Tyler Anderson	BSD commands		
11/7/2012	First revision		
11/13/2012	Second revision	Changes:	Added RESET and INIT columns in the parameter table Increased TRIG_MODE Datarg range to 6 Added DIG_DL to parameter table. Adjust legitimate command combinations table accordingly Modified delay and width default parameters to more sensible values.
Sai Im			
4/2/2013	Third revision	Changes:	Added PED1H-PED4H in place of PED1-PED4 Added PED1L-PED4L at bottom
05/02/13	Fourth revision	Changes:	Added PED5H-PEDT2L at the bottom

Command structure (32 bits)

Bit 31	Bits 30-24	Bits 23-16	Bits 15-0
Error	Action	Parameter	Data argument bits

Action List

Action	Hex Value	Execution when invalid	Definition
NOP	0x00	Echo with error bit	Command to send a "no operation" (EP2) and echo back FPGA logic rev no (EP6)
GET	0x01	Echo with error bit	Command to get the current value of a parameter (EP2) and respond with this value (EP6)
SET	0x02	Echo with error bit	Command to set a parameter value (EP2) and respond with this value (EP6)
INIT	0x03	Echo with error bit	Command to initialize all parameters to their default settings (EP2) and echo back 0x0000 (EP6)
EVENT	0x04	Echo with error bit	Command to initiate an event through software (EP2) and allow event to be read back (EP8)
RESET	0x05	Echo with error bit	Command to reset the BSD to it's powerinitiate an on state (EP2) and echo back the command (EP6)
RESET_FIFO	0x06	N/A	Command to reset the USB FIFOs (EP4) in case of loss of sync echo response on EP6. Note that any write to EP4 (no matter the packet contents) generates this FIFO reset

Parameter Table

Note: Datargs will be sent between PC and FPGA in "channel" units. Datargs are specified below in physical units only as a reference.

Parameter List	Hex Value	Associated HW_Signal	RESET Datarg (physical units)	INIT Datarg (physical units)	Datarg Range (physical units)	Resolution	Description
FPGA	0x00	N/A	0	0	0	N/A	The protoBSD Master FPGA
PED1H	0x01	DAC1HCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 1 pedestal for high-gain DAC. I think ~100 mV is 0x0A3, but check this.
PED2H	0x02	DAC2HCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 2 pedestal for high-gain DAC
PED3H	0x03	DAC3HCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 3 pedestal for high-gain DAC
PED4H	0x04	DAC4HCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 4 pedestal for high-gain DAC
THR1	0x05	DAC5CS\	0x0FFF (2.5V)	0x07AE (-100mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Trigger PMT 1 Threshold DAC
THR2	0x06	DAC6CS\	0x0FFF (2.5V)	0x07AE (-100mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Trigger PMT 2 Threshold DAC
D11_DL	0x07	d11	0x0013 (400ns)	0x0013 (400ns)	0ns to ~655360ns	Fast Clock Period	Time delay for quartet 1 analog timing switch 1
D21_DL	0x08	d21	0x0018 (500ns)	0x0018 (500ns)	0ns to ~655360ns	Fast Clock Period	Time delay for quartet 1 analog timing switch 2
D31_DL	0x09	d31	0x00F9 (5000ns)	0x00F9 (5000ns)	0ns to ~655360ns	Fast Clock Period	Time delay for quartet 1 analog timing switch 3
D12_DL	0x0A	d12	0x0013 (400ns)	0x0013 (400ns)	0ns to ~655360ns	Fast Clock Period	Time delay for quartet 2 analog timing switch 1
D22_DL	0x0B	d22	0x0018 (500ns)	0x0018 (500ns)	0ns to ~655360ns	Fast Clock Period	Time delay for quartet 2 analog timing switch 2
D32_DL	0x0C	d32	0x00F9 (5000ns)	0x00F9 (5000ns)	0ns to ~655360ns	Fast Clock Period	Time delay for quartet 2 analog timing switch 3
D13_DL	0x0D	d13	0x0013 (400ns)	0x0013 (400ns)	0ns to ~655360ns	Fast Clock Period	Time delay for quartet 3 analog timing switch 1
