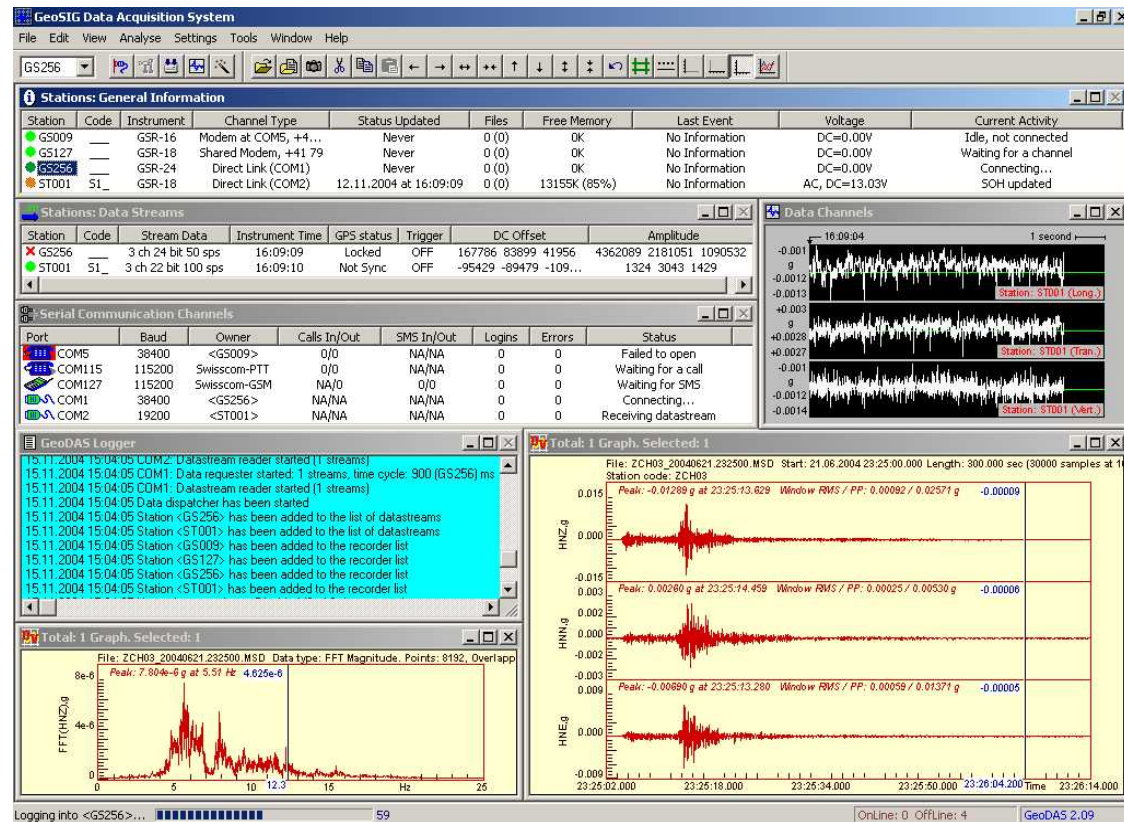


GeoDAS

Software of GeoSIG



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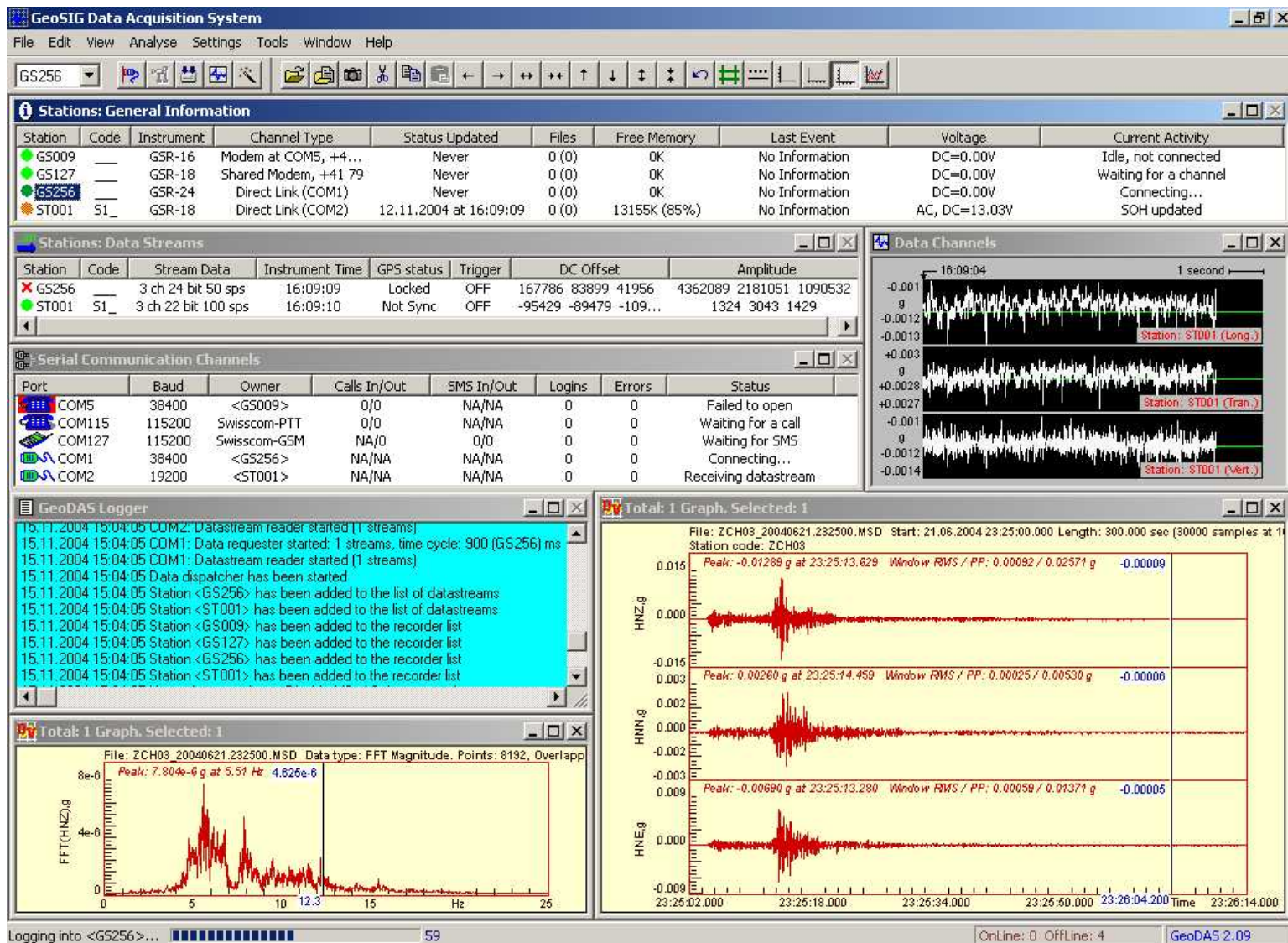
Automatic Event Processing

Automatic File Conversion

Thank you

Introduction

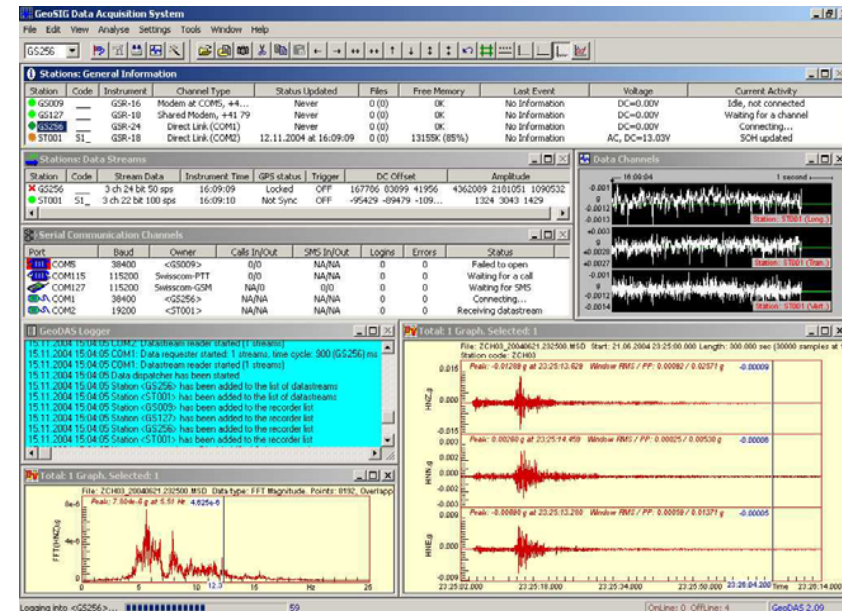
GeoDAS, Software of GeoSIG



Major Features

GeoDAS, Software of GeoSIG

- ❑ One of the best rated software of its kind in the industry
- ❑ Microsoft Windows-based application running under Windows 9x / 2000 / NT4 / XP / Vista
- ❑ Used for:
 - Instrument Configuration
 - Data Acquisition
 - Data Analysis
- ❑ Data is delivered through serial communication channels via:
 - Serial Port
 - Ethernet (LAN, Internet, Wireless, etc)
 - Modem (Landline, GSM, Satellite, etc)
- ❑ Can serve several instruments at the same time



General Tasks of GeoDAS

- ☐ Setup of an instrument. One can change any parameters of an instrument with GeoDAS.
- ☐ State of health (SOH) monitoring. GeoDAS performs permanent or periodical monitoring of an instrument status.
- ☐ Downloading of the event files from an instrument working as a recorder
- ☐ Off-line event data view and simple data analysis
- ☐ Support for serial data streams (GSBU GeoSIG-Bergen and CWB or IASPEI formats)
- ☐ Logger features. GeoDAS keeps important messages in a log file.
- ☐ Real-time data viewer for an instrument, which provides serial data stream.

