QUAKELOGIC

QuakeLogic QL-CarbonX LIBS Analyzer

Carbon Handheld Analyzer – IAEA RFQ 665846-MLP

CUSTOMER SATISFACTION 100% GUARANTEED

MADE IN USA WITH GLOBAL MATERIALS SOURCED

Analytical & Technical Performance

Core LIBS Technology

The QL-CarbonX employs **Laser-Induced Breakdown Spectroscopy (LIBS)** to deliver precise, real-time elemental analysis. With a spectral range of **190–610 nm** and laser pulse energy **≥ 5 MJ/pulse**, the system meets all IAEA performance thresholds for field deployment.

Classified as **Laser Safety Class 3 or higher**, the analyzer incorporates comprehensive safety protocols while maintaining exceptional analytical sensitivity across diverse steel matrices.

Analytical Specifications

- **Analytical Principle:** Laser-Induced Breakdown Spectroscopy (LIBS)
- **Spectral Range:** 190 – 610 nm
- **Laser Pulse Energy:** ≥ 5 MJ/pulse (exceeds requirement)
- **Laser Safety Class:** Class 3 or higher per specification
- **Operational Modes:** Quantitative analysis and qualitative alloy identification

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Elemental Coverage & Detection Capability

The QL-CarbonX provides comprehensive elemental analysis across two critical material categories, meeting or exceeding all IAEA-specified detection limits and concentration ranges for both low-alloy and stainless steel matrices.

Low-Alloy Steels

Elements Detected: C, Al, Si, Ti, V, Cr, Mn, Ni, Cu, Nb, Mo, Pb

Full compliance with specified detection ranges for structural and engineering steel applications, enabling accurate grade identification and quality verification in field conditions.

Stainless Steels

Elements Detected: C, Al, Si, Ti, V, Cr, Mn, Ni, Cu, Nb, Mo, W

Optimized calibration curves for austenitic, ferritic, and martensitic stainless grades, with particular emphasis on carbon determination critical to corrosion resistance and mechanical properties.

Handheld Design

Field-ready portability for on-site analysis

Carbon & Alloy ID

Comprehensive elemental determination

Non-Destructive

Rapid analysis without material damage

100% Compliant

Zero deviations from IAEA RFQ 665846-MLP

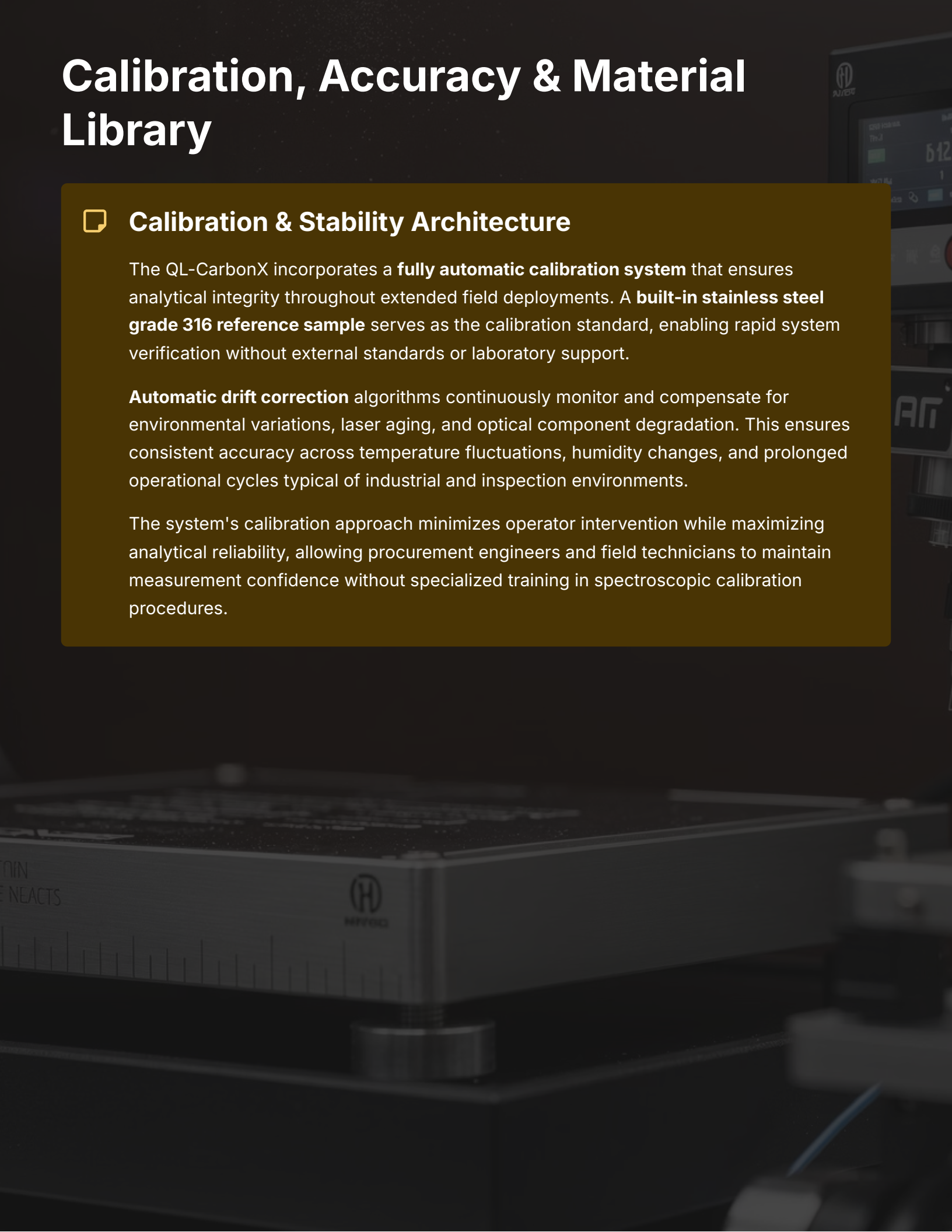
Calibration, Accuracy & Material Library

