Thermostat Settings

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I have begun the process of building up the firmware for my Digital Thermostat module to include some advanced features and settings. In order to help me organize this process, I have created a “memory map” that lists all the settings I plan to implement. It is shown below.

Digital Thermostat Module

Memory Settings Map, Version 0.1, Nick Viera, 2010/03/31

Permissions		Register / Setting			Values			Default	
Admin	User	Name	#	Function	Min	Max	Units	(state or value)	States
R	-	0.0	0	Unit unique Serial Number				xxxxxxxxxx	
R	R	0.1	1	Unit model ID Number				xxxxxx	
R/W	-	0.2	2	Admin Menu Passcode Mode				None (0)	None (0), On (1)
R/W	-	0.3	3	Admin Menu Passcode	0000	9999		0000	
R/W	R/W	0.4	4	User Menu Passcode Mode				None (0)	None (0), On (1)
R/W	R/W	0.5	5	User Menu Passcode	0000	9999		0000	
R/W	-	0.7	7	Temperature Lock mode applies to				Others (0)	Others (0), User and Others (1)
R/W	-	0.8	8	Temperature Lock mode				None (0)	None (0), Restricted (1), Fixed (2)
R/W	-	0.9	9	Restricted temperature range	0	7	+/- ºC	3	
R/W	R	1.0	10	Ethernet IP Address (low byte)	0	255		x	
R/W	R	1.1	11	Ethernet IP Address	0	255		x	
R/W	R	1.2	12	Ethernet IP Address	0	255		168	
R/W	R	1.3	13	Ethernet IP Address (high byte)	0	255		192	
R/W	R	1.4	14	Ethernet Port Number	1	9999		8428	
R/W	R	1.5	15	Control Mode				Auto (0)	Auto(0), Local Only (1)
R/W	R/W	2.0	20	LCD Contrast	0	255		200	
R/W	R/W	2.1	21	LCD Backlight Brightness	0	255		255	
R/W	R/W	2.2	22	LCD Backlight idle mode				Auto Off (0)	Auto Off (0), Auto Dim (1), On (2)
R/W	R/W	2.3	23	LCD Backlight idle time	1	15	seconds	4	
R/W	R/W	2.4	24	LED Brightness	0	255		127	
R/W	R/W	2.5	25	LED idle mode				On (2)	Auto Off (0), Auto Dim (1), On (2)
R/W	R/W	2.6	26	LED idle time	1	15	seconds	4	
R/W	R/W	3.0	30	Temperature Units				ºC (0)	ºC (0), ºF (1)
R/W	-	3.1	31	Automatic mode temperature gap	2	15	ºC	4	
R/W	-	3.2	32	Temperature Calibration offset	-5.0	5.0	ºC	0	
R/W	-	3.3	33	Humidity Calibration offset	-30	30	%RH	0	
R/W	-	3.4	34	Swing mode (hysteresis)				Temperature (0)	Temperature (0), Time (1), Auto-learn (2)
R/W	-	3.5	35	Temperature swing	0	7	0.5ºC	2	
R/W	-	3.6	36	Heating mode time swing	0	15	¼ mins	2	
R/W	-	3.7	37	Cooling mode time swing	0	15	¼ mins	2	
R/W	-	3.8	38	Auto-learning swing adjust	-10	10		0	
R/W	-	4.0	40	Cooling mode minimum off time	0	15	minutes	5	
R/W	-	4.1	41	Cooling mode minimum on time	0	15	minutes	5	
R/W	-	4.2	42	Heating mode minimum off time	0	15	minutes	5	
R/W	-	4.3	43	Heating mode minimum on time	0	15	minutes	5	
R/W	-	4.4	44	Auxiliary mode minimum off time	0	15	minutes	5	
R/W	-	4.5	45	Auxiliary mode minimum on time	0	15	minutes	5	
R/W	-	4.6	46	Circulation mode time period	10	255	minutes	90	
R/W	-	4.7	47	Circulation mode on time	3	(per-3)	minutes	20	

The map lists the expected values or states associated with each setting, and the default state or value. Each setting has two numerical identifiers. The first, listed under the column “Name,” is the identifier that will read out on the module’s LCD screen. Thus, this is the number that will be seen from the built-in interface menu(s), used for programming the thermostat.

The second numerical identifier is listed under the column “#”. This number is used to identify the settings when it is accessed throught the Ethernet interface from a remote client. Both identifiers are numeric and short in order to minimize memory usage. (Textual names would require a lot more memory to store).

The two left-most columns identify which settings can be read (R) / written (W) by whom. The thermostat will have two “log-in” modes, one for a “user”, and one for an “administrator”, which are both different from the standard mode, in which nobody is logged in (the default state.) Although not required, these two

special log-in modes will be used to restrict access to certain settings and adjustments on the thermostat by non-authorized users. More on this later…
