

## NEXT-GENERATION VIBROSEIS CONTROL SYSTEM

Force X combines industry-leading VHF synchronization with Secure Connect IoT to deliver complete, real-time control of vibroseis operations.

Designed for both centralized cabled systems and autonomous node deployments, Force X improves crew efficiency, data quality, and operational visibility across any scale of seismic program.



### VIBRATOR CONTROL

- Real-time sweep execution and control
- Adaptive dynamic force management
- Automated QC and performance monitoring



### DYNAMIC FORCE OUTPUT

- Real-time force optimization
- Infrastructure protection safeguards
- Continuous operational monitoring



### FIELD NAVIGATION

- NavLink precision positioning
- Fleet coordination and tracking
- Accurate, repeatable source point placement



### SECURE CONNECT

- Remote system access
- Secure data transfer (FTP/IoT)
- Encrypted connectivity across operations



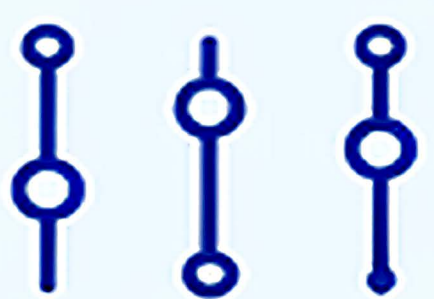
### SIGNAL ANALYSIS

- Source signature analysis
- VDisplay real-time monitoring
- Advanced diagnostics and troubleshooting



### CONNECTIVITY

- Cellular, Starlink, and Ethernet
- Integrated Wi-Fi networking
- Flexible field communication options



### CENTRALIZED CONTROL

Full command and control from a single platform



### REAL-TIME VISIBILITY

Live operational data for faster decision-making



### INTEGRATED SAFETY

Built-in protections for crew and equipment



### HIGH-QUALITY SIGNALS

Consistent, reliable seismic data output

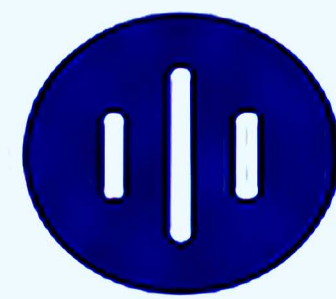


### SEAMLESS INTEGRATION

Compatible with existing and future systems

ForceX ClearWave™ technology delivers a cleaner, more faithful sweep by significantly reducing **harmonic distortion** and lowering noise in the correlation response.

The result is a higher quality seismic source signature with **cleaner frequencies** and **improved sweep fidelity**.



## LOWER DISTORTION

Dramatically reduces Total Harmonic Distortion (THD) across the sweep bandwidth.



## CLEANER SWEEP

Delivers a purer sweep with cleaner spectral content.



## QUIETER CORRELATION

Reduces noise in the crosscorrelation response for a more defined peak.



## SUPERIOR FIDELITY

Improves sweep fidelity and consistency for better data quality and imaging.

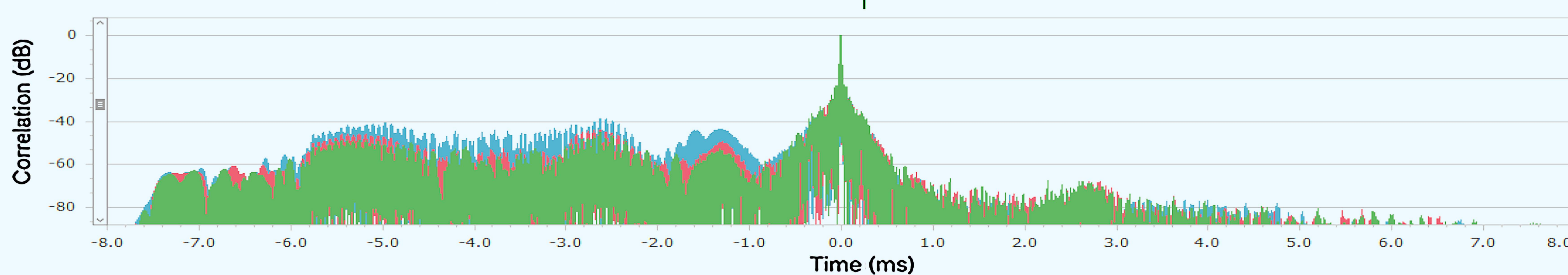


## MEASURED RESULTS. CLEAR DIFFERENCE.

Comparing three sweeps with different electronics and settings.

