

## SIMPLE SEISMIC NETWORK MANAGEMENT AND INSTRUMENT QUALITY ASSURANCE



Discovery dramatically simplifies instrument and data management and quality assurance, giving users access to powerful digitiser tools via its built-in web browser.

Discovery is the software platform for next generation Güralp digitisers.

Developed by Güralp, Discovery eliminates the need for static IP addresses by identifying the digitiser's address automatically. Discovery scans local networks and/or uses a registry (based in the data centre or the cloud) to identify digitisers on the public Internet.

Discovery also allows for simpler instrument and data management with access to hardware State-of-Health (SoH); data streaming; GNSS (Global Navigation and Satellite System) location; instrument response and calibration values.

The system offers a range of data quality assurance tools to assist in analysing instrument performance.

## State-of-health information

The Discovery web browser interface provides state-of-health information about the digitiser and connected instruments:

- > Host name and label
- > System and product types
- > Digitiser IP address
- > Digitiser activity status
- > Digitiser uptime and contact time
- > Supply voltage
- > Digitiser temperature, humidity and pressure\*
- > GNSS (Global Navigation and Satellite System) and PTP (Precision Time Protocol) status\*
- > MicroSD cards recording status and available storage space\*

\* Stand alone and integrated Minimus digitisers only

## Key features

IP address discovery of instrumentation on LAN or Internet

Simple instrument and data management with access to hardware State-of-Health (SoH); data streaming; GNSS location; instrument response and calibration values

Data can be streamed in GCF and GDI formats

GDI protocol streams data sample-by-sample and can incorporate instrument calibration parameters, so enabling low latency display of instrument output

Perform advanced analysis on waveform data, including plotting power spectral density graphs (PSDs), spectrograms, discrete Fourier transforms (DFTs), and histogram displays

Available for Windows, iOS and Linux operating systems

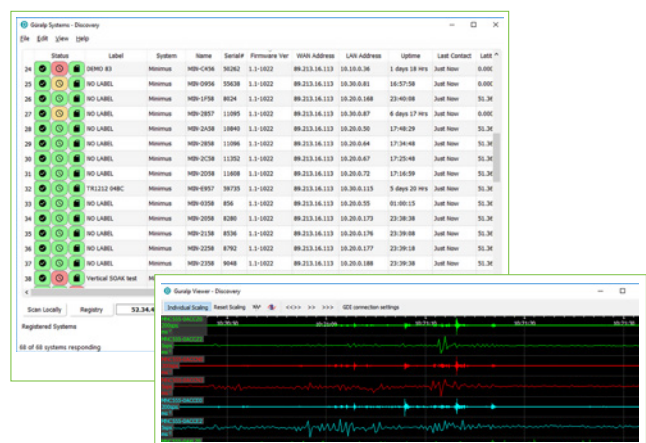
Map of triggered events from CAP (Common Alert Protocol) receiver

Facility to remotely upgrade the digitisers' firmware

Calibration of the Radian digital seismometer and traditional analogue seismometers

## Discovery toolkit

See pages 2 - 4 for a view of the network management tools available in Discovery



Further screenshots and example →

# Discovery Toolkit

## Network overview

Traffic light status system for rapid network assessment

Guralp Systems - Discovery											
File Edit View Help											
	Status	Label	System	Name	Serial#	Firmware Ver	WAN Address	LAN Address	Uptime	Last Contact	Latit ^
24		DEMO 83	Minimus	MIN-C456	50262	1.1-1022	89.213.16.113	10.10.0.36	1 days 18 Hrs	Just Now	0.000
25		NO LABEL	Minimus	MIN-D956	55638	1.1-1022	89.213.16.113	10.30.0.81	16:57:58	Just Now	0.000
26		NO LABEL	Minimus	MIN-1F58	8024	1.1-1022	89.213.16.113	10.20.0.168	23:40:08	Just Now	51.36
27		NO LABEL	Minimus	MIN-2B57	11095	1.1-1022	89.213.16.113	10.30.0.87	6 days 17 Hrs	Just Now	0.000
28		NO LABEL	Minimus	MIN-2A58	10840	1.1-1022	89.213.16.113	10.20.0.50	17:48:29	Just Now	51.36
29		NO LABEL	Minimus	MIN-2B58	11096	1.1-1022	89.213.16.113	10.20.0.64	17:34:48	Just Now	51.36
30		NO LABEL	Minimus	MIN-2C58	11352	1.1-1022	89.213.16.113	10.20.0.67	17:25:48	Just Now	51.36
31		NO LABEL	Minimus	MIN-2D58	11608	1.1-1022	89.213.16.113	10.20.0.72	17:16:59	Just Now	51.36

