

## OVERVIEW

Voyager® is Digitex Systems' central acquisition software for Structural Health Monitoring (SHM). It provides real-time acquisition, management, and analysis of data from all connected Sentry System devices and offers unmatched flexibility in deployment – either as part of the xPlover unit on site or as a cloud-based subscription service. Voyager is designed to ensure robust, scalable, and user-friendly monitoring of infrastructure assets.

## DESCRIPTION

Voyager functions as the central hub for data acquisition in SHM systems. It connects to multiple Digitex Sentry devices (xWave, xSense, xStrain, etc.) and manages streams from hundreds of channels in parallel. Users can configure channel scaling, offsets, trigger levels, pre- and post-event times, and communication parameters per device. All acquired data is stored in a robust local or cloud database, with continuous Ring Buffer recording to ensure that no events are missed.

The system supports multiple recording modes: manual (on demand), scheduled, triggered, or continuous Ring Buffer. Triggered recordings can be configured with parallel mechanisms such as Levelling, STA/LTA, Above Max, Below Min, and an advanced OMA-based trigger. This intelligent trigger leverages internal AI agents to perform continuous OMA analysis and notify users in case of significant structural changes.

Voyager also provides real-time data streaming to web clients, automated report generation in PDF format, and redundant data saving through FTP or SeedLink servers. Events and recordings can be previewed through time-history charts with zooming, FFT, and integration analysis, or fully analyzed using advanced signal processing tools including PSD, velocity and displacement integration, and tabular parameter review.

For system management, Voyager offers comprehensive device and channel configuration, digital filters, user authentication with role-based privileges, detailed event logs, and a Super Admin panel for central management. Remote functions such as over-the-air firmware updates, remote reboot, and configuration of connected devices ensure reliable and efficient operations.

## APPLICATIONS

- Bridges – centralized monitoring with automated triggers
- Dams and hydropower plants – redundant and secure recording of seismic and vibration events
- High-rise buildings – continuous monitoring of wind and seismic response
- Tunnels and pipelines – large multi-sensor systems with advanced event detection
- Mines and industrial plants – structural vibration and operational safety monitoring

## KEY FEATURES

- Flexible Deployment: Available as part of xPlover (on-premises) or as a cloud-based subscription service for remote access.
- Robust Database & Ring Buffer: Stores real-time data continuously with configurable Ring Buffer duration (up to 60 days). Ensures no events are missed.
- Multi-Mode Recording: Supports manual, scheduled, triggered, and continuous recordings.
- Advanced Triggering: Parallel triggering mechanisms: Levelling, STA/LTA, Above Max, Below Min, plus AI-driven OMA trigger for dynamic monitoring.
- Real-Time Streaming: Streams live data to web clients and supports redundant saving to FTP or SeedLink servers.
- Comprehensive Reporting: Automated PDF generation with charts (FFT, PA, PV, PD, P-P, MIN, MAX, AVG).
- Signal Analysis: Preview and Analyze modes with time history, FFT, PSD, integration to velocity/displacement, and parameter tables.
- Device & Channel Management: Add a large number of devices, configure channels, scaling, filters, triggers, and offsets with full control.
- Alarming Devices & Notifications: Support for specialized xAlarm devices that can act on events by sending SMS or email notifications, or by triggering relays and digital outputs to interact with third-party systems. Enables automated alarms and integration with wider safety systems.
- Data Format Compatibility: Voyager records and exports data in proprietary compressed format, MiniSEED, and ASCII, ensuring both efficiency and interoperability with third-party analysis tools and international standards.
- User Configurability: Highly configurable system parameters, including device descriptions, channel names, colours of charts, trigger settings, and filter options. Users can adjust report time zone, session timeouts, and other preferences for a personalized workflow.
- User Management: Secure authentication with multiple roles and privileges for different user groups.
- Remote Management: OTA firmware updates, device reboot, remote configuration, and log inspection.
- Customizable Filters: Butterworth, Chebyshev 1 & 2 filters applied to data, integration, and triggering.
- System Dashboard: Comprehensive dashboard with real-time system status, database size, uptime, connected sensors, and logs.
- Super Admin Panel: Centralized management for all user accounts, system settings, and privileges.

## SPECIFICATIONS

### General

- Supported Hardware:** Compatible with all xDAS family hardware units. Utilizes proprietary DigiteX communication protocols and data formats for real-time streaming. Supports connections to up to 254 devices.
- User Interface:** Web-based interface with multi-user access and role-based permissions.
- Data Formats:** miniSEED, ASCII (CSV)
- Visualization:** Real-time plots with FFT, PSD, STA/LTA, and integration to velocity/displacement.
- Database:** SQL-based database with custom DigiteX schema optimized for SHM applications.
- Operating Systems:** Linux Ubuntu (headless configuration).
- Integration:** Seamless interoperability with Observer®, Vista®, and Nexus® software suites.
- Security:** HTTPS encryption with JWT-based authentication and user access control.
- Backup & Recovery:** Automated data archiving, restoration scripts, and remote replication support.
- Software Updates:** Software updates managed exclusively by DigiteX support through proprietary service hardware.
- Accessibility:** Secure access through DigiteX proprietary SSH tunnel for each Voyager instance.
- Licensing:** Voyager® operates under a proprietary DigiteX Systems node-locked license.

### Features

- Flexible Deployment:** Available as part of xPlover (on-premises) or as a cloud-based subscription service for remote access.
- Robust Database & Ring Buffer:** Stores real-time data continuously with user configurable Ring Buffer duration (up to 60 days). Ensures no events are missed.
- Multi-Mode Recording:** Supports manual, scheduled, triggered, and continuous recordings.
- Advanced Triggering:** Up to 10 parallel triggering mechanisms: Leveling, STA/LTA, Above Max, Below Min, plus AI-driven OMA trigger for dynamic monitoring.
- Real-Time Streaming:** Streams live data to web clients and support redundant saving to FTP or SeedLink servers.
- Comprehensive Automated PDF generation with charts (FFT, PA, PV, PD, Reporting: P-P, MIN, MAX, AVG).**
- Basic Signal Analysis:** Preview and Analyze modes with time history, FFT, PSD, integration to velocity/displacement, and parameter tables.
- Device & Channel Management:** Add large number of devices, configure channels, scaling, filters, triggers, and offsets with full control.
- Alarming Devices & Notifications:** Support for specialized xAlarm devices that can act on events by sending SMS or email notifications, or by triggering relays and digital outputs to interact with third-party systems. Enables automated alarms and integration with wider safety systems.
- Data Format Compatibility:** Voyager records and exports data in MiniSEED and/or ASCII, ensuring both efficiency and interoperability with third-party analysis tools and international standards.
- User Configurability:** Highly configurable system parameters including device descriptions, channel names, colors of charts, trigger settings, and filter options. Users can adjust report time zone, session timeouts, and other preferences for a personalized workflow.
- User Management:** Secure authentication with multiple roles and privileges for different user groups.
- Remote Device Management:** Acquisition configuration and network settings, OTA firmware updates, device reboot, log inspection, test mode.
- Customizable Filters:** Butterworth, Chebyshev 1 & 2 filters applied to data, integration, and triggering.
- System Dashboard:** Comprehensive dashboard with real-time system status, database size, uptime, connected sensors, and logs.
- Super Admin Panel:** Centralized management for all user accounts, system settings, and privileges.

