

**UPS Standard Protocol**  
**Systems Enhancement Corporation**

**1. Introduction**

This document specifies a standard protocol for UPS manufacturers to use in the design and implementation of a UPS serial interface.

**2. Definition of available UPS parameters**

Note: **Length** is defined as the number of bytes that may be sent from the UPS to the host. The UPS may send less than the maximum number of bytes. **Length** will apply only to variables of the type **string**. **Range** is defined as the minimum and maximum integer values which may be sent from the UPS to the host. The integer values may be zero padded, but this is not required. **Range** will apply only to variables of the type **integer**. In some instances, only a defined set of integer values will be accepted by the host. This set will be specified in the description field.

**2.1 Identification Group**

Parameter Name	Type	Length	Description
Manufacturer	string	0 to 32	Name of the UPS manufacturer.
Model	string	0 to 64	UPS Model designation.
Software Version	string	0 to 32	UPS firmware/software version.
Identification	string	0 to 64	String identifying the UPS.

**2.2 Battery Group**

Parameter Name	Type	Range	Description
Battery Condition	integer	0 to 2	0 = Good 1 = Weak 2 = Replace
Battery Status	integer	0 to 2	0 = Battery OK 1 = Battery Low 2 = Battery Depleted
Battery Charge	integer	0 to 3	0 = Floating 1 = Charging 2 = Resting 3 = Discharging
Seconds on Battery	integer	0 to 99999	Seconds since UPS switched to battery.
Estimated Minutes	integer	0 to 999	Estimated time to battery charge depletion.
Estimated Charge	integer	0 to 999	Estimate of percent battery charge remaining.
Battery Voltage	integer	0 to 9999	Battery voltage in 0.1 volts DC.
Battery Current	integer	0 to 9999	Battery current in 0.1 amps DC.
Battery Temperature	integer	0 to 99	Battery temperature in degrees Celsius.

**2.3 Input Group**

Parameter Name	Type	Range	Description
Input Line Bads	integer	0 to 999	Number of out of tolerance conditions.
Input Num Lines	integer	0 to 9	Number of input lines used in this device.
Input Frequency 1	integer	0 to 999	Present input frequency in 0.1 Hz.
Input Voltage 1	integer	0 to 9999	Present input voltage in 0.1 volts.
Input Current 1	integer	0 to 9999	Present input current in 0.1 RMS Amps.
Input Power 1	integer	0 to 99999	Present input true power in Watts.
Input Frequency 2	integer	0 to 999	Present input frequency in 0.1 Hz.
Input Voltage 2	integer	0 to 9999	Present input voltage in 0.1 volts.
Input Current 2	integer	0 to 9999	Present input current in 0.1 RMS Amps.
Input Power 2	integer	0 to 99999	Present input true power in Watts.
Input Frequency 3	integer	0 to 999	Present input frequency in 0.1 Hz.
Input Voltage 3	integer	0 to 9999	Present input voltage in 0.1 volts.
Input Current 3	integer	0 to 9999	Present input current in 0.1 RMS Amps.
Input Power 3	integer	0 to 99999	Present input true power in Watts.

## 2.4 Output Group

Parameter Name	Type	Range	Description
Output Source	integer	0 to 5	Present source of output power 0 = Normal      1 = On Battery 2 = On Bypass    3 = Reducing 4 = Boosting     5 = Other
Output Frequency	integer	0 to 999	Present output frequency in 0.1 Hz
Output Num Lines	integer	0 to 9	Number of output lines used in this device.
Output Voltage 1	integer	0 to 9999	Present output voltage in 0.1 volts.
Output Current 1	integer	0 to 9999	Present output current in 0.1 RMS Amps.
Output Power 1	integer	0 to 99999	Present output true power in Watts.
Output Load 1	integer	0 to 999	Percent of UPS power capacity presently used.
Output Voltage 2	integer	0 to 9999	Present output voltage in 0.1 volts.
Output Current 2	integer	0 to 9999	Present output current in 0.1 RMS Amps.
Output Power 2	integer	0 to 99999	Present output true power in Watts.
Output Load 2	integer	0 to 999	Percent of UPS power capacity presently used.
Output Voltage 3	integer	0 to 9999	Present output voltage in 0.1 volts.
Output Current 3	integer	0 to 9999	Present output current in 0.1 RMS Amps.
Output Power 3	integer	0 to 99999	Present output true power in Watts.
Output Load 3	integer	0 to 999	Percent of UPS power capacity presently used.

