Maintenance and Repair Procedure for GSR-xx

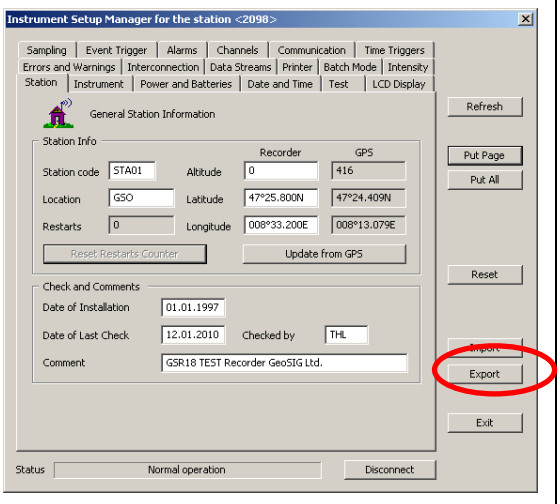
Document Revision

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

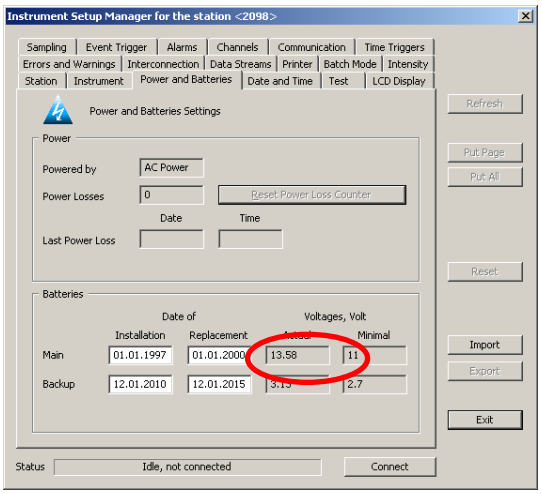
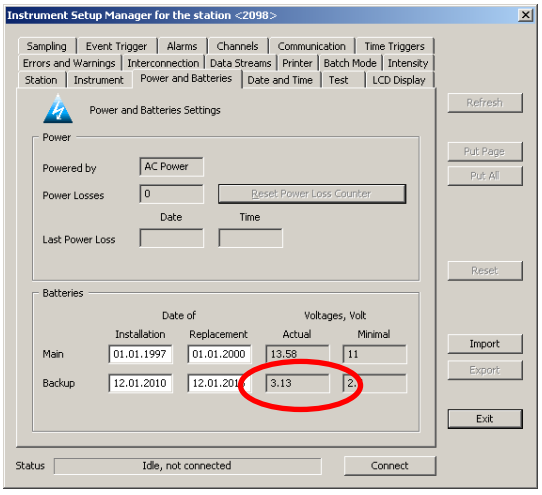
1. Installation

Ref.	Topic	Name	Description
1.1.	**Installation Condition**	• Check installation condition	Cables, connectors, dirt and dust
		• Check if Instrument is still properly earthed	

2. Configuration

Ref.	Topic	Name	Description
2.1.	**Configuration**	• Store the actual configuration  Fig 1. Instrument Setup Manager of GeoDAS	Login to the instrument Open “Instrument Setup Manager” 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”.

3. Batteries

Ref.	Topic	Name	Description
3.1.	**Main Battery**	• Measure the voltage of the Main battery  Fig 2. "Power and Batteries" Tab	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
		• 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  Fig 3. "Power and Batteries" Tab	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 in "Installation" the date when you replaced it 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.