Calibration & Stability Architecture

The QL-CarbonX incorporates a **fully automatic calibration system** that ensures analytical integrity throughout extended field deployments. A **built-in stainless steel grade 316 reference sample** serves as the calibration standard, enabling rapid system verification without external standards or laboratory support.

Automatic drift correction algorithms continuously monitor and compensate for environmental variations, laser aging, and optical component degradation. This ensures consistent accuracy across temperature fluctuations, humidity changes, and prolonged operational cycles typical of industrial and inspection environments.

The system's calibration approach minimizes operator intervention while maximizing analytical reliability, allowing procurement engineers and field technicians to maintain measurement confidence without specialized training in spectroscopic calibration procedures.



Automatic Calibration

Fully automated calibration protocol eliminates manual intervention

Built-In Reference

SS 316 standard integrated for field verification

Drift Correction

Real-time compensation for environmental and aging effects

Material Library & Database Management

The analyzer ships with a comprehensive built-in library containing **≥ 500 steel and alloy grades**, covering international standards including ASTM, EN, DIN, JIS, and GB specifications. This extensive database enables immediate alloy identification across global material classifications without supplementary reference materials.

The library is **fully user-editable and expandable**, allowing procurement teams to add proprietary grades, regional specifications, or custom alloy compositions specific to IAEA inspection protocols. Users can create new grade definitions, modify concentration ranges, and organize materials into project-specific libraries for streamlined workflow and consistent reporting across inspection campaigns.

Measurement parameters are **user-selectable and optimized** per material type, with adjustable integration times balancing analytical precision against throughput requirements. The system provides high repeatability and stability for field conditions, ensuring reliable data generation even in challenging operational environments.

User Interface, Data & Communications

Operator Interface & Visualization Systems

The QL-CarbonX features a **≥ 2.7-inch color touchscreen display** engineered for outdoor visibility and gloved-hand operation. The interface presents real-time analytical results, spectral data, and grade identification in an intuitive format optimized for rapid decision-making during field inspections.

An **integrated sample viewing camera** provides visual documentation of each measurement location, enabling traceable records that link analytical data to specific inspection points. The **laser target designator** ensures precise positioning on complex geometries, critical edges, and weld zones where accurate placement determines measurement validity.

