Level Shifter Command Summary

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How to connect

- The level shifter has Ethernet, USB, and JTAG interfaces.
  - Two telephone style I/O connectors allow one level shifter (with Ethernet connected) to be “HAPI buss master” and pass commands to up to 32 (20?) other level shifters.
  - USB is used primarily to download microcode, as is JTAG.
- Level shifter listens on ports 5000-5002
  - Example connection:
    - telnet 192.168.24.6x 5000
    - x = 1-4(?) for St1,2,3+,3-

List of commands

- 2 help commands: he & h1:

```
he

SeaQuest Level Adapter Command List
Main
 WT ch d    Write DAC0 Threshold, ch-0-7 (8=all),  d(0-4095),(0-4095mV @ DAC0)
 WC ch d    Write DAC1 ch0=IBLR, 1=TREFE, 2=TREF0, d(0-4095),(0-4095mV @ DAC1)
 ID n       Display Network Setup and Firmware Ver,(n=1 info)(n=0 Add hBus ##)
 MO n       Monitor, Temperature and ADC Channels. (n=1 info)(n=0 Add hBus ##)
 RDAC n     Read DACs (shadow), data as cnts(dec), (n=1 info)(n=0 Add hBus ##)
RJ11 Link
 HC b cmd   hBus command, b=(brd 1-20, 0=all), cmd(any valid command)
 HI         hBus Initialize, returns board count, (cmd 'HM' does this)
 HM         hBus sets board to hBus Master (reset heart beat LED rate)
 HS n       hBus status information, (n=1 info)
 H3V d      hBus Enable -3Volt power, (d=1=ON) (0 OFF)
Socket
 SET        Set Network Regs, Sockets, Ports, and serial number (SAVE)
 SOCK       Display Network Socket Status, Enabled 0-2, Disabled 3-7
 QUIT s     Close Network Socket, s=socket 0-2, if no param close this sock
Flash
 DREC s     Device Recall, from Flash,(s=Setup page 0-10, 0=Constants)
 DSAV s     Device Save,   to Flash,  (s=Setup page 1-10, 1=Boot page)
 FL         USB Flash Load (to ATMEL MEMORY) using Altera Binary File(*.rbf)
 FD         USB FPGA direct load over USB using Altera Binary File(*.rbf)
 FMR page   Flash Memory reads (DSAV page 1,,10), 11=Network, 0=Consants
 FMR adr 1  Flash Memory Reads 256 bytes ATMEL FLASH, (Addr(D) * 256)
Misc
 RD adr     Read Addr (hex even addr), returns data16(H)
 WR a d     Wr Addr(hex even addr), writes d=Data16(H)
 Help       HE and H1
 RESET      Hardware Reset of Ethernet, FPGA, then soft restart
 USB        If USB fails after uC reboot. Disconnect/Connect USB cable
h1
SeaQuest Level Adapter FPGA Address Map, BaseAddr(0xA0000000)
  OFFSET     Description
   FPGA TEST
    0x0      Test Reg Hi/Lo byte, for r/w tests
    0x6      Pulser, ~1Hz per count. (0=stop)
   FPGA DAC0
    0x0A     DAC0 Hi/Lo byte of 8-ch Threshold dac, data= nXXX (n=0-7)
             DAC0 data as 0340,1340,2340,3340,4340,5340,6340,7340
   FPGA DAC1
    0x0B     DAC1 Hi/Lo byte 4-ch dac, d= nXXX, n=2(IBLR),6(TREFE),A(TREF0)
             DAC1 data as 2930,6C00,AC00

    0x0D     Link CSR(8..0)  txf rfff rffe dcrf dcre prtBsy dsWr dsErr bErr
    0x0E     Link ADDR(3..0) dir 3vEna term dir(1=xmt)
```

Most commonly used commands

- Hm = make board w/Ethernet buss master – returns number of boards connected to master (1-N, with 1 furthest from master & N closest).
- Wt ch d (wt 8 1000)
  - Write threshold
  - Ch=0-7 is ASDQ #; 8 is all
  - d is a base-10 number 0-4095
    - Nominal threshold is 832.
- Wc 1 d = set TREFE=d (0-4095)
- Wc 2 d = set TREF0=d
- Wr 6 f = pulse ASDQ cards with frequency = f/sec.
- Mo [0] = read monitored voltages & temps (w/interpretation if 0 is included)
- Rdac [0] = read DACs (w/interpretation of 0 is included)
- To address a board other than the master:
  - Hc n command (hc 5 mo 0); n=board number
  - Broadcast command (including master) if n=0.

