

APPENDIX A: Full Commands List with Descriptions

The list of Digital Regulator Commands is included in the following pages.

Commands Document Conventions

Again, ASCII numbers from 000 to 999 are valid device bus addresses. Address 99 is reserved for an all device broadcast, which is only valid for settings such as minvolts, maxvolts, hstclear, etc.

The bus address is a string of decimal digits, and is always in the range 0 to 255 inclusive. Leading zeroes are allowed. When the regulator replies with a bus address, it will always send two or three digits. E.g.: 01, 099, or 200.

A broadcast command is one that responds to the broadcast address. The broadcast address is a single asterisk, i.e.: "*" or "99".

NOTE: The latest version of the regulator supports the two digit bus address 99 as the broadcast address. To use 99 as a bus address that does not mean broadcast, but instead exactly one bus address, specify at least one leading zero. E.g.: 099.

A broadcast command will not reply with any report or status.

A descriptive word representing one field will be set off in <angle brackets>. The brackets are not included in the actual command. E.g. <addr> may be replaced by 1, 2, 99, etc. An optional field will be set of in [square brackets]. The brackets are not included in the actual command. E.g. [<voltage>] may be replaced by 2.500 or left empty. Commands may be specified using their full syntax, abbreviated to their minimum syntax, or anything in between. An abbreviated command ends with a period "." A command that takes an argument after the command must end with a single period, whether or not it is abbreviated. All commands must be in lower case letters. E.g. 1e. but not 1E.

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Command Name	Full Syntax	Minimum Syntax	Broadcast Command	Example Command	Example Reply
btemp (bt.)	<addr>btemp<temp>	<addr>bt.<temp>	YES	1bt.120	01BT 120F
	FUNCTION: Sets cell temperature that will activate the STOP CHARGE LINE when a cell is above this temperature. The temperature must be set between 32F and 180F. If <temp> is not present then the stored setting is displayed. If btdisable has been activated, btemp will reset the regulator to activate the STOP CHARGE LINE if a cell exceeds the designated temperature - Factory default is 120F.				
btdisable (btd.)	<addr>btdisable	<addr>btd.	YES	1btd.	01BT DISABLE
	FUNCTION: Disables the ability to activate the STOP CHARGE LINE if a cell is over temperature.				
changead (ch.)	<addr>changead.<newaddr>	<addr>ch.<newaddr>	NO	1ch.9	01 Now:09
	FUNCTION: Changes the current bus address <addr> to the new address <newaddr>. The other bus addresses on the same regulator are adjusted respectively. The new address must always be from 0 to 255. Additionally, the new address must not force any other bus address on the same regulator to exceed 0 to 255. Factory default is bus address 1, this will need to be changed if more than one regulator is in the series.				
commandl (.)	<addr>commandl	<addr>.	NO	1.	--Rudman MK3x8 Regulator --V0.17 Unit:01-08 S/N: 00001 commandl hmaclear hmclear lights minvolts maxvolts querytot readlowv status sethigh setlow setover temperat tempwarm tempshot tempoff voltage xtrntemp commandl btemp btdisable
	FUNCTION: Lists regulator model, software version, bus address range, serial number and valid commands				
disable (d.)	<addr>disable	<addr>d.	YES	1d.	01Disable
	FUNCTION: Disables the regulators ability to shunt - Factory default has shunting enabled for cell protection and equalization				
enable (e.)	<addr>enable	<addr>e.	YES	1e.	01Enable
	FUNCTION: Enables the regulators ability to shunt - Factory default has shunting enabled for cell protection and equalization				
fan (f.)	<addr>fan[.<level>]	<addr>f.[<level>]	YES	1f.4	01F 4
	FUNCTION: Forces the fan to be ON at set <level> - Factory default automatically controls the fan by the heat sink temperature. The <level> must be 0 to 8. A fan <level> of 1 or more will force the fan to run, with 8 being at full power. Fan <level> 0 is the default automatic mode (controlled by the temperature.)				
firstpos (fi.)	<addr>firstpos[.<enable>]	<addr>fi.[<enable>]	YES	1fi.1	01FP 1
	FUNCTION: If <enable> is 1 it switches the cell # order in the EEPROM so that BMS will display the most positive cell as Cell #1. <enable> must be 0 or 1, if <enable> is not present, <addr>fi. reports the active mode - Factory default is 0 indicating the most negative cell is Cell #1.				
gethighv (g.)	<addr>gethighv	<addr>g.	NO	1g.	01G 3.792V
	FUNCTION: Replies with high voltage set point. There is only one set point per regulator, so all bus addresses on one regulator will give the same response. The high voltage set point can be adjusted with the sethigh command, this set point adjusts the cell voltage level at which shunting will turn on.				

