads.
	Non-standard PoE Load	<b>SolidSwitch</b> powers all IEEE 802.3af/at loads, UPOE loads, and some non-standard loads.
<b>No LAN connection</b>	Incompatible SFP module	Try to use a PoE port for LAN communication. If successful, "reboot" the unit as below and try again. If problem persists, please call Technical Support.

## HARD REBOOT OF SOLIDSWITCH

This requires the cover to be removed. This must be done by trained and qualified personnel in a controlled environment.

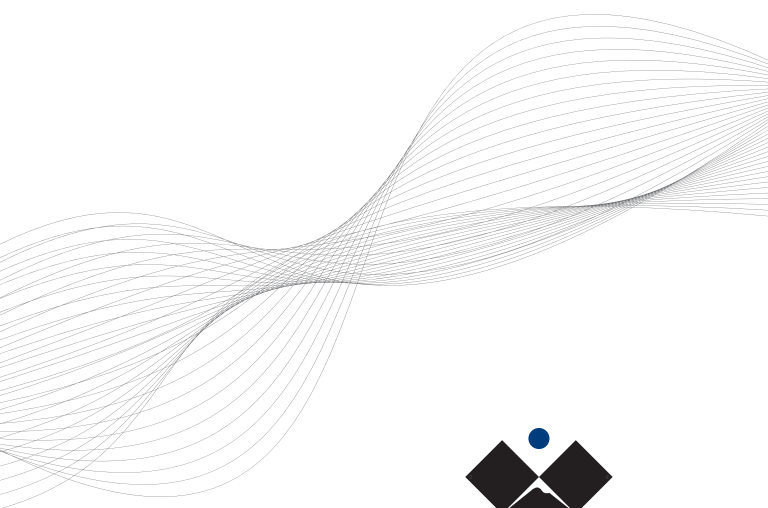
1. Disconnect AC power completely. Wait one minute for stored high voltage inside to decay.
2. Remove the cover (12 security screws).
3. Unplug all the batteries. Wait one minute for stored voltage to decay.
4. Reconnect the batteries (order is not important - the unit will not power up yet).
5. Replace the cover.
6. Reconnect AC power. The unit will come out of storage mode and wake up.

## SPECIFICATIONS

<b>Maximum Power Output</b>	240W
<b>Dimensions</b>	7Ahr unit: 283mm x 230mm x 76mm 28Ahr unit: 283mm x 230mm x 134mm
<b>Weight</b>	4.5Kg and 10.5Kg with UPS Power Cover
<b>VAC Input</b>	85 to 264 VAC 50 to 60HZ
<b>POE Out Voltage Range</b>	50 to 57 VDC
<b>Ports</b>	4 POE Ports and 1 SFP Port
<b>Connectors</b>	Shielded RJ-45 and Cage SFP
<b>Data Rates</b>	10/100/1000 Mbps
<b>POE Output</b>	Max output per port 60W and back compatible to IEEE802.3af/at
<b>Internal UPS Switching</b>	Glitch Free, undetectable switching from AC power source to internal DC supply
<b>Internal Battery Cells</b>	LG INR18650F1L, Cylindrical Li-Ion, Nominal Std charge/discharge: 3350mAh
<b>Internal Battery Pack</b>	1 each 28 cell 7S4P pack with up to 3 added packs in UPS Power Cover
<b>Internal UPS Emergency Power</b>	350Wh expandable to 1400Wh w/optional "Extended Run Cover"
<b>Mounting</b>	Wall Mountable or Pole Mountable w/optional Pole Mounting Kit
<b>Enclosure</b>	Dust and Water Intrusion: IEC60529, Level IP68, NEMA 6P
<b>Operating Ambient Temperature</b>	Switch: -35 - 60°C
<b>Operating Humidity</b>	Max 90% Non-Condensing
<b>Storage Temperature</b>	Switch:-40 - 80°C Battery Packs: -20 - 50°C for 3 months
<b>Storage Humidity</b>	95% Non-Condensing
<b>Safety and Regulatory Compliance</b>	UL, cUL, CE, RoHS Compliant, WEEE Compliant
<b>Warranty</b>	UPS Switch: 2 Years Battery Packs: 1 Year

## TECHNICAL SUPPORT

Please call +1 (713) 301-4140. 09:00 to 17:00 USA Central time.



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