Examples (mo)

```
dcc@PPD110028 ~
$ telnet 192.168.24.60 5000
Trying 192.168.24.60...
Connected to 192.168.24.60 (192.168.24.60).
Escape character is '^]'.
hm
hBus Master, (reset to exit this mode), Sending hBus Init
hBusCfg: BrdCnt= 18
mo 0
 TempC     = 30.0
 5.0v__Pos=  5.01v          (Ch00) 566 *  8.86mV/bit
 3.3v__Pos=  3.14v FUSE     (Ch01) 531 *  5.92mV/bit
 0.85v_Pos=  0.69v FUSE     (Ch04) 230 *  2.98mV/bit
 5.0v__Neg=  4.98v          (Ch02) 417 * 11.94mV/bit
 3.3vA_Neg=  3.12v FUSE     (Ch05) 350 *  8.92mV/bit
 3.3vB_Neg=  3.12v FUSE     (Ch14) 350 *  8.92mV/bit
 3.3v_Digi=  3.36v          (Ch15) 570 *  5.89mV/bit
 1.2v_Digi=  1.20v          (Ch03) 400 *  3.00mV/bit
hc 17 mo 0
 TempC     = 34.0
 5.0v__Pos=  4.98v          (Ch00) 562 *  8.86mV/bit
 3.3v__Pos=  3.20v FUSE     (Ch01) 540 *  5.92mV/bit
 0.85v_Pos=  0.77v FUSE     (Ch04) 257 *  2.98mV/bit
 5.0v__Neg=  5.07v          (Ch02) 425 * 11.94mV/bit
 3.3vA_Neg=  3.11v FUSE     (Ch05) 349 *  8.92mV/bit
 3.3vB_Neg=  0.00v FUSE     (Ch14)   0 *  8.92mV/bit  Warning
 3.3v_Digi=  3.31v          (Ch15) 562 *  5.89mV/bit
 1.2v_Digi=  1.21v          (Ch03) 404 *  3.00mV/bit
mo
0099 30.0  5.01  3.14  0.68  4.98  3.12  3.11  3.35  1.21
hc 17 mo
0017 34.0  4.99  3.21  0.77  5.09  3.12  0.00  3.31  1.22
```

Note blown fuse on board 17!

Examples (rdac)

```
rdac 0
dac_0 registers
  ch0= 832 cnts  ~ 208mV @ card
  ch1= 832 cnts  ~ 208mV @ card
  ch2= 832 cnts  ~ 208mV @ card
  ch3= 832 cnts  ~ 208mV @ card
  ch4= 832 cnts  ~ 208mV @ card
  ch5= 832 cnts  ~ 208mV @ card
  ch6= 832 cnts  ~ 208mV @ card
  ch7= 832 cnts  ~ 208mV @ card
dac_1 registers
  ch0=2700 cnts  IBLR
  ch1=3072 cnts  TREFE
  ch2=3072 cnts  TREF0
rdac
0099 0832 0832 0832 0832 0832 0832 0832 0832 2700 3072 3072
hc 17 rdac 0
dac_0 registers
  ch0= 832 cnts  ~ 208mV @ card
  ch1= 832 cnts  ~ 208mV @ card
  ch2= 832 cnts  ~ 208mV @ card
  ch3= 832 cnts  ~ 208mV @ card
  ch4= 832 cnts  ~ 208mV @ card
  ch5= 832 cnts  ~ 208mV @ card
  ch6= 832 cnts  ~ 208mV @ card
  ch7= 832 cnts  ~ 208mV @ card
dac_1 registers
  ch0=2700 cnts  IBLR
  ch1=3072 cnts  TREFE
  ch2=3072 cnts  TREF0
hc 17 rdac
0017 0832 0832 0832 0832 0832 0832 0832 0832 2700 3072 3072
```