## 2.5 Bypass Group

Parameter Name	Type	Range	Description
Bypass Frequency	integer	0 to 999	Present bypass frequency in 0.1 Hz.
Bypass Num Lines	integer	0 to 9	Number of bypass lines used in this device.
Bypass Voltage 1	integer	0 to 9999	Present bypass voltage in 0.1 volts.
Bypass Current 1	integer	0 to 9999	Present bypass current in 0.1 RMS Amps.
Bypass Power 1	integer	0 to 99999	Present bypass true power in Watts.
Bypass Voltage 2	integer	0 to 9999	Present bypass voltage in 0.1 volts.
Bypass Current 2	integer	0 to 9999	Present bypass current in 0.1 RMS Amps.
Bypass Power 2	integer	0 to 99999	Present bypass true power in Watts.
Bypass Voltage 3	integer	0 to 9999	Present bypass voltage in 0.1 volts.
Bypass Current 3	integer	0 to 9999	Present bypass current in 0.1 RMS Amps.
Bypass Power 3	integer	0 to 99999	Present bypass true power in Watts.

## 2.6 Alarm Group

Parameter Name	Type	Length	Description
Alarm Temperature	integer	0 or 1	0 = Temperature OK 1 = Over Temperature
Alarm Input Bad	integer	0 or 1	0 = Input OK 1 = Input Fault
Alarm Output Bad	integer	0 or 1	0 = Output OK 1 = Output Fault
Alarm Overload	integer	0 or 1	0 = UPS not Overloaded 1 = UPS Overloaded
Alarm Bypass Bad	integer	0 or 1	0 = Bypass OK 1 = Bypass Fault
Alarm Output Off	integer	0 or 1	0 = Output On 1 = Output Off
Alarm UPS Shutdown	integer	0 or 1	0 = UPS not Shutdown 1 = UPS Shutdown
Alarm Charger Failure	integer	0 or 1	0 = Charger OK 1 = Charger Fault
Alarm System Off	integer	0 or 1	0 = System On 1 = System Off
Alarm Fan Failure	integer	0 or 1	0 = Fan OK 1 = Fan Fault
Alarm Fuse Failure	integer	0 or 1	0 = Fuse OK 1 = Fuse Fault
Alarm General Fault	integer	0 or 1	0 = General system OK 1 = General system Fault
Alarm Awaiting Power	integer	0 or 1	0 = Not Awaiting Power 1 = Awaiting Power
Alarm Shutdown Pending	integer	0 or 1	0 = No shutdown Pending 1 = Shutdown Pending
Alarm Shutdown Imminent	integer	0 or 1	0 = No Shutdown Imminent 1 = Shutdown Imminent

## 2.7 Test Group

Parameter Name	Type	Length/Range	Description
Test Results Summary	integer	0 to 5	0 = No test performed 1 = Test Passed 2 = Test in progress 3 = General Test failed 4 = Battery Test failed 5 = Deep Battery Test failed
Test Results Detail	string	0 to 64	Additional information about the last self test.
Test Type	integer	-1 to 3	-1 = Abort test in progress 0 = No test 1 = General Systems Test 2 = Quick Battery Test 3 = Deep Battery Calibration

## 2.8 Control Group

Parameter Name	Type	Range	Description
Shutdown Type	integer	1 or 2	Shutdown action to be taken: 1 = UPS output only 2 = Entire UPS
Shutdown After Delay	integer	-1 to 9999999	Perform shutdown action defined by Shutdown Type after indicated number seconds. -1 = Cancel shutdown 0 = Shutdown immediately
Startup After Delay	integer	-1 to 9999999	Start output after indicated number of seconds. -1 = Cancel countdown 0 = Start output immediately
Reboot With Duration	integer	0 to 9999999	Perform immediate shutdown action defined by Shutdown Type and wait indicated number of seconds before restarting.
Auto Restart	integer	1 or 2	Flag indicating whether UPS should be automatically restarted after a shutdown. 1 = Automatic Restart 2 = Manual Restart