Data Analysis

Strong motion, earthquake engineering and civil engineering data analysis and preliminary seismic analysis of recorded data.

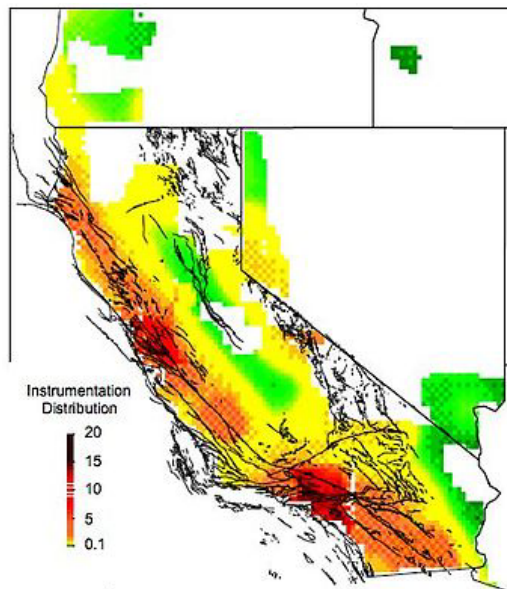
- ☐ Lowpass filtering (e.g. keep signal less than 20 Hz)
- ☐ Highpass filtering (e.g. keep signals more than 0.2 Hz)
- ☐ Baseline correction
- ☐ Integration of the signal to get acceleration → velocity → displacement
- ☐ Differentiation of the signal to get displacement → velocity → acceleration
- ☐ Vector Sum (of all channels)
- ☐ Cumulative Absolute Velocity (CAV)
- ☐ Time domain filtering (Parzen, Hanning, Welch, Hamming)
- ☐ Effective Values (DIN 45 669)
- ☐ Damping and Eigenfrequency
- ☐ Power Spectrum Calculation
- ☐ Fast Fourier Transformation (FFT)
- ☐ Terzband Spectrum calculation
- ☐ Response Spectrum for any damping in acceleration, velocity and displacement
- ☐ JMA Intensity
- ☐ STA/LTA Ratio
- ☐ Manual Event Check
- ☐ Signal Characteristics
- ☐ Running a batch of a sequence of above operations

Strong Motion Data Processing

PGA peak ground acceleration
PGV peak ground velocity
SD peak spectral displacements

of the measured earthquake
shaking.

→ Shakemap



Strong Motion Data Processing

General Settings

- ☒ Generate reports in the directory: \\RR1\WS\IncomingReports [Browse...]
- ☒ Send reports to the configured Rapid Response server(s) [Configure...]
- Components of parametric information to be used for mapping: Average value of X, Y

Data Simulation

- ☒ Simulate strong motion data reports according to the conditions listed below

Time Schedule

- Total number of simulations: 30
- Time of the first simulation, HH:MM: 12:00
- Simulation repeat interval, hours: 24
- Duration of the events, seconds: 60
- EVT sending interval, seconds: 30

Simulation Type

- ☐ Simulate the strong motion reports internally
- ☐ Send simulated reports as SMS messages
Note: SMS Manager must be set up correctly
Destination phone number: []
- ☒ Reports are simulated by the stations
Send parameters to: All Stations [Send]

Station Locations

- ☒ Use the real configuration of the stations
- ☐ Station information is taken from the file: Station.dat []

Distribution Type

- ☒ Random distribution throughout the area of monitoring
- ☐ Gradient distribution towards an epicenter
Direction of a seismic wave propagation, deg: 270