2.7" Color Touchscreen

High-visibility display with intuitive navigation

Integrated Camera

Sample viewing and documentation capability

Laser Targeting

Precise measurement point positioning

English Interface

All menus and displays in English language

Software Platform & Security

Built on an **Android-based embedded operating system**, the QL-CarbonX leverages proven mobile technology for reliability, security updates, and familiar user interaction paradigms. The platform supports sophisticated data management, wireless connectivity, and application extensibility while maintaining industrial-grade stability.

Password-protected user access ensures data integrity and prevents unauthorized operation, critical for quality assurance protocols and chain-of-custody requirements in regulatory inspection environments.

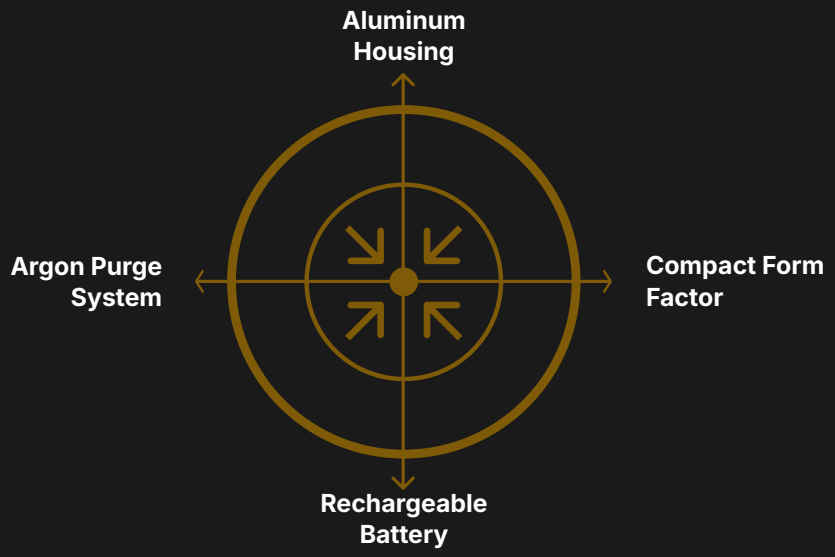
Data Storage & Connectivity Suite

The system provides **≥ 16 GB internal storage** for thousands of measurement records, spectral libraries, and calibration files. **SD card support (≥ 32 GB)** enables unlimited field data capacity and simplified data transfer.

Comprehensive connectivity includes:

- **Wi-Fi (IEEE 802.11 b/g/n):** Network integration and cloud synchronization
- **Bluetooth (BR/EDR + BLE):** Peripheral device pairing and data export
- **GPS:** Geolocation tagging for site mapping
- **USB-C:** High-speed data transfer and charging

Design, Power & Safety



The QL-CarbonX integrates mechanical robustness, ergonomic design, and advanced safety features in a compact package optimized for industrial field deployment and regulatory compliance.

Mechanical Architecture

The analyzer employs an **aluminum enclosure** that balances structural integrity with weight minimization, providing impact resistance and electromagnetic shielding in demanding inspection environments.

Dimensional Specifications:

- Width ≤ 220 mm
- Height ≤ 275 mm
- Thickness ≤ 60 mm
- Configuration: True handheld form factor

These dimensions ensure single-hand operation, access to confined spaces, and comfortable extended use during comprehensive inspection campaigns.

Power System & Argon Purge Technology

The QL-CarbonX is powered by a **rechargeable on-board lithium-ion battery** supporting full-shift operation without external power sources. The system accommodates both internal and external charging configurations, enabling continuous operation through battery swap protocols or field charging from vehicle or portable power supplies.

Li-Ion Battery

Rechargeable power for extended field deployment

Flexible Charging

Internal or external charging support

Argon Purge

Integrated Opti-Purge system for carbon accuracy

Argon Purge System (Opti-Purge)

Accurate carbon determination requires displacement of atmospheric oxygen and nitrogen from the laser ablation zone. The QL-CarbonX incorporates a proprietary **Opti-Purge argon delivery system** using replaceable mini-canisters integrated into the instrument handle.

