



GTEC UPS MODEL:

ZP120N 1-3 kVA

Command list - Parameters calibration

SERVICE MANUAL

Calibrating Parameters SOP for ZP120N RT 1~3K UPS via USB

GENERAL

The document is providing information for qualified engineer who has capability for service this UPS through USB port to calibrate parameters on UPS after replacing PCB boards such as power board (PSDR), control board (CNTL). Charger board...etc.

HARDWARE

Request tool as followings:

- 1) PC or lap-top with USB port;
- 2) USB2.0 to USB1.1 cable;

SOFTWARE

USB HID testing tool (HIDTestProgram for USB Card V4.0.0.7)

Step1: Connect PC or lap-top with UPS by using USB cable.

Step2: Turn UPS on in normal inverter mode with mains present.

Step3: Execute this USB HID testing tool and select 'Innova RT 1/1' and then click "Open Device" button as shown Fig 1.

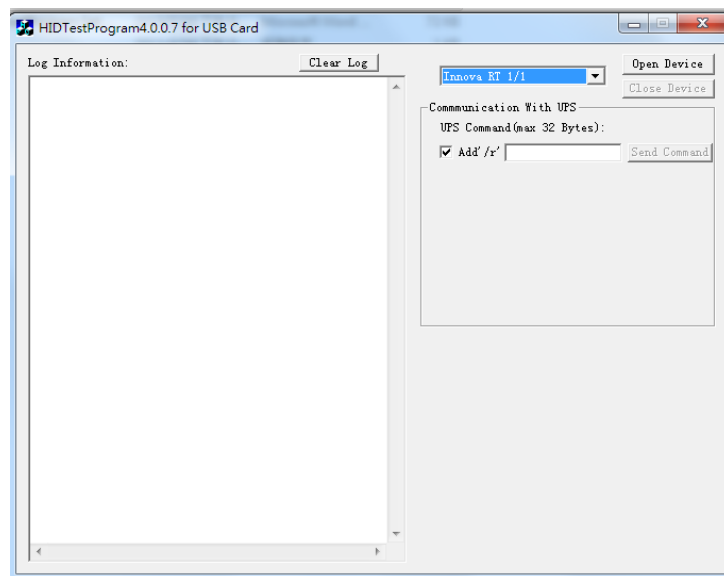


Fig 1. Main screen for USB HID testing tool

Note: If communication is successful, communicating dialog (log information) will pop out "Find the HID Device OK". If communication is unsuccessful, communicating dialog (log information) will pop out "Can not find the HID Device".

Step4: Go Appendix B. SOP for Charger Voltage Calibration to calibrate charge voltage first.

Step5: Input UPS Command as following page, then click “Send command” button.

COMMANDS FOR CALIBRATING PARAMETERS

Computer: SATEXX<n><cr>

UPS: ATEXX<cr>

XX: It is for parameter items which are required for calibration.

<n>: Values are between 0000-9999. It is for measured actual value/Unit by external instruments

Note:

1. If parameter items are not available, communicating dialog (log information) will pop out a question mark “?<cr>”.
2. If <n> values are out of adjusting limitation, communicating dialog (log information) will pop out “ABORTXX<cr>” and it means parameter calibration failed.
3. Recommended parameter items for calibration are shown in following table.

XX	Command content	Unit	Adjust limit
00	Battery voltage	0.1	The detected battery voltage value*3%
07	inverter voltage	0.1	The detected inverter voltage value*3%
10	line voltage	0.1	The detected bypass voltage value*3%
16	output current	0.01	The detected output current value*6%
19	output Watt	1	The detected output current value*5%

Table. Recommended parameter items for calibration

EXAMPLES

1. Calibrate battery voltage

Ex.1: If battery voltage displayed on LCD screen is 37.2V, but this voltage actually measured is 36.5V. Send command "SATE000365" to UPS. (00 means parameter item for battery voltage calibration. 0365 means the real measured battery voltage is 36.5V)

If this calibration is successful, communicating dialog (log information) will pop out "ATE00".

Ex.2: If battery voltage displayed on LCD is 102.2V, but battery voltage actually measured is 101.5V. Send command "SATE001015" to UPS.

2. Calibrate inverter voltage

To calibrate inverter voltage, UPS has to turn on in normal inverter mode with mains present.

Ex.1: If inverter voltage displayed on LCD screen is 230V, but this voltage actually measured is 235.4V. Send command "SATE072354" to UPS. (07 means parameter item for inverter voltage calibration. 2354 means the real measured inverter voltage is 235.4V)

If this calibration is successful, communicating dialog (log information) will pop out "ATE07"

3. Calibrate line voltage (bypass voltage)

Ex.1: If line voltage displayed on LCD screen is 228V, but this voltage actually measured is 230.1V. Send command "SATE102301" to UPS. (10 means parameter item for line voltage calibration. 2301 means the real measured inverter voltage is 231.1V)

If this calibration is successful, communicating dialog (log information) will pop out "ATE10"

4. Calibrate output current

This parameter item has to connect a certain level of load before calibration and it is recommended at least 80% RCD load of normal power rating of UPS.

Ex.1: If output current displayed on LCD screen is 11A, but output current actually measured is 10.5A. Send command "SATE161050" to UPS. (16 means parameter item for output current calibration. 1050 means the real measured output current is 10.5A)

If this calibration is successful, communicating dialog (log information) will pop out "ATE16"

5. Calibrate output Watt

This parameter item has to connect a certain level of load before calibration and it is recommended at least 80% RCD load of normal power rating of UPS.