Parametric Information

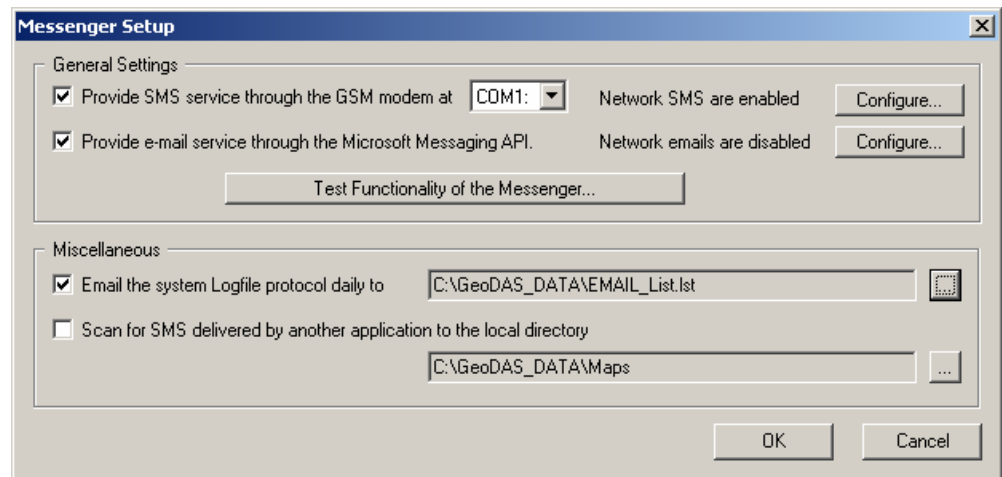
	PGA, g	PGV, cm/s	RSD at 5.00 Hz, cm	RSD at 3.33 Hz, cm	RSD at 2.00 Hz, cm	RSD at 1.11 Hz, cm
Absolute maximum	0.4	5	1	2.5	5	9
Absolute minimum	0.08	1	0.2	0.2	1	2

☐ Load parametric information from the file: E:\Cpp\Test\RRMap\SimulatedParam.txt []

Messenger of GeoDAS

Deliver different types of information from GeoDAS to the subscribers.
Two ways of delivery are currently supported:

- ☐ email
- ☐ SMS (short message service).



Network Links of GeoDAS

GeoDAS can communicate to other instances of GeoDAS as well as to other applications developed by GeoSIG

This features allows GeoDAS to:

- ☐ Accept the requests from remote GeoDAS and/or from other applications,
- ☐ Forward the information provided by data streams to the remote applications,
- ☐ Launch / monitor / restart an external application
- ☐ Make the following different GeoDAS services available for the remote clients:
 - Monitoring State of Health (SOH)
 - Downloading events and ring buffer files
 - Requests for statistics of communication
 - Real time data streaming
 - Remote configuration

Network Links

☒ Enable network links with the remote applications

Local settings of this application

Network name: GeoDAS_WW1WS
Password: *****
IP Address: Default

☒ Accept requests from the remote clients at port: 10240
☒ Accept requests from the configured applications only
☐ Support functions of a remote node (Options...)
☐ Support broadcasting of datagrams, port: 10241
☐ Launch the application

Remote application

Network name: RRMMapServer1
Password: *****
IP Address: 192.168.1.21
Connect through the port: 1024
Connection timeout, sec: 40
Inactivity timeout, sec: 600
☐ Remote node (Options...)
☒ Permanent monitoring (Monitor...)
☐ Packet mode (Settings...)

Configured remote applications

Name	Link Parameters	Conn.TO	Inactivity TO	Node	Monitor
RRMapServer1	TCP 192.168.1.21:1024	40	600	No	Yes
RRMapServer2	TCP 192.168.1.22:1024	40	600	No	Yes
GeoDAS_RR1TS	UDP 46400:192.168.1.11:46200	40	600	Yes	Yes
GeoDAS_RR2TS	UDP 46402:192.168.1.12:46202	40	600	Yes	Yes
GeoDAS_WW2WS	TCP 192.168.1.34:1024	40	600	No	Yes
GeoDAS_SERIAL	COM1, 19200 baud	40	600	Yes	Yes

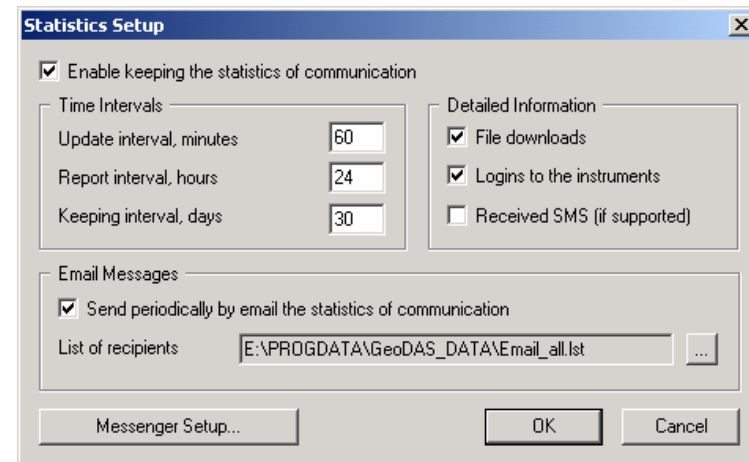
Buttons: Add, Remove, Update, OK, Cancel

Statistics of Communications

Statistical information can be used to optimise communication parameters for the purpose of debugging. The acquired information can be viewed, kept in a file and sent to email recipients.

