Documentation for Rabbit 4300 interface with HMR3500 and Digi-quartz pressure sensor

Connections:

HMR3500 : Vdd to 3.3V

GND to ground

Use serial C on board

Digi quartz transducer uses Serial D on RCM board

MOBY Blue spectrograph synch uses PE0

MOBY Red spectrograph synch uses PE1

New BSG shutter synch uses PE4

New RSG shutter synch uses PE5

For both of these control lines, 3.3V is shutter closed, 0V is shutter open.

Internet connection

I have to have the IP address on my mac to somewhere in the right domain…such as 192.168.0.1.

I have the subnet on my mac set at 255.255.255.0

The address of this rabbit is 192.168.0.120. I can telnet into it from my mac using a terminal window (command is telnet 192.168.0.7)

There are 4 commands that can be sent…presently the commands have to be upper case..could make it accept either, but why bother as it is a computer that will be sending the messages anyway and won’t make mistakes.

1) set time on rabbit

Tssmmhhddmoyyy is the format

Expects 14 characters, if you don’t send it in this format program just waits for another command…. The three year numbers are added to 1900 to get year (i.e. to get 2016, 116 should be put in for yyy).

2) IR

this is an instant pressure and temperature reading, returns one temperature and pressure reading.

3)TDXXXYYYZZZVVV

this is a timed collect data where XXX is the shutter time for the new blue spectrograph (need all three digits) in seconds, YYY is the shutter time for the new red spectrograph in seconds. ZZZ is the shutter time for the MOS Blue spec, and VVV is the shutter time for the MOS red spec. When it finishes it returns the mean, std, max, and min for each spec over this period. If either was zero it doesn't return anything for that spectrograph.

4) CD

collects data when shutter control lines tell it shutter is open. All control lines have to be high to start with (or returns an error message).

When any shutter synch line goes low, the program starts accumulating data for the appropriate SG. The accumulation continues for that SG as long as the synch line for that spec stays low (and is interrupted whenever the synch line for that SG is high). When all the shutter synch lines are simultaneously high, or after a maximum of 5 minutes, the accumulation stops and the results are returned.

If the CD command is sent, Rabbit will wait for 2 minutes for one of the shutters to do something. If nothing happens, the Rabbit will leave this command and return an error message.

Note…if the shutter synch for a particular SG never goes low, no data is reported for that SG.

5) TSsss where sss is number of seconds to collect.

This command will take a timeseries of up to 999 seconds (tested up to 300) of data and spit it out continually to the Ethernet line.

Sample Session

Bold is command sent to Rabbit over Ethernet, italic are notes written afterwards.

Last login: Mon Jun 29 15:15:23 on ttys000

Kenneth-Voss-computer-3:~ kennethvoss$ telnet 192.168.0.120

Trying 192.168.0.120...

Connected to 192.168.0.120.

Escape character is '^]'.

