

TRELIA DATA.

CONVERGE LOG

PC-based data acquisition system for ambient air and meteorological stations



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ARCHITECTURE.

Our system is built on Microsoft's .NET 8 framework, using C# and enhanced with R for advanced graphical and statistical analysis. Key advantages include:

- **Superior Performance and Security:** High-quality code ensures reliable and efficient operations.
- **Flexible Deployment:** Applications compile into single files, deployable as standalone units.
- **Open Source Community:** A vast user base contributes innovative ideas and solutions.
- **Portable Class Libraries:** Facilitates code reuse and includes robust testing tools for quality assurance.
- **Optimised Code:** Enables efficient, lightweight designs that are easy to adapt to customer needs.
- **User-Friendly Interface:** Windows integration ensures ease of use, security, and network compatibility.

HARDWARE.

Trelia Data Converge is optimised for efficiency without the need for high-performance computers with the following minimum specifications:

- Processor: Intel i3 or higher
- Memory: 16 GB RAM
- Storage: 256 GB SSD
- Operating System: Windows 10 IoT or later

Data is captured via digital communication protocols like Modbus or through external I/O modules, allowing for easy expansion with additional acquisition modules as needed. External devices can be triggered using the I/O modules.

While industrial-grade computers are recommended for enhanced reliability, Trelia Data Converge can also be installed on personal computers or existing systems that meet the minimum requirements.

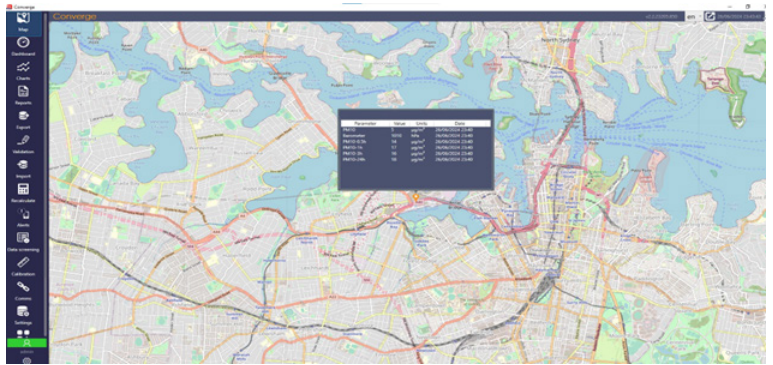
INSTRUMENT COMPATIBILITY.

Trelia Data Converge is fully compatible with major air quality and meteorological instruments, leveraging digital connectivity (serial or Ethernet) for transmitting environmental and diagnostic data. This enables predictive maintenance by monitoring instrument behavior to foresee potential issues before data loss occurs.

Converge supports both proprietary and standard protocols, including Modbus and HESSEN, ensuring compatibility with a wide range of equipment. New drivers are provided through version upgrades.

COMMUNICATIONS.

Trelia Data Converge supports data exchange with multiple servers using provided connectors and custom drivers for integration with other



manufacturers' data centers. As a Windows-based platform, it enables easy remote management via tools like Windows Remote Desktop, TeamViewer, and AnyDesk.

For security, VPN use is highly recommended and Converge is compatible with any Windows-supported VPN. The system supports all modern communication technologies, including 3G, 4G, 5G, fiber optic, and satellite.

DATA STORAGE.

Data is stored locally in a MySQL database, optimized for handling large volumes of time series data. Configuration data is also saved, enabling full system restoration from the latest backup in case of a failure.

FEATURES.

Trelia Data Converge Log complies with EN 17255 and EPA CFR 40 standards and can be customised to meet local requirements. It offers automated, customizable connectors for seamless data sharing with stakeholders and EPAs, ensuring secure communications and various access levels to maintain data integrity.

QUALITY CONTROL.

Automated Calibration: Performs calibration checks, generates reports, and sends alerts via email or SMS (SMS subscription required).
Programmable Multipoint Calibration: Supports unlimited steps and multiple components in calibration sequences.

DATA SCREENING.

The system separates raw and verified data, ensuring raw data remains unchanged. Automated filtering checks for anomalies such as out-of-range values, spikes, or fluctuating measurements, etc. Anomalous data is flagged and recorded for review by data controllers.

DATA AVERAGING & FLAGGING.

Data averaging conforms to standards (Australian, USEPA, European, or local). Logging periods are configurable for each channel, with data quality flags fully customizable. Converge automatically flags data based on conditions like calibration, instrument failure, or near-failure diagnostics to alert managers of potential data loss.

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System flags

Flag Id	Description	Set 1	Set 2	Set 3	Type	Colour
10	NOx fail	NOx			PeripheralFail	
19	Out of order	D			Fail	
18	Power Failure	F			Fail	
17	Invalid (negative)	N			Fail	
16	Maintenance	MA			Maintenance	
15	Calibration	C			Calibration	
14	Zero	Z			Calibration	
13	Invalid	I			Transient	
12	Insufficient Samples					
11	No data					
0	Raw					
1	Autovalidated					
2	Valid					
3	Corrected					
4	Reconstructed					

Instruments

Instrument configuration

Please select an instrument from the combo list

TAPI T100

Select the parameters in the same order as the columns of the instrument.