D23_DL	0x0E	d23	0x0018 (500ns)	0x0018 (500ns)	0ns to ~655360ns	Fast Clock Period	Time delay for quartet 3 analog timing switch 2
D33_DL	0x0F	d33	0x00F9 (5000ns)	0x00F9 (5000ns)	0ns to ~655360ns	Fast Clock Period	Time delay for quartet 3 analog timing switch 3
D14_DL	0x10	d14	0x0013 (400ns)	0x0013 (400ns)	0ns to ~655360ns	Fast Clock Period	Time delay for quartet 4 analog timing switch 1
D24_DL	0x11	d24	0x0018 (500ns)	0x0018 (500ns)	0ns to ~655360ns	Fast Clock Period	Time delay for quartet 4 analog timing switch 2
D34_DL	0x12	d34	0x00F9 (5000ns)	0x00F9 (5000ns)	0ns to ~655360ns	Fast Clock Period	Time delay for quartet 4 analog timing switch 3
D11_WD	0x13	d11	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for quartet 1 analog timing switch 1
D21_WD	0x14	d21	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for quartet 1 analog timing switch 2
D31_WD	0x15	d31	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for quartet 1 analog timing switch 3
D12_WD	0x16	d12	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for quartet 2 analog timing switch 1
D22_WD	0x17	d22	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for quartet 2 analog timing switch 2
D32_WD	0x18	d32	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for quartet 2 analog timing switch 3
D13_WD	0x19	d13	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for quartet 3 analog timing switch 1
D23_WD	0x1A	d23	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for quartet 3 analog timing switch 2
D33_WD	0x1B	d33	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for quartet 3 analog timing switch 3
D14_WD	0x1C	d14	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for quartet 4 analog timing switch 1
D24_WD	0x1D	d24	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for quartet 4 analog timing switch 2
D34_WD	0x1E	d34	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for quartet 4 analog timing switch 3
DON1_DL	0x1F	DON1\	0x0004 (~100ns)	0x0004 (~100ns)	0ns to ~655360ns	Fast Clock Period	Time delay for quartet 1 dynodes ON signal (active low)
DON2_DL	0x20	DON2\	0x0004 (~100ns)	0x0004 (~100ns)	0ns to ~655360ns	Fast Clock Period	Time delay for quartet 2 dynodes ON signal (active low)
DON3_DL	0x21	DON3\	0x0004 (~100ns)	0x0004 (~100ns)	0ns to ~655360ns	Fast Clock Period	Time delay for quartet 3 dynodes ON signal (active low)
DON4_DL	0x22	DON4\	0x0004 (~100ns)	0x0004 (~100ns)	0ns to ~655360ns	Fast Clock Period	Time delay for quartet 4 dynodes ON signal (active low)
DON1_WD	0x23	DON1\	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for quartet 1 dynodes ON signal (active low)
DON2_WD	0x24	DON2\	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for quartet 2 dynodes ON signal (active low)
DON3_WD	0x25	DON3\	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for quartet 3 dynodes ON signal (active low)
DON4_WD	0x26	DON4\	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for quartet 4 dynodes ON signal (active low)
TRIG_MODE	0x27	N/A	0	0	0 to 7	N/A	Trigger mode (see protoBSD_timing_Nov6_2012)
CONF_MODE	0x28	N/A	0	0	0 to 3	N/A	Confirmation mode (see protoBSD_timing_Nov6_2012)
COINC_WD	0x29	N/A	0x0004 (~100ns)	0x0004 (~100ns)	0ns to ~655360ns	Fast Clock Period	Coincidence window for Trigger PMTs
RECOV_WD	0x2A	N/A	0x00C3 (~500000ns)	0x00C3 (~500000ns)	0ns to ~10000000ns	Fast Clock + prescale	Recovery Time between DON\ deactivates and BSD ready for next event. LSB = 128 ns
