

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

REVISION HISTORY			
Revision Level	Effective Date	Initiator	ECO Number
A	11/2/2012	J.Villegas	ECO-002851
B	3/6/2013	J.Villegas	ECO-002946
C	4/12/2013	J.Villegas	ECO-003172
Section Number	Description and Justification of Changes		
ALL	Release to production		
ALL	Add references to sub-mounted without DO Sensor and float mounted versions. Add freshwater flush step to clean saltwater from system. Add details for checking PIB configuration. Add Checklist table.		
ALL	Add flowchart. Add a Check of Calibration Coefficients. Add Bench Test section. Added instructions regarding Sample Interval value for Vehicle Integration depending on whether a DO Sensor is included or not. Updated Flush command instructions.		

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

TABLE OF CONTENTS

1	PURPOSE	3
2	SCOPE	3
3	RESPONSIBILITIES	3
4	REFERENCES	3
5	REQUIRED MATERIALS AND EQUIPMENT	3
6	SAFETY REQUIREMENTS	3
7	FLOWCHART	4
8	HOW TO CONNECT TO THE GPCTD THROUGH SERIAL COMMUNICATION WITH A PC USING THE SEATERM SOFTWARE	5
8.1	Setting up a PC with the Required Software	5
8.2	Connecting the GPCTD to the PC	5
8.3	Connecting with SeaTerm	7
9	CHECKING CALIBRATION VALUES AND FIRMWARE VERSION	9
9.1	Check Calibration Values on GPCTD against Seabird Reports	9
9.2	Check Firmware Version of the GPCTD	10
10	ASSEMBLE COMPONENTS	10
11	BENCH TEST COMPARISON WITH GOLDEN UNIT	10
11.1	Bench Test Set-up	10
11.2	Configuring the GPCTDs with SeaTerm for Bench Test	11
11.3	Component Bench Testing with Tera Term	13
12	SYSTEM INTEGRATION AND TEST	16
12.1	Configuring the GPCTDs with SeaTerm for System Integration	16
12.2	Sub-Mounted System Test Set-Up	17
12.3	Float Mounted System Test Set-Up	18
12.4	Checking the PIB Configuration	19
12.5	System Test through WGMS	21
13	CHECKLIST	43

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

1 PURPOSE

This document provides detailed instructions on how to inspect, configure, and test the GPCTD (PN 01583) with and without DO Sensor (PN 02858) prior to integration and deployment.

2 SCOPE

This procedure applies to all GPCTD modules configured and integrated at Liquid Robotics headquarters and includes a checklist at the end of the document.

3 RESPONSIBILITIES

It is the responsibility of manufacturing technicians and engineers to configure and test the GPCTD as outlined in this document. Each set-up and configuration log created shall be recorded archived for the purposes of maintaining product history.

4 REFERENCES

- Seabird Electronics User Manual for *Glider Payload CTD (GPCTD) and Optional Dissolved Oxygen (DO) Sensor*. (The manual is attached to PN 02858 and also available on each CD included with each kit)
- Seabird Calibration Reports (included in box of each GPCTD kit)
- 070-03971 MPI, GPCTD-DO, GLIDER INTEGRATION 03729
- 070-04198 MPI, GPCTD, GLIDER INTEGRATION, 04197
- 070-04365 MPI, FLOAT MOUNTED GPCTD, 04294
- 070-04366 MPI, FLOAT MOUNTED GPCTD-DO, 03387
- 070-03970 MPI, REWORK, FW UPDATE, GPCTD

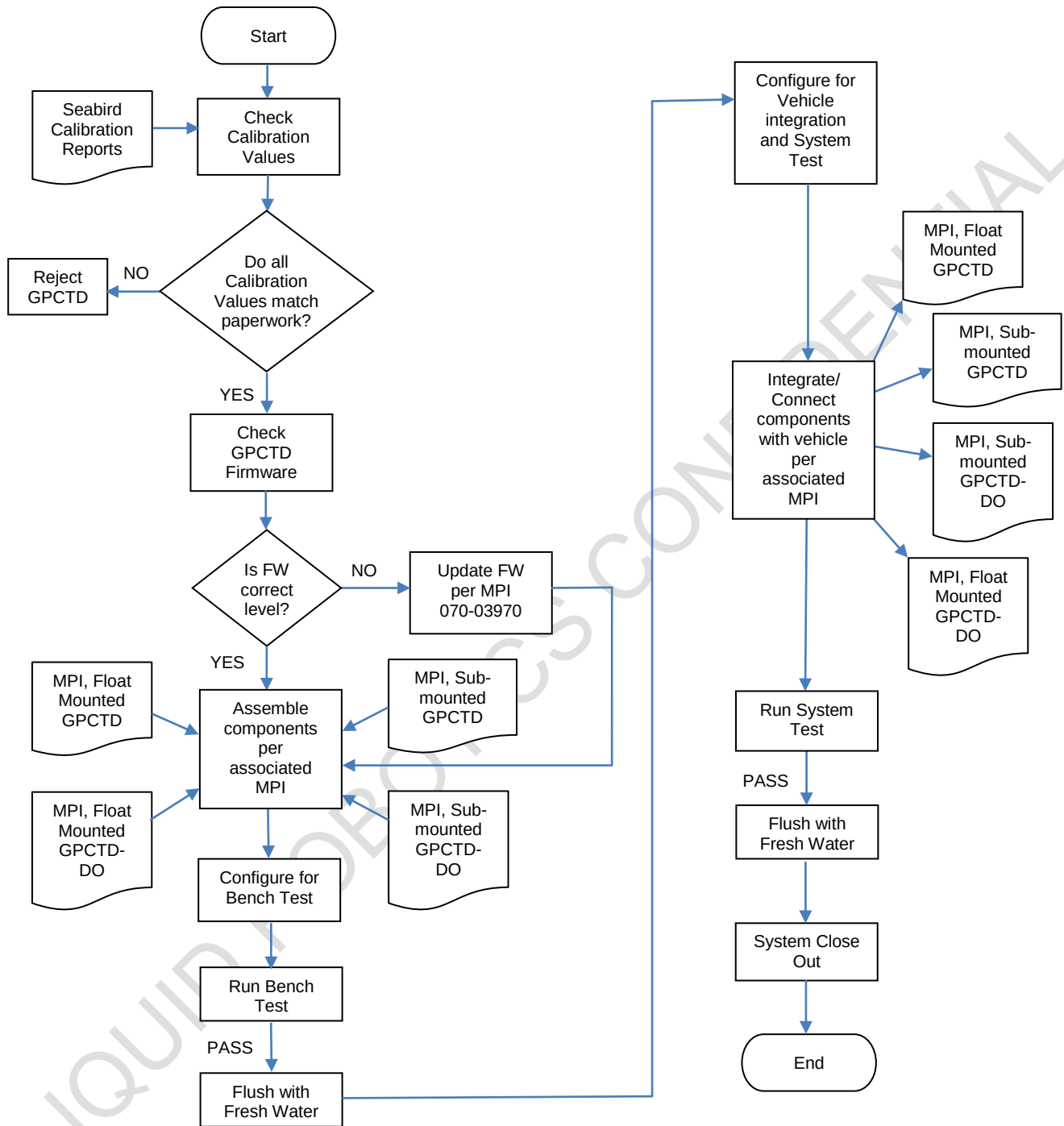
5 REQUIRED MATERIALS AND EQUIPMENT

- Test PC with DSub-9 com port or DSub9-to-USB adaptor
- Seabird Software CD with SeatermV2 application (comes with each Sensor Kit and only required for one-time installation on Test PC)
- Tera Term Software Application
- I/O Cable with 4-pin IE55 to DB-9S Serial Connector and external power jack input (4X)
- 12V Computer Power Supply with Power Jack (4X)
- 4-Port Serial hub
- Water Tank with Saltwater Solution
- Water Tank with Fresh Water
- Circulating Water Pump for Water Tank
- CTD Cable Assy, 8PIN MALE TO 4PIN IE55 from Kit (PN 01674)
- Gloves

6 SAFETY REQUIREMENTS

Warning: Hazardous Materials from Anti-Foulant Devices are present on the CTD. Corrosive - Causes irreversible eye damage and skin burns. Harmful if swallowed. Harmful if absorbed through the skin or inhaled. Prolonged or frequently repeated contact may cause allergic reactions in some individuals. Wash thoroughly with soap and water after handling. Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Wear protective gloves (rubber or latex), goggles or other eye protection, and clothing to minimize contact.

7 FLOWCHART



	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

8 HOW TO CONNECT TO THE GPCTD THROUGH SERIAL COMMUNICATION WITH A PC USING THE SEATERM SOFTWARE

8.1 Setting up a PC with the Required Software

Follow the installation instructions provided in Section 3 of the Seabird GPCTD User Manual using the CD provided by Seabird.



Software, and Electronic Copies of
Software Manuals and User Manual

Figure 1

OR use the following Seabird ftp link to download the latest version of the program:

<ftp://ftp.halcyon.com/pub/seabird/OUT/SeasoftV2/TerminalPrograms/SeatermV2/>

8.2 Connecting the GPCTD to the PC

- 8.2.1 Apply Silicone Spray (PN 01857) to the end of the connector of the I/O cable and connect it to the 4-Pin receptacle on the CTD. Be sure to fully seat the connector and hand-tighten the retaining sleeve.



Figure 2

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

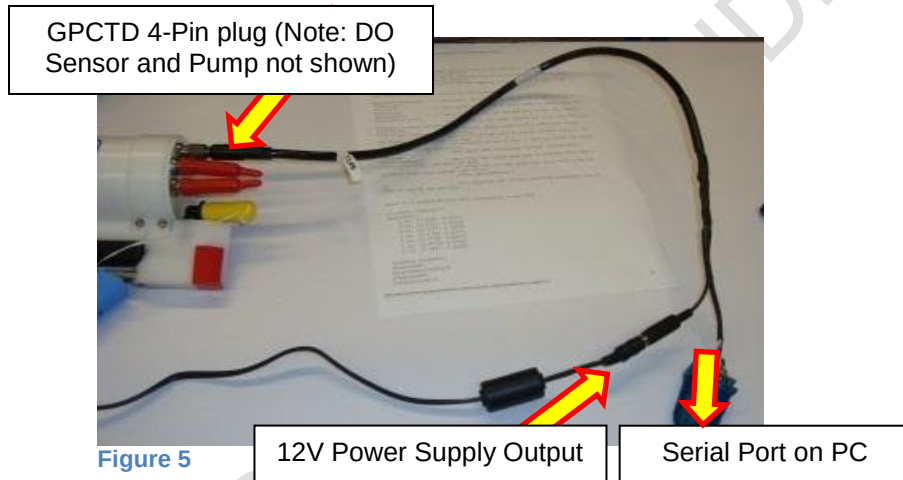
- 8.2.2 Connect the I/O cable to the CTD. Connect the Serial Port connector directly to the PC. Connect a 12V power supply into the power jack input. Refer to Figure 6 for connection diagram.



Figure 3: Computer Power Supply with 12V Output



Figure 4: I/O Cable with DSub and Power Input



- 8.2.3 Confirm that the PC sees the serial connection and assigns a COM Port. Note that the GPCTD initial factory settings for the serial connection COM Port should be Baud (or Bits per Second) = 9600, Parity = none, Data bits = 8, Stop Bits = 1. This can be checked, if needed, in Windows Device Manager, select the COM Port, then Right Click->Properties.

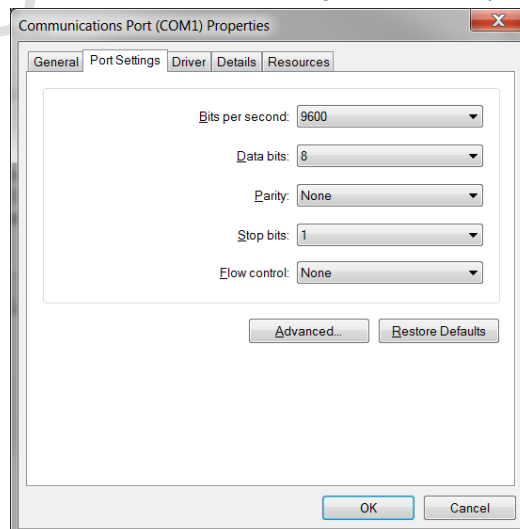


Figure 6

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

8.3 Connecting with SeaTerm

8.3.1 Double click on SeatermV2.exe to launch the application. The main screen appears.

8.3.2 In the Instruments menu, select SBE Glider Payload CTD.



Figure 7

8.3.3 Seaterm232 opens.

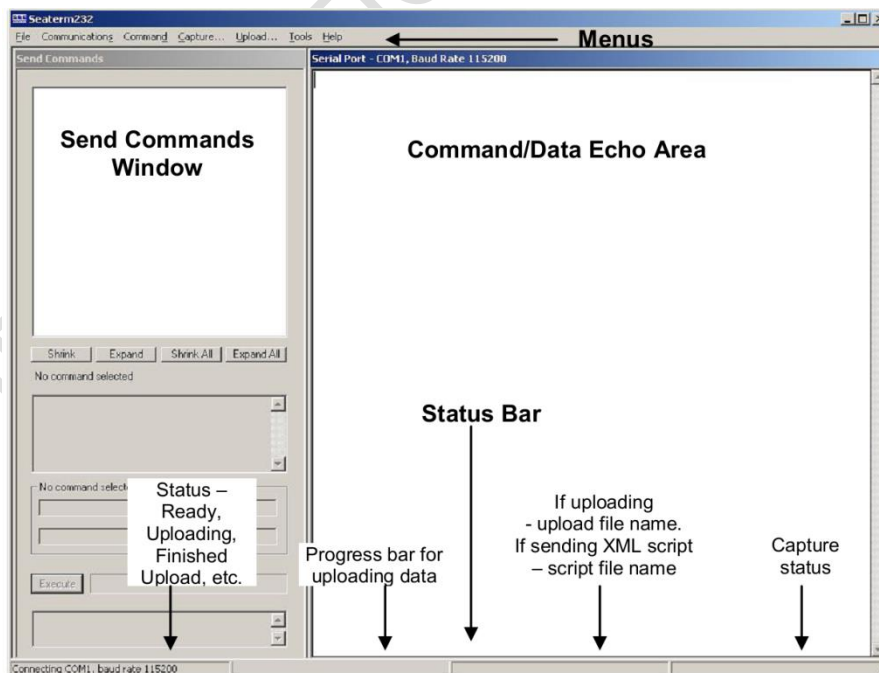


Figure 8

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

- 8.3.4 Seaterm232 tries to automatically connect to the GPCTD. (Note: If this is the first time Seaterm232 is being used, the Serial Port Configuration dialog box displays as shown in Figure 10. Select the COM Port and 9600 Baud then continue). As it connects, it sends GetHD and displays the response. Seaterm232 also fills the Send Commands window with the correct list of commands for the GPCTD.

If there is no communication, try the following:

A. In the Communications menu, select Configure. The Serial Port Configuration dialog box appears. Select the COM port of the device and set the baud rate to 9600 for communication, and click OK. Refer to Figure below.

B. In the Communications menu, select Connect (if Connect is grayed out, select Disconnect and reconnect). Seaterm232 will attempt to connect at the baud specified in Step A, but if unsuccessful will then cycle through all other available baud rates.

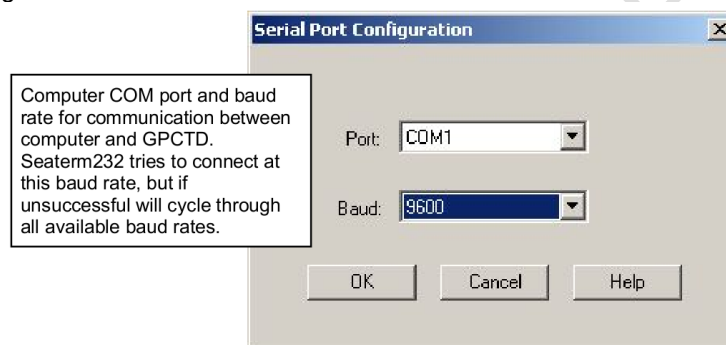


Figure 9

C. If there is still no communication, check cabling between the computer and GPCTD. Disconnect power and reconnect to try and establish a connection.

D. If there is still no communication, repeat Step A with a different COM port, and try to connect again.

- 8.3.5 Once communication is established, if sampling autonomously, where the system comes up and is sampling data as soon as it is powered on (this is the default setting from the factory), data will be displayed as shown below in the Command/Data Echo area (terminal window).

```
<!--start logging-->
<Executed/>
0.04, 23.2686, 0.00003
0.04, 23.2711, 0.00002
0.04, 23.2741, 0.00002
0.04, 23.2769, 0.00003
0.04, 23.2788, 0.00002
0.04, 23.2814, 0.00002
0.04, 23.2847, 0.00002
```

- 8.3.6 Command the GPCTD to stop logging by pressing the Enter key, typing **Stop**, and pressing the Enter key again. Note: The command "stop" will not be shown in the terminal window.

- 8.3.7 The terminal window will report that the logging stopped. <logging stopped/>

- 8.3.8 If the unit is not sampling autonomously, press the Enter key until a prompt appears.

