

# YOUR PORTAL TO SIMPLE SEISMIC NETWORK AND DATA MANAGEMENT



## **KEY FEATURES**

- > Easily identify your instrumentation on LAN or Internet with no need for fixed IP addresses
- > A State-of-Health (SoH) traffic light dashboard for simpllified instrument management
- > Advanced instrument and waveform analysis tools
- > Optional one-click set-up for data archiving in the cloud with network SOH and management tools
- > Remote update and configuration capabilities
- > Time-based data download for analysis
- > Access to configure and control additional modules such as MAGNA seismic monitoring service
- > Windows and Linux compatible

# DISCOVERY

A single unified interface to a range of powerful tools for managing your seismic instrumentation, archiving your data and monitoring your network state-of-health.



# **DISCOVERY:**

**Instrument Management** - Easily register instrumentation and acquire real-time State-of-Health parameters from telemetered systems, configure and control data streaming and sensor response settings

**Seismic Data Quality Assurance** - Analyse seismic data for quality and verification purposes

### DISCOVERY

At the simplest level, Discovery allows you easy access to your Minimus based instruments so you can configure their settings.

Discovery automatically identifies all the Minimus digitisers on your network or even over the internet with no need for fixed IP addresses. From here you have access to a host of essential tools that enable you to manage your instrumentation and assess the quality of your data.

In addition to the instrument management essentials, at a network level, Discovery acts as a portal to a number of other optional tools and modules that are designed to simplify your network management tasks.

### DATA ARCHIVING AND NETWORK STATE-OF-HEALTH WITH GÜRALP DATA CENTRE (GDC)

We offer a cloud based data archiving facility, Güralp Data Centre (GDC), to store all the data from your network. Data on the GDC archive can be accessed a number of ways, including the option to interrogate data from a specific date and time. This solution can easily be set up within Discovery and provides access to network state-of-health tools as well as data forwarding features.

For organisations that require all data archiving to be maintained on their own servers, we can also supply GDC for implementation on your LAN, giving you access to the same features and tools.

### GÜRALP MAGNA, SEISMIC MONITORING SERVICE

Magna has been designed for customers seeking to integrate seismic monitoring into their asset management programme.

Magna provides comprehensive guidance on each of your assets following a seismic event. To leverage the maximum value from the system, we can integrate your existing site-specific fragility data so that a rapid assessment of the likely damage to each instrumented facility can be made following an earthquake. We can also undertake bespoke integration with your existing systems to activate emergency protocols in the event of an earthquake above a specified threshold.

### **KEY FEATURES DISCOVERY**

Easily identify your instrumentation on the internet or your LAN with no need for fixed IP addresses

State-of-Health traffic light dashboard for simpllified instrument management

Perform advanced analysis on waveform data, including plotting power spectral density graphs (PSDs) and spectrograms

Remote update and configuration capabilities

Time-based data download from SD card or archive data at differing sample rates to streamed data.

Available for Windows and Linux operating systems

### **KEY FEATURES GDC**

One-click set-up for data archiving in the cloud with access to network management tools

Remote update and configuration capabilities

Time-based data download from archive

Option to utilise GDC on private servers

Available for Windows and Linux operating systems

Added layer of redundancy in data acquisition workflow

Enables remote and automated State-of-Health reports

#### **KEY FEATURES MAGNA**

Rapid assessment of geographically dispersed assets following a seismic event

Option to integrate site specific fragility curves for accurate analysis post event

Automated alerts and emergency protocols

Detailed shake maps within seconds of event

Triggered events displayed on a map using Common Alert Protocol (CAP) reciever

Cloud-based 'Desktop as a Service' solution

Can be set up on Güralp or private hosted GDC

# SCOVERY TOO **INSTRUMENT MANAGEMENT**

#### **REGISTERING YOUR INSTRUMENTS**

IP address discovery and network connectivity are handled automatically by a registry server that operates 'behind the scenes' to register the presence and IP address of running instruments. This eliminates the requirement for static instrument IP addresses

#### MONITORING STATE-OF-HEALTH (SOH)

Discovery displays a range of key parameters indicating the instruments' 'health', gathered and displayed in a traffic light dashboard for rapid assessment. Additional State-of-Health information can be displayed alongside according to preference. In the event of communication failure with an instrument, the system can be set to alert the operator via text and email. This list can be logged over time if required, with SOH channels available as miniSEED streams.

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#### STATE-OF-HEALTH INFORMATION

- > Host name and label
- > System and product types
- > Digitiser IP address
- > Location
- > Time since last contact
- > Supply voltage

#### RAPID INSTRUMENT CONFIGURATION

Instrument/digitiser configuration webpages can be accessed directly via an integrated VPN/Tunnel that circumvents Network Address Translations (NATs) present in internet modems and ADSL connections. Operators can remotely update firmware and upload configuration files to multiple units simultaneously for rapid application to multiple systems.

