KeyDog - Specification   **December 1, 2004**

MicroTools Part Numbers:
   KD-1PS2R - PS/2 Version with Relay
   KD-1USBR - USB Version with Relay

Functional Specification

- 24 - 5VDC inputs that can be programmed to provide any possible keyboard scan code
- 3 - 5VDC outputs for driving 10 ma loads
- 8 x 16 switch matrix programmable option for handling a full 104 key keyboard
- Optionally programmable to operate stand-alone (i.e. without a keyboard) or as a keyboard wedge (i.e. handling both discretes and a keyboard).
- Programmable Watchdog Timer with a relay with normally open and normally closed contacts for reseting your PC (through either the motherboard reset switch or the power-supply "power-good" input). For volume orders, a custom version (KD-1PS2SSR and KD-1USBSSR) is available with a solid state relay.
- Optional +5V DC power input (Not required for normal operation since KeyDog obtains its power from the PC on either the USB connector or the PS/2 connector).
- Watchdog restart time can be programmed from 10 ms to over 10 minutes.
- Programmable watchdog restart time following power-up
- Jumper Option for supporting either 5 VDC sourcing or Ground sinking inputs
- On board LED provides a indication at power up for operational readiness
- PCB (3" x 4") can be mounted in a PCI slot or separately mounted on standoffs.

Hardware Specification

Hardware Interface

Note: J2, J3, J7, J8, J10 pins are all on .100 " centers

2	J4, J5 PS/2 interface (mini DIN-6 sockets) - J4 provides an output to a PC and J5 provides an input from a keyboard (optionally used when configured in Wedge mode). Power is supplied to the PS/2 that goes to the keyboard (J5).
1	J9 2 pin optional barrel style power connector (5VDC and ground) used when KeyDog is being used as a WatchDog timer only (no keyboard)
1	J10 3 pin jumper for Pull Up or Pull down inputs
24	Inputs (24 pins on the J6 which is a 34 pin ribbon connector) that can be configured as 24 inputs or 8X16 scan matrix (104 keyboard) with three inputs undefined
3	Outputs - 3 pins on the 34 pin J6 connector current drive 10 ma:

        CAPS LOCK
        SCROLL LOCK
        NUM LOCK

1   Diagnostic LED indicative of Power and Status at power up (also this LED is the Scroll Lock LED)

1   Relay with one Normally Open (NO) contact and one Normally Closed contact (NC) for either a Reset Switch or Power Good (systems without reset switch which have a 5 VDC signal to the processor). Optionally there are 2 pins for a reset with a SSR.

Parts Included (KD-1PS2R)

1   PCB with removable PCI bracket
1   6 ' Cable - Mini DIN pins on both sides (PS/2 to PS/2) (Contact sales for cost and availability of custom sizes).
2   18" 2 pin reset cable compatible with most PC motherboards
1   Windows PC software for programming KeyDog

Parts Included (KD-1USBR)

1   PCB with removable PCI bracket
3   6 ' Cable - Standard USB A to B cable (Contact sales for cost and availability of custom sizes).
4   18" 2 pin reset cable compatible with most PC motherboards
2   Windows PC software for programming KeyDog

Optional Parts

1   Cable for reseting the PC through the Power-Good available from http://www.berkprod.com/atx_reset_adapter.htm

Detailed Connector Descriptions

J2 Connector Normally Open Relay Contacts	
pin	description
1	**Motherboard Reset in**
2	**Motherboard Reset out**
3	**Reset Switch in**
4	**Reset Switch out**

Note: J2-1 and J2-3, J2-2 and J2-4 are internally connected

J3 Programming Connector	
pin	description
1	**Reserved**
2	**Reserved**

J3 Programming Connector	
pin	description
3	**Reserved**
4	**Reserved**
5	**Reserved**
6	**Reserved**

J4 Connector PS/2 to the PC	
pin	description
1	**PC Data**
2	**NC**
3	**Gnd**
4	**5VDC**
5	**PC Clock**
6	**NC**

J5 Connector PS/2 to the Keyboard	
pin	description
1	**Keyboard Data**
2	**NC**
3	**Gnd**
4	**5VDC**
5	**Keyboard Clock**
6	**NC**