9 CHECKING CALIBRATION VALUES AND FIRMWARE VERSION

9.1 Check Calibration Values on GPCTD against Seabird Reports

9.1.1 From the command prompt in Seaterm, display the Firmware Version and Calibration Values on the unit by typing **DC** and pressing the Enter key. This displays the version, serial number, and calibration coefficients which are initially factory-set and should agree with Calibration Certificates shipped with GPCTD. The display will appear as shown on the left hand side:

S>DC

SBE Glider Payload CTD V 1.0A 41

temperature: 03-Nov-11

TA0 = -1.304146e-04

TA1 = 3.131112e-04

TA2 = -4.987268e-06

TA3 = 2.152378e-07

conductivity: 03-Nov-11

G = -9.810920e-01

H = 1.507981e-01

I = -3.919903e-04

J = 5.111417e-05

CPCOR = -9.570000e-08

CTCOR = 3.250000e-06

WBOTC = 1.955789e-07

pressure S/N 3220332, range = 44 psia 02-Nov-11

PA0 = 1.069121e-02

PA1 = 1.532532e-04

PA2 = -1.169700e-11

PTCA0 = 5.276172e+05

PTCA1 = 7.284800e+00

PTCA2 = -1.775743e-01

PTCB0 = 2.504225e+01

PTCB1 = -5.500000e-04

PTCB2 = 0.000000e+00

PTEMPA0 = -7.607843e+01

PTEMPA1 = 4.898582e-02

PTEMPA2 = -3.131463e-07

POFFSET = 0.000000e+00

SBE 43 S/N 0215 16-Sep-11

FOFFSET = -8.081500e+02

SOC = 3.116600e-04

A = -3.002500e-03

B = 1.740500e-04

C = -2.939600e-06

E = 3.600000e-02

TAU20 = 1.370000e+00

D1 = 1.926340e-04

D2 = -4.648030e-02

H1 = -3.300000e-02

H2 = 5.000000e+03

H3 = 1.450000e+03

S>

FW Version 1.0A **CTD Serial No.** 41

SENSOR SERIAL NUMBER: 0041
CALIBRATION DATE: 03-Nov-11

ITS-90 COEFFICIENTS

a0 = -1.304146e-004
a1 = 3.131112e-004
a2 = -4.987268e-006
a3 = 2.152378e-007

SBE GLIDER PAYLOAD CTD
TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

SENSOR SERIAL NUMBER: 0041
CALIBRATION DATE: 03-Nov-11

COEFFICIENTS:

g = -9.813135e-001
h = 1.508818e-001
i = -4.163334e-004
j = 5.300949e-005

SBE GLIDER PAYLOAD CTD
CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

CPCor = -9.5700e-008
CTcor = 3.2500e-006
WBOTC = 1.9558e-007

Example of non-matching values

SENSOR SERIAL NUMBER: 0041
CALIBRATION DATE: 02-Nov-11

COEFFICIENTS:

PA0 = 1.069121e-002
PA1 = 1.532532e-004
PA2 = -1.169700e-011
PTEMPA0 = -7.607843e+001
PTEMPA1 = 4.898582e-002
PTEMPA2 = -3.131463e-007

SBE GLIDER PAYLOAD CTD
PRESSURE CALIBRATION DATA
44 psia S/N 3220332

PTCA0 = 5.276172e+005
PTCA1 = 7.284800e+000
PTCA2 = -1.775743e-001
PTCB0 = 2.504225e+001
PTCB1 = -5.500000e-004
PTCB2 = 0.000000e+000

SENSOR SERIAL NUMBER: 0215
CALIBRATION DATE: 16-Sep-11

COEFFICIENTS

Soc = 3.1166e-04 (adj)
Foffset = -808.15
Tau20 = 1.37

A = -3.0025e-003
B = 1.7405e-004
C = -2.9396e-006
E nominal = 0.036

SBE 43F OXYGEN CALIBRATION DATA

NOMINAL DYNAMIC COEFFICIENTS

D1 = 1.92634e-4
D2 = -4.64803e-2
H1 = -3.30000e-2
H2 = 5.00000e+3
H3 = 1.45000e+3

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

- 9.1.2 Check all Calibration Values of the above result with the corresponding Calibration Certificate for that Serial Number. Highlight and save the displayed results as a text file named *CTDCalib_serial number of sensor* and print a record for comparison. Mark the printout indicating that it has been checked against the paperwork.

9.2 Check Firmware Version of the GPCTD

- 9.2.1 From the **DC** results, confirm that the Firmware version of the “*SBE Glider Payload CTD X.X*” is the correct version 1.0A.
- 9.2.2 If the firmware is NOT version 1.0A, then a firmware update (or downgrade) to version 1.0A is required. Refer to Rework Instructions for updating firmware MPI 070-03970.

10 ASSEMBLE COMPONENTS

Referring to the associated MPI of the particular configuration being tested, assemble and connect the GPCTD, Pump, and DO Sensor with the appropriate tubing and cabling.

11 BENCH TEST COMPARISON WITH GOLDEN UNIT

This bench test compares readings from each GPCTD against a gold unit placed within the same saltwater tank. It will allow for verification that the values are reasonable against a known calibrated working unit. The units are first configured using SeaTerm. Then the test is conducted using Tera Term software, which can run up to 4 GPCTDs, including the gold unit, simultaneously and record the results from each unit.

11.1 Bench Test Set-up

- 11.1.1 Prepare saltwater in a tank to be used for the test run. Place a water pump in the saltwater tank to circulate the saltwater solution.
- 11.1.2 Prepare a separate freshwater tank to be used later for flushing the components of saltwater once testing has been completed.
- 11.1.3 Set-up the 4-Port Serial Hub near the Saltwater Tank and plug in power.
- 11.1.4 The (4X) 12V Power supplies are to be plugged in and ready for use.
- 11.1.5 The GPCTD components are to have been pre-assembled. Remove the inlet and outlet plugs from the CTD and pump. Retain these plugs for later use.



Figure 10

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	



Figure 11

11.2 Configuring the GPCTDs with SeaTerm for Bench Test

- 11.2.1 Using the same set-up as described in Section 8, connect to the GPCTD components using SeaTerm software and establish the command prompt.
- 11.2.2 Next, display GPCTD status information by typing **DS** and pressing the Enter key. The display result will look like this:

FW Version

```
SBE Glider Payload CTD 1.0A SERIAL NO. 12345 17 Jul 2012 09:38:22
vMain = 9.37, vLith = 3.04
autorun = yes
samplenum = 57, free = 559183, profiles = 3
not logging
sample every 1 seconds
sample mode is continuous
data format = raw Decimal
do not force on RS232 transmitter
transmit real time data
acquire SBE 43 oxygen
minimum conductivity frequency = 3011.0
custom pump mode disabled
```

- 11.2.3 Be sure to verify that FW version is 1.0A before proceeding.

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

11.2.4 The following reference Figure 12 shows each of the CTD parameters and the commands used to modify them.

<i>Example:</i> (user input in bold; command used to modify parameter in parentheses)	
DS	
SBE Glider Payload CTD 1.1 SERIAL NO. 12345 17 Jul 2012 09:38:22	[DateTime=]
vMain = 9.37, vLith = 3.04	
autorun = no	[AutoRun=]
samplenum = 57, free = 559183, profiles = 3	[reset with ResetLogging]
not logging, never started	
sample every 1 seconds	[Interval=]
sample mode is continuous	[based on Interval=]
data format = raw Decimal	[OutputFormat=]
do not force on RS232 transmitter	[RS232ForceOn=]
transmit real time data	[TxRealTime=]
acquire SBE 43 oxygen	[OxygenInstalled=]
minimum conductivity frequency = 3011.0	[MinCondFreq=]
custom pump mode disabled	[CustomPumpMode=]

Figure 12

11.2.5 Set the following CTD parameters required for the BENCH TEST by typing each of the following commands in case-sensitive text:

- 1) **OutputExecutedTag=N** : Tells the CTD to use 'S>' as the prompt instead of <Executed/>
- 2) **OutputFormat=1** : Tells the CTD the desired data format (Converted Engineering Units). This format allows for the data be human readable and later exported to be analyzed.
- 3) **Interval=1** : This is already the default sample setting. Change to 1 if needed.
- 4) **CustomPumpMode=Y** : Ensures the custom pump mode is enabled. This setting uses a little more power, but ensures the pump always uses the fast pump mode which helps keep the plumbing clear from bubbles that could affect measurements.
- 5) **Autorun=Y** : This is already on by default. Set to Yes if not already enabled.
- 6) **ResetLogging** : This command will initialize memory and reset the sample number back to zero and reset the profiles back to zero.
- 7) **ResetLogging** : This must be entered twice as instructed by the software to confirm.

11.2.6 Next, display GPCTD status information by typing **DS** and pressing the Enter key to check the parameters match those displayed below.

```

SBE Glider Payload CTD 1.0A SERIAL NO. 0065 24 Sep 2012 16:10:04
vMain = 11.66, vLith = 2.82
autorun = Yes
samplenum = 0, free = 559240, profiles = 0
not logging, stop command
sample every 1 seconds
sample mode is continuous
data format = converted engineering
do not force on RS232 transmitter
transmit real time data
acquire SBE 43 oxygen
minimum conductivity frequency = 3000.0
custom pump mode enabled

```

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

- 11.2.7 If any of the other parameters do not match the display above, then they can be changed to match by using the commands listed in Figure 12 and referencing Appendix II of the User Manual.
- 11.2.8 Turn on the water pump in the tank to circulate the saltwater.
- 11.2.9 Place the unit into the Saltwater Tank. Seat the components as upright as possible where the pump outlet is facing upward.
- 11.2.10 From the command prompt, type **PumpFast** command to run water through the system and clear any air bubbles. Run the pump for a several seconds until all air bubbles appear to be cleared. To stop the pump type **PumpOff**.
- 11.2.11 Type **TS** to take a sample reading. Confirm that the conductivity is greater than the minimum conductivity frequency of 3000.0. This will ensure that the pump will run and data will be collected.
- 11.2.12 Disconnect the I/O cable power and serial port from the PC.
- 11.2.13 Plug the serial port to the 4-Port Serial hub. Do not apply power at this time by not connecting the power jack yet. Make sure the Gold Unit is plugged into Serial Port 1 on the hub.
- 11.2.14 If this is the Gold Unit, the configuration portion need only be applied once. Repeat Steps 11.2.1 – 11.2.12 on each unit that will be tested.
- 11.2.15 After configuring all units, close the SeaTerm application.

11.3 Component Bench Testing with Tera Term

- 11.3.1 Connect the 4-Port Serial hub to the PC Serial Port. Make sure the 4-Port Hub power has been plugged in and the unit is on.
- 11.3.2 Open the TeraTerm software.
- 11.3.3 Choose the COM Port for Serial Port 1 on the hub, which should be the gold unit. Note the COM Port and CTD Serial Number combination assigned to Serial Port 1 as the gold unit.

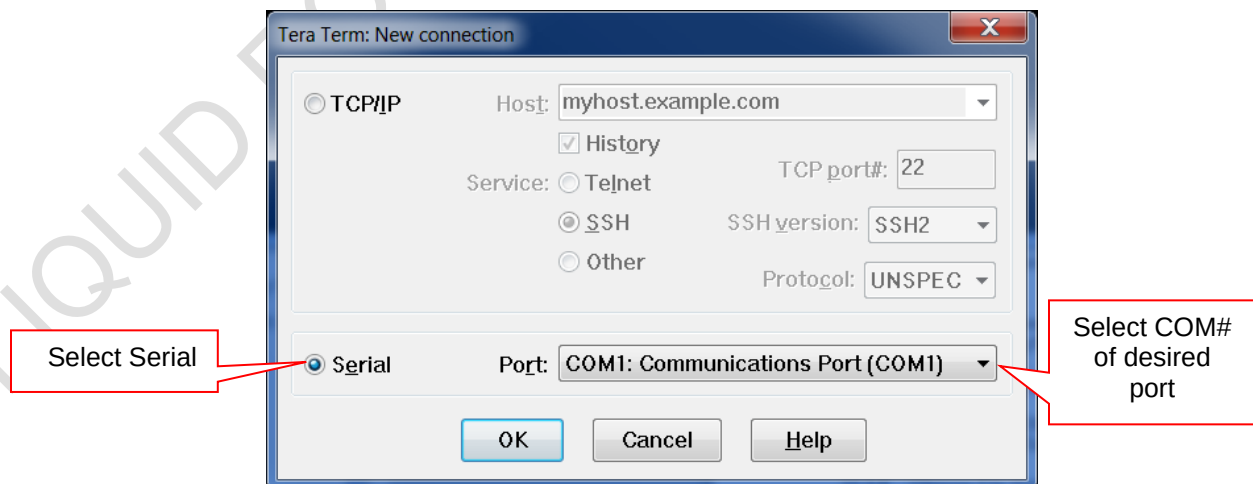


Figure 13

11.3.4 Configure the COM port by choosing **Setup** then **Serial port...** and set as shown below and click **OK**.

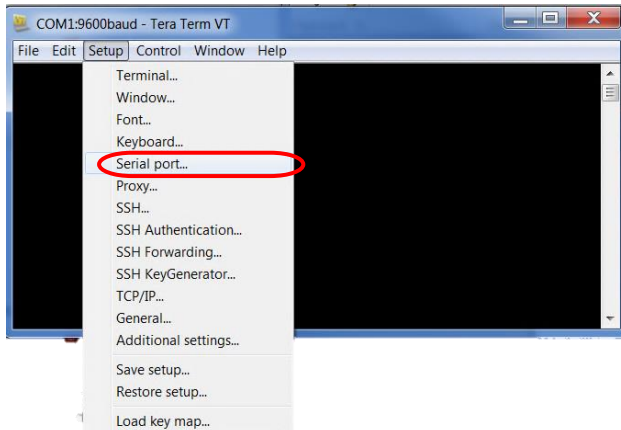


Figure 14

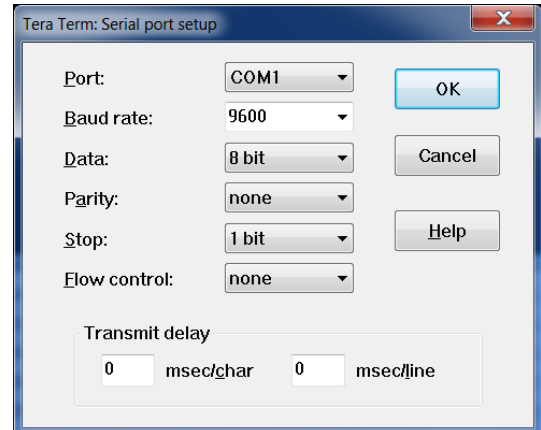


Figure 15

11.3.5 Choose **File** then **Log**. Name the file with the format *CTD_Date_Serial Number of Sensor_Gold Unit* and **Save**.

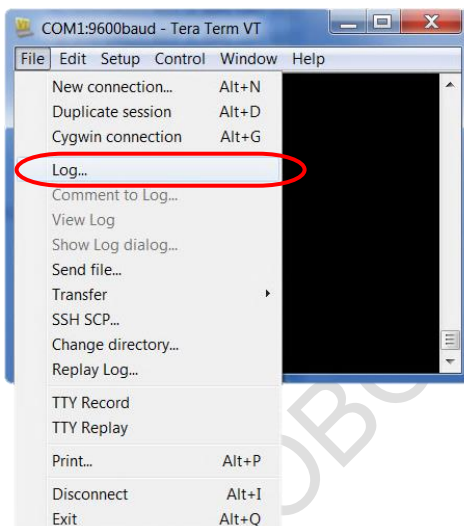


Figure 16

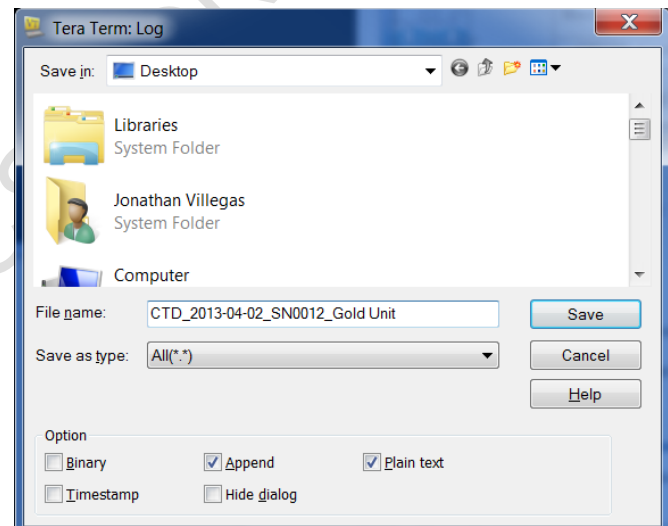


Figure 17

11.3.6 Plug in the power jack for Serial Port 1 to turn on the connection. Wait for data logging to begin streaming. Log the start time of the data stream.

11.3.7 Open another TeraTerm session window.

11.3.8 Choose the COM Port for Serial Port 2 on the hub, which should be the gold unit. Note the COM Port and CTD Serial Number combination assigned to Serial Port 2.

11.3.9 Choose **File** then **Log**. Name the file with the format *CTD_Date_Serial Number of Sensor* and **Save**.

11.3.10 Plug in the power jack for Serial Port 2 to turn on the connection. Wait for data logging to begin streaming. Log the start time of the data stream so that the data can be aligned with the other units.

11.3.11 Repeat steps 11.3.6 - 11.3.10 on up to 2 additional test units for Serial Ports 3 and 4.

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

11.3.12 Allow units to log data for at least 30 min.

11.3.13 Data is displayed in the following format and is logged in 1 second intervals:

ppppp.pp, ttt.tttt, cc.cccccc, oooooo.oo

1. Pressure (decibars) = ppppp.pp
2. Temperature (°C, ITS-90) = ttt.tttt
3. Conductivity (S/m) = cc.cccccc
4. Optional Oxygen (Hz) = oooooo.oo

Example: ppppp.pp, ttt.tttt, cc.cccccc, oooooo.oo = 0.06, 23.7658, 0.00019, 5138.30

- Pressure (decibars) = 0.06
- Temperature (°C, ITS-90) 23.7658
- Conductivity (S/m) = 0.00019
- Oxygen (Hz) = oooooo.oo = 5138.30

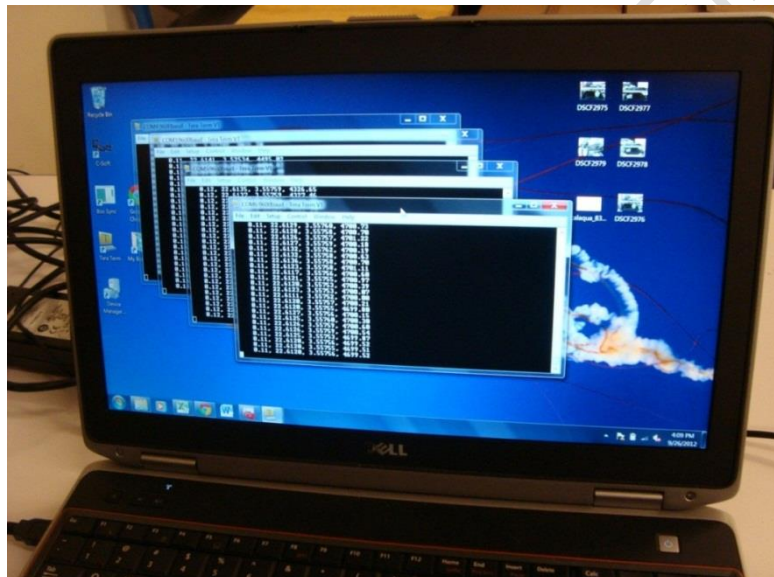


Figure 18

11.3.14 After 30min, stop each CTD by typing the command “Stop” in each Tera Term window then remove the power jack.

11.3.15 Each log file shall be compared against each other and to verify consistency.

11.3.16 Remove each test CTD from the saltwater tank and drain.

11.3.17 Place each test CTD into a freshwater bath.

11.3.18 Open a Tera Term session for each unit and apply power.

11.3.19 From the command prompt, type **PumpFast** command to run the pump for several minutes to ensure all saltwater has been flushed from the system. To stop the pump type **PumpOff**.