Box Temp
Dark Lamp
Dark PMT

Box Temp
Dark Lamp
Dark PMT
HVPS
Lamp Ratio
Norm PMT
Photo Absolute
PMT
PMT Signal

Cancel Back Next



PERMISSIONS-BASED SECURITY.

The system features three role levels: Administrator, Editor, and Viewer, to manage access and control.

DASHBOARDS AND CHARTS.

Dashboards, data tables, and graphs allow users to monitor equipment status in real time and track historical trends. Each display is fully configurable, with the ability to select any system signal.

EASY CONFIGURATION.

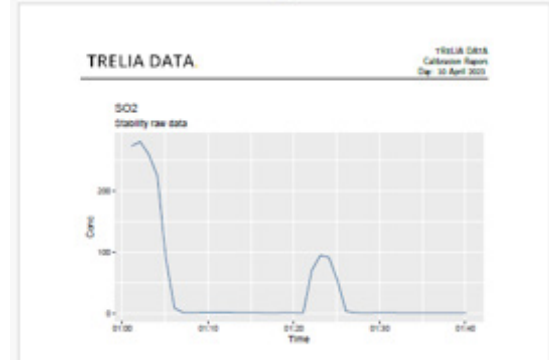
Configuration is streamlined with wizards, allowing new instruments and their channels (measurements and diagnostics) to be added with just a few clicks.

CALIBRATIONS.

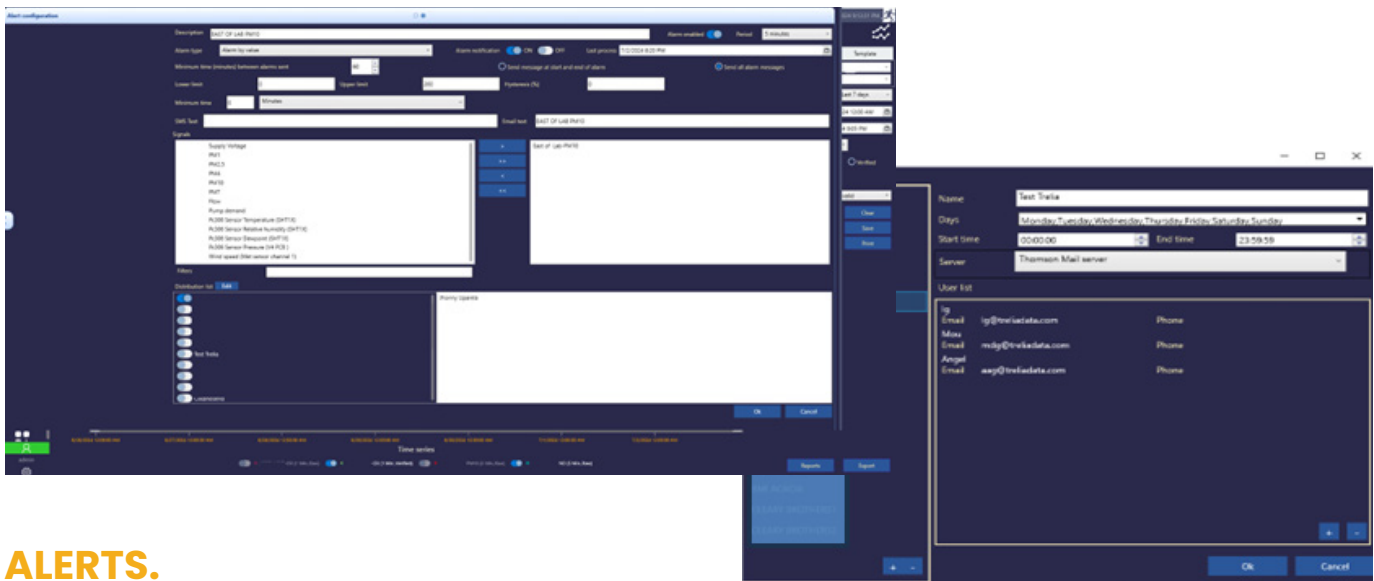
Trelia Converge features a robust calibration manager for programming zero, span checks, and complex multipoint or multichannel sequences. Automation handles the entire calibration process, with no limits on sequence numbers or steps. It supports calibrator drivers from major manufacturers and can also use valves (additional hardware required). Users can activate calibration sequences remotely or on-site.

CALIBRATION REPORTS.

Calibration data is stored in the database and can be represented in customizable graphs and reports. Reports include calibration results, control charts, standards, calibrators used, and a complete record of calibration data. Real-time operational parameters can also be included for enhanced quality control.



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ALERTS.

Trelia Converge can generate various alerts for incidents such as exceeding contaminant limits, equipment failures, or failed calibration checks. Alerts are sent via email, SMS, and/or Audible and Visual.

ALERT TYPES.

Alarms can be triggered by value, status, communication failures, or a combination of parameters using formulas. These formulas can integrate values from different parameters, such as pollutant concentrations and instrument diagnostics, or conditions

like equipment faults, calibration status, and meteorological ranges (e.g., wind direction between 90 and 180 degrees).

DISTRIBUTION LISTS.

Configured alarms can be sent to multiple recipients via distribution lists. Users can receive different alerts for the same parameter with varying activation levels and corresponding messages.

Distribution lists can include unlimited users and allow you to specify delivery times, such as only during working days and hours.



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