

# **Trust Energy Protector 325/525**

**User's Manual**

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## **Introduction**

This manual is a guide to the installation and use of the Trust Energy Protector 325/525 (UPS).

The Trust Energy Protector provides you with a perfect protection of your critical devices and makes your PC operate in an intelligent way. It has been developed with the newest technology and disposes of a powerful Automatic Voltage Regulation (AVR) function which allows an input voltage range from 75% to 125%, including an on-line voltage boost-up and buck-down.

The Trust Energy Protector is based on microprocessor controls. This means that it operates as soon as the utility power is connected, so there is no need to switch it on. In backup mode, the Energy Protector can be set to turn off automatically if none of the connected devices is operating in order to save battery energy.

The Trust Energy Protector is furthermore equipped with several LEDs to indicate for example when the battery needs to be replaced and a cyclic self-testing function to verify both the operation of the UPS and the condition of the battery.

## **Chapter 1: Important Safety Instructions**

Please follow the safety instructions below during the installation and maintenance of the Trust Energy Protector:

- Unplug the unit and make sure all switches are off before cleaning.
- Do not attempt to service this product yourself. When the unit is not functioning, return it to your dealer. Opening or removing covers may expose you to dangerous voltage.
- The outputs may have high voltage, even if the unit is not powered on.
- When the fuse has blown, replace it only with a fuse of the same type to reduce the risk of fire.
- The battery should only be serviced by experienced personnel. Keep unauthorised personnel away from the battery.
- Replace the battery only with the same type.
- Do not expose the battery to fire, it may explode.
- Do not open or mutilate the battery. The released electrolyte is toxic and is harmful to the skin and eyes.
- A battery contains a high short circuit current. Remove watches, rings or other metal objects and use tools with insulated handles when servicing the battery.



## Chapter 2: System Description

*Figure 1 Front panel*

1. Replace Battery indicator (red LED)  
The LED illuminates when the UPS's battery needs to be replaced.

**Note**

When replacing the battery, disconnect the power cord before opening the cover. Be aware of the battery's polarity while installing a new battery to avoid a short circuit.

2. Backup indicator (yellow LED)  
The LED illuminates when the UPS is supplying battery power to the connected devices.
3. Energy Normal indicator (green LED)  
The LED illuminates when the input voltage is normal. In case of power failure or automatic shut down to save energy, this LED will flash every 2 seconds.
4. On/Off/Test/Silence button  
Press the button and hold it longer than 1 second to switch the UPS on and off. Press the button less than 1 second to activate the self test or silence the backup alarm.
5. Backup mode (slow alarm)  
In this mode, the yellow LED illuminates and the UPS sounds an audible alarm. The alarm stops when the UPS returns to its normal operation.
6. Low Battery (rapid alarm)  
This mode means that the battery energy runs low. The UPS is beeping rapidly. The alarm stops when the UPS shuts itself down or returns to its normal operation.
7. Overload (continuous alarm)  
The UPS is overloaded when the connected devices exceed the maximum capacity and will then emit a continuous alarm. Remove non-critical devices from the UPS to stop the overload.
8. Name plate

*Figure 2 Rear panel*

1. Computer Interface (525)  
The interface provides a RS-232 serial connection and a relay signal to support Novell, Unix, Windows, DOS and other operation systems.
2. Power output
3. Power input



## Chapter 3: Setup

### *Figure 3 Connections*

# 1 connects the UPS to the mains.

# 2 connects the UPS to your PC for power supply.

# 3 connects the UPS to the serial input of your PC to allow you to view the status of the UPS with special software (525).

#### 1. Placement

Install the UPS in a protected area with adequate air flow and free of excessive dust. Do not put the UPS in an area with extreme temperatures or humidity.

#### 2. Connecting Computer Interface (Optional)

UPSMON or other power management software and interface kits can be used with this UPS. Use only kits supplied or approved by the manufacturer.

Connect the interface cable to the 9 pin interface port on the rear panel of the UPS, if you want to use this option (see figure 3: # 3).

**Note**

The computer interface connection is optional. The UPS also functions without an interface connection.

3. Connecting to mains  
Use the supplied AC power cord to connect the UPS to the mains to power up the UPS (see figure 3: # 1).
4. Charging the battery  
The UPS charges its battery whenever it is connected to the mains. For best results, charge the battery for 4 hours when you use the UPS for the first time.
5. Connecting devices  
Use the supplied IEC cord to connect devices with the UPS (see figure 3: # 2).  
Plug the devices into the output connectors on the rear panel of the UPS. If you want to use the UPS as a master on/off switch, make sure that all the connected devices are switched on.

## Chapter 4: Operation & Maintenance

### 4.1 How to operate the UPS

1. Switch on  
Press and hold the on/off/test/silence button for more than 1 second until the Energy Normal LED is lit. The UPS will perform a self-test each time it is switched on.
2. Switch off  
Press and hold the on/off/test/silence button for more than 1 second until the Energy Normal or Backup LED goes out.
3. Self-Test  
Use the self-test function to verify both the operation of the UPS and the condition of the battery. When the UPS is switched on, press the on/off/test/silence button for less than 1 second. The UPS will immediately start the self-test. During the self-test, the UPS operates in the Backup mode and will go back to the Energy Normal mode as soon as the self-test is finished.
4. Silence  
Use this function to silence the alarm. When the UPS is in the Backup mode, press the on/off/test/silence button for less than 1 second.