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

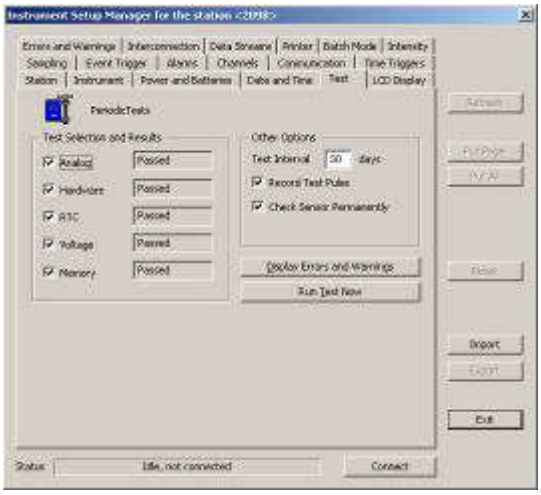
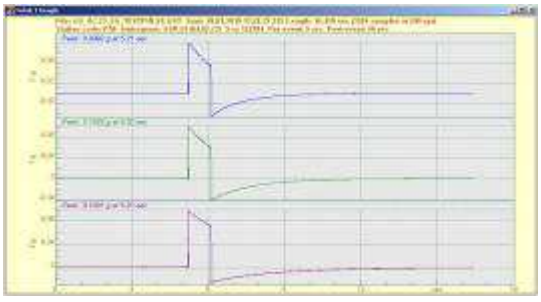
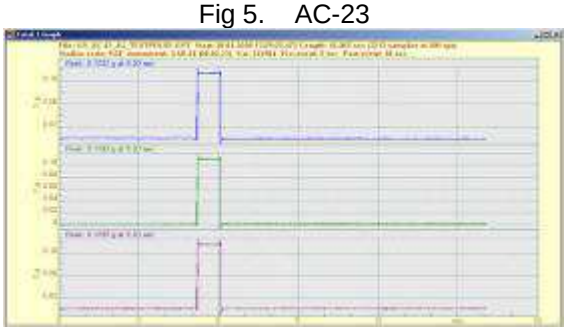
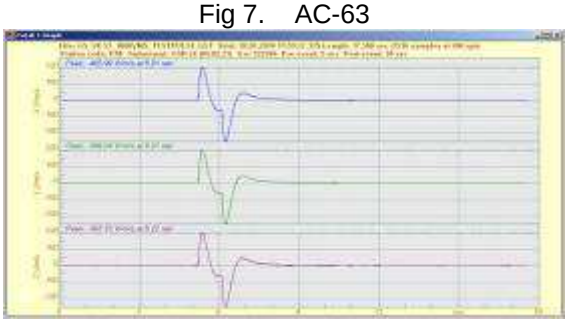
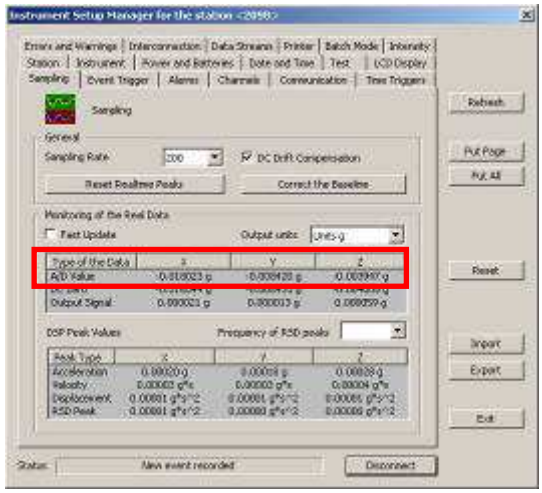
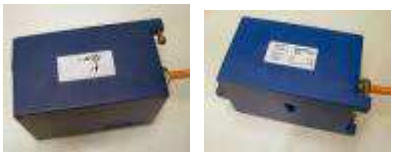
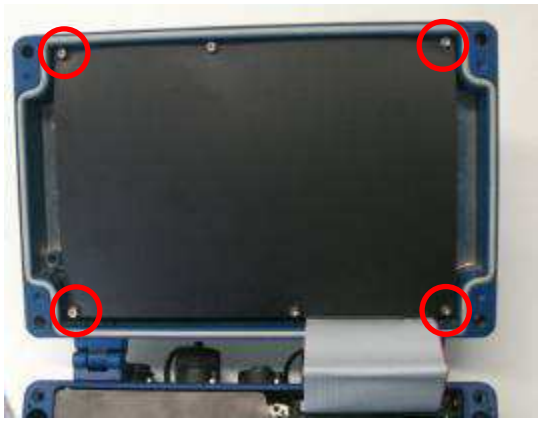
Ref.	Topic	Name	Description
4.1.	**Test Pulse**	• Send a Test Pulse  Fig 4. “Test” Tab	Open “Test” in the “Instrument Setup Manager”
		• Run Test Now	Make sure “Record Test Pulse” is enabled Push “Run Test Now” It may takes several time until test has been finished An event file will be recorded
		• Open the Testpulse event file and compare it with older records	Open the “Event Manager” and download the specific file (called “test”)
		 Fig 5. AC-23  Fig 6. AC-43	Examples of typical testpulse of different sensors

		 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**	• Test the sensor with a tilt test  Fig 9. "Sampling" Tab	Check the AD value in the "Instrument Setup manager" on the "Sampling" tab In case of an internal sensor, tilt the instrument ***Tilt Test can be done only with AC-43 and AC-63***
		• Tilt sensor on X axis  Fig 10. Tilt X Axis	X : + / - 1 g Y : 0 g Z : - 1 g