Statistical information acquired consist of:

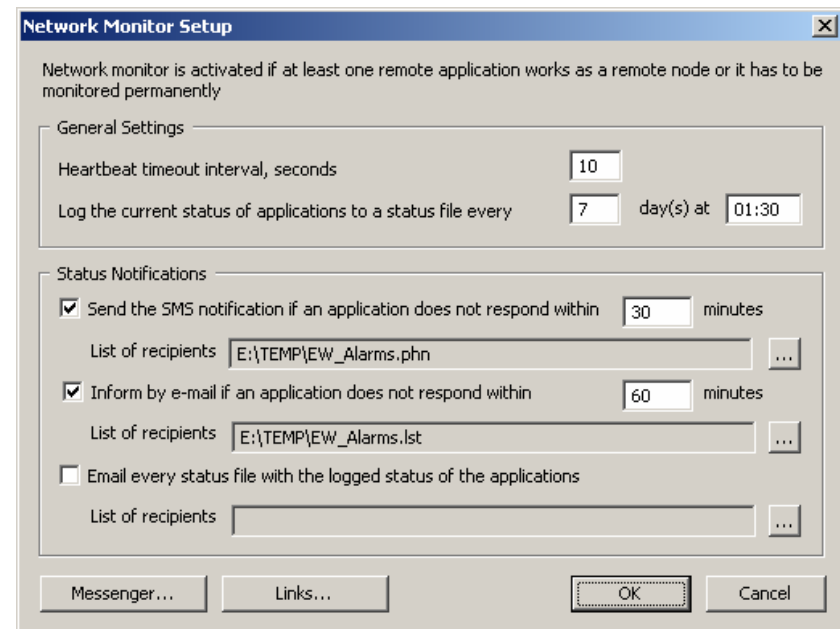
- ☐ The unique station name,
- ☐ Number of successful logins to the instrument,
- ☐ Total time spent logged in to the instrument,
- ☐ The number of downloaded files and total size,
- ☐ The rate of data transfer from the instrument,
- ☐ Minimum/maximum/mean waiting time for a free communication channel to lock it and get an access to the current station,
- ☐ Minimum/maximum/mean waiting time for dialling out,
- ☐ Number of failed attempts to login to the instrument,
- ☐ Number of event detected (EVT) messages received,
- ☐ Number of event completed (FIL) messages received,
- ☐ Number of state of health (SOH) messages received



Network Monitor

Control remote GeoSIG applications and provide general information about them to the subscribers by email and/or by SMS messages.

- ☐ Restart a remote application
- ☐ Reboot a remote computer
- ☐ Periodically checks the status
- ☐ Logged to the status file.
- ☐ Enhanced information displayed, monitored and logged



Event Checks

Check whether any event

- ☐ Can be declared as seismic one
- ☐ Meet the Operating Basis Earthquake (OBE) and Safe Shutdown Earthquake (SSE) criteria

Event Check Parameters

Seismic Check Parameters
An event should meet the following criteria in order to be declared seismic:

Minimum number of sites triggered: 2

Time frame for all triggers, sec: 3

Minimum duration of the event, sec: 2

Threshold for estimation of duration, g: 0.003

Max frequency of the FFT peak, Hz: 33

OBE/SSE Check Parameters
☒ OBE Parameters ☐ SSE Parameters

Frequency Range

RSA check range, Hz: From 2 To 10

RSV check range, Hz: 1 2

Absolute Exceedance Limits

Horizontal Vertical

RSA limits, g: 0.2 0.2

RSV limits, mm/s: 152.4 152.4

CAV limits, mm/s: 1569.6 1569.6

Parameters of Calculation

Response spectrum range, Hz: 0.1 - 100

Frequency points per decade: 40

CAV integration limit, g: 0.025

RSV calculation method:
☒ Integration in the frequency-domain
☐ Integration in the time-domain

Automatic Event Checks
☒ Events recorded by the stations listed below are checked automatically for OBE and SSE

Station	Alarm	Print	RSA Limits	RSV Limits
F1				F1_RSV.lmf
G1				G1_RSV.lmf
G2				G2_RSV.lmf
K1				K1_RSV.lmf
U1				U1_RSV.lmf

Results of event checks can be forced for the test purposes:

☐ Force to Seismic
☐ Force to OBE
☐ Force to SSE

If a OBE ann... and an event recorded by this station meets the signals are sent to the all configured

Path to the limit files: L:\GeoSIG\Project\CH-Le ... Edit Limit Files...