Blue and Red are conventional systems. Green is ForceX with ClearWave™ enabled.

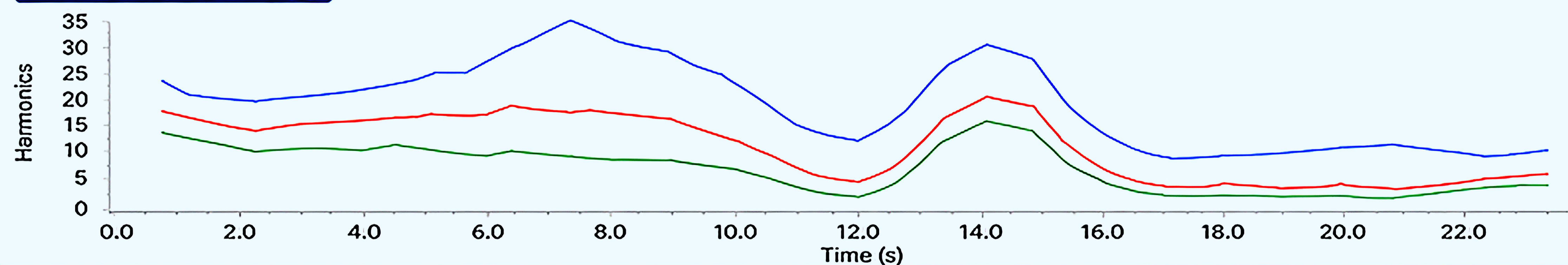
### CROSSCORRELATION ENVELOPE (dB) vs TIME (ms)



### QUIETER CORRELATION

ClearWave™ delivers a quieter correlation response with a cleaner, sharper peak.

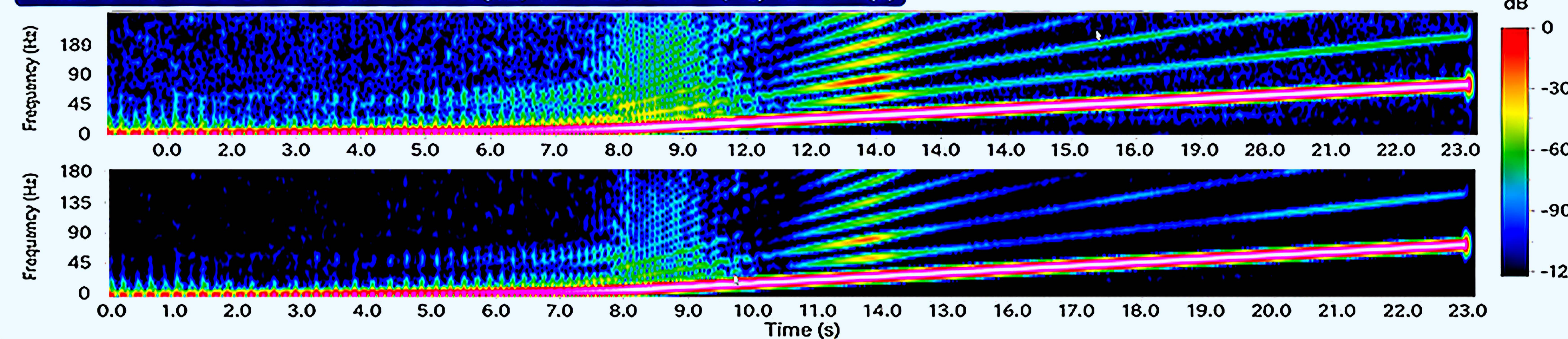
### HARMONICS vs TIME (s)



### LOWER HARMONICS

Significantly reduced harmonic content across the entire sweep duration.