Canister Capacity:

- **≥ 600 alloy samples** (without carbon determination)
- **≥ 125 steel samples** (with carbon determination)

This configuration eliminates the need for external argon cylinders, hoses, or regulators, dramatically improving field mobility while ensuring optimal purge gas delivery for precise low-concentration carbon measurement.

Safety Architecture & Marking

Comprehensive safety systems protect operators and comply with international laser safety standards:

- **Password protection:** Prevents unauthorized use
- **Laser safety controls:** Interlocks, indicators, and shutoff per specification
- **Safety markings:** All labels and warnings in English
- **Regulatory compliance:** Meets IAEA safety requirements

The system incorporates multiple layers of protection ensuring safe operation in industrial environments while maintaining compliance with procurement specifications and international safety regulations.

Delivery, Warranty & Compliance

1

Logistics & Delivery Terms

The QuakeLogic QL-CarbonX LIBS Analyzer will be delivered under **DAP (Delivered at Place) – Ukraine** terms in accordance with **Incoterms® 2020**. Under this arrangement, QuakeLogic assumes responsibility for transportation, export clearance, and delivery to the specified destination in Ukraine, with the buyer responsible for import clearance and unloading.

Lead time is stated in **weeks After Receipt of Order (ARO)** and will be confirmed upon order placement. All units are packed in protective cases suitable for international air shipment, meeting IATA regulations and ensuring instrument integrity throughout the logistics chain.

2

Warranty & Quality Assurance

QuakeLogic provides a **minimum twelve (12) month warranty** from the date of acceptance, covering defects in materials, workmanship, and performance. Warranty terms are **fully compliant with IAEA General Conditions of Contract**, ensuring alignment with procurement standards and expectations.

The QL-CarbonX is manufactured under an **ISO 9000-compliant quality management system**, ensuring consistent production standards, comprehensive testing protocols, and documented quality control at every manufacturing stage. Each unit undergoes **factory testing prior to shipment**, including calibration verification, performance validation, and functional testing across all subsystems.

12-Month Warranty

Comprehensive coverage from acceptance date

ISO 9000 Quality

Certified manufacturing standards

Factory Tested

Pre-shipment validation and calibration

Full Documentation

Complete package in English

Testing & Documentation Package

Each QL-CarbonX analyzer ships with a complete documentation package in English, including:

- **Certificate of Compliance:** Formal attestation of RFQ requirement fulfillment
- **Factory Test Reports:** Performance validation data and calibration records
- **User Manual:** Comprehensive operating instructions and maintenance procedures
- **Technical Specifications:** Detailed system parameters and performance characteristics
- **Safety Documentation:** Laser safety information and regulatory compliance certificates

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Compliance Statement

The **QuakeLogic QL-CarbonX LIBS Analyzer** is **100% compliant** with **IAEA RFQ No. 665846-MLP**. **No deviations, exceptions, or alternative conditions are proposed.** This offering represents a complete, conforming solution meeting all technical, functional, quality, safety, and administrative requirements specified in the IAEA Carbon Handheld Analyzer Specification dated January 26, 2026.

Advancing On-Site Elemental Analysis with QuakeLogic

Empowering **academic, laboratory, and public-sector field environments** with **high-accuracy carbon determination, rapid alloy identification, and compliance-driven analytical performance**, the **QuakeLogic QL-CarbonX LIBS Analyzer** sets a new standard for **handheld, research- and inspection-grade elemental analysis** in metallic materials.

Connect with QuakeLogic: Your Partner in handheld LIBS carbon and alloy analysis solutions.

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For strategic collaborations, enterprise-level instrumentation solutions, and comprehensive technical inquiries.

Our Unwavering Commitment to Operational Excellence

Certified Quality Assurance

Complying with international standards for product reliability, performance, and safety.

Pioneering Industry Leadership

Delivering advanced spectroscopy and sensing technologies that ensure precision, repeatability, and ease of use.

Dedicated Client Success

Providing responsive technical support, calibration guidance, and complete after-sales assistance for every system delivered.

Explore Our Complete Product Portfolio

Scan to Access Cutting-Edge Solutions

Discover how QuakeLogic's advanced machining technologies can transform your training programs, modernize your fabrication workflow, and elevate precision turning performance to new heights.

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