## 2.9 Configuration Group

Parameter Name	Type	Range/Length	Description
Nominal Input Voltage	integer	0 to 999	Nominal input voltage in Volts.
Nominal Input Frequency	integer	0 to 999	Nominal input frequency in 0.1 Hz.
Nominal Output Voltage	integer	0 to 999	Nominal output voltage in Volts.
Nominal Output Frequency	integer	0 to 999	Nominal output frequency in 0.1 Hz.
Nominal Volt-Amp Rating	integer	0 to 99999	Nominal Volt-Amp rating.
Nominal Output Power	integer	0 to 99999	Nominal true power rating in Watts.
Nominal Low Battery Time	integer	0 to 99	Number of estimated minutes remaining at which a low battery condition is declared.
Audible Alarm	integer	1 to 4	State of the audible alarm: 1 = Disabled 2 = Enabled 3 = Muted 4 = Disabled Until Low Battery Warning
Low Voltage Transfer Point	integer	0 to 999	Minimum input line voltage in Volts before UPS transfers to battery backup.
High Voltage Transfer Point	integer	0 to 999	Maximum input line voltage in Volts before UPS transfers to battery backup.
Battery Installed Date	string	8	The date that the battery was installed in the UPS (format mmdyyy).
Nominal Battery Life	integer	0 to 99999	The length of nominal useful battery life in days.

## 2.10 Baud Rate

Parameter Name	Type	Range	Description
UPS Baud Rate	integer	See Description	Baud rate of the UPS. Valid values are 1200, 2400, 4800, 9600, and 19200.

## 2.11 ID Number Assignments

ID #	Parameter	Command	Group
1	Alarm Awaiting Power	ST5	Alarm
2	Alarm Bypass Bad	ST5	Alarm
3	Alarm Charger Failure	ST5	Alarm
4	Alarm Fan Failure	ST5	Alarm
5	Alarm Fuse Failure	ST5	Alarm
6	Alarm General Fault	ST5	Alarm
7	Alarm Input Bad	ST5	Alarm
8	Alarm Output Bad	ST5	Alarm
9	Alarm Output Off	ST5	Alarm
10	Alarm Overload	ST5	Alarm
11	Alarm Shutdown Imminent	ST5	Alarm
12	Alarm Shutdown Pending	ST5	Alarm
13	Alarm System Off	ST5	Alarm
14	Alarm Temperature	ST5	Alarm
15	Alarm UPS Shutdown	ST5	Alarm
16	Audible Alarm	NOM	Configuration
17	Auto Restart	ATR	Control
18	Battery Charge	ST1	Battery
19	Battery Condition	ST1	Battery
20	Battery Current	ST1	Battery
21	Battery Installed Date	NOM	Configuration
22	Battery Status	ST1	Battery
23	Battery Temperature	ST1	Battery
24	Battery Voltage	ST1	Battery
25	Bypass Current 1	ST4	Bypass
26	Bypass Current 2	ST4	Bypass
27	Bypass Current 3	ST4	Bypass
28	Bypass Frequency	ST4	Bypass
29	Bypass Num Lines	ST4	Bypass
30	Bypass Power 1	ST4	Bypass
31	Bypass Power 2	ST4	Bypass
32	Bypass Power 3	ST4	Bypass
33	Bypass Voltage 1	ST4	Bypass
34	Bypass Voltage 2	ST4	Bypass
35	Bypass Voltage 3	ST4	Bypass
36	Estimated Charge	ST1	Battery
37	Estimated Minutes	ST1	Battery
38	High Voltage Transfer Point	NOM	Configuration
39	Identification	UID	Identification
40	Input Current 1	ST2	Input
41	Input Current 2	ST2	Input
42	Input Current 3	ST2	Input
43	Input Frequency 1	ST2	Input
44	Input Frequency 2	ST2	Input
45	Input Frequency 3	ST2	Input
46	Input Line Bads	ST2	Input
47	Input Num Lines	ST2	Input
48	Input Power 1	ST2	Input
49	Input Power 2	ST2	Input
50	Input Power 3	ST2	Input
51	Input Voltage 1	ST2	Input
52	Input Voltage 2	ST2	Input
53	Input Voltage 3	ST2	Input
54	Low Voltage Transfer Point	NOM	Configuration
55	Manufacturer	MAN	Identification
56	Model	MOD	Identification
57	Nominal Battery Life	NOM	Configuration

