

FAO Maintenance Guideline from Recorder Serial Console

1. Introduction

• This procedure describes a typical monthly check of a GeoSIG system. It will give some basic information about the state of recorder and sensor

2. Required Tools

Recorder and Sensor you want to check
 Computer, connected to Recorder Senial Console with ucon
 SD-Card reader and software to read test pulse files recorded in miniseed format (GeoDAS is recommended)

3. Check for existing Procedures

Please check if there is a project-specific procedure for your system to follow instead. Especially if your system is tied to an alarm system as the execution of the test pulse described in this procedure may cause an alarm.

4. Check Errors and Warnings

- In the main menu, check that no errors or warnings are present (both brackets show $(\mathbf{0})$)



- If there are errors or warnings, you can show more information pressing $\boldsymbol{[X]}$

5. Check Battery Voltages

In the Main Menu, select [5] to enter Shell Command Prompt
 Enter grep "Voltage=" /media/mmcblk0p1/websoh.xml (case sensitive) and confirm with [Enter]

Enter grep "Voltage=" / media/mmcbl
 CHSplus s/n 102833 version 21.12.29
 Nain nenu:
 C = Configuration
 Hessages ->
 S = Shell command images
 L = List fromerk tunnels
 L = List fromerk tunnels
 X = Display errors (1) and warnings (0)
 V = Clear errors and warnings
 F = Uiew/reset RIC trin values
 T = File statistics
 G = Uiew RIC status
 A = Uiew RIC status
 P = Uiew Finformation
 H = Set RIC trin
 Uiew RIC status
 I = Status
 Status
 Status
 Status
 L = List tring
 Uiew RIC status
 L = List tring
 Uiew RIC time
 U = User request
 R = Status
 Quit
 Linux command: grep "Voltage=" /media/mm

5 Linux Command: grep "Voltage=" /media/nmcblk0p1/websoh.xml

If the recorder is powered from AC (ACPower="ON"), Voltage= should at least show 13.5V
 If your recorder (only GMS-xx, GMSplus and CR-6plus) has a backup battery, the BackupVoltage= should be at least 3.0V

- GHSplus s/n 102803 version 21.12.29 Main nenu: C Configuration H Moliges J I List firmware inages N List firmware inages N List network tunnels N Display errors (1) and warnings (0) V Clear errors and warnings F View/reset RTC trin values T file statistics C View Alarn status P Uiew RTC status A View Alarn status P Uiew GPS information H Set RTC time U User request R Restart Q Quit

Linux Command: grep "Voltage=" /media/mmcblk0p1/websoh.xml CPowerNov AC

Main battery should be replaced every 3 years (See Warnings and Safety in User Manual)
 Backup battery should be replaced every 5 years (See Warnings and Safety in User Manual)

• To set battery installation date : In Test and Configuration Menu -> T - Battery installation dates (enter the menu pressing [Ctrl]+[Z] when prompted during startup)

Press Ctrl+Z to enter the test mode.. Instrument MAC address: 8C:8E:76:00:55:3A

Lougl	Chautaut	Decound	Decemietice					
Level	Snortcut	Password	vescription					
	Ctrl+ll	Nana	Pacie operations only					
Powerful liser	Ctr1+U	None	Also bardware ontions and pre-					
elected tests	0011.4	none	with an availe operand and pre-					
Administrator	Ctrl+A	None	Also manual tests and altering					
the FLASH memor	ru content		20					
RTC Watchdog t	imeout is 0	seconds	12 6.43					
Bootloader Men Access level:	u of the GM Powerful Us	Splus s/n 102 er	833					
Flash Ima	ges and Boo	t Options						
1 Link Clash								
L - List flash	images	inuration to	the uper default					
L – List flash Q – Reset inst U – Reset inst	images rument conf: rument conf	iguration to	the user default the factory default					
L - List flash Q - Reset inst V - Reset inst 5 - Boot now	inages runent conf: runent conf:	iguration to iguration to	the user default the factory default					
L - List flash Q - Reset inst V - Reset inst 5 - Boot now X - Reboot the	images rument conf: rument conf: instrument	iguration to iguration to	the user default the Factory default					

--- Hardware Setup and Monitor ---K - Instrument hardware parameters N - Notwork softings T - Battery installation dates