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Command Name	Full Syntax	Minimum Syntax	Broadcast Command	Example Command	Example Reply
hmaclear (hma.)	<addr>hmaclear	<addr>hma.	YES	1hma.	NO RESPONSE
	FUNCTION: Clears the history for the maximum sensed voltage for the given bus address.				
hmiclear (hmi.)	<addr>hmiclear	<addr>hmi.	YES	1hmi.	NO RESPONSE
	FUNCTION: Clears the history for the minimum sensed voltage for the given bus address.				
hstclear (h.)	<addr>hstclear	<addr>h.	YES	1h.	NO RESPONSE
	FUNCTION: Clears history for both minimum and maximum sensed voltages for the given bus address.				
lights (l.)	<addr>lights	<addr>l.	NO	1l.	--Rudman MK3x8 Regulator --V0.17 Unit:01 S/N: 00001
	FUNCTION: LED indicators will flash on regulator with given bus address and reply with the sign on message including, model, software version, bus address range and serial number				
maxvolts (ma.)	<addr>maxvolts	<addr>ma.	NO	1ma.	01MA 3.917V
	FUNCTION: Replies with maximum sensed voltage for given bus address				
minvolts (mi.)	<addr>minvolts	<addr>mi.	NO	1mi.	01MA 1.510V
	FUNCTION: Replies with minimum sensed voltage for given bus address				
phev (p.)	<addr>phev[.<enable>]	<addr>p.<enable>	YES	1p.	01P 0
	FUNCTION: Activates PHEV mode. The PHEV mode will be applied to all bus addresses per regulator. <enable> must be 0 or 1, 0 indicates PHEV is disabled, 1 indicates PHEV is enabled. If <enable> is not present, <addr>phev reports the active mode. If enabled (1), the STOP CHARGE LINE is activated whenever the UNDERVOLTAGE LINE is activated. The PHEV command can be used to trigger something to cut back when a cell gets below the low set point the same way the charger is normally notified when a cell gets too high. The low set point can be changed with the setlow command. The sethigh set point will still activate the STOP CHARGE LINE during charging.				
querytot (q.)	<addr>querytot	<addr>q.	NO	1q.	01Q 12.19V
	FUNCTION: Replies with the total real time sensed voltage for the regulators with the given bus address				
readlowv (r.)	<addr>readlowv	<addr>r.	NO	1r.	01R 2.496V
	FUNCTION: Replies with the low voltage set point. There is only one low voltage set point per regulator, so all bus addresses on one regulator will give the same response. When a cell falls below the low voltage set point the UNDERVOLTAGE LINE is activated.				
sethigh (seth.)	<addr>sethigh[.<voltage>]	<addr>seth.<voltage>	YES	01seth.3.792	01H 3.792V
	FUNCTION: Sets the high voltage set point. There is only one high voltage set point per regulator, so all bus addresses on one regulator are affected by the command. <voltage> must be from 0.000 to 9.999 and must contain exactly four digits. If <voltage> is not present, <addr>sethigh will give you the same result as the gethighv command. - Factory Default is 3.600V				
setlow (setl.)	<addr>setlow[.<voltage>]	<addr>setl.<voltage>	YES	01setl.2.496	01H 2.496
	FUNCTION: Sets the low voltage set point. There is only one low set point per regulator, so all bus addresses on one regulator are affected by the command. <voltage> must be from 0.000 to 9.999 and must contain exactly four digits. If <voltage> is not present, <addr>setlow will give you the same result as the readlowv command. If a cell falls below the low voltage set point the UNDERVOLTAGE LINE is activated. - Factory Default is 2.496				

