

# Communication Protocol 0005

Ali Rizavi

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## I. Controls:

Command	Response	Function	Data Format	Change
:A#<	A<	Activate Self-Test		
:C#<	C<	Cancel Inverter Shutdown		
:G#<	G<	Shutdown Inverter after Pre-Delay		
:Hhhh#<	H<	Shutdown after Pre-Delay & Wakeup After Delay	hhh = 2 <sup>24</sup> seconds (binary)	
:li#<	l<	Initialize Auto-Restart modes	l = bitmap (0/1 = off/on) of auto-restart modes; i <sub>0</sub> - i <sub>4</sub> = Shutdown, Delayed Wakeup, Voltage Cutoff, Overload, Overtemp	Low
:Krs#<	K<	Control Relays after Pre-Delay	r = receptacle number (0 = master); s = status desired (0/1 = off/on) (all ASCII encoded hex)	Note 12
:Nnn#<	N<	Set Pre-Delay Timer	nn = 2 <sup>16</sup> seconds (binary)	Note 7
:Q#<	Q<	Perform 10 sec Reboot		
:Jjj#<	J<	Write Unit ID Number	jj = 2 <sup>16</sup> (binary)	
:Z#<	Z<	Reset Vmin & Vmax register values		

## II. Queries:

Command	Response	Function	Data Format	Change
:D#<	Daadd<	Voltage Data (AC, DC)	aa = 2 <sup>8</sup> as if 120V input; dd = 2 <sup>8</sup> of 10 * voltage as if 12V battery (all ASCII encoded hex)	
:F#<	Fffffr<	Main uC Firmware (P/N, Rev)	(all ASCII characters)	Note 8
:L#<	Llbbzz<	Levels (% Load, % Batt Cap, Batt Curr)	ll = 2 <sup>8</sup> ; bb = 2 <sup>8</sup> ; zz = 2 <sup>8</sup> (all ASCII encoded hex)	
:M#<	Miimm<	Min, Max Vin (read only)	ii = 2 <sup>8</sup> ; mm = 2 <sup>8</sup> (all ASCII encoded hex)	
:P#<	Ppppp<	Power Rating	pppp = VA rating / 10 (all ASCII encoded hex)	
:R#<	Rmr<	Relay Status	m = 0/1 (master off/on); r = (0/1 = off/on) 8 bit receptacle status map. (all binary)	
:S#<	Slcpifw<	Status (low batt, self-test, tap, inverter, fault, load)	l = 0/1 (battery low/OK); c = 0-5 (OK, Batt Fail, In Progress, Overcurrent, Unknown, Batt Fail & Overcurrent); p = 0-3 (Norm, Cut, Boost1, Boost2); i = 0/1 (Inverter off/on); f = 0-3 (No fault, EPO, OTP, Both); w = 0-2 (Normal, Load Warning, Overload) (all ASCII encoded hex)	Note 9

:T#<	Tttfffm<	Temperature, Frequency, Freq. Mode	tt = 2 <sup>8</sup> of ADC count; fff = 2 <sup>12</sup> of 10*frequency; m = 0/1 (50/60Hz) (all ASCII encoded hex)	Note 10
:U#<	Uuu<	Unit ID Number	uu = 2 <sup>16</sup> (binary)	
:V#<	Vaddb<	Model Version (Vac, Vdc, # banks)	a = 0-3 (100V, 120V, 230V, 208V); dd = battery voltage / 6; b = 0-8 (# of switchable load banks) (all ASCII encoded hex)	
:0#<	0ppxxxx<	Communication Protocol ID	pp = 0-2 <sup>16</sup> hex communication protocol ID. This protocol has been assigned ID number 5. xxxx = ASCII XXXX. Note that the zero in :0 is hex 0 not ASCII 0.	Note 13

**III. Notes:**

1. # = two's complement checksum of all characters (except : and <).
2. < = carriage return.
3. All characters (except checksums, the hhh parameter of the :H control, the nn parameter of the :N control; the :R response and the :1 response) are ASCII encoded. If indicated, the decoded ASCII character will be interpreted as a hex value.
4. If a command is in process, new commands will be ignored (no response) until the in process command is finished.
5. The :1 response represents: xx = USB Vendor ID for Tripp Lite, which is 09AE; yy = USB Product ID number, which is 0001; zz = USB BCD Device Release Number, which is 0001.
6. The % Load response to the :L command will be 100% at line rated output current in both Line and Invert modes. No correction factor is needed in PowerAlert for Invert mode.
7. In Gen 2.9, the :K command format was :Kk#< where k = 0/1 (Master off/on); k = 2/3 (K1 off/on); k = 4/5 (K2 off/on); k = 6/7 (K3 off/on) using ASCII encoding.
8. In Gen 2.9, the :F response indicated the P/N and revision of the Line uC.
9. In Gen 2.9, the :S response was Slcpiyw< where i = 0-3 (Inverter/Recptacles: off/off, on/off, off/on, on/on); y = 0/1 (50Hz/60Hz mode).
10. In Gen 2.9, the :T response was Tttfffm< where ffff = 2<sup>16</sup> of 10\*frequency.
11. The product name characters are to be stored in the NVR. The production test will load in the correct characters for a given model. Characters 29-30 are a two byte two's complement checksum of characters 1-28.
12. New control command to allow user selection of auto-restart modes. Default selections are auto-restart inhibited.
13. :0 has been added. Note that the zero in :0 is hex 0 not ASCII 0