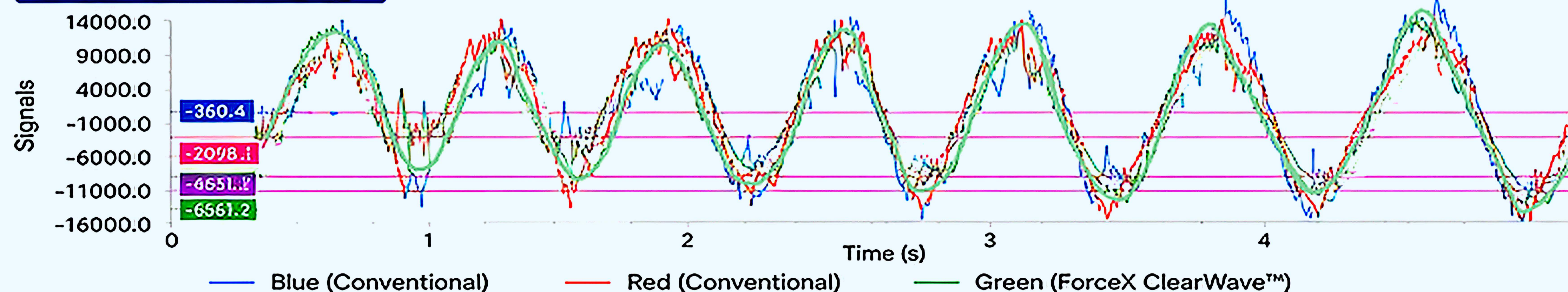
### TIME VARIANT SPECTRAL AMPLITUDE (dB) vs FREQUENCY (Hz) vs TIME (s)



### REDUCED DISTORTION PRODUCTS

ClearWave™ minimizes harmonic build-up and keeps energy focused in the fundamental frequency.

### SIGNAL TRACES vs TIME (s)



### CLEANER SIGNAL

ClearWave™ produces the cleanest and most stable sweep with superior signal fidelity.

A unified software environment that connects field operations, data analysis, and fleet management in real time.