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

5. Power Supply and Voltages

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

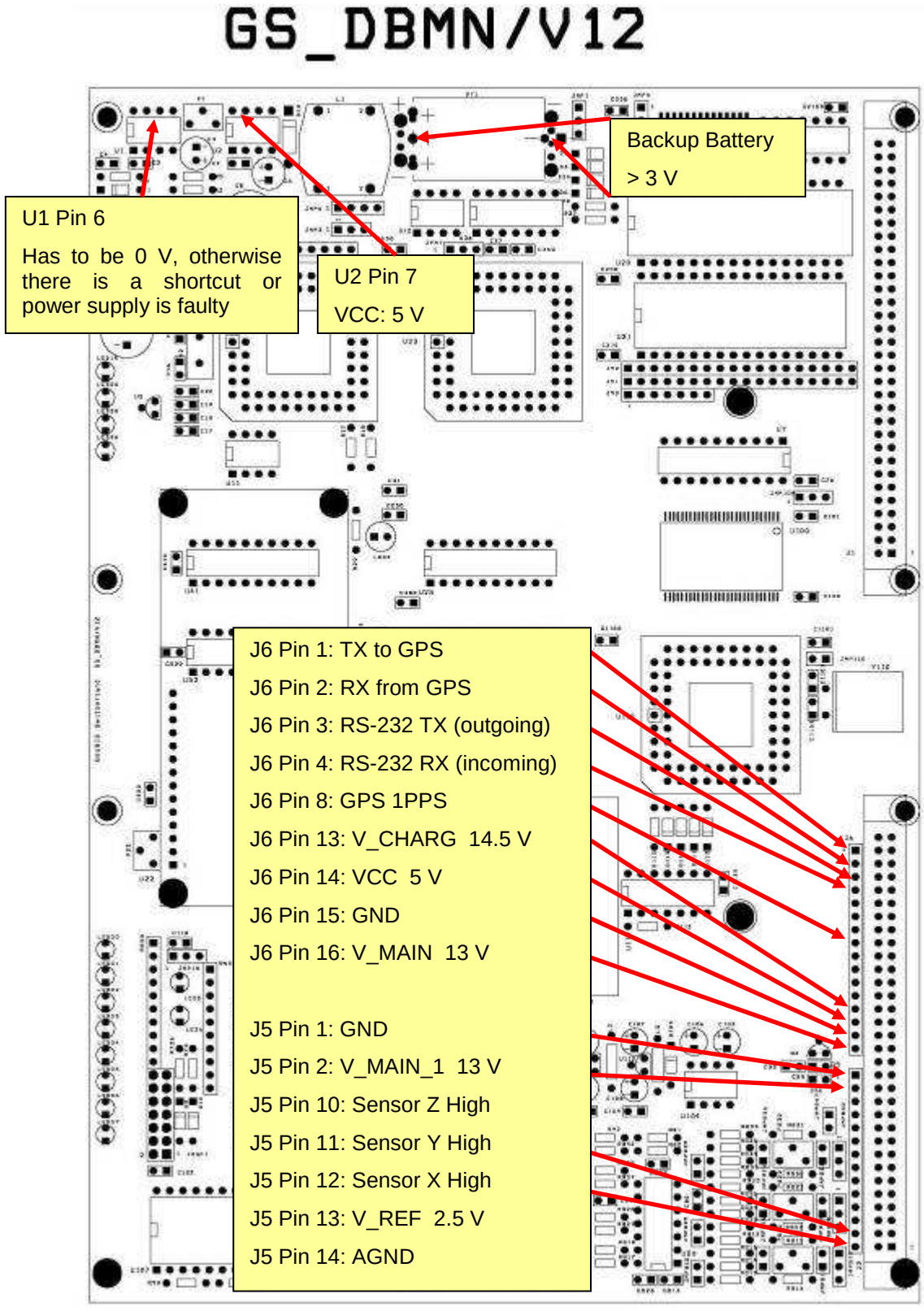


Fig 15. test points

V_MAIN : 13 V, main power coming from power supply or battery

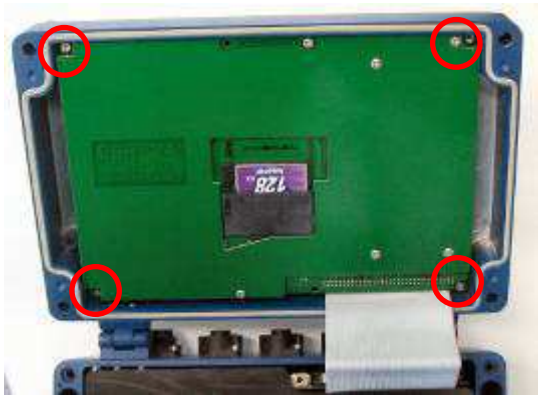
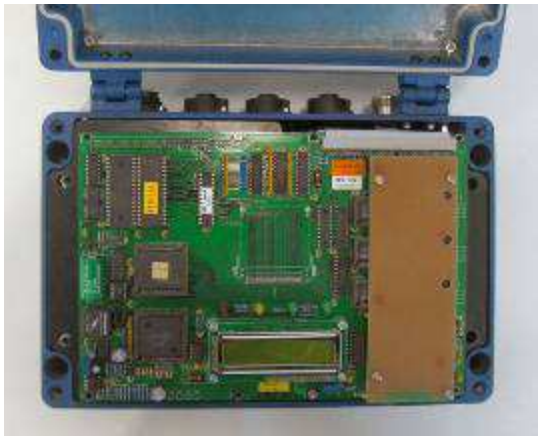