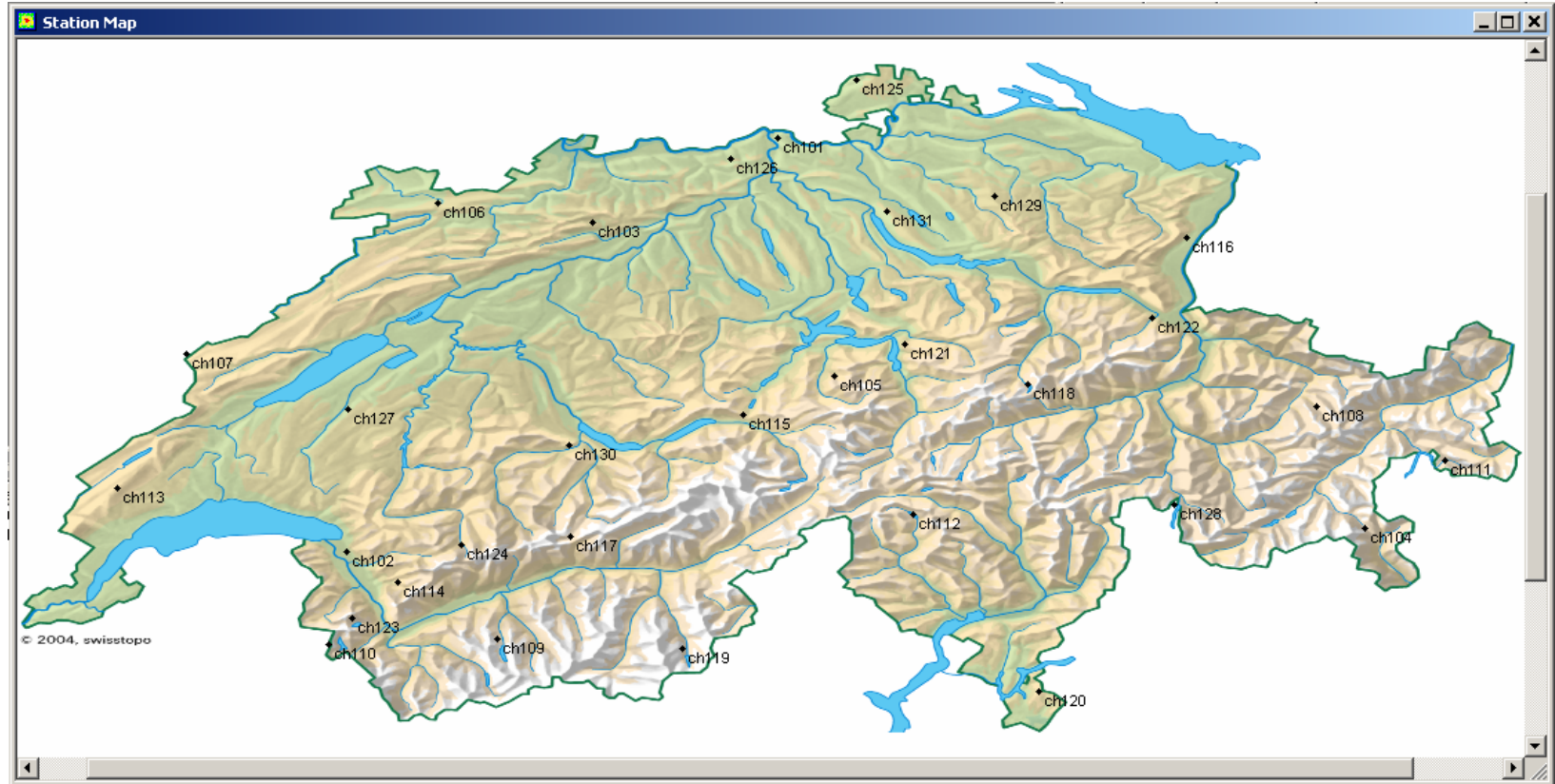
Automatic Report Generation
☒ Print reports on the default system printer ☐ Make PDF reports

The following types of events are reported: OBE and SSE events

Adjust template of the reports: First Page... Other Pages...

Station Map

Map showing the area where the stations are located



Support for ADC Boards

Acquire data directly from an industry standard A/D converter boards
Adjust trigger settings
Adjust parameters for processing of data streams
Also available for remote nodes

For each channel it is possible to define the following parameters:

- ☐ Whether it provides data to the acquisition system or not,
- ☐ Channel name,
- ☐ Connected Sensor and its full scale,
- ☐ Full Scale or DC gain,
- ☐ Units,
- ☐ Drift Compensation

Configuration of ADC Channels

Configuration Parameters

ADC unit name (up to 3 characters): AFS Configuration target: This Computer

ADC unit identification number: AUTO

ADC unit type: PCIM-DAS16JR/16

ADC voltage range: ± 20 volts

Sampling rate for all channels, sps: 10

☒ Single-ended channels ☐ Vector sum channels

☐ GSR-12/16PC LED control ☐ Master ADC

Streams... Delete Unit More...

