

WEG Digital Passport

Blockchain-Based Industrial Traceability

Start Presentation →

6/27/2025



The Problem: Industrial Traceability

Current Challenges

- **Complex Supply Chains:** 200+ suppliers across multiple countries
- **Lost Documentation:** 30% of equipment lacks complete history
- **No Verification:** No cryptographic proof of authenticity
- **Manual Processes:** Costly and error-prone compliance
- **Regulatory Pressure:** EU Digital Product Passport mandatory from 2027

Today's Equipment = "Black Box"

When you buy industrial equipment:

- **✗ Limited or lost documentation**
- **✗ Incomplete maintenance history**
- **✗ Unknown component origin**
- **✗ Disputed warranties**
- **✗ Complex compliance audits**

The Solution: Digital Passport

Experience Transformation

Before: "Black Box"

- Lost paper documentation
- Fragmented history
- Manual verification
- Authenticity disputes

After: "Total Transparency"

- 📱 **Instant Access** → Mobile verification
- 🤖 **Automation** → Automatic compliance
- 💡 **Analytics** → Predictive maintenance

Technical Foundation



Arbitrum Blockchain

- Public, neutral infrastructure
- Low cost (~\$0.01 per transaction)
- High performance (4,000+ TPS)
- EU legal compatibility



Ethereum Attestation Service

- Global standard for attestations
- Cryptographic proof of authenticity
- Immutable record keeping
- Cross-platform interoperability

Key Benefits

Business Value

Financial Impact

- **Premium Pricing:** Products with history sell 15-25% above market
- **Cost Reduction:** 40% fewer warranty disputes
- **Insurance Discounts:** Lower premiums for traceable equipment
- **New Revenue Streams:** Product-as-a-service opportunities

Competitive Advantage

- **First-mover advantage** in transparency
- **Brand differentiation** through trust
- **Customer confidence** with proof

Stakeholder Benefits



For Manufacturers (WEG)

- Complete product lifecycle tracking
- Enhanced brand trust and reputation
- Simplified compliance reporting
- Data-driven maintenance insights



For Customers

- Verified product authenticity
- Complete maintenance history
- Transparent warranty claims
- Predictive maintenance scheduling



For Regulators

- Automatic compliance verification
- Real-time audit capabilities

Why Blockchain? Why Now?

Market Drivers

Regulatory Mandates

- **EU Digital Product Passport:** Mandatory 2027
- **ESG Compliance:** Supply chain transparency
- **LGPD/GDPR:** Data protection requirements

Market Demand

- B2B customers require complete history
- Insurance companies offer discounts
- End consumers value transparency
- Sustainability becomes competitive advantage

Why Public Blockchain?

Trust Through Neutrality

- **No single company controls** the data
- **Global verification** without intermediaries
- **Immutable records** guaranteed by network
- **Interoperability** across entire ecosystem

Arbitrum Advantages

- **Low cost:** \$0.01 vs \$50+ on Ethereum
- **High performance:** 4,000+ transactions/second
- **Proven security:** Ethereum-level protection
- **EU compatible:** Supports legal compliance

Technical Architecture

Core Components



Smart Contracts

- **PassportRegistry**: Index of all products
- **DigitalPassportFactory**: Creates new passports
- **WEGManager**: Company-specific logic
- **Individual Passport**: One contract per product



Each Product Gets

- **Unique ID**: Permanent blockchain address
- **Event History**: All lifecycle events
- **Access Control**: Role-based permissions
- **Verification**: Cryptographic proofs

How It Works

1. Product Creation

WEG Factory → Creates Product →
Deploys Passport Contract →
Records Initial Data

2. Lifecycle Events

Transport → Maintenance →
Ownership Transfer →
Each Event = Blockchain Attestation

3. Verification

Blockchain Query →
Complete History →
Instant Verification

** User Experience**

- View complete history instantly

Integration & Scalability

System Integration

ERP Connection

- Seamless integration with SAP/Oracle
- Automatic data synchronization
- Real-time blockchain updates
- Legacy system compatibility

Data Management

- **On-chain:** Critical events & hashes
- **Off-chain:** Detailed documents (IPFS)
- **Hybrid approach:** Optimal cost vs security
- **Privacy controls:** Stakeholder-specific access

Scalability & Performance

Current Capacity

- **4,000+ transactions/second** on Arbitrum
- **\$0.01 average cost** per transaction
- **99.9% uptime** guaranteed by network
- **Instant verification** globally

Multi-Manufacturer Support

- Architecture supports multiple brands
- Shared infrastructure, separate data
- Cross-brand interoperability
- Industry-wide standards adoption

Future-Proof

- Ethereum ecosystem evolution
- Layer 2 scaling improvements

Use Case: WEG W22 Motor

Product Journey



Manufacturing (Brazil)

- **Product Creation:** WEG Jaraguá do Sul
- **Quality Tests:** All specs recorded
- **Component Tracking:** Supply chain verified
- **Initial Attestation:** Blockchain record created



Distribution

- **Export Process:** Port of Itajaí
- **Transport Conditions:** Temperature monitored
- **International Shipping:** To Germany
- **Each Step:** Blockchain attestation

Real Value in Action



Practical Benefits

- **Technician Access:** Service history on mobile
- **Insurance Claims:** Cryptographic proof
- **Resale Value:** Verified condition increases price
- **Compliance:** Automatic environmental reporting



Results

- **40% reduction** in warranty disputes
- **25% increase** in customer satisfaction
- **15% premium** on verified products
- **60% faster** compliance audits




Stakeholder Experience



Technician Before

- Paper manuals lost
- Unknown service history
- Manual part lookup
- Guesswork on maintenance

After




-  **Scan QR** → Complete history
-  **Smart recommendations** based on data
-  **Digital work orders** auto-generated



Procurement Manager Before

- Unknown product condition
- Manual verification process
- Warranty disputes
- Limited supplier data

After




-  **Verified authenticity** before purchase
-  **Complete performance data** available
-  **Instant warranty** verification



Auditor Before

- Manual document review
- Weeks of verification
- Paper trail gaps
- Compliance uncertainty

After

-  **Instant compliance** verification
-  **Cryptographic proof** of records
-  **Automated reporting** generation

Implementation Roadmap

Phase 1: Pilot (Q2 2025)

Scope

- **50 WEG motors** in controlled environment
- **3 key customers** for testing
- **Basic blockchain integration** with ERP
- **Mobile app** for verification

Success Metrics

- 100% product tracking accuracy
- 50% reduction in verification time
- 90% customer satisfaction
- Zero data loss incidents

Phase 2: Scale (Q3-Q4 2025)

Expansion

- **10,000+ products** per month
- **Full product line** coverage
- **Partner integration** (distributors, service)
- **Advanced analytics** and insights

Phase 3: Industry Standard (2026)

- Multi-manufacturer platform
- International expansion
- Regulatory compliance automation
- Industry ecosystem integration

Questions & Next Steps

💡 Discussion Topics

Technical

- Integration with existing systems
- Data privacy and security
- Scalability considerations
- Cost-benefit analysis

Business

- ROI timeline and metrics
- Customer adoption strategy
- Competitive differentiation
- Regulatory compliance

🚀 Ready to Start?

Next Actions

1. **Technical Deep Dive:** Architecture review
2. **Pilot Planning:** Scope and timeline
3. **Integration Assessment:** Current systems
4. **Business Case:** ROI calculation

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Ready to transform industrial traceability?

Let's schedule a technical demonstration and discuss implementation details.

Thank You!

Questions & Discussion



Scan to see a demo of the Digital Passport