--- Security ---O - Set password J - Reset all passwords

6. Check Time Synchronisation

• In the Main Menu, select [G] to view RTC status In the Main Menn, select [0] to New Rics
 BKSpius 5/N 102833 version 21.12.29
 Bkain menu:
 Configuration
 Hessages ->
 Shell command
 L List Firmware inages
 L List formware inages
 N - List network tunnels
 X - Display errors (0) and warnings (0)
 V - Clear errors and warnings
 F - Uiew/reset RIC trin values
 F - Uiew/reset RIC trin values G - View RTC status View Rick Status
 P - View GPS information
 H - Set RTC time
 U - User request
 R - Restart
 Q - Quit • Source should show NTP or GPS (whenever possible, an external time source such as NTP or GPS should be used) • Status should show Locked Status should show Locked
 CHSplus s/n 102830 version 21.12.29
 Main menu:
 C = Configuration
 Hessages ->
 S = Shell command
 L list frieware images
 L ist network tunnels
 V = List network tunnels
 V = List network tunnels
 V = Usar rerors and warnings (0)
 C = Configuration
 T = File statistics
 V = Uwew Ferrors and warnings
 V = View Are statistics
 V = Uwew FC status
 A = Uiew Alarn status
 P = Uiew FC since
 R = Strt
 R = Strt
 Quit
 Current RIC Local Time: 2023 ab 24 45-44 The second secon

7. Remove offset

- In the Main Menu, select $\left[\textbf{U} \right]$ to enter a User request In the Main Menu, select [U] to enter a Use
 CHSplus s/n 102833 version 21.12.29
 Hain menu:
 C = Configuration
 H = Nesses ->
 S = Statistical
 H = Nesses ->
 S = Statistical
 H = Nesses ->
 C = Nesses
 C = Nesses R - Resta Q - Quit • Enter command REMOVEDC and confirm pressing enter

Enter command REMOVEDC and confirm CHSplus s/n 102033 version 21.12.29 Main menu: C = Configuration H Messages -> S = Shell command L List frieware images H = List network tunnels X = Display errors (0) and warnings (0) X = Display errors (0) and warnings F = Uiew/reset RTC trin values F = Uiew/reset RTC trin values G = Uiew RTC status A = Uiew RTC status P = Uiew RTC status P = Uiew RTC status P = Uiew RTC status F = Uiew RTC status P = Uiew RTC time U = User request R = Restart Q = Quit U = Restart U = Resta

Command or HELP for more information --> REMOVEDC

Wait until the operation is completed

8. Request Test Pulse

• In the Main Menu, select **[U]** to enter a User request



9 Copy Data from SD Card

9.1 Turn off the Recorder

Turn off the recorder by pressing the power button for 3 seconds



Wait until the RUN LED stops flashing

- 9.2 Remove SD Card
 - · Remove the SD card from its slot (push to release)



9.3 Connect SD Card to Computer

Insert the SD card in your PC's card slot
 Windows cannot detect all partitions on the SD card, so it may ask you to format the card: PLEASE DO NOT FORMAT THE CARD, OTHERWISE ALL RECORDED DATA WILL BE LOST!



Press [Cancel] if the above message appears The SD card should appear as drive named with the serial number of the recorder

102833 (E:) 58.5 GB free of 59.2 GB

9.4 Copy Test Pulse File

• Check the Data folder on the SD card and look for the latest miniseed file with the recorded pulse (file prefix CAL_)



• Copy the file and paste it to a directory of your computer (remember the location for the check under 10.)

9.5 Remove SD Card

• Safely remove the drive (Right-click -> Eject)



9.6 Mount SD Card in Recorder

Insert the SD card back in the recorder's card slot and turn it on by pressing the power button

10. Check Test Pulse

132305 (L:) 6.31 GB free of 7.14 GB

• The shape of the test pulse is depending on the sensor type. A reference pulse recorded at the factory is shipped for each sensor on the usb key, the file can be found in the folder Calibration\Test_files_Sensors (file prefix TP_ with the SN of the sensor). It is also recommended to record a test pulse after installation and keep it with later records for comparison.