ID #	Parameter	Command	Group
58	Nominal Input Frequency	NOM	Configuration
59	Nominal Input Voltage	NOM	Configuration
60	Nominal Low Battery Time	NOM	Configuration
61	Nominal Output Frequency	NOM	Configuration
62	Nominal Output Power	NOM	Configuration
63	Nominal Output Voltage	NOM	Configuration
64	Nominal Volt-Amp Rating	NOM	Configuration
65	Output Current 1	ST3	Output
66	Output Current 2	ST3	Output
67	Output Current 3	ST3	Output
68	Output Frequency	ST3	Output
69	Output Load 1	ST3	Output
70	Output Load 2	ST3	Output
71	Output Load 3	ST3	Output
72	Output Num Lines	ST3	Output
73	Output Power 1	ST3	Output
74	Output Power 2	ST3	Output
75	Output Power 3	ST3	Output
76	Output Source	ST3	Output
77	Output Voltage 1	ST3	Output
78	Output Voltage 2	ST3	Output
79	Output Voltage 3	ST3	Output
80	Reboot With Duration	RWD	Control
81	Seconds on Battery	ST1	Battery
82	Shutdown Type	SDA	Control
83	Shutdown After Delay	PSD	Control
84	Software Version	VER	Identification
85	Startup After Delay	STD	Control
86	Test Results Detail	STR	Test
87	Test Results Summary	STR	Test
88	Test Type	TST	Test
89	UPS Baud Rate	UBR	Configuration

### 3. Communications

#### 3.1 Operating Parameters

Baud Rate - 2400 (default - can be modified with the UBR command)  
 Data Bits - 8  
 Stop Bits - 1  
 Parity - None

#### 3.2 Message Format

Header (1 byte)	Message Type (1 byte)	Data Length (3 bytes)	Data (128 bytes max)
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##### 3.2.1 Header

The message header is a single byte of data. The header will be a ^ (carat) character.

##### 3.2.2 Message Type

The message type is a single byte of data. The type will be one of the following:

- 0 - Command rejected (from UPS to attached system)
- 1 - Command accepted (from UPS to attached system)
- P - Poll command (from attached system to UPS)
- S - Set command (from attached system to UPS)
- \* - Unsolicited data (from UPS to attached system)
- D - Data returned (from UPS to attached system)

### 3.2.3 Data Length

The data length is the number of bytes of data passed.

### 3.2.4 Data

All data will be comma delimited. The variables should comply with the order specified in 3.3.1 and 3.3.4. If a variable value is not currently available, a comma with no data should be placed in the variable location. It is not necessary to provide commas beyond the last data value. For example, the ST1 command (Battery group) can return up to 9 data values. If only the 2nd, 4th, and 6th variables have valid data, the UPS response will have the following format :

^D010,1,,22,,82

Note that it is not necessary to provide the final 3 commas since there is no valid data for the final 3 variables.

## 3.3 Messages from the attached system to the UPS

### 3.3.1 Poll Commands

Command	Description	Max Data Length (bytes)	Parameters Returned
AP1	Available Parameters 1	128	Comma delimited parameter ID numbers indicating which parameters are available from the UPS. (ID #'s 1-46)
AP2	Available Parameters 2	128	Comma delimited parameter ID numbers indicating which parameters are available from the UPS. (ID #'s 47-89)
ATR	Auto Reboot	1	Auto reboot parameter
MAN	UPS Manufacturer	32	Manufacturer
MOD	UPS Model	64	UPS model
NOM	UPS Nominal Values	55	Nominal Input Voltage, Nominal Input Frequency, Nominal Output Voltage, Nominal Output Frequency, Nominal VA Rating, Nominal Output Power, Low Battery Time, Audible Alarm, Low Voltage Transfer Point, High Voltage Transfer Point, Battery Installed Date, Nominal Battery Life
SDA	Shutdown Action	1	Shutdown Type
ST1	Status group 1 (Battery)	32	Battery Condition, Battery Status, Battery Charge, Seconds on Battery, Estimated Minutes, Estimated Charge, Battery Voltage, Battery Current, Battery Temperature
ST2	Status group 2 (Input)	65	Input Line Bads, Input Num Lines, Input Frequency 1, Input Voltage 1, Input Current 1, Input Power 1, Input Frequency 2, Input Voltage 2, Input Current 2, Input Power 2, Input Frequency 3, Input Voltage 3, Input Current 3, Input Power 3
ST3	Status group 3 (Output)	66	Output Source, Output Frequency, Output Num Lines, Output Voltage 1, Output Current 1, Output Power 1, Output Load 1, Output Voltage 2, Output Current 2, Output Power 2, Output Load 2, Output Voltage 3, Output Current 3, Output Power 3, Output Load 3
ST4	Status group 4 (Bypass)	53	Bypass Frequency, Bypass Num Lines, Bypass Voltage 1, Bypass Current 1, Bypass Power 1, Bypass Voltage 2, Bypass Current 2, Bypass Power 2, Bypass Voltage 3, Bypass Current 3, Bypass Power 3
ST5	Status group 5 (Alarm)	29	Alarm Temperature, Alarm Input Bad, Alarm Output Bad, Alarm Overload, Alarm Bypass Bad, Alarm Output Off, Alarm UPS Shutdown, Alarm Charger Failure, Alarm System Off, Alarm Fan Failure, Alarm Fuse Failure, Alarm General Fault, Alarm Awaiting Power, Alarm Shutdown Pending, Alarm Shutdown Imminent
STR	Self Test Results	66	Self Test Result Summary, Self Test Result Details