V_MAIN_1 : 13 V, main power after shortcut protection circuit

V_CHARG : 14.5 V, used to charge the battery

V_REF : 2.5 V, used for specific sensors with 2.5V ± 2.5 V output

AVCC_CPU : 5 V, µProcessor power

VCC : 5 V, used to power most of the IC's

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

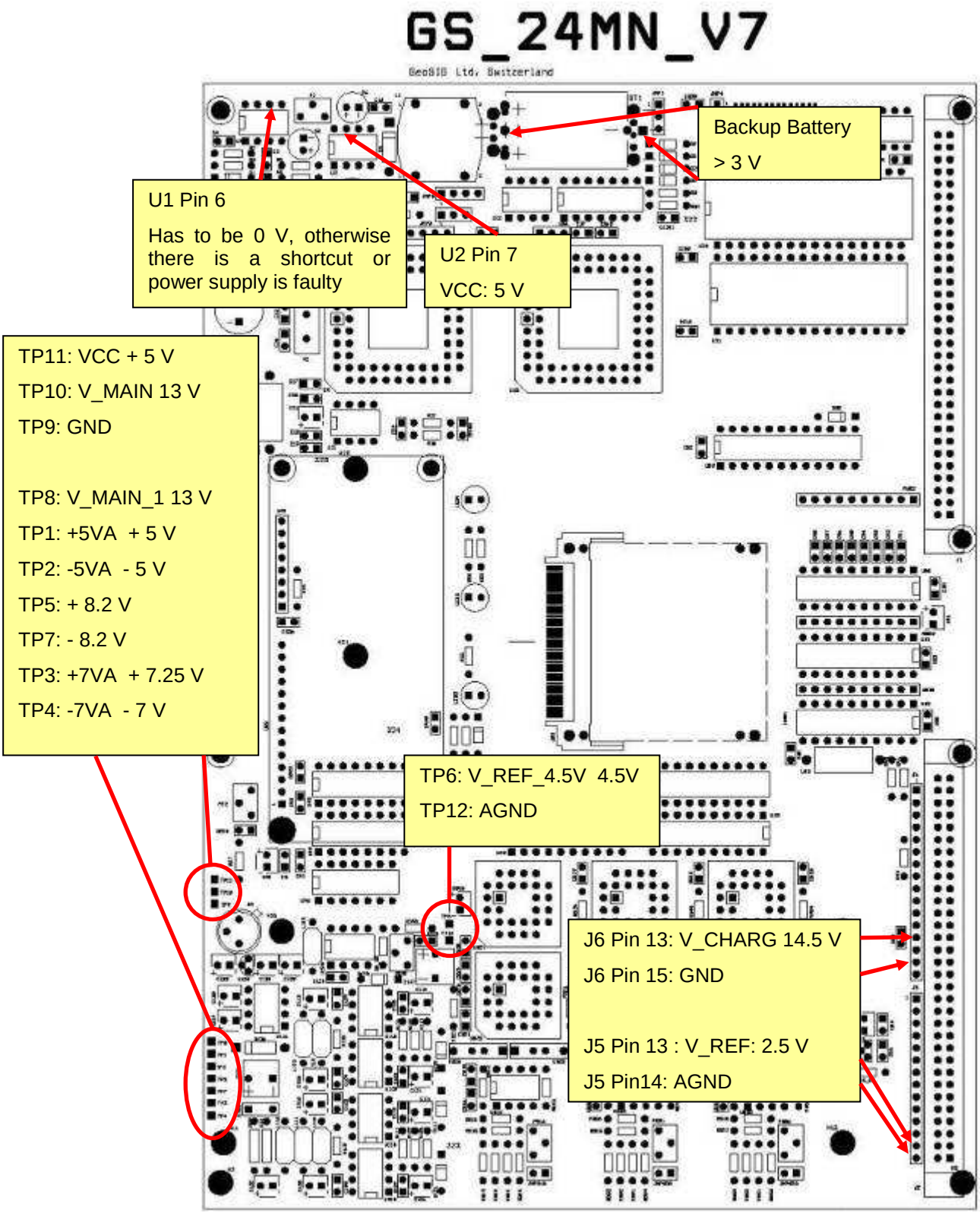
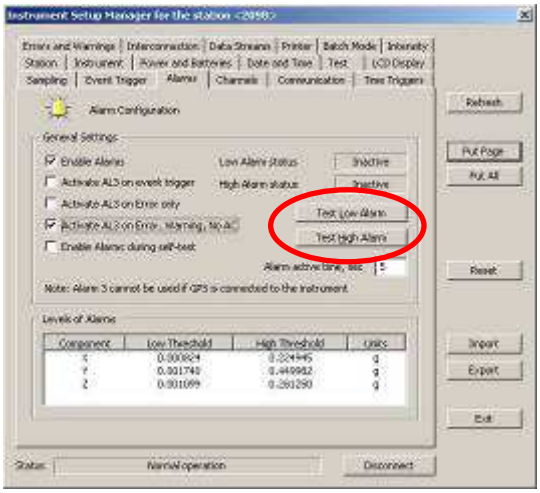


