# Maintenance and Repair Procedure for GSR-xx

#### **Document Revision**

Date	Description	Who	Checked	Approved
05.03.2010	First issue	THL		
17.12.2013	some testpoints added	THL		

#### 1. Installation

Ref.	Торіс	Name	Description
1.1.	Installation Condition	Check installation condition	Cables, connectors, dirt and dust
		<ul> <li>Check if Instrument is still properly earthed</li> </ul>	

# 2. Configuration

Ref.	Торіс	Name	Description
2.1.	Configuration	Store the actual configuration	Login to the instrument
		Instrument Setup Manager for the station <2098>	Open "Instrument Setup Manager"
		Sampling       Event Trigger       Alarms       Channels       Communication       Time Triggers         Errors and Warnings       Interconnection       Data Streams       Pinthe       Batch Mode       Intensity         Station       Instrument       Power and Batteries       Date and Time       Test       LCD Display         Image: Communication       Station       Information       Refresh       Put Page         Station Code       STADI       Altrude       0       416       Put Page         Station Code       STADI       Altrude       0       416       Put All         Location       GSO       Laitrude       47°25.800N       47°24.409M       Reset         Restarts       0       Longitude       008°33.200E       008°13.079E       Reset         Date of Installation       01.01.1997       Date of Last Check       12.01.2010       Checked by       THL         Comment       GSR18 TEST Recorder GeoSIG Ltd.       Export       Export	Push "Export" on the left side and store the configuration file on the PC. In "worst case" you still have the stored configuration before maintenance, which you can import at the end again with the button "import" and push "Put All".
		Status Normal operation Disconnect	
		Fig 1. Instrument Setup Manager of GeoDAS	

# 3. Batteries

Ref.	Торіс	Name	Description
3.1.	Main Battery	• Measure the voltage of the Main battery • Instrument Setup Manager for the station <2090> • Sempling Event Trigger Marms Channels Communication Time Triggers • Power and Batteries Date and Time Test LCD Display • Power and Batteries Settings • Power and Batteries Settings • Power Loss • Date of Velages, Volt •	Disconnect AC and use a multimeter Or login to the instrument and check the values in the "Date and Time" tab of the "Instrument Setup Manager" of GeoDAS
		Fig 2. "Power and Batteries" l ab     Does the battery leak?	Replace it immediately
			Add in the date when you replaced it Add + 3 years in the field "Replacement"
3.2.	Backup Battery	Measure the voltage of the Backup Battery      Manager for the station <2090>     Samping Event Trigger Alarms Channels Communication Time Triggers     Errors and Waning: Interconnection Data Streams Printer Batch Mode Intensity     Station Instrument. Power and Batteries Date and Time Test. LCD Display     Power and Batteries Settings     Power and Batteries Settings     Power Loss     Date of Voltages, Volt     Last Power Loss     Date of Voltages, Volt     Installation Replacement. Actual Minimal     II.01.1997     01.01.2000     13.88     11     Batteries     Time     Last Power Loss     Time     Last Power Loss     Time     Last Power Loss     Time     Last Power Loss     Date of Voltages, Volt     Export     Export	Disconnect AC and use a multimeter Or login to the instrument and check the values in the "Date and Time" tab of the "Instrument Setup Manager" of GeoDAS
		• If the voltage is below 3 volt, it should be replaced.	Add + 5 years in the field "Replacement"

### 4. Sensor Test

There are two possibilities to check the sensor, either by sending a testpulse or do a tilt test.

Ref. Topic Name Description 4.1. Test Open "Test" in the "Instrument Setup • Send a Test Pulse Pulse Manager" nt Setup Manager for the station (2008) × tmen and Warninge | Selectomettion | Deta Sonane | Steam | Batch Pock | Selemitip Songling | Event Tropper | Alamis | Channels | Concursion | Time Troppes Salatin | Sindhumant | Tower and Salatimes | Data and Time - <sup>Timet</sup> | LCD Deploy PeriodicTesta Test Selection and Results - Other Options Test Interval 50 days Passed P Analog P Record Test Pulse Passed 17 Hardwater 17 Check Senatz Permanent& Pacced P 810 P Voltage Parred gloplay Errors and Warnings Passet P Neriory Run Test Novi Dut life, not connected Connect Rota | Fig 4. "Test" Tab Make sure "Record Test Pulse" is Run Test Now enabled Push "Run Test Now" It may takes several time until test has been finished An event file will be recorded Open the "Event Manager" and Open the Testpulse event file and • download the specific file (called compare it with older records "test") Examples of typical testpulse of the set of the basis different sensors 1001000 Fig 5. AC-23 Fig 6. AC-43

**W** Tilt Test can be done only with AC-43 and AC-63

		Fig 7. AC-63 Fig 7. AC-63 Fig 8. VE-53 • KEEP THE RECORDS ! • Store or at least print it out.	The best is to send every month a testpulse and keep these records, so you can compare all the time with earlier recorded files. You can set in the "Test" tab to send a testpulse every xx day
4.2.	Tilt Test	<image/> <form><form></form></form>	Check the AD value in the "Instrument Setup manager" on the "Sampling" tab         In case of an internal sensor, tilt the instrument         Image: Tilt Test can be done only with AC-43 and AC-63         X:+/-1g         Y:0g         Z:-1g
		Fig 10. Tilt X Axis	