UBR	UPS Baud Rate	5	UPS Baud Rate
UID	UPS Identification	64	UPS identification
VER	UPS Version	32	UPS firmware and/or software version

### 3.3.1.1 Available Parameters

The **AP1** command will return a string of data which specifies which of the parameters (1-46) are available from the UPS. The data will be a list of supported ID numbers separated by commas. If a parameter is supported, that ID number is included in this list. If the parameter is not supported, that ID number will not be returned.

The **AP2** command is identical to the AP1 command except that it specifies which of the parameters (47-89) are available from the UPS.

### 3.3.1.2 UPS Identification

The **ATR** poll command will return 1 byte of data which provides the Auto Reboot value stored in the UPS.

Parameter Name	Max Length	Units
Auto Reboot	1	integer

The **MAN** command will return up to 32 bytes of data which provide the UPS Manufacturer value stored in the UPS.

Parameter Name	Max Length	Units
Manufacturer	32	string

The **MOD** command will return up to 64 bytes of data which provide the UPS Model Number value stored in the UPS.

Parameter Name	Max Length	Units
Model	64	string

The **SDA** poll command will return 1 byte of data which provides the Shutdown Type value stored in the UPS.

Parameter Name	Max Length	Units
Shutdown Type	1	integer

The **UID** command will return up to 64 bytes of data which provide the UPS Identification string value stored in the UPS.

Parameter Name	Max Length	Units
UPS Identification	64	string

The **VER** command will return up to 32 bytes of data which provide the UPS Software/Hardware version value(s) stored in the UPS.

Parameter Name	Max Length	Units
Software Version	32	string

The **NOM** command will return up to 55 bytes of data (including commas) which provide the UPS Nominal values stored in the UPS. All values are comma delimited.

Parameter Name	Max Length	Units
Nominal Input Voltage	3	volts
Nominal Input Frequency	3	0.1 Hz
Nominal Output Voltage	3	volts

Parameter Name	Max Length	Units
Nominal Output Frequency	3	0.1 Hz
Nominal VA Rating	5	volt-amps
Nominal Output Power	5	watts
Low Battery Time	2	minutes
Audible Alarm	1	1 = disabled 2 = enabled 3 = muted 4 = disabled until low battery
Low Voltage Transfer Point	3	volts
High Voltage Transfer Point	3	volts
Battery Installed Date	8	mmddyyyy
Nominal Battery Life	5	days

### 3.3.1.3 UPS Status

The **ST1** command will return up to 32 bytes of data (including commas) which provide dynamic information about the status of the UPS. All values are comma delimited.

Parameter Name	Max Length	Units
Battery Condition	1	0 = Good 1 = Weak 2 = Replace
Battery Status	1	0 = Battery OK 1 = Battery Low 2 = Battery Depleted
Battery Charge	1	0 = Floating 1 = Charging 2 = Resting 3 = Discharging
Seconds On Battery	5	seconds
Estimated Minutes	3	minutes
Estimated Charge	3	percent
Battery Voltage	4	0.1 volts
Battery Current	4	0.1 amps
Battery Temperature	2	degrees

The **ST2** command will return up to 65 bytes of data (including commas) which provide dynamic information about the status of the UPS. All values are comma delimited.