DIG_DL	0x2B	N/A	0x0008 (~20000ns)	0x0008 (~20000ns)	0ns to ~10000000ns	Fast Clock + prescale	Time from T0 to begin digitization. LSB = 128 ns
PULSE1_DL	0x2C	PULSE1	0x0000 (0ns)	0x0000 (0ns)	0ns to ~655360ns	Fast Clock Period	Time delay for PULSE1
PULSE2_DL	0x2D	PULSE2	0x001D (600ns)	0x001D (600ns)	0ns to ~655360ns	Fast Clock Period	Time delay for PULSE2
PULSE1_WD	0x2E	PULSE1	0x0001 (40ns)	0x0001 (40ns)	0ns to ~655360ns	Fast Clock Period	Time width for PULSE1
PULSE2_WD	0x2F	PULSE2	0x0001 (40ns)	0x0001 (40ns)	0ns to ~655360ns	Fast Clock Period	Time width for PULSE2
PULSE1_AMP	0x30	CSP1\	0x0FFF (2.5V)	0x0FFF (2.5V)	DAC full range (-2.5V to 2.5V)	DAC Resolution	Amplitude of PULSE1
PULSE2_AMP	0x31	CSP2\	0x0833 (1V)	0x0833 (1V)	DAC full range (-2.5V to 2.5V)	DAC Resolution	Amplitude of PULSE2
PULSE1_ON	0x32	PULSE1	0x0000 (OFF)	0x0000 (OFF)	0 to 1	N/A	PULSE1 ON (1) or OFF (0)
PULSE2_ON	0x33	PULSE2	0x0000 (OFF)	0x0000 (OFF)	0 to 1	N/A	PULSE2 ON (1) or OFF (0)
HV11	0x34	CSHV11\	0x0000 (0V)	0x0000 (0V)	0 to +5V	DAC Resolution	Dynode 1 Quartet 1 High Voltage DAC Value
HV12	0x35	CSHV12\	0x0000 (0V)	0x0000 (0V)	0 to +5V	DAC Resolution	Dynode 2 Quartet 1 High Voltage DAC Value
HV13	0x36	CSHV13\	0x0000 (0V)	0x0000 (0V)	0 to +5V	DAC Resolution	Main Quartet 1 High Voltage DAC Value
HV12	0x37	CSHV12\	0x0000 (0V)	0x0000 (0V)	0 to +5V	DAC Resolution	Dynode 1 Quartet 2 High Voltage DAC Value
HV22	0x38	CSHV22\	0x0000 (0V)	0x0000 (0V)	0 to +5V	DAC Resolution	Dynode 2 Quartet 2 High Voltage DAC Value
HV32	0x39	CSHV32\	0x0000 (0V)	0x0000 (0V)	0 to +5V	DAC Resolution	Main Quartet 2 High Voltage DAC Value
HV13	0x3A	CSHV13\	0x0000 (0V)	0x0000 (0V)	0 to +5V	DAC Resolution	Dynode 1 Quartet 3 High Voltage DAC Value
HV23	0x3B	CSHV23\	0x0000 (0V)	0x0000 (0V)	0 to +5V	DAC Resolution	Dynode 2 Quartet 3 High Voltage DAC Value
HV33	0x3C	CSHV33\	0x0000 (0V)	0x0000 (0V)	0 to +5V	DAC Resolution	Main Quartet 3 High Voltage DAC Value
HV14	0x3D	CSHV14\	0x0000 (0V)	0x0000 (0V)	0 to +5V	DAC Resolution	Dynode 1 Quartet 4 High Voltage DAC Value
HV24	0x3E	CSHV24\	0x0000 (0V)	0x0000 (0V)	0 to +5V	DAC Resolution	Dynode 2 Quartet 4 High Voltage DAC Value
HV34	0x3F	CSHV34\	0x0000 (0V)	0x0000 (0V)	0 to +5V	DAC Resolution	Main Quartet 4 High Voltage DAC Value
HVT1	0x40	CSHVT1\	0x0000 (0V)	0x0000 (0V)	0 to +5V	DAC Resolution	Main Trigger PMT 1 High Voltage DAC Value
HVT2	0x41	CSHVT2\	0x0000 (0V)	0x0000 (0V)	0 to +5V	DAC Resolution	Main Trigger PMT 2 High Voltage DAC Value
PEDT1	0x42	DAC7CS\	0x0801 (2mV)	0x0801 (2mV)	-2.5V to +2.5V	DAC Resolution	Trigger PMT 1 Pedestal DAC
PEDT2	0x43	DAC8CS\	0x0801 (2mV)	0x0801 (2mV)	-2.5V to +2.5V	DAC Resolution	Trigger PMT 2 Pedestal DAC
D1T1_DL	0x44	d1T1	0x0000 (0ns)	0x0000 (0ns)	0ns to ~655360ns	Fast Clock Period	Time delay for Trigger PMT 1 analog timing switch 1
D2T1_DL	0x45	d2T1	0x0004 (100ns)	0x0004 (100ns)	0ns to ~655360ns	Fast Clock Period	Time delay for Trigger PMT 1 analog timing switch 2
D3T1_DL	0x46	d3T1	0x0031 (1000ns)	0x0031 (1000ns)	0ns to ~655360ns	Fast Clock Period	Time delay for Trigger PMT 1 analog timing switch 3
D1T2_DL	0x47	d1T2	0x0000 (0ns)	0x0000 (0ns)	0ns to ~655360ns	Fast Clock Period	Time delay for Trigger PMT 2 analog timing switch 1
D2T2_DL	0x48	d2T2	0x0004 (100ns)	0x0004 (100ns)	0ns to ~655360ns	Fast Clock Period	Time delay for Trigger PMT 2 analog timing switch 2
D3T2_DL	0x49	d3T2	0x0031 (1000ns)	0x0031 (1000ns)	0ns to ~655360ns	Fast Clock Period	Time delay for Trigger PMT 2 analog timing switch 3