ADC Channel Parameters

N	Enabled	Name	Sensor	FS Gain0	FS Gain1	FS Gain2	Unit	Drift Comp.
1	Yes	Ch_01	AC-63 ±2g	2.000e+...	2.000e+000	2.000e+000	g	Yes
2	Yes	Ch_02	AC-23 ±1g	1.000e+...	1.000e+000	1.000e+000	g	Yes
3	Yes	Ch_03	Custom	0.0	13.0	0.0	V	Yes
4	Yes	Ch_04	GSV-3xx ±1-10...	1.000e+...	1.000e+001	1.000e+000	mm/s	Yes
5	Yes	Ch_05	Guralp CMG-ST	2.000e+...	2.000e+000	2.000e+000	g	Yes
6	Yes	Ch_06	Custom	0.0	10.0	0.0	V	Yes
7	Yes	Ch_07	Custom	0.0	10.0	0.0	V	Yes
8	Yes	Ch_08	Custom	0.0	10.0	0.0	V	Yes

Sensor gain: Gain 1 Note: Gain 1 must be selected for the sensors, which do not support different gains

Edit: ☒ Full Scale ☐ Permanent DC Offset

Note: Neither offset correction nor drift compensation is performed for the channels with nonzero permanent offset.

Apply OK Cancel

Static Measurements

In case of ADC Channels; all or some of these channels can be configured as static channels.

Static Channel: rather slowly changing channel, so it can be sampled with a time interval of several seconds, minutes or even hours. A typical example of static data is the air temperature.

Static Data Acquisition and Analysis

☒ Perform static analysis of data stream channels

Static Data Channels

Channels and Files		Alarm Levels		Control Levels and Signals			Rainflow Counting				Scale
Channel Name	Data Files	Low	High	Low	High	Bit Mask	Enable	Range	LPF,Hz	Threshold	Units
G18_Vert.	No	1	0	1	0	0x00	No	2	1	1	g
AFS01_DMS01	Yes	-18200	30400	1	0	0x00	Yes	50000	1.0	10	uStr
AFS01_DMS02	Yes	1	0	1	0	0x00	Yes	50000	1.5	10	uStr
AFS01_DMS03	Yes	-20100	30400	1	0	0x00	Yes	50000	1.8	10	uStr
AFS02_DMS04	Yes	1	0	1	0	0x00	Yes	50000	1.5	20	uStr
AFS02_Tair	Yes	1	0	5	100	0x01	No	100	1	1	°C
AFS02_Tin	Yes	1	0	0	0	0x00	No	100	1	1	°C
AFS03_W51	Yes	1	0	0	40	0x06	No	120	1	1	m/s
AFS03_W52	Yes	1	0	1	0	0x00	No	120	1	1	m/s

Data Acquisition and Output Formats

Sampling interval, seconds: 60

Length of every data file, hours: 24

Output data formats: ☒ CSV ☒ GPR

Messages and Notifications

Recipients listed in the file selected below are informed about exceeding alarm levels of the static channels

☐ By e-mail

☒ By SMS: E:\TEMP\EW_Alarms.phn

☐ Use SMS Messenger

☒ Use GSM modem shared for incoming calls

Data Transfers

☒ Accept incoming requests for static data

Modem for incoming calls is at: COM1

☒ Download static data from remote stations

Modem for outgoing calls is at: COM1

Phone number(s): +4122334455;P0312419;

Time of the first scheduled download: 01:20

Interval between downloads, minutes: 1440

☒ Data validity interval, days: 2

☒ GSM Modem

Baud rate: 19200

Download Data Now...

Rainflow Counting

Number of counting intervals: 10

Generate histogram files:

☐ Every hour ☐ Weekly

☒ Daily ☐ Monthly

☐ First time at: 00:00

and then every: 6 hours

Process Data Files...

OK Cancel

Automatic Event Processing

Automatic processing of event files recorded within a selected time interval, usually several hours or days.

A report is forwarded for printing out at the default system printer.

At the same time all processed data are stored together in a directory and can be printed later manually at any time.