Parameter Name	Max Length	Units
Input Line Bads	3	integer
Input Num Lines	1	integer (1-3)
Input Frequency 1	3	0.1 Hz
Input Voltage 1	4	0.1 volts
Input Current 1	4	0.1 amps
Input Power 1	5	watts
Input Frequency 2	3	0.1 Hz
Input Voltage 2	4	0.1 volts
Input Current 2	4	0.1 amps
Input Power 2	5	watts
Input Frequency 3	3	0.1 Hz
Input Voltage 3	4	0.1 volts
Input Current 3	4	0.1 amps
Input Power 3	5	watts



The **ST3** command will return up to 66 bytes of data (including commas) which provide dynamic information about the status of the UPS. All values are comma delimited.

Parameter Name	Max Length	Units
Output Source	1	0 = Normal    1 = On Battery 2 = On Bypass    3 = Reducing 4 = Boosting    5 = Other
Output Frequency	3	0.1 Hz
Output Num Lines	1	integer (1-3)
Output Voltage 1	4	0.1 volts
Output Current 1	4	0.1 amps
Output Power 1	5	watts
Output Load 1	3	percent
Output Voltage 2	4	0.1 volts
Output Current 2	4	0.1 amps
Output Power 2	5	watts
Output Load 2	3	percent
Output Voltage 3	4	0.1 volts
Output Current 3	4	0.1 amps
Output Power 3	5	watts
Output Load 3	3	percent

The **ST4** command will return up to 53 bytes of data (including commas) which provide dynamic information about the status of the UPS. All values are comma delimited.

Parameter Name	Max Length	Units
Bypass Frequency	3	0.1 Hz
Bypass Num Lines	1	integer (1-3)
Bypass Voltage 1	4	0.1 volts
Bypass Current 1	4	0.1 amps
Bypass Power 1	5	watts
Bypass Voltage 2	4	0.1 volts
Bypass Current 2	4	0.1 amps
Bypass Power 2	5	watts
Bypass Voltage 3	4	0.1 volts
Bypass Current 3	4	0.1 amps
Bypass Power 3	5	watts

The **ST5** command will return up to 29 bytes of data (including commas) which provide dynamic information about the status of the UPS. All values are comma delimited.

Parameter Name	Max Length	Units
Alarm Temperature	1	0 = No Alarm Active, 1 = Alarm Active
Alarm Input Bad	1	0 = No Alarm Active, 1 = Alarm Active
Alarm Output Bad	1	0 = No Alarm Active, 1 = Alarm Active
Alarm Overload	1	0 = No Alarm Active, 1 = Alarm Active
Alarm Bypass Bad	1	0 = No Alarm Active, 1 = Alarm Active
Alarm Output Off	1	0 = No Alarm Active, 1 = Alarm Active
Alarm UPS Shutdown	1	0 = No Alarm Active, 1 = Alarm Active
Alarm Charger Failure	1	0 = No Alarm Active, 1 = Alarm Active
Alarm System Off	1	0 = No Alarm Active, 1 = Alarm Active
Alarm Fan Failure	1	0 = No Alarm Active, 1 = Alarm Active
Alarm Fuse Failure	1	0 = No Alarm Active, 1 = Alarm Active
Alarm General Fault	1	0 = No Alarm Active, 1 = Alarm Active
Alarm Awaiting Power	1	0 = No Alarm Active, 1 = Alarm Active
Alarm Shutdown Pending	1	0 = No Alarm Active, 1 = Alarm Active
Alarm Shutdown Imminent	1	0 = No Alarm Active, 1 = Alarm Active

The **STR** command will return up to 66 bytes of data (including commas) which provide the detailed result of the most recent UPS self test performed. All values are comma delimited.

Parameter Name	Max Length	Units
Test Results Summary	1	0 = No test performed    1 = Test passed 2 = Test in progress    3 = General test failed 4 = Battery test failed    5 = Deep test failed
Test Results Detail	64	string

The **UBR** command will return up to 5 bytes of data showing the UPS baud rate.