D1T1_WD	0x4A	d1T1	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for Trigger PMT 1 analog timing switch 1
D2T1_WD	0x4B	d2T1	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for Trigger PMT 1 analog timing switch 2
D3T1_WD	0x4C	d3T1	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for Trigger PMT 1 analog timing switch 3
D1T2_WD	0x4D	d1T2	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for Trigger PMT 2 analog timing switch 1
D2T2_WD	0x4E	d2T2	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for Trigger PMT 2 analog timing switch 2
D3T2_WD	0x4F	d3T2	0x1387 (~100000ns)	0x1387 (~100000ns)	0ns to ~655360ns	Fast Clock Period	Time width for Trigger PMT 2 analog timing switch 3
D11_CM	0x50	d11	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	Quartet 1 Constant ON MODE is off (0x0000) or on (0x0001)
D21_CM	0x51	d21	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	Quartet 1 Constant ON MODE is off (0x0000) or on (0x0001)
D31_CM	0x52	d31	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	Quartet 1 Constant ON MODE is off (0x0000) or on (0x0001)
D12_CM	0x53	d12	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	Quartet 2 Constant ON MODE is off (0x0000) or on (0x0001)
D22_CM	0x54	d22	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	Quartet 2 Constant ON MODE is off (0x0000) or on (0x0001)
D32_CM	0x55	d32	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	Quartet 2 Constant ON MODE is off (0x0000) or on (0x0001)
D13_CM	0x56	d13	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	Quartet 3 Constant ON MODE is off (0x0000) or on (0x0001)
D23_CM	0x57	d23	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	Quartet 3 Constant ON MODE is off (0x0000) or on (0x0001)
D33_CM	0x58	d33	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	Quartet 3 Constant ON MODE is off (0x0000) or on (0x0001)
D14_CM	0x59	d14	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	Quartet 4 Constant ON MODE is off (0x0000) or on (0x0001)
D24_CM	0x5A	d24	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	Quartet 4 Constant ON MODE is off (0x0000) or on (0x0001)
D34_CM	0x5B	d34	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	Quartet 4 Constant ON MODE is off (0x0000) or on (0x0001)
D1T1_CM	0x5C	d1T1	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	igger PMT 1 Constant ON MODE is off (0x0000) or on (0x0001)
D2T1_CM	0x5D	d2T1	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	igger PMT 1 Constant ON MODE is off (0x0000) or on (0x0001)
D3T1_CM	0x5E	d3T1	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	igger PMT 1 Constant ON MODE is off (0x0000) or on (0x0001)
D1T2_CM	0x5F	d1T2	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	igger PMT 1 Constant ON MODE is off (0x0000) or on (0x0001)
D2T2_CM	0x60	d2T2	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	igger PMT 1 Constant ON MODE is off (0x0000) or on (0x0001)
D3T2_CM	0x61	d3T2	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	igger PMT 1 Constant ON MODE is off (0x0000) or on (0x0001)
DON1_CM	0x62	DON1\	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	Quartet 1 Dynodes ON Constant ON MODE is off (0x0000) or on (0x0001)
DON2_CM	0x63	DON2\	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	Quartet 1 Dynodes On Constant ON MODE is off (0x0000) or on (0x0001)
DON3_CM	0x64	DON3\	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	Quartet 1 Dynodes On Constant ON MODE is off (0x0000) or on (0x0001)
DON4_CM	0x65	DON4\	0x00000 (Constant mode off)	0x00000 (Constant mode off)	0 to 1	N/A	Quartet 1 Dynodes ON Constant ON MODE is off (0x0000) or on (0x0001)