### CALLS & MESSAGES

- Crew communication and coordination



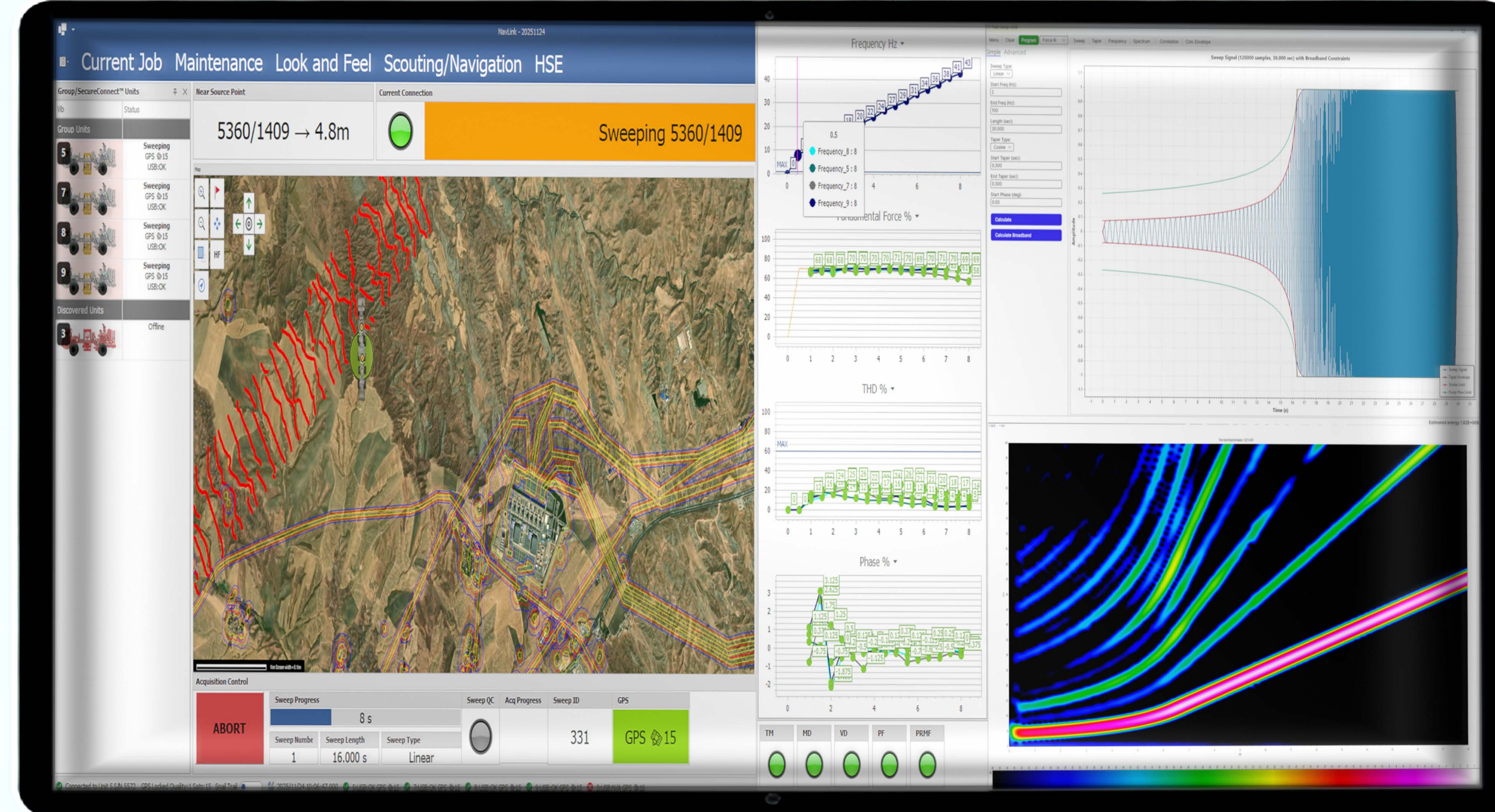
### WORK ORDERS

- Task management and execution tracking



### HAZARD REPORTING

- Real-time safety and incident logging



### FLEET TRACKING

- Live vehicle and equipment tracking



### DATA ACCESS

- Centralized data visibility and control



### SECURE CONNECT

- Remote system access and file transfer

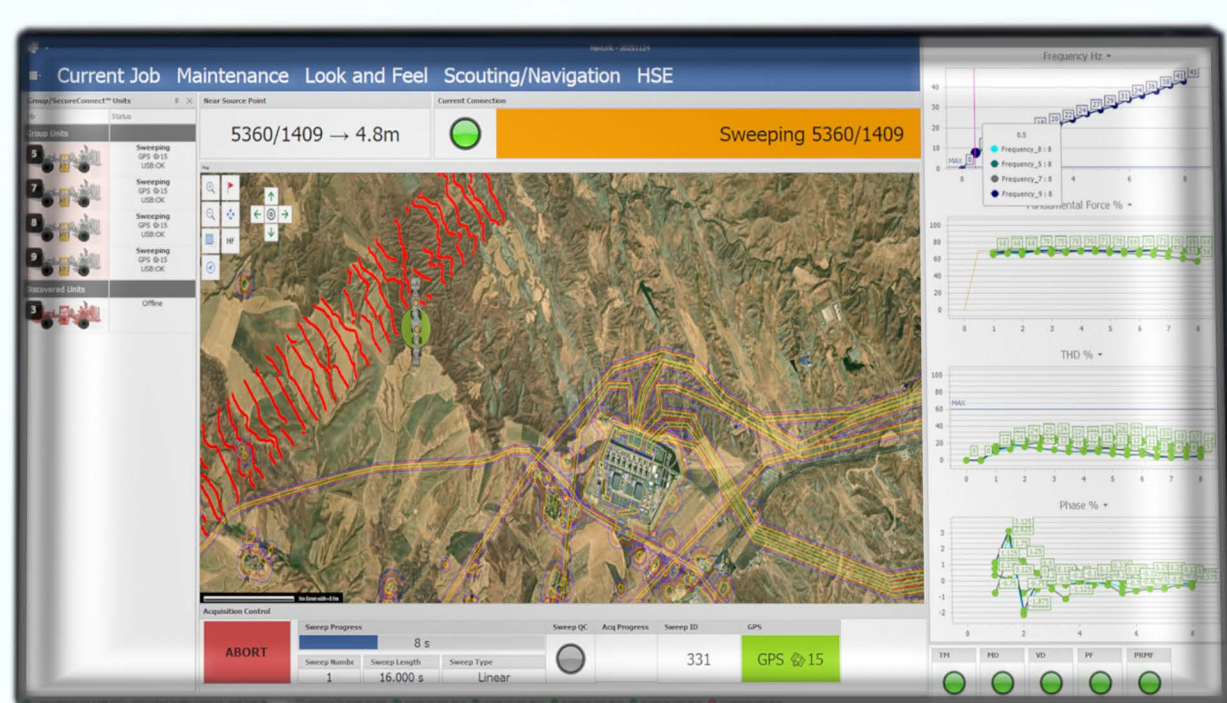


### REAL-TIME QC

- Continuous quality control monitoring

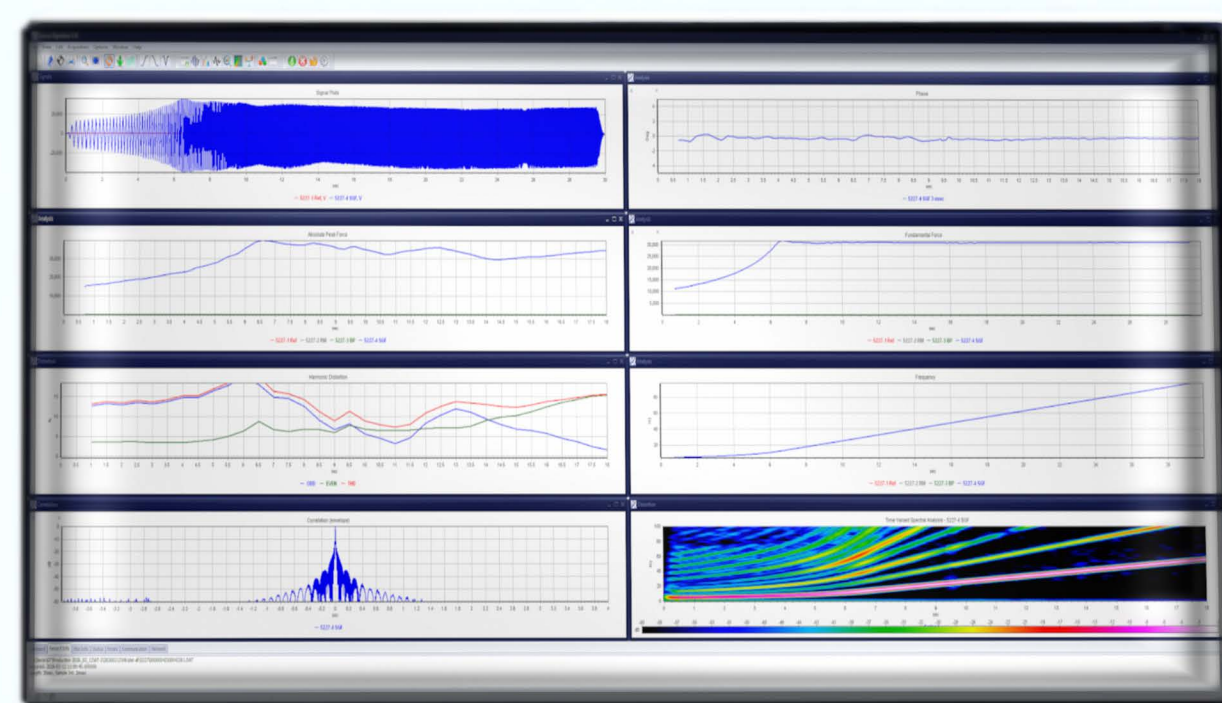
### NAVLINK

Vehicle navigation and tracking



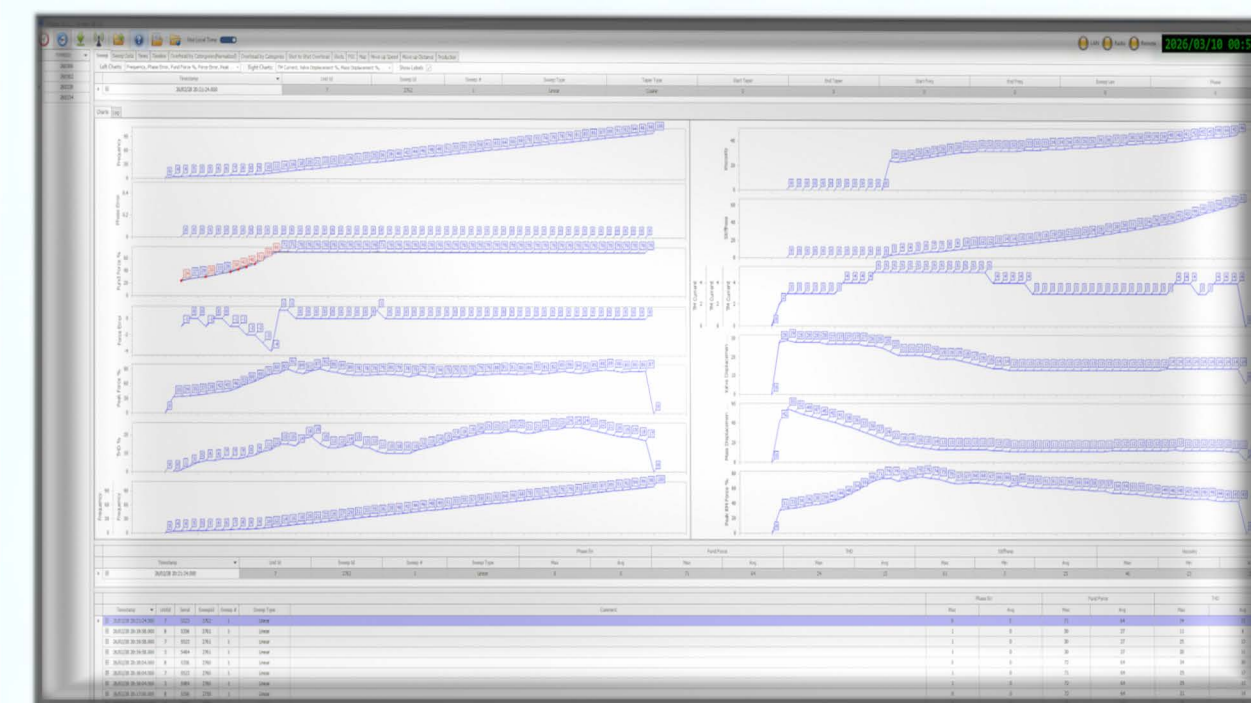
### SOURCE SIGNATURE

Vibroseis signal analysis



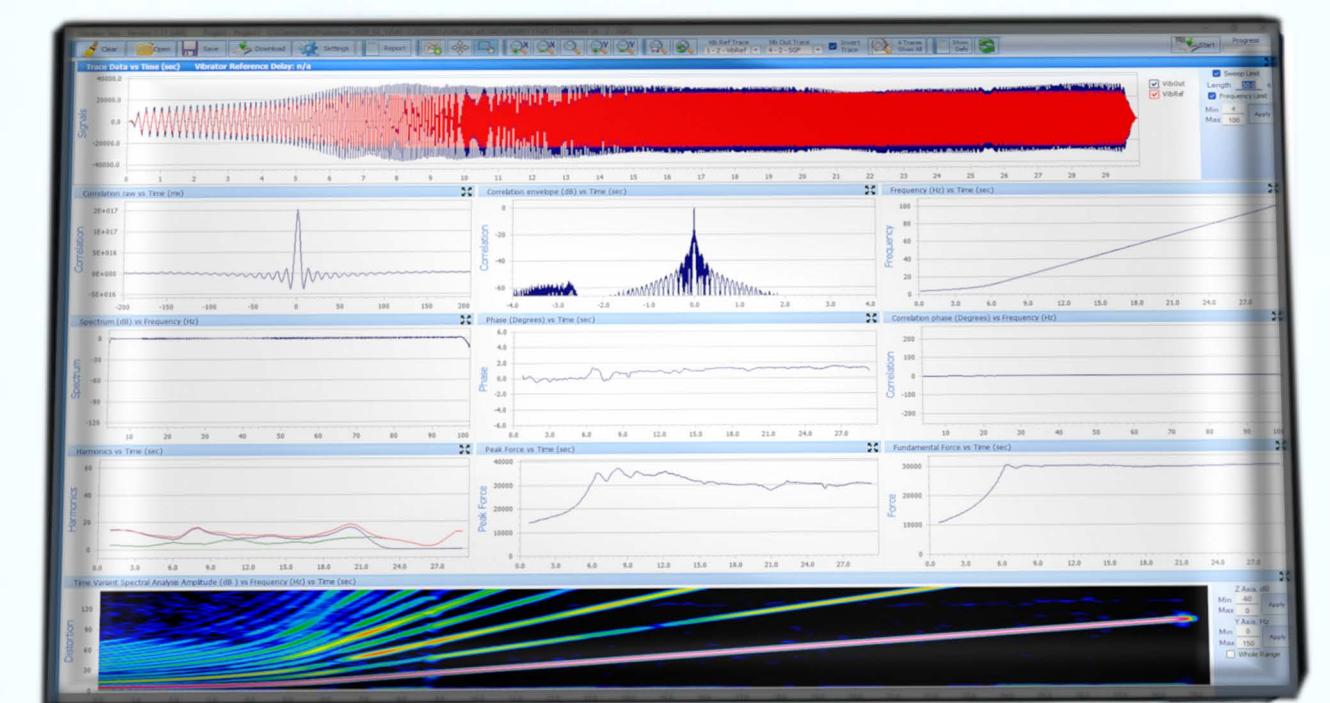
### VDISPLAY

Vibroseis performance monitoring



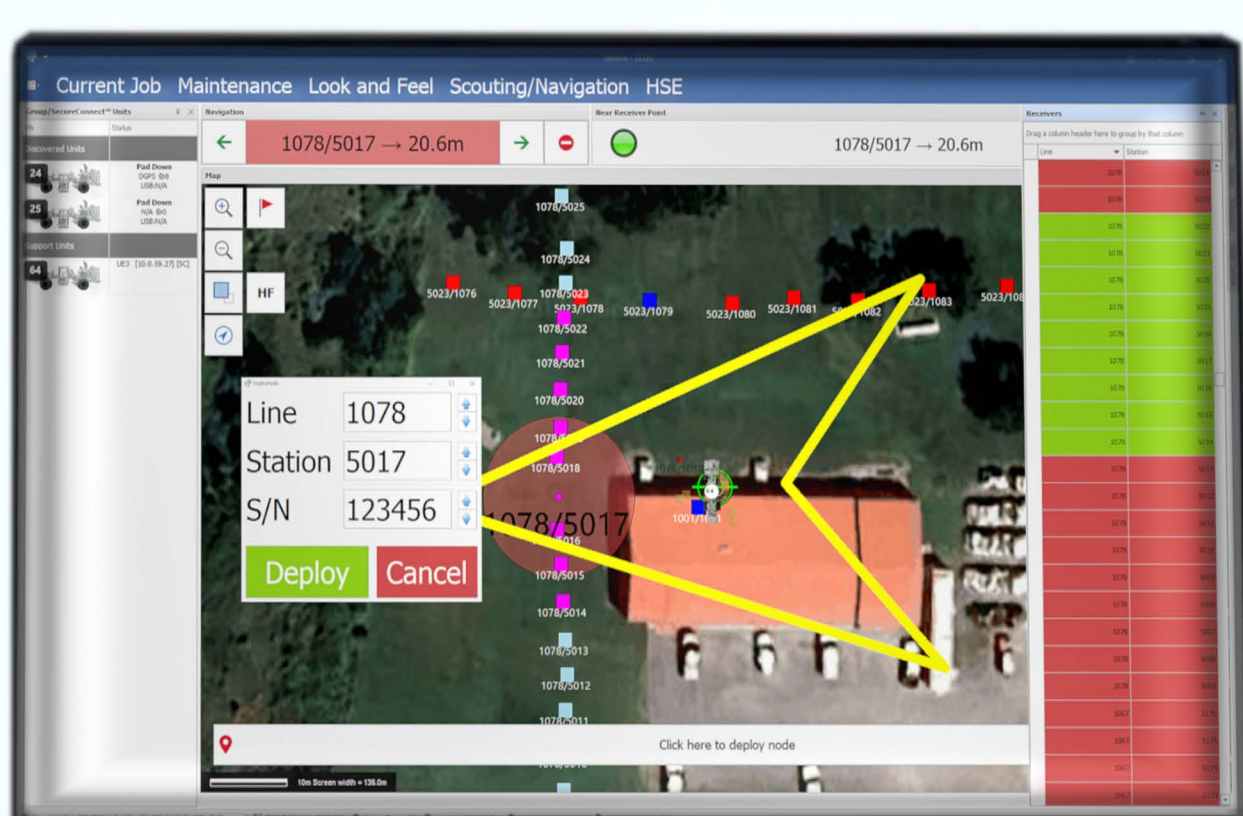
### VIBRATOR TEST

Vibroseis QC and diagnostics



### NODELINK

Real-time nodal field deployment