Parameter Name	Max Length	Units
UPS Baud Rate	5	1200, 2400, 4800, 9600, 19200

### 3.3.4 Set Commands

Command	Description	Max Length	Data	Parameter Set
ATR	If ON, UPS system will restart after a shutdown. If OFF, UPS must be restarted manually.	1	1 = ON (auto) 2 = OFF (manual)	Auto Reboot
NOM	Sets configuration group values.	55	Configuration group parameters (comma delimited)	Nominal Input Voltage, Nominal Input Frequency, Nominal Output Voltage, Nominal Output Frequency, Nominal volt-amp rating, Nominal Output Power, Nominal Low Battery Time, Audible alarm state, Low Volt Transfer Point, High Volt Transfer Point, Battery Installed Date, Nominal Battery Life
PSD	Performs shutdown action defined by <i>Shutdown Type</i> after the indicated number of seconds.	7	-1 = Abort 0 = Immediate >0 = seconds until shutdown	Shutdown After Delay
RWD	Immediately performs shutdown action defined by <i>Shutdown Type</i> , then restarts after indicated number of seconds.	7	Seconds	Reboot With Duration
SDA	Defines action to be taken at UPS shutdown.	1	1 = UPS output 2 = UPS system	Shutdown Type
STD	Starts UPS output after indicated number of seconds.	7	-1 = Abort 0 = Immediate >0 = seconds until startup	Startup After Delay
TST	Test	2	-1 = Abort Test 0 = No effect 1 = General Test 2 = Battery Test 3 = Deep Test	Test Type
UBR	Sets UPS baud rate	5	1200, 2400, 4800, 9600, 19200	UPS baud rate
UID	Sets UPS ID string.	64	ID string	Identification

### 3.4 Communication examples

Following are examples of commands that may be sent to a UPS, and responses to those commands from the UPS.

#### 3.4.1 Poll commands examples

**Host requests the Available parameters (part 1):**

^P003AP1

^ - Header character  
P - Record type (poll request)  
003 - Number of data bytes to follow  
AP1 - Request for Available parameters (part 1)

**UPS responds:**

^D0196,10,21,22,23,36,37

^ - Header character  
D - Record type (Data returned in response to poll)  
019 - number of data bytes to follow  
6 - Alarm General fault supported  
10 - Alarm overload supported  
21 - Battery installed date supported  
22 - Battery status supported  
23 - Battery Temperature supported  
36 - Estimated charge supported  
37 - Estimated minutes supported

**Host requests the UPS Manufacturer:**

^P003MAN

**UPS responds:**

^0

^ - Header character  
0 - Record type (command rejected/not supported)

**Host requests the UPS Model:**

^P003MOD

**UPS responds:**

^D010Model 9999

010 - Number of data bytes to follow  
Model 9999 - Model number

**Host requests the Nominal parameters:**

^P003NOM

**UPS responds:**

^D025,,,,,900,,,,,,04171995,750

025 - Number of data bytes to follow  
900 - Nominal Volt/amp rating  
04171995 - Battery installed date  
750 - Nominal Battery Life

**Host requests the Status parameters (part 1 - Battery):**

^P003ST1

**UPS responds:**

^D015,0,,,10,90,,,35

015 - Number of data bytes to follow  
0 - Battery status normal  
10 - Estimated minutes  
90 - Estimated charge  
35 - Battery temperature

**Host requests the Status parameters (part 2 - Input):**

^P003ST2

**UPS responds:**

^D007,,,1180

007 - Number of data bytes to follow  
1180 - Input voltage 1 (118.0 volts)

Note: Since no other parameters after Input Voltage 1 are returned,  
it is not necessary to provide the comma delimiters.

**Host requests the Status parameters (part 3 - Output):**

^P003ST3

**UPS responds:**

^D004,,,1200

007 - Number of data bytes to follow  
1200 - Output voltage 1 (120.0 volts)

**Host requests the Status parameters (part 5 - Alarms):**

^P003ST5

**UPS responds:**

^D013,,,1,,,,,,0

013 - Number of data bytes to follow  
1 - Alarm overload (true)  
0 - Alarm general fault (false)

**Host requests the UPS Self test results:**

^P003STR

**UPS responds:**

^D0011

^ - Header character  
D - Record type (Data returned in response to poll)  
001 - Number of data bytes to follow  
1 - Self test passed