		Tilt sensor on Y axis	X : 0 g
			Y : + / - 1 g
			Z : -1 g
		Fig 11. Tilt Y Axis	
		<ul> <li>Tilt sensor on Z axis</li> </ul>	X : 0 g
			Y : 0 g Z : - 2 g (except on a 1g sensor)
		Fig 12. Tilt Z Axis	
4.3.	Offset	Measure the offset	Should be as close as possible to 0 g

# 5. Power Supply and Voltages

Ref.	Торіс	Name	Description
5.1.	Important Voltages on GSR-12/16/18	Measure all the important voltages on the mainboard	<b>Turn off the</b> <b>instrument</b> Unscrew the mainboard
		Fig 13. open GSR	
			Lay it carefully on the black battery cover Turn instrument on
			according to Fig.15
		Fig 14. DBMN mainboard	

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# GS\_DBMN/V12



#### Fig 15. test points

V\_MAIN : 13 V, main power coming from power supply or battery

- V\_MAIN\_1 : 13 V, main power after shortcut protection circuit
- V\_CHARG : 14.5 V, used to charge the battery
- V\_REF : 2.5 V, used for specific sensors with 2.5V  $\pm$  2.5 V output
- AVCC\_CPU : 5 V,  $\mu$ Processor power
- VCC : 5 V, used to power most of the IC's

Ref.	Торіс	Name	Description
5.2.	Important Voltages or GSR-24	Measure all the important voltages on the mainboard	Turn off the instrument
			Unscrew the mainboard GS_24MN
		Fig 16. open GSR-24	
			Lay it carefully on the black battery cover
		- A A A A	Turn instrument on
			Measure the voltages according to Fig.18
		Fig 17. GS_24MN mainboard	

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Fig 18. GS\_24MN\_V7 mainboard

### 6. Alarm Test

Ref.	Торіс	Name	Description
6.1.	Alarm Test	Check the Alarm Relay	Open the "Alarms" tab in the "Instrument Setup Manager"
		Instrument Schur Manager for Holdschurter - 200000       Image of Manager and Batheres - Data Shawer Friet - Loo Display         Sample - Downer Tragger - Advance - Data Shawer Friet - Loo Display       Sample - Downer Tragger - Advance - Data Shawer - Data Shawe	You can push the "Test Alarm" buttons or shake/tilt the sensor to check if the relay switches. Either you check the LED on the Alarmboard or you connect (to make really sure) a multimeter to the alarm connector and measure if the relay does switch correctly. The results depend on how the alarmboard is set, means normally open or closed etc. Refer also to the GSR-Alarm Appendix I manual.

If an Alarm Board is installed, do the test 6.1.

# 7. Interconnection

Ref.	Торіс	Name	Description
7.1.	Intercon- nection Test	Sector Versit Trager         Average         Charvals         Conversitation         This Tragers           Sector         Journal Average         Charvals         Conversitation         This Tragers           Direct and the sector of a balance of balance of the tragers         Determined         Determined         Particle           V         Exclusion of a balance of balance of the sector of a balance of the tragers         Particle of the sector of a balance of the tragers         Particle of the sector of a balance of the tragers           V         Exclusion for a balance of the sector of a balance of the tragers         Particle of the sector of a balance of the tragers         Particle of the sector of a balance of the tragers           V         Exclusion for the sector of a balance of the tragers         Particle of the sector of the	Open the "Interconnection" tab in GeoDAS. All should be enabled, except the "Network Master Mode". Enable it ONLY on the Master Instrument. Refer to chapter 5.10 in the GeoDAS manual or 2.2.4 in the GSR_Interconnection Appendix G manual
		Fig 20. Interconnection Tab	
			From left to right : Yellow LED : Blinks in all recorders Red LED : Blinks in the recorders configured as Network Drivers and in the Central Communication Box Green LED : Blinks in the recorder configured as Software Master and during a trigger also in the corresponding Software Slave.

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			Yellow LED : Communication transmit signal
			Green LED : Communication receive signal
			Refer also to chapter 2.3 in the GSR-Interconnection Appendix G manual.
7.2.	Clock Test	<ul> <li>Change the time to check if the</li> </ul>	Login to the Master instrument
		network clock works Instrument Setup Markager for the station <20502	Open "Date and Time" tab in GeoDAS
		Dimen and Warnings   Indecommutation   Data Streams   Data Model   Johannito       Solaring   Every Nagoes   Alarces   Communitation   Trac Tragges     Solaring   Technologies   Between   Data and Time   Lob Deploy     Que   Color and Time Statings     Connect Times and Time Statings     Connect Times - Data and Times Indefen	Put a different date or time in the custom field and press "Update from custom settings".
		Dode         Tree         Lest Update         Put Page           Becorder         00:03:2000         10:00:07         90:00:00         90:00:00	Log out.
			Wait a couple minutes
		Grades Charles Consider Carlos	Login to the next instrument of the interconnection network. Check if the date/time has changes.
		Custor Gest (PS is always or)	Logout
		Salative used 14 Remarking SPS active take 5 million 1	Login to the next instrument and check and so on
		Fig 22. "Date and Time" Tab	Login to the Master instrument and change the date/time to the right value by pressing either "Update from PC RTC" or "Update from GPS", if a GPS is connected.