### DASHBOARD

Real-time deployment and Vibroseis production monitoring



### WORK ORDERS & HAZARDS

Task management and safety tracking



### SECURE CONNECT

IoT platform for remote access and data transfer



## FEATURES



### INTELLIGENT SWEEP CONTROL

- Adaptive sweep optimization
- Predictive PPV protection
- Automatic abort and safety control



### PRECISION POSITIONING

- Integrated RTK GNSS with dual antennas
- High-accuracy position and heading data



### SIGNAL QUALITY ENHANCEMENT

- ClearWave harmonic distortion reduction
- Broadband sweep generation
- Enhanced low-frequency performance



### ADVANCED CONNECTIVITY

- VHF and digital radio communication
- Secure Connect IoT platform
- Wi-Fi and cellular integration



### NAVIGATION COMPUTER

- Integrated Android-based control system
- Native NavLink support



### OPERATIONAL DASHBOARD

- Real-time fleet monitoring
- Live sweep and QC status
- Production performance tracking
- Remote supervisory control



### INTEGRATED SOFTWARE PLATFORM

- NavLink navigation
- SrcSig signal analysis
- VDisplay QC monitoring
- VibTest diagnostics



### CAN BUS INTEGRATION

- Direct vehicle system integration
- Real-time control communication
- Robust industrial protocol support
- Low-latency data exchange



## RUGGED HARDWARE PLATFORM

The Force X hardware platform is engineered for demanding seismic environments. Built with ruggedized components and industrial-grade connectors, it delivers reliable performance in the harshest field conditions.

### RUGGED DESIGN



- Solid aluminum construction
- Integrated Shock Protection
- Vibration-resistant design
- Field-ready enclosure

### BUILT-IN PROTECTIONS



- Overvoltage protection
- Thermal protection
- EMI / RFI shielding
- Reverse polarity protection

### INDUSTRIAL-GRADE CONNECTORS



- Internal RTK GNSS (standard)