05/29/2015 12:0:0

**T0036163006115** */example set time command*

06/30/2015 16:36:0

**IR** *//example immediate return command*

06/30/2015 16:36:8

Blue spec

pitch(deg) Mean,Std,Count,Max,Min

-0.373547, 999, 1, -10000.000000, 10000.000000

roll(deg) Mean,Std,Count,Max,Min

0.725120, 999, 1, -10000.000000, 10000.000000

azimuth(deg) Mean,Std,Count,Max,Min

-154.637191, 999, 1, -10000.000000, 10000.000000

forward Mean,Std,Count,Max,Min

26.999998, 999, 1, -10000.000000, 10000.000000

right Mean,Std,Count,Max,Min

51.999996, 999, 1, -10000.000000, 10000.000000

up Mean,Std,Count,Max,Min

-4093.999750, 999, 1, -10000.000000, 10000.000000

pressure (bar) Mean,Std,Count,Max,Min

1.008823, 999, 1, -1000.000000, 1000.000000

Red spec

pitch(deg) Mean,Std,Count,Max,Min

-0.373547, 999, 1, -10000.000000, 10000.000000

roll(deg) Mean,Std,Count,Max,Min

0.725120, 999, 1, -10000.000000, 10000.000000

azimuth(deg) Mean,Std,Count,Max,Min

-154.637191, 999, 1, -10000.000000, 10000.000000

forward Mean,Std,Count,Max,Min

26.999998, 999, 1, -10000.000000, 10000.000000

right Mean,Std,Count,Max,Min

51.999996, 999, 1, -10000.000000, 10000.000000

up Mean,Std,Count,Max,Min

-4093.999750, 999, 1, -10000.000000, 10000.000000

pressure (bar) Mean,Std,Count,Max,Min

1.008823, 999, 1, -1000.000000, 1000.000000

MOS Blue spec

pitch(deg) Mean,Std,Count,Max,Min

-0.373547, 999, 1, -10000.000000, 10000.000000

roll(deg) Mean,Std,Count,Max,Min

0.725120, 999, 1, -10000.000000, 10000.000000

azimuth(deg) Mean,Std,Count,Max,Min

-154.637191, 999, 1, -10000.000000, 10000.000000

forward Mean,Std,Count,Max,Min

26.999998, 999, 1, -10000.000000, 10000.000000

right Mean,Std,Count,Max,Min

51.999996, 999, 1, -10000.000000, 10000.000000

up Mean,Std,Count,Max,Min

-4093.999750, 999, 1, -10000.000000, 10000.000000

pressure (bar) Mean,Std,Count,Max,Min

1.008823, 999, 1, -1000.000000, 1000.000000

MOS Red spec

pitch(deg) Mean,Std,Count,Max,Min

-0.373547, 999, 1, -10000.000000, 10000.000000

roll(deg) Mean,Std,Count,Max,Min

0.725120, 999, 1, -10000.000000, 10000.000000

azimuth(deg) Mean,Std,Count,Max,Min

-154.637191, 999, 1, -10000.000000, 10000.000000

forward Mean,Std,Count,Max,Min

26.999998, 999, 1, -10000.000000, 10000.000000

right Mean,Std,Count,Max,Min

51.999996, 999, 1, -10000.000000, 10000.000000

up Mean,Std,Count,Max,Min

-4093.999750, 999, 1, -10000.000000, 10000.000000

pressure (bar) Mean,Std,Count,Max,Min

1.008823, 999, 1, -1000.000000, 1000.000000

**TD001002003004** *//example of TD command*

BSG,RSG,MBSG,MRSG started 06/30/2015 16:36:21

BSG ended 06/30/2015 16:36:22

RSG ended 06/30/2015 16:36:23

MBSG ended 06/30/2015 16:36:24

MRSG ended 06/30/2015 16:36:25

Blue spec

pitch(deg) Mean,Std,Count,Max,Min

-0.406506, 0.013455, 7, -0.401013, -0.439467

roll(deg) Mean,Std,Count,Max,Min

0.731398, 0.015378, 7, 0.769066, 0.725120

azimuth(deg) Mean,Std,Count,Max,Min

-154.918899, 999, 7, 205.208175, 204.785202

forward Mean,Std,Count,Max,Min

29.428572, 1.049781, 7, 32.000000, 29.000000

right Mean,Std,Count,Max,Min

52.428569, 1.049781, 7, 55.000000, 52.000000

up Mean,Std,Count,Max,Min

-4091.428460, 1.049781, 7, -4091.000000, -4094.000000

pressure (bar) Mean,Std,Count,Max,Min

1.008760, 0.000092, 7, 1.008823, 1.008604

Red spec

pitch(deg) Mean,Std,Count,Max,Min

-0.406140, 0.013071, 15, -0.401013, -0.439467

roll(deg) Mean,Std,Count,Max,Min

0.720725, 0.017624, 15, 0.769066, 0.697653

azimuth(deg) Mean,Std,Count,Max,Min

-154.894271, 999, 15, 205.318038, 204.785202

forward Mean,Std,Count,Max,Min

29.400000, 1.019804, 15, 32.000000, 29.000000

right Mean,Std,Count,Max,Min

51.666667, 1.247219, 15, 55.000000, 50.000000

up Mean,Std,Count,Max,Min

-4091.199950, 0.748331, 15, -4091.000000, -4094.000000

pressure (bar) Mean,Std,Count,Max,Min

1.008739, 0.000099, 15, 1.008823, 1.008604

MOS Blue spec