D11_ON	0x66	d11	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	itch 1 for Quartet 1 is ON (0x0001) or OFF (0x0000)
D21_ON	0x67	d21	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	itch 2 for Quartet 1 is ON (0x0001) or OFF (0x0000)
D31_ON	0x68	d31	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	itch 3 for Quartet 1 is ON (0x0001) or OFF (0x0000)
D12_ON	0x69	d12	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	itch 1 for Quartet 2 is ON (0x0001) or OFF (0x0000)
D22_ON	0x6A	d22	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	itch 2 for Quartet 2 is ON (0x0001) or OFF (0x0000)
D32_ON	0x6B	d32	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	itch 3 for Quartet 2 is ON (0x0001) or OFF (0x0000)
D13_ON	0x6C	d13	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	itch 1 for Quartet 3 is ON (0x0001) or OFF (0x0000)
D23_ON	0x6D	d23	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	itch 2 for Quartet 3 is ON (0x0001) or OFF (0x0000)
D33_ON	0x6E	d33	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	itch 3 for Quartet 3 is ON (0x0001) or OFF (0x0000)
D14_ON	0x6F	d14	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	itch 1 for Quartet 4 is ON (0x0001) or OFF (0x0000)
D24_ON	0x70	d24	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	itch 2 for Quartet 4 is ON (0x0001) or OFF (0x0000)
D34_ON	0x71	d34	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	itch 3 for Quartet 4 is ON (0x0001) or OFF (0x0000)
D1T1_ON	0x72	d1T1	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	h 1 for Trigger PMT 1 is ON (0x0001) or OFF (0x0000)
D2T1_ON	0x73	d2T1	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	h 2 for Trigger PMT 1 is ON (0x0001) or OFF (0x0000)
D3T1_ON	0x74	d3T1	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	h 3 for Trigger PMT 1 is ON (0x0001) or OFF (0x0000)
D1T2_ON	0x75	d1T2	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	h 1 for Trigger PMT 2 is ON (0x0001) or OFF (0x0000)
D2T2_ON	0x76	d2T2	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	h 2 for Trigger PMT 2 is ON (0x0001) or OFF (0x0000)
D3T2_ON	0x77	d3T2	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	h 3 for Trigger PMT 2 is ON (0x0001) or OFF (0x0000)
DON1_ON	0x78	DON1\	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	Quartet 1 Dynodes ON is ON (0x0001) or OFF (0x0000)
DON2_ON	0x79	DON2\	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	Quartet 1 Dynodes ON is ON (0x0001) or OFF (0x0000)
DON3_ON	0x7A	DON3\	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	Quartet 1 Dynodes ON is ON (0x0001) or OFF (0x0000)
DON4_ON	0x7B	DON4\	0x00001 (Constant ON)	0x00001 (Constant ON)	0 to 1	N/A	Quartet 1 Dynodes ON is ON (0x0001) or OFF (0x0000)
TRIG1_RATE	0x7C	N/A	0x0000	0x0000	0 to 65535	0 to 65535	Number of TRIGGER PMT 1 discriminator fires in last second
TRIG2_RATE	0x7D	N/A	0x0000	0x0000	0 to 65535	0 to 65535	Number of TRIGGER PMT 1 discriminator fires in last second
TRIG_SELF_RATE	0x7E	N/A	0x0000	0x0000	0 to 65535	0 to 65535	Number of SELF TRIGGER PMT discriminator fires in last second
TRIG_MT_RATE	0x7F	N/A	0x0000	0x0000	0 to 65535	0 to 65535	Number of EXTIN Triggers received in last second
TRIG_T0_RATE	0x80	N/A	0x0000	0x0000	0 to 65535	0 to 65535	Number of T0 triggers received in last second
PED1L	0x81	DAC1LCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 1 pedestal for low-gain DAC. I think ~100 mV is 0x0A3, but check this.