11.3.20 After completion, the test CTDs may be disconnected, drained, and sent to system integration.

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

12 SYSTEM INTEGRATION AND TEST

12.1 Configuring the GPCTDs with SeaTerm for System Integration

12.1.1 Connect to each GPCTD using the SeaTerm application (Refer to Section 8.3 if needed).

12.1.2 Type **DS** and press Enter to display the GPCTD status information.

12.1.3 Set the following GPCTD default parameters required for VEHICLE INTEGRATION by typing the following commands in case-sensitive text:

- 1) **OutputExecutedTag=N** : Tells the CTD to use 'S>' as the prompt instead of <Executed/>. This should already have been set during bench test,
 - 2) **Autorun=N** : Tells the CTD NOT to start sampling immediately when powered on.
 - 3) **OutputFormat=0** : Tells the CTD the desired data format (Hex Digits, Engineering Units). While not great for human reading this format is very easy for software to parse and interpret.
 - 4) **Interval=60** : If no DO Sensor, then set to a default sample interval of 1 sample every 60 seconds. This is performed as a safety precaution to make sure if someone blindly turns on the CTD without thinking about how they are planning to use it that it does not flood the system with data. In normal operations, this value can change through various user commands.
- OR**
- Interval=10** : If there is a DO Sensor, then the sample interval must be 10 Seconds in order for the DO Sensor to collect data.
- 5) **CustomPumpMode=Y** : Ensures the custom pump mode is enabled. This should already have been set during bench test. This setting uses a little more power, but ensures the pump always uses the fast pump mode which helps keep the plumbing clear from bubbles that could affect measurements.
 - 6) **ResetLogging** : This command will initialize memory and reset the sample number back to zero and reset the profiles back to zero.
 - 7) **ResetLogging** : This must be entered twice as instructed by the software to confirm.

12.1.4 Next, display GPCTD status information by typing **DS** and pressing the Enter key. The display shall appear with the configured updates shown in *Red Italics* displayed below:

```

SBE Glider Payload CTD 1.0A SERIAL NO. 0065 24 Sep 2012 16:10:04
vMain = 11.66, vLith = 2.82
autorun = no
samplenumber = 0, free = 559240, profiles = 0
not logging, stop command
sample every 60 seconds (OR 10 seconds - if DO is installed!)
sample mode is interval, discontinuous pump
data format = HEX engineering
do not force on RS232 transmitter
transmit real time data
acquire SBE 43 oxygen
minimum conductivity frequency = 3000.0
custom pump mode enabled

```

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

- 12.1.5 If any of the other parameters do not match the display above, then they can be changed to match by using the commands listed in Figure 11 and referencing Appendix II of the User Manual.
- 12.1.6 Highlight and copy each configuration status and save as a text file. Name each file by *CTDConfig_date_serial number of sensor*, for example. CTDConfig_2012-09-24_SN0065.txt.
- 12.1.7 Denote this configuration on the appropriate traveler/checklist for manufacturing records.

12.2 Sub-Mounted System Test Set-Up

- 12.2.1 Apply Silicone Spray (PN 01857) to the end of the connector of the 4-Pin CTD cable (PN 1674) on the vehicle and connect it to the 4-pin receptacle on the CTD. Be sure to fully seat the connector and hand-tighten the retaining sleeve.

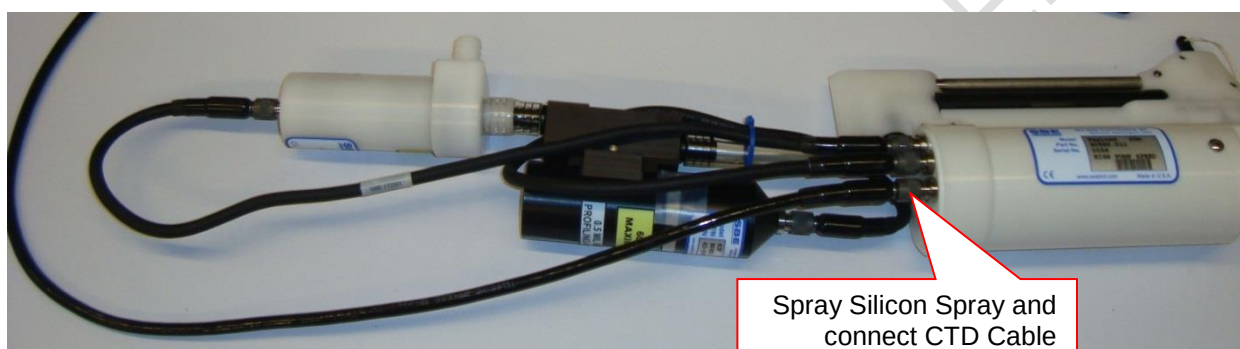


Figure 19: Sub-mounted GPCTD-DO

- 12.2.2 Place the configured and pre-assembled GPCTD or GPCTD-DO Sensor and pump components into a salt water bath tank next to the vehicle. Make sure to seat the components as upright as possible within the tank.



Figure 20



Figure 21

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

- 12.2.3 Connect the CTD cable (PN 01674) to the aux port of the glider. Refer to Sub-mounted Assembly MPI for greater detail on how to connect this cable to the sub. To allow for the cable to reach the tank, do NOT apply any of the cable clamps to the cable at this time. Next, connect the umbilical sub-conn to the dry-box in the vehicle.



Figure 22

- 12.2.4 Power on the C&C Dry Box.

12.3 Float Mounted System Test Set-Up

- 12.3.1 For Float Mounted GPCTD, integrate the GPCTD or GPCTD-DO per the associated MPI. Connect the GPCTD subconn to the Aft Payload and connect the Aft payload to the dry-box.
- 12.3.2 Place the Float onto the stand with the saltwater tank directly below the GPCTD.



Figure 23

- 12.3.3 Power on the C&C Dry Box.

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

12.4 Checking the PIB Configuration

12.4.1 Log into WGMS and enter the Gliders org.

12.4.2 Select the Vehicle under test.

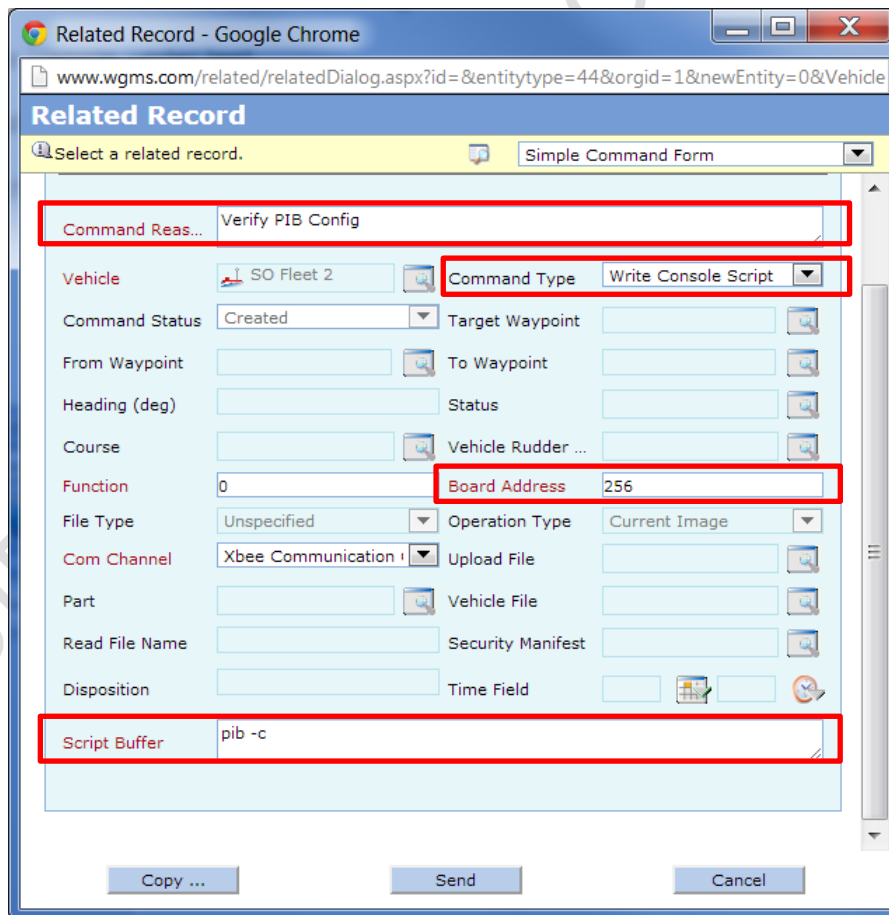
12.4.3 There are 2 ways to configure the PIB based upon which configuration is being installed. Verify that the PIB Pcom #1 is configured as needed for the correct situation per the associated Payload MPI.

a) For Float-Mounted CTDs and for Sub-Mounted CTD without a Towbody with SMC, PCom#1 should be set for CTD.

b) If a Towbody that has an SMC (such as the Turbidity) is also integrated with a Sub-mounted CTD, then PCom#1 should be set to COMM.

12.4.4 To check, select *More Commands* and enter the following:

- *Command Reason:* Verify PIB Config
- *Command Type:* Write Console Script
- *Board Address:* 256
- *Script Buffer:* pib -c



Related Record - Google Chrome

www.wgms.com/related/relatedDialog.aspx?id=&entitytype=44&orgid=1&newEntity=0&Vehicle

Related Record

Select a related record. Simple Command Form

Command Reason: Verify PIB Config

Vehicle: SO Fleet 2 Command Type: Write Console Script

Command Status: Created Target Waypoint:

From Waypoint: To Waypoint:

Heading (deg): Status:

Course: Vehicle Rudder ...

Function: 0 Board Address: 256

File Type: Unspecified Operation Type: Current Image

Com Channel: Xbee Communication Upload File:

Part: Vehicle File:

Read File Name: Security Manifest:

Disposition: Time Field:

Script Buffer: pib -c

Copy ... Send Cancel

Figure 24

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

- 12.4.5 Wait for the command to successfully Ack. Then check the Ack response in the Raw Outputs to confirm the PCom #1 configuration is for Seabird, “PM1=CTD”, OR if the case is with a Towbody with SMC then it should be “PM1=COMM”.

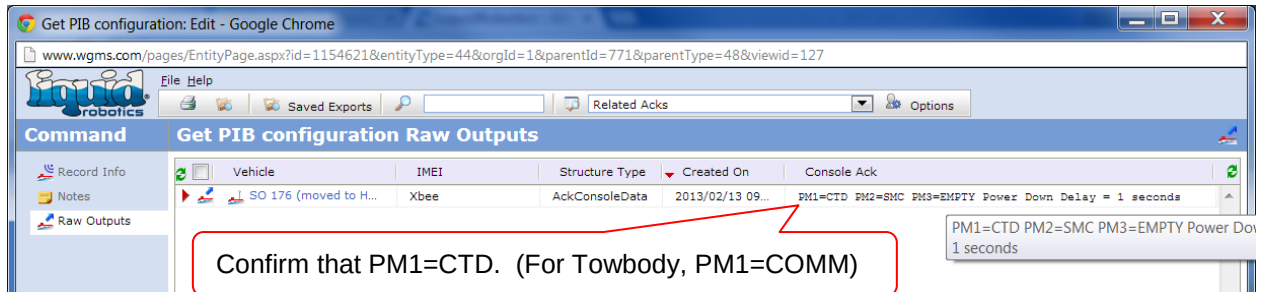


Figure 25

- 12.4.6 If the PCom #1 configuration is not correct, then it must be set by performing the following command by selecting More Commands and entering the following:

For Standard CTD	For Towbody SMC with Sub-Mounted CTD
- Command Reason: Config PIB for Seabird CTD - Command Type: Write Console Script - Board Address: 256 - Script Buffer: pib -1 ctd	- Command Reason: Config PIB for COMM (Sub-CTD with Towbody) - Command Type: Write Console Script - Board Address: 256 - Script Buffer: pib -1 comm

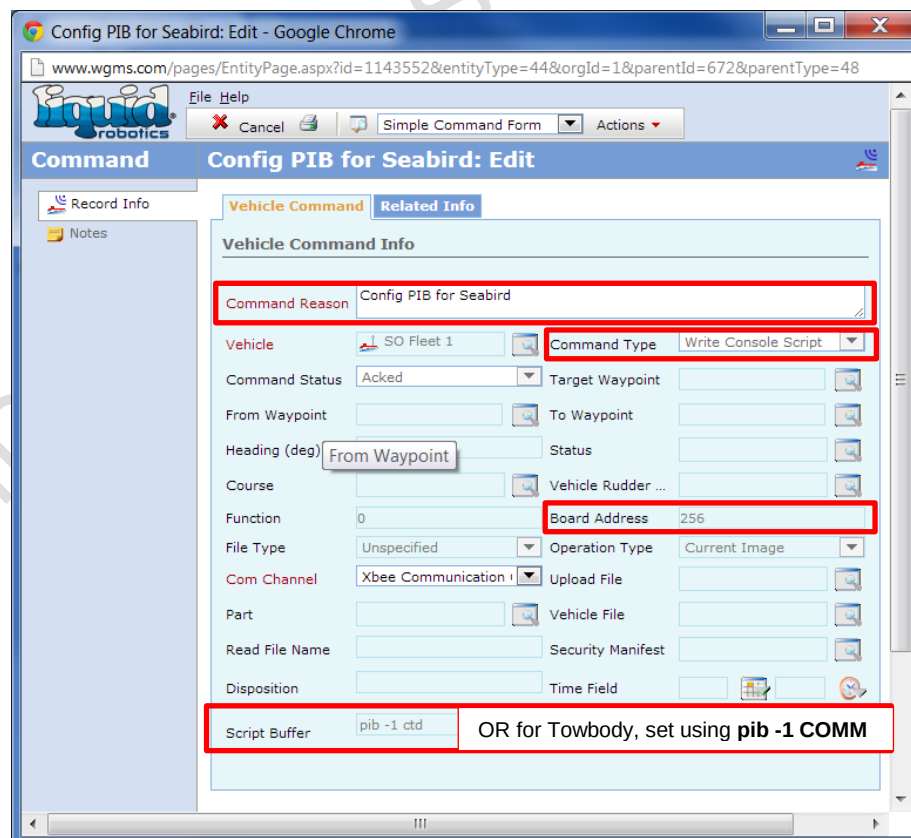


Figure 26

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

12.5 System Test through WGMS

From the Home Vehicle page, perform the following commands.

- 12.5.1 The preferred test method uses the XBee Comm Channel for the fastest response.
- 12.5.2 If using Iridium, click on the Mailbox Icon in the upper right or select *Set Parameter* to turn on Fast Mailbox to speed up command processing.

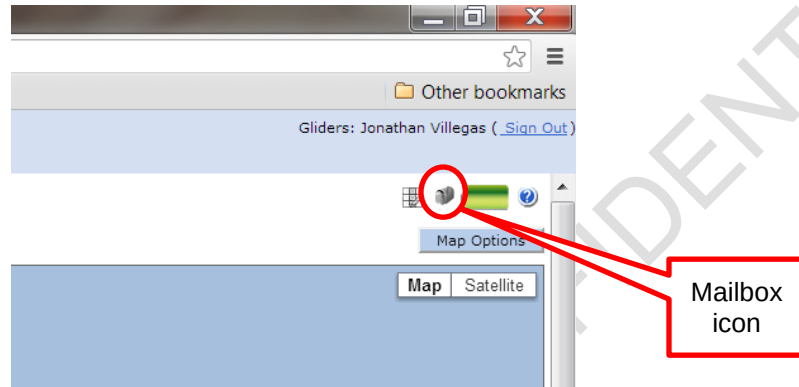
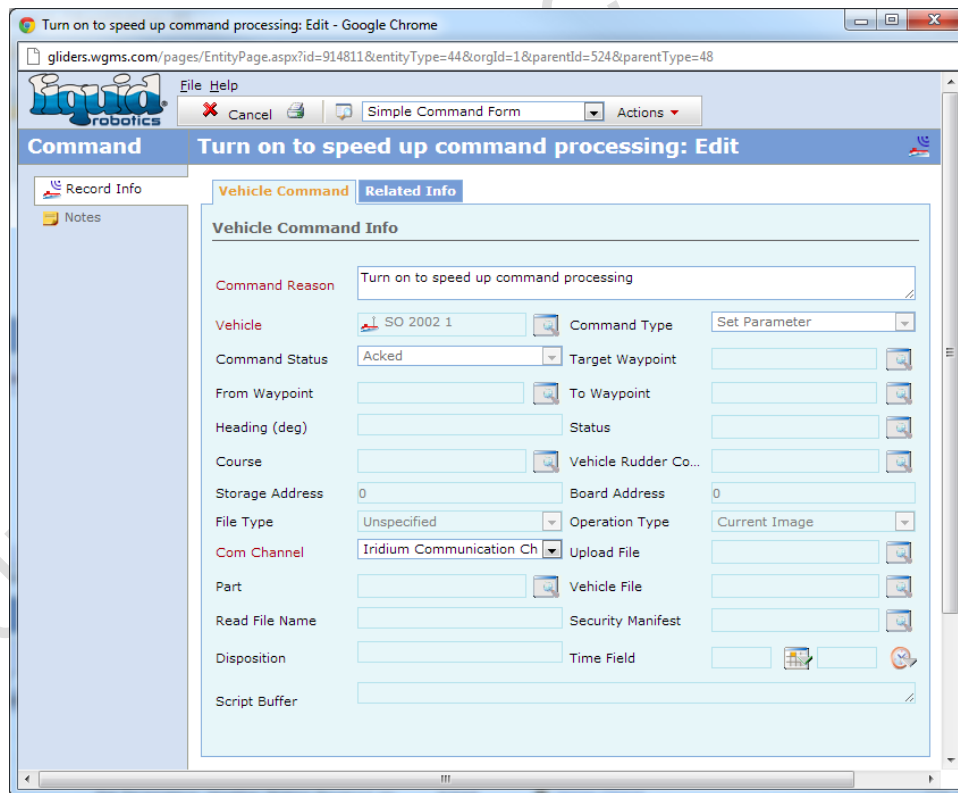


Figure 27



A screenshot of a web browser window showing the 'Turn on to speed up command processing: Edit' form. The form is titled 'Command' and 'Turn on to speed up command processing: Edit'. It contains various fields for configuring a command, including 'Command Reason', 'Vehicle', 'Command Status', 'From Waypoint', 'Heading (deg)', 'Course', 'Storage Address', 'File Type', 'Com Channel', 'Part', 'Read File Name', 'Disposition', 'Script Buffer', 'Command Type', 'Target Waypoint', 'To Waypoint', 'Status', 'Vehicle Rudder Co...', 'Board Address', 'Operation Type', 'Upload File', 'Vehicle File', 'Security Manifest', and 'Time Field'. The 'Com Channel' is set to 'Iridium Communication Ch'.