pitch(deg) Mean,Std,Count,Max,Min

-0.397192, 0.017629, 23, -0.373547, -0.439467

roll(deg) Mean,Std,Count,Max,Min

0.713894, 0.019605, 23, 0.769066, 0.670186

azimuth(deg) Mean,Std,Count,Max,Min

-154.835433, 999, 23, 205.499313, 204.785202

forward Mean,Std,Count,Max,Min

28.739130, 1.325909, 23, 32.000000, 27.000000

right Mean,Std,Count,Max,Min

51.173915, 1.403479, 23, 55.000000, 48.000000

up Mean,Std,Count,Max,Min

-4091.782470, 1.317327, 23, -4091.000000, -4094.000000

pressure (bar) Mean,Std,Count,Max,Min

1.008712, 0.000102, 23, 1.008823, 1.008604

MOS Red spec

pitch(deg) Mean,Std,Count,Max,Min

-0.393748, 0.017615, 31, -0.373547, -0.439467

roll(deg) Mean,Std,Count,Max,Min

0.710589, 0.019660, 31, 0.769066, 0.670186

azimuth(deg) Mean,Std,Count,Max,Min

-154.813705, 999, 31, 205.581710, 204.785202

forward Mean,Std,Count,Max,Min

28.483870, 1.316667, 31, 32.000000, 27.000000

right Mean,Std,Count,Max,Min

50.935482, 1.412741, 31, 55.000000, 48.000000

up Mean,Std,Count,Max,Min

-4091.483640, 1.478250, 31, -4089.000000, -4094.000000

pressure (bar) Mean,Std,Count,Max,Min

1.008695, 0.000099, 31, 1.008823, 1.008604

**CD** *//example where all the specs start at some time*

BSG has started 06/30/2015 16:36:37

MRSG has started 06/30/2015 16:36:37

RSG has started 06/30/2015 16:36:38

MBSG has started 06/30/2015 16:36:54

RSG ended 06/30/2015 16:36:57

MBSG ended 06/30/2015 16:37:0

MRSG ended 06/30/2015 16:37:2

BSG ended 06/30/2015 16:37:2

Blue spec

pitch(deg) Mean,Std,Count,Max,Min

-0.385210, 0.019595, 211, -0.329600, -0.439467

roll(deg) Mean,Std,Count,Max,Min

0.705464, 0.014760, 211, 0.725120, 0.670186

azimuth(deg) Mean,Std,Count,Max,Min

-154.833816, 999, 211, 205.795944, 204.576461

forward Mean,Std,Count,Max,Min

27.862558, 1.405834, 211, 32.000000, 24.000000

right Mean,Std,Count,Max,Min

50.568721, 1.074816, 211, 52.000000, 48.000000

up Mean,Std,Count,Max,Min

-4092.635250, 1.577238, 211, -4091.000000, -4097.000000

pressure (bar) Mean,Std,Count,Max,Min

1.008736, 0.000101, 211, 1.009001, 1.008426

Red spec

pitch(deg) Mean,Std,Count,Max,Min

-0.386495, 0.019067, 154, -0.329600, -0.439467

roll(deg) Mean,Std,Count,Max,Min

0.705501, 0.014918, 154, 0.725120, 0.670186

azimuth(deg) Mean,Std,Count,Max,Min

-154.849929, 999, 154, 205.642135, 204.631393

forward Mean,Std,Count,Max,Min

27.954546, 1.369145, 154, 32.000000, 24.000000

right Mean,Std,Count,Max,Min

50.571430, 1.086261, 154, 52.000000, 48.000000

up Mean,Std,Count,Max,Min

-4092.733880, 1.558563, 154, -4091.000000, -4097.000000

pressure (bar) Mean,Std,Count,Max,Min

1.008736, 0.000101, 154, 1.009001, 1.008426

MOS Blue spec

pitch(deg) Mean,Std,Count,Max,Min

-0.380009, 0.021057, 51, -0.329600, -0.401013

roll(deg) Mean,Std,Count,Max,Min

0.707886, 0.014350, 51, 0.725120, 0.670186

azimuth(deg) Mean,Std,Count,Max,Min

-154.858016, 999, 51, 205.795944, 204.631393

forward Mean,Std,Count,Max,Min

27.490194, 1.486838, 51, 29.000000, 24.000000

right Mean,Std,Count,Max,Min

50.745098, 1.044934, 51, 52.000000, 48.000000

up Mean,Std,Count,Max,Min

-4093.000000, 1.533929, 51, -4091.000000, -4097.000000

pressure (bar) Mean,Std,Count,Max,Min

1.008726, 0.000103, 51, 1.008823, 1.008426

MOS Red spec

pitch(deg) Mean,Std,Count,Max,Min

-0.385210, 0.019595, 211, -0.329600, -0.439467

roll(deg) Mean,Std,Count,Max,Min

0.705464, 0.014760, 211, 0.725120, 0.670186

azimuth(deg) Mean,Std,Count,Max,Min

-154.833816, 999, 211, 205.795944, 204.576461

forward Mean,Std,Count,Max,Min

27.862558, 1.405834, 211, 32.000000, 24.000000

right Mean,Std,Count,Max,Min

50.568721, 1.074816, 211, 52.000000, 48.000000

up Mean,Std,Count,Max,Min

-4092.635250, 1.577238, 211, -4091.000000, -4097.000000

pressure (bar) Mean,Std,Count,Max,Min

1.008736, 0.000101, 211, 1.009001, 1.008426

**CD** *//example showing only two specs operating*

BSG has started 06/30/2015 16:37:14

