



# ***SPS.ONE 900 RS*** **Communication Protocol**



Overview

Comm protocol used for serial communications SPS.ONE 900 RS UPS RS232C

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## Document Management.

### Document History.

Date	Ver.	Author	Description
13/09//2021	1.0	Rafa fieira	First release



# 1 Document Description

## 1.1 Goals

This document specifies the RS232C communications protocol used in Salicru ONE RS UPS.

## 1.2 Organization

The protocol provides the following features:

1. Monitor charger status.
2. Monitor battery status and condition.
3. Monitor the utility status.
4. Provide the power switch function for computer to turn on and off the utility on schedule for power saving.

Computer will control information exchange by a query followed by <cr>. UPS will respond with information followed by a <cr> or action.



## 2 Hardware

BAUD RATE..... : 2400 bps  
DATA LENGTH..... : 8 bits  
STOP BIT..... : 1 bit  
PARITY..... : NONE

### CABLING:

COMPUTER	UPS
=====	
RX <-----	TX (pin 2)
TX ----->	RX (pin 3)
GND <----->	GND (pin 5)

(9 pins female D-type connector)



### 3 Inquiry Command

#### 3.1 Q1<cr>: UPS Status parameters Inquiry

Computer: **Q1<cr>**

UPS: UPS status data stream, such as

(MMM.M NNN.N PPP.P QQQ RR.R S.SS TT.T b7b6b5b4b3b2b1b0<cr>

UPS status data stream: There should be a space character between every field for data separation.

Item	Data	description	Unit
a	(	Start code	
b	MMM.M	Input voltage	V rms
c	NNN.N	Input fault voltage	V rms
d	PPP.P	Output voltage	V rms
e	QQQ	Output load	Percentage (%)
f	RR.R	Output frequency	Hz
g	SS.S or S.SS	Battery voltage	V rms
h	TT.T	Internal temperature	Degree-C
i	U	UPS status	(8 bits)

The meaning of each field is list as followed:

a. Start byte: (

b. I/P voltage: MMM.M

(M is an integer number ranging from 0 to 9. The unit is Volt)



c. I/P fault voltage: NNN.N

(N is an integer number ranging from 0 to 9. The unit is Volt)

d. O/P voltage: PPP.P

(P is an integer number ranging from 0 to 9. The unit is Volt)

e. O/P current: QQQ

(QQQ is a percentage of maximum current, not an absolute value)

f. O/P frequency: RR.R

(R is an integer number ranging from 0 to 9. The unit is Hz)

g. Battery voltage: SS.S or S.SS

(S is an integer number ranging from 0 to 9. For on-line units battery voltage/cell is provided in the form S.SS. For standby units actual battery voltage is provided in the form SS.S. UPS type in UPS status will determine which reading was obtained).

h. Temperature: TT.T

(T is an integer number ranging form 0 to 9. The unit is degree celsius)

i. UPS Status: <U>

<U> is one byte of binary information such as <b7b6b5b4b3b2b1b0>. Where bn is a ASCII character '0' or '1'.



UPS status:

Bit	Description
7	1: Utility Fail (Immediate)
6	1: Battery Low
5	1: AVR 0: NORMAL
4	1: UPS Failed
3	1: UPS Type is Line-Interactive (0 is Online)
2	1: Test in Progress
1	1: Shutdown Active
0	1: Beeper On

j. Stop Byte: <cr>

Example: Computer: Q1<cr>

UPS: (208.4 140.0 208.4 034 59.9 2.05 35.0 00110000<cr>

Means: I/P voltage is 208.4V.

I/P fault voltage is 140.0V.

O/P voltage is 208.4V

O/P current is 34 %.

I/P frequency is 59.9 HZ.

Battery voltage is 2.05V.

Temperature is 35.0 degrees of centigrade.

UPS type is on-line, UPS failed. AVR active, and shutdown not active.



## 4 Control Command

### 4.1 T<cr>: 10 second's test.

Computer: T<cr>

UPS: None response.

Means: Test for 10 seconds and then return to utility.

- (1) If battery low occurs during testing, UPS will return to utility immediately.
- (2) Only when UPS is in line mode, and the battery voltage is not less than 13V/pcs, the command is executed

### 4.2 S<n>R<m><cr>: Shutdown and restore

Computer: S<n>R<m><cr>

UPS: None response

Means: Cut UPS output off in <n> minutes and waiting for <m> minutes and then turn on UPS output again.

The shut down sequence is the same as the previous command. When the <m> minutes expired, the utility do not restore, the UPS will wait until utility restore.

If UPS is in waiting shutdown status, the "C" command can let the shut down command cancelled.

If UPS is in restore waiting status, the "C" command can let the UPS output turned on, but UPS must be hold off at least 10 seconds. (if utility is present)

<n> is a number ranging from .2, .3, ..., 01, 02, ..., to 99.

<m> is a number ranging from 0000 to 9999. If it is 0000, there will be no restore, and if control power could be shut off, then turn off it immediately.

### 4.3 C<cr>: Cancel shutdown

Computer: C<cr>

UPS: None

Function: Cancel the S<n>R<m><cr> command.



Note:

UPS only accepts this command when the SnRm command has not been complete.

If UPS is in shut down waiting state, the shut down command is cancelled.

If UPS is in restore waiting state, the UPS output is turned on, but UPS must be hold off at least 10 seconds (if utility is present).

#### 4.4 Q<cr>: Turn On/Off beep -- Toggle the UPS beeper

PC sends to UPS: Q<cr>

Response from UPS: None.

Function: Toggle the UPS beep

Note:

When the AC power failed, UPS will generate a warning beep to inform the manager. Manager could toggle the warning beep by sending this command.

#### 4.5 F<cr>: UPS Rating Information

Computer: F<cr>

UPS: #MMM.M QQQ SS.SS RR.R<cr>

This function makes the UPS answer the rating value of UPS. There should be a space character between every field for separation. The UPS's response contains following information field:

- a. Rating Voltage : MMM.M
- b. Rating Current : QQQ
- c. Battery Voltage : SS.SS or SSS.S
- d. Frequency : RR.R



## 5 Command Summary

ITEM	COMMAND	DESCRIPTION
1	Q1	Status Inquiry
2	T	10 Seconds inverter battery tes
3	S<n>R<m>	Remote Shut Down and Restore Command
4	C	Cancel Remote Shut Down Command
5	Q	Turn On/Off beep (buzzer silence command)
6	F	UPS Rating Information

## 6 Invalid Command/Information Handling

If the UPS receives any command that it could not handle, the UPS should echo the received command back to the computer. The host should check if the command sends to UPS been echo or not.