Figure 28

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

12.5.3 If testing a Float Mounted CTD, skip the step below and continue to next step.

12.5.4 If testing a Sub Mounted CTD, then turn on Sub Payload:

Set Parameter: Turn Sub Payload ON for CTD Testing

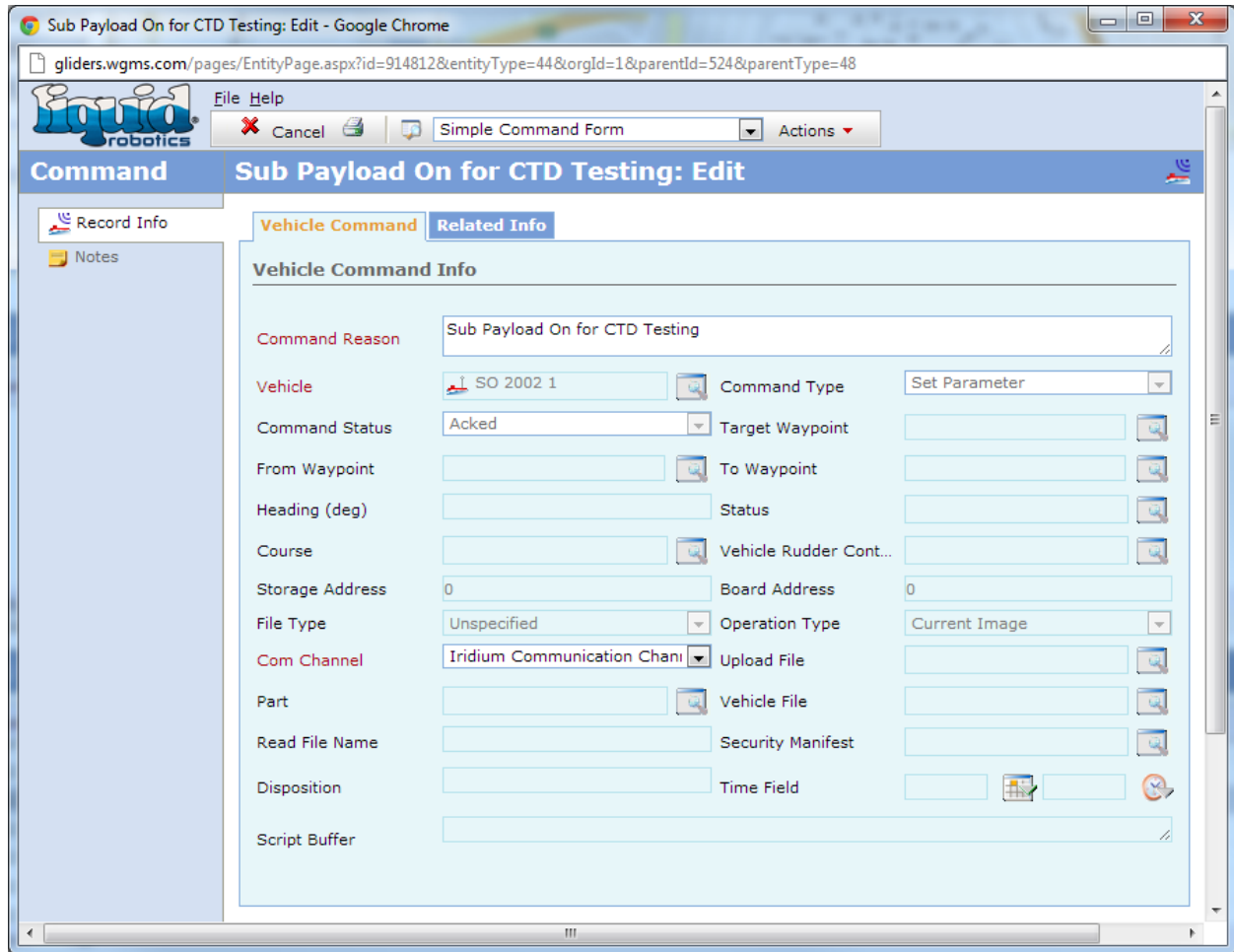


Figure 29

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

12.5.5 Set Parameter: Turn PL1 ON for CTD Testing (or PL2)



PL1 ON for CTD Testing: Edit - Google Chrome

gliders.wgms.com/pages/EntityPage.aspx?id=914813&entityType=44&orgId=1&parentId=524&parentType=48

File Help

Cancel Simple Command Form Actions

Command PL1 ON for CTD Testing: Edit

Record Info Notes

Vehicle Command Related Info

Vehicle Command Info

Command Reason PL1 ON for CTD Testing

Vehicle SO 2002 1 Command Type Set Parameter

Command Status Acked Target Waypoint

From Waypoint To Waypoint

Heading (deg) Status

Course Vehicle Rudder ...

Storage Address 0 Board Address 0

File Type Unspecified Operation Type Current Image

Com Channel Iridium Communication Upload File

Part Vehicle File

Read File Name Security Manifest

Disposition Time Field

Script Buffer

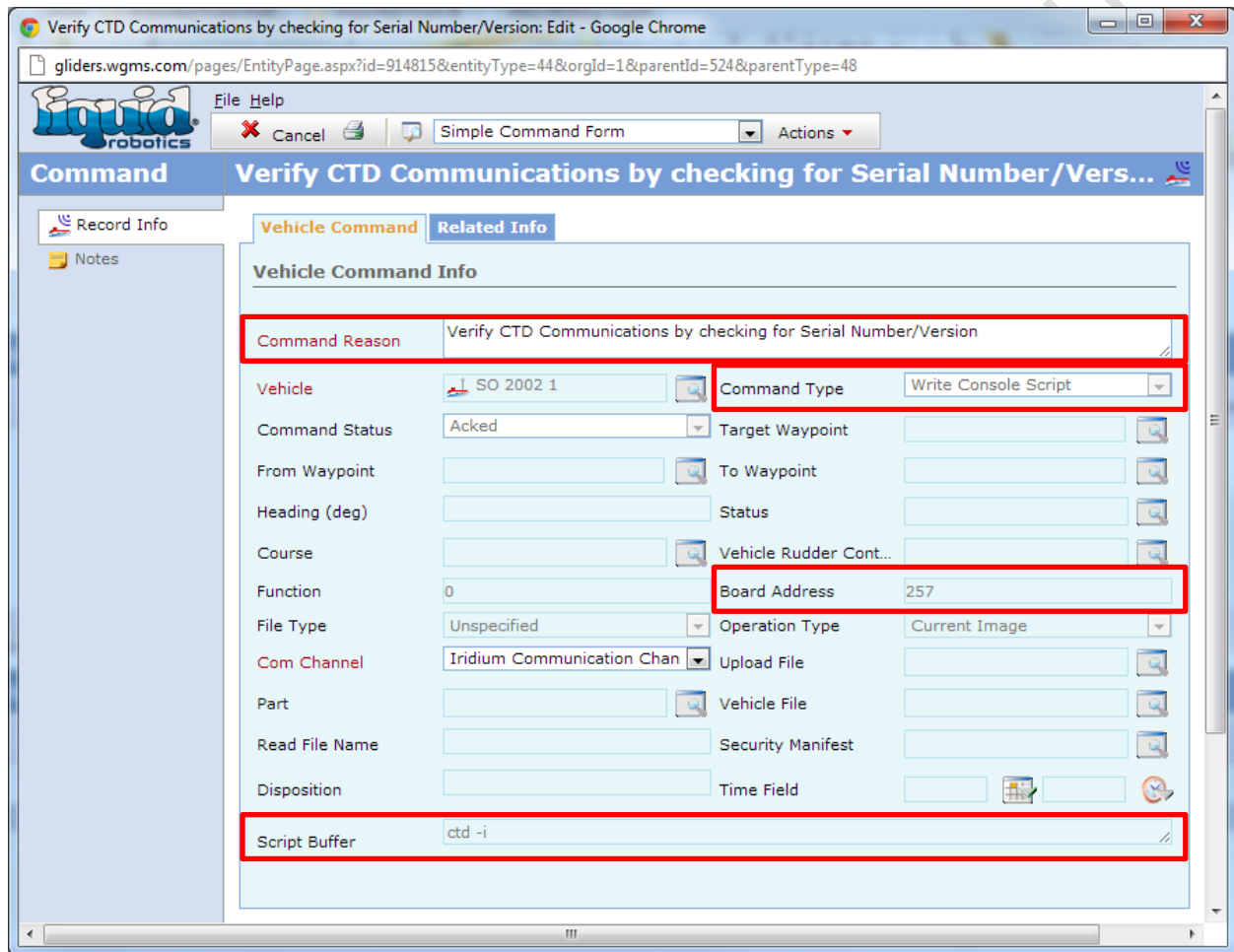
Figure 30

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

12.5.6 This step verifies that the CTD is on and that the system is communicating with it by sending the id command to check for the CTD Serial Number/Version and confirming the correct response.

12.5.6.1 Select *More Commands* and enter the following:

- *Command Reason:* Verify CTD Communications by checking for SN/Version
- *Command Type:* Write Console Script
- *Board Address:* 257 (or 513 if using Payload 2)
- *Script Buffer:* ctd -i



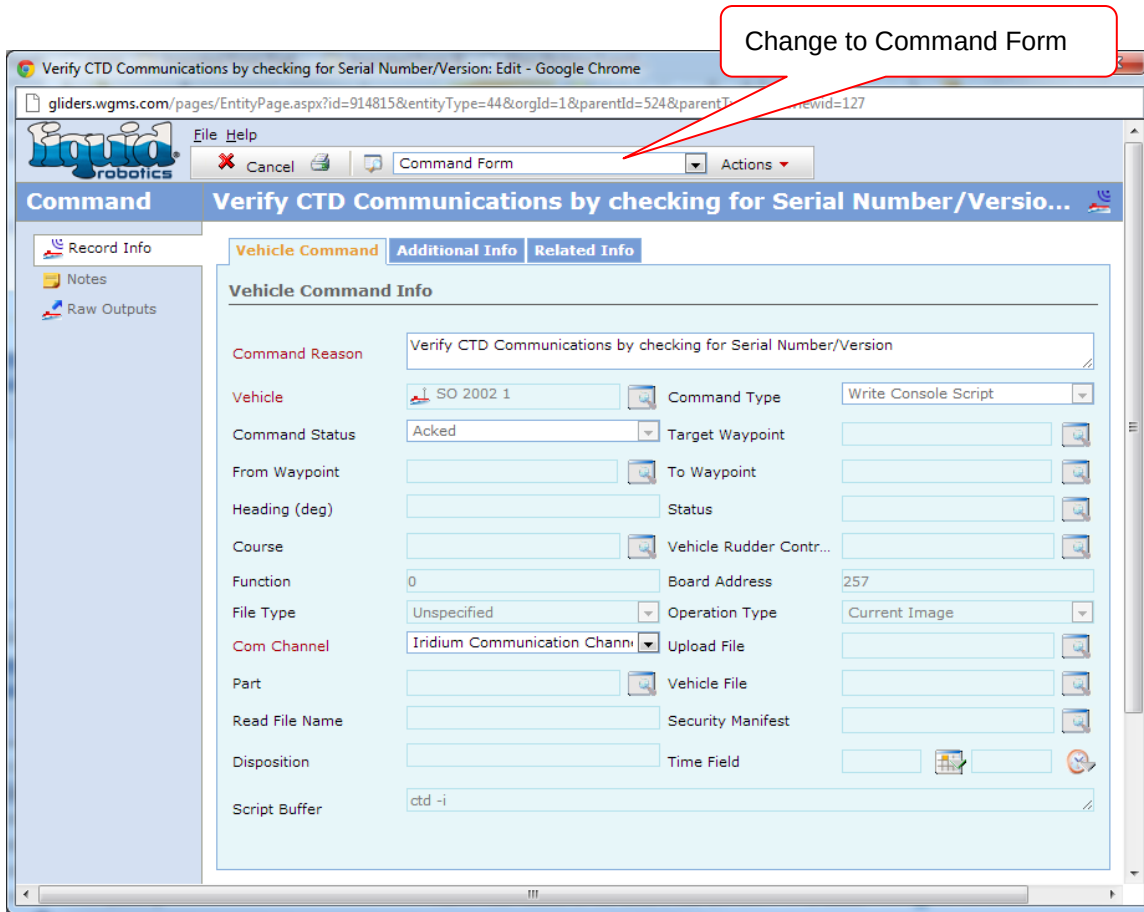
The screenshot shows a web browser window with the URL `gliders.wgms.com/pages/EntityPage.aspx?id=914815&entityType=44&orgId=1&parentId=524&parentType=48`. The page title is "Verify CTD Communications by checking for Serial Number/Version: Edit - Google Chrome". The page has a Liquid Robotics logo and a "Simple Command Form" header. The form is divided into two tabs: "Vehicle Command" (selected) and "Related Info". The "Vehicle Command Info" section contains the following fields:

- Command Reason:** Verify CTD Communications by checking for Serial Number/Version
- Vehicle:** SO 2002 1
- Command Type:** Write Console Script
- Command Status:** Acked
- From Waypoint:**
- To Waypoint:**
- Heading (deg):**
- Status:**
- Course:**
- Vehicle Rudder Cont...:**
- Function:** 0
- Board Address:** 257
- File Type:** Unspecified
- Operation Type:** Current Image
- Com Channel:** Iridium Communication Chan
- Upload File:**
- Part:**
- Vehicle File:**
- Read File Name:**
- Security Manifest:**
- Disposition:**
- Time Field:**
- Script Buffer:** ctd -i

Figure 31

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

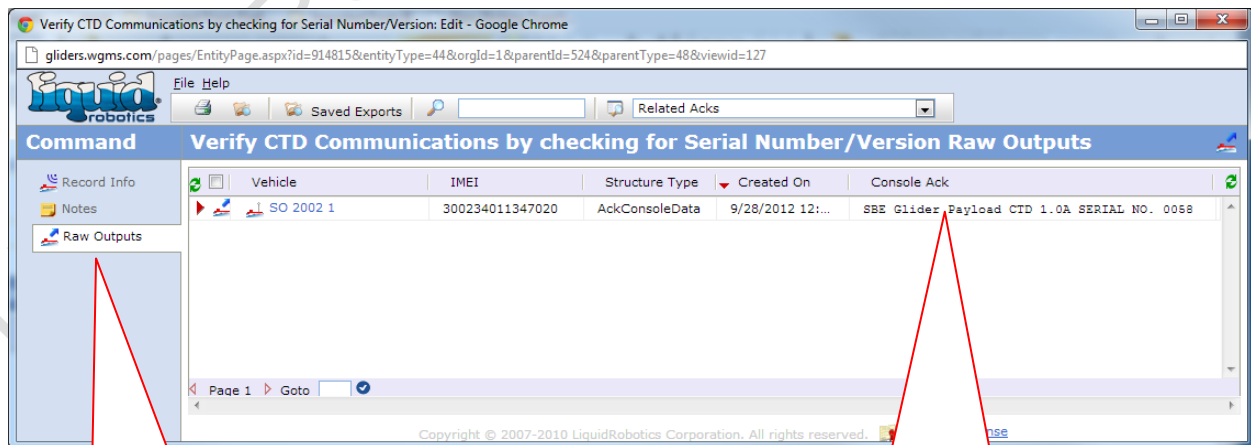
- 12.5.6.2 After this command has Acked, double click on the command line to check the results. Next, change from Simple Command Form to Command Form.



Change to Command Form

Figure 32

- 12.5.6.3 Click on *Raw Outputs* to verify CTD firmware version and serial number is reported in the Console Ack field.



Click on Raw Outputs

Confirm that the Version and Serial No. is reported.

Figure 33

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

12.5.7 Confirm the correct Sample Interval

12.5.6.4 If no DO Sensor is installed, then the default should remain at 60 seconds.

12.5.6.5 If a DO Sensor is installed, then verify that the Sample Interval has been set to 10 seconds from Section 12.1. Note: This 10 second interval setting is required for the DO Sensor to report data. If a DO Sensor is installed, but no DO data is being reported, be sure to recheck that this step has been completed.