### 3.4.2 SET Commands Examples

**Host attempts to set the UPS Identification string:**

^S008UIDA UPS

^ - Header character  
S - Record type (set request)  
008 - Number of data bytes to follow  
UID - Request to set UPS Identification string  
A UPS - UPS Identification string

**Host attempts to set the UPS Baud rate:**

^S007UBR9600

**Host attempts to set the perform test variable:**

^S004TST1

**Host attempts to set the Shutdown action:**

^S004SDA1

**Host attempts to set the Perform Shutdown:**

^S006PSD120

**Host attempts to set the Nominal values :**

^S015NOM120,60,,,600

015 - Number of data bytes to follow  
NOM - Request to set nominal values  
120 - Nominal Input Voltage  
60 - Nominal Input Frequency  
600 - Nominal VA Rating

## Revision History

Revision	Date	Comments
1.0	10/15/94	Initial draft.
1.1	11/01/94	Downsized packet sizes.
1.2	12/01/94	Increased packet sizes.
1.3	01/14/95	Added RWD command. Added ID# assignment table.
1.4	01/25/95	Split ST command into ST1, ST2, ST3, ST4. Split AP command into AP1, AP2. Replaced ID command with MAN, MOD, VER, UID, NOM. Removed checksum from packets. Increased the command length to 3 characters. Modified data lengths so all packets are <= 64 bytes. Added STR command to retrieve self test result details. Split 'bitwise' integers into separate integer fields.
1.5	02/01/95	Modified ST1 description in sections 3.3.1 and 3.3.1.3. Split out Battery Status integer to multiple status integers to match sections 2.2 and 3.3.1. Modified ST4 description in sections 3.3.1 and 3.3.1.3. Moved the Test Results Summary from the ST4 response into the STR response. Modified the STR description in section 3.3.1.3. Split ST4 command into ST4 and ST5. Changed temperature scale from centigrade to Celsius. Corrected spelling errors in Rev 1.4. Changed 'Header' Character to ^ character. Changed 'NAK' to 0 for NAK 1 for ACK. Modified Nominal Output Power to length of 5. Modified Input Power 1,2,3 to length of 5. Modified Output Power 1,2,3 to length of 5.
2.0	04/17/95	Modified ST1 command to make battery status 1 byte. Added example communication loops between host and UPS. Modified TST to accept 9 as the abort test in progress. Modified Input power fields to be a maximum of 5 digits. Modified Input current fields to be a maximum of 4 digits. Added Battery Installed date - 8 characters (MMDDYYYY). Added Nominal Battery Life - 5 characters (in days).
2.1	04/20/95	Modified Bypass power data lengths to 5 bytes maximum. Increased all voltage data to 4 bytes maximum (Voltage values will now represent voltages in .1 volts). Added poll commands: UBR - UPS Baud Rate                   TST - Test type SDA - Shutdown Action                PSD - Perform Shutdown SDT - Shutoff delay time           STD - Startup Delay RWD - Reboot with delay            ATR - Auto Reboot
2.2	05/10/95	Corrected data lengths of the set commands TST, PSD and STD. (Section 3.3.4). Replaced Abort Test in Progress, Deep Battery Calibration, General Systems Test and Quick Battery test with Test Type. Made the lengths of Nominal Input Frequency and Nominal Output Frequency consistently 3 digits throughout the protocol. Made the length of Nominal Output Power consistently 5 digits throughout the protocol. Replaced the INV, INF, ONV, ONF, NVA, NOP, LBT, AAS, LVT, HVT, BID and NBF set commands with the NOM set command.
2.3	06/05/95	Minor clean-up changes. Changed data length to 3 bytes. Removed PSD, RWD, STD, and TST poll commands.
2.4	06/09/95	Changed Shutdown UPS parameter to Shutdown After Delay. Moved UPS Baud Rate from the Configuration group. Modified description of Auto Restart. Removed Shutoff Delay Time parameter and SDT command. Modified parameter return order for ST1 and NOM. Increased range of Bypass Currents to 9999. Changed Power units from 0.1 watts to watts. Modified PSD command.
2.5	06/13/95	Minor clean-up changes
2.6	06/22/95	Added 3.2.4 to explain comma-delimited data. Modified maximum data size in 3.2. Added Discharging (3) to 2.2 and 3.3.1.3. Added Disabled Until Low Battery (4) to Audible Alarm in 3.3.1.2. Added NOM example to 3.4.2.