J6 Connector 2 x 17 Ribbon Header	
pin	description
1	**Key input 1 or Scan Row 1**
2	**Key input 2 or Scan Row 2**
3	**Key input 3 or Scan Row 3**
4	**Key input 4 or Scan Row 4**
5	**Key input 5 or Scan Row 5**
6	**Key input 6 or Scan Row 6**
7	**Key input 7 or Scan Row 7**
8	**Key input 8 or Scan Row 8**
9	**Key input 9 or Scan Row 9**
10	**Key input 10 or Scan Row 10**
11	**Key input 11 or Scan Row 11**
12	**Key input 12 or Scan Row 12**
13	**Key input 13 or Scan Row 13**
14	**Key input 14 or Scan Row 14**
15	**Key input 15 or Scan Row 15**
16	**Key input 16 or Scan Row 16**

J6 Connector 2 x 17 Ribbon Header	
pin	description
17	**Key Input 17 or Scan Column 1**
18	**Key Input 18 or Scan Column 2**
19	**Key Input 19 or Scan Column 3**
20	**Key Input 20 or Scan Column 4**
21	**Key Input 21 or Scan Column 5**
22	**Key Input 22 or Scan Column 6**
23	**Key Input 23 or Scan Column 7**
24	**Key Input 24 or Scan Column 8**
25	**Gnd**
26	**Gnd**
27	**Caps Lock Led**
28	**Gnd**
29	**Num Lock LED**
30	**Gnd**
31	**Scroll Lock LED**
32	**Gnd**
33	**+5v**
34	**+5v**

NOTE: Key Inputs are closures to ground when the Pull Inputs jumper (J10) is connected to +5 and +5 VDC sources when J10 is connected to Gnd.

J7 Connector Reserved Jumper	
pin	description
1-3	**Keyboard**
2-4	**Keyboard**
3-5	**MIDI**
4-6	**MIDI**

J7 is reserved for a discrete to MIDI interface. For KeyDog, J7 is configured at the factory with Pins 1-3 and 2-4 connected

J8 Connector Normally Closed Relay Contacts	
pin	description
1	**Power Good in**
2	**Power Good out**

J9 Optional 5 VDC input power	
pin	description
Center	**5 VDC**
Outer	**Ground**

J10 Pull up Jumper	
pin	description
1-2	**Pull Up Resistors (for switch to gnd)**
2-3	**Pull Down Resistor (for switch to +5)**

Sort by Key			Sort by matrix address			Sort by scan code		
Matrix address	Key	Scan Code	Matrix address	Key	Scan Code	Matrix address	Key	Scan Code
03	A	1C	00	RIGHT SHIFT	59	06	F9	01
51	B	32	01	APPS	E0,2F	77	F5	03
71	C	21	02	LEFT GUI	E0,1F	97	F3	04
a3	D	23	03	A	1C	B7	F1	05
45	E	24	04	R	2D	A7	F2	06
93	F	2B	05	7	3D	10	F12	07
83	G	34	06	F9	01	C6	F10	09
73	H	33	07	ESC	76	47	F8	0A
84	I	43	10	F12	07	67	F6	0B
63	J	3B	11	BACKSPACE	66	87	F4	0C
53	K	42	12	UP ARROW	E0,75	D1	TAB	0D
43	L	4B	13	KEYPAD \	EO,4A	a6	`	0E
80	M	3A	14	KEYPAD *	7C	A1	LEFT ALT	11
41	N	31	16	KEYPAD ENTER	E0,5A	90	LEFT SHIFT	12
74	O	44	17	RIGHT GUI	E0,27	B2	LEFT CTRL	14
64	P	4D	20	RIGHT ARROW	E0,74	65	Q	15
65	Q	15	21	DOWN ARROW	E0,72	96	1	16
04	R	2D	22	LEFT ARROW	E0,6B	42	Z	1A
b3	S	1B	23	NUM LOCK	77	b3	S	1B
b4	T	2C	24	KEYPAD +	79	03	A	1C
94	U	3C	30	PG DN	E0,7A	55	W	1D
61	V	2A	31	END	E0,69	86	2	1E
55	W	1D	32	F11	78	71	C	21
81	X	22	33	KEYPAD 9	7D	81	X	22