To set this through WGMS, select *More Commands* and enter the following:

- *Command Reason:* Set CTD Sample Interval to 10 seconds
- *Command Type:* Write Console Script
- *Board Address:* 257 (or 513 if using Payload 2)
- *Script Buffer:* ctd -p 10

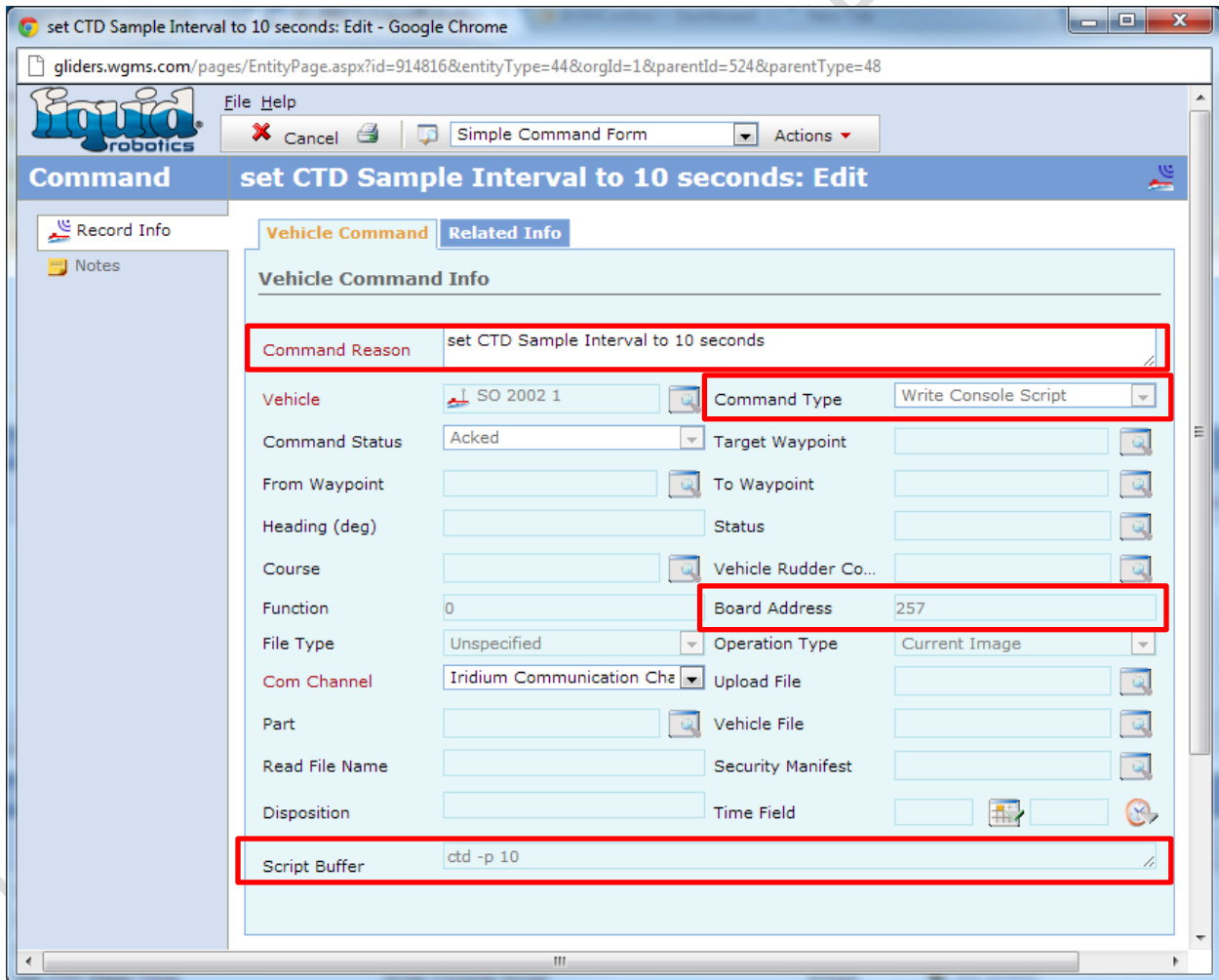


Figure 34

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

12.5.8 Set CTD Sleep Time to 520.

Select *More Commands* and enter the following:

- Command Reason: Set CTD Sleep Time.
- *Command Type*: Write Console Script
- *Board Address*: 257 (or 513 if using Payload 2)
- *Script Buffer*: ctd -y 520

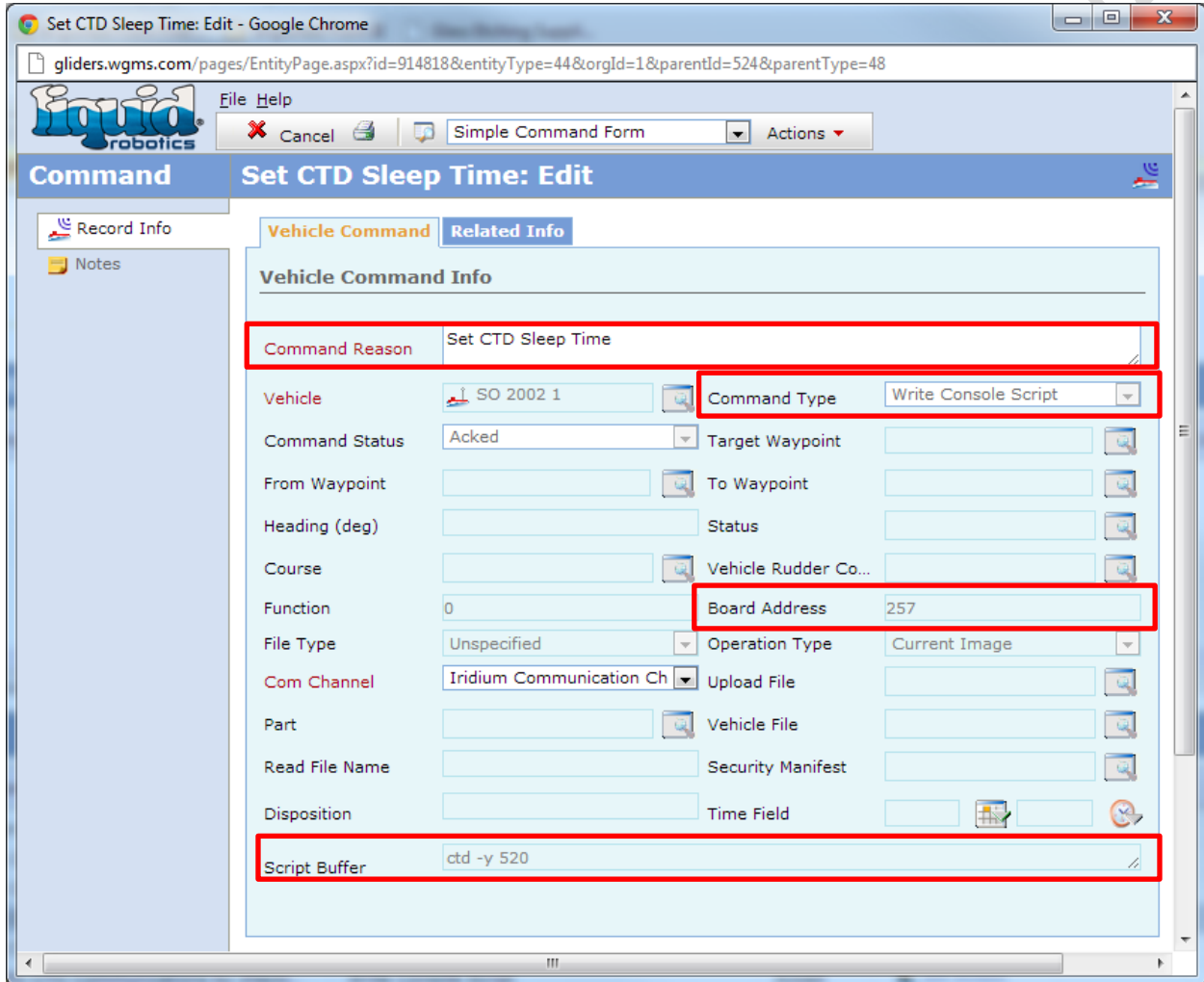


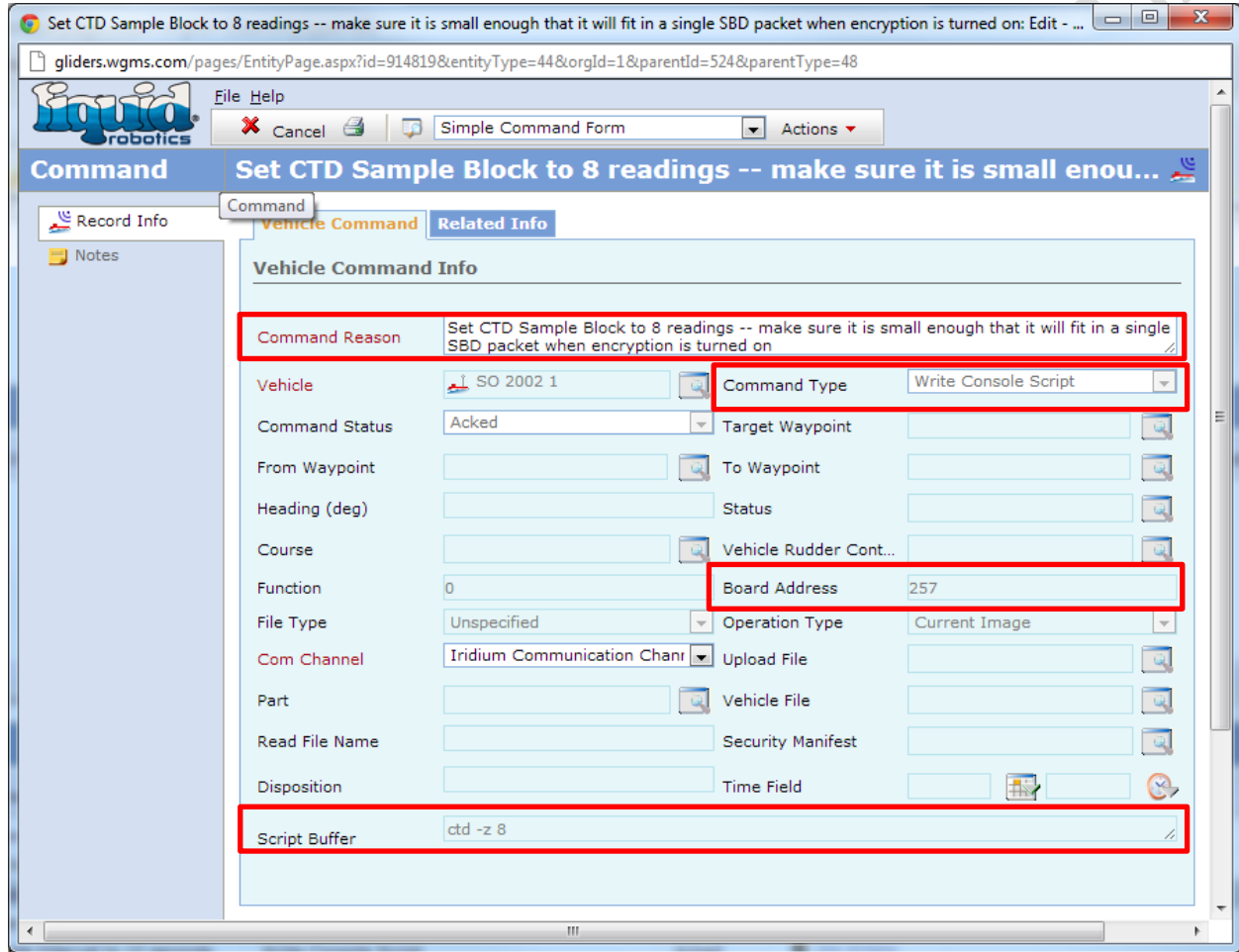
Figure 35

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

12.5.9 Set CTD Sample Block to 8 Readings. This makes sure it is small enough that it will fit in a single SBD packet when encryption is tuned on.

Select *More Commands* and enter the following:

- Command Reason: Set CTD Sample Block to 8 Readings
- *Command Type*: Write Console Script
- *Board Address*: 257 (or 513 if using Payload 2)
- *Script Buffer*: ctd -z 8



Set CTD Sample Block to 8 readings -- make sure it is small enough that it will fit in a single SBD packet when encryption is turned on: Edit - ...

gliders.wgms.com/pages/EntityPage.aspx?id=914819&entityType=44&orgId=1&parentId=524&parentType=48

File Help

Cancel Simple Command Form Actions

Command

Record Info Notes

Vehicle Command Related Info

Vehicle Command Info

Command Reason Set CTD Sample Block to 8 readings -- make sure it is small enough that it will fit in a single SBD packet when encryption is turned on

Vehicle SO 2002 1

Command Status Acked

From Waypoint

Heading (deg)

Course

Function 0

File Type Unspecified

Com Channel Iridium Communication Chan

Part

Read File Name

Disposition

Script Buffer ctd -z 8

Command Type Write Console Script

Target Waypoint

To Waypoint

Status

Vehicle Rudder Cont...

Board Address 257

Operation Type Current Image

Upload File

Vehicle File

Security Manifest

Time Field

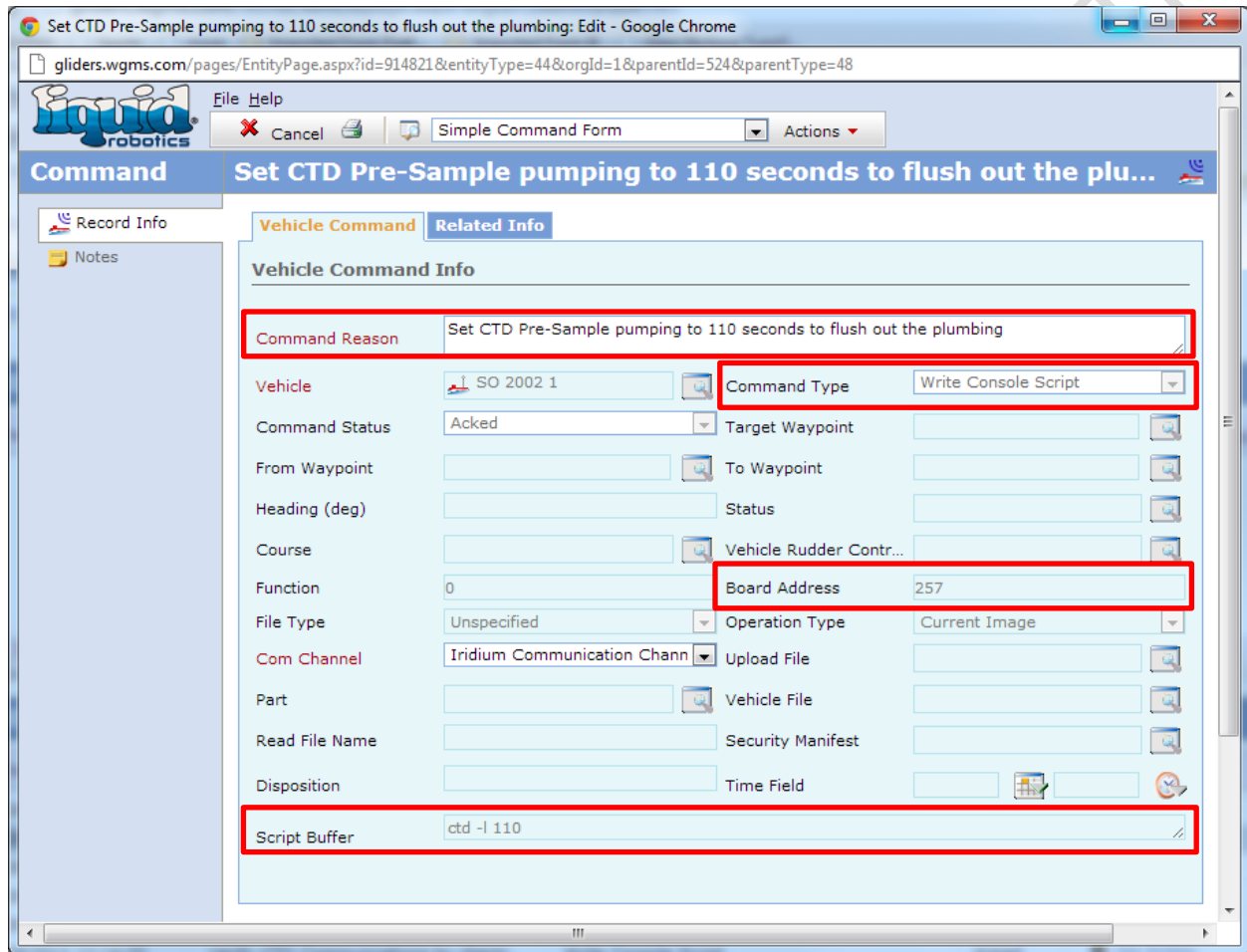
Figure 36

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

12.5.10 Set CTD Pre-Sample pumping to 110 seconds to flush out the plumbing.

Select *More Commands* and enter the following:

- *Command Reason:* Set CTD Pre-Sample pumping to 110 seconds
- *Command Type:* Write Console Script
- *Board Address:* 257 (or 513 if using Payload 2)
- *Script Buffer:* ctd -l 110



The screenshot shows a web browser window with the URL `gliders.wgms.com/pages/EntityPage.aspx?id=914821&entityType=44&orgId=1&parentId=524&parentType=48`. The page title is "Set CTD Pre-Sample pumping to 110 seconds to flush out the plumbing: Edit - Google Chrome". The page has a "Liquid Robotics" logo and a "File Help" menu. The main content area is titled "Set CTD Pre-Sample pumping to 110 seconds to flush out the plu..." and contains a "Vehicle Command" section. The "Vehicle Command Info" section includes the following fields:

- Command Reason:** Set CTD Pre-Sample pumping to 110 seconds to flush out the plumbing
- Vehicle:** SO 2002 1
- Command Type:** Write Console Script
- Command Status:** Acked
- From Waypoint:**
- Heading (deg):**
- Course:**
- Function:** 0
- File Type:** Unspecified
- Com Channel:** Iridium Communication Chann
- Part:**
- Read File Name:**
- Disposition:**
- Script Buffer:** ctd -l 110
- Target Waypoint:**
- To Waypoint:**
- Status:**
- Vehicle Rudder Contr...:**
- Board Address:** 257
- Operation Type:** Current Image
- Upload File:**
- Vehicle File:**
- Security Manifest:**
- Time Field:**

Figure 37

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

12.5.11 If desired, check CTD Status to confirm the previous settings. Note: This command can be used at any time to check the Power Status and the Configuration of the CTD.