- Corrosion-resistant connectors
- Pre/post sweep camera integration
- RJ45 Ethernet (2.5GBASE-T)
- USB connectivity

### KEY FEATURES



- VSS standard support
- GPS or VHF timing synchronization
- Integrated Wi-Fi radio
- Designed for extreme environments

## TECHNICAL SPECIFICATIONS

### GENERAL

|                             |                                     |
|-----------------------------|-------------------------------------|
| Sweep Configurations        | 16 standard / 16 linked / 16 stored |
| Sweep Resolution            | 24-bit                              |
| Sample Interval             | 0.25 ms                             |
| Signature Recording         | VSS standard                        |
| Timing                      | GPS or VHF                          |
| Ethernet                    | 2.5 Gbps (2.5GBASE-T)               |
| Maximum Vibrators Supported | 256                                 |

### PHYSICAL

|                        |                                        |
|------------------------|----------------------------------------|
| Weight                 | 24 lb (11 kg)                          |
| Dimensions (L x H x W) | 22 x 13 x 6 in<br>(558 x 330 x 152 mm) |
| Operating Temperature  | -20°C to +60°C<br>(-4°F to +140°F)     |
| Storage Temperature    | -40°C to +70°C<br>(-40°F to +158°F)    |
| Humidity               | 0–95% non-condensing                   |

### POWER

|             |                                           |
|-------------|-------------------------------------------|
| Input       | 9 – 36 VDC                                |
| Consumption | Typical 25 W                              |
| Protection  | Surge, reverse polarity, ESD, overvoltage |



### CAMERAS (STANDARD)

Connect to Linux system. Automatically captures and stores images before and after each sweep.