## Digitiser web interface

Access networked digitiser web interface

Status

Network

Setup

Power

Trigger

Data Flow

Data Record

Storage

System type: Minimus | Host label: Support | Host name: MIN-C555 (10.10.0.13) | Serial number: 50517

System Status

General information

Host name	MIN-C555	Host label	Support	System type	Minimus
Serial number	c555	Firmware version	1.1-1022	IPv4 address	10.10.0.13 (DHCP)
Digitiser temperature	30.1 °C	Digitiser humidity	25%	Input voltage	12.751 V

GNSS Status

GNSS connection status	Connected	Last timestamp	2017-11-29 10:22:39	
Last lock time	2017-11-29 07:00:48	GNSS stability	100%	
Latitude	51.3607	Longitude	-1.1631	
Altitude	121.50 m	Horizontal dilution of precision	0.78	
GNSS PPS status	Trusted Pulsing	GNSS NMEA stream	Input OK	
GNSS Lock state	2D locked 3D locked	Number of satellites	Used: 12 In view: 13	

Data record status

microSD status	Recording	microSD total	60817408 KiB	microSD used	5726340 KiB
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Sensors

Number of sensors detected	1								
Sensor0	<table> <tr> <td>Serial number (0)</td> <td>c555</td> <td>Firmware ver (0)</td> <td>3.11</td> </tr> <tr> <td>Seismometer Z (0)</td> <td>22759</td> <td>Seismometer N (0)</td> <td>-8956</td> </tr> </table>	Serial number (0)	c555	Firmware ver (0)	3.11	Seismometer Z (0)	22759	Seismometer N (0)	-8956
Serial number (0)	c555	Firmware ver (0)	3.11						
Seismometer Z (0)	22759	Seismometer N (0)	-8956						

## Digitiser configuration

UNDERSTAND OPTIMISE PROTECT

Minimus

Status Network **Setup** Power Trigger Data Flow Data Record Storage Logout Help

System type: Minimus | Host label: NO LABEL | Host name: MIN-C555 (10.10.0.13) | Serial number: 50517

Digitiser Config Please reboot this Minimus if you have changed any settings

Date: Mon 04 Dec 2017 Time: 3:02:49 PM Auto Refresh: 1 Auto Reboot: On Error

Label: NO LABEL Station Name: TEST Network Code: DG Site Name: No site

Bluetooth PIN: 0000 Filter quality: High

Deploy mode: Normal Deploy

**Applied Rotation**

Analogue 0: 0 ° Radian 1: 0 ° Radian 2: 0 ° Radian 3: 0 ° Radian 4: 0 ° Radian 5: 0 ° Radian 6: 0 ° Radian 7: 0 ° Radian 8: 0 °

Reboot

**Analogue Sensor**

Input Gain: 1 Unity Sensor Type: Fortis Calibration Select: Disable Calibration Signal: Disable Calibration Level: Full

Recenter: Sensor Gain: External Switch: Sensor0 Calibrate: Disable Sensor0 Streams: Normal

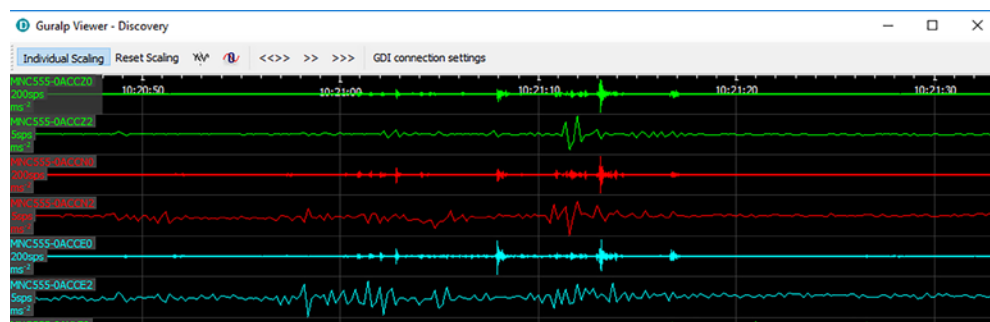
**Radian Sensor**

Number of Radars: 0 Datalink status: Ready Displayed Radian Controls: Radian 1

**FPGA firmware update** FPGA update takes around 15 minutes and requires cold power cycle when finished. Built-in version: 3.11