12.5.11.1 Select *More Commands* and enter the following:

- *Command Reason:* Check CTD Status
- *Command Type:* Write Console Script
- *Board Address:* 257 (or 513 if using Payload 2)
- *Script Buffer:* ctd -s

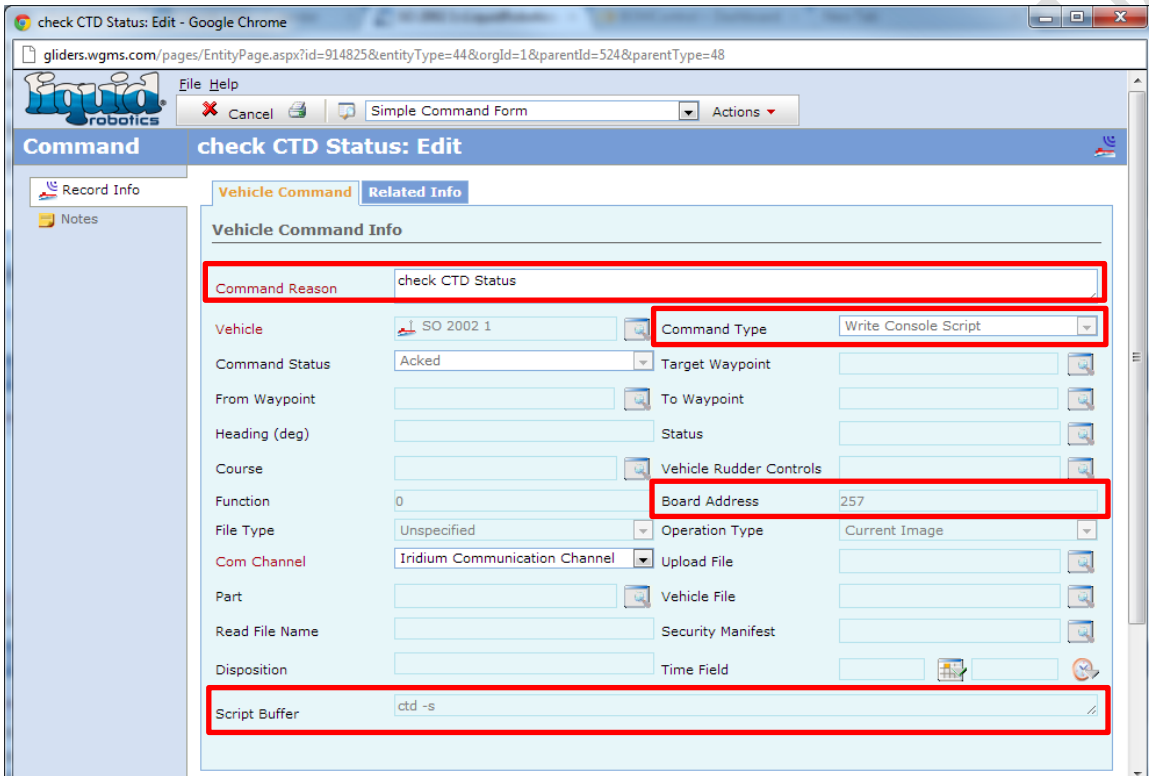


Figure 38

12.5.11.2 After this command Acked, double click on the command line to confirm the response. Next, change from Simple Command Form to Command Form and then click on *Raw Outputs* and review all of the settings.

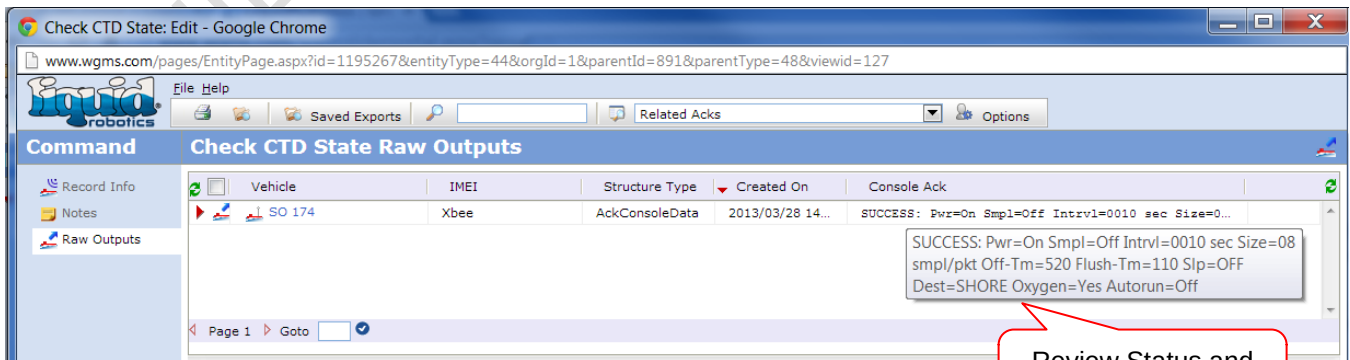


Figure 39

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

12.5.12 Start CTD Sampling (Run).

12.5.12.1 Select *More Commands* and enter the following:

- *Command Reason:* Start CTD Sampling (Run)
- *Command Type:* Write Console Script
- *Board Address:* 257 (or 513 if using Payload 2)
- *Script Buffer:* ctd -r

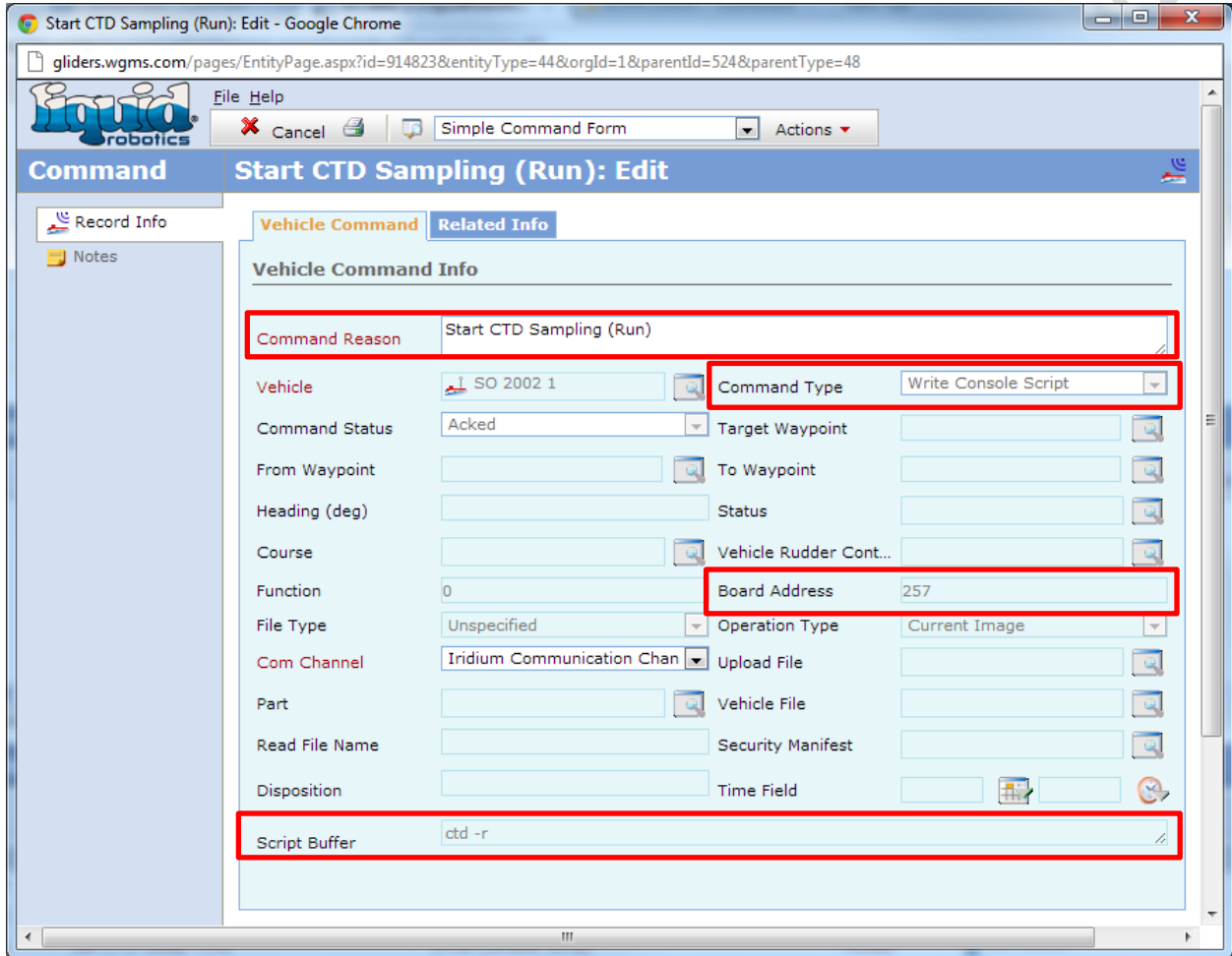


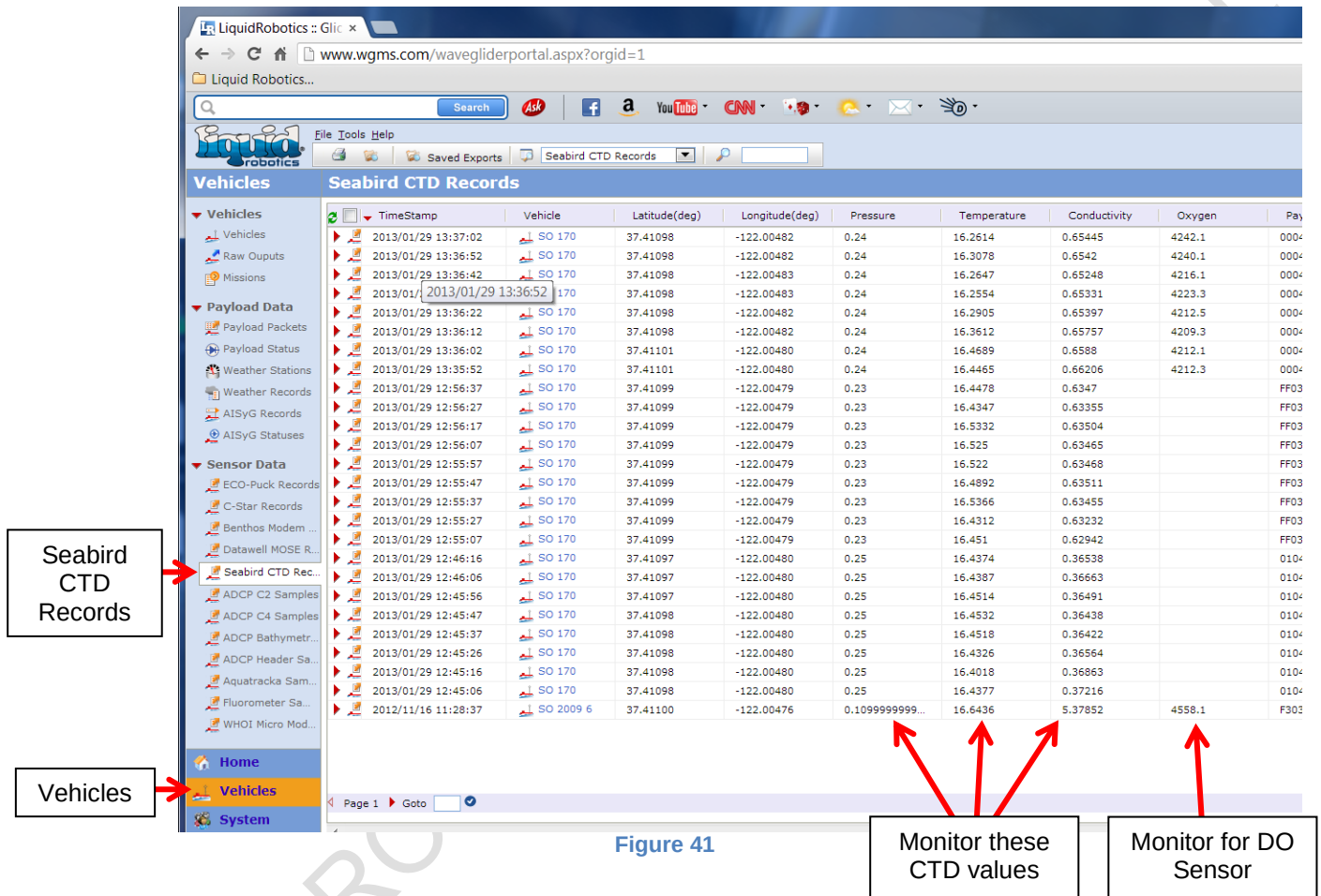
Figure 40

12.5.12.2 Check the pump in the tank to verify it has started. It will run 110 seconds to flush the plumbing and then begin taking samples.

12.5.12.3 Allow the CTD to collect samples for several minutes.

12.5.12.4 Confirm the CTD data is landing in WGMS. If DO Sensor is included, confirm the Oxygen readings are also reporting. Note: If DO installed, but no Data is being reported, verify that Sample Interval has been set to 10 seconds per Section 7.5.7.

To check CTD Data in WGMS, go to the Vehicles page, and under *Sensor Data* select *Seabird CTD Records*.

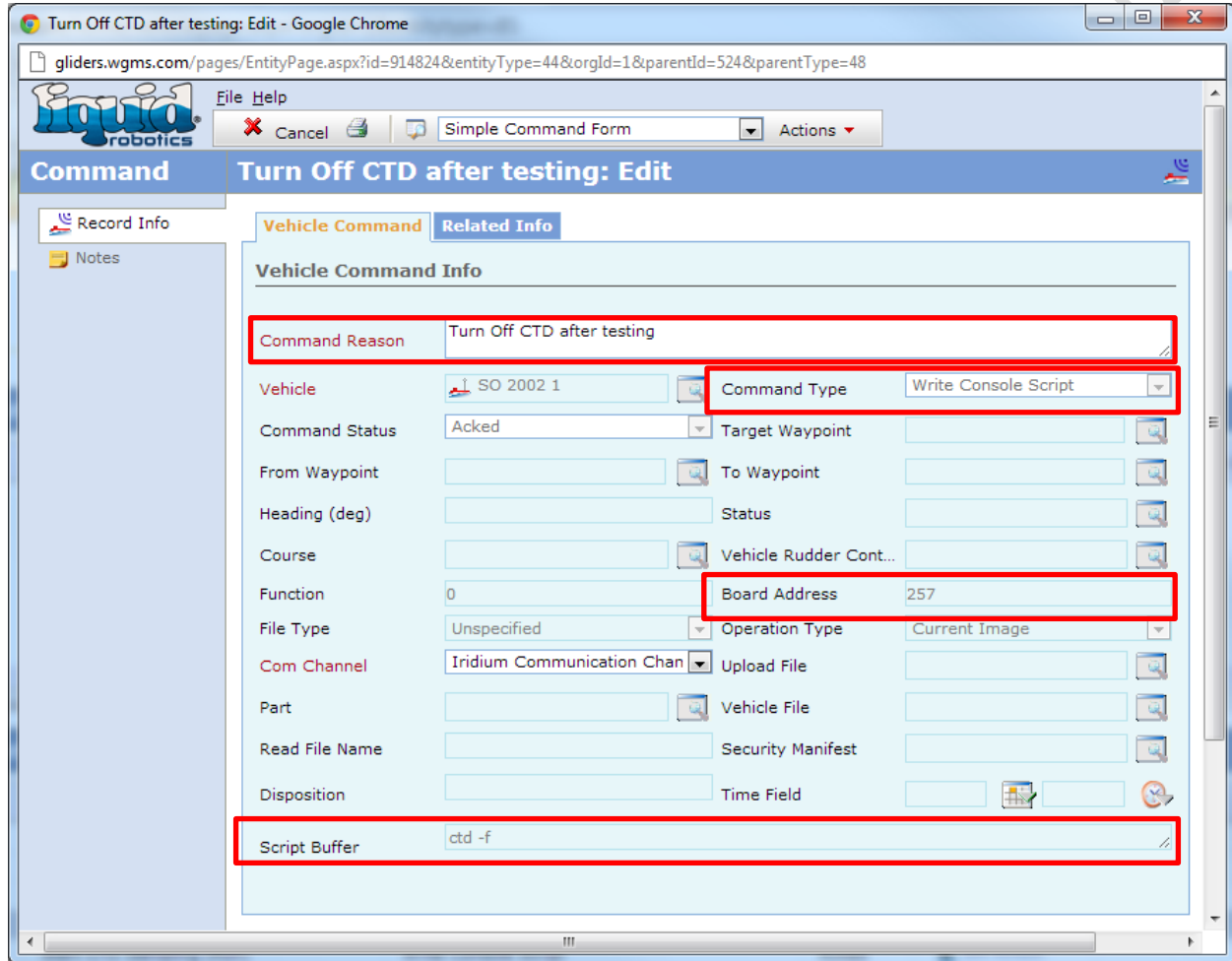


	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

12.5.13 After Sampling is complete, turn Off CTD. This command directs the PIB to power off the CTD.

Select *More Commands* and enter the following:

- *Command Reason:* Turn Off CTD after testing
- *Command Type:* Write Console Script
- *Board Address:* 257 (or 513 if using Payload 2)
- *Script Buffer:* ctd -f



Turn Off CTD after testing: Edit - Google Chrome

gliders.wgms.com/pages/EntityPage.aspx?id=914824&entityType=44&orgId=1&parentId=524&parentType=48

File Help

Cancel Simple Command Form Actions

Command Turn Off CTD after testing: Edit

Record Info Notes

Vehicle Command Related Info

Vehicle Command Info

Command Reason	Turn Off CTD after testing		
Vehicle	SO 2002 1	Command Type	Write Console Script
Command Status	Acked	Target Waypoint	
From Waypoint		To Waypoint	
Heading (deg)		Status	
Course		Vehicle Rudder Cont...	
Function	0	Board Address	257
File Type	Unspecified	Operation Type	Current Image
Com Channel	Iridium Communication Chan	Upload File	
Part		Vehicle File	
Read File Name		Security Manifest	
Disposition		Time Field	
Script Buffer	ctd -f		

Figure 42

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

12.5.14 Check CTD Status to confirm it has turned off. Note: This command can be used at any time to check the Power Status and the Configuration of the CTD.