MRSG has started 06/30/2015 16:37:14

MRSG ended 06/30/2015 16:37:17

BSG ended 06/30/2015 16:37:17

Blue spec

pitch(deg) Mean,Std,Count,Max,Min

-0.386837, 0.013726, 31, -0.373547, -0.401013

roll(deg) Mean,Std,Count,Max,Min

0.701197, 0.011552, 31, 0.725120, 0.670186

azimuth(deg) Mean,Std,Count,Max,Min

-154.864547, 999, 31, 205.471847, 204.812667

forward Mean,Std,Count,Max,Min

27.967741, 0.999480, 31, 29.000000, 27.000000

right Mean,Std,Count,Max,Min

50.258068, 0.841187, 31, 52.000000, 48.000000

up Mean,Std,Count,Max,Min

-4092.354730, 1.492959, 31, -4091.000000, -4094.000000

pressure (bar) Mean,Std,Count,Max,Min

1.008743, 0.000111, 31, 1.008823, 1.008405

MOS Red spec

pitch(deg) Mean,Std,Count,Max,Min

-0.386837, 0.013726, 31, -0.373547, -0.401013

roll(deg) Mean,Std,Count,Max,Min

0.701197, 0.011552, 31, 0.725120, 0.670186

azimuth(deg) Mean,Std,Count,Max,Min

-154.864547, 999, 31, 205.471847, 204.812667

forward Mean,Std,Count,Max,Min

27.967741, 0.999480, 31, 29.000000, 27.000000

right Mean,Std,Count,Max,Min

50.258068, 0.841187, 31, 52.000000, 48.000000

up Mean,Std,Count,Max,Min

-4092.354730, 1.492959, 31, -4091.000000, -4094.000000

pressure (bar) Mean,Std,Count,Max,Min

1.008743, 0.000111, 31, 1.008823, 1.008405

**CD** *//example where I sent command and didn't do anything for 2 minutes*

can only wait 2 minutes after sending CD before shutters start

**IR** *//here showing it worked again after the timeout above*

06/30/2015 16:39:43

Blue spec

pitch(deg) Mean,Std,Count,Max,Min

-0.373547, 999, 1, -10000.000000, 10000.000000

roll(deg) Mean,Std,Count,Max,Min

0.697653, 999, 1, -10000.000000, 10000.000000

azimuth(deg) Mean,Std,Count,Max,Min

-154.653671, 999, 1, -10000.000000, 10000.000000

forward Mean,Std,Count,Max,Min

26.999998, 999, 1, -10000.000000, 10000.000000

right Mean,Std,Count,Max,Min

49.999996, 999, 1, -10000.000000, 10000.000000

up Mean,Std,Count,Max,Min

-4093.999750, 999, 1, -10000.000000, 10000.000000

pressure (bar) Mean,Std,Count,Max,Min

1.009001, 999, 1, -1000.000000, 1000.000000

Red spec

pitch(deg) Mean,Std,Count,Max,Min

-0.373547, 999, 1, -10000.000000, 10000.000000

roll(deg) Mean,Std,Count,Max,Min

0.697653, 999, 1, -10000.000000, 10000.000000

azimuth(deg) Mean,Std,Count,Max,Min

-154.653671, 999, 1, -10000.000000, 10000.000000

forward Mean,Std,Count,Max,Min

26.999998, 999, 1, -10000.000000, 10000.000000

right Mean,Std,Count,Max,Min

49.999996, 999, 1, -10000.000000, 10000.000000

up Mean,Std,Count,Max,Min

-4093.999750, 999, 1, -10000.000000, 10000.000000

pressure (bar) Mean,Std,Count,Max,Min

1.009001, 999, 1, -1000.000000, 1000.000000

MOS Blue spec

pitch(deg) Mean,Std,Count,Max,Min

-0.373547, 999, 1, -10000.000000, 10000.000000

roll(deg) Mean,Std,Count,Max,Min

0.697653, 999, 1, -10000.000000, 10000.000000

azimuth(deg) Mean,Std,Count,Max,Min

-154.653671, 999, 1, -10000.000000, 10000.000000

forward Mean,Std,Count,Max,Min

26.999998, 999, 1, -10000.000000, 10000.000000

right Mean,Std,Count,Max,Min

49.999996, 999, 1, -10000.000000, 10000.000000

up Mean,Std,Count,Max,Min

-4093.999750, 999, 1, -10000.000000, 10000.000000

pressure (bar) Mean,Std,Count,Max,Min

1.009001, 999, 1, -1000.000000, 1000.000000

MOS Red spec

pitch(deg) Mean,Std,Count,Max,Min

-0.373547, 999, 1, -10000.000000, 10000.000000

roll(deg) Mean,Std,Count,Max,Min

0.697653, 999, 1, -10000.000000, 10000.000000

azimuth(deg) Mean,Std,Count,Max,Min

-154.653671, 999, 1, -10000.000000, 10000.000000

forward Mean,Std,Count,Max,Min

26.999998, 999, 1, -10000.000000, 10000.000000

right Mean,Std,Count,Max,Min

49.999996, 999, 1, -10000.000000, 10000.000000

up Mean,Std,Count,Max,Min

-4093.999750, 999, 1, -10000.000000, 10000.000000

pressure (bar) Mean,Std,Count,Max,Min

1.009001, 999, 1, -1000.000000, 1000.000000