- > System temperature, internal humidity
- > GNSS status for time acquisition
- > MicroSD cards recording status and available storage space
- > Solar charge status/battery status when using Güralp Power Pack Modules

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The Minimus webpage

# DISCOVERY TOOLS SEISMIC DATA QUALITY ASSURANCE

#### VERSATILE WAVEFORM VIEWER

Choose to view live streamed data or loaded miniSEED files. Basic amplitude and time zoom functions with streams easily added or removed.



Signal statistics, measurements and comparisons can be performed with ease.



#### **INSTRUMENT RESPONSE**

New generation Güralp instruments and instruments connected via the Güralp Minimus digitiser have response (Poles/Zeros) and gain parameters recorded internally. This simple tool plots these parameters to verify their integrity.



#### POWER SPECTRAL DENSITY PLOT (PSD)

PSDs of individual or groups of instruments forms the basis of a set of tools used to evaluate an instruments performance as well as the quality of the installation.



#### MIN PSD

Analysis of instrument data over long periods of time can highlight intermittent faults or installation shortcomings.

The Min PSD function looks for the spread of noise recorded over time.



# GURALP DATA CENTRE DATA ARCHIVING SERVICES

# Record, forward and archive network data: cloud based or locally hosted solutions.

#### DATA ARCHIVING

To assist our customers with simplifying their data archive workflows, we offer a cloud-based data archiving service, Güralp Data Centre (GDC), to store all the data from your network. GDC allows users to leverage a Güralp cloud server providing a synchronous data buffer for up to 12 months and adding a seamless layer of redundancy to any seismic network. Completely scalable, this facility is availabe for small arrays of five instruments up to networks of 100 or more.

GDC allows for users to confidently add a parallel pathway to their existing data workflow for additional data redundancy, without interfering with existing data streams to common third party processing software.

Users have access to their data via a web portal which allows for easy data download including the option to interrogate data from a specific date and time. This solution can easily be set up within Discovery and provides access to network state-ofhealth tools as well as data forwarding features.

For organisations that require all data archiving to be maintained on their own servers, it is also possible to deploy GDC on your own servers, offering the same features and tools.

#### NETWORK STATE OF HEALTH

GDC is not just an archive, the software also provides users with a suite of other tools to assist network operators such as mass configuration and data on network latency performance.

GDC incorporates the capability to analyse station metadata over the long-term. This allows for analysis of long-term latency performance across the network and sub-networks as well as outage instances and bandwidth usage.

The performance data is captured and displayed in a number of applets designed to make the maintenance of large networks as simple as possible, directing resources to stations or sub-networks that require attention.

All of these tools are accessed through the Discovery platform.



#### Cloud-based Data Archiving

Güralp Data Centre

- > Easy opt-in via Discovery interface
- > Charged per instrument/per month turn off or on as required
- > 12 month rolling data archive with facility to download full dataset at any time during this period

### Data Archiving on Private Servers

Güralp Data Centre

- >Annual licence
- > One-off configuration charge
- > Optional staff training programme
- > Annual technical support allowance included

# MAGNA EVENT ALERTS AND REPORTING

MAGNA builds on the existing capabilities within the Güralp Data Centre framework to offer a solution for customers seeking to integrate seismic monitoring into their asset management programme.

Following a seismic event, the MAGNA module processes triggered data to produce user-friendly reports, shake maps and email / SMS text alerts.

The severity levels and recipient details can be modified by permitted users to meet the needs of the business.

#### UNINTERRUPTED OPERATIONS

Our instrumentation can be configured to utilise sophisticated multi-instrument voting mechanisms to mitigate false positive alerts. This minimises the potential disturbance on your operations whilst offering comprehensive guidance after a seismic event.

To leverage the maximum value from the system, we can integrate your existing site-specific fragility data for each of the sites on your network so that a rapid assessment of the likely damage to each facility can be made following an earthquake. If desired, we can also undertake bespoke integration with your existing systems to activate emergency protocols in the event of an earthquake above a specified threshold.

MAGNA is available either: as a full turnkey service that combines live SMS and email event alerts with site specific reporting or; we can provide your team with a platform they can interrogate at any time to see both baseline and earthquake activity at each site.

As a cloud-based system, users do not need to download and maintain the software on their computer systems, simplifying hardware and networking requirements.

Access to specific applications is set on a per user basis. Desktop as a Service ("DaaS") technology allows the connection to be made via a web browser, yet offers desktop versatility on cloud hosted systems maintained and resourced by Güralp.

MAGNA operates alongside GDC which provides the long-term archive of seismic and ancilliary data as required.

#### EVENT MAP VIEW AND SHAKE MAP

Triggered events from the Common Alert Protocol (CAP) receiver are displayed on a map. The information contained in the CAP message is displayed at the right-hand side of the window.

When multiple event messages are received, Discovery's CAP receiver can produce a shake map and an estimate of the earthquake epicentre.



#### SITE FRAGILITY CATEGORISATION

An advanced prioritisation option is available, utilising existing site fragility curves, for each individual station to provide a personalised colour category based on the expected response of the site to the type and scale of event. This feature enables your team to make rapid assessments of where they need to focus their resource.





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In the interests of continual improvement with respect to design, reliability, function or otherwise, all product specifications and data are subject to change without prior notice.

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