12.5.14.1 Select *More Commands* and enter the following:

- *Command Reason:* Check CTD Status
- *Command Type:* Write Console Script
- *Board Address:* 257 (or 513 if using Payload 2)
- *Script Buffer:* ctd -s

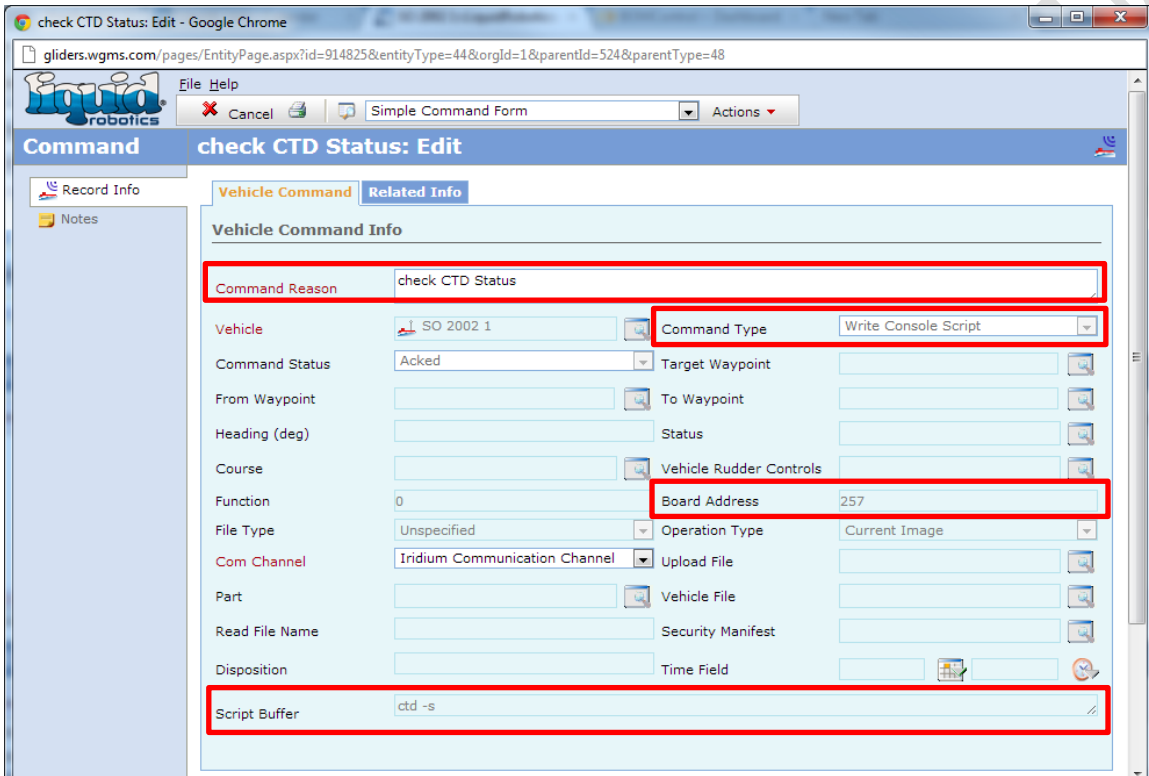


Figure 43

12.5.14.2 After this command Acked, double click on the command line to confirm the response. Next, change from Simple Command Form to Command Form and then click on *Raw Outputs* and confirm that the Console Ack reports that the Power is off.

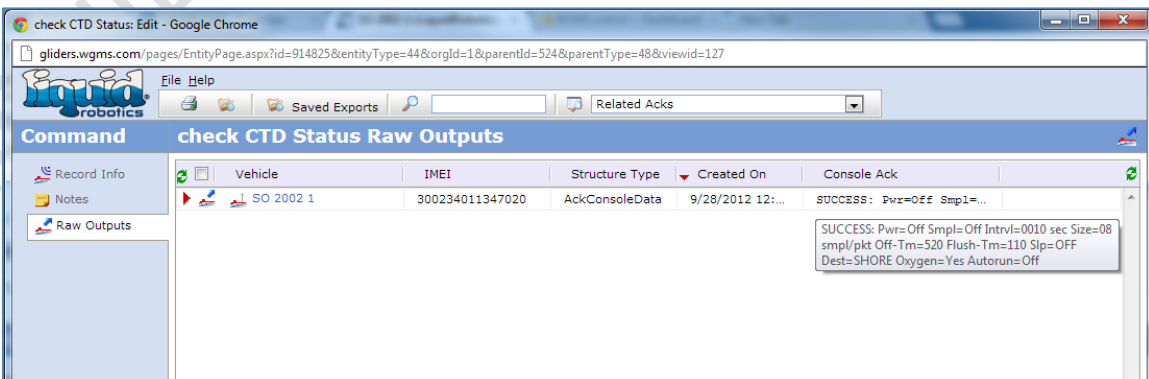


Figure 44

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

12.5.15 This completes the system test portion. The results are logged in WGMS as part of the vehicle history.

12.5.16 The components must now be flushed as soon as possible with fresh water to ensure all salt solution is removed from the internal plumbing prior to shipment. To flush the system, remove the components from the saltwater tank and place them in a tank of fresh water.



Figure 45: Move Sub-CTD to Fresh Water Tank



Figure 46: Move Sub-CTD to Fresh Water Tank

12.5.17 In order for the pump to run in fresh water, use the **PumpFast** command for the GPCTD. This will allow the pump to run without the GPCTD checking for the minimum conductivity frequency threshold. During this time the GPCTD and DO will not collect any samples. Each time this command is sent, it will run for 120 seconds then stop on its own. To properly flush the system, run for a minimum of 3-5 times.

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

12.5.18 Power on the CTD without Sampling. This will apply power to the CTD. The return data in the Raw Outputs will include the serial number of the CTD and the default sampling parameters (sample interval, report block size, and destination address).

Select *More Commands* and enter the following:

- *Command Reason:* Power on CTD for freshwater flush
- *Command Type:* Write Console Script
- *Board Address:* 257 (or 513 if using Payload 2)
- *Script Buffer:* ctd -o

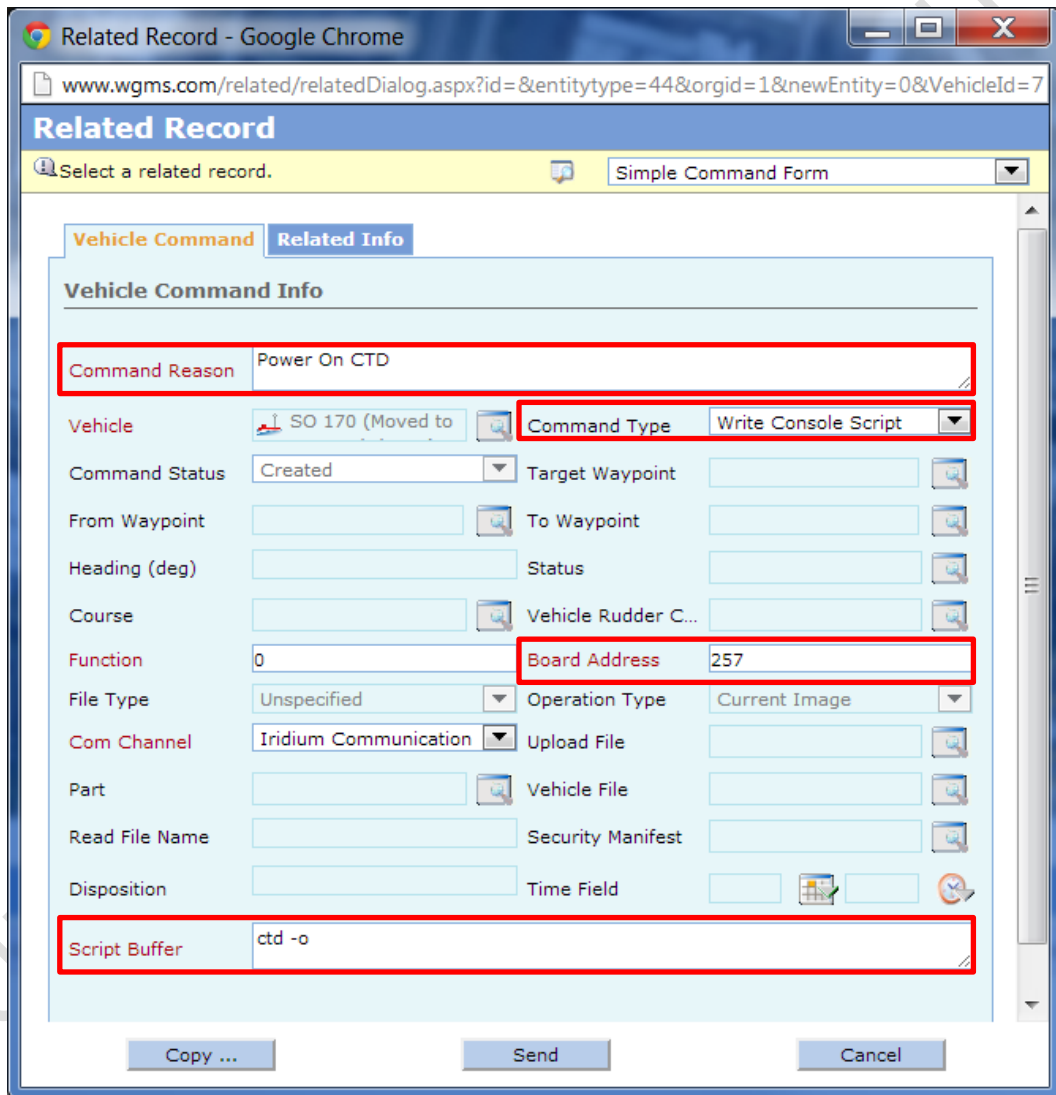


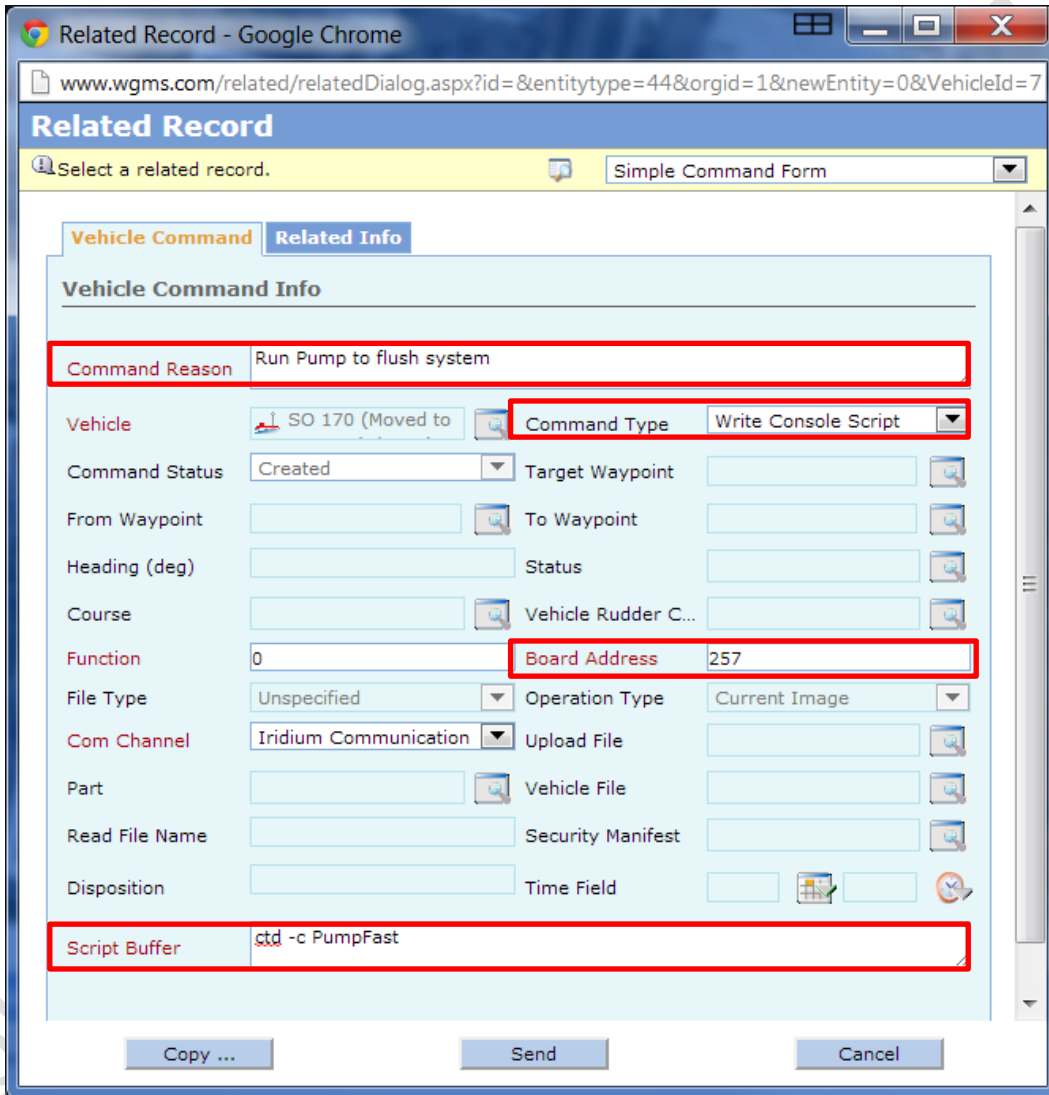
Figure 47

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

12.5.19 Start the pump to flush with fresh water. This command will run the pump for 120 seconds. Repeat for a total of 3-5 flushes.

Select *More Commands* and enter the following in case sensitive text.:

- *Command Reason:* Run pump to flush system after testing
- *Command Type:* Write Console Script
- *Board Address:* 257 (or 513 if using Payload 2)
- *Script Buffer:* ctd -c PumpFast



Related Record - Google Chrome

www.wgms.com/related/relatedDialog.aspx?id=&entitytype=44&orgid=1&newEntity=0&VehicleId=7

Related Record

Select a related record. Simple Command Form

Vehicle Command **Related Info**

Vehicle Command Info

Command Reason Run Pump to flush system

Vehicle SO 170 (Moved to) Command Type Write Console Script

Command Status Created Target Waypoint

From Waypoint To Waypoint

Heading (deg) Status

Course Vehicle Rudder C...

Function 0 Board Address 257

File Type Unspecified Operation Type Current Image

Com Channel Iridium Communication Upload File

Part Vehicle File

Read File Name Security Manifest

Disposition Time Field

Script Buffer ctd -c PumpFast

Copy ... Send Cancel

Figure 48

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

12.5.20 NOTE: This step is NOT required, but provided for reference. If at any time it is needed to stop the pump while the 120 second PumpFast is running. Used the PumpOff command. Otherwise, the pump will stop after 120 seconds on its own.

Select *More Commands* and enter the following in case-sensitive text:

- *Command Reason:* Stop Pump
- *Command Type:* Write Console Script
- *Board Address:* 257 (or 513 if using Payload 2)
- *Script Buffer:* ctd -c PumpOff

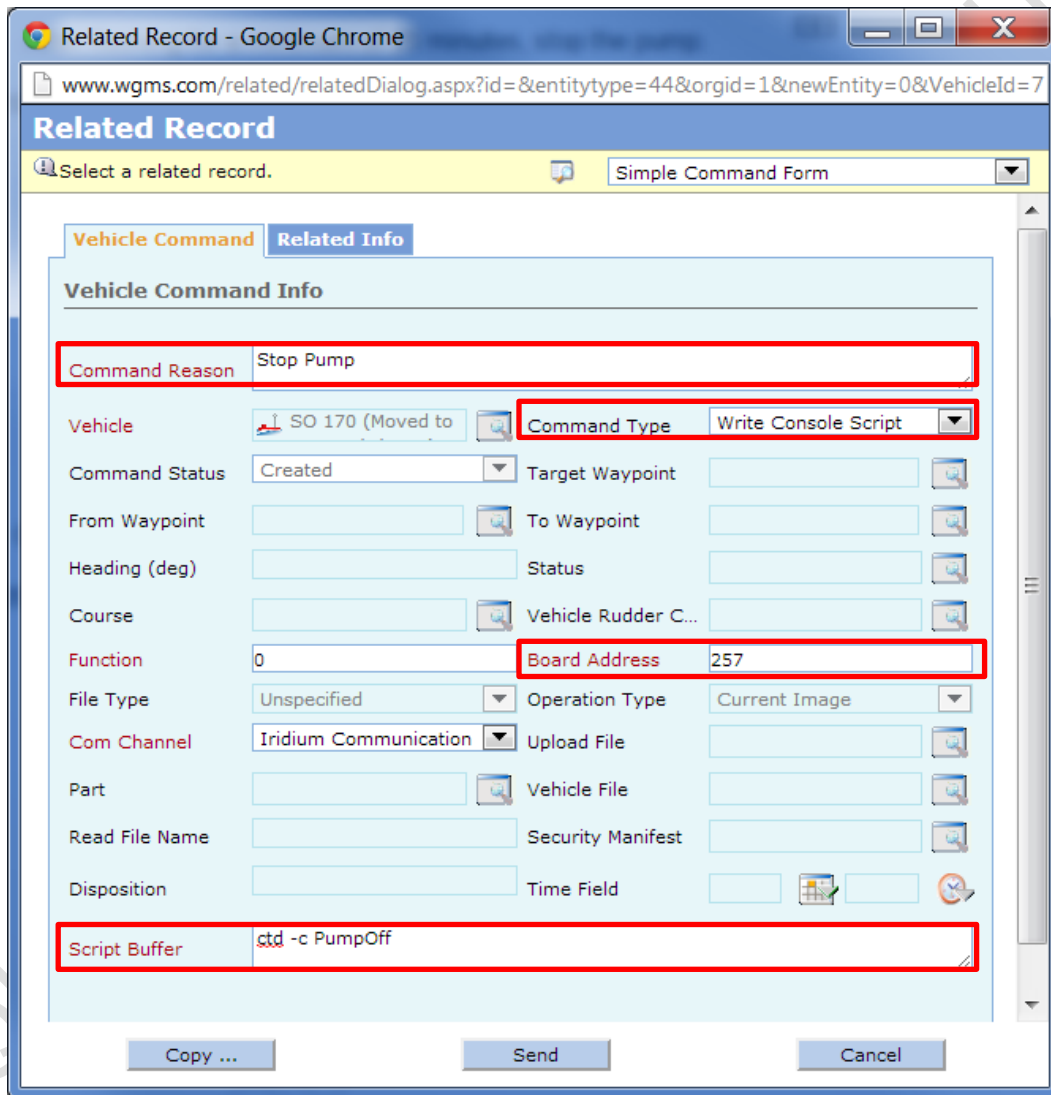


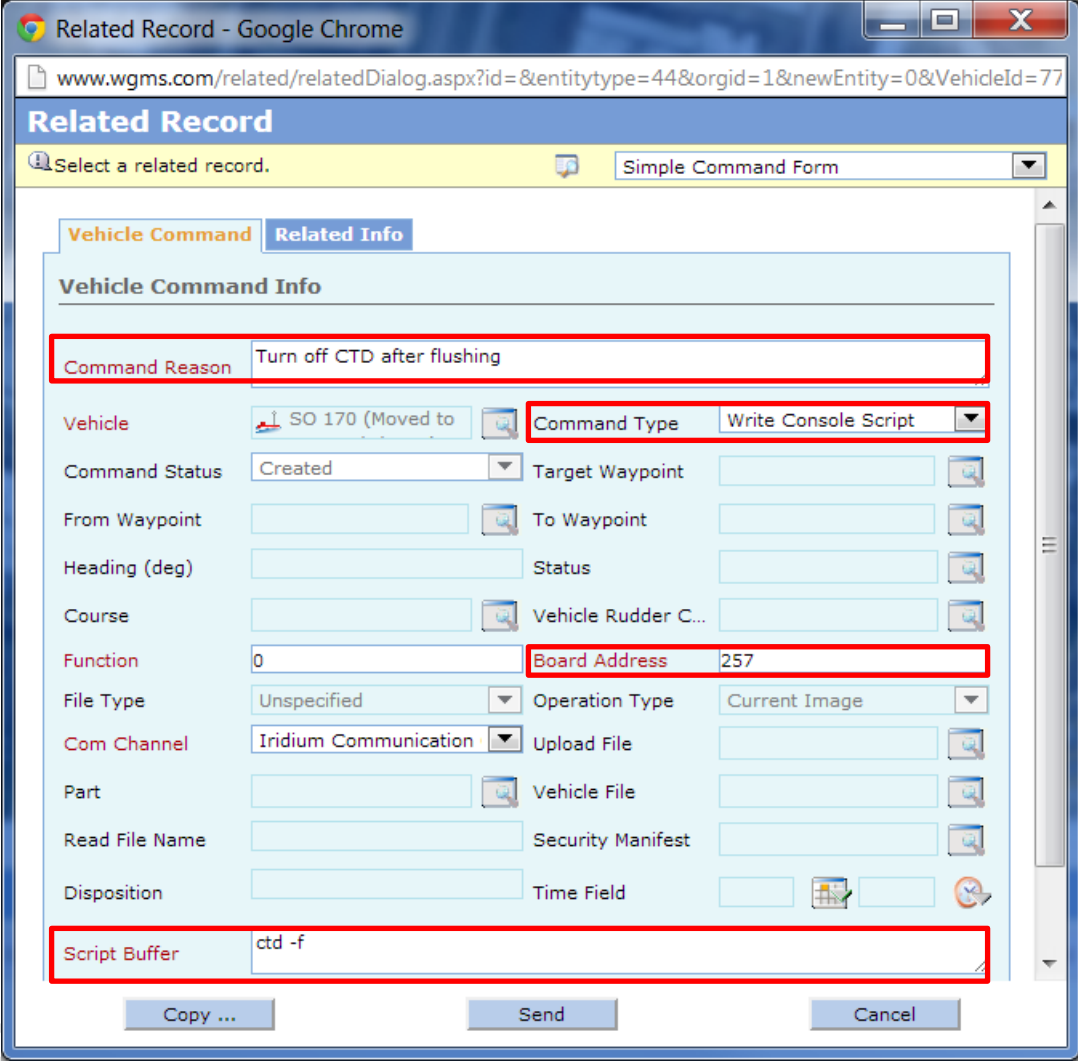
Figure 49

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

12.5.21 Once the pump has stopped, turn off the CTD.

Select *More Commands* and enter the following:

- *Command Reason:* Turn Off CTD after flushing
- *Command Type:* Write Console Script
- *Board Address:* 257 (or 513 if using Payload 2)
- *Script Buffer:* ctd -f



Related Record - Google Chrome

www.wgms.com/related/relatedDialog.aspx?id=&entitytype=44&orgid=1&newEntity=0&VehicleId=77

Related Record

Select a related record. Simple Command Form

Vehicle Command **Related Info**

Vehicle Command Info

Command Reason Turn off CTD after flushing

Vehicle SO 170 (Moved to) **Command Type** Write Console Script

Command Status Created **Target Waypoint**

From Waypoint **To Waypoint**

Heading (deg) **Status**

Course **Vehicle Rudder C...**

Function 0 **Board Address** 257

File Type Unspecified **Operation Type** Current Image

Com Channel Iridium Communication **Upload File**

Part **Vehicle File**

Read File Name **Security Manifest**

Disposition **Time Field**

Script Buffer ctd -f

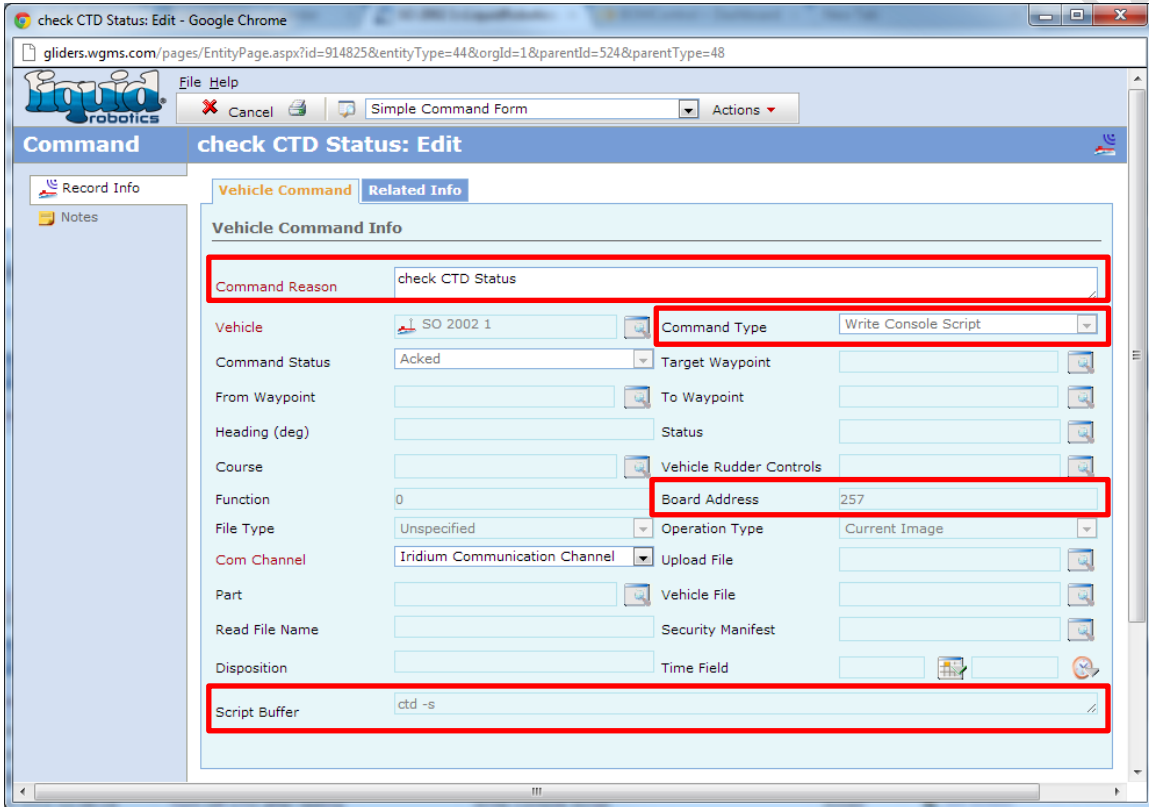
Copy ... Send Cancel

Figure 50

12.5.22 Check CTD Status to confirm it has turned off.

12.5.20.1 Select *More Commands* and enter the following:

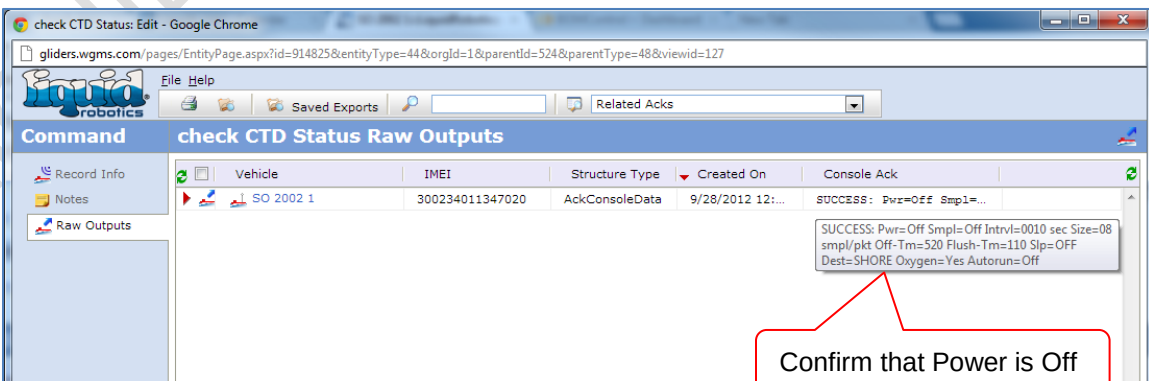
- *Command Reason:* Check CTD Status
- *Command Type:* Write Console Script
- *Board Address:* 257 (or 513 if using Payload 2)
- *Script Buffer:* ctd -s



The screenshot shows the 'check CTD Status: Edit' form. The 'Command Reason' field is set to 'check CTD Status'. The 'Command Type' dropdown is set to 'Write Console Script'. The 'Board Address' field is set to '257'. The 'Script Buffer' field is set to 'ctd -s'. Other fields like 'Vehicle', 'Command Status', 'From Waypoint', 'Heading (deg)', 'Course', 'Function', 'File Type', 'Com Channel', 'Part', 'Read File Name', 'Disposition', 'Target Waypoint', 'To Waypoint', 'Status', 'Vehicle Rudder Controls', 'Operation Type', 'Upload File', 'Vehicle File', 'Security Manifest', and 'Time Field' are also visible but not highlighted.

Figure 51

12.5.20.2 After this command Acked, double click on the command line confirm the response. Next, change from Simple Command Form to Command Form and then click on *Raw Outputs* and confirm that the Console Ack reports that the Power is off.



The screenshot shows the 'check CTD Status Raw Outputs' form. It displays a table with the following data:

Vehicle	IMEI	Structure Type	Created On	Console Ack
SO 2002 1	300234011347020	AckConsoleData	9/28/2012 12:...	SUCCESS: Pwr=Off Smpl=Off Intrl=0010 sec Size=08 smpl/pkt Off-Tm=520 Flush-Tm=110 Slp=OFF Dest=SHORE Oxygen=Yes Autorun=Off

A red box highlights the 'Console Ack' column, and a red arrow points from the text 'Confirm that Power is Off' to the 'Console Ack' column.

Figure 52

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

12.5.23 If using Iridium, turn off Fast Mailbox. Click on the Mailbox Icon in the upper right or select *Set Parameter* to turn off Fast Mailbox.

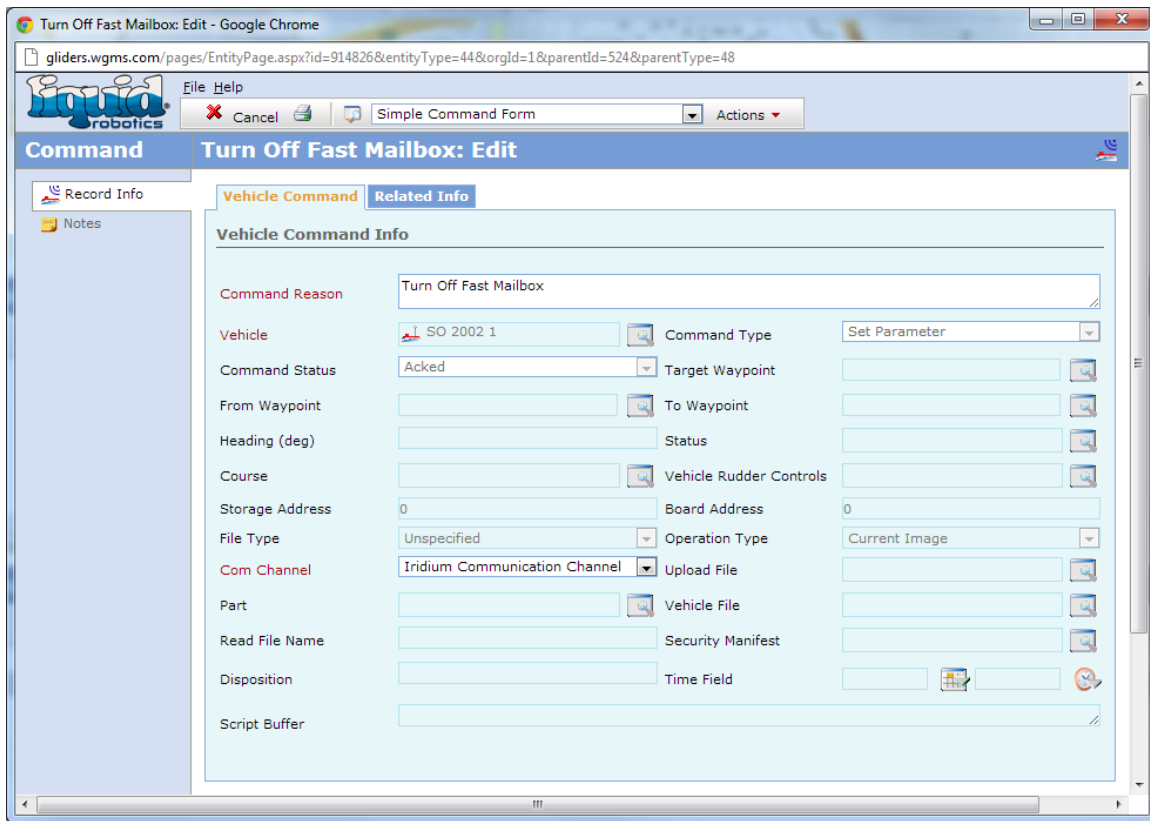


Figure 53

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

12.5.24 *Set Parameter:* Turn off Sub and PL1. (Note: If testing float-mounted CTD, then turn off PL1 only)

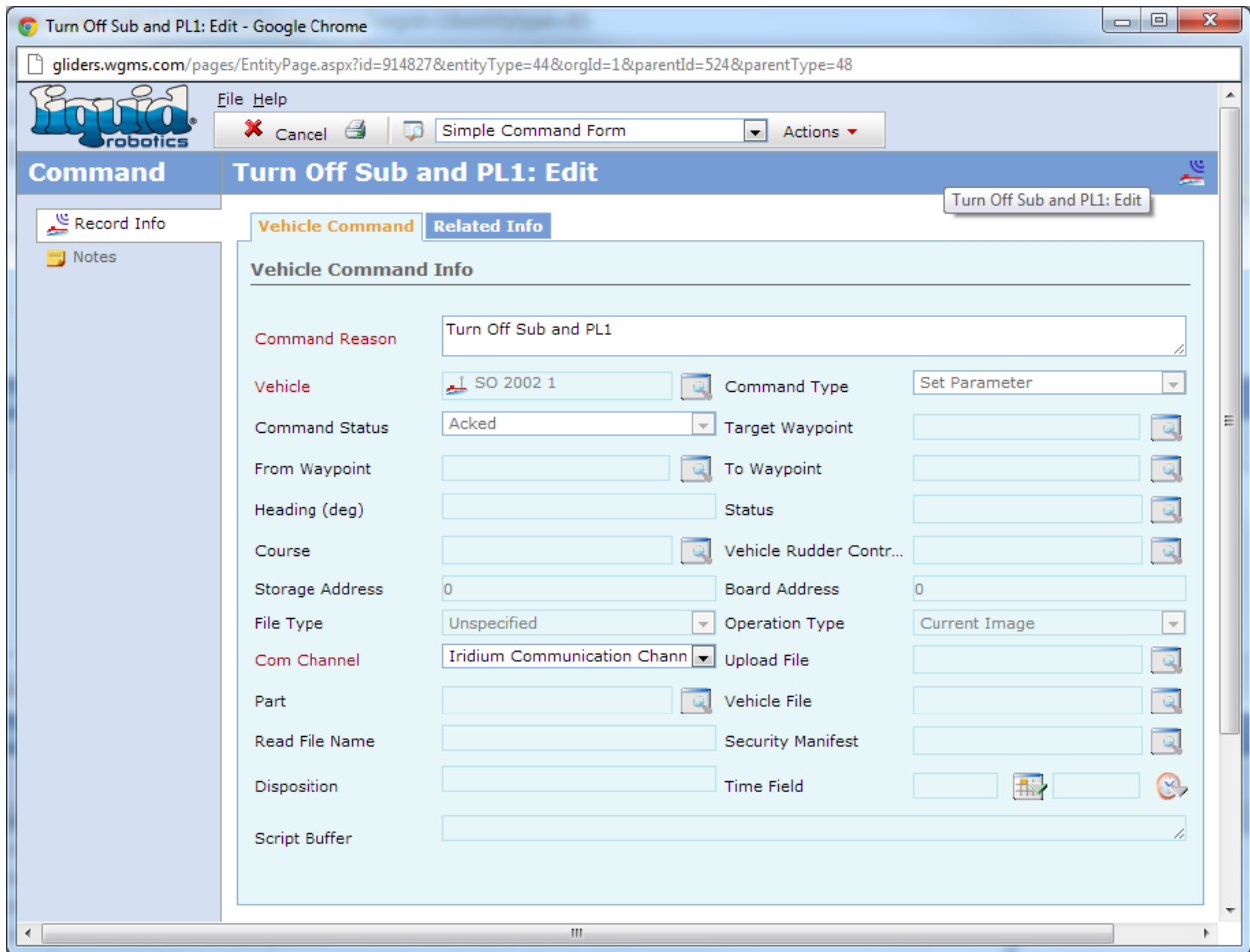


Figure 54

12.5.25 The components may now be removed from the fresh water tank, drained, and dried out.

12.5.26 Re-install the CTD inlet plug with warning tag and the pump outlet plug.



Figure 55

12.5.27 The GPCTD or GPCTD-DO is ready for assembly integration per the associated assembly MPI.

	Manufacturing Process Instructions	Document Number: 070-03968 Revision: C
	GPCTD, Configuration and Test	

13 CHECKLIST

Serial Numbers:

<i>Vehicle ID:</i>	<i>GPCTD:</i>	<i>DO Sensor:</i>	<i>Pump:</i>
--------------------	---------------	-------------------	--------------

Number	Items	Completed By	Verified By	Date	Notes
1	GPCTD+DO Calibration Values have been checked against paperwork				
2	GPCTD FW version is 1.0A				
3	GPCTD+DO Bench Test Completed				
4	CTD configured for Vehicle Integration/System Test per Section 12.1				
5	Verify PIB is configured for CTD. OR If Towbody is installed with Sub-mounted CTD, PIB is configured for COMM				
6	CTD ON and status confirmed				
7	Set Default CTD Sample Interval to 60 seconds. If DO Sensor installed, then must set CTD Sample Interval set to 10 seconds				
8	CTD Sleep Time set to 520				
9	CTD Sample Block set to 8 Readings				
10	CTD Pre-Sample pumping set to 110 seconds				
11	CTD Sampling Run with CTD and DO Data is landing in WGMS				
12	CTD freshwater flush to remove salt from plumbing.				
13	Payloads Turned off				
14	Plugs and Warning tags have been re-installed.				