**Note**

This function does not work when the UPS has a Low Battery or Overload status.

If you are using the UPSMON software, you can set the UPS to turn off automatically during the Backup mode, if none of the connected devices is operating.

## **4.2 How to maintain the UPS**

The unit is designed for years of trouble-free operation, so only a little maintenance is required. Please pay attention to a few helpful instructions:

- Make sure the UPS is off before you attempt to clean it.
- Do not use liquid or aerosol cleaners, use only a water dampened cloth to wipe the exterior occasionally.
- Periodically vacuum dust from ventilation openings.

## **Chapter 5: Software (525)**

If you have connected the UPS to a remote port (COM 1 or COM 2) of your PC, you can use the supplied program UPSMON. Please refer to the READ.ME file for installation instructions and available features.

UPSMON displays all the diagnostic symptoms on your monitor, such as voltage, frequency, battery level etc. It is also possible to shut down a connected device in the event of power failure.

The software is available for DOS and Windows 3.1x or Windows 95.

*Figure 4 UPSMON for DOS*

*Figure 5 UPSMON for Windows*

## Chapter 6: Troubleshooting

If the UPS does not function properly, please check the troubleshooting chart below. When the unit has to be returned to the dealer for service, write down the information below:

- Model number and serial number
- Date of purchase
- Full description of the problem

Finally, pack the UPS in the original carton.

Troubleshooting Chart		
Problem	Possible Cause	Action
UPS is not switched on LED is not lit	1 on/off/test/silence button not pressed or pressed too short 2 battery voltage less than 10V 3 PCB failure  4 load less than 15W in battery mode	1 press the on/off/test/silence button for more than 1 sec. 2 recharge the UPS for at least 4 hours 3 PCB needs to be replaced, call for service 4 normal condition
UPS is always in battery mode	1 power cord is loose 2 AC fuse has burned out 3 line voltage is too high, too low or has blacked out 4 PCB failure	1 reconnect it 2 replace the AC fuse 3 normal condition 4 PCB needs to be replaced, call for service
Back-up time is too short	1 battery is not fully charged 2 PCB failure	1 recharge the UPS for at least 4 hours 2 PCB needs to be replaced, call for service
Buzzer is continuously beeping	1 overload	1 remove the non critical devices
Red LED is lit	battery failure	recharge the UPS for at least 4 hours, if the problem is not solved, replace the battery, call for service

## Appendix A: Specifications

Model		325 (UPS+AVR)	525 (UPS+AVR)
Power rating (UPS output)		325 VA	525 VA
Input	voltage frequency	75% to 125% of 100V, 110V, 120V, 220V, 230V, 240V 50Hz or 60Hz	
Output (inverter)	voltage voltage regulation frequency stability wave form	115V, 230V ± 3% 1000 PPM PWM step wave	
Back-up time		10 to 30 min. (depending on computer load)	
Transfer	line to inverter  inverter to line  transfer time	over-voltage transfer at 125% nominal under-voltage transfer at 75% nominal over-voltage re-transfer at 121% nominal under-voltage re-transfer at 79% nominal 0.3 ms inverter to line; 2 ms line to inverter	
AVR (on-line mode)	on-line boost-up  on-line buck-down	AVR automatically increases output voltage 15% above input voltage if -9% to -25% of nominal AVR automatically decreases output voltage -15% below input voltage if +9% to +25% of nominal	
Protection	unit input UPS output overload  UPS output short circuit	fuse for overload protection electronic type protection complete UPS shutdown immediately if overload exceeds 130% UPS output cut off immediately	
Indicator		on-line, battery backup, replace battery	

Alarm	battery backup battery low overload	slow beeping sound (about 0.47 Hz) rapid beeping sound (about 1.825 Hz) continuous beeping sound	
Filter	EMI/RFI filter	10 dB at 0.15 Mhz, 50 dB at 30 MHz	
Spike protection	110/120V model 220/240V model	max. energy: 320 Joules/2 ms; clamping voltage: 360/50A max. energy: 320 Joules/2 ms; clamping voltage: 765/50A	
Interface	D type 9 pin connector	provides both RS-232 and contact signal and many functions such as power failure, battery low, UPS shutdown, power failure history record, schedule on/off, countdown time setting, UPS power status display, back-up time prediction (not available for 325).	
Physical	dimension in mm (W x D x H) net weight gross weight	97x260x135 4.7 kgs 5.0 kgs	97x320x135 6.2 kgs 6.5 kgs

**Note**

Characteristics are subject to change without prior notice.

## **Appendix B: Computer Interface Port (525)**

D type 9 pin connector

Provides both RS-232 and relay signal. UPS can send power failure and battery low signals to the PC and receive shutdown signal and scheduled on/off time table from the PC.

*Figure 6 D type 9 pin connector*

1. contacts normally open
2. signal high minimal 1 second
3. low battery
4. mains failure
5. ground
6. UPS shutdown or RS-232 TD pin 3
7. RS-232 RD pin 2
8. RS-232 RTS pin 7
9. RS-232 DTR pin 4
10. no connection
11. pin number