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Command Name	Full Syntax	Minimum Syntax	Broadcast Command	Example Command	Example Reply	
setover (seto.)	<addr>setover[.<voltage>]	<addr>seto.[<voltage>]	YES	01seto.3.984	01H 3.984V	
	FUNCTION: Sets the over voltage set point. This set point must be higher than the high voltage set point designated with the sethigh command. The sethigh voltage set point will enable dissipation where as the setover voltage set point is when the BMS will tell the charger to cut back. There is only one over voltage set point per regulator, so all bus addresses on one regulator are affected by the command. <voltage> must be from 0.000 to 9.999 and must contain exactly four digits. If <voltage> is not present, <addr>setover reports the current set point. - Factory Default is 3.648V					
status (s.)	<addr>status	<addr>s.	NO	1s.	01S 28	
	FUNCTION: Replies with real time status bits of the regulator with the given bus address as two hexadecimal digits. These digits are a sum of the hexadecimal digits from the immediate condition. For example if you have an over temp cell all of the bus addresses for that regulator will display a status bit of 01, but the bus address associated with the specific over temp cell will also have 02, therefore displays 03 because 01+02=03. Or if the shunt is disabled, status bit 80, and a cell is below the low voltage set point, status bit 20 then the reported status would be A0, following hexadecimal summation. Below is a table of the status bits and their meaning:					
	STATUS BIT		LED INDICATORS	MEANING		
	0x01	Blue ON, Yellow FLASHING	Regulator heat sink or a cell on the regulator is over temperature			
	0x02	Blue ON, Yellow FLASHING	Designates the exact bus address with an over temp cell			
	0x04	NONE	Reserved for future features			
	0x08	Red ON	The bus address has been below the low voltage set point			
	0x10	Green ON	The bus address is above the high voltage set point			
	0x20	Yellow ON, Red ON	The bus address is below the low voltage set point			
0x40	Green ON, Cell Green ON	The shunt is enabled and the bus address is above the high voltage set point				
0x80	NONE	The shunt is disabled				
temperat (t.)	<addr>temperat	<addr>t.	NO	1t.	01T 064F	
	FUNCTION: Replies with the real time temperature of the heat sink or unit if there is no heatsink like the MK3x12. There is only one heat sink temperature per regulator, so all bus addresses on one regulator will give the same response.					
temphot (tempH.)	<addr>temphot.<temp>	<addr>tempH.<temp>	YES	1tempH.151	01TH 151F	
	FUNCTION: Sets the heatsink temperature that will make the fan run at full speed. The fan speed scales up from tempwarm to temphot. <temp> must be from 32 to 181 and between the tempwarm and tempoff set points.					
tempoff (tempO.)	<addr>tempoff.<temp>	<addr>tempO.<temp>	YES	1tempO.171	01TO 171F	
	FUNCTION: Sets the heatsink temperature that forces the regulator to stop dissipating in order to avoid internal heat damage. <temp> must be from 32 to 181 and greater than temphot.					
tempwarm (tempW.)	<addr>tempwarm.<temp>	<addr>tempW.<temp>	YES	1tempW.120	01TW 120F	
	FUNCTION: Sets the heatsink temperature that starts the fan. The fan speed scales up from tempwarm to temphot. tempwarm must be from 32 to 181 and less than temphot.					
xtrntemp (x.)	<addr>xtrntemp	<addr>x.	NO	1x.	01X Cold	
	FUNCTION: Replies with the real time temperature of the given bus address cell's external temperature sensor if the optional sensors have been installed. The MK3x12 has only 6 sensors so temp sensor 1 reports as bus address 1 & 2, temp sensor 2 reports as 3 & 4 etc.					