Sort by Key			Sort by matrix address			Sort by scan code		
Matrix address	Key	Scan Code	Matrix address	Key	Scan Code	Matrix address	Key	Scan Code
a4	Y	35	34	KEYPAD -	7B	a3	D	23
42	Z	1A	35	KEYPAD 8	75	45	E	24
95	0	45	36	KEYPAD 7	6C	66	4	25
96	1	16	40	SPACE	29	76	3	26
86	2	1E	41	N	31	40	SPACE	29
76	3	26	42	Z	1A	61	V	2A
66	4	25	43	L	4B	93	F	2B
56	5	2E	44	]	5B	b4	T	2C
46	6	36	45	E	24	04	R	2D
05	7	3D	46	6	36	56	5	2E
b5	8	3E	47	F8	0A	41	N	31
a5	9	46	50	/	4A	51	B	32
a6	`	0E	51	B	32	73	H	33
85	-	4E	52	DELETE	E0,71	83	G	34
75	=	55	53	K	42	a4	Y	35
62	\	5D	54	[	54	46	6	36
11	BACKSPACE	66	55	W	1D	80	M	3A
40	SPACE	29	56	5	2E	63	J	3B
D1	TAB	0D	57	F7	83	94	U	3C
92	CAPS LOCK	58	60	.	49	05	7	3D
90	LEFT SHIFT	12	61	V	2A	b5	8	3E
B2	LEFT CTRL	14	62	\	5D	70	,	41
02	LEFT GUI	E0,1F	63	J	3B	53	K	42
A1	LEFT ALT	11	64	P	4D	84	I	43
00	RIGHT SHIFT	59	65	Q	15	74	O	44

Sort by Key			Sort by matrix address			Sort by scan code		
Matrix address	Key	Scan Code	Matrix address	Key	Scan Code	Matrix address	Key	Scan Code
A2	RIGHT CTRL	E0,14	66	4	25	95	0	45
17	RIGHT GUI	E0,27	67	F6	0B	a5	9	46
B1	RIGHT ALT	E0,11	70	,	41	60	.	49
01	APPS	E0,2F	71	C	21	50	/	4A
B6	ENTER	5A	72	'	52	43	L	4B
07	ESC	76	73	H	33	82	;	4C
B7	F1	05	74	O	44	64	P	4D
A7	F2	06	75	=	55	85	-	4E
97	F3	04	76	3	26	72	'	52
87	F4	0C	77	F5	03	54	[	54
77	F5	03	80	M	3A	75	=	55
67	F6	0B	81	X	22	92	CAPS LOCK	58
57	F7	83	82	;	4C	00	RIGHT SHIFT	59
47	F8	0A	83	G	34	B6	ENTER	5A
06	F9	01	84	I	43	44	]	5B
C6	F10	09	85	-	4E	62	\	5D
32	F11	78	86	2	1E	11	BACKSPACE	66
10	F12	07	87	F4	0C	D5	KEYPAD 1	69
D2	PRT SCR*	E0,7C	90	LEFT SHIFT	12	C5	KEYPAD 4	6B
A0	SCROLL	7E	92	CAPS LOCK	58	36	KEYPAD 7	6C
D0	PAUSE*	E1,77	93	F	2B	D6	KEYPAD 0	70
C2	INSERT	E0,70	94	U	3C	C7	KEYPAD PERIOD	71
C1	HOME	E0,6C	95	0	45	D3	KEYPAD 2	72
C0	PG UP	E0,7D	96	1	16	C3	KEYPAD 5	73
52	DELETE	E0,71	97	F3	04	C4	KEYPAD 6	74