10.1 Test pulse of AC-7x

Double-click the file to open it in GeoDAS
Click into the yellow part of the window to make the cursor appear
Move the cursor to the flat part of the pulse
Check that the value of the flat part for each axis is within the range of 0.1125g-0.1375g

	Peak: 0.1357 g at 10:37:38 Window RMS / PP: 0.0273 / 0.1456 g	0.1245						
0.40								
0.10								
0.05								
-								
NH 0.00								
×								
-0.05								
0.10								
-0.10								
	Peak: 0.1344 g at 10.37.38 Window RMS / PP: 0.0269 / 0.1448 g	0.1228		1	i	1		1
0.10								
0.10								
0.05	E							
0, Z								
NHO 0.00								
*								
-0.05								
-0.10								
	Peak: 0.1349 g at 10.37.38 Window RMS / PP: 0.0270 / 0.1456 g	0.1235		2. 2	1	***************************************		2 40
0.10								
0.05								
5'3								
1402 0.00								
.0.05								
-0.05	E I I							
-0.10								
10:3	7.33 10.37.35 10.37.37 10.3	7:39.410 10:3	641 10:3	7:43 10:3	37:45 10:	37.47 10.3	7:49 Ti	me 10:37

10.2 Test pulse of AC-2x

- Double-click the file to open it in GeoDAS
 Click into the yellow part of the window to make the cursor appear
 Move the cursor right after the peak, the point that forms the beginning of a straight line with some slope
 Check that the value right after the peak for each axis is within the range of 0.09g-0.11g
 Visually check that the angle of the slope is similar on all axis (compare with a reference pulse file if unsure)



10.3 Test pulse of AC-4x

Double-click the file to open it in GeoDAS
 Click into the yellow part of the window to make the cursor appear
 Move the cursor to the file part of the pulse, x- and y-axis should show a similar value, the z-axis should show a higher value
 Open a reference file of the same sensor and check that the flat part for each axis on the newly recorded pulse does not deviate more than +/-10%

GSGM	IS File: TP_58324_102845_20220505_072002_Start: 05.05.202	22 07:20:01.	.400 Length: 13.305 sec (20	661 san	mples at 200 sps)								
Peak	c: 0.2492 g at 07:20:06 Window RMS / PP: 0.0446 / 0.2682 g	0.2290											
0.20													
0.10													
50.10													
8 0.00	· · · ·		-										
9 10					Dofo	rong	0						
-0.10					Rele	Ienc	,e						
-0.20				0	0.2299								
Poak	c. 0.2522 a st 07:20:06 Mindow BMS / PP: 0.0452 / 0.2726 a	0.0000						-			1		
0.24	(0.2332 g at 07.20.00 Window Rin37 PP. 0.04327 0.2720 g	0.2350											
0.16 E									Axis	New TP	Reference	Deviation %	
□ 0.08				0	0.2315				v	0 2200	0 2200	0.20	
8 0.00									<u>^</u>	0.2250	0.2255	-0.35	
0 0.00		•	+					-	Y	0.2330	0.2315	0.65	
-0.08									Z	0.3134	0.3128	0.19	
-0.16					1 3128								
-0.24													
0 32 Peak	c: 0.3388 g at 07:20:06 Window RMS / PP: 0.0606 / 0.3661 g	0.3134											
-			-										
0.16				-									
8 0.00	·····	1	January and the second										
9 -													
-0.16													
Norman Parts													
-0.32		1											
07:20:02	07:20:04 07	20:06.475	07:20	0:08	07:2	0:10	07:20:1	2			Time		07:20:1

10.4 Test pulse of AC-6x

Double-click the file to open it in GeoDAS
Click into the yellow part of the window to make the cursor appear
Move the cursor to the filt apt of the pulse, depending on the sensor generation, the pulse may be negative or positive
Open a reference file of the same sensor and check that the flat part for each axis on the newly recorded pulse does not deviate more than +/-10%



10.5 Test pulse of VE-1x

Double-click the file to open it in GeoDAS
 Click into the yellow part of the window to make the cursor appear
 Check that the pulse is with similar shape as shown in the picture below
 Move the cursor to the peak of the positive pulse to read the value for each axis
 Open a reference file of the same sensor and check that the peak for each axis on the newly recorded pulse does not deviate more than +/-10%



10.6 Test pulse of VE-2x

Double-click the file to open it in GeoDAS
Click into the yellow part of the window to make the cursor appear
Cleck that the pulse is with similar shape as shown in the picture below
Move the cursor to the peak of the positive pulse to read the value for each axis
Open a reference file of the same sensor and check that the peak for each axis on the newly recorded pulse does not deviate more than +/-10%



10.7 Test pulse of VE-5x-SP

Double-click the file to open it in GeoDAS
Click into the yellow part of the window to make the cursor appear
Check that the pulse is with similar shape as shown in the picture below
Move the cursor to the peak of the positive pulse to read the value for each axis
Open a reference file of the same sensor and check that the peak for each axis on the newly recorded pulse does not deviate more than +/-10%



10.8 Test pulse of VE-5x-BB