PED2L	0x82	DAC2LCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 2 pedestal for low-gain DAC
PED3L	0x83	DAC3LCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 3 pedestal for low-gain DAC
PED4L	0x84	DAC4LCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 4 pedestal for low-gain DAC
PED5H	0x85	DAC5LCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 5 pedestal for high-gain DAC
PED5L	0x86	DAC5HCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 5 pedestal for low-gain DAC
PED6H	0x87	DAC6HCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 6 pedestal for high-gain DAC
PED6L	0x88	DAC6LCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 6 pedestal for low-gain DAC
PED7H	0x89	DAC7HCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 7 pedestal for high-gain DAC
PED7L	0x8A	DAC7LCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 7 pedestal for low-gain DAC
PED8H	0x8B	DAC8HCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 8 pedestal for high-gain DAC
PED8L	0x8C	DAC8LCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 8 pedestal for low-gain DAC
PED9H	0x8D	DAC9HCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 9 pedestal for high-gain DAC
PED9L	0x8E	DAC9LCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 9 pedestal for low-gain DAC
PED10H	0x8F	DAC10HCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 10 pedestal for high-gain DAC
PED10L	0x90	DAC10LCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 10 pedestal for low-gain DAC
PED11H	0x91	DAC11HCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 11 pedestal for high-gain DAC
PED11L	0x92	DAC11LCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 11 pedestal for low-gain DAC
PED12H	0x93	DAC12HCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 12 pedestal for high-gain DAC
PED12L	0x94	DAC12LCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 12 pedestal for low-gain DAC
PED13H	0x95	DAC13HCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 13 pedestal for high-gain DAC
PED13L	0x96	DAC13LCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 13 pedestal for low-gain DAC
PED14H	0x97	DAC14HCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 14 pedestal for high-gain DAC
PED14L	0x98	DAC14LCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 14 pedestal for low-gain DAC
PED15H	0x99	DAC15HCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 15 pedestal for high-gain DAC
PED15L	0x9A	DAC15LCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 15 pedestal for low-gain DAC
PED16H	0x9B	DAC16HCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 16 pedestal for high-gain DAC
PED16L	0x9C	DAC16LCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Quartet 16 pedestal for low-gain DAC
PEDT1H	0x9D	DACT1HCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Trigger 1 pedestal, low-gain
PEDT1L	0x9E	DACT1LCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Trigger 1 pedestal, low-gain
PEDT2H	0x9F	DACT2HCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Trigger 2 pedestal, high-gain
PEDT2L	0xA0	DACT2LCS\	0x0801 (2mV)	0x0801 (2mV)	DAC full range (-2.5V to 2.5V)	DAC resolution	Trigger 2 pedestal, low-gain

Legitimate command combinations

Action List	Start Parameter	End Parameter
NOP	FPGA	FPGA
GET	PED1H	PEDT2L
SET	PED1H, PED1L	DON4_ON, PEDT2L
INIT	FPGA	FPGA
EVENT	FPGA	FPGA
RESET	FPGA	FPGA
RESET_FIFO	FPGA	FPGA