Sort by Key			Sort by matrix address			Sort by scan code		
Matrix address	Key	Scan Code	Matrix address	Key	Scan Code	Matrix address	Key	Scan Code
31	END	E0,69	A0	SCROLL	7E	35	KEYPAD 8	75
30	PG DN	E0,7A	A1	LEFT ALT	11	07	ESC	76
12	UP ARROW	E0,75	A2	RIGHT CTRL	E0,14	23	NUM LOCK	77
22	LEFT ARROW	E0,6B	a3	D	23	32	F11	78
21	DOWN ARROW	E0,72	a4	Y	35	24	KEYPAD +	79
20	RIGHT ARROW	E0,74	a5	9	46	D4	KEYPAD 3	7A
23	NUM LOCK	77	a6	`	0E	34	KEYPAD -	7B
13	KEYPAD \	EO,4A	A7	F2	06	14	KEYPAD *	7C
14	KEYPAD *	7C	B1	RIGHT ALT	E0,11	33	KEYPAD 9	7D
34	KEYPAD -	7B	B2	LEFT CTRL	14	A0	SCROLL	7E
24	KEYPAD +	79	b3	S	1B	57	F7	83
16	KEYPAD ENTER	E0,5A	b4	T	2C	B1	RIGHT ALT	E0,11
C7	KEYPAD PERIOD	71	b5	8	3E	A2	RIGHT CTRL	E0,14
D6	KEYPAD 0	70	B6	ENTER	5A	02	LEFT GUI	E0,1F
D5	KEYPAD 1	69	B7	F1	05	17	RIGHT GUI	E0,27
D3	KEYPAD 2	72	C0	PG UP	E0,7D	01	APPS	E0,2F
D4	KEYPAD 3	7A	C1	HOME	E0,6C	13	KEYPAD \	E0,4A
C5	KEYPAD 4	6B	C2	INSERT	E0,70	16	KEYPAD ENTER	E0,5A
C3	KEYPAD 5	73	C3	KEYPAD 5	73	31	END	E0,69
C4	KEYPAD 6	74	C4	KEYPAD 6	74	22	LEFT ARROW	E0,6B

Sort by Key				Sort by matrix address				Sort by scan code		
Matrix address	Key	Scan Code		Matrix address	Key	Scan Code		Matrix address	Key	Scan Code
36	KEYPAD 7	6C		C5	KEYPAD 4	6B		C1	HOME	E0,6C
35	KEYPAD 8	75		C6	F10	09		C2	INSERT	E0,70
33	KEYPAD 9	7D		C7	KEYPAD PERIOD	71		52	DELETE	E0,71
54	[	54		D0	PAUSE*	E1,77		21	DOWN ARROW	E0,72
44	]	5B		D1	TAB	0D		20	RIGHT ARROW	E0,74
82	;	4C		D2	PRT SCR*	E0,7C		12	UP ARROW	E0,75
72	'	52		D3	KEYPAD 2	72		30	PG DN	E0,7A
70	,	41		D4	KEYPAD 3	7A		D2	PRT SCR*	E0,7C
60	.	49		D5	KEYPAD 1	69		C0	PG UP	E0,7D
50	/	4A		D6	KEYPAD 0	70		D0	PAUSE*	E1,77

* Denotes non-standard scan code assignment

Software Interface

Keyboard Interface

When in Switch Matrix Mode, a debounced (must be closed for > 24 ms) closure of an Input (brought to ground or sourced to 5 VDC) will produce a key defined by the 104 key standard keyboard

By default, when in Discrete Mode, a debounced closure will result in either the default key (see Table 1) or in another scan code when the default table has been replaced by a user selected set of scan codes.

Table 1 – Factory Default Values

Address (Input)	Key	Hex Scan Code
1	1	16
2	2	1E
3	3	26
4	4	25
5	5	2E
6	6	36
7	7	3D
8	8	3E
9	9	46
10	0	45
11	Up Arrow	E0 75
12	Down Arrow	E0 72
13	Left Arrow	E0 6B
14	Right Arrow	E0 74
15	Home	E0 6C
16	End	E0 69
17	Delete	E0 71
18	Page Up	E0 7D
19	Page Down	E0 7A
20	Enter	5A
21	Esc	76
22	Back Space	66
23	- (Minus)	7B
24	. (Period)	71
25*	**Bit 0 - Watchdog Enable/Disable** 0 = Watchdog disabled 1 = Watchdog enabled **Bit 1 - Standby Option (USB Only)** 0 = Watchdog will attempt to wake-up the processor if enabled on the first time out. On the second time out, the	Factory Default is Watchdog Disabled, no Standby Option, no Keyboard Wedge, Ground activated inputs

Address (Input)	Key	Hex Scan Code
	Watchdog will reset the processor. 1 = Watchdog will be suspended when the PC goes into standby and restored to the previous state when the PC wakes up. **Bit 2 - Input Configuration** 0 = 24 Discretes 1 = 8 x 16 switch matrix **Bit 3 – Wedge** 0 = No wedge 1 = Wedge NOTE: In Wedge mode, a keyboard must be present to supply the clock.	(inputs are pulled up to 5 VDC).
26*	Watchdog Initial Reset Time - default is	
27*	Watchdog Reset Time (after startup)	

*Applicable for the Watchdog portion of the module

User Programming the Keyboard / Watchdog Controller

The user can override most of the default operation through a Windows based program. The following parameters can be overridden:

1. The scan code sent for each of the 24 input switch closures
2. Watchdog Enable/Disable (slot 25) 0 = Disabled, 1 = Enabled
3. For the USB version, you can configure how the Watchdog handles PC Standby mode.
4. Watchdog Initial Time Out (slot 26) 01 = .01 seconds 65535 = 655.35 seconds
5. Watchdog Time Out (slot 27) 01 = .01 seconds 65535 = 655.35 seconds

How to change the User Parameters

All of the User programmable parameters can be programmed through a Windows based program;

The steps to do this are as follows:
1. Load the Software onto your PC
2. Create a file called KEYDOG.DEF in the directory where the PC Software resides (an KEYDOG.INI file can change where that file is located).
3. The file consists of up to 32 lines consisting of address and data (one or two bytes of data per address). The first 24 addresses represent the scan codes associated with each input. See Table 2 for a complete list of all scan codes. Since some keys send one and some two scan codes, either one or two bytes

must be defined. The position (line number) in the file indicates the position in the table. The format of each line is:

ww xx [yy] <cr><lf>

where ww is the address
where xx is the first byte in HEX format
where a space or a tab is the delimiter
where yy is an optional second byte in HEX format

In assigning input closures to scan codes, you cannot assign a input closure to the Pause key. The Print Screen scan code will be TBD 2 byte scan code.

It is not necessary to program all 24 addresses. Any address that is not defined in the file will retain it previous settings.

Addresses 25-27 are special cases:

For Address 25, the user can define:

- Whether the Watchdog is enabled or disabled at Power up (Default Enabled)
- Whether J6 is configured as 24 Discretes or an 8 x 16 switch matrix
- Whether a keyboard wedge is employed
- Watchdog disable during standby (for USB Versions only)

The following defines the settings as they can be stored in KEYDOG.DEF and their meaning at Address 25.

Byte 1 Value	Watchdog at Power Up	USB Standby Option	24 Discretes or 8 X 16 Switch Matrix	Keyboard Wedge
0	Disabled	Disabled	24 Discretes	No Wedge
1	Enabled	Disabled	24 Discretes	No Wedge
2	Disabled	Enabled	24 Discretes	No Wedge
3	Enabled	Enabled	24 Discretes	No Wedge
4	Disabled	Disabled	8 X 16 Switch Matrix	No Wedge
5	Enabled	Disabled	8 X 16 Switch Matrix	No Wedge
6	Disabled	Enabled	8 X 16 Switch Matrix	No Wedge
7	Enabled	Enabled	8 X 16 Switch Matrix	No Wedge
8	Disabled	Disabled	24 Discretes	Wedge
9	Enabled	Disabled	24 Discretes	Wedge
A	Disabled	Enabled	24 Discretes	Wedge
B	Enabled	Enabled	24 Discretes	Wedge
C	Disabled	Disabled	8 X 16 Switch Matrix	Wedge
D	Enabled	Disabled	8 X 16 Switch Matrix	Wedge

E	Disabled	Enabled	8 X 16 Switch Matrix	Wedge
F	Enabled	Enabled	8 X 16 Switch Matrix	Wedge

Address 26 defines the number of seconds after power-up, before the first watchdog time out. This allows software to re-boot and initialize before the application software (with a watchdog restart command in it) needs to restart the watchdog timer.

The format in the KEYDOG.DEF file for both of these assignments is:

Address # of Seconds # of hundredths of a second.

Thus the following lines in the KEYDOG.DEF file:

26 3.23
27 600.01

would program the initial watchdog timeout at 3.23 seconds and the normal timeout at 600.01 seconds

4. Disconnect your keyboard from the PC and plug the cable provided into the PC and into the board
5. Start the MicroTools Configuration Utility with the Mouse.
6. Review that the data displayed on the screen is the data you desire to program.
7. Select the "Program Now" button
8. If successful, power cycle KeyDog and reconnect your keyboard to the PC. If unsuccessful, make the necessary corrections and restart.