The screenshot shows the 'Automatic Event Processing' dialog box. It has a blue title bar and a light beige background. The 'Enable automatic processing' checkbox is checked. Under 'Processing Parameters', there is a note about static data analysis, input fields for 'Start time' (08:00:00), 'Time interval, min' (1440), and 'Delay, min' (20). Two radio buttons are present: 'Events detected by several stations at the same time (network trigger)' (selected) and 'Any local events recorded by any station'. A 'Settings...' button is next to the second radio button. A checked checkbox 'Extract and process data recorded at these times:' is followed by a text field containing '19:50 21:30 23:15'. Below this is a note about stream data and an unchecked 'Generate ASCII output' checkbox. The 'List of Stations' section contains a list box with 'AFS01', 'AFS02' (highlighted), 'SNY01@RemoteGeoDAS', and 'ST001'. Below the list are 'Add' and 'Remove Selected Stations' buttons. The 'Print Options' section has 'Template' and 'Page Setup' sub-sections. The 'Template' sub-section has a dropdown menu showing 'STAT10' and another dropdown showing 'AEPEVTFIT'. The 'Page Setup' sub-section has buttons for '1st Page', '2nd Page', and 'Other Pages'. A checked checkbox 'Print processed events automatically' is at the bottom of this section. The 'Reporting' section has two checked checkboxes: 'E-mail full reports to' and 'E-mail brief reports to'. The first has a text field with 'swwsupport@geosig.com' and the second with 'info@geosug.com'. There is also a 'Path to the report files' field with a file explorer button. At the bottom are buttons for 'Load', 'Save', 'Print', 'Process Now!', 'OK', and 'Close'.

Automatic Event Processing

☒ Enable automatic processing of events recorded by the stations listed below

Processing Parameters

Note: Static data analysis of the data stream channels as well as the vector sum channels must be enabled for the automatic event processing to work correctly.

Start time: 08:00:00 Time interval, min: 1440 Delay, min: 20

☒ Process all events detected within the specified time interval

☒ Events detected by several stations at the same time (network trigger) [Settings...](#)

☐ Any local events recorded by any station

☒ Extract and process data recorded at these times: 19:50 21:30 23:15

In order to extract and process data recorded at the predefined times make sure that the stream data are stored in the local data files (ring buffers)

☐ Generate ASCII output

List of Stations

- AFS01
- AFS02
- SNY01@RemoteGeoDAS
- ST001

SNY01@Remote [Add](#)

[Remove Selected Stations](#)

Print Options

Template: STAT10

Page Setup: AEPEVTFIT

☒ Print processed events automatically

Reporting

☒ E-mail full reports to: swwsupport@geosig.com

☒ E-mail brief reports to: info@geosug.com

Path to the report files: C:\Documents and Settings\OR\Desktop\Template : ...

[Load](#) [Save](#) [Print](#) [Process Now!](#) [OK](#) [Close](#)

Automatic File Conversion

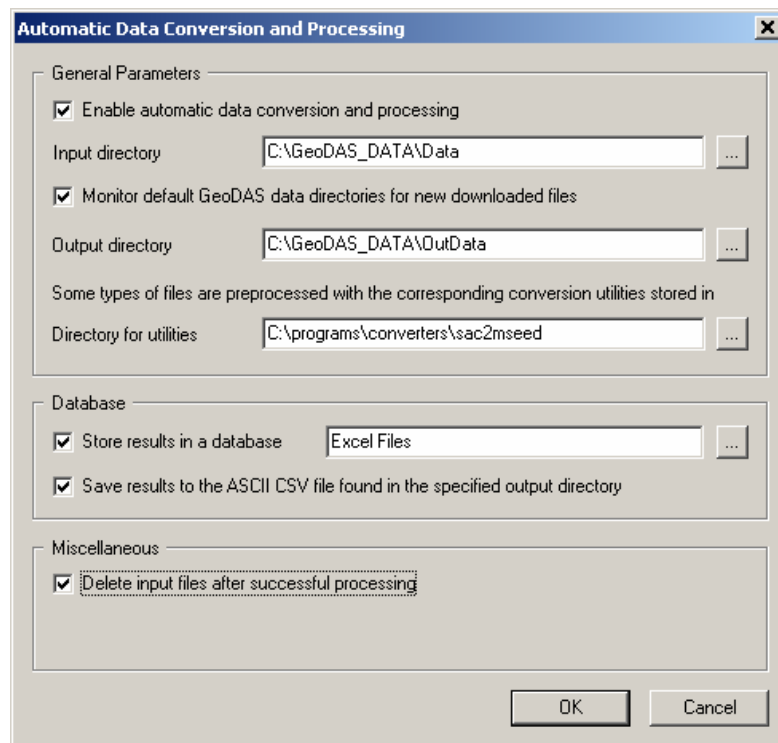
Data files are converted to another format and this operation is performed automatically.

All important event-related information

Peak event amplitude calculated

Both collected and calculated data are inserted into the database

Data processing and storage is performed channel-wise.



Thank you...

Thank you...