FPGA update status: Idle FPGA update sensor: Digitiser Update

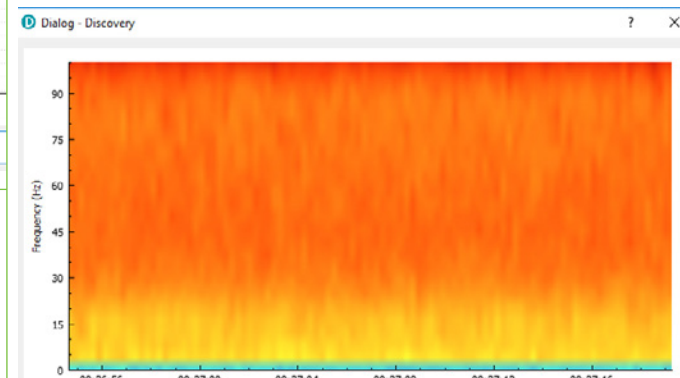
## Real-time waveform viewer



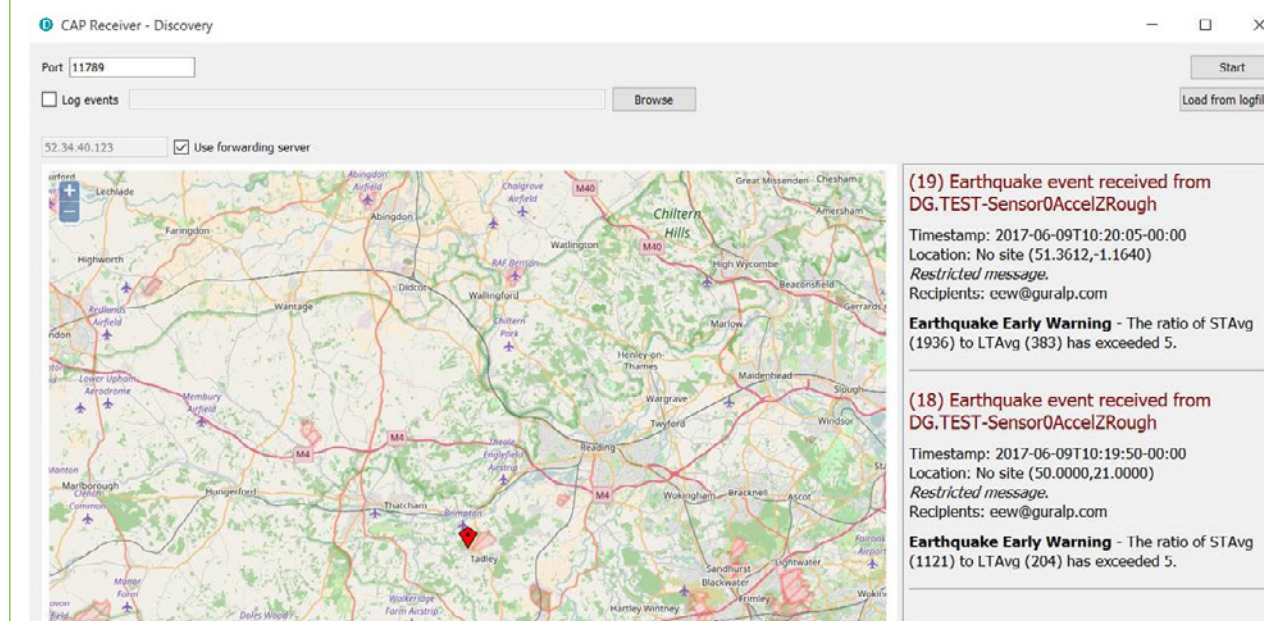
## Instrument power spectral density graphs



## Spectrogram



## Map of triggered events from CAP receiver



## SIMPLE SEISMIC NETWORK MANAGEMENT AND INSTRUMENT QUALITY ASSURANCE

### Network management using Discovery