Table 2

Pin	17	18	19	20	21	22	23	24
1	right shift	apps	left GUI	a	r	7	F9	Esc
2	F12	Backspace	gray up	key pad /	key pad *		key pad Enter	right GUI
3	right arrow	down arrow	left arrow	num lock	key pad +			
4	page down	end	F11	key pad 9	key pad -	key pad 8	key pad 7	
5	space	n	z	l	]	e	6	F8
6	/	b	delete	k	[	w	5	F7
7	.	v	\	j	p	q	4	F6
8	,	c	'	h	o	=	3	F5
9	m	x	;	g	i	-	2	F4
10	left shift		caps lock	f	u	0	1	F3
11	scroll lock	left alt	right cntrl	d	y	9	`	F2
12		right alt	left cntrl	s	t	5	enter	F1
13	page up	home	insert	key pad 5	key pad 6	key pad 4	F10	key pad Period
14	pause	tab	print screen	key pad 2	key pad 3	key pad 1	key pad 0	

Note: This table reflects the Rows and Columns defined in the J6 connector definition.

For example - If KeyDog were configured as a switchmatrix, and thus wish to only define Home and Enter, the user would connect Pins 12 and 23 for Enter and Pins 18 and 13 for Home

Watchdog Interface

How to restart the Watchdog

The Watchdog timer can be restarted before the Reset time with any toggle of the Scroll Lock, the Num Lock or the Caps Lock LED.

Startup Conditions

Because it takes so long for a PC to initialize, KeyDog provides two different timeouts for the Watchdog timer. This will enable the system designer to have a very short Watchdog timeout yet prevent the Watchdog from resetting the system during an initial start up. The first value (defaults to 5 minutes and is programmable at address 26) defines the timeout period after a power up or a keyboard reset (these are usually the same). This timeout period remains in effect until KeyDog receives its first restart command. From that time forward, KeyDog will use the second timeout value (defaults to 1 minute and is programmable at address 27).

By default, the Watchdog is enabled at startup. However, this condition can be changed programmatically. As an alternative to using the initial timeout delay to handle the very long time it takes a PC to initialize, the system designer could program KeyDog to be disabled at power up and not enable it until all of the critical pieces are in place. There is a simple command that can be used to enable the watchdog.

Standby and Power Conservation Issues

On the PS/2 version, the Watchdog must be disabled before the PC system goes into standby. Otherwise, the Watchdog will reset the PC. However, this will not provide any protection during standby. We would recommend that the PC be programmed to shut down the Monitor and Hard Drive but leave the PC processor operational.

On the USB version with the Standby Option selected, when the PC system goes into standby, KeyDog will automatically disable the Watchdog. When the USB bus becomes active (i.e. when the PC comes out of standby), KeyDog will automatically return the Watchdog to its previous state (i.e. if it was disabled when the PC went into standby, it will remain disabled. If it was enabled when the PC went into standby, it will be re-enabled). When this option is not enabled, KeyDog can be used to provide protection against the PC inadvertantly going into standby.

Additional protection is provided on the USB version against lock-up during standby. If one of KeyDog's inputs change resulting in a wake up request to the PC and the watch dog was enabled before standby, the Watchdog timer will be

started (using the Initial restart time) independent of the PC coming out of standby.

If the Standby Option is not selected on the USB version, KeyDog will attempt to wake-up the processor on the first watchdog timeout after going into Standby. On the second watchdog timeout after going into Standby, KeyDog will reset the processor.

Minimum Restart Times

By default, the initial reset timeout after startup is 5 minutes and following the first restart command, timeouts are 1 minute. This can be configured to range between 10 ms to 655.35 seconds.

How to enable/disable the Watchdog

The software can enable a "disabled" watchdog or disable an "enabled" watchdog by sending a command using the Scroll lock LEDs and the Cap Locks LED. MicroTools provides both an Windows API as well as a two applications that do this For example, your Kiosk can be configured with the Watchdog disabled and only enabled once the application starts. When the application is ended for maintenance, the watchdog can then be disabled. This Enabling and Disabling is not "sticky." If the watchdog is configured as enabled and is subsequently disabled via Keyboard commands, the watchdog will re-start as enabled following a reset. The restart count will be the Initial Power Up value.

User Programming the Watchdog

Addresses 25, 26, and 27 in the file are used to configure the Watchdog

25 is used to enable and disable the Watchdog at power up as well as to select the Standby Option.
26 is a XX.YY where XX is the number of seconds and YY is the number of 100ths of second for the initial time out period after powerup (this only applies until the first restart command is received if you are enabled at power up.)
27 is the same as 26 for subsequent timeouts or the first period after the watchdog is programmatically enabled.