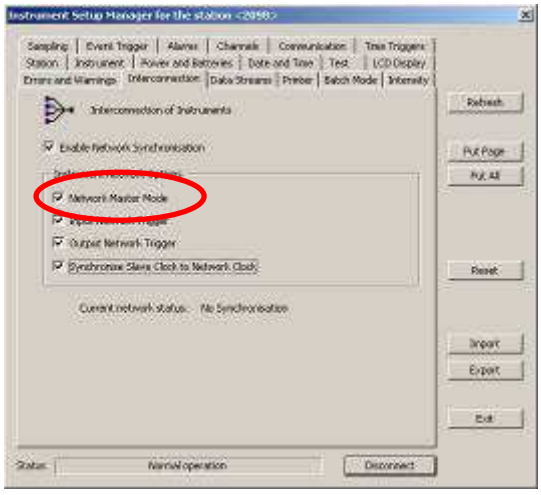
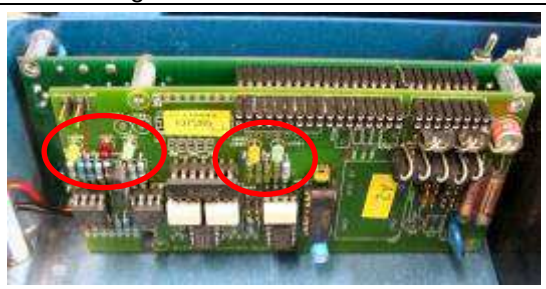
Fig 18. GS_24MN_V7 mainboard

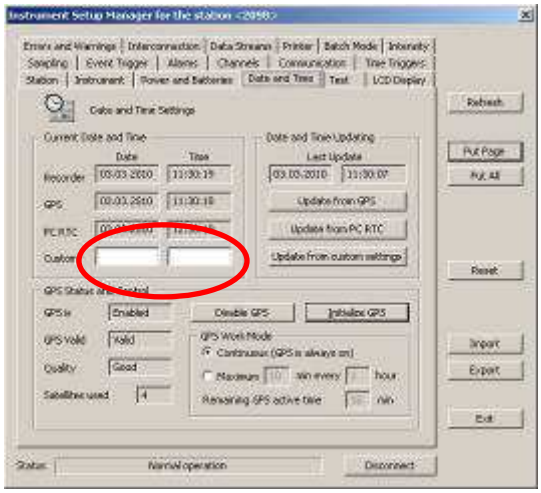
6. Alarm Test

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

Ref.	Topic	Name	Description
6.1.	**Alarm Test**	• Check the Alarm Relay	Open the "Alarms" tab in the "Instrument Setup Manager"
		 Fig 19. "Alarm" Tab	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.

7. Interconnection

Ref.	Topic	Name	Description
7.1.	**Intercon-nection Test**	 Fig 20. Interconnection Tab	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 21. GS_ICC_V5 board	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.

			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**	• Change the time to check if the network clock works  Fig 22. "Date and Time" Tab	Login to the Master instrument Open "Date and Time" tab in GeoDAS Put a different date or time in the custom field and press "Update from custom settings". Log out. Wait a couple minutes Login to the next instrument of the interconnection network. Check if the date/time has changes. Logout Login to the next instrument and check and so on… 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.