Ex. 1: If output Watt displayed on LCD screen is 1440W, but output watt actually measured is 1652W. Send command "SATE191652" to UPS. (19 means parameter item for output Watt calibration. 1652 means the real measured output Watt is 1652W)

If this calibration is successful, communicating dialog (log information) will pop out "ATE19"

Appendix A.

If those values difference between displayed on LCD and measured by external instruments are out of adjusting limitation, it has to use SATEXX<n> command several times for calibration to make values are the same between displayed on LCD and measured by external instruments.

For example:

A. Calibrate inverter voltage

Real measured inverter voltage is 237Vac and this 7Vac different is out of the maximum precision 6.4V therefore it is suggested firstly sending SATE072340 to UPS. <n> 2340 is a midst values between 230 and 237. After firstly calibrated inverter output AC voltage, values displayed on LCD will be rewritten and then measure real values again by external instruments for next calibration until values are the same between displayed on LCD and measured by external instruments.

Computer: SATE072340 // the first calibration

UPS: ATE07

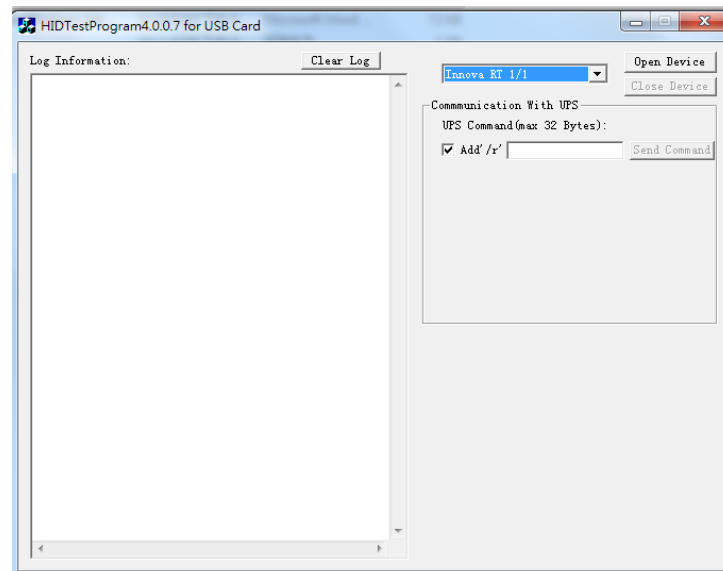
Computer: SATE07<n> // "the real values measured by external instruments after first calibration" // second calibration or so on

Appendix B. SOP for Charger Voltage Calibration

As a result of the method for charger voltage calibration is requesting additional procedure for operating and this information is providing information for qualified engineer who has capability for service this UPS through USB port to calibrate parameters on UPS after replacing PCB boards such as power board (PSDR), control board (CNTL). Charger board...etc.

Steps/Procedures:

- a. Connect PC or lap-top with UPS by using USB cable.
- b. Turn UPS on in normal inverter mode with mains present.
- c. Execute this USB HID testing tool and select 'Innova RT 1/1' and then click "Open Device" button.



- d. Send command **SAHD011** to let UPS force in charging mode. Communicating dialog (log information) will pop out "AHD01".
- e. Disconnect all batteries from UPS (including internal and external battery).
- f. Measure the charger voltage from the battery terminal by a multi-meters.
For 1000VA UPS, stop calibration if the actual measured value is between 42.48V and 42.84V,
For 2000VA UPS, stop calibration if the actual measured value is between 56.64V and 57.12V,
For 3000VA UPS, stop calibration if the actual measured value is between 84.96V and 85.68V,
- g. If the actual measured value is out of the above range. Follow the next operation,
✧ Send command **SCHGR-<n>** if the actual measured value is higher than acceptable ranges.

- ✧ Send command **SCHGR+<n>** if the actual measured value is lower than acceptable ranges.

Command:

Computer: SCHGR+/-<n>

UPS:ACK

<n> is a number between 0-9 and 1 unit means 0.1V, if this calibration is out of range, UPS will return "NAK".

- h. Command **SCHGR+/-<n>** could be sent repeatedly until the actual measured value is in acceptable ranges

For examples:

Ex1. RT 1000VA UPS, if the actual measured value by multi-meters is 43V, Engineer can use command "SCHGR-2", then the actual measured value becomes 42.8V, stop calibration and go next step i.

Ex2. If the actual measured value is 41.5V after sending command "SCHGR-2", engineer must send command "SCHGR+<n>" again such as "SCHGR+9" and so on until the actual measured value is in acceptable ranges (42.48V ~ 42.84V), go next step i.

- i. Send command **SAHD010** to let UPS quit charging mode, UPS reply AHD01.
- j. Connect all batteries back with UPS and recover UPS.
- k. Send command **SCE** for saving calibrated parameters in EEPROM while UPS is under standby or bypass mode and communicating dialog (log information) will pop out "ACK". UPS reply ACK meaning calibrated parameters saved successfully.
- l. Finish.

Appendix C. Commands for change EPO POLARITY

COMMAND

Set EPO polarity is normally close

Computer: SASB190

UPS: SASB19

Set EPO polarity is normally open

Computer: SASB191

UPS: SASB19

Get EPO polarity

Computer: SASB19?

UPS: GASB190 or GASB191